THE WORLD COMES HERE

TMS 2020

149th Annual Meeting & Exhibition

February 23-27, 2020
San Diego Convention Center and Marriott Marquis & Marina
San Diego, California, USA • www.tms.org/TMS2020
#TMSAnnualMeeting

PRELIMINARY TECHNICAL PROGRAM

The content in this preliminary program was generated on December 10, 2019. However, changes are still being implemented for the technical program. Please refer to the online session sheets for the most up-to-date information.

11th International Symposium on High Temperature Metallurgical Processing
Mon AM: Simulation of High-Temperature Processes
Mon PM: Energy Efficient Clean Metallurgical Technologies
Tue AM: Fundamentals of Metallurgical Processes
Tue PM: High-Temperature Processing
Tue Poster: Poster Session
Wed AM: Extraction and Recovery of Metals
Wed PM: Process Optimization
Thu AM: Preparation of Alloys and Materials
Thu AM: Sintering and Pelletizing
Thu PM: Ironmaking and Steelmaking
Thu PM: Utilization of Complex Ores

2020 Institute of Metals Lecture/Robert Franklin Mehl Award
Wed AM: 2020 Institute of Metals Lecture/Robert Franklin Mehl Award

2020 Light Metals Keynote Session
Mon AM: Attracting and Growing the Next Generation of Technical Talent for the Light Metals Industry

Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling
Mon Poster: Poster Session
Thu AM: Current and Advanced Structural Materials II
Tue PM: Current and Advanced Nuclear Fuels
Wed AM: Accelerated Materials Evaluation
Wed PM: Current and Advanced Structural Materials I

Acta Materialia Symposium
Tue PM: Award Session

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications
Mon AM: Processing-Structure-Property-Performance I
Mon Poster: Poster Session
Tue AM: Processing-Structure-Property-Performance II
Tue PM: Processing-Structure-Property-Performance III
Wed AM: Processing-Structure-Property-Performance IV
Wed PM: Joint Session with Fatigue in Materials Symposium - Microstructure-based Fatigue Studies on Additive-Manufactured Materials
Thu AM: Property Prediction I
Thu PM: Property Prediction II

Additive Manufacturing for Energy Applications II
Mon Poster: Poster Session
Tue AM: Qualification, Intensification and Up-scaling
Tue PM: Modelling
Wed AM: Characterization I
Wed PM: Nuclear
Thu AM: Heat Transfer Components and Joining
Thu PM: Characterization II

Additive Manufacturing of Functional and Energy Materials
Mon Poster: Poster Session
Wed AM: Energy Materials
Wed PM: Shape Memory Alloys
Thu AM: Magnetic Materials
Thu PM: Novel Applications

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques
Mon AM: Synchrotron, Neutron, and In Situ Techniques: Keynote
Mon Poster: Poster Session
Tue AM: High Speed X-ray Imaging and Diffraction
Tue PM: Residual Stress: Neutron, X-ray, and Other Measurements
Wed AM: Industrial Applications and Perspectives
Wed PM: Structure and Microstructure
Thu AM: In Situ Monitoring and Diagnostics: Directed Energy Deposition
Thu PM: In Situ Monitoring and Diagnostics: Powder Bed

Additive Manufacturing: Alternative Processes (Beyond the Beam)
Mon AM: Binder Jetting
Mon Poster: Poster Session
Tue AM: Emerging Additive Processes
Tue PM: Sintering and Novel Processes
Wed AM: Solid State Processes

Additive Manufacturing: ICME Gap Analysis
Tue AM: Session I
Tue PM: Session II

Additive Manufacturing: Materials Design and Alloy Development II
Mon AM: Fundamentals of Alloy Design
Mon Poster: Poster Session
Tue AM: Alloy Design- Aluminum Alloys
Tue PM: Alloy Design-Aluminum Alloys and Composites
Wed AM: Alloy Design-High Temperature and Fe based Alloys
Wed PM: Alloy Design- Titanium Alloys
Thu AM: Alloy Design-Accelerated Development and Modeling
Thu PM: Alloy Design-Functional Materials

Additive Manufacturing: Processing Effects on Microstructure and Material Performance
Mon AM: Process Variables I
Mon Poster: Poster Session
Tue AM: Solidification
Tue PM: Post Processing
Wed AM: Process Variables II
Wed PM: Al-alloys and Other Materials
Wed PM: Residual Stress and Texture
Thu AM: Porosity
Thu PM: Microstructure and Mechanical Properties

Advanced Characterization Techniques for Quantifying and Modeling Deformation
Mon AM: Phase Transformation Plasticity, Grain Boundaries, and Interfaces
Mon PM: Deformation Twinning
Tue AM: Dislocations and Planar Faults
Tue PM: Local Strain / Misorientation I
Tue Poster: Poster Session
Wed AM: Local Strain / Misorientation II
Wed PM: Plasticity Modeling / Experiments
Thu AM: Deformation

Advanced High Strength Steels IV
Tue AM: Session I
Tue PM: Session II
Tue Poster: Poster Session
Wed AM: Session III
Wed PM: Session IV
Thu AM: Session V
Thu PM: Session VI

Advanced Magnetic Materials for Energy and Power Conversion Applications
Mon AM: Application of Advanced Soft Magnetic Materials in Power Electronics and Motors
Mon PM: Developments in Magnetic Materials for Sensors and Data Storage
Mon Poster: Poster Session
Tue AM: High-energy Product Permanent Magnets
Tue PM: Magnetocalorics and Energy Harvesting
Wed AM: Structures and Modelling of Soft Magnetic Materials
Wed PM: Developments in Rare-earth Free Permanent Magnets
Thu AM: Advances in Characterization and Design of Emerging Permanent Magnetic Materials
Thu PM: Additive Manufacturing of Magnetic Materials

Advanced Materials for Energy Conversion and Storage VI
Mon AM: Energy Conversion and Storage I
Mon PM: Sustainability Materials
Mon Poster: Poster Session
Tue AM: Energy Conversion with Emphasis on SOFC
Tue PM: Functional Materials for Energy
Wed AM: Energy Storage with Emphasis on Batteries I
Wed PM: Energy Storage with Emphasis on Batteries II
Thu AM: Energy Conversion and Storage III
Thu AM: Young Investigator and Energy Conversion and Storage II
Thu PM: Energy Conversion and Storage IV

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder
Mon AM: Quality and Reliability of Advanced Microelectronic Packaging
Mon PM: Advanced Microelectronic Packaging Materials
Mon Poster: Poster Session
Tue AM: Pb-free Solder Alloys I
Tue PM: 3D Microelectronic Packaging and Emerging Interconnects I
Wed AM: Pb-free Solder Alloys II

Wed PM: 3D Microelectronic Packaging and Emerging Interconnects II
Thu AM: Solder Joint Intermetallics

Advanced Real Time Imaging
Mon AM: Emerging Techniques
Mon PM: Alloys
Tue AM: Iron & Steelmaking
Tue PM: Bio-Nano Interfaces and Engineering Applications (Joint Session)
Tue Poster: Poster Session
Wed AM: Mechanical
Wed PM: Energy & Environment

Advanced Solid Phase Processing Symposium
Mon AM: Advanced Friction Processing and Severe Plastic Deformation
Mon PM: Fundamental Deformation Mechanisms
Tue AM: Advanced Applications and Modeling
Tue PM: Additive Approaches
Tue Poster: Poster Session

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films
Mon AM: Non-equilibrium Nanostructures
Mon PM: 2-dimensional Materials and Thin Films
Tue AM: Metal Oxide Thin Films
Tue PM: Nanocomposites
Tue Poster: Poster Session

Advances in Biomaterials for 3D Printing
Mon Poster: Poster Session
Thu AM: Advances in Biomaterials for 3D Printing

Advances in Powder and Ceramic Materials Science
Mon AM: Structure Design and Processing
Mon PM: Advanced Ceramics and Processes
Tue AM: Ceramic Nanoparticles and Powder
Tue PM: Ceramic-based Composite Materials
Tue Poster: Poster Session

Advances in Surface Engineering II
Mon AM: Session I
Mon PM: Session II
Tue Poster: Poster Session

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys
Mon AM: Alternate Processes
Mon PM: Environmental Damage and Protection
Mon Poster: Poster Session
Tue AM: Processing – Casting, Forging, Heat Treatment
Tue PM: Ni-based Superalloys – Structure & Properties
Wed AM: Co-based Superalloys – Structure & Properties
Wed PM: Ni-based Superalloys – Modeling Structure & Properties
Thu AM: Welding, Joining, Rejuvenation, Surface Treatment

Algorithm Development in Materials Science and Engineering
Mon AM: Electronic Scale Calculations and Machine Learning
Mon PM: Interatomic Potential Developments and Atomistic Modeling I
Tue AM: Interatomic Potential Developments and Atomistic Modeling II
Tue PM: Machine Learning and Atomistic Algorithms
Tue Poster: Poster Session
Wed AM: Algorithms and Machine Learning Approaches for Microscale
Wed PM: Models and Algorithms for Microscale
Thu AM: Microscale Experiments and Machine Learning

Alloys and Compounds for Thermoelectric and Solar Cell Applications VIII
Mon Poster: Student Poster Session
Tue AM: Session I
Tue PM: Session II
Wed AM: Session III
Wed PM: Session IV

Alumina and Bauxite
Mon PM: Bauxite, Impurities and Alternative Processes
Mon Poster: Poster Session
Tue AM: Bayer Process and Iron
Tue PM: Residue Reuse and Remediation

Aluminum Alloys, Processing and Characterization
Mon PM: Characterization of Aluminium Alloys
Mon Poster: Poster Session
Tue AM: New and Optimized Aluminium Alloys I
Tue PM: Properties of Aluminium Alloys I
Wed AM: New and Optimized Aluminium Alloys II
Wed PM: Properties of Aluminum Alloys II
Thu AM: Processing of Aluminium Alloys

Aluminum Reduction Technology
Mon PM: Modelling
Tue AM: Reduction Cell Operation and Process Control
Tue PM: Spent Pot Lining (SPL) -Joint session with Aluminum Reduction Technology Symposium
Wed AM: Fundamental
Wed PM: Alumina: Transport Systems, Feeding and Dissolution
Thu AM: Environment
Thu PM: Reduction Cell Technology and Development

Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials III
Wed AM: General Methods and Development
Wed PM: Applications in Alloys and Ceramics

Biodegradable Materials for Medical Applications II
Mon AM: Magnesium Implants
Mon PM: Magnesium Implants II
Mon Poster: Poster Session
Tue AM: Polymers and Ceramics
Tue PM: Zinc and Iron Implants

Biological Materials Science
- Mon AM: Biological and Natural Materials I
- Mon PM: Biomimetic and Bioinspired Materials
- Mon Poster: Poster Session
- Mon Poster: Student Poster Competition
- Tue AM: Biomaterials I
- Tue PM: Biological and Natural Materials II
- Wed AM: Biomaterials II
- Wed PM: Bioenabled Materials

Bio-Nano Interfaces and Engineering Applications
- Mon Poster: Poster Session
- Tue PM: Bio-Nano Interfaces and Engineering Applications (Joint Session)
- Wed AM: Bio-Nano Interfaces I
- Wed PM: Bio-Nano Interfaces II
- Thu AM: Bio-Nano Interfaces III

Bladesmithing 2020
- Wed AM: Session I
- Wed PM: Session II

Bulk Metallic Glasses XVII
- Tue Poster: Poster Session
- Wed AM: Alloy Development and Application I
- Wed PM: Structures and Mechanical Properties
- Thu AM: Alloy Development and Application II
- Thu AM: Structures and Modeling
- Thu PM: Mechanical and Other Properties
- Thu PM: Structures and Characterization

Cast Shop Technology
- Mon PM: EHS and Cast House Products
- Mon Poster: Poster Session
- Tue AM: Melting and Casting
- Tue PM: Melt Treatment
- Wed PM: Grain Refinement and Cast Structure
- Thu AM: Virtual Cast Shop and Specialties

Cast Shop Technology: Recycling and Sustainability Joint Session
- Wed AM: Recycling and Sustainability Joint Session

Characterization of Minerals, Metals and Materials
- Mon AM: Advances in Characterization Methods I
- Mon PM: Advances in Characterization Methods II
- Mon PM: Mineral Processing and Analysis I
- Tue AM: 3D Characterization
- Tue AM: Minerals Processing and Analysis II
- Tue PM: Characterization of Mechanical Properties I
- Tue Poster: Poster Session
- Wed AM: Mineral Processing and Analysis III

Wed PM: Characterization of Corrosion Resistance
Thu AM: Characterization of Electronic and Magnetic Materials
Thu AM: Characterization of Polymers and Composites I
Thu AM: Characterization of Surface, Thin Films and Coatings
Thu PM: Characterization of Mechanical Properties II
Thu PM: Characterization of Polymers and Composites II

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification

Mon AM: Structural Descriptors Enabling PSP Linkages
Mon PM: Structural Descriptors Enabling PSP Linkages
Tue AM: Grain Boundary Descriptors
Tue PM: 3D Microstructure Descriptors & Uncertainty
Wed AM: Diffraction, Microscopy & Machine Learning
Wed PM: Microscopy & Machine Learning

Coatings and Surface Engineering for Environmental Protection II

Mon Poster: Poster Session
Wed AM: Corrosion Control Session I
Wed PM: Corrosion Control Session II
Thu AM: Corrosion Control Session III

Computational Discovery and Design of Emerging Materials

Mon AM: Session I
Mon PM: Session II
Tue AM: Session III
Tue PM: Session IV
Tue Poster: Poster Session
Thu AM: Session V
Thu PM: Session VI

Computational Materials Science and Engineering of Materials in Nuclear Reactors

Mon Poster: Poster Session
Tue AM: Chemical Interactions and Modeling
Tue PM: Microstructure and Atomistic Simulations
Wed AM: Defects and Modeling
Wed PM: Thermomechanical Properties and Modeling
Thu AM: Multiscale Modeling I
Thu PM: Multiscale Modeling II

Computational Thermodynamics and Kinetics

Mon AM: Microstructural Evolution and Phase Stability I
Mon PM: Microstructural Evolution and Phase Stability II
Tue AM: Solid-Liquid Transformations and Properties
Tue PM: Defects and Kinetics
Tue Poster: Poster Session
Wed AM: Diffusion, Excitations and Rare Events I
Wed PM: Diffusion, Excitations and Rare Events II
Thu AM: Data and High Throughput Methods I
Thu PM: Data and High Throughput Methods II

Current Trends in Magnetocaloric Materials: An FMD Symposium in Honor of Ekkes Brueck
Mon AM: Characterization of Structure and Magnetic Properties of Magnetocaloric Materials
Mon PM: Phase Equilibria and Magnetic Structure of Magnetocaloric Materials
Tue AM: Strain Enhanced Magnetocaloric, Barocaloric Materials, and Thermomagnetic Generators

Defects and Properties of Cast Metals
Mon AM: Defects I - Molten Metal and Inclusions
Mon PM: Defects II & Properties I
Tue AM: Properties II
Tue PM: Porosity & Cracking
Tue Poster: Poster Session
Wed AM: Cast Iron & Steel
Wed PM: Continuous Casting

Deformation and Transitions at Grain Boundaries VII
Mon AM: Grain Boundary Structure: Disconnections, Complexions, Twins
Mon PM: Grain Boundary structure: FCC and Hexagonal
Mon Poster: Poster Session
Tue AM: Grain Boundary Effects at the Nanoscale
Tue PM: Grain Boundary Evolution
Wed AM: Grain Boundary-Dislocation Interactions
Wed PM: Grain Boundary Decohesion and Fracture
Thu AM: Mesoscale Characterization and Simulation of Polycrystal Deformation

Electrode Technology for Aluminum Production
Mon PM: Carbon Anode Development and Production - Where is the Cutting Edge?
Tue AM: Anode Production
Tue PM: Spent Pot Lining (SPL) -Joint session with Aluminum Reduction Technology Symposium
Wed AM: Anode Assembly and Cathodes
Wed PM: Raw Materials

Electrometallurgy 2020
Mon AM: Hydrometallurgy
Mon PM: Molten Salts
Tue AM: Applications to Battery or Materials Synthesis
Tue Poster: Poster Session

Energy Technologies and CO2 Management Symposium
Mon AM: Session I
Mon PM: Session II
Mon Poster: Poster Session
Tue AM: Session III
Tue PM: Session IV

Environmental Degradation of Additively Manufactured Alloys
Mon Poster: Poster Session
Wed PM: Perspective, Challenges and Opportunities of Additively Manufactured Alloys in Corrosive Environments / High Temperature Oxidation and Corrosion
Thu AM: Environmental Assisted Cracking, Material Degradation in Irradiated Environments
Thu PM: Aqueous Corrosion

Environmentally Assisted Cracking: Theory and Practice
- Mon Poster: Poster Session
- Tue AM: Stress Corrosion Cracking I
- Tue PM: Hydrogen Embrittlement I
- Wed AM: Innovative Techniques in Corrosion Research
- Wed PM: Stress Corrosion Cracking II
- Thu AM: Environmental Embrittlement, Fracture, and Fatigue
- Thu AM: Hydrogen Embrittlement II
- Thu PM: Corrosion and Fracture in Harsh Environments

Expanding the Boundaries of Materials Science: Unconventional Collaborations
- Mon AM: Multidisciplinary Research
- Mon PM: Unconventional Collaborations

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling
- Mon AM: Fatigue Characterization Using Advanced Experimental Methods in 2D and 3D
- Mon PM: Crack Initiation Mechanisms and Crack Growth Behavior
- Mon Poster: Poster Session
- Tue AM: Data-Driven Investigations of Fatigue
- Tue PM: Multi-mechanical Interactions during Extreme Environment Fatigue Loading
- Wed AM: Multiscale Modeling Approaches to Improve Fatigue Predictions
- Wed PM: Joint Session with Fatigue in Materials Symposium - Microstructure-based Fatigue Studies on Additive-Manufactured Materials

Fracture Modeling of Composite Materials
- Mon AM: Fracture Modeling of Composite Materials

Frontiers of Materials Award Symposium: Leveraging Materials in Topology Optimization
- Tue AM: Session I
- Tue PM: Session II

Frontiers of Materials Award Symposium: Machine Learning and Autonomous Researchers for Materials Discovery and Design
- Thu AM: Session I
- Thu PM: Session II

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies
- Mon AM: Translating Innovation into Pioneering Technologies I
- Mon PM: Translating Innovation into Pioneering Technologies II
- Tue AM: Translating Innovation into Pioneering Technologies III
- Tue PM: Translating Innovation into Pioneering Technologies IV
- Tue Poster: Poster Session I
- Tue Poster: Poster Session II
- Wed AM: Translating Innovation into Pioneering Technologies V
- Wed PM: Translating Innovation into Pioneering Technologies VI

General Poster Session
- Mon Poster: Additive Technologies
- Tue Poster: Advanced Materials
- Mon Poster: Biomaterials

Tue Poster: Characterization
Mon Poster: Corrosion
Mon Poster: Electronic Materials
Mon Poster: Energy & Environment
Mon Poster: Light Metals
Tue Poster: Materials Design
Tue Poster: Materials Processing
Mon Poster: Mechanics & Structural Relilability
Tue Poster: Nanostructured and Heterostructured Materials
Mon Poster: Nuclear Materials
Tue Poster: Physical Metallurgy

High Entropy Alloys VIII
Tue Poster: Poster Session I
Tue Poster: Poster Session II
Wed AM: Alloy Development and Applications
Wed PM: Structures and Mechanical Properties
Thu AM: Modeling and Machine Learning
Thu AM: Structures and Modeling I
Thu AM: Synthesis and Alloy Development
Thu PM: Structures and Characterization
Thu PM: Structures and Modeling II
Thu PM: Thermal and Other Properties

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering
Mon AM: Opening Session
Mon PM: CALPHAD and First Principles
Tue AM: Applications
Tue PM: CALPHAD Future Directions
Wed AM: Building CALPHAD Databases: Essential Experiments
Wed PM: CALPHAD Thermodynamic and Diffusion Database Development

ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design
Tue Poster: Poster Session
Wed AM: Session I
Wed PM: Session II
Thu AM: Session III
Thu PM: Session IV

Innovations in High Entropy Alloys and Bulk Metallic Glasses: An SMD & FMD Symposium in Honor of Peter K. Liaw
Mon AM: High Entropy Alloys: Mechanical Properties
Mon PM: High Entropy Alloys: Alloy Design and Processing
Tue AM: High Entropy Alloys: Other Properties and Modeling
Tue PM: Bulk Metallic Glasses and Other Materials

Low-cost Titanium: 'Affordable Ti'
Mon AM: Session I
Mon PM: Session II
Tue Poster: Poster Session

Magnesium Technology 2020
Mon AM: Keynote Session
Mon PM: Alloy Development
Mon Poster: Poster Session
Tue AM: Alloy Design and Solidification
Tue PM: Fundamentals, Mechanical Behavior, Twinning, Plasticity, and Texture I
Wed AM: Thermomechanical Processing
Wed PM: Corrosion
Thu AM: Solidification and Production of Magnesium
Thu PM: Fundamentals, Mechanical Behavior, Twinning, Plasticity, and Texture II

Material Behavior Characterization via Multi-Directional Deformation of Sheet Metal
Mon AM: Session I
Mon PM: Session II
Tue AM: Session III
Tue PM: Session IV

Materials and Chemistry for Molten Salt Systems
Mon Poster: Poster Session
Wed AM: Corrosion I
Wed PM: Salt Properties and Fundamental Science
Thu AM: Corrosion II
Thu PM: Electrochemistry

Materials Design Approaches and Experiences V
Mon AM: Alloy Design Strategy and Tools
Mon PM: Superalloys
Wed AM: High Entropy Alloys and High Temperature Alloys
Wed PM: Light Metals
Thu AM: Ferrous Alloys I
Thu PM: Ferrous Alloys II

Materials Processing Fundamentals
Tue PM: Nucleation, Crystallization, and Solidification
Tue Poster: Poster Session
Wed AM: Thermomechanical Processing
Wed PM: Thermodynamic Modeling
Thu AM: Steelmaking Process Modeling and Composites
Thu PM: Molten Metal Processing

Materials Research in Reduced Gravity
Wed AM: Programmatics and Facility Status; Thermophysical Properties I
Wed PM: Solidification I
Thu AM: Thermophysical Properties II
Thu PM: Solidification II

Mechanical Behavior at the Nanoscale V
- Mon AM: Microstructure Effects
- Mon PM: Size Effects
- Tue AM: Modeling
- Tue PM: Deformation
- Tue Poster: Poster Session
- Wed AM: In-Situ Testing I
- Wed PM: In-Situ Testing II
- Thu AM: Dislocations
- Thu PM: Deformation and Failure

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling
- Tue AM: Session I
- Tue PM: Session II
- Wed AM: Session III
- Wed PM: Session IV
- Thu AM: Session V
- Thu PM: Session VI

Metal-Matrix Composites: Analysis, Modeling, Observations and Interpretations
- Mon AM: Marvels of Microstructure
- Mon PM: Processing - Microstructure - Performance
- Tue AM: Mechanical Properties and Performance
- Tue PM: Analysis and Characterization Techniques

Metastable Phases and Phase Equilibria: Towards Designing the Next Generation of Alloys
- Tue Poster: Poster Session
- Wed AM: Session I
- Wed PM: Session II

Microstructural Template Consisting of a Face-Centered Cubic Matrix with Ordered Precipitates: Microstructural Evolution and Properties
- Mon AM: Al Base Alloys
- Mon PM: Ni Base Superalloys
- Tue AM: Complex Concentrated Alloys/High Entropy Alloys
- Tue PM: Other FCC Based Alloys

Nanocomposites VI: Nanoscience and Nanotechnology in Advanced Composites
- Wed AM: Processing and Fabrication of Nanocomposites
- Wed PM: Microstructure and Properties of Nanocomposites
- Thu AM: Processing-Properties-Performance of Nanocomposites
- Thu PM: Polymer and Other Nanocomposites

Nix Award and Lecture Symposium: Mechanistic Understanding of Mechanical Behavior Across Length Scales
- Wed AM: Session I
- Wed PM: Session II

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing

Mon AM: Lead and Zinc Future Outlook: Plenary Session
Mon AM: PbZn Process Fundamentals I
Mon AM: Secondary Zinc I
Mon AM: Zinc Electrowinning
Mon PM: PbZn Process Technologies
Mon PM: Primary Lead
Mon PM: Primary Zinc I
Tue AM: By-product Recovery I
Tue AM: Lead and Zinc Current Challenges and Opportunities: Plenary Session
Tue AM: Primary Zinc II
Tue AM: Zinc Leaching & Fe-control I
Tue PM: PbZn Process Fundamentals II
Tue PM: PbZn Sustainability
Tue PM: Secondary Lead
Tue PM: Zinc Hydrometallurgy
Tue Poster: Poster Session
Wed AM: By-product Recovery II
Wed AM: Environmental & Safety Practices
Wed AM: Lead and Zinc Sustainability and Social License: Plenary Session
Wed AM: Mineral Processing
Wed PM: Lead Refining
Wed PM: Secondary Zinc II
Wed PM: Zinc Leaching & Fe-control II

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIX

Mon AM: Interfacial Reaction of Electronic Materials
Mon PM: Advanced Electronic Materials
Mon Poster: Poster Session
Tue AM: Phase Stability of Energy Materials
Tue PM: Advanced Electronic Interconnection

Phase Transformations and Microstructural Evolution

Mon AM: Modeling and Simulation
Mon PM: Martensitic Transformation
Tue AM: Microstructure and Precipitation I
Tue PM: Microstructure and Precipitation II
Tue Poster: Poster Session
Wed AM: Phase Transformations in Ferrous Alloys
Wed PM: Phase Transformations in Non-Ferrous Alloys
Thu AM: General Topics I
Thu PM: General Topics II

Powder Materials for Energy Applications

Mon Poster: Poster Session
Wed AM: Ceramic Powder Materials
Wed PM: Metal Powder Systems
Thu AM: Additive Manufacturing and Harsh Environment Materials

Thu PM: Novel Materials and Processes

Process Metallurgy and Electrochemistry of Molten Salts, Liquid Metal Batteries, and Extra-terrestrial Materials Processing: An EPD Symposium in Honor of Don Sadoway

Wed AM: Prof. Sadoway Honorary Session I
Wed PM: Prof. Sadoway Honorary Session II
Thu AM: Prof. Sadoway Honorary Session III
Thu PM: Prof. Sadoway Honorary Session IV

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday

Mon AM: Overview and Nanostructured Metals I
Mon PM: Nanostructured Metals II
Tue AM: Nanostructured Metals III
Tue PM: Materials Design and Advanced Characterization
Tue Poster: Poster Session
Wed AM: Additive Manufacturing
Wed PM: High-entropy Alloys
Thu AM: Synthesis and Mechanical Behavior
Thu PM: Light-weight Alloys

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin

Mon AM: Superalloys
Mon PM: Additive Manufacturing
Tue AM: Titanium Alloys
Tue PM: Modeling
Wed AM: Enhanced Properties via Thermomechanical Processing
Wed PM: Advances and Challenges in ICME

Radiation Effects in Metals and Ceramics

Mon AM: Advanced Techniques of Radiation Damage Characterization
Mon PM: Synergy of Irradiation and Corrosion Processes
Mon Poster: Poster Session I
Mon Poster: Poster Session II
Tue AM: Irradiation of Fe-based Systems
Tue PM: Chemical and Phase Stability under Irradiation
Wed AM: Mechanical Assessment of Irradiated Microstructures
Wed PM: Irradiation of Welds&Irradiation of High Entropy Alloys
Thu AM: Irradiation of Ceramics and Uranium Fuels
Thu PM: Irradiation of Zircinium, Tungsten and Copper Systems

Rare Metal Extraction & Processing

Mon AM: Lithium, Cobalt, Rare Earth Metals
Mon PM: Rare Earth Metals
Tue AM: PGM, Zn, V, Ti, U, Th, In, Ag, Fe
Tue PM: V, Mn, Co, Zn, Mo, Cu, REEs
Tue Poster: Poster Session

Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications
- Mon AM: Printed Electronics Advances
- Mon PM: Printed Electronics I: Functional Materials and Devices
- Mon Poster: Poster Session
- Tue AM: Printed Electronics II: Functional Materials and Devices
- Tue PM: Printed Electronics III: Functional Materials and Devices

Recent Developments in Biological, Structural and Functional Thin Films and Coatings
- Mon AM: Lubricant-free Forming Processes
- Mon PM: Biomedical and PolymericApplications
- Mon Poster: Poster Session
- Tue AM: Functional Films and Coatings
- Tue PM: Functional Thin Films and Coatings I
- Wed AM: Functional Thin Films and Coatings II

Recycling of Secondary, Byproduct Materials and Energy
- Mon AM: Recycling of Ferrous Materials
- Mon PM: Recycling of Non-ferrous Materials
- Mon Poster: Poster Session
- Tue AM: Recycling of E-Waste
- Tue PM: Reducing EMbodied-energy and Decreasing Emissions (REMADE)
- Wed AM: Environmental and Energy Aspects

Refractory Metals 2020
- Mon AM: Nb Processing and Applications; Mechanical Behaviors of Refractory Metals
- Mon PM: Refractory Metal Alloys, Silicides, and Composites
- Tue AM: Refractory Metals Production and Processing

Solar Cell Silicon
- Mon AM: Synthesis, Production, and Refyning
- Mon PM: Properties, Photovoltaics, and Other Applications

Solid State Diffusion Bonding of Metals and Alloys
- Mon AM: Solid State Diffusion Bonding of Metals and Alloys I
- Mon PM: Solid State Diffusion Bonding of Metals and Alloys II
- Tue AM: Solid State Diffusion Bonding of Metals and Alloys III
- Tue Poster: Poster Session

Thermal Transport in Crystalline and Non-crystalline Solids: Theory and Experiments
- Mon AM: Fundamentals of Phonon Mediated Thermal Transport
- Mon PM: Multiscale Thermal Transport
- Tue AM: Electron Mediated Transport and Thermoelectrics
- Tue PM: Interfaces

TMS 2020 Annual Meeting & Exhibition: All-comference Plenary
- Mon AM: All-Conference Plenary

Ultrafine-grained and Heterostructured Materials (UFGH XI)
- Mon AM: Microstructure & Property
- Mon PM: Processing & Microstructure I
- Tue AM: Fundamentals
- Tue PM: Processing & Microstructure II
- Tue Poster: Poster Session I
- Tue Poster: Poster Session II
- Wed AM: Processing, Microstructure & Property
- Wed PM: Fundamentals & Processing
- Thu AM: Processing & Property

Understanding and Predicting Dynamic Behavior of Materials
- Mon AM: Spall Fracture un Metals -- Modeling and Experiments
- Mon PM: Behavior of High Explosives
- Tue AM: Strength in Metals
- Tue PM: Deformation in Metals
- Wed AM: Metals/HE Interactions -- ejecta and frag
- Wed PM: Equation of State
- Thu AM: Composites and Brittle Materials
- Thu PM: Materials in Extremes

Use of Large Scale Facilities to Understand the Physical Metallurgy of Fe-based Alloys
- Mon AM: Session I
- Mon PM: Session II

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Simulation of High-Temperature Processes

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Monday AM | February 24, 2020
12 | San Diego Convention Ctr

Session Chairs: Jiann-Yang Hwang, Michigan Technological University; Jesse White, Elkem Carbon AS

8:00 AM Introductory Comments

8:15 AM
Hydraulic Model Study of Combined Blowing in 65t Electric Arc Furnace (EAF): *Xuetao Wu*[1]; Rong Zhu[1]; Guangsheng Wei[1]; Kai Dong[1]; Lingzhi Yang[2]; [1]University of Science and Technology, Beijing; [2]Central South University

8:35 AM
Simulation Model for Slag/Refractory-corrosion in the Metallurgical Engineering: *Christoph Sagadin*[1]; [1]Montanuniversitaet Leoben

8:55 AM
A New and Highly Efficient Argon Blowing Mode for a 70t Steelmaking Ladle: Zhanpeng Tie[1]; Qun Hu[1]; Xiaosong Li[1]; Jinwen Liu[1]; Jiaquan Zhang[1]; Zhanbing Yang[1]; *Haiyan Tang*[1]; [1]University of Science and Technology Beijing

9:15 AM
A Kinetic Model for the Interaction of FeO with MgO-14.5 wt. % C Refractory under the Conditions of the Novel Flash Ironmaking Technology (FIT): *Rahul Sarkar*[1]; Hong Yong Sohn[1]; [1]University of Utah

9:35 AM Break

9:50 AM
Development of a Heat and Mass Transfer Model for a Shaft Kiln to Preheat Manganese Ore with Hot Air: *Sifiso Sambo*[1]; Susanna Hockaday[1]; Tumi Seodigeng[2]; [1]MINTEK; [2]Vaal University of Technology

10:10 AM
Numerical Simulation Study on Optimization of Large Capacity Single Strand Tundish Flow Control Devices: *Aiping Zhang*[1]; Ming Mei Zhu[1]; Yong Zhong[1]; Bing Huang[1]; [1]Chongqing University

10:30 AM
Predictive Modelling and Optimization of the Variant Combinations of Material Ratios in the Gasification-reduction Coupling Process: *Yiru Yang*[1]; Lei Guo[1]; Qipeng Bao[1]; Zhancheng Guo[1]; [1]University of Science and Technology Beijing

LIGHT METALS

2020 Light Metals Keynote Session — Attracting and Growing the Next Generation of Technical Talent for the Light Metals Industry

Sponsored by: TMS Light Metals Division, TMS: Aluminum Comittee

Program Organizer: Corleen Chesonis, Metal Quality Solutions, LLC

Monday AM | February 24, 2020
6D | San Diego Convention Ctr

Session Chair: Corleen Chesonis, Metal Quality Solutions LLC

8:00 AM Introductory Comments

8:05 AM Keynote
Feeding the Talent Pipeline: A New Zealand Perspective on Diversity in STEM: *Margaret Hyland*[1]; [1]Victoria University of Wellington

8:35 AM Keynote
The Future of Light Metals Technology and Education: Opportunities and Challenges: *Alan Luo*[1]; [1]The Ohio State University

9:05 AM Keynote
Novelis' Technical Career Path, a Structure to Create Your Future: *Robert Wagstaff*[1]; [1]Novelis Inc.

9:35 AM Break

9:55 AM Keynote
The Norwegian Perspective: *Nina Dahl*[1]; [1]SINTEF Industry

10:25 AM Keynote
Talent Acquisition and Development from a Hatch Perspective: *Joe Lombard*[1]; [1]Hatch

10:55 AM Panel Discussion

11:25 AM Concluding Comments

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Processing-Structure-Property-Performance I

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Monday AM | February 24, 2020
7B | San Diego Convention Ctr

Session Chair: Mohsen Seifi, ASTM International

8:00 AM Invited
Fatigue in γ-TiAl Produced by Additive Manufacturing: *Mauro Filippini*[1]; [1]Politecnico Di Milano

8:30 AM
Effect of Microstructural Features on Fatigue Behaviour of Hastelloy X Manufactured by Selective Laser Melting and Electron Beam Melting: *Amal Shaji Karapuzha*[1]; Darren Fraser[2]; Xinhua Wu[1]; Aijun Huang[1]; [1]Monash Centre for Additive Manufacturing (MCAM), Monash University; [2]CSIRO

8:50 AM
Crack Propagation in Dual-phase Titanium Alloys Made by Additive Manufacturing: In-situ Tensile and EBSD Studies: *Zhiying Liu*[1]; Yu Zou[1]; [1]University of Toronto

9:10 AM
Linking Porosity Characteristics to the Mechanical Properties of Additive Manufactured AlSi10Mg and 316 Stainless Steel: *Christopher Laursen*[1]; Jay Carroll[1]; Philip Noell[1]; David Moore[2]; [1]Sandia National Laboratories, Materials Mechanics and Tribology; [2]Sandia National Laboratories, Nondestructive Evaluation and Experimental Mechanics

9:30 AM Break

9:50 AM Invited
Mechanical Behavior of Induced Lack of Fusion Flaws in AlSi10Mg: *Brett Conner*[1]; John Lewandowski[2]; Austin Ngo[2]; Varthula De Silva Jayasekera[1]; Griffin Jones[3]; Kenneth Meinert[3]; [1]Youngstown State University; [2]Case Western Reserve University; [3]Pennsylvania State University Applied Research Lab

10:20 AM
Additively Manufactured Lightweight Designed Car Suspension Double Wishbone by Electron Beam Melting: *Pan Wang*[1]; Mui Ling Sharon Nai[1]; Jun Wei[1]; [1]Singapore Institute of Manufacturing Technology (SIMTech)

10:40 AM
Predicting the Integrity of Additively Manufactured Nickel Alloys: Quantifying the Evolution of Texture and Elastic Constants Using Resonant Ultrasound Spectroscopy: *Jeffrey Rossin*[1]; Marie-Agathe Charpagne[1]; Brent Goodlet[1]; Chris Torbet[1]; Michael Groeber[2]; Bill Musinski[2]; Jonathan Miller[2]; Stephen Smith[3]; Samantha Daly[1]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Air Force Research Laboratory; [3]NASA Langley Research Center

11:00 AM
Flaw Identification in Additively Manufactured Components: Capabilities and Limitations: Griffin Jones[1]; Rachel Reed[2]; *Jayme Keist*[1]; Veeraraghavan Sundar[2]; [1]Penn State; [2]UES, Inc.

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — Synchrotron, Neutron, and In Situ Techniques: Keynote

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Monday AM | February 24, 2020
8 | San Diego Convention Ctr

Session Chairs: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory

8:00 AM Introductory Comments

8:10 AM Keynote
3D Printing, Porosity, Synchrotron Experiments and Machine Learning: *Anthony Rollett*[1]; [1]Carnegie Mellon University

8:40 AM Keynote
Using High Energy X-ray Diffraction to Probe Additively Manufactured Metals over a Range of Length and Time Scales: *John Carpenter*[1]; Donald Brown[1]; Bjorn Clausen[1]; Maria Strantza[1]; Jason Cooley[1]; Reeju Pokharel[1]; Erik Watkins[1]; [1]Los Alamos National Laboratory

9:10 AM Keynote
Utilization of Backscattered Electrons for Process Monitoring During Electron Beam Melting: *Carolin Korner*[1]; Christopher Arnold[1]; Christoph Breuning[1]; [1]University of Erlangen-Nuremberg

9:40 AM Break

10:00 AM Keynote
The Important Contribution of Synchrotron X-ray and Neutron Measurements to Metal Additive Manufacturing Benchmarks: *Lyle Levine*[1]; Fan Zhang[1]; Thien Phan[1]; Maria Strantza[2]; Bjorn Clausen[3]; Donald Brown[3]; Darren Pagan[4]; Andrew Allen[1]; Jan Ilavsky[5]; [1]National Institute of Standards and Technology; [2]Lawrence Livermore National Laboratory ; [3]Los Alamos National Laboratory; [4]Cornell High Energy Synchrotron Source; [5]Advanced Photon Source

10:30 AM Keynote
Investigating the Mechanics of Additively Manufactured Materials Using Neutron Diffraction: *Allison Beese*[1]; Zhuqing Wang[2]; Alexandru Stoica[3]; Dong Ma[3]; [1]Pennsylvania State University; [2]Kennametal; [3]Oak Ridge National Laboratory

11:00 AM Keynote
Sensor Enabled Material Optimization in Powder Bed Fusion Additive Manufacturing: *Justin Gambone*[1]; Subhrajit Roychowdhury[1]; Xiaohu Ping[1]; [1]GE Research

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Alternative Processes (Beyond the Beam) — Binder Jetting

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Powder Materials Committee

Program Organizers: Paul Prichard, Kennametal Inc.; Matthew Dunstan, U.S. Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal; James Paramore, U.S. Army Research Laboratory

Monday AM | February 24, 2020
7A | San Diego Convention Ctr

Session Chair: Paul Prichard, Kennametal

8:00 AM
Material Property Comparison of Parts Produced Using Binder Jet 3D Printing with Water and Gas Atomized Powders: *Andrew Klein*[1]; Kyle Myers[1]; [1]ExOne

8:20 AM
Multifunctional Binder for Binder Jet Additive Manufacturing: Dustin Gilmer[1]; Lu Han[2]; Michelle Lehmann[1]; Amy Elliott[2]; *Tomonori Saito*[2]; [1]The University of Tennessee; [2]Oak Ridge National Laboratory

8:40 AM
Multi-physics Modeling Fframework of Binder Jetting Process: *Wenda Tan*[1]; [1]University of Utah

9:00 AM
Evolution of Pore Distribution in the Binder Jetting of WC-Co: *Paul Prichard*[1]; [1]Kennametal Inc.

9:20 AM
Effects of Printing Parameters on Green and Final Part Density of Binder Jet Printed WC-Co: *Katerina Kimes*[1]; Pierangeli Rodriguez De Vecchis[1]; Danielle Brunetta[1]; Drew Elhassid[2]; Markus Chmielus[1]; [1]Univ of Pittsburgh; [2]General Carbide Corporation

9:40 AM Break

10:00 AM
Processing Parameters for H13 Utilizing Binder Jet Additive Manufacturing: *Dustin Gilmer*[1]; Tomonori Saito[1]; Peeyush Nandwana[2]; Amy Elliott[2]; [1]University of Tennessee Knoxville/Oak Ridge National Laboratory Bredesen Center; [2]Oak Ridge National Laboratory

10:20 AM
3D-printing and Consolidation of 316L Stainless Steel Powder Components: *Ifeanyichukwu Olumor*[1]; Geuntak Lee[1]; Eugene Olevsky[1]; [1]Mechanical Engineering, San Diego State University

10:40 AM
Effect of Print Parameters on Dimensional Accuracy and Sintering Behavior of Binder Jet 3D Printed Water and Gas Atomized Inconel 625: *Runbo Jiang*[1]; Lorenzo Monteil[1]; Markus Chmielus[1]; [1]University of Pittsburgh

11:00 AM
The Effect of Sintering Condition on the Microstructure Evolution of Binder-jet Printed IN625 Alloy: Amir Mostafaei[1]; *Chuyuan Zheng*[2]; Pierangeli Rodriguez[2]; Ian Nettleship[2]; Markus Chmielus[2]; [1]Carnegie Mellon University; [2]University of Pittsburgh

11:20 AM
Effect of Print Processing Parameters on the Green Part Properties and Densification Behavior in Binder Jet 3D Printed Co-Cr Biomaterials: *Amir Mostafaei*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Fundamentals of Alloy Design

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Monday AM | February 24, 2020
6F | San Diego Convention Ctr

Session Chair: Behrang Poorganji, GE Additive

8:00 AM Introductory Comments Behrang Poorganji

8:05 AM Keynote
Additive Manufacturing and Architected Materials: New Process Developments and Materials: *Christopher Spadaccini*[1]; [1]Lawrence Livermore National Laboratory

8:35 AM Keynote
Accelerated Development of Functional Materials via Additive Manufacturing: *Ryan Ott*[1]; Fanqiang Meng[1]; Emrah Simsek[1]; Ikenna Nlededim[1]; Matthew Kramer[1]; [1]Ames Laboratory/Cmi

9:05 AM
Development of Non-equilibrium Thermodynamic Tools for Additive Manufacturing: *Kaisheng Wu*[1]; Deepankar Pal[2]; Adam Hope[1]; Paul Mason[1]; [1]Thermo-Calc Software Inc; [2]ANSYS Inc.

9:25 AM
Alloy Development For Additive Manufacturing For High Volume Automotive Applications: *Anil Sachdev*[1]; [1]General Motors Global Research & Development

9:45 AM Break

10:00 AM Keynote
An Overview of Metal Alloy Development Needs and Activities at NASA JPL: *Douglas Hofmann*[1]; [1]NASA JPL/Caltech

10:30 AM Invited
Thinking Beyond the Prototypical ICME Approach: Alloy Design for Additive Manufacturing: *Peter Collins*[1]; Richard LeSar[1]; [1]Iowa State University

10:55 AM Invited
Solidification Based Alloy Design for Metal Additive Manufacturing: *Mark Easton*[1]; Michael Benoit[1]; Duyao Zhang[1]; Dong Qiu[1]; David StJohn[2]; Milan Brandt[1]; [1]RMIT University; [2]University of Queensland

11:20 AM
Uncertainty Quantification in Additive Manufacturing from CALPHAD to ICME Models: *Jiadong Gong*[1]; Changning Niu[1]; Abhinav Saboo[1]; Jason Sebastian[1]; Greg Olson[1]; [1]QuesTek Innovations LLC

11:40 AM
A Coupled Phase Field - Mechanics Framework for Process-microstructure-property Relationships in Additively Manufactured Multi-component Metallic Alloys: *Kartikey Joshi*[1]; Siu Sin Quek[1]; David Wu[1]; [1]Institute of High Performance Computing

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Process Variables I

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Monday AM | February 24, 2020
6E | San Diego Convention Ctr

Session Chairs: Eric Lass, The University of Tennessee, Knoxville; Joy Gockel, Wright State University

8:00 AM
Towards Accelerated Maturation of Additive Titanium Alloys: *Soumya Nag*[1]; Neil Johnson[1]; Lee Kerwin[2]; Yiming Zhang[1]; Sathyanarayanan Raghavan[1]; Sreekar Karnati[1]; Eric MacDonald[3]; Alex Kitt[2]; Changjie Sun[1]; Genghis Khan[1]; Chris Williams[4]; Thomas Broderick[5]; Mark Benedict[5]; Dave Siddle[6]; [1]GE Research; [2]EWI - Buffalo Manufacturing Works; [3]Youngstown State University; [4]GE Aviation; [5]Air Force Research Laboratory; [6]America Makes

8:20 AM
Process-structure-property Relationships for As-built Inconel 718 Thin Walls Manufactured with the Laser Powder Bed Fusion Process: *Paul Paradise*[1]; Mandar Shinde[1]; Sridhar Niverty[1]; Dhruv Bhate[1]; Nikhilesh Chawla[1]; [1]Arizona State University

8:40 AM
Selection of Process Parameters for Controlling Microstructural Properties in Additive Manufacturing: A Machine Learning Based Approach: Sudeepta Mondal[1]; Daniel Gwynn[1]; Asok Ray[1]; *Amrita Basak*[1]; [1]Pennsylvania State University

9:00 AM
P-V Process Optimization for Microstructure Homogeneity and Cracking Control of SLM-fabricated H13 Tool Steel: *Yining He*[1]; Nicholas Jones[1]; Ming Zhong[1]; Bryan Webler[1]; Jack Beuth[1]; [1]Carnegie Mellon Univ

9:20 AM
Experimental and Numerical Studies on Melt Pools of Single Tracks Processed by Laser Powder Bed Fusion: *Yoon Suk Choi*[1]; Jaewoong Kim[1]; Seulbi Lee[1]; [1]Pusan National University

9:40 AM Break

10:00 AM
Laser Beam Shaping for the Additive Manufacturing of Metal Components with Reduced Texture and Equiaxed Grains: *Tien Roehling*[1]; John Roehling[1]; Rongpei Shi[1]; Saad Khairallah[1]; Gabe Guss[1]; Joseph McKeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

10:20 AM
Tailoring Microstructure Through Beam Shaping: *Saad Khairallah*[1]; Rongpei Shi[1]; Tien Roehling[1]; Tae Wook Heo[1]; Joseph Mckeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

10:40 AM
Microstructure and Materials Properties for Scanning Multiple Lateral Laser Spots in Selective Laser Melting: *Jyi Sheuan Ten*[1]; Hang Li Seet[1]; Sharon Mui Ling Nai[1]; [1]Singapore Institute of Manufacturing Technology

11:00 AM
A Comparison Between Multi-scale Area Analysis and ISO Surface Roughness Parameters for Characterizing Additively Manufactured Surfaces: *Nathaniel Rutkowski*[1]; Christopher Brown[1]; Sneha Narra[1]; [1]Worcester Polytechnic Institute

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Phase Transformation Plasticity, Grain Boundaries, and Interfaces

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Monday AM | February 24, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: Eric Homer, Brigham Young University; Amy Clarke, Colorado School of Mines

8:00 AM Invited
TRIP/TWIP of Structural Metallic Alloys for Performance in Extreme Environments: *Amy Clarke*[1]; Benjamin Ellyson[1]; John Copley[1]; Francisco Coury[2]; Jonah Klemm-Toole[1]; Yaofeng Guo[1]; Jinling Gao[3]; Chandler Becker[1]; Brian Milligan[1]; Christopher Finfrock[1]; Chloe Johnson[1]; Kester Clarke[1]; Wayne Chen[3]; Niranjan Parab[4]; Tao Sun[4]; Kamel Fezzaa[4]; [1]Colorado School of Mines; [2]Universidade Federal de São Carlos; [3]Purdue University; [4]Advanced Photon Source, Argonne National Laboratory

8:30 AM
A Critical Assessment of the Dual-TRIP Effect: Beneficial or Not?: *Shaolou Wei*[1]; Jinwoo Kim[1]; Cemal Tasan[1]; [1]Massachusetts Institute of Technology

8:50 AM
Reversible Phase Transformations in a Metastable Beta Titanium Alloy Resolved with Quantitative Electron Microscopy: *Kui Du*[1]; Lu Qi[1]; Chunjin Chen[1]; Yulin Hao[1]; Rui Yang[1]; Hengqiang Ye[1]; [1]Institute of Metal Research

9:10 AM
Investigating the Microstructure and Mechanical Behavior Relationship of Advanced Titanium Alloys Using High-energy Diffraction In-situ Tensile Testing: *Priya Ravi*[1]; Diwakar Naragani[1]; Jun-Sang Park[2]; Kartik Kapoor[1]; Ryan Noraas[3]; Vasisht Venkatesh[3]; Jonathan Almer[2]; Michael Sangid[1]; [1]Purdue University; [2]Argonne National Laboratory; [3]Pratt & Whitney

9:30 AM Break

9:50 AM Invited
Simulations of Grain Boundary-dislocation Interactions in FCC Nickel: *Eric Homer*[1]; David Page[1]; Devin Adams[1]; Ricky Wyman[1]; David Fullwood[1]; Robert Wagoner[2]; [1]Brigham Young University; [2]Ohio State University

10:20 AM Invited
Characterization of 3-D Slip Fields in Deforming Polycrystals: *Darren Pagan*[1]; Kelly Nygren[1]; Matthew Miller[2]; [1]Cornell High Energy Synchrotron Source; [2]Cornell University

10:50 AM
Slip and Hydrides in Zirconium: Siyang Wang[1]; Finn Giuliani[1]; *Thomas Britton*[1]; [1]Imperial College London

11:10 AM
A Quantitative Study of Slip Band-Grain Boundary Interactions in Mg Alloys: *Mohsen Taheri Andani*[1]; Aaditya Lakshmanan[1]; Veera Sundararaghavan[1]; John Allison[1]; Amit Misra[1]; [1]University of Michigan

11:30 AM
Room Temperature Interface Sliding in TIMETAL-407: *Zachary Kloenne*[1]; Gopal Viswanathan[1]; Matt Thomas[2]; Michael Loretto[3]; Hamish Fraser[1]; [1]Ohio State University; [2]TIMET; [3]University of Birmingham

---

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Application of Advanced Soft Magnetic Materials in Power Electronics and Motors

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Monday AM | February 24, 2020
Del Mar | Marriott Marquis Hotel

Session Chair: Alex Leary, NASA Glenn Research Center

8:00 AM Invited
Metal Amorphous Nanocomposite (MANC) Soft Magnetic Materials (SMM) for Motor Applications.: *Michael McHenry*[1]; Satoru Simizu[1]; Kevin Byerly[2]; Paul Ohodnicki[2]; Subhashish Bhattacharya[3]; [1]Carnegie Mellon University; [2]NETL; [3]North Carolina State University

8:25 AM Invited
Strain Annealed Co-rich and Fe-rich Nanocrystalline Materials for Inductive Components: *Christian Polak*[1]; [1]Vacuumschmelze Gmbh & Co. Kg

8:55 AM Invited
New Trends in the Amorphous and Nanocrystalline Soft Magnetic Ribbon Market: *Eric Theisen*[1]; [1]Metglas Inc.

9:20 AM Invited
Processing and Advanced Characterization of Selectively Paramagnetized Laminates for Synchronous Reluctance Motors: *Orlando Rios*[1]; Hunter Henderson[1]; Min Zou[2]; Craig Bridges[1]; Michael Kesler[1]; Michael Brady[1]; [1]Oak Ridge National Laboratory; [2]GE Global Research

9:50 AM Break

10:05 AM
Multi-objective Design of Permeability Engineered Soft Magnetic Metal Amorphous Nanocomposite Cores: *Paul Ohodnicki*[1]; Vinicius Cabral Do Nascimento[1]; Richard Beddingfield[1]; Kevin Byerly[1]; Seung-Ryul Moon[1]; Scott Sudhoff[2]; [1]National Energy Technology Laboratory; [2]Purdue University

10:25 AM
Dual Phase Soft Magnetic Laminates for Permanent Magnet Assisted Synchronous Reluctance Electric Machines: Shenyan Huang[1]; *Min Zou*[1]; Wanming Zhang[1]; Joseph Zierer[1]; Anoop Jassal[1]; Vandana Rallabandi[1]; Steve Buresh[1]; PR Subramanian[1]; [1]GE Research

10:45 AM
Continuous Strain Anneal Processing of Amorphous Ribbons for Inductor Applications: *Kevin Byerly*[1]; Paul Ohodnicki[1]; Seungryul Moon[1]; Byron Beddingfield[2]; Satoru Simizu[3]; Alex Leary[4]; Vladimir Keylin[4]; Eric Theisen[5]; M.E. McHenry[3]; [1]National Energy Technology Laboratory; [2]North Carolina State University; [3]Carnegie Mellon University; [4]NASA Glenn Research Center; [5]Metglas, Inc.

11:05 AM
Designing High Efficiency, High Power Transformers with Metal Amorphous Nanocomposites: *Richard Beddingfield*[1]; Subhashish Bhattacharya[2]; Kevin Byerly[3]; Seung Moon[3]; Alex Leary[4]; Ronald Noebe[4]; Randy Bowman[4]; Michael McHenry[5]; Paul Ohodnicki[1]; [1]National Energy Technology Laboratories; [2]North Carolina State University; [3]Leidos, Contractor for National Energy Technology Laboratory; [4]NASA Glenn Research Center; [5]Carnegie Mellon University

11:25 AM
Tunable Power Inductors Utilizing Magnetoelectric PZT/Metglas Composites: *Mark Nations*[1]; Paul Ohodnicki[1]; Subhashish Bhattacharya[1]; [1]North Carolina State University

---

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Energy Conversion and Storage I

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Monday AM | February 24, 2020
16B | San Diego Convention Ctr

Session Chairs: Soumendra Basu, Boston University; Partha Mukherjee, Purdue University

---

8:00 AM Keynote
Isolating the Thermophysical and Electrochemical Signatures of Internal Faults within an Intensively Coupled System, Lithium-ion Batteries: Rachel Carter[1]; Connor Fear[2]; Aashutosh Mistry[2]; Partha Mukherjee[2]; *Corey Love*[1]; [1]US Naval Research Laboratory; [2]Purdue University

8:30 AM Keynote
Challenges for Future Electric Vehicle Battery System: *Koichiro Aotani*[1]; [1]Nissan Motor Co., Ltd.

9:00 AM Keynote
Design, Fabrication and Performance of Thin-film Solid Oxide Fuel Cells: *Nguyen Minh*[1]; Yoon Ho Lee[1]; Tuyen Tran[1]; Haowen Ren[2]; Eric Fullerton[2]; Erik Wu[3]; Ying Meng[3]; [1]Center for Energy Research, University of California, San Diego; [2]Material Science and Engineering Program, University of California, San Diego; [3]Department of Nanoengineering, University of California San Diego

9:30 AM Break

9:50 AM Invited
Flexible Multimodal In-situ Characterization Approaches for Understanding Battery Electrode Cycling: *Shen Dillon*[1]; [1]University of Illinois

10:10 AM Invited
Rare-earth Nickelate Cathodes for Air Independent Operation of Solid Oxide Fuel Cell Systems: Jane Banner[1]; *Srikanth Gopalan*[1]; [1]Boston University

10:30 AM Keynote
Synthesis, Design and Fabrication of Oxide Thermoelectrics via Plasma Spray Technology: *Sanjay Sampath*[1]; Felipe Caliari[1]; [1]Stony Brook University

11:00 AM Invited
Alternative Spinel for Advanced Protective Layer for SOFC Stacks: *Jung Pyung Choi*[1]; Jeffry Stevenson[1]; [1]Pacific Northwest National Laboratory

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — Quality and Reliability of Advanced Microelectronic Packaging

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Monday AM | February 24, 2020
Palomar | Marriott Marquis Hotel

Session Chairs: Andre Delhaise , Celestica Inc.; Luke Wentlent, Universal Instruments

8:00 AM Introductory Comments

8:05 AM
Synchrotron X-ray Study of Sn Electromigration, Sn Whisker Growth, and Residual Strain Evolution in A Blech Structure: *Pei-Tzu Lee*[1]; Wan-Zhen Hsieh[2]; Cheng-Yu Lee[3]; Xiao-Yun Li[2]; Shao-Chin Tseng[2]; Mau-Tsu Tang[2]; Ching-Shun Ku[2]; C. Robert Kao[1]; Cheng-En Ho[3]; [1]National Taiwan University; [2]National Synchrotron Radiation Research Center; [3]Yuan Ze University

8:25 AM
Recrystallized Shallow Grains as the Whisker Growth Sites in Large-grain Sn-alloy Films: Wei-Hsun Chen[1]; *Congying Wang*[2]; John Blendell[2]; Carol Handweker[2]; [1]ASML; [2]Purdue University

8:45 AM
Using Applied Pressure to Make Tin Whiskers Grow: Measurements and Analysis: *Nupur Jain*[1]; Piyush Jagtap[1]; Allan Bower[1]; Eric Chason[1]; [1]Brown University

9:05 AM
Tin Whisker Growth on Pb-Free, Bi-containing Solder Alloys after Ambient Temperature, High Humidity Storage: *Andre Delhaise*[1]; Zohreh Bagheri[1]; Stephan Meschter[2]; Jeffrey Kennedy[1]; Polina Snugovsky[1]; [1]Celestica; [2]BAE Systems

9:25 AM Break

9:45 AM
Effects of Electrical Current Stressing to the Formation of Whiskers/Hillocks on Sn-0.7Cu-0.05Ni-1.5Bi and Sn-0.7Cu-0.05Ga Solder Alloys: *Noor Zaimah Mohd Mokhtar*[1]; Mohd Arif Anuar Mohd Salleh[1]; [1]University Malaysia Perlis

10:05 AM Invited
Micro Interconnect Mechanical Stability in Cryogenic Temperature Environments: Ande Kitamura[1]; Ruben Contreras[1]; *Tae-Kyu Lee*[1]; [1]Portland State University

10:25 AM Invited
Comparison of Corrosion Resistance between Electroless and Electroplating Ni/Pd/Au Surface Finish on PCB: *Albert T. Wu*[1]; Yi-Ting Shen[1]; Nico Li[2]; Freeze Wang[2]; Chih-Yuan Hsiao[2]; [1]National Central University; [2]Taiwan Uyemura Co.

10:45 AM
Chlorination and Power Cycling Characteristics of Fine Au/Pd Coated Copper Wire: *Che-Hao Chang*[1]; Fei-Yi Hung[1]; [1]National Cheng Kung University

11:05 AM
Electromigration in 2µm Nano-twinned Cu Redistribution Lines: *Hung-Hsuan Li*[1]; Chih Chen[1]; [1]National Chiao Tung University

CHARACTERIZATION

Advanced Real Time Imaging — Emerging Techniques

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Monday AM | February 24, 2020
Theater A-4 | San Diego Convention Ctr

Session Chair: To Be Announced

8:00 AM Keynote
X-ray Phase Contrast Imaging of Dynamic Compression of Additively Manufactured High-solids-loaded Polymer Composites: Karla Wagner[1]; Andrew Boddorff[1]; Greg Kennedy[1]; Min Zhou[1]; *Naresh Thadhani*[1]; [1]Georgia Institute of Technology

8:40 AM Invited
Ultrafast Synchrotron X-ray Imaging Studies of Ultrasonic Processing of Structural and Functional Materials: *Jiawei Mi*[1]; [1]School of Engineering University of Hull

9:00 AM
In-situ TEM Analysis of Mechanical Behavior of the 3D Printed Alloys Exposed to High Temperature: *Supriya Koul*[1]; Le Zhou[1]; Yongho Sohn[1]; Akihiro Kushima[1]; [1]University of Central Florida

9:20 AM
Spatial and Time-dependent Uranium Oxidation Measurements using White-Light Interferometry: *Yaakov Idell*[1]; Mark Wall[1]; Wigbert Siekhaus[1]; Kerri Blobaum[1]; William McLean[1]; [1]Lawrence Livermore National Laboratory

9:40 AM Break

10:00 AM Invited
Observing the Growth of Hydrated Crystalline Calcium Carbonate by In-situ Liquid Cell Transmission Electron Microscopy: *Yiping Su*[1]; [1]Southern University of Science and Technology

10:20 AM Invited
Atomically Visualizing Elemental Segregation Induced Surface Alloying and Restructuring: *Guangwen Zhou*[1]; [1]State University of New York

10:40 AM
An Investigation of the Impact Changes in Gas Composition, Flow Rate, and Heating/Cooling Rates Have on a Simulated Gasifier Slag Using a Confocal Laser Microscope: *Carlos Ortiz*[1]; Jinichiro Nakano[2]; Anna Nakano[2]; James Bennett[3]; [1]Oak Ridge Institute for Science and Education ; [2]Leidos Research Support Team; [3]U.S. Department of Energy National Energy Technology Laboratory

11:00 AM
The Mechanisms of Ultrasound Metrology in Metal Melt: *Bitong Wang*[1]; Andrew Caldwell[2]; Antoine Allanore[2]; Douglas Kelley[1]; [1]University of Rochester; [2]Massachusetts Institute of Technology

10:30 AM
Thermo-mechanical Processing of ZK Series Magnesium Alloys for Improved Low Temperature Performance: *Guney Yapici*[1]; [1]Ozyegin University

10:50 AM
Incremental Equal Channel Angular Pressing as a Tool for Manufacturing Large Ultra-fine Grained Copper Rods: *Marta Ciemiorek*[1]; Piotr Bartkowski[1]; Witold Chrominski[1]; Lech Olejnik[1]; Malgorzata Lewandowska[1]; [1]Warsaw University Of Technology

11:10 AM
Tailoring the Magnetic Properties of Nanostructured Alloys by Severe Plastic Deformation: Martin Stückler[1]; Lukas Weissitsch[1]; Stefan Wurster[1]; Heinz Krenn[2]; *Andrea Bachmaier*[1]; [1]Erich Schmid Institute, Austrian Academy of Sciences; [2]Institute of Physics, University of Graz

ADVANCED MATERIALS

Advanced Solid Phase Processing Symposium — Advanced Friction Processing and Severe Plastic Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, University of California, Riverside; Cynthia Powell, Pacific Northwest National Laboratory; Kester Clarke, Colorado School of Mines; Anthony Reynolds, University of South Carolina; Mostafa Hassani, Cornell University

Monday AM | February 24, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Suveen Mathaudhu, UC Riverside; Mageshwari Komarasamy, Pacific Northwest National Laboratory

8:00 AM Invited
Thermally Stable Nanostructured Immiscible Alloys via Friction Stir Processing: *Rajiv Mishra*[1]; [1]University of North Texas

8:25 AM Invited
Linear Friction Welding of Ti Components: Investigation of Residual Stress and Fatigue Performance: Ritwik Bandyopadhyay[1]; *Michael Sangid*[1]; [1]Purdue University

8:50 AM
Structure-Property Correlations in Friction Stir Welded 304L Stainless Steel: *Madhumanti Bhattacharyya*[1]; Arnab Kundu[1]; Indrajit Charit[1]; Krishnan Raja[1]; Jens Darsell[2]; Saumyadeep Jana[2]; [1]University of Idaho; [2]Pacific Northwest National Laboratory

9:10 AM
Investigation of Metastable Structure Evolution in Friction Consolidation: *Mageshwari Komarasamy*[1]; Xiao Li[1]; Scott Whalen[1]; Glenn Grant[1]; [1]Pacific Northwest National Laboratory

9:30 AM
Joining Dissimilar Materials via Rotational Hammer Rivet Technique: *Tianhao Wang*[1]; Scott Whalen[1]; Woongjo Choi[1]; [1]Pacific Northwest National Laboratory

9:50 AM Break

10:10 AM Invited
Recent Developments in Upscaling High Pressure Torsion: *Anton Hohenwarter*[1]; Reinhard Pippan[2]; [1]University of Leoben; [2]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — Non-equilibrium Nanostructures

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Srinivasa Rao Singamaneni, University of Texas at El Paso; Amit Pandey, MicroTesting Solutions; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | February 24, 2020
Solana | Marriott Marquis Hotel

Session Chairs: Ritesh Sachan, Oklahoma State University; Amit Pandey, Ansys

8:00 AM Keynote
Discoveries of Q-carbon and Q-BN and Direct Conversion of Carbon into Diamond and h-BN into c-BN: *Jagdish Narayan*[1]; Ritesh Sachan[2]; [1]North Carolina State University; [2]Oklahoma State University

8:40 AM Invited
Quasi-one-dimensional Mo Chains for Efficient Hydrogen Evolution Reaction: Yong Pei[1]; Bingan Lu[2]; *Rao Apparao*[3]; [1]Xiangtan University; [2]Hunan University; [3]Clemson University

9:10 AM Invited
Laser Processing in the Transmission Electron Microscope: *Gerd Duscher*[1]; Chenze Liu[1]; Yu-Chuan Lin[2]; Yueying Wu[1]; Philip Rack[1]; Mathew Chisholm[2]; Alexander Pureztky[2]; David Geohegan[2]; [1]University of Tennesse; [2]Oak Ridge National Laboratory

9:40 AM Break

10:00 AM Invited
Emergence of Shallow Energy Levels in B-doped Q-carbon: A high- temperature Superconductor: *Ritesh Sachan*[1]; Jagdish Narayan[2]; Jordan Hachtel[3]; Juan Idrobo[3]; [1]Oklahoma State University; [2]North Carolina State University; [3]Oak Ridge National Laboratory

10:30 AM
Controlling Nanoscale Eutectic Microstructures in Directionally Laser Melted Al-Cu Alloyed Thin Films: *Eli Sullivan*[1]; John Tomko[1]; Jonathan Skelton[1]; Patrick Hopkins[1]; James Fitz-Gerald[1]; Jerrold Floro[1]; [1]University of Virginia

10:55 AM
Fabrication of Nanodiamond and Q-carbon by Ultrafast Quenching of Carbon Structures for Electron Field Emission Devices: *Ariful Haque*[1]; Ritesh Sachan[1]; Jagdish Narayan[1]; [1]North Carolina State University

11:20 AM
Microstructure Morphology and Concentration Modulation of Bicontinuous Nanocomposite Thin-films during Physical Vapor Deposition: James Stewart[1]; *Remi Dingreville*[1]; [1]Sandia National Laboratories

11:40 AM
Synthesis and Densification of Functional Metal-oxide Nano Bulk Composite with Far from Equilibrium State: *Yasuhiro Kodera*[1]; A Volodchenkov[1]; Kyle Chan[1]; Takahito Imai[2]; Javier Garay[1]; [1]University of California, San Diego; [2]Ryukoku University

---

CHARACTERIZATION

Advances in Powder and Ceramic Materials Science — Structure Design and Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Sergio Monteiro, Military Institute of Engineering; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama

Monday AM | February 24, 2020
Theater A-6 | San Diego Convention Ctr

Session Chairs: Jinhong Li, China University of Geosciences (Beijing); Rajiv Soman, Eurofins EAG Materials Science, LLC

8:00 AM Introductory Comments

8:05 AM Invited
Progress on Porous Ceramics for Heat-insulation: *Chang-An Wang*[1]; [1]Tsinghua University

8:25 AM
Structure, Chemistry, Optical and Dielectric Properties of a New Pyrophosphate: LiGaP2O7: *Mallesham Bandi*[1]; Ron Broner[2]; Samuel Arredondo[1]; Ramana Chintalapalle[1]; [1]University of Texas at El Paso; [2]University of California, Santa Barbara

8:45 AM
Application of Inorganic Adsorbents for Radwaste Water Treatment: *Hsien-Ming Hsiao*[1]; Yun-Chung Shen[1]; Yi-Kuo Chang[1]; Hsien-Te Hsieh[1]; Hong-Ping Lin[1]; [1]Institute of Nuclear Energy Research

9:05 AM
Sintering Process and Characteristics of Glass-Ceramics from Coal Fly Ash: Hongjuan Sun[1]; *Li Zeng*[1]; [1]Southwest University of Science and Technology

9:25 AM Break

9:35 AM
Preparation and Characterization of Porous Cordierite Ceramics Based on Particle-stabilized Emulsions: Xuezhu Luan[1]; *Kaiyue Huang*[1]; Siyi Zhao[1]; Jinhong Li[1]; [1]China University of Geosciences

9:55 AM
Role of Anisometric Particles in Microstructure Evolution, Structural Stability and Compressive Mechanical Properties in Ice-templated Ceramics with Directional Porosity: *Dipankar Ghosh*[1]; Mahesh Banda[1]; [1]Old Dominion University

10:15 AM
Preparation of Abrasion & Erosion-resistant Ceramic Coating on Copper by Slurry Method: Zefei Zhang[1]; *Hao Bai*[1]; Ning Li[1]; Jian Zhang[1]; Huanmei Yuan[1]; [1]University of Science and Technology Beijing

---

MATERIALS PROCESSING

Advances in Surface Engineering II — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Tushar Borkar, Cleveland State University; Arif Mubarok, PPG; Rajeev Gupta, University of Akron; Sandip Harimkar, Oklahoma State University; Tanaji Paul, Florida International University

Monday AM | February 24, 2020
9 | San Diego Convention Ctr

Session Chair: Rajeev Gupta, University of Akron

8:00 AM
Characterization of Precipitates Evolution in Laser Assisted Cold Spray of AA7050 and AA 7075: *Ning Zhu*[1]; Luke Brewer[1]; [1]University of Alabama Tuscaloosa

8:20 AM
Enhanced Bond Durability of 7xxx Automotive Alloy by Surface Modification: *Theresa MacFarlane*[1]; Tudor Piroteala[1]; Rashmi Monty[1]; Sazol Das[1]; Yudie Yuan[1]; Thomas Beck[1]; Lasitha Cumaranatunge[1]; [1]Novelis Inc

8:40 AM
Surface Chemistry and Subsurface Microstructure after Spot-by-spot laser-interference Processing of Al 2024-T3: *Adrian Sabau*[1]; Harry Meyer[1]; Donovan Leonard[1]; [1]Oak Ridge National Laboratory

9:00 AM Invited
Multilayer, Multifunctional Thermal Coatings Enabled by Layered Manufacturing: *Sanjay Sampath*[1]; [1]Stony Brook University

9:40 AM Break

10:00 AM
Laser Assisted Cold Spray Applied to Austenitic Stainless Steel: *Venkata Satish Bhattiprolu*[1]; Luke Brewer[1]; [1]University of Alabama

10:20 AM
High Temperature Oxidation Behaviors of SiON Coated AISI 441 in Different Atmospheres: *Kathy Lu*[1]; Kaustubh Bawane[1]; Rajendra Bordia[2]; [1]Virginia Polytechnic Institute and State University; [2]Clemson University

10:40 AM
Contact Angle Measurement Comparisons of Common Additive Materials and Processes: *Holly Martin*[1]; Arthur Kasson[2]; Ibrahim Al Qanber[1]; Brett Conner[1]; [1]Youngstown State University; [2]KRUSS USA

11:00 AM
Investigation on the Laser Surface Treatment of Steel and Aluminum with a Single Mode Pulsed Fiber Laser Source: Quentin Perry Auger[1]; Jean-Michaël Deschênes[1]; *Alex Fraser*[1]; [1]Laserax Inc

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Alternate Processes

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Monday AM | February 24, 2020
11B | San Diego Convention Ctr

Session Chairs: Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive / Lancaster University

8:00 AM Invited
Performance of Gamma Prime Alloys Processed Through Electron Beam Melting: *Michael Kirka*[1]; Patxi Fernandez-Zelai[1]; Donovan Lenord[1]; Obed Acevedo[1]; Peeyush Nandwana[1]; Andres Marquez Rossy[1]; [1]Oak Ridge National Laboratory

8:30 AM
A Comparison of Creep Properties between Conventionally Cast and Additive Manufactured CMSX-4: *David Bürger*[1]; Alireza Parsa[1]; Markus Ramsperger[2]; Carolin Körner[3]; Gunther Eggeler[1]; [1]Ruhr-Universität Bochum; [2]GE Additive; [3]Friedrich Alexander Universität Erlangen Nürnberg

8:50 AM Invited
Innovation in Ni- and Co-base Superalloys at Carpenter Technology Corporation: *Stephane Forsik*[1]; Karl Heck[1]; Ning Zhou[1]; [1]Carpenter Technology Corporation

9:20 AM
Microstructure and Mechanical Properties of a CoNi-base Superalloy Fabricated by Electron Beam Melting: *Sean Murray*[1]; Kira Pusch[1]; Andrew Polonsky[1]; Chris Torbet[1]; Peeyush Nandwana[2]; Michael Kirka[2]; Ryan Dehoff[2]; Ning Zhou[3]; Stéphane Forsik[3]; William Slye[3]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory; [3]Carpenter Technology Corporation

9:40 AM Break

10:00 AM Invited
Advancing Alternate Processing of Rene 65 with Additive Manufacturing: *Kelsey Rainey*; Laura Dial[1]; Andrew Wessman[2]; [1]GE Global Research; [2]University of Arizona

10:30 AM
Analysis of the APB Energy in an Additive Manufactured Polycrystalline Ni-based Superalloy with High γ' Volume Fraction: *Larissa Heep*[1]; Casper Schwalbe[2]; Christoph Heinze[3]; Antonin Dlouhy[4]; Catherine Rae[2]; Gunther Eggeler[1]; [1]Ruhr-Uni-Bochum; [2]Cambridge University; [3]Siemens AG; [4]The Czech Academy of Sciences

10:50 AM
Ni-based Superalloy Design Exploration by the High-throughput Hot-isostatic-pressing Micro-synthesis Method: *Lei Zhao*[1]; Liang Jiang[2]; Zaiwang Huang[3]; Lixia Yang[1]; Hui Wang[1]; Haizhou Wang[1]; [1]China Iron & Steel Research Institute Group; [2]Yantai University; [3]Central South University

11:10 AM
Development of a New High Energy X-ray Diffraction NDT for High Pressure Turbine Blades: *Alexiane Arnaud*[1]; Clément Remacha[1]; Edward Romero[1]; Virginie Jaquet[1]; Frédéric Jenson[1]; Henry Proudhon[2]; [1]SAFRAN; [2]Centre des Matériaux Mines Paristech

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Electronic Scale Calculations and Machine Learning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Monday AM | February 24, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

8:00 AM Introductory Comments Mohsen Asle Zaeem

8:05 AM Invited
High-throughput Computational Design of Organic-inorganic Hybrid Halide Semiconductors Beyond Perovskites: *Kesong Yang*[1]; Yuheng Li[1]; [1]University of California, San Diego

8:35 AM Invited
Stochastic Exchange for Efficient Long-range-hybrid-DFT for Thousands of Electrons and More: *Daniel Neuhauser*[1]; [1]UCLA

9:05 AM
Machine Learning Approaches for Improving Density Functional Tight Binding Models of Reactive Materials: Application to Astrobiolgical Materials and Surface Chemistry: *Nir Goldman*[1]; [1]Lawrence Livermore National Laboratory

9:25 AM
Uncertainty Quantification for Machine Learning Methods Applied to Material Properties: Kamal Choudhary[1]; *Francesca Tavazza*[1]; [1]Umcp/Nist

9:45 AM Break

10:00 AM Invited
Unraveling Exciton Dynamics in 2D Van der Waals Heterostructures: Junyi Liu[1]; Xu Zhang[1]; *Gang Lu*[1]; [1]California State University Northridge

10:30 AM Invited
Isolated Dislocation Core Energy from First Principles Energy Density Method: Yang Dan[1]; *Dallas Trinkle*[1]; [1]University of Illinois at Urbana-Champaign

11:00 AM
A First Principles Multi-cell Monte Carlo Method for Phase Prediction: *You Rao*[1]; Changning Niu[2]; Wolfgang Windl[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University; [2]QuesTek Innovations LLC

11:20 AM
Boosting the CALPHAD Modeling of Multi-component Systems by ab initio Calculations: Selected Case Studies: *Giancarlo Trimarchi*[1]; Qing Chen[1]; [1]Thermo-Calc Software AB

BIOMATERIALS

Biodegradable Materials for Medical Applications II — Magnesium Implants

Sponsored by: TMS Functional Materials Division, TMS: Biomaterials Committee

Program Organizers: Jaroslaw Drelich, Michigan Technological University; Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University; Jan-Marten Seitz, Syntellix AG; Petra Maier, Stralsund University of Applied Sciences; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California, Riverside

Monday AM | February 24, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Jaroslaw Drelich, Michigan Technological University; Jan-Martin Seitz, Syntellix AG

8:00 AM Introductory Comments

8:05 AM Keynote
Proteins and Flow Conditions: How They Influence the Degradation of Mg: Ruiqing Hou[1]; Frank Feyerabend[1]; *Regine Willumeit Romer*[1]; [1]Helmholtz Center Geesthacht

8:40 AM Invited
Biodegradable Magnesium Implants – From Alloy Development to In Vivo Testing: *Hans Maier*[1]; Peter Wriggers[1]; Andrea Meyer-Lindenberg[2]; [1]Leibniz Universität Hannover; [2] Ludwig-Maximilians-Universität München

9:05 AM Invited
An Mg-Zn-Ca-based Alloy and a Biocompatible Ceramic Coating Towards Resorbable Bone Fixation Devices: Hamdy Ibrahim[1]; Alan Luo[2]; David Dean[2]; Rigoberto Advincula[3]; *Mohammad Elahinia*[4]; [1]University of Tennessee at Chattanooga; [2]Ohio State University; [3]Case Western Reserve University; [4]University of Toledo

9:30 AM Invited
In-Vivo and In-Vitro Performance of Bioabsorbable BioMg 250 Mg Alloy Implants: *Jacob Edick*[1]; Raymond Decker[1]; Stephen LeBeau[1]; [1]Nanomag LLC

9:55 AM Break

10:10 AM
Hydrogen Sensors for Noninvasively Monitoring the Status of Bioresorbable Magnesium Implants: *William Heineman*[1]; Daoli Zhao[1]; [1]University of Cincinnati

10:30 AM Invited
Current Development Status of Surgical Stapler and Clip Made of Mg Alloy in Kobe University: *Takumi Fukumoto*[1]; Masahiro Kido[1]; Naoko Ikeo[1]; Toshiji Mukai[1]; [1]Kobe University

10:55 AM
Influence of Solution Heat Treatment on Microstructure, Hardness and Corrosion Behavior of Extruded RESOLOY: *Petra Maier*[1]; Benjamin Clausius[1]; Norbert Hort[2]; [1]Stralsund University of Applied Sciences; [2]Helmholtz-Zentrum Geesthacht

11:15 AM
High Strength Rare Earth Free Mg Alloys with Controlled Degradation Behavior Through Microstructural Manipulation: *Ehsan Mostaed*[1]; Malgorzata Sikora-Jasinska[1]; Jaroslaw W. Drelich[1]; [1]Michigan Technological University

BIOMATERIALS

Biological Materials Science — Biological and Natural Materials I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Monday AM | February 24, 2020
Leucadia | Marriott Marquis Hotel

Session Chairs: Steven Naleway, University of Utah; David Restrepo, University of Texas at San Antonio

8:00 AM Invited
Arapaima Fish Scale: One of the Toughest Flexible Biological Materials: *Wen Yang*[1]; Haocheng Quan[1]; Marc Meyers[1]; Robert Ritchie[2]; [1]University of California San Diego; [2]University of California, Berkeley

8:30 AM
Collagen's Role in the Dermal Armor of the Boxfish: *Sean Garner*[1]; Steven Naleway[2]; Maryam Hosseini[3]; Claire Acevedo[2]; Eric Schaible[4]; Bernd Gludovatz[5]; Jae-Young Jung[1]; Joanna McKittrick[1]; Pablo Zavattieri[3]; [1]Univ of California San Diego; [2]University of Utah; [3]Purdue University; [4]Lawrence Berkeley National Laboratory; [5]University of New South Wales

8:50 AM
Characterization of Timbers of Paubrasilia Echinata Lam. from Reforestation and Natural Forest for Violin Bows: *Sinval Marques*; José de Oliveira[1]; [1]UFES

9:10 AM Invited
Seeing is Believing - In-situ SEM Wear Experiments of Animal Teeth: *Horacio Espinosa*[1]; Alireza Zaheri[1]; Hoang Nguyen[1]; David Restrepo[2]; Michael Frank[3]; Joanna McKittrick[3]; [1]Northwestern University; [2]University of Texas, San Antonio; [3]UCSD

9:40 AM Break

9:55 AM Invited
Multiscale Architectures in the Exoskeletal Armor of a Crush Resistant Insect: Jesus Rivera[1]; Maryam Hosseini[2]; Satoshi Murata[3]; Allison Pickle[1]; Drago Vasile[1]; David Restrepo[4]; Atsushi Arakaki[3]; Pablo Zavattieri[2]; *David Kisailus*[1]; [1]University of California Riverside; [2]Purdue University; [3]Tokyo University of Agriculture and Technology; [4]University of Texas San Antonio

10:25 AM Invited
Role of the Inner Architecture of a Naturally-ocurring Interlocking Interface Found in the Diabolical Ironclad Beetle: Maryam Hosseini[1]; Jesus Rivera[2]; David Restrepo[3]; David Kisailus[2]; *Pablo Zavattieri*[1]; [1]Purdue University; [2]University of California, Riverside; [3]Purdue University/University of Texas San Antonio

10:55 AM
Structure-property Relation of Arapaima Gigas Scales as Structural Material: *Henry Colorado*[1]; Sergio Neves Monteiro[2]; [1]Universidad de Antioquia; [2]Military Institute of Engineering, IME

11:15 AM
Structure and Behavior of Viper Snake Fangs: Susana Estrada[1]; Juan Arredondo[1]; J Pereañez[2]; Sean Ghods[3]; Dwayne Arola[3]; *Alex Ossa*[1]; [1]Universidad Eafit; [2]Universidad de Antioquia; [3]University of Washington

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Advances in Characterization Methods I

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Monday AM | February 24, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Mingming Zhang, ArcelorMittal Global R&D; Kelvin Xie, Texas A&M University

8:00 AM Introductory Comments

8:05 AM
Auger Spectroscopy Analysis of Alpha Brass Fracture: *Sergio Monteiro*[1]; Fabio Garcia Filho[1]; Fernanda da Luz[1]; Ulisses Costa[1]; Lucio Nascimento[1]; [1]Military Institute of Engineering - IME

8:25 AM
Comparison of Diffraction Techniques for Texture Evaluation in Triaminotrinitrobenzene (TATB): *Matthew Schmitt*[1]; Sven Vogel[1]; John Yeager[1]; Ricardo Schwarz[1]; [1]Los Alamos National Laboratory

8:45 AM
EBSD Characterization of Aluminum Magnesium Alloys: *Karina Hemmendinger*[1]; Joel Bahena[1]; Andrea Hodge[1]; [1]University of Southern California

9:05 AM
Using the New Rotation Vector Base Line Electron Back Scatter Diffraction (RVB-EBSD) Method to Characterize Single Crystal Cast Microstructures: *Pascal Thome*[1]; Setareh Medgalchi[1]; Felicitas Scholz[1]; Gunther Eggeler[1]; Jan Frenzel[1]; [1]Ruhr-Universität-Bochum

9:25 AM
On the Depth Resolution of Transmission Kikuchi Diffraction (TKD) Analysis: *Junliang Liu*[1]; Sergio Lozano-Perez[1]; Angus Wilkinson[1]; Chris Grovenor[1]; [1]University of Oxford

9:45 AM Break

10:00 AM
Correlative Microscopy Studies of <c+a> Dislocations in a Hot-roll AZ31 Mg Alloy: *Dexin Zhao*[1]; Xiaolong Ma[1]; Kelvin Xie[1]; [1]Texas A&M University

10:20 AM
Micromechanical Properties of Marginal Glass Forming Alloys: *Ilkay Kalay*[1]; Tolga Han Ulucan[2]; Sezer Özerinç[2]; Yunus Kalay[2]; [1]Çankaya University; [2]Middle East Technical University

10:40 AM
Case Study of A36 Steel Plate: *Ramon Martinez*[1]; Veronica Livescu[1]; Jillian Bennett[1]; Carl Cady[1]; James Valdez[1]; Carl Trujillo[1]; [1]Los Alamos National Laboratory

11:00 AM
In-situ Raman Microprobing and Ex-situ Raman Mapping of Indented Glasses: *Yvonne Gerbig*[1]; Chris Michaels[1]; [1]National Institute of Standards and Technology (NIST)

11:20 AM
Synchrotron X-ray Diffraction and Computed Tomography Studies of Ultrasonic Welding Dissimilar Mg-Fe Metals: *Lianghua Xiong*[1]; Chihpin Chuang[1]; Dileep Singh[1]; Jian Chen[2]; Yong Chae Lim[2]; Zhili Feng[2]; [1]Argonne National Laboratory; [2]Oak Ridge National Laboratory

CHARACTERIZATION

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification — Structural Descriptors Enabling PSP Linkages

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee

Program Organizers: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, U.S. Army Research Laboratory; James Hogan, University of Alberta; Srikanth Patala, North Carolina State University; Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Monday AM | February 24, 2020
Theater A-3 | San Diego Convention Ctr

Session Chairs: Srikanth Patala, North Carolina State University; Shawn Coleman, CCDC Army Research Laboratory

8:00 AM Introductory Comments

8:05 AM Invited
Feature Engineering of Material Structure for Extracting Process-structure-property Linkages: *Surya Kalidindi*[1]; [1]Georgia Institute of Technology

8:35 AM Invited
Integrated Structural Methods Addressing Aviation Challenges in Composites: Andrew Makeev[1]; *Sarvenaz Ghaffari*[1]; [1]University of Texas Arlington

9:05 AM Invited
Investigations of Microstructural Effects on Porosity Evolution: *Nathan Barton*[1]; [1]Lawrence Livermore National Lab

9:35 AM Break

9:55 AM Invited
Large Scale Microstructure Synthesis Using LEGOMAT: Application to Additive Manufacturing: *Veera Sundararaghavan*[1]; Iman Javaheri[1]; [1]University of Michigan

10:25 AM Invited
Advancement of Data Intensive Approaches in Materials Discovery and Design: *David Elbert*[1]; Brian Schuster[2]; Nick Carey[1]; Connor Krill[1]; Ali Rachidi[1]; William Phelan[1]; Tyrel McQueen[1]; [1]Johns Hopkins University; [2]ARL

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Monday AM | February 24, 2020
32B | San Diego Convention Ctr

Session Chair: Sugata Chowdhury, National Institute of Standards and Technology

8:00 AM Invited
Sorting through Messy Materials with First Principles Calculations: *Giulia Galli*[1]; [1]University of Chicago

8:30 AM
Accelerated Discovery of Materials with Programmable Decomposition in Flow Batteries via Machine Learning: *Hieu Doan*[1]; Garvit Agarwal[1]; Rajeev Assary[1]; [1]Argonne National Laboratory

8:50 AM
Active Learning Guided Polymer Space Exploration and Discovery: *Huan Tran*[1]; Abhirup Patra[1]; Deepak Kamal[1]; Lihua Chen[1]; Chiho Kim[1]; Rampi Ramprasad[1]; [1]Georgia Institute of Technology

9:10 AM
Neural Network Potentials for Water-in-salt Electrolytes: *Sarah Allec*[1]; Woochul Shin[2]; P. Alex Greaney[1]; Xiulei Ji[2]; [1]University of California Riverside; [2]Oregon State University

9:30 AM Break

9:50 AM Invited
Computation Accelerated Design of Fast Ion Conducting Materials for Solid-state Batteries: *Yifei Mo*[1]; [1]University Of Maryland College Park

10:20 AM
Computational Screening of 2D Transition Metal Dichalcogenides for Water Splitting Catalysts: *Shwetank Yadav*[1]; [1]University of Toronto

10:40 AM
Computational Design of Non-Precious Transition Metal/Nitrogen Doped Carbon Electrocatalysts for Sustainable Energy Technology: *Guofeng Wang*[1]; Boyang Li[1]; [1]University of Pittsburgh

11:00 AM
Frequency-dependent Dielectric Constant Prediction of Polymeric Dielectrics with Machine Learning: *Lihua Chen*[1]; Rohit Batra[1]; Chiho Kim[1]; Tran Huan[1]; Rampi Ramprasad[1]; [1]Georgia Institute of Technology

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Microstructural Evolution and Phase Stability I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Monday AM | February 24, 2020
33C | San Diego Convention Ctr

Session Chairs: Alexander Chadwick, Northwestern University; Christopher Weinberger, Colorado State University

8:00 AM Invited
The Evolution of Bicontinuous Structures by Interfacial and Bulk Diffusion: W. Beck Andrews[1]; Kate Elder[2]; Katsuyo Thornton[1]; *Peter Voorhees*[2]; [1]University of Michigan; [2]Northwestern University

8:20 AM
Phase Stability, Chemo-mechanics and Microstructure Space in TiAlZrN Ultra-hard Nanocoatings: *Vahid Attari*[1]; Raymundo Arroyave[1]; [1]Texas A&M University

8:40 AM
Multiscale Modeling of Mass Transport in Transition Metal Carbides: Rofiques Salehin[1]; Xiaochuan Tang[1]; Gregory Thompson[2]; *Christopher Weinberger*[1]; [1]Colorado State University; [2]University of Alabama

9:00 AM Invited
Microstructure Formation from Atomistic Viewpoint: *Yasushi Shibuta*[1]; [1]The University of Tokyo

9:30 AM Break

9:50 AM Invited
Phase Field Modeling and Simulation Study of Multiferroic Magnetoelectric Composite Materials: *Yongmei Jin*[1]; Liwei Geng[1]; Yu Wang[1]; [1]Michigan Technological University

10:20 AM
Probing Solid-solid Interfacial Reactions in All-solid-state Batteries: *Hanmei Tang*[1]; Zhi Deng[1]; Abhik Banerjee[1]; Erik Wu[1]; Han Nguyen[1]; Zhuoying Zhu[2]; Shirley Meng[1]; Shyue Ping Ong[1]; [1]UCSD NanoEngineering Department; [2]UCSD

10:40 AM
Phase-field Model of Kirkendall Porosity Formation During Ti/Ni Interdiffusion to Form NiTi Microwires: *Alexander Chadwick*[1]; David Dunand[1]; Peter Voorhees[1]; [1]Northwestern University

11:00 AM Invited
Localized Phase Equilibria and Dynamic Phase Transformations at Extended Defects – a New Alloy Design Strategy for Unprecedented Properties: Longsheng Feng[1]; Yipeng Gao[2]; Dong Wang[3]; Yufeng Zheng[1]; Michael Mills[1]; Hamish Fraser[1]; *Yunzhi Wang*[1]; [1]The Ohio State University; [2]Idaho National Laboratory; [3]Xi'an Jiao Tong University

SPECIAL TOPICS

Current Trends in Magnetocaloric Materials: An FMD Symposium in Honor of Ekkes Brueck — Characterization of Structure and Magnetic Properties of Magnetocaloric Materials

Sponsored by: Functional Materials Division

Program Organizers: Victorino Franco, Universidad de Sevilla; Frank Johnson, Niron Magnetics, Inc.

Monday AM | February 24, 2020
Marina Ballroom F | Marriott Marquis Hotel

Session Chair: Durga Paudyal, Ames Laboratory

8:00 AM Introductory Comments

8:05 AM Invited
Fe2P an Intriguing Binary Alloy: *Ekkes Brueck*[1]; [1]TU Delft

8:35 AM Invited
CaloriSMART – A New Tool for Rapid Experimental Evaluation of Active Magnetic Regenerator Materials: Lucas Griffth[1]; Agata Czernuszewicz[1]; Julie Slaughter[1]; *Vitalij Pecharsky*[1]; [1]Ames Laboratory

9:05 AM Invited
Quantitative Identification of First-order Phase Transitions Using Magnetocaloric Studies: *Jia Yan Law*[1]; [1]Sevilla University

9:35 AM Break

10:00 AM Invited
Synchrotron X-ray Studies on Magnetocaloric Materials: *Niels Van Dijk*[1]; [1]Delft University of Technology

10:30 AM Invited
Magnetism and Magnetocalorics of Fe_2P and Related Alloys: *Per Nordblad*[1]; [1]Uppsala University, Department of Engineering Sciences

11:00 AM Invited
Structure, Magnetisim and Spin Dynamics of Magnetocaloric $Mn_{5-x}Fe_xSi_3$ Compounds: *Karen Friese*[1]; Nikolaos Biniskos[1]; Nour Maraytta[1]; Paul Hering[1]; Yuri Skourski[2]; Andrzej Grzechnik[3]; Stephane Raymond[4]; Joerg Voigt[1]; Thomas Brueckel[1]; Karin Schmalzl[1]; [1]Research Centre Jülich GmbH; [2]Helmholtz Zentrum Dresden Rossendorf; [3]RWTH Aachen University; [4]Universite des Alpes

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Defects I - Molten Metal and Inclusions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Monday AM | February 24, 2020
17B | San Diego Convention Ctr

Session Chairs: Mark Jolly, Cranfield University; Jan Frenzel, Ruhr University Bochum

8:00 AM Introductory Comments

8:05 AM Invited
Crystal Mosaicity in Single Crystal Ni-based Superalloys: *Jan Frenzel*[1]; Philipp Hallensleben[1]; Felicitas Scholz[1]; Pascal Thome[1]; Gunther Eggeler[1]; [1]Ruhr University Bochum

8:35 AM
In-situ Tomographic Investigation of Co-base Alloy Solidification Features: *Tim Wigger*[1]; Mohammed Azeem[2]; Shyamprasad Karagadde[3]; Zhipeng Guo[4]; Robert Atwood[5]; Nghia Vo[5]; Peter Lee[1]; [1]University College London; [2]University of Leicester; [3]Indian Institute of Technology Bombay; [4]Tsinghua University; [5]Diamond Light Source Ltd

8:55 AM
An Experimental Characterization of Thermophysical Properties of a Porous Ceramic Shell Used in the Investment Casting Process: *Christopher Jones*[1]; Mark Jolly[1]; Anders Jarfors[2]; Mark Irwin[3]; [1]Cranfield University; [2]Jonkoping University; [3]TPC Components AB

9:15 AM
Influence of Casting Conditions on Crack Sensitivity of Micro-alloyed Steel Slabs During Continuous Casting: *Hossam Ibrahim*[1]; Heinz Palkowski[1]; [1]Clausthal University of Technology

9:35 AM Break

9:55 AM
Spatially Resolved Compositional and Isotopic Analysis of As-cast Metallic Nuclear Fuels: *Elizabeth Kautz*[1]; Vineet Joshi[1]; Curt Lavender[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory - PNNL

10:15 AM
Defects Comparison Between Single and Double-sided Electron Beam Welded Dissimilar DP600 Steel to 5754 Al Alloy Joints: X-ray Tomography Study: *Soumitra Dinda*[1]; Prakash Srirangam[2]; Gour Gopal Roy[1]; [1]Indian Institute of Technology Kharagpur; [2]Warwick Manufacturing Group

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Grain Boundary Structure: Disconnections, Complexions, Twins

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Monday AM | February 24, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

8:00 AM Invited
Dislocation Density Distribution at Slip Band-grain Boundary Intersections: *Yi Guo*[1]; David Collins[2]; Edmund Tarleton[3]; Felix Hofmann[3]; Angus Wilkinson[3]; Ben Britton[1]; [1]Imperial College London; [2]Birmingham University; [3]University of Oxford

8:20 AM
Roughening and Screening Transitions in Grain Boundaries: A Disconnection-based Monte Carlo Simulation Approach: *Jian Han*[1]; Kongtao Chen[2]; David Srolovitz[1]; [1]City University of Hong Kong; [2]University of Pennsylvania

8:40 AM
Continuum Dislocation Dynamics at Finite Deformation: Computational Modeling and Preliminary Results: *Kyle Starkey*[1]; Anter El-Azab[1]; Grethe Winther[2]; [1]Purdue University; [2]Technical University of Denmark

9:00 AM
Predictions of Grain Boundary Segregation in bcc Refractory Metals based on Electronic Descriptors: *Yong-Jie Hu*[1]; Ge Zhao[2]; Baiyu Zhang[3]; Chaoming Yang[1]; Xiaofeng Qian[3]; Liang Qi[1]; [1]University of Michigan; [2]The Pennsylvania State University ; [3]Texas A&M University

9:20 AM
Twinning Nucleation Process at Grain Boundary in BCC Crystals: *Scott Mao*[1]; Jiangwei Wang[1]; [1]University of Pittsburgh

9:40 AM Break

10:00 AM
Unusual Size Effects from Tilted Twin Boundaries in Nano-twinned Metals: *Caizhi Zhou*[1]; Sixie Huang[1]; Irene Beyerlein[2]; [1]Missouri University of Science and Technology; [2]University of California at Santa Barbara

10:20 AM
Dislocation Interactions and the Formation of Low-angle Grain Boundary: *Pranay Chakraborty*[1]; Tengfei Ma[1]; Abigail Hunter[2]; Yinan Cui[3]; Lei Cao[1]; [1]University of Nevada; [2]Los Alamos National Laboratory; [3]Tsinghua University

10:40 AM
The Evolution of Interfacial States in Nanocrystalline Al-Ni-Ce and their Influence on Mechanical Behavior and Thermal Stability: *Glenn Balbus*[1]; Yolita Eggeler[1]; Jungho Shin[1]; Fulin Wang[1]; Verena Maier-Kiener[2]; Daniel Kiener[2]; Daniel Gianola[1]; [1]University of California, Santa Barbara; [2]Montanuniversität Leoben

11:00 AM
Effect of Silica and Rare Earth Oxides on the Grain Boundary Chemistries in Hot-pressed Boron suboxide (B6O) and the Observance of Nanolayer Films: *Kristopher Behler*[1]; Christopher Marvel[2]; Jerry LaSalvia[3]; J. Dunn-Synowczynski[3]; S.D. Walck[1]; Martin Harmer[2]; [1]CCDC Army Research Laboratory, SURVICE Engineering; [2]Lehigh University; [3]CCDC Army Research Laboratory

11:20 AM
Thick Amorphous Complexions Enabled by Compositional and Thermal Manipulation: *Charlette Grigorian*[1]; Timothy Rupert[1]; [1]University of California, Irvine

MATERIALS PROCESSING

Electrometallurgy 2020 — Hydrometallurgy

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Georges Houlachi, Hydro-Quebec; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp

Monday AM | February 24, 2020
14A | San Diego Convention Ctr

Session Chairs: Michael Free, University of Utah; Georges Houlachi, Hydro-Quebec

8:00 AM Introductory Comments

8:05 AM Keynote
Future Prospects for Copper Leaching, Solvent Extraction and Electrowinning Technology: *David Dreisinger*[1]; [1]University of British Columbia

8:35 AM
Effective Copper Diffusion Coefficients in $CuSO_4$ – H_2SO_4 Electrowinning Electrolytes: *Joseph Bauer*[1]; Michael Moats[1]; [1]Missouri University of Science and Technology

8:55 AM
Theories of Electrodeposition, Beings-of-reason, and Reality: *Peter Adcock*[1]; Cora Masterlark[2]; [1]PalaTeck Scientific LLC,; South Dakota School of Mines & Technology; [2]South Dakota School of Mines & Technology

9:20 AM Break

9:35 AM
The Electrochemical Conversion of Chalcopyrite to Less Refractory Mineral Phases for Hydrometallurgical Processing: *Jonathan Vardner*[1]; Campbell Donnelly[1]; Zhengyan Zhang[1]; Minghui Wang[1]; Angela Ye[1]; Scott Banta[1]; Alan West[1]; [1]Columbia University

9:55 AM
Modeling Nickel and Zinc Electrowinning Based on Ion Mass Transport and Electrode Reaction Kinetics: *Zongliang Zhang*[1]; Michael Free[1]; [1]University of Utah

ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management Symposium — Session I

Sponsored by: TMS Extraction and Processing Division, TMS: Energy Committee

Program Organizers: Xiaobo Chen, RMIT University; Yulin Zhong, Griffith University; Lei Zhang, University of Alaska Fairbanks; John Howarter, Purdue University; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology

Monday AM | February 24, 2020
17A | San Diego Convention Ctr

Session Chairs: Shanqing Zhang, Griffith University; Yulin Zhong, Griffith University

8:00 AM Keynote
Oxygen Vacancy for Energy Conversion and Storage Devices?: *Shanqing Zhang*[1]; [1]Griffith University

8:20 AM Invited
Electrochemical Engineering of Graphene Oxide for Wearable Smart Devices: *Yulin Zhong*[1]; [1]Griffith University

8:45 AM Invited
Bio-inspired Superhydrophobic and Superhydrophilic Materials: *Ziqi Sun*[1]; [1]Queensland University of Technology

9:10 AM
Integrated Sensor Network and Battery Management System for State of Health Estimation and Safety Control of Lithium- ion Batteries: *Bing Li*[1]; Vikas Tomar[1]; Thomas Adams[2]; Corey Love[3]; Vilas Pol[1]; [1]Purdue University; [2]Naval Surface Warfare Center; [3]U.S. Naval Research Laboratory

9:30 AM Break

9:50 AM
Impact of Solar Thermal Resource Characteristics on Solar Thermal Preheating of Manganese Ores: *Susanna Hockaday*[1]; Reiner Buck[2]; Martina Neiseis-van Puttkamer[2]; Willie Smit[3]; [1]MINTEK; [2]DLR; [3]Stellenbosch University

10:10 AM
The Compatibility of Metallic Thermal Storage Materials and Housing Materials: A Computational Survey and Accelerated Reaction Experiment Results: *Anthony Rawson*[1]; Tina Gläsel[1]; Benedikt Nowak[1]; David Boon[1]; Veronika Stahl[2]; Florian Kargl[1]; [1]Institute of Material Physics in Space, German Aerospace Centre (DLR); [2]Institute of Vehicle Concepts, German Aerospace Centre (DLR)

10:30 AM
Optimization and Management of On-site Power Plants Under Time-of-use Power Price: A Case Study in Steel Mill: Xiancong Zhao[1]; Huanmei Yuan[2]; *Zefei Zhang*[2]; Hao Bai[2]; [1]Peking university; [2]University of Science and Technology Beijing

SPECIAL TOPICS

Expanding the Boundaries of Materials Science: Unconventional Collaborations — Multidisciplinary Research

Program Organizers: Sourabh Kadambi, North Carolina State University; Alex Hsain, North Carolina State University; Brady Dowdell, North Carolina State University; Benjamin Anthony, University of Florida

Monday AM | February 24, 2020
4 | San Diego Convention Ctr

Session Chairs: Alex Hsain, North Carolina State University; Sourabh Kadambi, North Carolina State University

8:00 AM Introductory Comments

8:05 AM Invited
Innovation in Materials Research Collaborations: DOE Basic Energy Sciences: *Linda Horton*[1]; [1]Department of Energy - Basic Energy Sciences

8:35 AM Invited
Mechanical Properties of Molecular Crystals--Connecting with Chemistry: *Ramamurty Upadrasta*[1]; [1]NTU

9:05 AM Invited
Integrating Experiment, Data, and Computations to Accelerate the Design of Materials: *Peter Voorhees*[1]; Greg Olson[1]; Juan DePablo[2]; [1]Northwestern University; [2]University of Chicago

9:35 AM Break

10:00 AM Invited
Convergence: Supporting Multidisciplinary Research at the National Science Foundation: *Alexis Lewis*[1]; [1]National Science Foundation

10:30 AM Invited
Machine Learning for Materials Design and Discovery: *Bryce Meredig*[1]; [1]Citrine Informatics

11:00 AM
Regularization of Materials Failure Data for Damage Mechanism Categorization by Machine Learning: *John Hasier*[1]; Keo-Yuan Wu[2]; Rachel Wittman[1]; [1]Intertek; [2]UCLA

MECHANICS & STRUCTURAL RELIABILITY

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Fatigue Characterization Using Advanced Experimental Methods in 2D and 3D

Sponsored by: TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University

Monday AM | February 24, 2020
11A | San Diego Convention Ctr

Session Chair: Antonios Kontsos, Drexel University

8:00 AM Invited
Fatigue Damage Initiation in Nickel Superalloys by Slip Localization and Redistribution: *Jean-Charles Stinville*[1]; Patrick Callahan[2]; M. P. Echlin[1]; Marie-Agathe Charpagne[1]; A.T. Polonsky[1]; Valery Valle[3]; I.J. Beyerlein[1]; T. M. Pollock[1]; [1]University of California, Santa Barbara; [2]Naval Research Laboratory; [3]Institut P' - UPR 3346, CNRS - Université de Poitiers - ENSMA

8:20 AM
Multiscale Analysis of Fatigue Crack Initiation in Stainless Steel 316L: *Pragna Bhaskar*[1]; Josh Kacher[1]; [1]Georgia Tech

8:40 AM
Unraveling Cyclic Deformation Mechanisms of a Precipitate-strengthened Magnesium Alloy using In-situ Neutron Diffraction: *Di Xie*[1]; Zongyang Lyu[1]; Ke An[2]; Yan Chen[2]; Peter Liaw[1]; Yanfei Gao[1]; [1]the University of Tennessee; [2]Oak Ridge National Laboratory

9:00 AM
Fatigue Behavior and Modeling of PEEK Polymer under Uniaxial and Multiaxial Loadings: *Rakish Shrestha*[1]; Jutima Simsiriwong[2]; Nima Shamsaei[1]; [1]Auburn University; [2]University of North Florida

9:20 AM
Experimental-numerical Analysis of the Correlation Between the Stress & Strain Fields Induced by the Graphite Particles and the Crack Nucleation and Propagation Path in Ductile Cast Iron: *Tito Andriollo*[1]; Yubin Zhang[1]; Søren Fæster[1]; Jesper Hattel[1]; Varvara Kouznetsova[2]; [1]Technical University of Denmark; [2]Eindhoven University of Technology

9:40 AM Break

10:00 AM
Microstructure-sensitive Evaluation of the Cyclic Behavior of Additively Manufactured Metals: *Emine Tekerek*[1]; Brian Wisner[2]; Antonios Kontsos[1]; [1]Drexel University; [2]Ohio University

10:20 AM
In-situ Characterization and Modelling of Cyclic Deformation in Rare-earth Magnesium Alloys: *Duncan Greeley*[1]; Mohammadreza Yaghoobi[1]; Darren Pagan[2]; Veera Sundararaghavan[1]; John Allison[1]; [1]University of Michigan; [2]Cornell High Energy Synchrotron Source

10:40 AM
Capturing the Spatial Field of Deformation Ahead of a Fatigue Crack in Hydrogen-charged 316L Stainless Steel using High Energy X-ray Diffraction: *Kelly Nygren*[1]; Daniel Banco[2]; Akihide Nagao[3]; Shuai Wang[4]; Eric Miller[2]; Darren Pagan[1]; [1]Cornell High Energy Synchrotron Source; [2]Tufts University; [3]JFE Steel Corporation; [4]Southern University of Science and Technology

11:00 AM
Characterization of Fatigue Mechanisms in Nickel Microbeams: *Alejandro Barrios*[1]; Ebiakpo Kakandar[2]; Xavier Maeder[3]; Gustavo Castelluccio[2]; Olivier Pierron[1]; [1]Georgia Institute of Technology; [2]Cranfield University; [3]Empa, Swiss Federal Laboratories for Materials Science and Technology

MECHANICS & STRUCTURAL RELIABILITY

Fracture Modeling of Composite Materials — Fracture Modeling of Composite Materials

Program Organizers: Yan Li, Dartmouth College; Saurabh Puri, Microstructure Engineering

Monday AM | February 24, 2020
10 | San Diego Convention Ctr

Session Chairs: Yan Li, California State University, Long Beach; Saurabh Puri, Microstructure Engineering

8:00 AM Invited
An Integrated Computational and Experimental Framework to Understand the Competing Failure Mechanisms in Metal Matrix Composites: *Yan Li*[1]; Jun Cao[2]; Cyril Williams[3]; [1]Thayer School of Engineering, Dartmouth College; [2]California State University, Long Beach; [3]US Army Research Laboratory

8:30 AM
Computational Polyethylene-ceramic Composite Plate Design and Optimization: *Trenin Bayless*[1]; [1]Montana Technological University

8:50 AM
A Reactive Molecular Dynamics Study on the Mechanical Properties of Alumina/Carbon Nanotube Composites: *Yixin Su*[1]; Yang Wang[1]; Narumasa Miyazaki[1]; Yusuke Ootani[1]; Nobuki Ozawa[1]; Momoji Kubo[1]; [1]Tohoku University

9:10 AM
Evaluation of Fracture Toughness of Cryogenically Treated High Nitrogen Martensitic Steel: *Narendra Dhokey*[1]; [1]Government College of Engineering

9:30 AM Break

10:00 AM Invited
Developing a Virtual Damage Sensor Using a Multiscale Coupled Electro-mechanical FE Model of a Piezoelectric Material: *Somnath Ghosh*[1]; Preetam Tarafder[1]; Saikat Dan[1]; [1]Johns Hopkins University

10:30 AM
Micromechanical Analysis of Matrix Crack-induced Delamination in Cross-ply Laminates Under Tension: *Chen Fu*[1]; Xi Wang[1]; [1]School of Mechanical, Electronic and Control Engineering, Beijing Jiaotong University

10:50 AM
Modelling of Crack Nucleation and Propagation in SiC/SiC Accident-tolerant Fuel During Routine Operational Transients Using Peridynamics: *Thomas Haynes*[1]; Mark Wenman[1]; [1]Imperial College London

11:10 AM
An Improved Fracture Mechanics-informed Multiscale Thermomechanical Damage Model for Ceramic Matrix Composites: *Travis Skinner*[1]; Jacob Schichtel[1]; Aditi Chattopadhyay[1]; [1]Arizona State University

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Translating Innovation into Pioneering Technologies I

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Monday AM | February 24, 2020
Point Loma | Marriott Marquis Hotel

Session Chairs: Min-Kyu Song, Washington State University; Nasrin Hooshmand, Georgia Tech

8:00 AM Invited
Energy Harvesting Silicon Nanostructures: From Ballistic Electron Ratchets to Multi-junction Photovoltaics: *James Cahoon*[1]; [1]UNC Chapel Hill

8:20 AM Invited
Design Nanostructured Anode Materials for Li-/Na-ion Batteries: *Xiaolin Li*[1]; Haiping Jia[1]; Jiguang Zhang[1]; David Reed[1]; Vincent Sprenkle[1]; [1]Pacific Northwest National Laboratory

8:40 AM Invited
Development of Solid-State Li/Sulfur-Selenium as Safe and High Capacity Batteries: *James Wu*[1]; [1]Nasa Glenn Research Center

9:00 AM Invited
Interfacial Engineering of Energy Conversion and Storage Materials using Atomic Layer Deposition: Robin Rodríguez[1]; Tae Cho[1]; M. Ravandi[1]; William LePage[1]; Mihaela Banu[1]; M. D. Thouless[1]; *Neil Dasgupta*[1]; [1]University of Michigan, Ann Arbor

9:20 AM Invited
Multi-modal, Multi-length-scale Characterization of Composition Graded Ni-rich Layered Oxide Cathode Materials: *Seongmin Bak*[1]; Xiao-Qing Yang[1]; Youngho Shin[2]; [1]Brookhaven National Laboratory; [2]Argonne National Laboratory

9:40 AM Break

10:00 AM Invited
Graphene Coating on Ni-rich Cathode Materials to Improve Energy Density of Electrode for Lithium-ion Battery: *Young-Jun Kim*[1]; Chang-Won Park[1]; Jung-Hun Lee[1]; Soo-Min Hwang[1]; [1]Sungkyunkwan University

10:20 AM Invited
2D Materials for Energy Storage Applications: *Reza Shahbazian-Yassar*[1]; [1]University of Illinois at Chicago

10:40 AM
Metal–organic Frameworks for Lithium–oxygen Batteries with Enhanced Cycling Performance: *Xiahui Zhang*[1]; Panpan Dong[1]; Younghwan Cha[1]; Min-Kyu Song[1]; [1]School of Mechanical and Materials Engineering, Washington State University

11:00 AM Invited
Engineered Si/SiOx Nanocomposites for Lithium Ion Battery: *Hansu Kim*[1]; [1]Hanyang University

MATERIALS DESIGN

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering — Opening Session

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Michael Gao, National Energy Technology Laboratory; Wei Xiong, University of Pittsburgh

Monday AM | February 24, 2020
32A | San Diego Convention Ctr

Session Chair: Carelyn Campbell, National Institute of Standards and Technology

8:00 AM Introductory Comments

8:10 AM Invited
William Hume-Rothery Award Lecture: Phase Diagrams, Computational Thermodynamics and CALPHAD: *Ursula Kattner*[1]; [1]National Institute of Standards and Technology

8:50 AM Invited
Tomorrow fcc Ordering Model: *Nathalie Dupin*[1]; [1]Calcul Thermodynamique

9:30 AM Break

9:50 AM Invited
Materials Property Databases Developed by the CALPHAD Approach and Their Applications in Materials Design: *Fan Zhang*[1]; Jun Zhu[1]; Chuan Zhang[1]; Duchao Lv[1]; Shuanglin Chen[1]; Weisheng Cao[1]; [1]CompuTherm LLC

10:30 AM Invited
On the Next Generation of Thermodynamic CALPHAD Databases: *Malin Selleby*[1]; [1]KTH Royal Institute of Technology

11:10 AM
The Third Generation of CALPHAD Descriptions: Case Studies on Al-C and W-C: *Zhangting He*[1]; Malin Selleby[1]; [1]KTH Royal Institute of Technology

ADVANCED MATERIALS

Innovations in High Entropy Alloys and Bulk Metallic Glasses: An SMD & FMD Symposium in Honor of Peter K. Liaw — High Entropy Alloys: Mechanical Properties

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee

Program Organizers: Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Yanfei Gao, University of Tennessee - Knoxville; Robert Maass, University of Illinois at Urbana-Champaign; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Soo Yeol Lee, Chungnam National University; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Liang Jiang, Yantai University

Monday AM | February 24, 2020
Marina Ballroom G | Marriott Marquis Hotel

Session Chairs: Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University

8:00 AM Introductory Comments

8:10 AM Invited
Research on Bulk Metallic Glasses and High Entropy Alloys: *Peter Liaw*[1]; [1]University of Tennessee

8:35 AM Invited
Structures and Mechanical Properties of Multiphase High-entropy Alloys at Room and Elevated Temperatures: Tao Yang[1]; Boxuan Cao[1]; *Chain Tsuan Liu*[1]; [1]City University Of Hong Kong

9:00 AM Invited
Element Effects of CoCrFeNi-based High-entropy Alloys on Low-cycle Fatigue: *E-Wen Huang*[1]; Che-Wei Tsai[2]; An-Chou Yeh[2]; Soo Yeol Lee[3]; Stefanus Harjo[4]; Peter Liaw[5]; Tu-Ngoc Lam[1]; You-Shiun Chou[1]; [1]National Chiao Tung University; [2]National Tsing Hua University; [3]Chungnam National University; [4]J-PARC Center, Japan Atomic Energy Agency; [5]University of Tennessee

9:20 AM Invited
High Temperature Strength of Refractory Complex Concentrated Alloys: *Oleg Senkov*[1]; Stephane Gorsse[2]; Daniel Miracle[1]; [1]United States Air Force Research Laboratory; [2]Universite de Bordeaux, CNRS

9:40 AM Invited
Tensile Behavior of BCC Refractory High-entropy Alloys: *Easo George*[1]; [1]Oak Ridge National Laboratory

10:00 AM Break

10:10 AM Invited
Mechanical Behavior of Transformative Complex Concentrated Alloys: *Rajiv Mishra*[1]; [1]University of North Texas

10:30 AM Invited
Slip Avalanches in Amorphous and Crystalline Materials: *Karin Dahmen*[1]; [1]University of Illinois

10:50 AM Invited
Portevin-Le Chatelier Mechanism in Face-Centered-Cubic Metals from Low to High Entropy: Che-Wei Tsai[1]; Chi Lee[1]; Po-Ting Lin[1]; Xie Xie[2]; Shuying Chen[2]; Robert Carroll[3]; Michael LeBlanc[3]; Braden A. W. Brinkman[4]; Peter Liaw[5]; Karin Dahmen[3]; *Jien-Wei Yeh*[1]; [1]National Tsing Hua University; [2]The University of Tennessee-Knoxville; [3]University of Illinois at Urbana-Champaign; [4] University of Washington; [5]National Tsing Hua University; The University of Tennessee-Knoxville

11:10 AM Invited
Modeling and Analysis of Serrated Flows in High Entropy Alloys: Past, Present, and Future: *Jamieson Brechtl*[1]; Xie Xie[2]; Shuying Chen[3]; Chanho Lee[3]; Yunzhu Shi[4]; Haoyan Diao[5]; Zhong Wang[6]; Yang Ren[7]; Junwei Qiao[6]; Peter Liaw[3]; [1]Oak Ridge National Laboratory; [2]FCA US LLC; [3]University of Tennessee; [4]University of Science and Technology Beijing ; [5]Kaiser Aluminum; [6]Taiyuan University of Technology; [7]Argonne National Laboratory

MATERIALS PROCESSING

Low-cost Titanium: 'Affordable Ti' — Session I

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee, TMS: Powder Materials Committee

Program Organizers: Ramana Reddy, University of Alabama; M. Ashraf Imam, George Washington University

Monday AM | February 24, 2020
Theater A-8 | San Diego Convention Ctr

Session Chairs: Ashraf Imam, George Washington University; Ramana Reddy, The University of Alabama

8:00 AM Invited
Electrodeposition of Titanium Aluminide (TiAl) Alloy from AlCl3-BMIC Ionic Liquid at Low Temperature: *Pravin Shinde*[1]; Yuxiang Peng[1]; Ramana Reddy[1]; [1]The University of Alabama

8:40 AM
Calciothermic Synthesis of Fine, Hydrogenated Ti- and Ti-Nb-powder: *Inge Lindemann*[1]; Patrick Langhelm[1]; Margitta Uhlemann[1]; Annett Gebert[1]; [1]Leibniz Institute for Solid State and Materials Research Dresden

9:00 AM
Production of Fine Titanium and Titanium Alloy Powders by the Shuttle of Disproportion Reaction in Molten Salt: *Xin Lu*[1]; Takuya Ono[1]; Haochen Jiang[1]; Osamu Takeda[1]; Hongmin Zhu[1]; [1]Tohoku University

9:20 AM
Cost-effective PM Ti Compositions and Processing: *Leandro Bolzoni*[1]; [1]The University of Waikato

9:40 AM Break

9:55 AM Invited
Fast Step 3- Titanium Swarf to Engine Parts in 3 Steps: *Martin Jackson*[1]; Ben Thomas[1]; Nick Weston[1]; [1]The University of Sheffield

10:35 AM
Influence of Substitution of V with Mn on Heat Treatment Behavior in Ti-Mn-V-Al Alloys: Masato Ueda[1]; *Masahiko Ikeda*[1]; [1]Kansai University

10:55 AM
Aeration Leaching Process for Producing Synthetic Rutile in a Novel Gas-liquid-solid Reactor: *Qiuyue Zhao*[1]; Maoyuan Li[1]; Zimu Zhang[1]; Zhang Tingan[1]; [1]Northeastern University

LIGHT METALS

Magnesium Technology 2020 — Keynote Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Monday AM | February 24, 2020
6C | San Diego Convention Ctr

Session Chairs: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida

8:00 AM Introductory Comments

8:10 AM Keynote
Twin Transmission Across Grain Boundaries in Mg: *Carlos Tome*[1]; M Arul Kumar[1]; John Graham[1]; Khanh Dang[1]; Yue Liu[2]; Pengzhang Tang[2]; Shujuan Wang[1]; Rodney McCabe[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory; [2]Shanghai Jiao Tong University

8:55 AM Keynote
Hierarchically Structured Ultrafine Grained Magnesium Alloys: *Rajiv Mishra*[1]; [1]University of North Texas

9:40 AM Break

10:00 AM Keynote
MultiStage Fatigue (MSF) Modeling of Magnesium in a Corrosion Environment: *Mark Horstemeyer*[1]; [1]Liberty University

10:45 AM Keynote
Novel Texture Controlling of Mg Alloys: *Bin Jiang*[1]; Guangsheng Huang[1]; Fusheng Pan[1]; [1]Chongqing University

CHARACTERIZATION

Material Behavior Characterization via Multi-Directional Deformation of Sheet Metal — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Daniel Coughlin, Los Alamos National Laboratory; Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory; John Carsley, Novelis, Inc.

Monday AM | February 24, 2020
Theater A-1 | San Diego Convention Ctr

Session Chair: To Be Announced

8:00 AM Invited
Measuring the Multiaxial Nature of Thermomechanical Constitutive Relationships of Crystalline Materials: Garrison Hommer[1]; Ashley Bucsek[2]; Harshad Paranjape[1]; Zachary Brunson[1]; Jinesh Dahal[1]; *Aaron Stebner*[1]; [1]Colorado School of Mines; [2]University of Michigan

8:40 AM Invited
Multi-directional Deformation Capabilities in the NIST Center for Automotive Lightweighting (NCAL): *Adam Creuziger*[1]; Mark Iadicola[1]; Thomas Gnaupel-Herold[1]; William Luecke[1]; Tim Foecke[1]; Matthias Merzkirch[1]; Dilip Banerjee[1]; [1]National Institute of Standards and Technology

9:20 AM
Large-strain Cruciform Testing for Characterization of Macro- and Micro-scale Formability of Sheet Metals: Baran Guler[1]; Orhan Aytuna[1]; *Mert Efe*[1]; [1]Middle East Technical University

9:40 AM Break

10:00 AM
High Precision Material Modeling of 5000 Series Aluminum Alloy Sheet Using Biaxial Tensile Tests and Hole Expansion Simulation: *Noa Miyake*[1]; Toshihiko Kuwabara[1]; [1]Tokyo University of Agriculture and Technology

10:20 AM
Material Modeling in Biaxial Stress Field and Hole Expansion Simulation of Hot-rolled Steel Sheets: *Shunya Nomura*[1]; Toshihiko Kuwabara[1]; [1]Tokyo University of Agriculture and Technology

10:40 AM
Multiscale Modeling of Self-piercing Riveting Process: *Georges Ayoub*[1]; Andrey Ilinich[2]; [1]University of Michigan; [2]Ford Motor Company

11:00 AM
Microstructural Response of Stainless Steel Subjected to Biaxial Load Path Changes: In-situ Neutron Diffraction and Multi-scale Modeling: *Manas Upadhyay*[1]; Jan Capek[2]; Tobias Panzner[2]; Helena Van Swygenhoven[2]; [1]École Polytechnique; [2]Paul Scherrer Institute

MATERIALS DESIGN

Materials Design Approaches and Experiences V — Alloy Design Strategy and Tools

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Akane Suzuki, GE Research; Ji-Cheng Zhao, University of Maryland; Michael Fahrmann, Haynes International; Qiang Feng, University of Science and Technology Beijing; Michael Titus, Purdue University

Monday AM | February 24, 2020
33A | San Diego Convention Ctr

Session Chairs: Ji-Cheng Zhao, University of Maryland; Akane Suzuki, GE Research

8:00 AM Introductory Comments

8:05 AM Invited
Material and Process 4.0: Model-Based Material and Process Development: *David Furrer*[1]; Vasisht Venkatesh[1]; Jean Philippe Thomas[1]; [1]Pratt & Whitney

8:35 AM Invited
Materials, Manufacturing, and Design: Perspectives on New and Nascent Techniques: *Dennis Dimiduk*[1]; Stephen Niezgoda[2]; Michael Groeber[2]; [1]BlueQuartz Software LLC; [2]The Ohio State University

9:05 AM Invited
Accelerated Materials Design Strategy for Additive Manufacturing at Access e.V.: *Ulrike Hecht*[1]; Michael Mathes[1]; Daniel Röhrens[1]; [1]Access e.V.

9:35 AM Break

9:55 AM Invited
Alloy Design Through Sequential Learning: *James Saal*[1]; [1]Citrine Informatics

10:25 AM Invited
Further Developments of CALPHAD Based Tools for Accelerating Alloy Design: *Paul Mason*[1]; Adam Hope[1]; Kaisheng Wu[1]; Qing Chen[2]; Hai-Lin Chen[2]; Jiayi Yan[2]; Ralf Rettig[2]; Johan Jeppsson[2]; Anders Engstrom[2]; [1]Thermo-Calc Software Inc.; [2]Thermo-Calc Software AB

10:55 AM Invited
High-throughput CALPHAD Calculation for Accelerated Materials Design: *Fan Zhang*[1]; Chuan Zhang[1]; Weisheng Cao[1]; Jun Zhu[1]; Duchao Lv[1]; Shuanglin Chen[1]; [1]CompuTherm LLC

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Microstructure Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Monday AM | February 24, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Garritt Tucker, Colorado School of Mines; Chuang Deng, University of Manitoba

---

8:00 AM
Improved Strength and Toughness in Metal-MAX Nanolaminates Through Nanoscale Mechanistic Competition: *Jacob Gruber*[1]; Siddhartha Pathak[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]University of Nevada, Reno

8:20 AM
Micromechanical Studies of Laser Surface Remelted Hypereutectic Al-20Si Alloy: *Huai-Hsun Lien*[1]; Amit Misra[1]; Jyoti Mazumder[1]; [1]University of Michigan

8:40 AM
Stability of Nanotwinned Thin Metal Films: *Shefford Baker*[1]; Nathaniel Rogers[1]; Kenneth Shaughnessy[1]; [1]Cornell University

9:00 AM Invited
Atomistic Simulation of Twinning Mediated Deformation and Plasticity in Au Nanowires: *Chuang Deng*[1]; Frederic Sansoz[2]; Reza Rezaei[3]; [1]University of Manitoba; [2]University of Vermont; [3]University of Tehran

9:40 AM Break

10:00 AM
Mechanical Phase Mapping of Meteorites: Combining EDX and Nanoindentation: *Jeffrey Wheeler*[1]; [1]ETH Zurich

10:20 AM
Role of Grain Boundaries on Plasticity and Fracture of Nanocrystalline MgAl2O4: *Jessica Maita*[1]; Jacob Davis[2]; James Wollmershauser[3]; Edward Gorzkowski[3]; Boris Feigelson[3]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]University of Massachusetts Amherst; [3]U.S. Naval Research Laboratory

10:40 AM
Role of Grain Boundary in Plastic Deformation of Nanoporous Gold: Ye-Yuan Zhang[1]; *Hai-Jun Jin*[1]; [1]Institute of Metal Research, CAS

11:00 AM
Deformation Mechanisms in a Nanocrystalline CuTa alloys under Shock Loading Conditions: *Billy Hornbuckle*[1]; Steven Dean[1]; Xuyang Zhou[2]; Anit Giri[1]; Anthony Roberts[1]; Greg Thompson[2]; Kris Darling[1]; [1]US Army Research Laboratory; [2]University of Alabama

---

MATERIALS DESIGN

Metal-Matrix Composites: Analysis, Modeling, Observations and Interpretations — Marvels of Microstructure

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys; William Harrigan, Gamma Alloys

Monday AM | February 24, 2020
31A | San Diego Convention Ctr

Session Chair: William Harrigan, Gamma Alloys

8:00 AM Invited
Microstructure, Interfaces and Mechanical Properties of Nano Composites Manufactured in Solid State: *Ramasis Goswami*[1]; Alex Moser[1]; [1]Naval Research Laboratory

8:30 AM
Microstructure Analysis and Modeling of the Effective Properties of Damaged Fe-TiB2 Metal Matrix Composites: *Khaoula Dorhmi*[1]; Katell Derrien[1]; Zehoua Hadjem-Hamouche[1]; Leo Morin[1]; Frederic Bonnet[1]; Jean-Pierre Chevalier[1]; [1]PIMM-ENSAM

8:55 AM
Effects of Interface Characteristics on High Volume Fraction Al/SiCp Composites under Compressive Stress: *Taegyu Lee*[1]; Donghyun Lee[2]; Hobyung Chae[3]; Soo Yeol Lee[3]; Ho Jin Ryu[1]; [1]Korea Advanced Institute of Science and Technology; [2]Korea Institute of Materials Science; [3]Chungnam National University

9:20 AM Break

9:40 AM
Microstructures and Wear Behavior of Titanium Matrix Composite Coatings Fabricated by Gas Tungsten Arc Cladding: *Qi An*[1]; Lujun Huang[1]; Atieh Moridi[2]; Lin Geng[1]; [1]Harbin Institute of Technology; [2]Cornell University

10:05 AM
Fabrication of Multi-layered Aluminum/carbon Fiber Composite for Electromagnetic Interference Shielding: *Jungjoon Kim*[1]; Hyunjoo Choi[1]; [1]Kookmin University

MATERIALS DESIGN

Microstructural Template Consisting of a Face-Centered Cubic Matrix with Ordered Precipitates: Microstructural Evolution and Properties — Al Base Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Rajarshi Banerjee, University of North Texas; Eric Lass, University of Tennessee, Knoxville; Ashley Paz Y Puente, University of Cincinnati; Tushar Borkar, Cleveland State University; Keith Knipling, Naval Research Laboratory; Sophie Primig, University of New South Wales

Monday AM | February 24, 2020
30D | San Diego Convention Ctr

Session Chair: Rajarshi Banerjee, University of North Texas

8:00 AM Introductory Comments

8:10 AM Keynote
Evolution of Ordered Intermetallic Phases in Alloys Through Concomitant Clustering and Ordering Processes: Rumu Halder Banerjee[1]; Ashok Arya[1]; *Srikumar Banerjee*[1]; [1]Bhabha Atomic Research Centre; Homi Bhabha National Institute

8:50 AM
Sc-free Nanoprecipitate-strengthened Aluminum Alloys with Exceptional Creep Resistance: *Richard Michi*[1]; David Seidman[1]; David Dunand[1]; [1]Northwestern University

9:10 AM
D022 + D022' Dual-phase Microstructure in As-cast Al-Mo-Ti Alloys: *Andreas Leineweber*[1]; Mario Kriegel[1]; Stefan Martin[1]; ShunLi Shang[2]; Zi-Kui Liu[2]; [1]TU Bergakademie Freiberg; [2]Pennsylvania State University

9:30 AM Break

10:00 AM Invited
High Temperature Microstructural Stability Mechanisms Revealed by Microscopy in Al-Cu-Mn-Zr Alloys: *Jonathan Poplawsky*[1]; Patrick Shower[2]; Lawrence Allard[1]; Matthew Chisholm[1]; Dongwon Shin[2]; Amit Shyam[2]; [1]The Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; [2]Materials Science and Technology Division, Oak Ridge National Laboratory

10:30 AM Invited
Nanoscale Precipitation-strengthened Al-Er-Sc-Zr-(V,Nb,Ta) Alloys: *Keith Knipling*[1]; [1]Naval Research Laboratory

11:00 AM
Impact of $L1_2$-phase Dispersoids on the Hardening Behavior of Multi-phase Strengthened Aluminum Alloys: *Viktor Wessely*[1]; Robin Schäublin[1]; Stephan Gerstl[1]; Stefan Pogatscher[2]; Peter Uggowitzer[1]; Jörg Löffler[1]; [1]Laboratory of Metal Physics and Technology, Department of Materials, ETH Zurich; [2]Nonferrous Metallurgy, Montanuniversität Leoben

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Lead and Zinc Future Outlook: Plenary Session

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday AM | February 24, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

8:00 AM Introductory Comments

8:15 AM Plenary
EPD Distinguished Lecture: "Around the Lead and Zinc Metallurgical World in Eighty Days" A Virtual Tour of World Lead and Zinc Operations and Technologies: *Phillip Mackey*[1]; [1]P.J. Mackey Technology Inc.

8:45 AM Plenary
Evolution of Global Secondary Lead Production: *Huw Roberts*[1]; [1]CHR Metals Limited

9:15 AM Plenary
A Review of Zinc Smelting and Refining in North and South America: *Stephen James*[1]; E. R. Hamilton[2]; [1]Nyrstar ; [2]Limpact International

9:45 AM Question and Answer Period

10:15 AM Break

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — PbZn Process Fundamentals I

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday AM | February 24, 2020
14B | San Diego Convention Ctr

Session Chair: To Be Announced

10:40 AM
Refractory Challenges in Lead and Zinc Furnaces: *Dean Gregurek*[1]; Katja Reinharter[1]; Jürgen Schmidl[1]; Alfred Spanring[1]; [1]RHI Magnesita

11:00 AM
Numerical Simulation of Gas-liquid Flow Mixing Effect in Bottom-blown Bath: Dongbo Li[1]; Peng Li[1]; *Xin Yao*[1]; Cheng Liu[1]; Zeshang Dong[1]; [1]China ENFI Engineering Corporation

11:20 AM
Slag Reduction Kinetics of a Lead Slag from a Secondary Lead Smelter: *Stuart Nicol*[1]; Joseph Grogan[1]; Boyd Davis[2]; Trevor Lebel[2]; [1]Gopher Resource; [2]Kingston Process Metallurgy

11:40 AM
Phase Evolution during the Oxidation Process of Low Grade Lead-zinc Oxide Ore: *Hai-Peng Gou*[1]; Kuo-Chih Chou[2]; Zhong-Ye Pei[1]; Song-Xuan Chen[1]; Xue-Gang Chen[1]; Ming-Chuan Li[1]; [1]China ENFI Engineering Corporation; [2]University of Science and Technology Beijing

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Secondary Zinc I

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday AM | February 24, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

10:40 AM
A New Era in Smelting Sustainability - Intensification of the Outotec® Ausmelt Top Submerged Lance (TSL) Process for Zinc Production: *Jacob Wood*[1]; David Wilson[1]; Stephen Hughes[1]; [1]Outotec Pty Ltd

11:00 AM
Production of SHG Zinc from 100% Recycled Materials: *John Pusateri*[1]; Brandon Tirpak[1]; J. R. de Wet[1]; [1]American Zinc Recycling Corp.

11:20 AM
Treatment of Weak Acid Leaching Residues in the Waelz Furnace of Juiz de Fora Smelter: *Julia Martins*[1]; Paulo Metzker[1]; Sergio Penchel[1]; Fabiana Teixeira[1]; Robson de Carvalho[1]; Tone Takayama[1]; [1]Nexa Resources

11:40 AM
Recent Development of EAF Dust Treating at Shisaka Smelting Co., Ltd: *Satoru Takaya*[1]; Naoki Kubota[1]; Hiroshi Watanabe[1]; Takao Kudo[1]; [1]Shisaka Smelting Co., LTD.

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Zinc Electrowinning

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday AM | February 24, 2020
15B | San Diego Convention Ctr

Session Chair: To Be Announced

10:40 AM
Increased Current Efficiency in Zinc Electrolysis in the Cajamarquilla Refinery: Juliano Alves de Lima[1]; Eder Lúcio Martins[1]; Gian Gonzales[1]; *Tone Filho*[1]; [1]Nexa

11:00 AM
To Polarize or not to Polarize: Practical Advice on How to Control Zinc Electrodeposition: *Michael Moats*[1]; Timothy Hymer[2]; [1]Missouri University of Science and Technology; [2]The Doe Run Company

11:20 AM
Evaluation of Anodic Oxygen Evolution Activity and Durability of MnOx Electrodeposited Catalysts for Zinc Electrowinning: Sheida Arfania[1]; *Edouard Asselin*[1]; [1]The University of British Columbia

11:40 AM
Optimizing Additive Ratios in Alkaline Zincate Electrodeposition: Margaret Scott[1]; *Michael Moats*[1]; [1]Missouri University of Science and Technology

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIX — Interfacial Reaction of Electronic Materials

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hiroshi Nishikawa, Osaka University; Shi-Kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology, CAS; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; Song-Mao Liang, Clausthal University of Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH

Monday AM | February 24, 2020
Marina Ballroom E | Marriott Marquis Hotel

Session Chairs: A S Md Abdul Haseeb, University of Malaya; Hiroshi Nishikawa, Osaka University

8:00 AM
Interfacial Reactions between Lead-free Solders and Electroless Co(B) Metallization: *Chao-hong Wang*[1]; Yu-bin Guo[1]; [1]National Chung Cheng University

8:20 AM
Interfacial Reaction in the Lead-free Solder/Cu-2.0Be (Alloy 25) Couples: *Yu-Chun Li*[1]; Ching-Hsun Chang[1]; Hsien-Ming Hsiao[2]; Satoshi Ikubo[3]; Yee-Wen Yen[4]; [1]Department of Materials Science and Engineering, National Taiwan University of Science and Technology; [2]Institute of Nuclear Energy Research.; [3]Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology; [4]National Taiwan University of Science and Technology

8:40 AM
Effects of Pd(P) Thickness on the Interfacial Reaction and Mechanical Properties of the Sn-3.5Ag/Au/Pd(P)/Ni(P) Microelectronic Joints: *Cheng-Yu Lee*[1]; Wei-Ling Chou[1]; Ming-Kai Lu[1]; Tsai-Tung Kuo[2]; Cheng-En Ho[1]; [1]Yuan Ze University; [2]Taiwan Uyemura Limited Company

9:00 AM
Effects of Copper Electroplating Parameters on the Copper-based Solder Joint Reactions: *Chih Ming Chen*[1]; Hsuan Lee[1]; [1]National Chung Hsing University

9:20 AM
Real-time Observation of the Accelerated Growth of (Cu,Ni)6Sn5 on Cu-xNi Current Collectors: *Xin Tan*[1]; Hideyuki Yasuda[2]; Stuart McDonald[1]; Kazuhiro Nogita[1]; [1]The University of Queensland; [2]Kyoto University

9:40 AM Break

10:00 AM
In-situ Study of Electrochemical Migration of Tin in Presence of Contaminants: *A.S.Md Abdul Haseeb*[1]; Ee Lynn Lee[1]; Yi Sing Goh[1]; Y. H. Wong[1]; M. F. M. Sabri[1]; B. Y. Low[1]; [1]University of Malaya

10:20 AM
Study on Eelectromigration of Cu-Sn IMC Formation Due to Currents Stress and Temperature: Chao-Chi Huang[1]; Po Hsun Wang[1]; *Ming-Tzer Lin*[1]; [1]National Chung Hsing University

10:40 AM
Learning from the Ni3Sn2 for Cu6Sn5: *Andreas Leineweber*[1]; Christian Wieser[2]; Werner Hügel[2]; [1]TU Bergakademie Freiberg; [2]Robert Bosch GmbH

11:00 AM
Zn Whisker Growth under High Temperature and Humidity conditions: *Eul Yong Chae*[1]; Keun Soo Kim[2]; [1]Hyundai Motor Company; [2]Hoseo University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Modeling and Simulation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Monday AM | February 24, 2020
33B | San Diego Convention Ctr

Session Chairs: Rongpei Shi, Lawrence Livermore National Laboratory; Tae Wook Heo, Lawrence Livermore National Laboratory

8:00 AM
Interaction between Phase Transformations and Dislocation Evolution: Phase Field Approaches: *Valery Levitas*[1]; [1]Iowa State University

8:20 AM
Phase-field Modeling of Precipitates in Multicomponent Alloys with Various Coherency States: *Tianle Cheng*[1]; Youhai Wen[2]; Jeffrey Hawk[2]; [1]U.S. Department of Energy, National Energy Technology Laboratory / LRST; [2]U.S. Department of Energy, National Energy Technology Laboratory

8:40 AM
Phase-Field Simulation of Grain Growth in Porous Materials: Miral Verma[1]; *Rajdip Mukherjee*[1]; [1]Indian Institute of Technology Kanpur

9:00 AM
Phase-field Simulation of Microstructure Evolution during Solidification in Metal Additive Manufacturing: *Jiwon Park*[1]; Chang-Seok Oh[1]; [1]Korea Institute of Materials Science

9:20 AM
Multiphase Modeling of Artificial Aging in a Multicomponent Aluminum Alloy based on the Subcritical Growth Theory: *Daniel Larouche*[1]; Tohid Naseri[1]; Rémi Martinez[2]; Francis Breton[3]; Denis Massinon[4]; [1]Laval University; [2]Linamar Corporation; [3]Rio Tinto; [4]Montupet Laigneville

9:40 AM Break

10:00 AM
Mesoscale Models for Investigating Solid-state Phase Transformations in Metal Hydrides for Hydrogen Storage: *Tae Wook Heo*[1]; Xiaowang Zhou[2]; ShinYoung Kang[1]; Rongpei Shi[1]; Brandon Wood[1]; [1]Lawrence Livermore National Laboratory; [2]Sandia National Laboratories

10:20 AM
Atomistic modeling based on the Quasiparticle Approach of the Fcc-bcc Phase Transformations: *Helena Zapolsky*[1]; Mykola Lavrskyi[1]; Renaud Patte[1]; Olha Nakonechna[1]; Gilles Demange[1]; Frederic Danoix[1]; [1]Gpm, Umr 6634

10:40 AM
Lattice Boltzmann Phase-field Modelling of Solidification Process for the Ni-Nb Binary-alloy: *Xueqin Huang*[1]; [1]Texas A&M University

11:00 AM
Beyond Modified Mean Field: A Case for a Stochastic Grain Growth Model in the Short Time Limit: Chandra Pande[1]; *Alex Moser*[1]; [1]Naval Research Laboratory

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Overview and Nanostructured Metals I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Monday AM | February 24, 2020
31B | San Diego Convention Ctr

Session Chair: Haiming Wen, Missouri University of Science and Technology

8:00 AM Introductory Comments

8:10 AM Invited
Enrique J. Lavernia – A Retrospective View of his Accomplishments and Contributions: *Diran Apelian*[1]; [1]Worcester Polytechnic Institute

8:40 AM Invited
"10": *Guillermo Aguilar*[1]; [1]University of California, Riverside

9:10 AM
Microstructurally Stable Nanocrystalline Mg Alloys: *Suveen Mathaudhu*[1]; [1]University of California, Riverside

9:30 AM
Hetero-deformation Induced (HDI) Hardening in Heterostructured Materials: *Yuntian Zhu*[1]; Xiaolei Wu[2]; [1]North Carolina State University; [2]Institute of Mechanics

9:50 AM Break

10:10 AM Invited
Processing Pathways to Stabilized Nanocrystalline Structures: *Christopher Schuh*[1]; [1]Massachusetts Institute of Technology

10:40 AM Invited
Using High-pressure Torsion for the Processing of Ultra-strong Bulk Solids: Megumi Kawasaki[1]; *Terence Langdon*[2]; [1]Oregon State University; [2]University of Southampton

11:10 AM Invited
Recent Findings on Paradoxes of Severe Plastic Deformation: *Ruslan Valiev*[1]; [1]UFA State Aviation Technical University

MATERIALS DESIGN

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin — Superalloys

Sponsored by: TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Ayman Salem, MRL Materials Resources LLC; Viola Acoff, University of Alabama; Nathan Levkulich, UES; Michael Glavicic, Rolls-Royce; Yufeng Zheng, University of Nevada, Reno; John Rotella, Purdue University

Monday AM | February 24, 2020
30E | San Diego Convention Ctr

Session Chairs: Tresa Pollock, UCSB; Paul Jablonski, National Energy Technology Laboratory

8:00 AM Introductory Comments: Adam L. Pilchak

8:10 AM Invited
Directional Recrystallization Processing: *Ian Baker*[1]; [1]Dartmouth College

8:40 AM Invited
The Operation of a Research Scale Esr Furnace and its Impact on Trace Elements: *Paul Jablonski*[1]; Martin Detrois[1]; [1]National Energy Technology Laboratory

9:10 AM Invited
Microstructure Control of Nickel based Superalloy Forgings: a Focus onto Post-dynamic Evolutions: *Nathalie Bozzolo*[1]; Marc Bernacki[1]; [1]MINES ParisTech

9:40 AM Break

10:00 AM Invited
Annealing Twins in Wrought Polycrystalline Superalloys: Marie-Agathe Charpagne[1]; Jean-Charles Stinville[1]; Will Lenthe[1]; McLean Echlin[1]; *Tresa Pollock*[1]; [1]University of California, Santa Barbara

10:30 AM Invited
Towards Rapid Throughout Measurement of Grain Boundary Properties: Jin Zhang[1]; *Peter Voorhees*[1]; Henning Poulsen[2]; [1]Northwestern University; [2]Technical University of Denmark

11:00 AM Invited
Enhancing the Properties of Ni-based Superalloys via Mesoscale Engineering: *Sammy Tin*[1]; [1]Illinois Institute of Technology

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Advanced Techniques of Radiation Damage Characterization

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Monday AM | February 24, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Djamel Kaoumi, North Carolina State University; Aurelie Gentils, universite Paris Saclay

8:00 AM Invited
Applications of Advanced Electron Microscopy to Understand Irradiation Damage of Fusion and Fission Materials: *Chad Parish*[1]; Daniel Morrall[1]; Yutai Katoh[1]; Arunodaya Bhattacharya[1]; Andrew Lupini[1]; Philip Edmondson[1]; [1]Oak Ridge National Laboratory

8:30 AM
Depth-dependent Characterization and 3D Tomography of In-situ Ion Irradiated Microstructure: *Wei-Ying Chen*[1]; Meimei Li[1]; [1]Argonne National Laboratory

8:50 AM
Effect of Chemical Compositions on Precipitate Coherency Loss After In-situ Irradiations: *Ling Wang*[1]; Wei-Ying Chen[2]; David Martin[1]; Peter Baldo[2]; Meimei Li[2]; Brian Wirth[1]; Steven Zinkle[1]; [1]University of Tennessee; [2]Argonne National Laboratory

9:10 AM
Correlation of In-situ TEM Characterization and Ex-situ Microchemistry Analysis of Radiation Damage in Metal/Oxide Multilayers: *Jacob Cooper*[1]; Ryan Schoell[1]; Djamel Kaoumi[1]; [1]Department of Nuclear Engineering, North Carolina State University

9:30 AM Break

9:50 AM Invited
Quantitative Analysis of Atomic Scale Defects in Irradiated Materials: *Farida Selim*[1]; Sahil Agarwal[1]; Aaron Kohnert[2]; Jacob Cooper[3]; Nan Li[2]; Yongqiang Wang[2]; Djamel Kaoumi[3]; Danny Edwards[4]; Laurent Capolungo[4]; Peter Hosmann[5]; Blas Uberuaga[2]; [1]Bowling Green State University; [2]Los Alamos National Laboratory; [3]North Carolina State University; [4]Pacific Northwest National Laboratory; [5] University of Califorina, Berkeley

10:20 AM
Probing Thermal Diffusivity Degradation and Point Defect Density in self-ion Implanted Tungsten with Transient Grating Spectroscopy: *Mohamed Abdallah Reza*[1]; Hongbing Yu[1]; Kenichiro Mizohata[2]; Felix Hofmann[1]; [1]Department of Engineering Science, University of Oxford; [2]Materials Physics, University of Helsinki

10:40 AM
Raman Signature of Point Defects in Boron Carbide: *Guido Roma*[1]; Gaëlle Gutierrez[1]; Kevin Gillet[1]; Dominique Gosset[1]; [1]CEA

11:00 AM
Noble Gas Bubble Superlattice in bcc Metals under Irradiation: *Cheng Sun*[1]; D. Sprouster[2]; S. Gill[2]; M. Topsakal[2]; L. Ecker[2]; J. Gan[1]; [1]Idaho National Laboratory; [2]Brookhaven National Laboratory

11:20 AM
Study of Neutron Irradiation Damage of HT-UPS Steel Using Synchrotron X-ray Techniques: *Sri Tapaswi Nori*[1]; Alejandro Figueroa[1]; Jonova Thomas[1]; Gyuchul Park[1]; Walter Williams[1]; Hemant Sharma[2]; Jun-Sang Park[2]; Peter Kenesei[2]; Jonathan Almer[2]; Zhengrong Lee[3]; Mark Warren[3]; Jeff Terry[3]; Maria Okuniewski[1]; [1]Purdue University; [2]Argonne National Laboratory; [3]Illinois Institute of Technology

11:40 AM
Ion Beam Synthesis of Nano-metallic Oxide Particles in High Purity FeCr: *Stephanie Jublot-Leclerc*[1]; Martin Owusu-Mensah[1]; Joël Ribis[2]; Vladimir Borodin[3]; Ryan Schoell[4]; Ce Zheng[4]; Djamel Kaoumi[4]; Aurélie Gentils[1]; [1]CSNSM, Univ Paris-Sud and CNRS, Université Paris-Saclay; [2]DEN, SRMA, CEA, Université Paris-Saclay; [3]NRC "Kurchatov Institute", and National Research Nuclear University MEPhI, Moscow; [4]Department of Nuclear Materials, North Carolina State University

MATERIALS PROCESSING

Rare Metal Extraction & Processing — Lithium, Cobalt, Rare Earth Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Kerstin Forsberg, KTH Royal Institute of Technology; Alafara Baba, University of Ilorin

Monday AM | February 24, 2020
13 | San Diego Convention Ctr

Session Chair: To Be Announced

8:00 AM Keynote
Development of a Physiochemical Model Combined with an Engineering Model for Predicting Solvent Extraction Performances within the Context of Lithium-ion Battery Recycling: *Alexandre Chagnes*[1]; [1]GéoRessources, Université de Lorraine

8:30 AM
A Fundamental Investigation of Li2CO3 Crystallization from Li2SO4 System: *Hongting Liu*[1]; Gisele Azimi[1]; [1]University of Toronto

8:50 AM
Recycling of End-of-life Lithium-ion Battery of Electric Vehicles: *Ka Ho Chan*[1]; Monu Malik[1]; John Anawati[1]; Gisele Azimi[1]; [1]Department of Chemical Engineering and Applied Chemistry, University of Toronto

9:10 AM
Optimal Hydrometallurgical Extraction Conditions for Lithium from a Nigerian Polylithionite Ore for Industrial Application: *Omoniyi Israel*[1]; Agaku Peter[1]; Baba Alafara[2]; [1]Ahmadu Bello University; [2]University of Ilorin

9:30 AM Break

9:45 AM
Selective Lithium Recovery from Brines Using Hydrothermally Treated Titania Slag: *Raja Shekhar Marthi*[1]; York Smith[1]; [1]University Of Utah

10:05 AM
Review on Removal of Impurities from REE Processing Solutions: *William Judge*[1]; Gisele Azimi[1]; [1]University of Toronto

10:25 AM
Molecular Recognition Approach to REE Extraction, Separation and Recycling: *Gulaim Seisenbaeva*[1]; [1]SLU

10:45 AM
Production of Energy Saving Materials from the Waste Mixtures of REEs: *Martina Petranikova*[1]; Moufida Mansouri[1]; Cristian Tunsu[1]; Burcak Ebin[1]; [1]Chalmers University of Technology

11:05 AM
Selective Recovery of Scandium from Nickel Laterite Ore by Acid Roasting - Water Leaching: *John Anawati*[1]; Runlin Yuan[1]; Jihye Kim[1]; Gisele Azimi[1]; [1]University of Toronto

ELECTRONIC MATERIALS

Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications — Printed Electronics Advances

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Ravindra Nuggehalli, New Jersey Institute of Technology; Anming Hu, University of Tennessee; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Yong Lin Kong, University of Utah; Mariappan Paranthaman, Oak Ridge National Laboratory

Monday AM | February 24, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Pooran Joshi, Oak Ridge National Laboratory; Ravindra Nuggehalli, New Jersey Institute of Technology

8:00 AM Invited
Aerosol Jet 3D Printed Sensors: *Rahul Panat*[1]; Md. Taibur Rahman[1]; Matthew Schrandt[2]; Michael Renn[2]; Chintalapalle Ramana[3]; [1]Carnegie Mellon University; [2]Optomec Inc.; [3]University of Texas at El Paso

8:25 AM
Direct Ink Writing of Soft Robotics with Embedded Sensors: *Domenic Cipollone*[1]; Derek Doyle[2]; Konstantinos Sierros[1]; [1]West Virginia University; [2]Air Force Research Laboratory

8:45 AM Invited
Multiscale Additive Manufacturing of Biomedical Electronics: *Yong Lin Kong*[1]; [1]University of Utah

9:10 AM Invited
Evaluating Electro-mechanical Reliability of Polymer Supported Films Using In-situ Methods: *Megan Cordill*[1]; [1]Erich Schmid Institute

9:35 AM Break

9:55 AM Invited
Towards the Next Generation of 3D Printable Energy Storage Devices: *Konstantinos Sierros*[1]; [1]West Virginia University

10:20 AM Invited
Multi-material Additive Manufacturing of Ionomeric Polymer Membranes with 3D Topologies: *Kwang Kim*[1]; Zakai Olsen[1]; [1]University of Nevada, Las Vegas

10:45 AM
Electric Field Assisted Ultra-Fast R2R Printing Technology for High-Performance Skin-like Smart Sensors: *Ying Zhong*[1]; Long Wang[2]; Rui Kou[2]; [1]University of South Florida; [2]University of California at San Diego

11:05 AM Invited
Understanding 3D-printing Processes through Operando X-ray Photon Correlation Spectroscopy: *Maria Torres Arango*[1]; Yugang Zhang[1]; Gregory Doerk[2]; Ruipeng Li[1]; Chonghang Zhao[3]; Yu-chen Karen Chen-Wiegart[4]; Andrei Fluerasu[1]; Lutz Wiegart[1]; [1]National Synchrotron Light Source II, Brookhaven National Laboratory; [2]Center for Functional Nanomaterials, Brookhaven National Laboratory; [3]Stony Brook University; [4]National Synchrotron Light Source II, Brookhaven National Laboratory. Stony Brook University.

BIOMATERIALS

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Lubricant-free Forming Processes

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carrado, IPCMS - CNRS; Heinz Palkowski, Clausthal University of Technology; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Ramana Chintalapalle, University of Texas at El Paso; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington; Vikas Tomar, Purdue University

Monday AM | February 24, 2020
Oceanside | Marriott Marquis Hotel

Session Chair: Heinz Palkowski, TU Clausthal

8:00 AM Keynote
Coated and Structured Tool Surfaces for Lubricant Free Forming Processes: *Thomas Seefeld*[1]; Adrian Ditsche[1]; [1]BIAS - Bremer Institut für Angewandte Strahltechnik GmbH

8:40 AM Invited
Deposition of Nanoscopic Smooth DLC tool Coatings for Dry Forming of Aluminum Sheets: *Tim Abraham*[1]; Ingmar Bialuch[1]; Günter Bräuer[1]; Felix Flegler[2]; Peter Groche[2]; [1]Fraunhofer-Institute for Surface Engingeering and Thin Films; [2]Darmstadt University of Technology, Institute for Production Engineering and Forming Machines

9:10 AM Invited
Impact of Peak Material Volume of Polycrystalline CVD-diamond Coatings on Dry Friction against Aluminum: Markus Prieske[1]; *Annika Bohlen*[1]; Frank Vollertsen[1]; [1]BIAS - Bremer Institut für angewandte Strahltechnik GmbH

9:40 AM Invited
Dry Deep Drawing of Aluminium and the Role of Sheet Metal Roughness: *Felix Flegler*[1]; Peter Groche[1]; Tim Abraham[2]; Günter Bräuer[2]; [1]TU Darmstadt Institute for Production Engineering and Forming Machines; [2]Fraunhofer Institute of Surface Engineering and Thin Films IST

10:10 AM Break

10:30 AM Invited
Advances in Dry Metal Forming Using Volatile Lubricants Injected through Laser Drilled Microholes: Gerd Reichardt[1]; *Manuel Henn*[2]; Mathias Liewald[1]; Rudolf Weber[2]; Thomas Graf[2]; [1]Institute for Metal Forming Technology; [2]Institut fuer Strahlwerkzeuge

11:00 AM Invited
A Thermoelectrically Based approach to Reduce Adhesive Wear during Blanking: *Markus Welm*[1]; Philipp Tröber[2]; Hannes Alois Weiss[1]; Peter Demmel[3]; Roland Golle[1]; Wolfram Volk[1]; [1]Technical University of Munich, Chair of Metal Forming and Casting; [2]Technical University of Munich; [3]MAN Truck and Bus AG

11:30 AM Keynote
Selective Oxidation of Tool Surfaces – An Approach to Reduce Friction and Wear in Dry Metal Forming: *Hans Maier*[1]; Bernd-Arno Behrens[1]; [1]Leibniz Universität Hannover

ENERGY & ENVIRONMENT

Recycling of Secondary, Byproduct Materials and Energy — Recycling of Ferrous Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Mingming Zhang, ArcelorMittal Global R&D; John Howarter, Purdue University; Elsa Olivetti, Massachusetts Institute of Technology; Alan Luo, Ohio State University; Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology

Monday AM | February 24, 2020
16A | San Diego Convention Ctr

Session Chairs: John Howarter, Purdue University; Mingming Zhang, ArcelorMittal Global R&D

8:00 AM Introductory Comments

8:05 AM
Towards 100% Recycling of Steelmaking Offgas Solid Wastes by Reallocating Zinc-bearing Materials: *Naiyang Ma*[1]; [1]Arcelor Mittal

8:30 AM
Granulation and Carbonization Process of Titanium-bearing Blast furnace Slag: Mingrui Yang[1]; Gangqiang Fan[1]; Feifei Pan[1]; Jie Dang[1]; Xuewei Lv[1]; *Chenguang Bai*[1]; [1]Chongqing University

8:50 AM
Achieving an Internal Recirculation of Slag towards a Zero Waste Stainless-steel Production: *Mattia De Colle*[1]; Pär Jönsson[1]; Andrey Karasev[1]; [1]KTH Royal Institute of Technology

9:10 AM
Study on Cracking Control of Cold Bonded Pellets Containing Converter Dust Based on Nonhydraulic Hardening Mechanism: *Xiang Li*[1]; Ping Tang[1]; Xueqin Zhu[1]; Pengpeng Qin[1]; Guanghua Wen[1]; [1]Chongqing University

9:30 AM Break

9:50 AM
A Review of Iron and Steel Scrap Recycling in Ironmaking and Steelmaking Processes: *Mingming Zhang*[1]; [1]ArcelorMittal Global R&D

10:10 AM
Experimental Study on Stainless Steel Dust by Reduction and Enrichment for Preparation Raw Material of Powder Metallurgy: *Ziyang Wang*[1]; [1]Shanghai University

ADVANCED MATERIALS

Refractory Metals 2020 — Nb Processing and Applications; Mechanical Behaviors of Refractory Metals

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee

Program Organizers: Eric Taleff, University of Texas at Austin; Gary Rozak, H.C. Starck Inc; Todd Leonhardt, Rhenium Alloys Inc.

Monday AM | February 24, 2020
Cardiff | Marriott Marquis Hotel

Session Chairs: Eric Taleff, University of Texas; Gary Rozak, H.C. Starck Inc.

8:00 AM
Dislocation Mechanics-based Crystal Plasticity of Nb: *Eureka Pai Kulyadi*[1]; Jean-Francois Croteau[2]; Di Kang[1]; Philip Eisenlohr[1]; Thomas Bieler[1]; Elisa Cantergiani[2]; [1]Michigan State University; [2]I-Cube Research, Toulouse, France

8:20 AM
Effect of Dislocations and Grain Boundaries on Magnetic Flux Trapping in High-purity Niobium used for Superconducting Radio Frequency Cavities: Mingmin Wang[1]; Shreyas Balachandran[2]; Santosh Chetri[2]; Anatolii Polyanskii[2]; Peter Lee[2]; *Thomas Bieler*[1]; [1]Michigan State University; [2]National High Magnetic Field Laboratory

8:40 AM
Effect of Strain Rate on the Anisotropic Tensile Mechanical Properties of High Purity Niobium Single Crystals: *Jean-Francois Croteau*[1]; Eureka Pai Kulyadi[2]; Chaitanya Kale[3]; Di Kang[2]; Derek Siu[4]; Thomas Bieler[2]; Philip Eisenlohr[2]; Kiran Solanki[3]; Elisa Cantergiani[1]; Nicolas Jacques[5]; Daniel Balint[4]; Paul Hooper[4]; Said Atieh[6]; [1]I-Cube Research; [2]Michigan State University; [3]Arizona State University; [4]Imperial College; [5]ENSTA Bretagne; [6]CERN

9:00 AM
Static and Dynamic Grain Growth in Niobium at 1200 to 1500: *Emily Brady*[1]; Eric Taleff[1]; [1]University of Texas at Austin

9:20 AM
Mechanism of Hardening and Damage Initiation in Oxygen Embrittlement of Body-Centred-Cubic Niobium: *Weizhong Han*[1]; Ping-Jiong Yang[1]; [1]Xi'an Jiaotong University

9:40 AM Break

10:00 AM
Dynamic Grain Growth in Refractory Metals: *Eric Taleff*[1]; [1]University of Texas at Austin

10:20 AM
Molybdenum Foil Tensile Testing: *Brandon Kenny*[1]; Gary Rozak[2]; [1]Miami University; [2]H.C. Starck Inc

10:40 AM
Thermally Activated Deformation Processes in W-Re Alloys: *Verena Maier-Kiener*[1]; Johann Kappacher[1]; Daniel Kiener[1]; Helmut Clemens[1]; [1]Montanuniversität Leoben

11:00 AM
On Deformation Behavior of Polycrystalline Rhenium at Low Homological Temperature: *Peter Panfilov*[1]; Yuri Gornostyrev[2]; Mikhail Petrik[2]; [1]Ural Federal University; [2]Institute of Metalphysics of the Ural Branch of the RAS

ELECTRONIC MATERIALS

Solar Cell Silicon — Synthesis, Production, and Refyning

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee, TMS: Materials Characterization Committee

Program Organizers: Shadia Ikhmayies, Al Isra University; Neale Neelameggham, IND LLC

Monday AM | February 24, 2020
Miramar | Marriott Marquis Hotel

Session Chair: Shadia Ikhmayies, Isra University

8:00 AM Introductory Comments

8:05 AM
Molten Salt Electrolysis Production of Solar Silicon from Natural Quartzite: *Aditya Moudgal*[1]; Sarat Buasai[1]; Alexander McMahon[1]; Yi Jie Wu[1]; Adam Powell[1]; Uday Pal[2]; Yu Zhong[1]; [1]Worcester Polytechnic Institute; [2]Boston University

8:25 AM
Phase Diagrams of the Si-P Binary System: *Shadia Ikhmayies*[1]; [1]Al Isra University

8:45 AM
Thermo-calc Determination of the Phase Diagram of Si-B Binary System: *Shadia Ikhmayies*[1]; [1]Al Isra University

9:05 AM Break

9:15 AM
Combustion Synthesis of Nanostructured Silicon: *Sergio Cordova*[1]; Evgeny Shafirovich[1]; [1]University of Texas at El Paso

9:35 AM
Zr Addition for Enhanced B Removal from Si by Si-Cu Solvent Refining: *Yongsheng Ren*[1]; Kazuki Morita[1]; [1]The University of Tokyo

9:55 AM
Effect of Mg on Boron Removal in Electromagnetic Solidification of Si-Al Melt: *Jie Mei*[1]; Wenzhou Yu[1]; Piao Hou[1]; Yang Xue[1]; Xuewei Lv[1]; [1]Chongqing University

PHYSICAL METALLURGY

Solid State Diffusion Bonding of Metals and Alloys — Solid State Diffusion Bonding of Metals and Alloys I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Mohamed Elbakhshwan, University of Wisconsin Madison; Mark Anderson, University of Wisconsin Madison; Todd Allen, University of Michigan ; Tasnim Hassan, North Carolina State University

Monday AM | February 24, 2020
19 | San Diego Convention Ctr

Session Chairs: Mohamed Elbakhshwan, UW-Madison; Tasnim Hassan, North Carolina State University; Mark Anderson, University of Wisconsin Madison

8:00 AM Introductory Comments

8:10 AM Invited
Effect of Diffusion Bonding Parameters on Joint Efficiency of Fe- and Ni-base Alloys: Sung Hwan Kim[1]; Ji-Hwan Cha[1]; *Changheui Jang*[1]; [1]Korea Advanced Institute of Science & Technology

8:40 AM
Diffusion Bonding of AgC-Cu Bi-Layered Electrical Contacts: *Daudi Waryoba*[1]; Linsea Paradis[1]; [1]Pennsylvania State University

9:00 AM
Diffusion Bonding of Ti-6Al-4V Alloy to Interstitial Free (IF) Steel Using Copper and Nickel Interlayers: *Manil Raj*[1]; M.J.N.V. Prasad[1]; K Narasimhan[1]; [1]IIT Bombay. MEMS Dept.

9:20 AM
Bulk-state Reaction for Synthesizing Bulk Hybrid Alloys through High-pressure Torsion: *Megumi Kawasaki*[1]; Jae-Kyung Han[1]; Terence Langdon[2]; [1]Oregon State University; [2]University of Southampton

9:40 AM Break

10:10 AM
Effect of Hydrogen Addition on the Diffusion Bonding Behavior of Titanium Alloys: *Xifeng Li*[1]; Fuhui Zhu[1]; Huiping Wu[1]; Jun Chen[1]; [1]Shanghai Jiao Tong University

10:30 AM
Interfacial Recrystallization and Element Diffusion during the Hot Compression-bonding of Ti-6321 to TC4: Bijun Xie[1]; *Mingyue Sun*[1]; Bin Xu[1]; Dianzhong Li[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

10:50 AM
Mechanical Characterization of Diffusion Bonded Alloy 800H: *Heramb Mahajan*[1]; Tasnim Hassan[1]; [1]North Carolina State University

PHYSICAL METALLURGY

Thermal Transport in Crystalline and Non-crystalline Solids: Theory and Experiments — Fundamentals of Phonon Mediated Thermal Transport

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Marat Khafizov, Ohio State University; Michael Manley, Oak Ridge National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Aleksandr Chernatynskiy, Missouri Science and Technology University

Monday AM | February 24, 2020
18 | San Diego Convention Ctr

Session Chairs: Marat Khafizov, Ohio State University; Michael Manley, Oak Ridge National Laboratory

8:00 AM Invited
Phonon Dispersion and Linewidth in ThO_2 Measured by Neutron Scattering: *Matthew Bryan*[1]; Lyuwen Fu[2]; Matthew Mann[3]; Chris Marianetti[2]; Michael Manley[1]; [1]Oak Ridge National Laboratory; [2]Columbia University; [3]Air Force Research Laboratory

8:30 AM Invited
Thermal Transport in ThO_2: *Chris Marianetti*[1]; [1]Columbia University

9:00 AM
Study of Thermal Transport Properties of Thorium Dioxide Single Crystals: *Narayan Poudel*[1]; Xiaxin Ding[1]; Matthew Mann[2]; Krzysztof Gofryk[1]; [1]Idaho National Laboratory; [2]Air Force Research Laboratory

9:20 AM
Lattice Dynamics and Thermodynamics of Strongly Anharmonic Solids via Bayesian Learning: *Taishan Zhu*[1]; Jeffrey Grossman[1]; [1]Massachusetts Institute of Technology

9:40 AM Break

10:00 AM Invited
Multi Scale Modeling of the Thermal Conductivity: Combining First Principle Calculations with Monte Carlo: *Laurent Chaput*[1]; David Lacroix[1]; [1]University De Lorraine

10:30 AM Invited
Advancing Insights into Phonon Thermal Transport with Theory/experiment Interactions: *Lucas Lindsay*[1]; [1]Oak Ridge National Laboratory

11:00 AM Invited
Lattice Thermal Conductivity of Quartz at High Pressure and Temperature from the Boltzmann Transport Equation: Xue Xiong[1]; Eugene Ragasa[2]; Aleksandr Chernatynskiy[3]; DaWei Tang[4]; *Simon Phillpot*[2]; [1]Chinese Academy of Sciences; [2]University of Florida; [3]Missouri University of Science and Technology; [4]Dalian University of Technology

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Microstructure & Property

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Monday AM | February 24, 2020
Marina Ballroom D | Marriott Marquis Hotel

Session Chairs: Qin Yu, University of California, Berkeley; Paulo Branicio, University of Southern California; Xinghang Zhang, Purdue University; Terry Lowe, Colorado School of Mines

8:00 AM Invited
Mechanical Behavior of Structurally Gradient Alloys: Jie Ding[1]; Qiang Li[1]; Zhongxia Shang[1]; *Xinghang Zhang*[1]; [1]Purdue University

8:20 AM Invited
Deformation and Failure of Gradient Metallic Nanoglasses: *Paulo Branicio*[1]; [1]University of Southern California

8:40 AM
Deformation Compatibility between Nanotwinned and Recrystallized Grains Enhances Resistance to Interface Cracking in Cyclic Loaded Stainless Steel: *Qian Li*[1]; Fen Kai Yan[1]; Nairong Tao[1]; Ke Lu[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

9:00 AM
Properties of Ultrafine Grain Titanium Fabricated by Multimode Deformation Processing: *Benjamin Ewing*[1]; Benjamin Davis[1]; Lane Bailey[1]; Jeffrey Slater[1]; Mathew Hayne[2]; Skyler Davis[2]; Melina Endsley[2]; Terry Lowe[2]; Tamás Ungár[3]; [1]Fort Wayne Metals; [2]Colorado School of Mines; [3]Eötvös University

9:20 AM Break

9:40 AM Invited
On the Fracture Toughness of Gradient Pure Nickel: *Qin Yu*[1]; Ruqing Cao[2]; Jie Pan[2]; Yan Lin[2]; Andrew Sweet[1]; Yi Li[2]; Robert Ritchie[1]; [1]Lawrence Berkeley National Laboratory; [2]Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

10:00 AM Invited
Fracture Strain and Forging Limit Analysis of Polycrystalline Alloys at Elevated Temperatures: *Yanfei Gao*[1]; Wei Zhang[1]; [1]University of Tennessee - Knoxville

10:20 AM
Deformation Induced Microstructures in Ultrafine Grain Magnesium Fabricated by ECAP-C: Casey Davis[1]; *Adam Griebel*[2]; Jeremy Schaffer[2]; Terry Lowe[1]; Tamás Ungár[3]; [1]Colorado School of Mines; [2]Fort Wayne Metals; [3]Eötvös University

10:40 AM
Fatigue Properties and Cyclic Behavior of Tensile Pre-deformed Nanotwinned Cu: *Qingsong Pan*[1]; Haofei Zhou[2]; Huajian Gao[3]; Lei Lu[1]; [1]Institute of Metal Research, Chinese Academy of Sciences; [2]Zhejiang University; [3]Brown University

11:00 AM
Heterogeneities in Plastic Deformation Mechanisms in UFG Aluminum Studied by In-situ TEM Straining and Bulk Deformation: *Witold Chrominski*[1]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology

11:20 AM
Effect of Stacking Fault Energy (SEF) and Surface Mechanical Attrition Treatment (SMAT) on Mechanical Properties of Copper and Copper Alloys: *Xinkun Zhu*[1]; Hongliang Gao[1]; Shu Baipo[1]; Pan Hongjiang[1]; [1]Kunming University Of Science And Technology

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Spall Fracture un Metals -- Modeling and Experiments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Monday AM | February 24, 2020
5A | San Diego Convention Ctr

Session Chair: Saryu Fensin, LANL

8:00 AM Introductory Comments

8:05 AM Invited
Influence of Grain Boundary Crystallography on Dynamic Failure (Spall): *Mukul Kumar*[1]; Roger Minich[1]; [1]Lawrence Livermore National Laboratory

8:45 AM
Experimental Measurements and Modeling of LatticeTotation around Inter and Transgranular Spall Voids in Shocked Copper Bicrystals: Elizabeth Fortin[1]; Benjamin Shaffer[1]; Saul Opie[1]; *Pedro Peralta*[1]; [1]Arizona State University

9:05 AM
Understanding and Predicting Damage and Failure at Grain Boundaries in BCC Ta: *Jie Chen*[1]; Eric Hahn[2]; Avinash Dongare[1]; Saryu Fensin[2]; [1]University of Connecticut; [2]Los Alamos National Laboratory

9:25 AM
Application of X-ray Phase Contrast Imaging to Spall in Magnesium Alloy AZ31B: *David Chapman*[1]; Lukasz Farbaniec[1]; John Jonsson[1]; Michael Rutherford[1]; Liam Smith[1]; Emilio Escauriza[1]; Daniel Eakins[1]; [1]University of Oxford

9:45 AM Break

10:05 AM Invited
A Grain Level Investigation of Ductile Failure using High-energy X-ray Characterization: Diwakar Naragani[1]; Jun-Sang Park[2]; Peter Kenesei[2]; *Michael Sangid*[1]; [1]Purdue University; [2]Argonne National Laboratory

10:45 AM
Role of Shock Loading Orientation and Grain Boundaries on the Shock Compression and Spall Behavior of Iron at Atomic Scales: *Ke Ma*[1]; Avinash Dongare[1]; [1]University of Connecticut

11:05 AM
Shock Recompaction of Existing Spall Damage in Copper: *David Jones*[1]; Saryu Fensin[1]; Robert Hixson[1]; [1]Los Alamos National Laboratory

ADVANCED MATERIALS

Use of Large Scale Facilities to Understand the Physical Metallurgy of Fe-based Alloys — Session I

Sponsored by:

Program Organizers: Sebastien Allain, Institut Jean Lamour; Alexis Deschamps, Genoble Institute of Technology; MingXin Huang, University of Hong Kong; Amy Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology

Monday AM | February 24, 2020
Mission Hills | Marriott Marquis Hotel

Session Chair: Sébastien Allain, Institut Jean Lamour

10:00 AM
Precipitation Kinetics and Chemistry Evolution of Oxide Dispersion Strengthened Steels throughout their Consolidation Process Evaluated by In-situ Anomalous Small-angle X-ray Scattering: *Gabriel Spartacus*[1]; Joël Malaplate[1]; Frédéric De Geuser[2]; Denis Sornin[1]; Alexis Deschamps[2]; [1]CEA Saclay; [2]SIMaP, Grenoble Alpes University

10:20 AM
Nucleation and Evolution of Sigma Phase and Nitrides during Heat Treatment and Welding of Duplex Stainless Steels: *Shirin Nouhi*[1]; Niklas Pettersson; Lars Höglund[1]; Amer Malik[1]; Jan Jonsson[1]; Staffan Hertzman[1]; Sten Wessman[1]; Andreas Stark[1]; David Lindell[1]; [1]Swerim AB

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Energy Efficient Clean Metallurgical Technologies

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Monday PM | February 24, 2020
12 | San Diego Convention Ctr

Session Chairs: Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita

2:30 PM Introductory Comments

2:45 PM
Clean and Efficient Recovery of Precious Metals from Ag-rich Lead Slime Anode: Bin Yang[1]; Guozheng Zha[1]; Xiaofeng Zhang[1]; *Xiangfeng Kong*[1]; Dachun Liu[1]; Daxin Huang[1]; Wenlong Jiang[1]; Baoqiang Xu[1]; [1]Kunming University of Science and Technology

3:05 PM
Effects of Electrolytic Parameters on the Deposition of Element Boron at the Cathode During the Molten Salt Electrolysis for Silicon: *Tao Wang*[1]; Tian Zhongliang[1]; Shu Yang[1]; Yanqing Lai[1]; [1]Central South University

3:25 PM
The Application of an Effective Equilibrium Reaction Zone Model Based on CALPHAD Thermodynamics to Steel Making: *Paul Mason*[1]; Nicholas Grundy[2]; Ralf Rettig[2]; Lina Kjellqvist[2]; Johan Jeppsson[2]; Ake Jansson[2]; Johan Bratberg[2]; [1]Thermo-Calc Software Inc.; [2]Thermo-Calc Software AB

3:45 PM Break

4:00 PM
Mechanical Properties of a Laser Deposited Spherical Ti4822 Alloy: *Monnamme Tlotleng*[1]; Sisa Pityana[1]; Samuel Skhosane[1]; [1]Council for Science & Industrial Research

4:20 PM
Study on the Relationship Between Process Reconstruction and Energy Saving of Iron and Steel Manufacturing Process in China: *Shuangping Wu*[1]; Anjun Xu[1]; Qi Zhang[2]; Ji Li[1]; [1]University of Science and Technology Beijing; [2]Northeastern University,China

4:40 PM
Effect of Magnetic Field on CaO-SiO2-CaF2 Mould Flux:New Insight from Molecular Dynamic Simulation: *Qi Jiang*[1]; Weitong Du[1]; Yu Wang[1]; [1]Chongqing University

5:00 PM
Investigation of Crack Initiation and Propagation in Super Duplex Stainless Steel During Hot Working: *Wei Shen*[1]; Fuming Wang[1]; Zhanbing Yang[1]; Changrong Li[1]; Ping Lin[2]; Xiaojie Zhu[2]; [1]University of Science and Technology Beijing; [2]TSINGSHAN

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Deformation Twinning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Monday PM | February 24, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: Shujuan Wang, Los Alamos National Laboratory; Philip Eisenlohr, Michigan State University

2:30 PM Invited
More than Crystal Plasticity: Multiphysics in DAMASK: *Philip Eisenlohr*[1]; Aritra Chakraborty[2]; Pratheek Shanthraj[3]; Martin Diehl[4]; Darren Pagan[5]; Thomas Bieler[1]; [1]Michigan State University; [2]Argonne National Laboratory; [3]University of Manchester; [4]Max Planck Institut für Eisenforschung GmbH; [5]Cornell University

3:00 PM
Microscratch-induced Deformation Twins in Mg Single Crystals: *Kehang Yu*[1]; Xin Wang[1]; Olivia Donaldson[1]; Subhash Mahajan[2]; Irene Beyerlein[3]; Timothy Rupert[1]; Julie Schoenung[1]; Enrique Lavernia[1]; [1]University of California, Irvine; [2]University of California, Davis; [3]University of California, Santa Barbara

3:20 PM
Study of the Interplay of Basal Slip Activities and Double Twinning Mechanism in Magnesium Using SEM In-situ Tensile Tests Concurrently with HR-EBSD: *Nicolo Maria della Ventura*[1]; Xavier Maeder[1]; Szilvia Kalácska[1]; Thomas Edwards[1]; Daniele Casari[1]; Johann Jakob Schwiedrzik[1]; Johann Michler[1]; [1]Empa

3:40 PM
Antitwinning in Nanoscale Tungsten: *Jiangwei Wang*[1]; Ting Zhu[2]; [1]Zhejiang University; [2]Georgia Institute of Technology

4:00 PM Break

4:20 PM
In-situ Mapping of Twin Related Local Stress Fields in HCP Titanium: *M Arul Kumar*[1]; Laurent Capolungo[1]; Rodney McCabe[1]; Wenjun Liu[2]; Jon Tischler[2]; Carlos Tome[1]; [1]Los Alamos National Laboratory; [2]Argonne National Laboratory

4:40 PM
Three-dimensional Faceted Boundaries of Different Twin Modes in hcp Metals: *Shujuan Wang*[1]; Khanh Dang[1]; Rodney McCabe[1]; Laurent Capolungo[1]; Carlos Tome[1]; [1]Los Alamos National Laboratory

5:00 PM
{10-12} Twin Boundary Segregation of Y in Mg Alloys: *Xin Wang*[1]; Yang Hu[1]; Kehang Yu[1]; Subhash Mahajan[2]; Irene Beyerlein[3]; Enrique Lavernia[1]; Timothy Rupert[1]; Julie Schoenung[1]; [1]University of California Irvine; [2]University of California, Davis; [3]University of California, Santa Barbara

5:20 PM
Micron-scale Characterization of Twinning and Dislocation Slip in Magnesium Single-crystals by Advanced In-situ Techniques: *Kristián Máthis*[1]; Dávid Ugi[2]; Petr Harcuba[1]; Michal Knapek[1]; František Chmelík[1]; Péter Ispánovity[2]; István Groma[2]; [1]Charles University; [2]Eötvös Loránd University

5:40 PM
Quantifying Elastic Strain Near Twin Interface in Magnesium with Nanometric Resolution: *Jinsong Chen*[1]; Yue Liu[1]; Jian Wang[2]; Carlos Tomé[3]; [1]Shanghai Jiao Tong University; [2]University of Nebraska-Lincoln; [3] Los Alamos National Laboratory

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Developments in Magnetic Materials for Sensors and Data Storage

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Monday PM | February 24, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Paul Ohodnicki, National Energy Technology Laboratory; Ivan Skorvanek, Institute of Experimental Physics SAS

2:30 PM Invited
From Shapeable Magnetoelectronics to Soft Robotics with Embedded Magnetic Cognition: *Denys Makarov*[1]; [1]Helmholtz-Zentrum Dresden-Rossendorf e.V.

2:55 PM Invited
Soft Magnetic Amorphous and Nanocrystalline Bilayer Ribbons for GMI Sensors: *Ivan Skorvanek*[1]; Frantisek Andrejka[1]; Branislav Kunca[1]; Jozef Marcin[1]; Peter Svec[2]; [1]Institute of Experimental Physics Sas; [2]Institute of Physics SAS

3:20 PM
Ferromagnetic Transition Metal Selenides for Spintronics: *Pierre Poudeu*[1]; [1]University of Michigan

3:40 PM
Engineering of Magnetic Properties of Co-rich Microwires by Post-processing: Lorena Gonzalez-Legarreta[1]; Valentina Zhukova[1]; Paula Corte-Leon[1]; Mihail Ipatov[1]; Juan Blanco[2]; *Arcady Zhukov*[3]; [1]Dept. Phys.Mater, Univ. Basque Country; [2]Dept. Appl. Phys., Univ. Basque Country; [3]UPV/EHU, and Ikerbasque, Basque Foundation for Science

4:00 PM Break

4:20 PM Invited
High-performance Amorphous Wire Magnetoimpedance Sensor for Biomagnetic Field Detection: *Tsuyoshi Uchiyama*[1]; Jiaju Ma[1]; [1]Nagoya University

4:45 PM
A Study of Processing High-grade Magnetite Concentrates by Combination of Magnetic Separation and Reverse Flotation Separation to Prepare Raw Materials for Ferrite Magnet: Bin Xu[1]; *Yujuan Zhou*[1]; Yongpeng Ma[1]; Jintian Wu[1]; Tao Jiang[1]; [1]Central South University

5:05 PM Invited
Electrochemical Polishing of Thin Metallic Glass Ribbons: *Ferenc Zamborszky*[1]; Eva Fazakas[2]; Elek Csizmadia[1]; Mark Kovacs[1]; [1]Magnetec-Ungarn Kft.; [2]Budapest University of Technology and Economics

5:30 PM Invited
The Invention of On-ASIC Type GSR Sensor Excited by GHz Pulse Current: *Yoshinobu Honkura*[1]; S. Honkura[2]; [1]Magnedesign Corporation; [2]Nanocoil Incorporation

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Sustainability Materials

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Monday PM | February 24, 2020
16B | San Diego Convention Ctr

Session Chairs: Surojit Gupta, University of North Dakota; George Nelson, University of Alabama in Huntsville

2:30 PM
Enhanced Photo Response by Oxygen Retreatment at Hetero-interface of MoS2/Si Solar Cells: *Sangram Pradhan*[1]; Messaoud Bahoura[1]; [1]Norfolk State University

2:50 PM Invited
Highly Stable and Efficient Perovskite Solar Cells with Functional Nanocomposites and Interface Engineering: *Yoon-Bong Hahn*[1]; [1]Chonbuk National University

3:10 PM
Preparation of Macro Encapsulated Phase Change and Nano Materials for High Temperature Energy Storage Applications: *Seyed Mojtaba Sadrameli*[1]; Sajad Soleimanpour[1]; [1]Tarbiat Modares University

3:30 PM
Life Cycle Analysis of Battery Materials: a Circular Economy Perspective: *Qiang Dai*[1]; Olumide Winjobi[1]; [1]Argonne National Laboratory

3:50 PM Invited
On the Design and Development of Lignin based Sustainable Materials: *Surojit Gupta*[1]; [1]University of North Dakota

4:10 PM Break

4:30 PM Invited
Solar Water Oxidation at GaAs Absorbers Protected by Electrodeposited Alloys: *Giovanni Zangari*[1]; Yin Xu[1]; [1]University of Virginia

4:50 PM
MWCNTs/Al2S3 Heterostructure Decorated on NiCo Foam as a Highly Performance Cathode Material for Supercapacitors: Mutawara Mahmood Baig[1]; *Muhammad Taqi Mehran*[1]; Iftikhar Hussain Gul[1]; [1]National University of Sciences and Technology, Islamabad

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — Advanced Microelectronic Packaging Materials

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Monday PM | February 24, 2020
Palomar | Marriott Marquis Hotel

Session Chairs: Albert Wu, National Central University, Taiwan; Fan-Yi OuYang , National TsingHua University, Taiwan

2:30 PM Invited
Pressureless Silver Sintering of SiC MOSFET Power Module for Vehicle: *Won Sik Hong*[1]; Mi-Song Kim[1]; Chulmin Oh[1]; [1]Korea Electronics Technology Institute

2:50 PM
Si and Ag Particles Sintering Technology For Die Attach: *Minoru Ueshima*[1]; Motoharu Haga[1]; Tomoaki Mototsuji[2]; Yusuke Isono[2]; [1]Daicel Corp.; [2]Osaka University

3:10 PM
Bonding and High-temperature Storage Performance of Sintering Ag Paste on Bare Direct Bonding Aluminum (DBA) Substrate: *Zheng Zhang*[1]; Chuantong Chen[1]; Shijo Nagao[1]; Katsuaki Suganuma[1]; [1]Osaka university, Institute of scientific and industrial research

3:30 PM
Die-bonding Performance and Mechanism of Ag Micron Paste with Pressure-less Sintering: *Tetsu Takemasa*[1]; Shingo Ishihara[2]; Junya Kano[2]; Katsuaki Suganuma[3]; [1]Department of Adaptive Machine Systems, Graduate School of Engineering, Osaka University; [2]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University; [3]Institute of Scientific and Industrial Research, Osaka University

3:50 PM Break

4:10 PM
Fatigue and Creep Properties of Sintered Ag Paste from Room Temperature to High Temperature: *Chuantong Chen*[1]; Chanyang Choe[1]; Aiji Suetake[1]; Katsuaki Suganuma[1]; [1]Osaka University

4:30 PM
On the Adhesion of a Sintered Ag Joint on a Cu Substrate using Laser Shocks Influence of Aging: Anna Gordun Peiro[1]; Thibaut De Resseguier[1]; Loic Signor[1]; Eloic Ferdinand[1]; Jacques Baillargeat[1]; Hadi Bahsoun[2]; *Xavier Milhet*[1]; [1]Prime Institute CNRS ENSMA; [2]Prime Institute CNRS Université Poitiers

4:50 PM
Low Temperature Cu-Cu Bonding by Copper-based Paste with Small Amount Sn Additive: *Kuo-Shuo Huang*[1]; Wei Liu[1]; Albert T. Wu[1]; [1]National Central University

5:10 PM
Low Temperature Polyimide-to-polyimide Direct Bonding with Low Curing Temperature Polyimide Films: *Hong-Che Liu*[1]; [1]Chih Chen

CHARACTERIZATION

Advanced Real Time Imaging — Alloys

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Monday PM | February 24, 2020
Theater A-4 | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM Invited
Computational Real Time Imaging and Understanding of Microstructure Evolution: Bo Wang[1]; Xiaoxing Cheng[1]; Tiannan Yang[1]; Fei Li[2]; *Long-Qing Chen*[1]; [1]Pennsylvania State University; [2]Xi'an Jiaotong University

2:50 PM
In-situ Analysis of Incipient Melting in a Novel High Strength Al-Cu Cast Alloy using Laser Scanning Confocal Microscopy (LSCM): Bernoulli Andilab[1]; *Comondore Ravindran*[1]; Neslihan Dogan[2]; [1]Ryerson Univ; [2]McMaster University

3:10 PM
In-situ Heating S/TEM Observations of Weld Microstructure Evolution in Ni-30Cr Alloy with Tantalum and Molybdenum Additions: *Cheng-Han Li*[1]; Sriram Vijayan[1]; Carolin Fink[1]; Joerg Jinschek[1]; [1]Ohio State University

3:30 PM
In-situ Observation of Hyperbranched Dendrite Growth: *Tiberiu Stan*[1]; Kate Elder[1]; Xianghui Xiao[2]; Peter Voorhees[1]; [1]Northwestern University; [2]Brookhaven National Laboratory

3:50 PM
In-situ Measurements of Dissolution of TiN in Liquid Cobalt: Ming Zhong[1]; Chris Pistorius[1]; *Bryan Webler*[1]; [1]Carnegie Mellon University

4:10 PM Break

4:30 PM Invited
In-situ Diagnosis and Modeling of Disorder Trapping in Rapid Solidification of Intermetallic Compound: *Jianrong Gao*[1]; [1]Northeastern University

4:50 PM
Nanoscale 4D Microstructural Characterization of Corrosion in Aluminum Alloys using In-situ Transmission X-ray Microscopy (TXM): *Sridhar Niverty*[1]; Arun Singaravelu[1]; Xianghui Xiao[2]; Wah-Keat Lee[2]; Nikhilesh Chawla[1]; [1]Arizona State University; [2]Brookhaven National laboratory

5:10 PM
Time-Resolved X-ray Tomography Studies of Dendritic Evolution in Al-Cu Alloys: *Kate Elder*[1]; Tiberiu Stan[1]; Yue Sun[1]; Xianghui Xiao[2]; Peter Voorhees[1]; [1]Northwestern University; [2]Brookhaven National Laboratory

ADVANCED MATERIALS

Advanced Solid Phase Processing Symposium — Fundamental Deformation Mechanisms

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, University of California, Riverside; Cynthia Powell, Pacific Northwest National Laboratory; Kester Clarke, Colorado School of Mines; Anthony Reynolds, University of South Carolina; Mostafa Hassani, Cornell University

Monday PM | February 24, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Anthony Reynolds, University of South Carolina; Bharat Gwalani, Pacific Northwest National Laboratory

2:30 PM Invited
Phase Transformations Induced by Large Plastic Deformations under High Pressure: Four-Scale Theory and in Situ Experiments: *Valery Levitas*[1]; [1]Iowa State University

2:55 PM Invited
Plastic Flow Instability, Surface Folding and a Mechanochemical Effect in Large Strain Deformation of Metals: *Srinivasan Chandrasekar*[1]; Anirudh Udupa[1]; Tatsuya Sugihara[2]; Koushik Viswanathan[3]; James Mann[4]; [1]Purdue University; [2]Osaka University; [3]Indian Institute of Science; [4]University of West Florida

3:20 PM
Multimodal Analysis of Microstructural Evolution of Metallic Alloys under Shear Deformation: *Arun Devaraj*[1]; Bharat Gwalani[1]; Tamas Varga[1]; changyong Park[2]; Luciano Bergmann[3]; Jorge Santos[3]; Peter Staron[3]; Benjamin Klusemann[3]; Tiffany Kaspar[1]; Peter Sushko[1]; Suveen Mathaudhu[1]; Cynthia Powell[1]; [1]Pacific Northwest National Laboratory; [2]High Pressure Collaborative Access Team; [3]Helmholtz-Zentrum Geesthacht

3:40 PM
Strain in Friction Extrusion: *Tony Reynolds*[1]; Md. Reza-E-Rabby[2]; Xiao Li[2]; Komarasamy Mageshwari[2]; Jeffrey Holliday[1]; [1]University of South Carolina; [2]PNNL

4:00 PM Break

4:20 PM Invited
Hybrid Cutting-Extrusion for Sheet Metal Production with Exceptional Microstructure Control: *Kevin Trumble*[1]; B. Stiven Puentes[1]; Mohammed Issahaq[1]; Mojib Saei[1]; Anirudh Udupa[1]; James Mann[2]; Srinivasan Chandrasekar[1]; [1]Purdue University; [2]University West Florida

4:45 PM
Microstructural Analysis and Modeling of Grain Refinement During Tribometric Surface Deformation: *Aashish Rohatgi*[1]; Yulan Li[1]; Bharat Gwalani[1]; Shenyang Hu[1]; Yang He[1]; Arun Devaraj[1]; Erin Barker[1]; Tiffany Kaspar[1]; Jinhui Tao[1]; Chongmin Wang[1]; Petr Sushko[1]; Suveen Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California Riverside

5:05 PM
Structural and Compositional Changes During Shear Assisted Processing of Materials: *Bharat Gwalani*[1]; Matthew Olszta[1]; Yang He[1]; Jinhui Tao[1]; Chongmin Wang[1]; Tiffany Kaspar[1]; Aashish Rohatgi[1]; Peter Sushko[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

5:25 PM
Electrical conductivity and wear properties of pure copper processed by high pressure sliding: *Evander Ramos*[1]; Takahiro Masuda[2]; Yoichi Takizawa[3]; Zenji Horita[2]; Suveen Mathaudhu[1]; [1]University of California Riverside; [2]Kyushu University; [3]Nagano Forging Co.

5:45 PM
Simultaneously Reducing Mechanical Anisotropy and Enhancing Ductility in Mg Alloys by Advanced Solid Phase Processing: *Dalong Zhang*[1]; Vineet Joshi[1]; Jens Darsell[1]; Nicole Overman[1]; Scott Whalen[1]; Darrell Herling[1]; [1]Pacific Northwest National Laboratory

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — 2-dimensional Materials and Thin Films

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Srinivasa Rao Singamaneni, University of Texas at El Paso; Amit Pandey, MicroTesting Solutions; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday PM | February 24, 2020
Solana | Marriott Marquis Hotel

Session Chairs: Amit Pandey, Ansys; Ritesh Sachan, Oklahoma State University

2:30 PM Invited
Tunable 2D Materials from Synthesis to Applications: *Wonbong Choi*[1]; [1]University of North Texas

3:00 PM Invited
Magnetism in Graphene Nanoribbons: *Srinivasa Rao Singamaneni*[1]; [1]University of Texas at El Paso

3:30 PM Invited
Formation of Reduced Graphene Oxide/amorphous Carbon P-N Junctions via Highly Nonequilibrium Route of Nanosecond Laser Irradiation: *Siddharth Gupta*[1]; Jagdish Narayan[1]; [1]North Carolina State University

3:55 PM
Understanding the Effects of Lattice Strain on MoS2 through Irradiation: *Kory Burns*[1]; [1]University of Florida

4:20 PM Break

4:40 PM
Development of Reactive Molecular Dynamics (MD) and Hybrid Reverse Monte Carlo (HRMC) Modeling to Synthesize Amorphous Boron Carbide: *Ridwan Sakidja*[1]; Rajan Khadka[1]; Nirmal Baishnab[1]; George Opletal[2]; [1]Missouri State University; [2]CSIRO

5:00 PM
The Transition from Amorphous Carbon to Carbon Nanohorns by DC Arc Discharge: *Da Zhang*[1]; Feng Liang[1]; Kai Ye[1]; Tao Qu[1]; Yongnian Dai[1]; [1]Kunming University of Science and Technology

CHARACTERIZATION

Advances in Powder and Ceramic Materials Science — Advanced Ceramics and Processes

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Sergio Monteiro, Military Institute of Engineering; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama

Monday PM | February 24, 2020
Theater A-6 | San Diego Convention Ctr

Session Chairs: Shefford Baker, Cornell University; Hongjuan Sun, Southwest University of Science and Technology

2:30 PM Introductory Comments

2:35 PM Invited
Design of cell-windows structure macroporous ceramics derived from particle-stabilized emulsions: *Jinhong Li*[1]; [1]China University of Geosciences (Beijing)

2:55 PM
Effect of B_4C Addition on (Hf,Zr)B_2 based Ultra High Temperature Ceramics: *Shipra Bajpai*; Sudhanshu Shekhar Singh[1]; Kantesh Balani[1]; [1]IIT kanpur

3:15 PM
Toughening Mechanism of ZTA-TiC-Fe Ceramic Materials Produced by High Gravity Combustion Synthesis: *Hongwei Zhao*[1]; [1]China Iron and Steel Research Institute Group

3:35 PM
ICME-based Design of Cermet Tool Material for Friction Stir Welding (FSW) of High-strength Materials: *Amit Behera*[1]; Qiaofu Zhang[1]; Greg Olson[1]; Rajiv Mishra[2]; [1]QuesTek Innovations LLC; [2]Univeristy of North Texas

3:55 PM Break

4:05 PM
Structural and Dielectric Properties of InCr1-xTixO3+x/2 (x = 2/6, 2/7, and 2/8): *Victor Emmanuel Alvarez Montaño*[1]; Raul Escamilla[2]; Francisco Brown[1]; Subhash Sharma[2]; Noboru Kimizuka[1]; Alejandro Durán[2]; [1]Universidad de Sonora; [2]Universidad Nacional Autonoma de México

4:25 PM
Microstructure-processing Relationships in Rare Earth Doped Alumina Ceramics for Lighting/Laser Applications.: *Xingzhong Wu*[1]; Matthew Duarte[1]; Yasuhiro Kodera[1]; Elias Penilla[1]; Javier Garay[1]; [1]University of California San Diego

MATERIALS PROCESSING

Advances in Surface Engineering II — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Tushar Borkar, Cleveland State University; Arif Mubarok, PPG; Rajeev Gupta, University of Akron; Sandip Harimkar, Oklahoma State University; Tanaji Paul, Florida International University

Monday PM | February 24, 2020
9 | San Diego Convention Ctr

Session Chair: Tushar Borkar, Cleveland State University

2:30 PM
Effects of Ti and Y Addition on the Scale Spalling Resistance of CoNiCrAl Alloys: *Liang Yang*[1]; Yu Zheng[1]; Zhigang Yang[1]; [1]Tsinghua University

2:50 PM
Electroplating Powder for Cold Spray Applications: *Gwendolyn Bracker*[1]; Madeline Scott[1]; Elizabeth Hodges[1]; Richard Berdos[2]; Jeffery Rigali[3]; Victor Champagne[4]; Robert Hyers[5]; [1]University of Massachusetts; [2]Raytheon ; [3]Pratt & Whitney; [4]Cold Spray Innovations International; [5]University of Massachusetts

3:10 PM
Surface Characterization and Mechanical Properties of Cr-coated Zr-4 Accident Tolerant Fuels Cladding Prepared using Different Coating Techniques: *Rajnikant Umretiya*[1]; Santiago Vargas[1]; Jessika Rojas[1]; Carlos Castano[1]; Reza Mohammadi[1]; [1]Virginia Commonwealth University

3:30 PM
Morphological Control of Tantalum Carbide through Surface Doping: Tianqi Ren[1]; *Richard Tran*[1]; Sebastian Lee[1]; Aric Bandera[1]; Manuel Herrera[2]; Xiang-Guo Li[1]; Shyue Ong[1]; Olivia Graeve[1]; [1]University of California, San Diego; [2]Universidad Nacional Autónoma de México

3:50 PM
Mitigation of Asphaltene Deposition on Pipeline Alloy Steel Using Low-temperature Pack Aluminization: *Soheil Daryadel*[1]; Pralav Shetty[1]; Velu Subramani[2]; Paul Braun[1]; Jessica Krogstad[1]; [1]University of Illinois at Urbana-Champaign; [2]BP Products North America, Inc

4:10 PM Break

4:30 PM
Pulse Potentiostatic Deposition of Fe-Zn based Intermetallic Coatings and Evaluation of its Catalytic Activity for Hydrogen Evolution Reaction: *Srija Biswas*[1]; Sourav Das[1]; Sambedan Jena[2]; Arijit Mitra[1]; Siddhartha Das[1]; Karabi Das[1]; [1]Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur; [2]School of Nano Science and Technology, Indian Institute of Technology Kharagpur

4:50 PM
Development of a Novel Cyanide-free Electroplating Solution for Electrodeposition of Silver: A Study of Microstructures and Mechanical Properties: *Bangmaya Satpathy*[1]; Sambedan Jena[2]; Tapas Bandyopadhyay[1]; Karabi Das[1]; Siddhartha Das[1]; [1]Department of Metallurgical and Materials Engineering; [2]School of Nano Science & Technology

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Environmental Damage and Protection

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Monday PM | February 24, 2020
11B | San Diego Convention Ctr

Session Chairs: Mario Bochiechio, Pratt & Whitney; Kinga Unocic, Oak Ridge National Laboratory

2:30 PM Invited
Environmental Effect Solutions for Superalloys Today and Tomorrow: *Bruce Pint*[1]; [1]Oak Ridge National Laboratory

3:00 PM Invited
New Insights into Under-platform Corrosion and the Stress Induced Cracking of Nickel-based Single Crystal Superalloys under High Temperature Corrosion Environments at 550-600°C: *John Nicholls*[1]; Simon Gray[1]; Laurie Brooking[1]; Fabian Duarte-Martinez[1]; [1]Cranfield University

3:30 PM
Enhancement of EB-PVD Thermal Barrier Coating Adhesion Strength by Laser Surface Texturing: *Lucille Despres*[1]; Jonathan Cormier[1]; Sophie Costil[2]; Romain Cariou[3]; Aurélien Joulia[3]; Amar Saboundji[3]; [1]Institut Pprime; [2]ICB-LERMPS; [3]SAFRAN TECH

3:50 PM
Formation and Composition of Hot Corrosion Deposits on Model Ni-Cr-Al Alloys: *Kevin Meisner*[1]; Elizabeth Opila[1]; [1]University of Virginia

4:10 PM Break

4:30 PM Invited
New Insights on Al_2O_3-Scale Growth on Ni-Based Alloys and the Influence of Reactive Elements: Arthur Heuer[1]; *Brian Gleeson*[2]; [1]Case Western Reserve University; [2]University of Pittsburgh

5:00 PM
A damage Model with Oxidation Effects: *Jean-Briac le Graverend*[1]; Seungjun Lee[1]; [1]Texas A&M University

5:20 PM
High-temperature Corrosion of Ni-based Superalloys in Impure CO_2 Power Cycle Environments: *Richard Oleksak*[1]; Joseph Tylczak[1]; Gordon Holcomb[1]; Omer Dogan[1]; [1]National Energy Technology Laboratory

5:40 PM
A Comparative Study of the Effects of Surface Treatments and Finishes on the High Temperature Oxidation Behavior of Alloy 800 in a 400 °C Steam Environment: *Richard Chiang*[1]; Sebastien Teysseyre[2]; Jeffery Aguiar[3]; Geogy Abraham[4]; Vivekanand Kain[4]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]Canadian Nuclear Laboratories; [3]Idaho National Laboratory; [4]Bhabha Atomic Research Centre

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Interatomic Potential Developments and Atomistic Modeling I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Monday PM | February 24, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM Invited
Advancing Methods for Atomic-scale Modeling of Heterogeneous Systems: *Susan Sinnott*[1]; [1]Pennsylvania State University

3:00 PM Invited
The ReaxFF Force Field- application Overview and New Directions in Accelerated Dynamics, Ferroelectric Materials and Treatment of Explicit Electrons: *Adrianus Van Duin*[1]; [1]Penn State

3:30 PM Invited
Recent Interatomic Potential Development Activities at Sandia: *Xiaowang Zhou*[1]; [1]Sandia National Laboratories

3:50 PM Break

4:20 PM Invited
Second Nearest-neighbor Modified Embedded-atom Method Potential: Development, Validation and Challenges: *Byeong-Joo Lee*[1]; [1]Pohang University of Science & Technology

4:50 PM
Development of a Modified Embedded-atom Method Interatomic Potential for 2D Titanium Carbides (Tin+1Cn) MXenes: *Ning Zhang*[1]; Yu Hong[2]; Mohsen Asle Zaeem[2]; [1]University of Alabama; [2]Colorado School of Mines

5:10 PM
MEAM-BO: Extension of MEAM to Include Bond Order for Polymer: *Sungkwang Mun*[1]; Ric Carino[1]; Andrew Bowman[1]; Steven Gwaltney[2]; Sasan Nouranian[3]; Mark Horstemeyer[4]; Michael Baskes[2]; [1]Center for Advanced Vehicular Systems (CAVS); [2]Mississippi State University; [3]University of Mississippi; [4]Liberty University

LIGHT METALS

Alumina and Bauxite — Bauxite, Impurities and Alternative Processes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: James Vaughan, University of Queensland

Monday PM | February 24, 2020
2 | San Diego Convention Ctr

Session Chair: Steve Healy, Consultant

2:30 PM Introductory Comments

2:40 PM Keynote
The Alumina Technology Roadmap 4.0.: *Anne Duncan*[1]; [1]HATCH

3:10 PM
Impacts of Mineralogy on Soluble Phosphorus Concentrations During Low Temperature Processing of Jamaican Bauxites: *Michael Coley*[1]; Anthony Greenaway[1]; Khadeen Henry-Herah[1]; [1]University of the West Indies

3:30 PM
Effects of the Granular Properties of Bauxite Pisolites on the Solid/Liquid Separation in Liquid Fluidized Beds of Classifiers: *Thomas Grillot*[1]; Guy Simard[1]; Romain Chesnaux[1]; Damien Boudeville[2]; Lou Perrachon[2]; [1]Université du Quebec à Chicoutimi; [2]Rio Tinto

3:50 PM
Mineralogical Assessment of the Solid Phase Obtained on Leaching of Brazilian Red Mud: *Amilton Botelho Junior*[1]; Denise Espinosa[1]; Jorge Tenório[1]; [1]University of Sao Paulo

4:10 PM Break

4:30 PM
Low-quality Aluminum-containing Raw Materials: Experience, Problems and Prospects: Vadim Lipin[1]; *Ekaterina Sofronova*[1]; [1]Saint Petersburg State University of Industrial Technologies and Design

4:50 PM
Inhibition of Kaolinite Dissolution in Bayer Liquor Through Addition of Lithium: Horace OGilvie[1]; James Vaughan[1]; *Hong Peng*[1]; [1]University of Queensland

5:10 PM
Ionic Effect of NaCl and KCl on the Flotation of Diaspore and Kaolinite using Sodium Oleate as Collector: Chaojun Fang[1]; *Shichao Yu*[2]; Hong Peng[3]; Xiaowei Deng[1]; Jun Wang[2]; [1]Henan Polytechnic University; [2]Central South University; [3]The University of Queensland

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Characterization of Aluminium Alloys

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Monday PM | February 24, 2020
1A | San Diego Convention Ctr

Session Chair: Dmitry Eskin, Brunel University London

2:30 PM Introductory Comments

2:40 PM Invited
Stress Characterization of Bore-chilled Sand Cast Aluminum Engine Blocks in As-cast and T7 Condition with Application of Neutron Diffraction: *Dimitry Sediako*[1]; Joshua Stroh[1]; Glenn Byczynski[2]; Anthony Lombardi[3]; Anna Paradowska[4]; [1]University Of British Columbia; [2]Nemak USA/CAN; [3]Nemak Canada Corporation; [4]Australia's Nuclear Science and Technology Organisation

3:05 PM Invited
Molecular Dynamics Simulations of the Solidification of Pure Aluminium: *Michail Papanikolaou*[1]; Konstantinos Salonitis[1]; Mark Jolly[1]; [1]Cranfield University

3:30 PM
Nanoindentation and Cavitation-induced Fragmentation Study of Primary Al_3Zr Intermetallics Formed in Al Alloys: *Abhinav Priyadarshi*[1]; Tungky Subroto[2]; Marcello Conte[3]; Koulis Pericelous[4]; Dmitry Eskin[2]; Paul Prentice[5]; Iakovos Tzanakis[1]; [1]Oxford Brookes University; [2]Brunel University London; [3]Anton Paar TriTec SA; [4]University of Greenwich; [5]University of Glasgow

3:55 PM
In-situ Neutron Diffraction Solidification Analyses of Rare Earth Reinforced Hypoeutectic and Hypereutectic Aluminum-silicon Alloys: *Joshua Stroh*[1]; Dimitry Sediako[1]; David Weiss[2]; Vanessa Peterson[3]; [1]University of British Columbia Okanagan; [2]Eck Industries; [3]ANSTO

4:20 PM Break

4:35 PM
Influence of TiB_2 Particles on Modification of Mg_2Si Eutectic Phase in Al-Zn-Si-Mg-Cu Cast Alloys: *Byung Joo Kim*[1]; Sung Su Jung[1]; Yong Ho Park[2]; Young Cheol Lee[1]; [1]Korea institute of industrial technology; [2]Pusan National University

5:00 PM
A Statistical Analysis to Study the Effect of Silicon Content, Surface Roughness, Droplet Size and Elapsed Time on Wettability of Hypoeutectic Cast Aluminum-silicon Alloys: *Amir Kordijazi*[1]; Swaroop Behera[1]; Omid Akbarzadeh[2]; Marco Povolo[3]; Pradeep Rohatgi[1]; [1]University of Wisconsin Milwaukee; [2]University of Malaya; [3]University of Bologna

5:25 PM
Aluminum Trace Elements Analyses using Epsilon 1 Meso EDXRF Technique: *Al Halwachi Hussain*[1]; [1]Aluminium Bahrain (Alba)

LIGHT METALS

Aluminum Reduction Technology — Modelling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Jayson Tessier, Alcoa

Monday PM | February 24, 2020
6D | San Diego Convention Ctr

Session Chair: André Felipe Schneider, Hatch

2:30 PM Introductory Comments

2:35 PM
Comparison Between Different Laminated Aluminum Busbars Expansion Joints in Terms of Mechanical Performance and Relative Costs: *Andre-Felipe Schneider*[1]; Daniel Richard[1]; David Leroux[2]; Olivier Charette[1]; Francis Quintal[1]; [1]Hatch Ltd.; [2]Canmec Industriel, Inc.

2:55 PM
Demo Retrofit Study of a Chinese Inspired Cell Technology: *Marc Dupuis*[1]; Valdis Bojarevics[2]; [1]GeniSim Inc.; [2]University of Greenwich

3:15 PM
MassTransport by Waves on the Bath Metal Interface in Electrolysis Cell: *Lovatiana Rakotondramanana*[1]; László Kiss[1]; Sándor Poncsák[1]; Sébastien Guérard[2]; Jean-François Bilodeau[2]; [1]Université du Québec à Chicoutimi; [2]Rio Tinto Aluminium

3:35 PM
Numerical Investigation of Flow Field Effect on Ledge Shape in Aluminum Reduction Cell by Coupled Thermo-flow Model: Hongliang Zhang[1]; *Qiyu Wang*[1]; Shuai Yang[1]; Jie Li[1]; Jinding Liang[1]; Ling Ran[1]; [1]Central South University

BIOMATERIALS

Biodegradable Materials for Medical Applications II — Magnesium Implants II

Sponsored by: TMS Functional Materials Division, TMS: Biomaterials Committee

Program Organizers: Jaroslaw Drelich, Michigan Technological University; Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University; Jan-Marten Seitz, Syntellix AG; Petra Maier, Stralsund University of Applied Sciences; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California, Riverside

Monday PM | February 24, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Petra Maier, University of Applied Sciences Stralsund; Norbert Hort, Helmholtz-Zentrum Geesthacht

2:30 PM Keynote
Are those Biproducts of Bidegradable Metals Deleterious to Bone Healing?: *Kelvin Yeung*[1]; [1]The University of Hong Kong

3:05 PM Invited
On Contributors to Fracture in Absorbable Metals: *Adam Griebel*[1]; Jeremy Schaffer[1]; [1]Fort Wayne Metals

3:30 PM
Non Invasive Degradation Tracking of Mg Implants in Humans: *Jan-Marten Seitz*[1]; Patrick Varady[1]; Tim Vockensohn[1]; [1]Syntellix AG

3:50 PM
Tailoring Degradation Behavior of Mg-5Nd Alloy by Intermetallic Distribution: *Yaping Zhang*[1]; Yuanding Huang[1]; Frank Feyerabend[1]; Karl Ulrich Kainer[1]; Norbert Hort[1]; [1]Helmholtz-Zentrum Geesthacht

4:10 PM Break

4:25 PM
Microstructure and Biodegradation Behavior of Additively Manufactured Magnesium: *Leila Sorkhi*[1]; James Tomich[1]; Joshua Hammel[1]; Grant Crawford[1]; [1]South Dakota School of Mines and Technology

4:45 PM
In-vitro Corrosion and Mechanical Performance of Mg Alloy WE43 Processed by Spark Plasma Sintering: *Julie Soderlind*[1]; Subhash Risbud[1]; Joerg Loeffler[2]; [1]University of California, Davis; [2]ETH Zurich

5:05 PM
Evaluation of in vitro Fatigue Property of Grain Refined Mg-Ca Alloy: *Naoya Kawamura*[1]; Taichi Uemura[1]; Naoko Ikeo[1]; Toshiji Mukai[1]; [1]Kobe University

5:25 PM
Effect of Secondary Processing on Microstructure, Mechanical and Corrosion Response of a Biodegradable Mg1Zn2Ca Alloy: Diksha Matta[1]; *Gururaj Parande*[2]; Sravya Tekumalla[2]; Manoj Gupta[2]; [1]Vellore Institute of Technology; [2]National University of Singapore

BIOMATERIALS

Biological Materials Science — Biomimetic and Bioinspired Materials

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Monday PM | February 24, 2020
Leucadia | Marriott Marquis Hotel

Session Chairs: Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); Maryam Hosseini, Purdue University

2:30 PM Invited
The Convergence of Biology and Materials Through Bioinspiration: *Marc Meyers*[1]; [1]University of California San Diego

3:00 PM
Density Control in Wood-templated Epoxy-silicon Carbide Composites: *Albert Matsushita*[1]; Daniel Kupor[1]; Joanna McKittrick[1]; [1]Univ of California San Diego

3:20 PM
Energy Absorbing and Toughening Strategies in Reinforced Tubule Architectures: *Audrey Hogan*[1]; Marc Meyers[1]; [1]University of California San Diego

3:40 PM Invited
Bioinspired Design of Multi-scale Structures: From the Nano- to the Micro- and Macro-Scales: *Winston Soboyejo*[1]; [1]Worcester Polytechnic Institute

4:10 PM Break

4:25 PM Invited
Bioinspired Design of Next Generation Structural and Thermal Materials: *Nima Rahbar*[1]; [1]Worcester Polytechnic Institute

4:55 PM
Bioinspired Porous Materials Through Ice and Ultrasound Templating: *Max Mroz*[1]; Taylor Ogden[1]; Isaac Nelson[1]; Milo Prisbrey[1]; Bart Raeymaekers[1]; Steven Naleway[1]; [1]University of Utah

5:15 PM Invited
Mechanics of Segmented Protection in Nature and in Engineering: A Rich Landscape for Tunability and Performance: *Francois Barthelat*[1]; Ali Shafiei[2]; [1]University of Colorado Boulder; [2]McGill University

5:45 PM
Fabricating Bioinspired Helical and Bouligand Scaffolds using a Tri-axial Nested Helmholtz Coils-based Freeze-casting Setup: *Isaac Nelson*[1]; Paul Wadsworth[1]; Max Mroz[1]; Owen Kingstedt[1]; Jamie Kruzic[2]; Steven Naleway[1]; [1]University of Utah; [2]UNSW Sydney

LIGHT METALS

Cast Shop Technology — EHS and Cast House Products

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Monday PM | February 24, 2020
1B | San Diego Convention Ctr

Session Chair: Jean-Francois Desmeules, Dynamic Concept

2:30 PM Introductory Comments

2:45 PM
Hands-free-casting at AMAG Casting GmbH – it is Possible!: *Bernd Prillhofer*[1]; Rudolf Dobler[1]; Thomas Mrnik[1]; [1]AMAG Casting GMBH

3:05 PM
User-friendly Surveillance Tools to Prevent Bleed-out During Cast Start: Mark Badowski[1]; *Daniel Krings*[1]; Gerd-Ulrich Gruen[1]; Werner Droste[1]; Philip Meslage[2]; Benjamin Jaroni[1]; [1]Hydro Aluminium Rolled Products; [2]Aluminium Norf GmbH

3:25 PM
Beryllium Reduction Potential in AlMg Cast Alloys: *Jan Steglich*[1]; Alexandra Basa[1]; Anne Kvithyld[2]; Nichloas Smith[2]; Ines Zerbin[1]; [1]Trimet Aluminium Se; [2]SINTEF

3:45 PM
Accurate Real-time Elemental (LIBS) Analysis of Molten Aluminum and Aluminum Alloys: Sveinn Hinrik Gudmundsson[1]; Jon Matthiasson[2]; *Kristjan Leosson*[1]; [1]DT Equipment; [2]Innovation Center Iceland

4:05 PM Break

4:20 PM
Industrial Verification of Two Rotor Fluxing in Large Crucibles: *Terje Haugen*[1]; Arild Hakonsen[1]; Vegard Innerdal[1]; [1]Hycast AS

4:40 PM
Dynafeed: An Improved Crucible Transfer System: Jean Francois Desmeules[1]; *André Tremblay*[1]; Martin Dubois[1]; [1]Dynamic Concept

5:00 PM
Metal Transfer from Furnace to Furnace – a Case Study: *Olivier Dion-Martin*[1]; Jean Francois Desmeules[1]; Pierre Jeanroy[1]; [1]Dynamic Concept

5:20 PM
Heavily Loaded Areas in Aluminum Melting Furnaces and Possible Refractory Solutions: *Thomas Schemmel*[1]; Rüdiger Pfaar[1]; Uwe Kremer[2]; [1]Refratechnik Steel Gmbh; [2]Trimet Aluminium S.E.

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Advances in Characterization Methods II

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Monday PM | February 24, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Jian Li, CanmetMATERIALS; Mingsheng He, Wuhan Iron & Steel Co

2:30 PM
Characterization of the World's Finest Gold at LANL: *Sven Vogel*[1]; Raquel Alonso-Perez[2]; Michelle Espy[1]; Cort Gautier[1]; Adrian Losko[1]; John Rakovan[3]; Frank Keutsch[2]; [1]Los Alamos National Laboratory; [2]Harvard University; [3]Miami University, Ohio

2:50 PM
Phase Transformation Characterization by Means of High Temperature Digital Image Correlation for Graded Thermo-mechanical Processing of Steel Sheet Parts: *Alexander Reitz*[1]; Olexandr Grydin[1]; Mirko Schaper[1]; [1]Department of Materials Science, Paderborn University

3:10 PM
Unconventional Sodium Chloride in Graphene Liquid Cell: Jaeyoung Hong[1]; Jee-Hwan Bae[1]; Hee-Young Park[1]; Sehyun Lee[1]; Juyoung Kim[1]; Sung Jong Yoo[1]; *Dong Won Chun*[1]; [1]Korea Institute of Science and Technology

3:30 PM
A Fully Integrated In-Situ Solution for Materials Testing in Sem: *Fang Zhou*[1]; [1]Carl Zeiss Microscopy GmbH

3:50 PM
Analysis and Detection of Road Surface Defects Using Multiple Sensing Methods: *Jeongguk Kim*[1]; [1]Korea Railroad Research Institute

4:10 PM Break

4:25 PM
Autonomous Light Optical Microscopy for Quality Control Screening: *Andrew Kitahara*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

4:45 PM
The Influence of Microstructure in Stress Relaxation Cracking: *Dafni Daskalaki Mountanou*[1]; Tom McAuliffe[1]; Chris Bilsland[1]; Alex Foden[1]; Thomas Britton[1]; [1]Imperial College London

5:05 PM
Austenite Stability Under Focused Ion Beam Milling: *Jian Li*[1]; Pei Liu[1]; [1]Canmetmaterials

5:25 PM
Optical Characterization of Grain Orientation by Directional Reflectance Microscopy: *Bernard Gaskey*[1]; Ludwig Hendl[1]; Xiaogang Wang[1]; Matteo Seita[1]; [1]Nanyang Technological University

5:45 PM
Accurate Determination of EBSD Pattern Centers with Applications in Resolving Pseudosymmetry: *Edward Pang*[1]; Peter Larsen[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Mineral Processing and Analysis I

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Monday PM | February 24, 2020
8 | San Diego Convention Ctr

Session Chairs: Bowen Li, Michigan Technological University; Chenguang Bai, Chongqing University

2:30 PM
Characterization of Iron Ore Sinter Samples by Automated SEM: *Mingming Zhang*[1]; Marcelo Andrade[1]; [1]ArcelorMittal Global R&D

2:50 PM
Effects of Sintering Temperature and Time on Preparation of Refractory Materials from Ferronickel Slag under Microwave Irradiation: Huimin Tang[1]; *Zhiwei Peng*[1]; Foquan Gu[1]; Lei Yang[1]; Ziming Liu[1]; Quanle Leng[1]; Weiguang Tian[1]; Mingjun Rao[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University

3:10 PM
Non-isothermal Carbothermic Reduction Kinetics of Calcium Ferrite: *Gang Li*[1]; Xuewei Lv[1]; Xuangeng Zhou[1]; Guishang Pei[1]; Guibao Qiu[1]; [1]Chongqing University

3:30 PM
Solid State Reaction Behavior of Calcium Ferrite and TiO2 at Temperature Range of 1423K to 1623K: *Mingrui Yang*[1]; Xuangeng Zhou[1]; Zhongci Liu[1]; Xuewei Lv[1]; [1]Chongqing University

3:50 PM Break

4:05 PM
Effect of Pre-Treatment During Leaching of High Iron, Cobalt Containing Ore: *Yotamu Hara*[1]; Douglas Musowoya[1]; Golden Kaluba[1]; Choolwe Muchindu[1]; Haggai Simfukwe[1]; [1]Copperbelt Univ

4:25 PM
Gasificating Dephosphorization During the Carbothermic Reduction of Medium Phosphorus Iron Ore Concentrate in Presence of Na2CO3 and SiO2: *Jing Zhang*[1]; Guoping Luo[1]; Yanbiao Chen[1]; Wenbin Xin[1]; Jianguo Zhu[1]; [1]Inner Mongolia University of Science and Technology

4:45 PM
Non-isothermal Reduction Kinetics of Roasted High Alumina Iron Ore Pellets: *Zuoliang Zhang*; Ren Chen[1]; [1]Liaoning Institute of Science and Technology

5:05 PM
Kinetics of Coke Gasification Reaction Catalyzed by Alkali Carbonates: *Yunpeng Fang*[1]; Shengfu Zhang[1]; Cheng Yin[1]; Yuhan Zhu[1]; Rongjin Zhu[1]; Yang Li[1]; [1]Chongqing University

CHARACTERIZATION

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification — Structural Descriptors Enabling PSP Linkages

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee

Program Organizers: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, U.S. Army Research Laboratory; James Hogan, University of Alberta; Srikanth Patala, North Carolina State University; Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Monday PM | February 24, 2020
Theater A-3 | San Diego Convention Ctr

Session Chairs: James Hogan, University of Alberta; Tomoko Sano, CCDC Army Research Laboratory

2:30 PM Introductory Comments

2:35 PM Invited
Artificial Intelligence Approaches to Microstructural Science: *Elizabeth Holm*[1]; [1]Carnegie Mellon University

3:05 PM Invited
Methods for the Correction of Epistemic Resolution Error through Data Collection Process Simulations: *Lori Graham-Brady*[1]; Noah Wade[1]; [1]Johns Hopkins University

3:35 PM
Determination of Representative Volume Elements for Small Cracks in Heterogeneous Domains via Convolutional Neural Networks: *Karen DeMille*[1]; Ashley Spear[1]; [1]University of Utah

3:55 PM Break

4:15 PM
Machine Learning Approaches to Image Segmentation of Large Materials Science Datasets: *Tiberiu Stan*[1]; Zachary Thompson[1]; Bo Lei[2]; Elizabeth Holm[2]; Peter Voorhees[1]; [1]Northwestern University; [2]Carnegie Mellon University

4:35 PM
Predicting Crack Location Using a Radial Distribution Function as a Unique Descriptor of Pore Networks: *John Erickson*[1]; Ashley Spear[1]; Aowabin Rahman[1]; [1]University of Utah

4:55 PM
Investigating the Effect of Solute Segregation to Grain Boundaries in Nanocrystalline Alloys Toward Stability and Strengthening: *Ankit Gupta*[1]; Gregory Thompson[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]University of Alabama

5:15 PM
Predicting Compressive Strength of Consolidated Solids from Features Extracted from SEM Images: *T. Yong Han*[1]; [1]Lawrence Livermore National Lab

5:35 PM
Utilizing Convolutional Neural Networks for Prediction of Process and Material Parameters from Microstructural Images: *Richard Couperthwaite*[1]; Levi McClenny[1]; Jaylen James[1]; Vahid Attari[1]; Raymundo Arróyave[1]; Ulisses Braga Neto[1]; [1]Texas A&M University

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Monday PM | February 24, 2020
32B | San Diego Convention Ctr

Session Chair: Sugata Chowdhury, National Institute of Standards and Technology

2:30 PM Invited
Identification of 11 New Solid Lithium-ion Conductors with Promise for Batteries using Data Science Approaches
: Austin Sendek[1]; *Evan Reed*[1]; [1]Stanford University

3:00 PM
Predicting Organic Ligands Mechanical Behavior with Deep Neural Network and Understanding the Mechanism: *Weiyi Zhang*[1]; Chengxi Yang[1]; Alan Fern[2]; Matthew Campbell[2]; P. Alex Greaney[1]; [1]UC, Riverside; [2]Oregon State University

3:20 PM
Haber–Bosch Reaction Mechanism and Kinetics on Highly Reactive Iron Surface and Hierarchical High-throughput in Silico Screening Catalyst Design: *Qi An*[1]; Alessandro Fortunelli[2]; William Goddard[3]; [1]University of Nevada, Reno; [2]CNR-ICCOM,ThC2-Lab, Consiglio Nazionale delle Ricerche; [3]Caltech

3:40 PM
Machine-learning based Discovery of Novel Scintillator Chemistries: *Anjana Talapatra*[1]; Blas Uberuaga[1]; Chris Stanek[1]; Ghanshyam Pilania[1]; [1]Los Alamos National Laboratory

4:00 PM
A General Machine Learning Framework for Impurity Level Prediction in Semiconductors: *Arun Kumar Mannodi Kanakkithodi*[1]; Michael Toriyama[1]; Fatih Sen[1]; Michael Davis[1]; Robert Klie[2]; Maria Chan[1]; [1]Argonne National Laboratory; [2]University of Illinois Chicago

4:20 PM Break

4:40 PM Invited
High-Throughput Screening and Synthesis of Semiconductor Electrodes for Photocatalytic Water Splitting: *Ismaila Dabo*[1]; [1]Pennsylvania State University

5:10 PM
Machine Learning Guided Search for Single Phase High Entropy Oxides: *Shruba Gangopadhyay*[1]; Prasanna Balachandran[1]; [1]University of Virginia

5:30 PM
Use of Atomistic-based Modeling and Materials Informatics to Design and Synthesize Ultra-thin Tunnel Junctions: *Ridwan Sakidja*[1]; Devon Romine[1]; Jagaran Acharya[2]; Ryan Goul[2]; Judy Wu[2]; [1]Missouri State University; [2]The University of Kansas

5:50 PM
Designing High Glass Transition Temperature Polymers using Machine Learning: *Chiho Kim*[1]; Rohit Batra[1]; Lihua Chen[1]; Huan Tran[1]; Rampi Ramprasad[1]; [1]Georgia Institute of Technology

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Microstructural Evolution and Phase Stability II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Monday PM | February 24, 2020
33C | San Diego Convention Ctr

Session Chairs: Emily Moore, Lawrence Livermore National Laboratory; Daniela Wipp, TU Wien

2:30 PM Invited
Nonequilibrium Nanoscale Patterns and Negative Effective Interface Energy: A Phase Field Approach: *Pascal Bellon*[1]; Qun Li[1]; Robert Averback[1]; [1]University of Illinois at Urbana-Champaign

3:00 PM
Computing Grain Boundary Diagrams: *Chongze Hu*[1]; Jian Luo[1]; [1]University of California San Diego

3:20 PM
Formation of Conducting Filament due to the Electrochemical Changes in the Memresistive Systems: a Phase Field Study: *Arijit Roy*[1]; Pil-Ryung Cha[1]; [1]Kookmin University

3:40 PM
Simulating Precipitation of Detrimental Boron Nitrides in Micro-alloyed Steels Based on Experimental Elemental Distributions: *Daniela Wipp*[1]; Maximilian Weiss[2]; Andreas Limbeck[2]; Tomasz Wojcik[3]; Sabine Zamberger[4]; Matthew Galler[5]; Erwin Povoden-Karadeniz[1]; [1]Christian Doppler Laboratory for Interfaces and Precipitation Engineering CDL-IPE, Institute of Materials Science and Technology, TU Wien; [2]Institute of Chemical Technologies and Analytics, TU Wien; [3]Institute of Materials Science and Technology, TU Wien; [4]voestalpine Forschungsservicegesellschaft Donawitz GmbH; [5]voestalpine Wire Rod Austria GmbH

4:00 PM Break

4:20 PM Invited
CALPHAD for Complex Concentrated Alloy Development: New Opportunities: *Wei Xiong*[1]; [1]University of Pittsburgh

4:50 PM Invited
Thermodynamics, Structure, and the 3D Geometry of Bendable 2D Materials: *Joel Berry*[1]; [1]Lawrence Livermore National Laboratory

5:20 PM
Thermodynamic Assessment of Actinide Alloys: the Pu-U-Al-Fe-Ga-Ni System: *Emily Moore*[1]; Alexander Landa[1]; Aurélien Perron[1]; [1]Lawrence Livermore National Laboratory

5:40 PM
Theoretical Calculation of Atomic Size in a Solid Solution: *Tetsuo Mohri*[1]; [1]Tohoku University

SPECIAL TOPICS

Current Trends in Magnetocaloric Materials: An FMD Symposium in Honor of Ekkes Brueck — Phase Equilibria and Magnetic Structure of Magnetocaloric Materials

Sponsored by: TMS Functional Materials Division

Program Organizers: Victorino Franco, Universidad de Sevilla; Frank Johnson, Niron Magnetics, Inc.

Monday PM | February 24, 2020
Marina Ballroom F | Marriott Marquis Hotel

Session Chair: Luana Caron, Bielefeld University

2:30 PM Invited
Ferromagnetic Shape Memory Heuslers: from Bulk to Nano: *Franca Albertini*[1]; Francesca Casoli[1]; Simone Fabbrici[1]; Milad Takhsha Ghahfarokhi[1]; Riccardo Cabassi[1]; Lucia Nasi[1]; Cecilia Bennati[1]; Massimo Solzi[2]; Francesco Cugini[2]; Paola Tiberto[3]; Federica Celegato[3]; [1]IMEM-CNR; [2]Università di Parma; [3]INRIM

3:00 PM Invited
Magnetocaloric Effect in Heusler-type Magnetic Shape Memory Materials: *Volodymyr Chernenko*[1]; Victor L´vov[2]; Eduard Cesari[3]; Jose Manuel Barandiaran[1]; [1]BCMaterials & University of the Basque Country (UPV/EHU); [2]Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; [3]Universitat de les Illes Balears, Palma de Mallorca, Spain

3:30 PM Invited
Unprecedented Magnetism, Magneto-crystalline Anisotropy, and Magneto-structural Phase Transformation in Rare Earth Containing Materials: *Durga Paudyal*[1]; Renu Choudhary[1]; [1]Ames Laboratory

4:00 PM Break

4:30 PM Invited
The Interplay of Electronic, Magnetic and Lattice Degrees of Freedom in La-Fe-Si-based Magnetocaloric Materials: *Markus Gruner*[1]; [1]University of Duisburg-Essen

5:00 PM Invited
Itinerant-electron Magnetism, Spin-fluctuations, and Magnetocaloric Effect in $La(Fe,Si)_{13}$-based Magnetocaloric Compounds: *Asaya Fujita*[1]; [1]National Institute of Advanced Industrial Science and Technology

5:30 PM Invited
Magneto-structural Transformation and Hysteresis in Materials with First-order Transitions: *Konstantin Skokov*[1]; Gutfleisch Oliver[1]; [1]Technische Universitat Darmstadt

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Defects II & Properties I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Monday PM | February 24, 2020
17B | San Diego Convention Ctr

Session Chairs: Alex Plotkowski, Oak Ridge National Laboratory; Matthew Krug, Air Force Research Laboratory

2:30 PM Invited
Coupling Hot-tearing of High ' Nickel Alloys to Processing Parameters Through Classic Solidification Criteria: Kevin Chaput[1]; *Matthew Krug*[1]; Edwin Schwalbach[1]; [1]Air Force Research Labroatory

3:00 PM
Controlling Freckle Defect Formation Using Magnetic Fields: *Andrew Kao*[1]; Ivars Krastins[1]; Natalia Shevchenko[2]; Sven Eckert[2]; Koulis Pericleous[1]; [1]University of Greenwich; [2]HZDR

3:20 PM
The Prediction of Solidification Defects: A Multi-defects Modeling: *Jun Li*[1]; Hongbiao Dong[1]; [1]University of Leicester

3:40 PM
Interplay Between Directional Solidification Morphology and Buoyancy-induced Melt Flow Pattern: *Elaheh Dorari*[1]; Mohsen Eshraghi[2]; Sergio Felicelli[1]; [1]University of Akron; [2]California State University, Los Angeles

4:00 PM Break

4:20 PM
Phase-field Simulation on Dendritic Motion and Growth, Freckle Defects and Dendritic Coarsening During Solidification: *Shaoxing Meng*[1]; Ang Zhang[1]; Zhipeng Guo[1]; [1]Tsinghua University

4:40 PM
Simulation and Casting Defects Prediction Using Magmasoft: *Salihu Tanimowo*[1]; Jamiu Odusote[1]; Niels Tiedje[2]; [1]University of Ilorin; [2]Technical University of Denmark

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Grain Boundary structure: FCC and Hexagonal

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Monday PM | February 24, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM
Structure, Deformation Response and Diffusion in Random [110] Tilt Grain Boundaries in FCC Alloys: *Diana Farkas*[1]; [1]Virginia Polytechnic Institute

2:50 PM
Anisotropic Mobility in Faceted Σ11 <110> tilt FCC Grain Boundaries and the Effect of Subsequent Doping: *Megan McCarthy*[1]; Timothy Rupert[1]; [1]University of California, Irvine

3:10 PM
Interplay of Chemistry and Faceting at Grain Boundaries in an Al-alloy: *Huan Zhao*[1]; Liam Huber[1]; Wenjun Lu[1]; Nicolas Peter[1]; Dayong An[1]; Frédéric De Geuser[1]; Dirk Ponge[1]; Baptiste Gault[1]; Dierk Raabe[1]; [1]Max-Planck-Institut Fur Eisenforschung G

3:30 PM
Quantifying and Predicting a "local" Stacking Fault Energy in Multi-principal Element Alloys: *Carlyn LaRosa*[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

3:50 PM Invited
Simulating Grain Boundary Structures with DFT Accuracy Through Active Learning of Interatomic Potentials: Tolga Akiner[1]; *Srikanth Patala*[1]; [1]North Carolina State University

4:10 PM Break

4:30 PM
Study on Effect of Symmetric Tilt Grain Boundaries on Twin Nucleation in Ti: *Deepesh Giri*[1]; Christopher Barrett[1]; Haitham El Kadiri[1]; [1]Mississippi State University

4:50 PM
Vacancy-mediated Solute/Twin Boundary Interactions in HCP Alloys: *Mohammad Shahriar Hooshmand*[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

5:10 PM
The Role of Microstructure and Loading Parameters on Deformation Twinning in Nanocrystalline Mg at High Strain Rates: *Sergey Galitskiy*[1]; Garvit Agarwal[2]; Avinash Dongare[1]; [1]University of Connecticut; [2]Argonne National Laboratory

5:30 PM
Database and Predictive Model of Grain Boundary Properties of Elemental Metals: *Hui Zheng*[1]; Xiang-Guo Li[1]; Richard Tran[1]; Chi Chen[1]; Matthew Horton[2]; Donny Winston[2]; Kristin Persson[2]; Shyue Ping Ong[1]; [1]Universisity of California San Diego; [2]Lawrence Berkeley National Laboratory

LIGHT METALS

Electrode Technology for Aluminum Production — Carbon Anode Development and Production - Where is the Cutting Edge?

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Duygu Kocaefe, University of Quebec at Chicoutimi

Monday PM | February 24, 2020
3 | San Diego Convention Ctr

Session Chair: Barry Sadler, Net Carbon Consulting Pty Ltd

2:30 PM Introductory Comments

2:35 PM Keynote
The Development of Anode Shape, Size and Assembly Designs - Past Present and Future Needs: *Barry Welch*[1]; [1]Welbank Consulting

3:05 PM Keynote
10 years of Research and Development: Alcoa & Université Laval Experience: *Jayson Tessier*[1]; Julien Lauzon-Gauthier[1]; Mario Fafard[2]; Houshang Alamdari[2]; Carl Duchesne[2]; Louis Gosselin[2]; [1]Alcoa; [2]REGAL

3:30 PM Invited
Carbon Anode Raw Materials – Where is the Cutting Edge?: *Les Edwards*[1]; [1]Rain Carbon Inc.

3:55 PM Break

4:10 PM Invited
Solids Flow Considerations and their Impact in Smelter Carbon Plant Operations and Product Quality: Brian Pittenger[1]; *Andrés Orlando*[1]; [1]Jenike & Johanson, Inc.

4:35 PM Invited
How to Improve the Environmental Efficiency of the Hall-Heroult Process While Producing and Using Carbon Anodes?: *Antti Koulumies*[1]; Ana Maria Becerra[1]; Lasse Piechowiak[1]; Paul Merlin[2]; Martin Zapke[1]; [1]Outotec GMBH & CO KG; [2]Outotec Canada Ltd

5:00 PM Invited
Trends in Carbon Anode Production: *Derek Santangelo*[1]; [1]Hatch

5:25 PM Panel Discussion

MATERIALS PROCESSING

Electrometallurgy 2020 — Molten Salts

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Georges Houlachi, Hydro-Quebec; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp

Monday PM | February 24, 2020
14A | San Diego Convention Ctr

Session Chairs: Antoine Allanore, MIT; Hojong Kim, Penn State; Takanari Ouchi, The University of Tokyo

2:30 PM Keynote
A Key Role for Electrometallurgy in Climate Change Mitigation: *Adam Powell*[1]; [1]Worcester Polytechnic Institute

3:00 PM
Capital Cost Estimation for Electrochemical Processes: *Caspar Stinn*[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

3:20 PM
Electrolytic Extraction of Liquid Copper and Iron from Chalcopyrite Ore: Lucas Rush[1]; Caspar Stinn[1]; Andrew Caldwell[1]; Mary Elizabeth Wagner[1]; Ryohei Yagi[1]; *Katrin Daehn*[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

3:40 PM
Development of a Magnesium Metal Production Process Using North Korean Magnesite: *Jungshin Kang*[1]; Tae-Hyuk Lee[1]; Young Min Kim[2]; Jin-Young Lee[1]; [1]Korea Institute of Geoscience and Mineral Resources; [2]Korea Institute of Materials Science

4:00 PM
Development of a Novel Magnesium Metal Production Process by Electrolysis of Magnesium Oxide Using a Tin Metal Cathode: *Tae-Hyuk Lee*[1]; Young Min Kim[2]; Jin-Young Lee[1]; Jungshin Kang[1]; [1]Korea Institute of Geoscience and Mineral Resources; [2]Korea Institute of Materials Science

4:20 PM Break

4:35 PM
A 3-D Numerical Model to Predict Low Temperature Aluminum Electrochemical Process Using Ionic Liquids as Electrolytes at Different Boundary Conditions: *Aqi Dong*[1]; Laurentiu Nastac[1]; Ramana Reddy[1]; [1]University of Alabama

4:55 PM
Production of Phosphorus in a Molten Salt: *Xiao Yang*[1]; [1]University of Tokyo

5:15 PM
Aluminum Extraction by Al-Si-Fe Alloy Electrolysis: *Huan Shuxing*[1]; [1]Northeastern University

5:35 PM
Enhanced Aluminum Electrorefining Process from Aluminum Alloy Scraps via Surface Engineering: *Yifan Wang*[1]; Ruigang Wang[1]; [1]University of Alabama

5:55 PM
Electrorefining of Molten Iron: William Judge[1]; *Gisele Azimi*[1]; [1]University of Toronto

ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management Symposium — Session II

Sponsored by: TMS Extraction and Processing Division, TMS: Energy Committee

Program Organizers: Xiaobo Chen, RMIT University; Yulin Zhong, Griffith University; Lei Zhang, University of Alaska Fairbanks; John Howarter, Purdue University; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology

Monday PM | February 24, 2020
17A | San Diego Convention Ctr

Session Chairs: Da-Wei Wang, UNSW Sydney; Jun Zhao, University of Science and Technology Beijing

2:30 PM
Electrified Layered Organic-inorganic Hybrids for Capacitive Storage: *Da-Wei Wang*[1]; Kefeng Xiao[1]; Huabo Liu[1]; Jiaxing Liang[1]; [1]UNSW Sydney

2:50 PM
Cerium Ion Adsorption on Ultrathin Graphitic Carbon Nitride and its Photocatalytic Application: *Saikat Kuila*[1]; Tarun Kundu[1]; [1]Indian Institute of Technology Kharagpur

3:10 PM
Economic Metals Rescue from Spent Zinc-carbon Batteries for Industrial Value Additions: *Alafara Baba*[1]; Folahan Adekola[1]; Rafiu Bale[1]; Abdul Alabi[2]; Mustapha Rajil[1]; [1]University of Ilorin; [2]Kwara State University, Malete

3:30 PM
The Co-extraction of Low-rank Coal and Biomass by Polar Solvent at Mild Conditions: *Jun Zhao*[1]; Haibin Zuo[2]; [1]University Of Science And Technology Beijing; [2]University of Science and Technology Beijing

3:50 PM
Improving In-vitro and In-vivo Antibacterial Functionality of Mg Alloys Through Micro-alloying with Sr and Ga: *Xiaobo Chen*[1]; [1]RMIT University

4:10 PM Break

4:30 PM
Discussion on the Application of Rooftop Photovoltaic Power Plant in the Steel Enterprise: Xiancong Zhao[1]; *Huanmei Yuan*[2]; Yuzhao Han[2]; Zefei Zhang[2]; Hao Bai[2]; [1]Peking university; [2]University of Science and Technology Beijing

4:50 PM
Transient Thermal Modeling of Aluminum Cells for Renewable Energy Integration: Gustavo Ospina[1]; *Mohamed Hassan*[1]; Sgouris Sgouridis[1]; Ali Bouabid[1]; [1]Khalifa University of Science and Technology

5:10 PM
Performance of Anodes with Proper Active Metal Elements Added to the Al-0.16wt%In in Alkaline Electrolyte for Al-air Batteries: *Huimin Lu*[1]; Neale Neelameggham[2]; Jing Leng[1]; Jianxue Liu[1]; [1]Beihang University; [2]IND LLC

SPECIAL TOPICS

Expanding the Boundaries of Materials Science: Unconventional Collaborations — Unconventional Collaborations

Program Organizers: Sourabh Kadambi, North Carolina State University; Alex Hsain, North Carolina State University; Brady Dowdell, North Carolina State University; Benjamin Anthony, University of Florida

Monday PM | February 24, 2020
4 | San Diego Convention Ctr

Session Chairs: Benjamin Anthony, North Carolina State University; Brady Dowdell, North Carolina State University

2:30 PM
Creating the Next-Generation Materials Genome Initiative Workforce: *David McDowell*[1]; [1]Georgia Institute of Technology

3:00 PM Invited
Accelerating Materials Design Through Community, Open Data and Collaboration: *Matthew Horton*[1]; Kristin Persson[2]; [1]Lawrence Berkeley National Lab; [2]Lawrence Berkeley National Lab and University of California, Berkeley

3:30 PM
Additive Manufacturing for Novel Thermal Devices: *Scott Roberts*[1]; Ben Furst[1]; Stefano Cappucci[1]; Takuro Daimaru[1]; Eric Sunada[1]; [1]Jet Propulsion Laboratory

4:00 PM Break

4:20 PM Panel Discussion - Best practices on effective communication and strategies for making the most out of interdisciplinary research collaborations. Panel members are select speakers from the symposium.

4:50 PM Concluding Comments

MECHANICS & STRUCTURAL RELIABILITY

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Crack Initiation Mechanisms and Crack Growth Behavior

Sponsored by: TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University

Monday PM | February 24, 2020
11A | San Diego Convention Ctr

Session Chair: Garrett Pataky, Clemson University

2:30 PM Invited
Dislocation Patterns and Crack Initiation in Fatigued Nickel Single Crystal Microcrystals: Micro-Scale In-situ Scanning Electron Experiments: Steven Lavenstein[1]; *Jaafar El-Awady*[1]; [1]Johns Hopkins University

2:50 PM
Microstructure-interacting Short Crack Growth in Blocky Alpha Zircaloy-4: *Weifeng Wan*[1]; Fionn Dunne[1]; [1]Imperial College London

3:10 PM
Mission Loading Effects on Small Crack Growth in an Alpha+Beta Titanium Alloy: *Reji John*[1]; Patrick Golden[1]; Sushant Jha[2]; W. Porter[2]; [1]Air Force Research Laboratory; [2]University of Dayton Research Institute

3:30 PM
Characterization of Fatigue Short Crack Growth in Rare-earth Magnesium Alloy WE43 using High Energy X-ray Diffraction Microscopy: *Duncan Greeley*[1]; Jacob Adams[1]; Peter Kenesei[2]; Ashley Spear[3]; John Allison[1]; [1]University of Michigan; [2]Argonne National Laboratory; [3]University of Utah

3:50 PM
Characterization of Fatigue Crack Growth Behavior in CrCoFeNi High Entropy Alloy: Wm Williams[1]; Mitra Shabani[1]; *Garrett Pataky*[1]; Paul Jablonski[2]; [1]Clemson University; [2]National Energy Technology Laboratory

4:10 PM Break

4:30 PM Invited
Watching High-cycle Fatigue in Nanocrystalline Pt and Pt-Au: *Nathan Heckman*[1]; Christopher Barr[1]; Khalid Hattar[1]; David Adams[1]; Timothy Furnish[1]; Brad Boyce[1]; [1]Sandia National Laboratories

4:50 PM
Volumetric Defect Quantification of Pure Aluminum During Fatigue Loading Below the Yield Stress: *Joseph Indeck*[1]; Jefferson Cuadra[2]; Kavan Hazeli[1]; [1]University Of Alabama, Huntsville; [2]Lawrence Livermore National Laboratory

5:10 PM
Propositions for Functional Fatigue and Fatigue-crack Initiation in Shape Memory Alloys: *Ahmedsameerkhan Mohammed*[1]; Huseyin Sehitoglu[1]; [1]University of Illinois Urbana-Champaign

5:30 PM
Moving Cracks Form White Etching Areas During Rolling Contact Fatigue in Bearings: Lutz Morsdorf[1]; David Mayweg[1]; Yujiao Li[2]; Annika Diederichs[3]; Dierk Raabe[1]; *Michael Herbig*[1]; [1]Max-Planck-Institute fuer Eisenforschung; [2]Ruhr University Bochum; [3]Denmark Technical University

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Translating Innovation into Pioneering Technologies II

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Monday PM | February 24, 2020
Point Loma | Marriott Marquis Hotel

Session Chairs: Joseph Teprovich, California State University; Min-Kyu Song, Washington State University

2:30 PM Invited
Nano-carbon Materials for Advanced Energy Storage: *Cengiz Ozkan*

2:50 PM Invited
Compact Graphene Powders with High Volumetric Capacitance: Microspherical Assembly of Graphene via Surface Modification using Cyanamide: *Kwang-Bum Kim*[1]; Young Hwan Kim[1]; Byung Hoon Park[1]; Yeon Jun Choi[1]; Geon Woo Lee[1]; [1]Yonsei University

3:10 PM Invited
Stress Relaxation and Battery: *Hanqing Jiang*[1]; [1]Arizona State Univ

3:30 PM Invited
Photophysical and Electrochemical Properties of Fullerene and Closo-borane based Materials: *Joseph Teprovich*[1]; [1]California State University Northridge

3:50 PM
Strain Engineering of Two-dimensional Semiconductors: *SungWoo Nam*[1]; [1]University of Illinois, Urbana-Champaign

4:10 PM Break

4:30 PM Invited
New Materials and Devices Beyond Silicon and Field-effect Transistors: *Qing Cao*[1]; [1]University of Illinois at Urbana-Champaign

4:50 PM Invited
Understanding Nanoscale Evolution of Materials and Interfaces in Batteries: *Matthew McDowell*[1]; [1]Georgia Tech

5:10 PM Invited
High Throughput Screening of Nano Catalysts for PEMFC/AEMFC and Machine Learning Prediction of Chemisorption: Soonho Kwon[1]; Jung Woo Choi[2]; *Hyuck Mo Lee*[2]; [1]CALTECH; [2]KAIST

5:30 PM Invited
2D Conjugated Polymer Nanosheets for Photocatalytic Overall Water Splitting: *Hangxun Xu*[1]; [1]University of Science and Technology of China

MATERIALS DESIGN

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering — CALPHAD and First Principles

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Michael Gao, National Energy Technology Laboratory; Wei Xiong, University of Pittsburgh

Monday PM | February 24, 2020
32A | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM Invited
A Hexagonal Close Packed Multi-principal-element Alloy Identified Computationally: Axel van de Walle[1]; Ruoshi Sun[1]; Qijun Hong[1]; Julian Sabisch[2]; Andrew Minor[3]; *Mark Asta*[3]; [1]Brown University; [2]Sandia National Laboratory; [3]University of California, Berkeley

3:10 PM Invited
First-principles Thermodynamics of Refractory Alloys and their Oxides: *Anton Van Der Ven*[1]; Naga Sri Gunda[1]; Anirudh Natarajan[1]; [1]University of California, Santa Barbara

3:50 PM Invited
On the Intrinsic Alloying Behavior in the A and M Sublattices of MAX Phases: *Raymundo Arroyave*[1]; Anjana Talapatra[2]; Thien Duong[3]; Miladin Radovic[1]; [1]Texas A&M University; [2]Los Alamos National Laboratory; [3]Argonne National Laboratory

4:30 PM Break

4:50 PM Invited
Thermodynamic Modeling of Precipitates of Topologically Close-packed Phases: *Thomas Hammerschmidt*[1]; [1]ICAMS Ruhr-University Bochum

5:30 PM Invited
Alloys, Processing, Applications, Models and Software: The Wide Domain of Gibbs Energies Sets Giving Impulse to Invention: *Suzana Fries*[1]; Sara Catalina Pineda Heresi[1]; Daniela Ivanova[1]; Uzair Rehman[1]; Silvana Tumminello[2]; [1]Ruhr-Universität Bochum; [2]German Aerospace Center

---

ADVANCED MATERIALS

Innovations in High Entropy Alloys and Bulk Metallic Glasses: An SMD & FMD Symposium in Honor of Peter K. Liaw — High Entropy Alloys: Alloy Design and Processing

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee

Program Organizers: Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Yanfei Gao, University of Tennessee - Knoxville; Robert Maass, University of Illinois at Urbana-Champaign; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Soo Yeol Lee, Chungnam National University; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Liang Jiang, Yantai University

Monday PM | February 24, 2020
Marina Ballroom G | Marriott Marquis Hotel

Session Chairs: Liang Jiang, Yantai University ; Soo Yeol Lee, Chungnam National University

---

2:30 PM Invited
Alloying Effects on Mechanical Properties of CoCrFeNi-based \947'-Strengthened Multi-principal Element Alloys for Elevated Temperature Applications: Akane Suzuki[1]; *Shenyan Huang*[1]; Doug Konitzer[2]; [1]GE Research; [2]GE Aviation

2:50 PM Invited
A Grain-growth-resistant High-entropy Alloy for Forging Applications: *Zhi Tang*[1]; Chuan Zhang[2]; Oleg Senkov[3]; Jonathan Poplawsky[4]; Fan Zhang[2]; Michael Gao[5]; Peter Liaw[6]; [1]University of Tennessee; Arconic Engines; [2]CompuTherm LLC; [3]Air Force Research Laboratory; [4]Oak Ridge National Laboratory; [5]National Energy Technology Laboratory; [6]University of Tennessee

3:10 PM Invited
Metastability Engineering in Aged Non-equiatomic High Entropy Alloys with Heterogenous Structure Towards Superior Strength-ductility Synergy: *Cheng Zhang*[1]; Chaoyi Zhu[2]; Xin Wang[1]; Fan Ye[1]; Kevin Kaufman[2]; Penghui Cao[1]; Xiaoqing Pan[1]; Julie Schoenung[1]; Kenneth Vecchio[2]; Enrique Lavernia[1]; [1]Department of Materials Science and Engineering, University of California Irvine; [2]University of California San Diego

3:30 PM Invited
Manipulating Structures/Properties of Bulk Metallic Glasses and High-entropy Alloys by Severe Plastic Deformation: *Koichi Tsuchiya*[1]; [1]International Center for Young Scientists; National Institute for Materials Science

3:50 PM Invited
Ductility Improvement Methodologies in Metallic Glasses and High Entropy Alloys: *Yanfei Gao*[1]; Hongbin Bei[1]; [1]University of Tennessee - Knoxville

4:10 PM Break

4:20 PM Invited
Novel NiAl-strengthened High Entropy Alloys with Balanced Tensile Strength and Ductility: *Haoyan Diao*[1]; Dong Ma[2]; Rui Feng[3]; Tingkun Liu[3]; Chao Pu[3]; Chuan Zhang[4]; Wei Guo[2]; Jonathan Poplawsky[2]; Yanfei Gao[3]; Peter Liaw[3]; [1]Kaiser Aluminum; [2]Oak Ridge National Laboratory; [3]University of Tennessee Knoxville; [4]Computherm LLC

4:40 PM Invited
Mechanical Behavior of Additive Manufactured CoCrNi High Entropy Alloy at 298K and 210K: *Soo Yeol Lee*[1]; You Sub Kim[1]; Hobyung Chae[1]; Wanchuck Woo[2]; Dong-Kyu Kim[3]; E-Wen Huang[4]; Takuro Kawasaki[5]; Stefanus Harjo[5]; [1]Chungnam National University; [2]Korea Atomic Energy Research Institute; [3]University of Ulsan; [4]National Chiao Tung University; [5]Japan Atomic Energy Agency

5:00 PM Invited
High-throughput Hot-isostatic-pressing Micro-synthesis for Accelerating Studies of High Entropy Alloys: Lei Zhao[1]; *Liang Jiang*[2]; Lixia Yang[1]; Bin Liu[3]; Hui Wang[1]; Haizhou Wang[1]; [1]Central Iron & Steel Research Institute; [2]Yantai University; [3]Central South University

5:20 PM Invited
Improvement of Lattice Distortion by Addition of Zr Element in NbTaTiV Refractory High-entropy Alloy: *Chanho Lee*[1]; Yi Chou[2]; George Kim[3]; Gian Song[4]; Michael C. Gao[5]; Ke An[6]; Chuan Zhang[7]; Wei Chen[3]; Jonathan D. Poplawsky[6]; Yi-Chia Chou[2]; Peter K. Liaw[1]; [1]University of Tennessee; [2]National Chiao Tung University; [3]Illinois Institute of Technology; [4]Kongju National University; [5]National Energy Technology Laboratory; [6]Oak Ridge National Laboratory; [7]Computherm, LLC

5:40 PM Invited
Peierls Barrier Characteristic and Anomalous Strain Hardening Provoked by Dynamic-strain-aging Strengthening in a Body-centered-cubic High-entropy Alloy: *Shuying Chen*[1]; Peter Liaw[1]; [1]University of Tennessee

---

MATERIALS PROCESSING

Low-cost Titanium: 'Affordable Ti' — Session II

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee, TMS: Powder Materials Committee

Program Organizers: Ramana Reddy, University of Alabama; M. Ashraf Imam, George Washington University

Monday PM | February 24, 2020
Theater A-8 | San Diego Convention Ctr

Session Chairs: Ashraf Imam, George Washington University; Z. Zak Fang, University of Utah

---

2:30 PM Invited
Making Affordable Titanium Alloy with Wrought-like Mechanical Properties from Sintering Low-Cost Titanium Powder: *Pei Sun*[1]; Z. Zak Fang[1]; [1]University of Utah

3:10 PM
Low Temperature Synthesize of TiH2 Powder from TiCl4 Reduction with MgH2 Powder: Mohammad Rezaei Ardani[1]; *Sheikh Rezan*[1]; Ahmad Fauzi Mohd Noor[1]; Hooi Ling Lee[2]; Abdul Rahman Mohamed[3]; Ismail Ibrahim[4]; [1]School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia; [2]Nanomaterials Research Group, School of Chemical Sciences, Universiti Sains Malaysia; [3]School of Chemical Engineering, Universiti Sains Malaysia; [4]Mineral Research Centre, Department of Mineral and Geoscience Malaysia

3:30 PM
Low-cost Titanium Extraction Process: Molten Salt Electrolysis with Titanium Oxycarbide (TiC_xO_{1-x}) as Soluble Anode: *Jiusan Xiao*[1]; Hongmin Zhu[2]; Shuqiang Jiao[1]; Jun Zhu[3]; [1]Univ of Science and Technology Beijing; [2]Tohoku University; [3]University of Science and Technology Beijing

3:50 PM
Preparation of Ti-6Al-4V Alloy Powder by Aluminothermic Reduction: *Wang Tian*[1]; Wang Yaowu[1]; [1]Northeast University

4:10 PM Break

4:25 PM
A Systematic Experimental Investigation of the Planar-to-wavy Slip Transition in Model Ti-O Alloys: *Yan Chong*[1]; Ruopeng Zhang[1]; Shiteng Zhao[1]; Mark Asta[1]; Daryl Chrzan[1]; Andrew Minor[1]; [1]University of California, Berkeley

4:45 PM
High Strength and Ductility Titanium Materials with Cheap Alloying Elements Fabricated by Powder Metallurgy: *Katsuyoshi Kondoh*[1]; Takayuki Tanaka[1]; Shota Kariya[1]; Junko Umeda[1]; [1]Osaka University

5:05 PM
Electroplastic Effects in a Dilute Ti-Al Alloy: *Shiteng Zhao*[1]; Ruopeng Zhang[1]; Andrew Minor[1]; [1]University of California, Berkeley

5:25 PM
Machine Learning Assisted Discovery of Affordable Biomedical Ti Alloy: *ChunTe Wu*[1]; Hsiao-Tzu Chang[2]; Shi-Wei Chen[3]; Sih-Ying Huang[1]; Yeong-Tsuen Pan[2]; Joshua Chou[4]; Hung-Wei Yen[1]; [1]National Taiwan University; [2]China Steel Corporation; [3]National Synchrotron Radiation Research Center; [4]University of Technology Sydney

---

LIGHT METALS

Magnesium Technology 2020 — Alloy Development

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Monday PM | February 24, 2020
6C | San Diego Convention Ctr

Session Chairs: Norbert Hort, MagIC - Helmholtz Zentrum Geesthacht; Neale Neelameggham, IND LLC

2:30 PM Invited
Design of Ductile Rare-earth-free Mg Alloys: *William Curtin*[1]; Rasool Ahmada[1]; Binglun Yin[1]; Zhaoxuan Wu[2]; [1]Institute of Mechanical Engineering, École Polytechnique Fédérale de Lausanne; [2]Institute of High Performance Computing

3:00 PM
Microstructure Evolution and Precipitation Strengthening in Ca-containing Mg-rare Earth Alloys: *Qianying Shi*[1]; Bruce Williams[2]; John Allison[1]; [1]University of Michigan; [2]CanmetMATERIALS, Natural Resources Canada

3:20 PM
A Die-cast Magnesium Alloy for Applications at Elevated Temperatures: *Xixi Dong*[1]; Eric Nyberg[2]; Shouxun Ji[1]; [1]Brunel University London; [2]Tungsten Parts Wyoming

3:40 PM
Effect of Gd and Nd Additions on the Thermo-mechanical Response of a MgMn Alloy: *Domonkos Tolnai*[1]; Serge Gavras[1]; Pere Barriobero-Vila[2]; Andreas Stark[1]; Norbert Schell[1]; [1]Helmholtz-Zentrum Geesthacht; [2]DLR

4:00 PM
Development of Ultra Lightweight, Corrosion Resistant Mg Alloys: *Taylor Cain*[1]; Joseph Labukas[1]; [1]US Army Research Laboratory

4:20 PM Break

4:40 PM Poster Pitches

CHARACTERIZATION

Material Behavior Characterization via Multi-Directional Deformation of Sheet Metal — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Daniel Coughlin, Los Alamos National Laboratory; Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory; John Carsley, Novelis, Inc.

Monday PM | February 24, 2020
Theater A-1 | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM Invited
Evolution of Local Formability Concepts for Advanced High Strength Steels (AHSS): *Brandon Hance*[1]; [1]U. S. Steel

3:10 PM Invited
Industry Perspective on the Mechanical Characterization of Next Generation Steels: *Erik Pavlina*[1]; Jun Hu[1]; Kavesary Raghavan[1]; [1]AK Steel

3:50 PM
An Investigation into Improved Elongation-to-fracture in AHSS via Continuous Bending Under Tension: *Rishabh Sharma*[1]; Camille Poulin[2]; Marko Knezevic[2]; Michael Miles[1]; David Fullwood[1]; [1]Brigham Young University; [2]University of New Hampshire

4:10 PM Break

4:35 PM
Development of a Lean Duplex TRIP Steel with a Superior Formability: *Peijun Hou*[1]; Yuan Li[1]; Jun-Sang Park[2]; Dongchul Chae[3]; Chanho Lee[1]; Yang Ren[2]; Ke An[4]; Hahn Choo[1]; [1]University of Tennessee; [2]Argonne National Laboratory; [3]POSCO Technical Research Laboratory; [4]Oak Ridge National Laboratory

4:55 PM
Experimental Studies into the Role of Cyclic Bending during Stretching of Dual-phase Steel Sheets: *Marko Knezevic*[1]; Camille Poulin[1]; [1]University of New Hampshire

5:15 PM
Damage Detection of Sheet Metal via Multi-directional Deformation: *Brahmananda Pramanik*[1]; John Becker[1]; Jared Schmidlin[1]; Wednesday Rehm[1]; [1]Montana Tech

5:35 PM
Neutron Measurement of the Multi-axial Yield Function in Automotive Sheet Metals: *Thomas Gnaupel-Herold*[1]; [1]National Institute Of Standards And Technolog

MATERIALS DESIGN

Materials Design Approaches and Experiences V — Superalloys

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Akane Suzuki, GE Research; Ji-Cheng Zhao, University of Maryland; Michael Fahrmann, Haynes International; Qiang Feng, University of Science and Technology Beijing; Michael Titus, Purdue University

Monday PM | February 24, 2020
33A | San Diego Convention Ctr

Session Chairs: Yunzhi Wang, The Ohio State University; Qiang Feng, University of Science and Technology Beijing

2:30 PM Invited
Design of Cobalt Base Single Crystal Superalloys: Sean Murray[1]; Colin Stewart[1]; Robert Rhein[1]; Carlos Levi[1]; Anton Van Der Ven[1]; *Tresa Pollock*[1]; [1]University of California, Santa Barbara

3:00 PM
Improved 3rd Generation Single Crystal Superalloy CMSX-4® Plus (SLS) – a Study of Evolutionary Alloy Development: *Jacqueline Wahl*[1]; Ken Harris[1]; [1]Cannon-Muskegon Corp

3:20 PM
Development of Ni-based Alloys For Transportation Applications: *Govindarajan Muralidharan*[1]; John Chiles[1]; Dean Pierce[1]; Lawrence Allard[1]; Donovan Leonard[1]; Jonathan Poplawsky[1]; [1]Oak Ridge National Laboratory

3:40 PM
Designing for Local Phase Transformation Strengthening in Nickel Based Superalloys: *Ashton Egan*[1]; Lola Lilensten[2]; Paraskevas Kontis[2]; Sammy Tin[3]; Michael Mills[1]; [1]Ohio State University; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Illinois Institute of Technology

4:00 PM Break

4:20 PM Invited
New Alloy Design Strategy via Non-conventional Phase Transformation Pathways: Longsheng Feng[1]; Tianlong Zhang[2]; Dong Wang[3]; Yipeng Gao[4]; Yufeng Zheng[1]; Michael Mills[1]; Hamish Fraser[1]; *Yunzhi Wang*[1]; [1]The Ohio State University; [2]City University of Hong Kong; [3]Xi'an Jiao Tong University; [4]Idaho National Laboratory

4:50 PM
Equilibrium Segregation and Localized Phase Transition at Stacking Faults in Ni-based Superalloys: *Longsheng Feng*[1]; You Rao[1]; Ashton Egan[1]; Michael Mills[1]; Maryam Ghazisaeidi[1]; Yunzhi Wang[1]; [1]The Ohio State University

5:10 PM
Precipitate-mediated Dislocation Transformer in Ni-base Superalloys: *Longsheng Feng*[1]; Michael Mills[1]; Yunzhi Wang[1]; [1]The Ohio State University

5:30 PM
Design of a New Ni-base Superalloy for Large-scale Casting via High-throughput CALPHAD Computation: *Lanting Zhang*[1]; Feng Sun[1]; Hong Wang[1]; [1]Shanghai Jiao Tong University

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Size Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Monday PM | February 24, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Yu Zou, University of Toronto; Alice Lassnig, Austrian Academy of Sciences

2:30 PM
Failure Mechanisms in SiC Fiber - SiC Matrix Composites: *David Armstrong*[1]; Robin DeMeyer[1]; [1]University of Oxford

2:50 PM
Effect of Layer Spacing on Mechanical Properties of Cu/Co Nanolaminates Through Tensile Testing: *Rohit Berlia*[1]; Paul Rasmussen[1]; Santhosh Rajarajan[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

3:10 PM
Size Effect of NiTi-based Shape Memory Nanoparticles on Recoverable Strain: *Ji Young Kim*[1]; So Yeon Kim[2]; Jin woo Kim[2]; Won seok Ko[3]; Eun Soo Park[1]; [1]Seoul National University; [2]Seoul National University; Massachusetts Institute of Technology; [3]Ulsan University

3:30 PM Invited
Grain Size Effect on Thin Film Adhesion: *Alice Lassnig*[1]; [1]Erich Schmid Institute of Materials Science

4:10 PM Break

4:30 PM
Tension-compression Asymmetry in Plasticity of Nanoporous Gold: *Hansol Jeon*[1]; Eun-Ji Gwak[1]; Hangeul Kim[1]; Ju-Young Kim[1]; [1]UNIST

4:50 PM
Fracture Properties of Ultrafinegrain Chromium at RT: Dislocations Processes and Toughening Mechanisms: *Inas Issa*[1]; Anton Hohenwarter[1]; Reinhard Fritz[1]; Daniel Kiener[1]; [1]Montanuniversitat Leoben

5:10 PM
Studying the Anisotropic Deformation of Sapphire in Different Crystallographic Orientations using Nanoindentation and Micropillar Compression: *Anugraha Thyagatur Kidigannappa*[1]; Alex Montagne[2]; Xavier Maeder[2]; Johann Michler[2]; Veronica Trabadelo[3]; Fatemeh Saeidi[2]; M. Parlinska-Wojtan[4]; Kilian Wasmer[2]; Siddhartha Pathak[1]; [1]university of Nevada Reno; [2]EMPA – Swiss Federal Laboratories for Materials Testing and Research; [3]Mohammed VI Polytechnic University, Materials Science and Nano-engineering Department; [4] Institute of Nuclear Physics, Polish Academy of Sciences

5:30 PM
Exploring Small-scale Quasicrystal Plasticity in Unknown Temperature Regimes: *Yu Zou*[1]; [1]University of Toronto

MATERIALS DESIGN

Metal-Matrix Composites: Analysis, Modeling, Observations and Interpretations — Processing - Microstructure - Performance

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys; William Harrigan, Gamma Alloys

Monday PM | February 24, 2020
31A | San Diego Convention Ctr

Session Chair: Ramasis Goswami, Naval Research Laboratory

2:30 PM Invited
Aluminum Matrix Composite Fabricated using Additive Friction Stir Deposition: *Yuzheng Zhang*[1]; William Harrigan[1]; [1]Gamma Alloys

3:00 PM Invited
Role of Matrix Microstructure on the Mechanical Behavior and Corrosion Response of Two Magnesium Metal Matrix Composites: Jayalakshmi S[1]; Arvind Singh R[1]; Xizhang Chen[1]; Sergey Konovalov[2]; *Srivatsan T.S.*[3]; Seshan Sambasivam[4]; Manoj Gupta[5]; [1]Wenzhou University; [2]Samara National Research University; [3]The University of Akron; [4]Indian Institute of Science; [5]National University of Singapore

3:30 PM
Simultaneously Applied Electromagnetic and Mechanical Ultrasound for Particle Dispersion in Liquid Metals: *Imants Kaldre*[1]; Andris Bojarevics[1]; [1]University of Latvia

3:55 PM Break

4:15 PM
Investigation of Friction Stir Spot Welding of Aluminium Alloys using Zinc as an Interlayer: *Pragya Rai*[1]; Sushanta Panda[1]; Jinu Paul[1]; [1]IIT Kharagpur

4:40 PM
Effect of Reinforced Materials Size on Corrosion and Wear Behavior of Cu/B4C Metal Matrix Composites Fabricated by Friction Stir Processing: *Jae-Ha Kim*[1]; Hyun-Joon Park[1]; Choong-Jae Lee[1]; Seung-Boo Jung[1]; [1]Sungkyunkwan University

MATERIALS DESIGN

Microstructural Template Consisting of a Face-Centered Cubic Matrix with Ordered Precipitates: Microstructural Evolution and Properties — Ni Base Superalloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Rajarshi Banerjee, University of North Texas; Eric Lass, University of Tennessee, Knoxville; Ashley Paz Y Puente, University of Cincinnati; Tushar Borkar, Cleveland State University; Keith Knipling, Naval Research Laboratory; Sophie Primig, University of New South Wales

Monday PM | February 24, 2020
30D | San Diego Convention Ctr

Session Chair: Sophie Primig, University of New South Wales

2:30 PM Keynote
Precipitation and Deformation Mechanisms of 'γ/γ" Co-precipitates in Alloy 718: Hariharan Sriram[1]; Kamal Kadirvel[1]; Rongpei Shi[1]; Longsheng Feng[1]; Michael Mills[1]; *Yunzhi Wang*[1]; [1]The Ohio State University

3:10 PM Invited
Correlative High-resolution Characterization of the Early Stages of Precipitation During Direct Aging of Alloy 718: *Felix Theska*[1]; Vitor Rielli[1]; Keita Nomoto[2]; Flora Godor[3]; Bernd Oberwinkler[3]; Aleksandar Stanojevic[3]; Simon Ringer[2]; Sophie Primig[1]; [1]University of New South Wales Sydney; [2]The University of Sydney; [3]voestalpine BÖHLER Aerospace GmbH & Co KG

3:40 PM
In-situ Transmission Electron Microscopy Investigation of Continuous Precipitation of Ni3Mo in a Ni-25Mo-8Cr Alloy Formed by Direct Current Magnetron Sputtering: Megan Emigh[1]; *Jessica Krogstad*[2]; [1]University of California, Santa Barbara; [2]University of Illinois at Urbana-Champaign

4:00 PM Break

4:30 PM Invited
Ordered Precipitates and Mechanical Properties of Nickel-base Superalloys Studied by Analytical Scanning and Transmission Electron Microscopy: Micheal Kattoura[1]; Jie Song[2]; Anurag Sharma[2]; Seetha Mannava[2]; *Vijay Vasudevan*[2]; [1]LSP Technologies; [2]University of Cincinnati

5:00 PM Invited
The Quantitative Model for Heat Treatment Parameters and Gamma Prime Variations on Nickel-base Superalloys: Nishan Senanayake[1]; *Jennifer Carter*[1]; [1]Case Western Reserve University

5:30 PM Invited
Alloying for Corrosion Resistance: the Effect of Manganese and Silicon on a Polycrystalline Nickel-based Superalloy: *Stella Pedrazzini*[1]; Noel Glaenzer[2]; Mark Hardy[3]; Paul Mignanelli[3]; T William Clyne[2]; Howard Stone[2]; [1]Imperial College London; [2]University of Cambridge; [3]Rolls-Royce plc

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — PbZn Process Technologies

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday PM | February 24, 2020
15B | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM Invited
Contributions of Non-ferrous Smelters to Metal Resource Circulation in Japan: *Etsuro Shibata*[1]; [1]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

2:50 PM
Complex Lead and Zinc Feed Treatment through Combining ISASMELT™ and Albion Process™: *Stanko Nikolic*[1]; Paul Voigt[1]; Ben Hogg[1]; Mike Hourn[1]; [1]Glencore Technology

3:10 PM
Linking a Dynamic Pb-Cu Smelting SimuSage TSL Furnace Model with HSC Sim to Optimize a Smelter: *Francois van Schalkwyk*[1]; Alejandro Abadias Llamas[2]; Markus Reuter[1]; [1]Helmholtz Institute Freiberg for Resource Technology; [2]TU Bergakademie Freiberg

3:30 PM
The Process and Application of Oxygen-rich Side-blowning Smelting for Lead-zinc Materials: *Ling Zhang*[1]; Leru Zhang[1]; Yilin He[1]; [1]CINF Engineering Co., Ltd.

3:50 PM Break

4:10 PM
New Ideas for the Design of Green Smelting Project of Domestic Lead and Zinc Resources: *Cui Chen*[1]; Hua Hua[1]; Min He[1]; [1]CINF Engineering Co,.Ltd

4:30 PM
Recent Operation at Hachinohe Smelter: *Shojiro Mataoka*[1]; Ushio Enomoto[1]; Kazuhiko Nishina[1]; [1]Hachinohe Smelting Company Limited

4:50 PM
Kinetic Aspects of an Innovative Technology for the Reprocessing of ISF Slag: *Walter Schatzmann*[1]; Juergen Antrekowitsch[1]; [1]Montanuniversität Leoben

5:10 PM
Evaluation and Certification Strategies for Lead-zinc Bearing Residues: *Juergen Antrekowitsch*[1]; G Hanke[1]; [1]University of Leoben

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Primary Lead

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday PM | February 24, 2020
14B | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM
Lead Metal Production at Paroo Station Mine Using Leach-electrowinning Process in Methane Sulfonic Acid Solution: *David Dreisinger*[1]; Ken Baxter[2]; Andrew Worland[2]; Tom Cooper[3]; Nick Waters[2]; [1]University of British Columbia; [2]LeadFX Inc.; [3]Rosslyn Hill Mining Limited

2:50 PM
Lead Plant Transformations: A Liu[1]; *Michael Reed*[1]; R Close[1]; L Thompson[1]; [1]Worley Services Pty Ltd

3:10 PM
Long Service Life of Removable Roof at Hindustan Zinc: *Allan MacRae*[1]; Sanjay Pal[2]; [1]Macrae Technologies, Inc.; [2]Hingustan Zinc Limited

3:30 PM
Reduction of Lead Rich Slags with Coke in the Lead Blast Furnace: *Robin Vanparys*[1]; Geoffrey Brooks[1]; M. Akbar Rhamdhani[1]; Tijl Crivits[2]; [1]Swinburne University of Technology; [2]Umicore

3:50 PM Break

4:10 PM
Research and Application of Oxygen-enriched Side-blowing Continuous Smelting Technology for Lead-antimony-silver Complex Materials: *Jian Ping Yang*[1]; [1]Changsha Engineering and Research Institute Ltd. of Nonferrous Metallurgy

4:30 PM
KCM – Innovator in the Pb Metal Production through Ausmelt Technology and Variable SO2 Concentration Off-gas Utilization: Nikolay Starev[1]; *Georgi Doganov*[1]; [1]KCM AD

4:50 PM
Application of CSC Technology in Nonferrous Metallurgy: *Xliasong Wu*[1]; [1]CINF Engineering Co., Ltd.

5:10 PM
Installation of a Brown Field Slag Reduction Furnace: State of the Art Off-gas Treatment with Dry Gas Cleaning for SO2 Capture: Peter Weber[1]; *Dirk Behrmann*[1]; Thomas Breuer[1]; [1]Küttner GmbH & Co. KG

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Primary Zinc I

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Monday PM | February 24, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM
A Dynamic Model of a Submerged Plasma Slag Fuming Process: *Samant Nagraj*[1]; Mathias Chintinne[1]; Muxing Guo[2]; Bart Blanpain[2]; [1]Metallo Belgium N.V.; [2]KU Leuven

2:50 PM
Start-up and Improvements of the New Electrolysis Plant at Annaka Refinery: *Takuhiro Yamaguchi*[1]; [1]TOHO ZINC CO.,LTD.

3:10 PM
Zinc Recovery of Low Grade Concentrate from Vazante Mine by the Waelz Process: *Fabiana Teixeira*[1]; Julia Martins[1]; Sérgio Penchel[1]; Eder Martins[1]; Pablo Pina[1]; Tone Takayama[1]; Thiago Leite[1]; [1]Nexa Resources SA

3:30 PM
ZnSO4.H2O Thermal Decomposition in the Presence of Reducing Agent (S2) and Catalyst (Pd): *Rodrigo Souza*[1]; Gabriela Kurban[1]; Nathalli Mello[1]; Rogério Navarro[1]; Eduardo Brocchi[1]; [1]Pontifícia Universidade Católica do Rio de Janeiro

3:50 PM
Increase in Zinc Recovery from a Silicate Concentrate by Pre Neutralization Process: *Maria Dias*[1]; Daniel Pereira[1]; Mateus Araujo[1]; Caio Oliveira[1]; Adelson Souza[1]; [1]Nexa Resources

4:10 PM Break

4:30 PM
Characterization and Processing of Residues from Hydrometallurgical Zinc Smelters: *Juergen Antrekowitsch*[1]; G. Hanke[1]; [1]University of Leoben

4:50 PM
Zinc Residues Fuming Process in Side-submerged Combustion Furnace + Fuming Furnace: *Xu Liang*[1]; Ma Shaobin[1]; [1]China ENFI Engineering Corporation

5:10 PM
A Critical Review on Generation, Characteristics, and Utilization of Zinc Slag: *Yan Song*[1]; Weiguo Wu[1]; Liang Xu[1]; Xiangqiang Chen[1]; Ge Zhang[1]; [1]China ENFI Engineering Corporation

5:30 PM
Recovery of Lead from Zinc Plant Residue by Alkaline Leaching Process Followed by Cementation: *Jonghyun Kim*[1]; Jae-chun Lee[1]; Min-seuk Kim[1]; Kyeong Woo Chung[2]; K Kurniawan[1]; [1]Korea University of Science and Technology/Korea Institute of Geoscience and Mineral Resources; [2]Korea Institute of Geoscience and Mineral Resources

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIX — Advanced Electronic Materials

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hiroshi Nishikawa, Osaka University; Shi-Kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology, CAS; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; Song-Mao Liang, Clausthal University of Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH

Monday PM | February 24, 2020
Marina Ballroom E | Marriott Marquis Hotel

Session Chairs: Jaeho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University

2:30 PM Invited
Nanotwinned Copper Composite with High Strength and High Tensile Ductility: *Shien Ping Feng*[1]; Yu Ting Huang[1]; Wei-Ting Wang[1]; Zeyang Zhang[1]; Mingyang Zhang[1]; Wei-Ting Yeh[2]; [1]University of Hong Kong; [2]High Performance Solution Co. Ltd.

3:00 PM Invited
Facile and Scalable Fabrication of Copper Nanoparticles with Superior Antioxidative Properties, Improved Sinterability and their Applications in Electronics: *Pengli Zhu*[1]; Gang Li[1]; Rong Sun[1]; [1]Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences

3:30 PM
Electrodepositon of Nanotwinned Copper within through Silicon via and its Reaction with Sn during Soldering: *Zhi-Quan Liu*[1]; Fu-Long Sun[2]; Li-Yin Gao[2]; [1]Shenzhen Institutes of Advanced Technology, CAS; [2]Institute of Metal Research, Chinese Academy of Sciences

3:50 PM
The Effect of the Cu Preferred Orientation on the Adhesion between Cu and LCP in FCCL: *Chia-Hung Lee*[1]; Cheng-Yi Liu[1]; [1]National Central University

4:10 PM Break

4:30 PM
Electroplating of Rhodium using Pulse Current Plating Method: Seo-Hyang Lee[1]; *Jaeho Lee*[1]; [1]Hongik University

4:50 PM
4D Characterization of Electromigration-induced Grain Boundary Damage of Cu Interconnects: X-ray Tomography Experiments and Phase-field Simulations: William Farmer[1]; Amey Luktuke[1]; Marion Branch Kelly[1]; Nikhilesh Chawla[1]; *Kumar Ankit*[1]; [1]Arizona State University

5:10 PM
Electromigration Effect Upon Single-phase and Two-phase Ag-Cu Alloy: an In-situ Study: *Yu-chen Liu*[1]; Yung-si Yu[1]; Shih-kang Lin[1]; Shang-Jui Chiu[2]; [1]National Cheng Kung University; [2]National Synchrotron Radiation Research Center

5:30 PM
Revisit the Blech Critical Product: Lattice Strain Induces Electromigration Effect: *Kuan-Hsueh Lin*[1]; Yu-chen Liu[1]; Shih-kang Lin[1]; Ching-Shun Ku[2]; Shang-Jui Chiu[2]; [1]National Cheng Kung University; [2]National Synchrotron Radiation Research Center

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Martensitic Transformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Monday PM | February 24, 2020
33B | San Diego Convention Ctr

Session Chairs: Yongmei Jin, Michigan Technological University; Deep Choudhuri, New Mexico Institute of Mining and Technology

2:30 PM
Macroscopic Energy Barrier and Rate-independent Hysteresis in Martensitic Transformations: *Yongmei Jin*[1]; Yu Wang[1]; Armen Khachaturyan[2]; [1]Michigan Technological University; [2]Rutgers University

2:50 PM
Concurrent Modeling of Martensitic Transformation and Crack Growth in Shape Memory Ceramics: *Ehsan Moshkelgosha*[1]; Mahmood Mamivand[1]; [1]Boise State University

3:10 PM
The Effects of Quenching Medium and Cooling Rates on the Phase Transformation of '-Fe4N to Achieve Iron Nitride Martensite: *Bin Ma*[1]; Guannan Guo[1]; Jian-Ping Wang[1]; [1]University of Minnesota

3:30 PM
A Martensitic Transformation Kinetics Law Sensitive to Stress State Implemented in Crystal Plasticity for Modeling of Strain and Stress Driven Austenite to Martensite Transformation: *Marko Knezevic*[1]; Zhangxi Feng[1]; Milovan Zecevic[2]; [1]University of New Hampshire; [2]Los Alamos National Laboratory

3:50 PM
The Effect of Interface Compatibility and Grain Constraint in ZrO_2-based Shape-memory Ceramics: *Edward Pang*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

4:10 PM Break

4:30 PM Invited
Young Leaders International Scholar – JIM: Co-based Heusler Alloys with Reentrant Martensitic Transformation Behavior: Fundamentals and Application Possibilities: *Xiao Xu*[1]; Takeshi Kanomata[2]; Ryosuke Kainuma[1]; [1]Tohoku University; [2]Tohoku Gakuin University

5:00 PM
Effect of Precipitates on Martensitic Transformation in NiTiHf Shape Memory Alloys: *Taiwu Yu*[1]; Yipeng Gao[2]; Peter Anderson[1]; Michael Mills[1]; Yunzhi Wang[1]; [1]Ohio State University; [2]Idaho National Laboratory

5:20 PM
Martensitic Transformation in a Rapidly-quenched Interstitial-free Steel using a Gleeble 3800 Thermo-mechanical Simulator: *Mrinmoy Sinha*[1]; Sadhan Ghosh[1]; [1]IIT Roorkee

5:40 PM
Critical Defect Concentration for Strain Glass Transition in Doped Ferroelastics: *Chuanxin Liang*[1]; Dong Wang[1]; Yunzhi Wang[2]; [1]Xi'An Jiaotong University; [2]The Ohio State University

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Nanostructured Metals II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Monday PM | February 24, 2020
31B | San Diego Convention Ctr

Session Chairs: Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University

2:30 PM Invited
Sputter Deposited Nanotwinned NiMoW Alloys with Impressive Properties and Stability: *Kevin Hemker*[1]; [1]Johns Hopkins University

3:00 PM Invited
Trimodal Composites: An Overview: *Julie Schoenung*[1]; [1]University of California, Irvine

3:30 PM Invited
Real Space Charge Density Imaging with Sub-Å Resolution by 4D STEM: *Xiaoqing Pan*[1]; [1]University of California, Irvine

4:00 PM Break

4:20 PM Invited
Nanotechnology Enabled Metallurgy for New Age of Metals: *Xiaochun Li*[1]; [1]University of California, Los Angles

4:50 PM Invited
Targeted Processing of Nanocrystalline Alloys to Elicit Nonequilibrium Interfacial States: Glenn Balbus[1]; Zhitong Bai[2]; McLean Echlin[1]; Tresa Pollock[1]; Yue Fan[2]; *Daniel Gianola*[1]; [1]University of California, Santa Barbara; [2]University of Michigan

5:20 PM Invited
Moving Closer to Equilibrium but Maintaining the Defects (and the Properties): *Timothy Rupert*[1]; [1]University of California, Irvine

5:50 PM
Targeting Specific Nanotwin Configurations in Sputter Deposited Alloys to Enable Systematic Investigation of Dislocation-twin Interactions: Francisco Andrade Chavez[1]; Orcun Koray Celebi[1]; Huseyin Sehitoglu[1]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign

6:10 PM
Ultrafine-grained and Nanocrystalline Steels for Enhanced Mechanical Properties and Irradiation Resistance: *Haiming Wen*[1]; Andrew Hoffman[1]; Jiaqi Duan[1]; Maalavan Arivu[1]; [1]Missouri University of Science and Technology

MATERIALS DESIGN

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin — Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Ayman Salem, MRL Materials Resources LLC; Viola Acoff, University of Alabama; Nathan Levkulich, UES; Michael Glavicic, Rolls-Royce; Yufeng Zheng, University of Nevada, Reno; John Rotella, Purdue University

Monday PM | February 24, 2020
30E | San Diego Convention Ctr

Session Chairs: Aymn Salem, MRL; Pete Collins, Iowa State University

2:30 PM Invited
An (incomplete) ICME Framework for Modeling Additive Manufacturing: *Peter Collins*[1]; Thomas Ales[1]; Andrew Baker[2]; Yunzhi Wang[3]; D. Harlow[4]; Hamish Fraser[3]; [1]Iowa State University; [2]The Boeing Company; [3]The Ohio State University; [4]Lehigh University

3:00 PM
Modeling of the Solidification Structure Evolution of Ti-6Al-4V Processed via Electron Beam Powder Bed Fusion: *Laurentiu Nastac*[1]; Edwin Schwalbach[2]; Kevin Chaput[2]; Todd Butler[2]; [1]University of Alabama; [2]Air Force Research Laboratory

3:30 PM
Mesoscale Simulations of Processing-microstructure Linkages during Additive Manufacturing: *Bala Radhakrishnan*[1]; Younggil Song[1]; Sarma Gorti[1]; John Turner[1]; Ranadip Acharya[2]; Lyle Levine[3]; [1]Oak Ridge National Laboratory; [2]United Technologies Research Center; [3]National Institute of Standards and Technology

4:00 PM Break

4:20 PM Invited
Role of Thermo-mechanical-chemical Transients: Relevance to Welding and Additive Manufacturing of Structural Metals: *Sudarsanam Babu*[1]; [1]University of Tennessee, Knoxville

4:50 PM Invited
Optimizing Metals Additive Manufacturing: *Aaron Stebner*[1]; [1]Colorado School of Mines

5:20 PM
Metallic Alloy Microstructure Selection during Rapid Solidification and Additive Manufacturing: *Amy Clarke*[1]; Joseph McKeown[2]; Jonah Klemm-Toole[1]; Alec Saville[1]; Chandler Becker[1]; Benjamin Ellyson[1]; Yaofeng Guo[1]; Chloe Johnson[1]; Brian Milligan[1]; Andrew Polonsky[3]; Kira Pusch[3]; Kester Clarke[1]; Hunter Martin[4]; Damien Tourret[5]; Alain Karma[6]; Sven Vogel[7]; Niranjan Parab[8]; Tao Sun[8]; Kamel Fezzaa[8]; Tresa Pollock[3]; [1]Colorado School of Mines; [2]Lawrence Livermore National Laboratory; [3]University of California, Santa Barbara; [4]HRL Laboratories; [5]IMDEA Materials; [6]Northeastern University; [7]Los Alamos National Laboratory; [8]Advanced Photon Source, Argonne National Laboratory

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Synergy of Irradiation and Corrosion Processes

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Monday PM | February 24, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Djamel Kaoumi, North Carolina State University; T. S. Byun, Oak Ridge National Laboratory

2:30 PM Invited
Future: Fundamental Understanding of Transport Under Reactor Extremes: *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory

3:00 PM
Design and Results of the Irradiation Corrosion Experiment (ICE): *Franziska Schmidt*[1]; Yongqiang Wang[2]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory

3:20 PM
Metal-ionic Phase Reactions in Molten Salt ionic Liquids: Experimental, Thermodynamic and Kinetic Analysis of the Alteration of Preformed-oxides on Fe-Cr and Ni-Cr Alloys: *Marlene Wartenberg*[1]; Junsoo Han[1]; Peter Hosemann[2]; Nan Li[3]; John Scully[1]; [1]University of Virginia; [2]University of California, Berkeley; [3]Los Alamos National Laboratory

3:40 PM
Structural and Chemical Heterogeneities at the Nanoscale affecting Passive Film Formation during Irradiation and Corrosion: *Sandra Taylor*[1]; Timothy Lach[1]; Matthew Olszta[1]; Karen Kruska[1]; Danny Edwards[1]; Thak Sang Byun[1]; Daniel Schreiber[1]; [1]Pacific Northwest National Laboratory

4:00 PM Break

4:20 PM
Microstructure and Microchemistry Characterization of Neutron Irradiated M5® and X2® Fuel Cladding: *Zefeng Yu*[1]; Kory Linton[2]; Lingfeng He[3]; Mukesh Bachhav[3]; Xiang Liu[3]; Adrien Couet[1]; [1]University of Wisconsin; [2]Oak Ridge National Laboratory; [3]Idaho National Laboratory

4:40 PM
Neutron Radiation Damage of ß Phase and its Impact on In-core Corrosion of Zr-Nb alloy: *Guanze He*[1]; Junliang Liu[1]; Anne Callow[1]; Jing Hu[2]; Mir Anamul Haq[3]; Sergio Lozano-Perez[1]; Chris Grovenor[1]; [1]Department of Materials. University of Oxford; [2]Argonne National Laboratory ; [3]University of Huddersfield

5:00 PM
Influence of Zircaloy Alloying Elements and Impurities on Point Defects Formation in ZrO2 Corrosion Films and Resultant Zircaloy Corrosion Rate: *William Howland*[1]; Richard Smith[1]; Bruce Kammenzind[1]; Mikael Christensen[2]; Volker Eyert[2]; Erich Wimmer[2]; [1]Naval Nuclear Laboratory; [2]Materials Design, Inc.

5:20 PM
Understanding the Effect of Gamma Radiation on the Corrosion of Zirconium Alloys: *Choen May Chan*[1]; Paul Binks[1]; Douglas Rishel[2]; Aliaksandr Baidak[3]; [1]Wood; [2]Naval Nuclear Laboratory; [3]Dalton Cumbrian Facility

MATERIALS PROCESSING

Rare Metal Extraction & Processing — Rare Earth Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Kerstin Forsberg, KTH Royal Institute of Technology; Alafara Baba, University of Ilorin

Monday PM | February 24, 2020
13 | San Diego Convention Ctr

Session Chair: To Be Announced

2:30 PM Keynote
Supercritical Fluid Extraction of Rare Earth Elements from Waste Fluorescent Lamp: Jiakai Zhang[1]; *Gisele Azimi*[1]; [1]University of Toronto

3:00 PM
Supercritical Fluid Extraction of Rare Earth Elements from a Canadian Ore: *Jiakai Zhang*[1]; Kimberly Watada[1]; Nattanai Kunanusont[1]; Maziar Sauber[2]; Gisele Azimi[1]; [1]University of Toronto; [2]CanmetMINING, Natural Resources Canada

3:20 PM
Optimizing Zr and REE Recovery from Zircon through a Better Understanding of the Mechanisms Governing its Decomposition in Alkali Media: *Yves Thibault*[1]; Joanne Gamage McEvoy[1]; Dominique Duguay[1]; [1]Natural Resources Canada

3:40 PM
An Innovative Process for Extracting Scandium from Nickeliferous Laterite Ore: *Jihye Kim*[1]; Gisele Azimi[1]; [1]University of Toronto

4:00 PM
Recovery of Strategic Materials from Canadian Bauxite Residue by Smelting Followed by Acid Baking – Water Leaching: *John Anawati*[1]; Gisele Azimi[1]; [1]University of Toronto

4:20 PM Break

4:35 PM Keynote
The Dynamics of the Circular Economy of Rare Earth Elements: *Fiseha Tesfaye*[1]; Joseph Hamyuni[2]; Daniel Lindberg[3]; Pekka Taskinen[3]; Leena Hupa[1]; [1]Abo Akademi University; [2]Outotec (Finland) Oy; [3]Aalto University

5:05 PM
Application of Microwave Pretreatment for Rare Earth Element Recovery from Phosphogypsum: *Adrian Lambert*[1]; John Anawati[1]; Mugdha Walawalkar[1]; Jason Tam[1]; Gisele Azimi[1]; [1]University of Toronto

5:25 PM
Separation of Nd and Dy by Molten Salt Electrolysis Using an Alloy Diaphragm: *Tetsuo Oishi*[1]; Miki Yaguchi[1]; Yumi Katasho[1]; Toshiyuki Nohira[1]; [1]AIST

ELECTRONIC MATERIALS

Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications — Printed Electronics I: Functional Materials and Devices

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Ravindra Nuggehalli, New Jersey Institute of Technology; Anming Hu, University of Tennessee; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Yong Lin Kong, University of Utah; Mariappan Paranthaman, Oak Ridge National Laboratory

Monday PM | February 24, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University

2:30 PM Invited
Laser Welding Nanowires for Smart Sensing: *Yongchao Yu*[1]; Lingyue Zhang[1]; Pooran Joshi[2]; Anming Hu[1]; [1]University of Tennessee; [2]Oak Ridge National laboratory

2:55 PM Invited
Large Scale Laser Direct Manufacturing of Functional Structures for Electro–optical Applications: *Gary Cheng*[1]; [1]Purdue University

3:20 PM
Laser Scripted Graphene and Metal-nanostructures for Flexible Microwave Devices: *Ruozhou Li*[1]; Jing Yan[1]; Yuming Fang[1]; Ying Yu[1]; [1]Nanjing University of Posts and Telecommunications

3:40 PM
Highly Sensitive and Selective Room Temperature Ammonia Sensor: *Shivani Sharma*[1]; Rajan Saini[2]; Sandeep Sharma[3]; [1]Guru Nanak Dev University; [2]Rutgers The State University of New Jersey; [3]Guru Nanak Dev University, Punjab

4:00 PM Break

4:20 PM Invited
Microporous Metal-organic Framework and Polymer Sensing Layers for Energy Infrastructure Monitoring Applications: *Paul Ohodnicki*[1]; Ki-Joong Kim[1]; Jeffrey Culp[1]; Tao Hong[1]; [1]National Energy Technology Laboratory

4:45 PM
Applications of Magnetic Augmented Rotation System (MARS) – Prototypes Via 3-D Printing: *Balraj Mani*[1]; Tyler Brunstein-Ellenbogen[1]; Kevin Nino[1]; Jaime Siguenza[1]; Tien See Chow[2]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology; [2]Energy Technology Development Inc.

5:05 PM
Site-selective Synthesis of Core-Shell Nanowires for Nanoelectronics Assembly and Soldering: *Edward Fratto*[1]; Jirui Wang[1]; Brendan Lucas[1]; Hongwei Sun[1]; Zhiyong Gu[1]; [1]University of Massachusetts, Lowell

5:25 PM
3D Printed Magnetic Augmented Rotation System - Design, Fabrication & Performance: *Navjot Panchi*[1]; Jonathan Martinez[1]; Linus Garcia[1]; Tien See Chow[2]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology; [2]ETD Inc.

5:45 PM
Multi-scale Modeling Method of Laser Selective Melting: *Ze-Chen Fang*[1]; Zhi-Lin Wu[1]; Chen-Wu Wu[2]; [1]Nanjing University of Science and Technology; [2]Institute of Mechanics,Chinese Academy of Sciences

BIOMATERIALS

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Biomedical and Polymeric Applications

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carrado, IPCMS - CNRS; Heinz Palkowski, Clausthal University of Technology; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Ramana Chintalapalle, University of Texas at El Paso; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington; Vikas Tomar, Purdue University

Monday PM | February 24, 2020
Oceanside | Marriott Marquis Hotel

Session Chairs: Adele Carradò, CNRS IPCMS UNISTRA; Nancy Michael, University of Texas Arlington

2:30 PM Keynote
Functionalization of Polymers and Surfaces: a Way to Get Specific and Controlled Host Response towards Implantable Medical Devices: *Véronique Migonney*[1]; [1]University of Paris

3:10 PM Invited
Surface Color on Demand: Chameleon effect: *Karine Mougin*[1]; Hendrik HOELSCHER[2]; [1]IS2M-CNRS; [2]KIT

3:40 PM Break

4:00 PM Keynote
Sono-electrodeposition Approach for Biomimetic Calcium-deficient Hydroxyapatite Coating on Carbon Fiber Cloth: *Sylvie Bonnamy*[1]; Florian Olivier[1]; Sandrine Delpeux[1]; Jérôme Chancolon[1]; Vincent Sarou-Kanian[2]; Franck Fayon[2]; Nathalie Rochet[3]; [1]CNRS/University of Orleans; [2]CNRS; [3]CNRS/INSERM

4:40 PM Invited
Determining the Effects of Surface Treatments on the Surface Energy of Titanium in an Effort to Bond a Bioactive Coating: *Holly Martin*[1]; Patrick McWhorter[1]; Ibrahim Al Qanber[1]; Arthur Kasson[1]; Snjezana Balaz[1]; [1]Youngstown State University

5:10 PM
Poly(methyl methacrylate) Brushes on Titanium Sheets: Characterization of the Polymer Chains: Martial Morin[1]; Abdoulaye Ouattara[1]; Wenjia He[1]; Patrick Masson[1]; Geneviève Pourroy[1]; Heinz Palkowski[2]; *Adele Carrado*[1]; [1]IPCMS - CNRS; [2]Clausthal University of Technology

5:30 PM
Evaluation of 316L Nitrided for Hemocompatibility Applications: *Diana Galeano*[1]; Santiago Vargas[1]; Carlos Castano Londono[1]; [1]Virginia Commonwealth University

ENERGY & ENVIRONMENT

Recycling of Secondary, Byproduct Materials and Energy — Recycling of Non-ferrous Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Mingming Zhang, ArcelorMittal Global R&D; John Howarter, Purdue University; Elsa Olivetti, Massachusetts Institute of Technology; Alan Luo, Ohio State University; Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology

Monday PM | February 24, 2020
16A | San Diego Convention Ctr

Session Chairs: Mingming Zhang, ArcelorMittal; John Howarter, Purdue University; Chengguang Bai, Chongqing University; Mark Strauss, Idaho National Laboratory

2:30 PM Introductory Comments

2:35 PM Invited
Recycling Research in the Kroll Institute for Extractive Metallurgy: *Patrick Taylor*[1]; [1]Colorado School of Mines

3:00 PM
Recycling of Waste Neodymium Magnet trough Electrorefining of Molten Salt: *Xin Lu*[1]; Xinyuan Zhang[1]; Aketagawa Mayu[1]; Osamu Takeda[1]; Hongmin Zhu[1]; [1]Tohoku University

3:20 PM
Experimentation, Modeling and Optimum Conditions of Pyro-hydrometallurgical-precipitation Reaction Technology for Recovery of Copper as Oxide of Nanoparticles from a Copper Dust: Abraham Adeleke[1]; Patricia Popoola[2]; Olawale Popoola[2]; *Daniel Okanigbe*[2]; [1]Obafemi Awolowo University ; [2]Tshwane University of Technology

3:40 PM
Recycling of Metallurgical Slag for Electromagnetic Waves Interference Functions: *Yong Fan*[1]; [1]Institut fur Eisen- und Stahltechnologie

4:00 PM Break

4:20 PM
Recovery Nickel-ferous Compound from Nickel-bearing Secondary Resources: *Qiuju Li*[1]; [1]Shanghai University

4:40 PM
Extraction and Processing of Crystalline Metallurgical-Grade Silicon prepared from Rice Husk Byproduct: *Iyen Cookey*[1]; Benedict Ayomanor[2]; Vitalis Mbah[2]; [1]Federal University Wukari; [2]Federal Polytechnic Nasarawa

5:00 PM
Separation and Recovery of Copper from Copper-bearing Pyrite Cinder via an Acid Leaching Process: *Yikang Tu*[1]; Manman Lu[1]; Zijian Su[1]; Yuanbo Zhang[1]; Tao Jiang[1]; [1]Central South University

ADVANCED MATERIALS

Refractory Metals 2020 — Refractory Metal Alloys, Silicides, and Composites

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee

Program Organizers: Eric Taleff, University of Texas at Austin; Gary Rozak, H.C. Starck Inc; Todd Leonhardt, Rhenium Alloys Inc.

Monday PM | February 24, 2020
Cardiff | Marriott Marquis Hotel

Session Chairs: Eric Taleff, University of Texas; Todd Leonhardt, Rhenium Alloys

2:30 PM Invited
Intermetallic Precipitate Reinforced Refractory Metal Alloys toward 'bcc-superalloys': *Alexander Knowles*[1]; Chris Hardie[2]; David Dye[3]; [1]University of Birmingham; [2]Culham Centre for Fusion Energy; [3]Imperial College London

2:50 PM
Alloying for Precipitation Hardening in Chromium: *Mathias Galetz*[1]; Anke Ulrich[1]; Petra Pfitzenmaier[2]; Uwe Glatzel[2]; [1]DECHEMA-Forschungsinstitut; [2]University Bayreuth

3:10 PM
Development of Refractory Complex Concentrated Alloys RCCAs Using Diffusion Couple Approach: *Vivek Verma*[1]; Michael Titus[2]; David Johnson[2]; Kaustubh Kulkarni[3]; [1]Department of Materials Science and Engineering, Indian Institute of Technology; [2]School of Materials Engineering, Purdue University; [3]Department of Materials Science and Engineering, Indian Institute of Technology, Kanpur

3:30 PM
ZrC-W Composites Prepared by Reactive Melt Infiltration of Zr2Cu alloy into Binder-jet Printed WC/ZrC Preforms: *Rina Mudanyi*[1]; Corson Cramer[2]; Amy Elliott[2]; Dhananjay Kumar[1]; [1]North Carolina A &T State University; [2]Oak Ridge National Laboratory

3:50 PM
Mechanically Activated SHS of Niobium Silicides with High Concentrations of Niobium: *Reina Trevino*[1]; Edgar Maguregui[1]; Frank Perez[1]; Evgeny Shafirovich[1]; [1]University of Texas at El Paso

4:10 PM Break

4:30 PM
Seeking Toughness in Mo-Si-B: Composites of Stable Oxides: *Peter Marshall*[1]; Sharvan Kumar[2]; Xiang Yu[2]; Alex Jackson[1]; [1]Imaging Systems Technology; [2]Brown University

4:50 PM
Microstructure, Microhardness and Oxidation Behavior of Mo-Si-B alloys in the Moss+Mo2B+Mo5SiB2 Three Phase Region: *Longfei Liu*[1]; John Perepezko[1]; [1]University of Wisconsin, Madison

5:10 PM
Magnetic Field Effects on the Compression Properties of Pure Tantalum: *Hitesh Adhikari*[1]; Rajiv Mishra[1]; [1]University of North Texas

ELECTRONIC MATERIALS

Solar Cell Silicon — Properties, Photovoltaics, and Other Applications

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee, TMS: Materials Characterization Committee

Program Organizers: Shadia Ikhmayies, Al Isra University; Neale Neelameggham, IND LLC

Monday PM | February 24, 2020
Miramar | Marriott Marquis Hotel

Session Chair: Shadia Ikhmayies, Isra University

2:30 PM Introductory Comments

2:35 PM
First Principles Modeling of Water-induced Polymer Encapsulant Degradation in Silicon Modules: *Arun Kumar Mannodi Kanakkithodi*[1]; Rishi Kumar[2]; David Fenning[2]; Maria Chan[1]; [1]Argonne National Laboratory; [2]University of California, San Diego

2:55 PM
Thermodynamic Properties of Si-P Binary System: *Shadia Ikhmayies*[1]; [1]Al Isra University

3:15 PM
Using Thermo-calc Software to Deduce the Thermodynamic Properties of Si-B Binary System: *Shadia Ikhmayies*[1]; [1]Al Isra University

3:35 PM
Mulitscale Modeling of the Hydrochlorination Process: *Shwetank Yadav*[1]; [1]University of Toronto

3:55 PM
Dislocation-based Thermodynamic Models of V-pits Formation and Strain Relaxation in InGaN/GaN Epilayers on Si Substrates: Khaled Khafagy[1]; *Tarek Hatem*[2]; Salah Bedair[1]; [1]North Carolina State University; [2]The British University in Egypt

4:15 PM Break

PHYSICAL METALLURGY

Solid State Diffusion Bonding of Metals and Alloys — Solid State Diffusion Bonding of Metals and Alloys II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Mohamed Elbakhshwan, University of Wisconsin Madison; Mark Anderson, University of Wisconsin Madison; Todd Allen, University of Michigan ; Tasnim Hassan, North Carolina State University

Monday PM | February 24, 2020
19 | San Diego Convention Ctr

Session Chairs: Tasnim Hassan, North Carolina State University; Heramb Heramb Mahajan , North Carolina State University

2:30 PM Invited
Tensile Performance of Diffusion Bonded Haynes 230 Alloy for use in a Compact Heat Exchanger: *Kyle Rozman*[1]; W. Pratte[2]; Thaddeus Rahn[2]; Brian Fronk[2]; Brian Paul[2]; Ömer Dogan[1]; [1]National Energy Technology Laboratory; [2]Oregon State University

3:00 PM
Anisotropic Grain Growth in Cu Joints at Low Temperatures by <111>-oriented Nanotwinned Copper Films: *Chang Chih Hsieh*[1]; Chih Chen[1]; [1]National Chiao Tung University

3:20 PM
Microstructural Characterizations and Mechanical Properties of Diffusion Bonded Stainless Steel 316H and Inconel 800H: *Mohamed Elbakhshwan*[1]; Ian Jentz[1]; Collin Magnin[1]; Andrew Brittan[2]; Mark Anderson[1]; Todd Allen[3]; [1]University of Wisconsin, Madison; [2]Oregon State University; [3]University of Michigan

3:40 PM
Microstructure Evolution and Mechanical Properties of Diffusion Bonded Ti6Al4V Alloy Joints for Aerospace Applications: *Rajakumar S*[1]; Pragatheswaran T[1]; Kavitha S[1]; Balasubramanian V[1]; Vijay Petley[2]; Shweta Verma[2]; [1]Annamalai University; [2]Gas Turbine Research Establishment (GTRE)

4:00 PM Break

4:30 PM
Modeling Strength of Diffusion Bonded Interface Using Phase-Field Recrystallization and Creep-Damage Models.: Aritra Chakraborty[1]; *Andrea Rovinelli*[1]; Mark Messner[1]; T. L. Sham[1]; [1]Argonne National Laboratory

4:50 PM
Solid-state Diffusion Bonding of Glass-metal for the International Thermonuclear Experimental Reactor (ITER) Diagnostic Windows: *Lee Aucott*[1]; [1]United Kingdom Atomic Energy Authority

5:10 PM
Solid State Joining of Dissimilar Ni-based Superalloys Using Field Assisted Sintering Technology: *Charis Lin*[1]; Namiko Yamamoto[1]; Derek King[2]; Jogender Singh[1]; [1]The Pennsylvania State University; [2]UES Inc.

PHYSICAL METALLURGY

Thermal Transport in Crystalline and Non-crystalline Solids: Theory and Experiments — Multiscale Thermal Transport

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Marat Khafizov, Ohio State University; Michael Manley, Oak Ridge National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Aleksandr Chernatynskiy, Missouri Science and Technology University

Monday PM | February 24, 2020
18 | San Diego Convention Ctr

Session Chairs: Miaomiao Jin, Idaho National Laboratory; Michael Tonks, University of Florida

---

2:30 PM Invited
Determining the Impact of Material Microstructure on the Effective Thermal Conductivity Using Mesoscale Simulation and Modeling: *Michael Tonks*[1]; [1]University of Florida

3:00 PM Invited
The Degradation of the Thermal Conductivity of Oxide Nuclear Fuel: *Michael Cooper*[1]; Ben Liu[1]; Chris Stanek[1]; David Andersson[1]; [1]Los Alamos National Laboratory

3:30 PM
Mesoscale Modeling of Thermal Conductivity of a UO_2 and BeO Composite Nuclear Fuel: *Karim Ahmed*[1]; Sean Mcdeavitt[1]; [1]Texas A&M University

3:50 PM
Influence of Irradiation-induced Microstructural Defects on the Thermal Conductivity of Single Crystal Thorium Dioxide: *Amey Khanolkar*[1]; Zilong Hua[1]; Marat Khafizov[2]; Vinay Chauhan[2]; Yuzhou Wang[2]; Tiankai Yao[1]; Lingfeng He[2]; J. Matthew Mann[3]; Anter El-Azab[4]; Jian Gan[1]; David Hurley[1]; [1]Idaho National Laboratory; [2]The Ohio State University; [3]Air Force Research Laboratory; [4]Purdue University

4:10 PM Break

4:30 PM Invited
Thermal Transport in Crystalline Solids with Irradiation-Induced Defects: Computational Modeling and Experiments: *Anter El-Azab*[1]; [1]Purdue University

5:00 PM Invited
Multi-scale Thermal Transport Characterization of Nuclear Fuels: *Zilong Hua*[1]; Robert Schley[1]; Amey Khanolkar[1]; Austin Fleming[1]; Colby Jensen[1]; David Hurley[1]; [1]Idaho National Laboratory

5:30 PM
Impact of Irradiation Induced Nanoscale Defects on Optical and Thermal Properties of Cerium Dioxide: *Vinay Chauhan*[1]; Lingfeng He[2]; Janne Pakarinen[3]; David Hurley[2]; Marat Khafizov[1]; [1]The Ohio State University; [2]Idaho National Labratory; [3]Belgian Nuclear Research Centre (SCK·CEN)

NO SYMPOSIUM KEYWORD FOUND!

TMS Annual Meeting & Exhibition — All-Conference Plenary

Monday PM | February 24, 2020
6A | San Diego Convention Ctr

12:00 PM Introductory Comments

12:05 PM Invited
Leveraging Materials Innovation to Drive Industrial Gas Turbine Performance and Secure a Sustainable Future: *John Mason*[1]; [1]Solar Turbines Incorporated

12:45 PM Question and Answer Period

12:55 PM Concluding Comments

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Processing & Microstructure I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Monday PM | February 24, 2020
Marina Ballroom D | Marriott Marquis Hotel

Session Chairs: Mohsen Zaeem, Colorado School of Mines; Jingtao Wang, Nanjing University of Science and Technology; Erhard Schafler, University Of Vienna; Kaka Ma, Colorado State University

2:30 PM Invited
Heterogeneous Pore Architecture Achieved by Spark Plasma Sintering: Alexander Preston[1]; Yuchen Lin[1]; *Kaka Ma*[1]; [1]Colorado State University

2:50 PM Invited
Heterogeneous High-entropy Alloys: A Review: Rui Feng[1]; *Peter Liaw*[1]; [1]University of Tennessee

3:10 PM
Cu-Ta FCC-BCC Metal Composites Fabricated via Powder Consolidation by Equal Channel Angular Extrusion: *Zachary Levin*[1]; Michael Demkowicz[1]; K. Hartwig[1]; [1]Department of Material Science and Engineering, Texas A&M University

3:30 PM
Effect of High-pressure Torsion on Corrosion Behavior of a Magnesium ZK60 Alloy in 0.1M NaCl: *Hamidreza Torbati-Sarraf*[1]; Seyed Alireza Torbati Sarraf[2]; Terence Langdon[3]; [1]Clemson University; [2]University of Southern California; [3]University of Southampton

3:50 PM
Hierarchical Structures in Ti-6Al-4V by Thermohydrogen Refinement of Microstructure: *Brady Butler*[1]; Laura Moody[2]; Daniel Lewis[2]; Ion Powell[2]; Matthew Dunstan[1]; James Paramore[1]; [1]United States Army Research Laboratory; [2]Texas A&M University

4:10 PM Break

4:30 PM Invited
Nanostructures and Properties of Rapid Directional Solidification of Al Alloys: *Mohsen Asle Zaeem*[1]; [1]Colorado School of Mines

4:50 PM Invited
Kinetic Path Dependent Thermal Stability of Copper after Severe Plastic Deformation: *Jing Tao Wang*[1]; [1]Nanjing University of Science & Technology

5:10 PM
In-situ Synchrotron X-ray Profile Analysis during High Pressure Torsion: *Erhard Schafler*[1]; Michael Kerber[1]; Florian Spieckermann[2]; Roman Schuster[3]; Torben Fischer[4]; [1]University of Vienna; [2]University of Leoben; [3]University of Technology Vienna; [4]Helmholtz-Zentrum Geesthacht

5:30 PM
Mechanical Properties and Microstructure Evolution of Multilayered Al-Cu Hybrid Materials Produced by High-pressure Torsion: *Piotr Bazarnik*[1]; Barbara Romelczyk-Baishya[1]; Jiaoyan Dai[2]; Yi Huang[3]; Malgorzata Lewandowska[1]; Terence Langdon[3]; [1]Warsaw University of Technology; [2]Institute of Materials, Ningbo University of Technology; [3]University of Southampton

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Behavior of High Explosives

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Monday PM | February 24, 2020
5A | San Diego Convention Ctr

Session Chair: John Yeager, Los Alamos National Laboratory

2:30 PM Demonstration

3:10 PM
Anisotropic Damage Model for Cyclotrimethylene Trinitramine (RDX) under Impact: *Nisha Mohan*[1]; [1]Los Alamos National Laboratory

3:30 PM
Controlled Fragment Impact Experiments for Initiation Response of PBXs: *Patrick Bowden*[1]; Andrew Schmalzer[1]; John Yeager[1]; Joseph Lichthardt[1]; Alexander Mueller[1]; [1]Los Alamos National Laboratory

3:50 PM
Experiments and Modeling to Explore Dynamic Behavior of Materials via Kolsky Bar at Equilibrium and Beyond: *Benjamin Morrow*[1]; Francis Addessio[1]; Christopher Meredith[2]; Kyle Ramos[1]; Cheng Liu[1]; Carl Cady[1]; Clarissa Yablinsky[1]; [1]Los Alamos National Laboratory; [2]U.S. Army Research Laboratory

4:10 PM Break

4:30 PM
Dynamic Response of Porous Energetic Materials under Shock Loading Conditions and the Formation of Localized Hotspots: *Chunyu Li*[1]; Brenden Hamilton[1]; Alejandro Strachan[1]; [1]Purdue University

4:50 PM
One Dimensional Shock Initiation of the HMX- based Explosive PBX-9012: *Malcolm Burns*[1]; [1]Los Alamos National Laboratory

5:10 PM
Multiscale Modeling to Study Effects of Microstructure in Shocked Hexanitrostilbene: *Judith Brown*[1]; David Kittell[1]; Mitchell Wood[1]; Aidan Thompson[1]; Dan Bolintineanu[1]; [1]Sandia National Laboratories

5:30 PM
Single Crystal Plasticity for the High Rate Deformation of an HMX-based Plastic Bonded Explosive: *Milovan Zecevic*[1]; Marc Cawkwell[1]; Kyle Ramos[1]; Darby Luscher[1]; [1]Los Alamos National Laboratory

ADVANCED MATERIALS

Use of Large Scale Facilities to Understand the Physical Metallurgy of Fe-based Alloys — Session II

Sponsored by:

Program Organizers: Sebastien Allain, Institut Jean Lamour; Alexis Deschamps, Genoble Institute of Technology; MingXin Huang, University of Hong Kong; Amy Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology

Monday PM | February 24, 2020
Mission Hills | Marriott Marquis Hotel

Session Chairs: Mingxin Huang, The University of Hong Kong; Alexis Deschamps, SIMAP

2:30 PM
Carbide-free Bainite Transformations in Non-isothermal Conditions Investigated by In-situ High-energy X-ray Diffraction Experiments: *Cécile Rampelberg*[1]; Guillaume Geandier[1]; Julien Teixeira[1]; Thomas Sourmail[2]; Sébastien Allain[1]; [1]Institut Jean Lamour; [2]Ascometal

2:50 PM
High Throughput Characterization by Synchrotron X-ray Diffraction of the Austenite-to-ferrite Transformation Kinetics in Compositionally Graded Steels: Imad-Eddine Benrabah[1]; *Alexis Deschamps*[1]; Hugo Van Landeghem[2]; Frédéric Bonnet[3]; Benoît Denand[4]; Guillaume Geandier[4]; [1]Genoble Institute of Technology; [2]SIMAP - CNRS; [3]ArcelorMittal Research; [4]Institut Jean Lamour

3:10 PM
Real-time Investigation of Recovery, Recrystallization and Austenite Transformation during Annealing of a Cold-rolled Steel Using High Energy X-ray Diffraction (HEXRD): Marc Moreno[1]; Guillaume Geandier[1]; Julien Teixeira[1]; Jean-Christophe Hell[2]; Frédéric Bonnet[2]; *Sebastien Allain*[1]; [1]Institut Jean Lamour; [2]ArcelorMittal Maizières Research SA

3:30 PM
In-situ Synchrotron X-ray Diffraction Stress Analysis during Laser Surface Line Hardening of Samples with Specific Geometric Features: Dominik Kiefer[1]; *Jens Gibmeier*[1]; Fabian Wilde[2]; Felix Beckmann[2]; [1]Karlsruhe Institute of Technology - Institute for Applied Materials; [2]Helmholtz-Zentrum Geesthacht - Institute of Materials Research

3:50 PM
In situ HEXRD Determination and Numerical Simulation of Internal Stresses during HeatTtreatment of Carburized and Carbonitrided Low-alloyed Steels: Karthikeyan Jeyabalan[1]; *Julien Teixeira*[1]; Sabine Denis[1]; Guillaume Geandier[1]; Jacky Dulcy[1]; Benoît Denand[1]; Grégory Michel[2]; Simon Catteau[3]; Marc Courteaux[4]; [1]Institute Jean Lamour; [2]IRT-M2P; [3]Ascometal - CREAS; [4]Groupe PSA - Centre Technique de Belchamp

4:10 PM Break

4:30 PM
Stress Tensor Determination during Phase Transformation of a Metal Matrix Composite using In situ High Energy X-ray Diffraction: *Guillaume Geandier*[1]; Lilian Vautrot[1]; Benoît Denand[1]; Sabine Denis[1]; [1]Intitut Jean Lamour

4:50 PM
Microstructure Evolution and Phase Transformations during Deformation of Metastable Austenitic CrMnNi Steel as Revealed by In situ Synchrotron Radiation X-ray Diffraction: *Christiane Ullrich*[1]; Stefan Martin[1]; Christian Schimpf[1]; Andreas Stark[2]; Norbert Schell[2]; David Rafaja[1]; [1]TU Bergakademie Freiberg; [2]Helmholtz-Zentrum Geesthacht

5:10 PM
In situ Quantitative Study of Retained Austenite Mechanical Stability in 3rd Generation TRIP-aided Steels by High-Energy X-ray Diffraction on Synchrotron Beamline: *Mathias Lamari*[1]; Sebastien Allain[1]; Guillaume Geandier[1]; Julien Teixeira[1]; Astrid Perlade[2]; Kangying Zhu[2]; [1]Institut Jean Lamour; [2]ArcelorMittal Maizières Research SA, Product Center

5:30 PM
Combining Interrupted Hopkinson Bar Tensile Tests with Synchrotron XRD to Study Work Hardening Behavior of Q&P Steels at High Strain Rates: Ming Wang[1]; *MingXin Huang*[1]; [1]University of Hong Kong

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Fundamentals of Metallurgical Processes

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Tuesday AM | February 25, 2020
12 | San Diego Convention Ctr

Session Chairs: Baojun Zhao, University of Queensland; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

8:30 AM Introductory Comments

8:45 AM
Corrosion Behaviors of Al_2O_3 and ZrO_2 Refractories in Contact with High-basicity Refining Slag: *Liwen Xue*[1]; Tongsheng Zhang[1]; Wanlin Wang[1]; [1]Central South University

9:05 AM
Phase Equilibria in the System Al_2O_3-MnO-SiO_2: Thermodynamic and Application: Yunhui Hua[1]; *Baojun Zhao*[1]; [1]University of Queensland

9:25 AM
Thermodynamic Analysis of Chlorination of Zinc-bearing Phases in Pyrite Cinder: Deqing Zhu[1]; *Dingzheng Wang*[1]; Congcong Yang[1]; Jian Pan[1]; Hongyu Tian[1]; Yuxiao Xue[1]; [1]Central South University

9:45 AM
Numerical Simulation Study on Height and Angle of Rotary Bottom Burner Arrangement: *Yang Wang*[1]; [1]Chongqing University

10:05 AM Break

10:20 AM
Estimation of Thermodynamic Properties of Sodium Magnesium Silicates by Polyhedron Method: Zhongping Zhu[1]; *Jinxiang You*[1]; Xin Zhang[1]; Jian Wang[1]; Jiaoyang Duan[1]; Tao Zhang[1]; Zhiwei Peng[1]; T Jiang[1]; Mingjun Rao[1]; [1]Central South University

10:40 AM
Numerical Simulation on Distributor Optimization of Twin-roll Strip Continuous Casting: *Yong Zhong*[1]; Ming Mei Zhu[1]; Ai Ping Zhang[1]; Bing Huang[1]; [1]Chongqing University

11:00 AM
Effect of Al and Ca Content on the Behavior of the Inclusion in High Grade 304 Type Stainless Steel: *Tongsheng Zhang*[1]; Hualong Zhang[1]; Wanlin Wang[1]; Liwen Xue[1]; Shifan Dai[1]; Guomin Ying[1]; [1]Central South University

11:20 AM
Development of Online Control Software for Precise Calcium Treatment of Steels: Yan Luo[1]; Weijian Wang[1]; *Lifeng Zhang*[1]; Yang Liu[2]; Wen Yang; [1]University of Science and Technology Beijing; [2]Institute of metal research,Chinese Academy of Sciences

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Processing-Structure-Property-Performance II

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Tuesday AM | February 25, 2020
10 | San Diego Convention Ctr

Session Chair: John Lewandowski, Case Western Reserve University

---

8:30 AM Invited
Tailoring the Microstructures of AM Metals for Enhanced Fracture Toughness and Fatigue Resistance: *Ramamurty Upadrasta*[1]; [1]NTU

9:00 AM
High Strain Rate Fracture Properties of Additively Manufactured (AM) Stainless Steel: *Kevin Lamb*[1]; Josh Kacher[2]; [1]University of Tennessee-Knoxville; [2]Georgia Institute of Technology

9:20 AM
Shielding Gas Effects on the Fatigue Behavior of LB-PBF 17-4 PH Stainless Steel in the high Cycle and Very High Cycle Fatigue Regimes: Pooriya D. Nezhadfar[1]; Palmer Frye[2]; *Jutima Simsiriwong*[2]; Nima Shamsaei[1]; [1]Auburn University; [2]University of North Florida

9:40 AM
Static and Dynamic Mechanical Properties of Selective Laser Melted Ti-6Al-4V Solid Material Printed with Optimized Argon Flow: *Oscar Quintana*[1]; Robert Rybolt[1]; William Relue[1]; [1]DePuy Synthes Joint Reconstruction

10:00 AM Break

10:20 AM Invited
Microstructure Design for Optimizing Mechanical Performance of Additive Manufactured Metallic Alloys: *Ayman Salem*[1]; Daniel Satko[1]; [1]MRL Materials Resources LLC

10:50 AM
Optimization of Additively Manufactured Low Carbon Steels for Fatigue-critical Applications: *Matthew Ryder*[1]; Colt Montgomery[2]; Michael Brand[2]; Robin Pacheco[2]; John Carpenter[2]; Peggy Jones[3]; Diana Lados[1]; [1]Worcester Polytechnic Institute, Integrative Materials Design Center; [2]Los Alamos National Laboratory; [3]General Motors Powertrain

11:10 AM
Fatigue Crack Growth Behavior of DED Type 304L Stainless Steel: *Christine Smudde*[1]; Christopher San Marchi[2]; Christopher D'Elia[1]; Michael Hill[1]; Jeffery Gibeling[1]; [1]University of California, Davis; [2]Sandia National Laboratory, Livermore

11:30 AM
Effect of Laser Shock Peening Processing Parameters on the Microstructure, Residual Stress, and Fatigue Behavior of Additive Manufactured CoCrMo Alloy: *Micheal Kattoura*[1]; Boetang Twum Donkor[2]; Jie Song[2]; Jan Kaufman[3]; Seetha Ramaiah Mannava[2]; Vijay Vasudevan[2]; [1]LSP Technologies Inc.; [2]University of Cincinnati; [3]Institute of Physics of the Czech Academy of Sciences

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications II — Qualification, Intensification and Up-scaling

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Tuesday AM | February 25, 2020
9 | San Diego Convention Ctr

Session Chairs: Isabella van Rooyen, Idaho National Laboratory; Edward Herderick, Ohio State University

---

8:30 AM Invited
The Intensification and Scale-up of Electric Field Assisted Sintering Techniques (FAST) for the Net-shape Production of Complex Materials and Components: *Robert O'Brien*[1]; Richard Martineau[1]; Troy Holland[1]; Derek Gaston[1]; David Hansinger[2]; Robert Aalund[2]; [1]Idaho National Laboratory; [2]Thermal Technology LLC

9:00 AM
Process-related Cyclic Properties of Additively Manufactured Structures: *Matilde Scurria*[1]; Rainer Wagener[1]; Benjamin Möller[1]; Tobias Melz[1]; [1]Fraunhofer Lbf

9:20 AM
A High-throughput Alloy Development Strategy for Corrosion Resistant Materials via Directed Energy Deposition: *Phalgun Nelaturu*[1]; Michael Moorehead[1]; Bonita Goh[1]; Dan Thoma[1]; Adrien Couet[1]; Kumar Sridharan[1]; [1]University of Wisconsin

9:40 AM
Improving the Corrosion Performance of Additively Manufactured 316L via Optimized SLM Processing Parameters: *Joseph Sopcisak*[1]; Steven Storck[1]; Rengaswamy Srinivasan[1]; Morgan Trexler[1]; [1]The Johns Hopkins University Applied Physics Laboratory

10:00 AM Break

10:20 AM Invited
Development and Testing of AM Based Nuclear Components for Commercial Nuclear Reactors: *David Huegel*[1]; [1]Westinghouse Electric Co.

10:50 AM
In-situ Monitoring to Inform Process Optimization and Microstructure Control: *Glenn Bean*[1]; David Witkin[1]; Tait McLouth[1]; Alison Kremer[1]; [1]The Aerospace Corporation

11:10 AM
Influence of Wire Arc Additive Manufacturing on Mechanical Properties of Ti-64 for Large Scale Aviation Parts: *Daniel Elitzer*[1]; Heinz Höppel[1]; Mathias Göken[1]; Daniel Baier[2]; Christina Fuchs[2]; Heinz Bähr[3]; Thomas Meyer[4]; Andreas Gallasch[5]; Markus Manger[6]; [1]Friedrich-Alexander University Erlangen-Nürnberg; [2]Technical University Munich; [3]Aircraft Philipp GmbH & CO. KG; [4]HEGGEMANN AG; [5]Software Factory GmbH; [6]Fronius International GmbH

11:30 AM
Probabilistic Component Acceptance Method as an Additive Manufacturing Qualification Approach: *George Griffith*[1]; Isabella van Rooyen[1]; [1]Idaho National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — High Speed X-ray Imaging and Diffraction

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Tuesday AM | February 25, 2020
8 | San Diego Convention Ctr

Session Chair: Tao Sun, Argonne National Laboratory

8:30 AM Invited
Capturing Pore Formation During Laser Blown Powder Directed Energy Deposition: *Peter Lee*[1]; Yunhui Chen[1]; Lorna Sinclair[1]; CL Alex Leung[1]; Samuel Clark[1]; Sebastian Marussi[1]; Robert Atwood[2]; Martyn Jones[3]; Gavin Baxter[3]; [1]University College London; [2]Diamond Light Source; [3]Rolls-Royce plc

8:50 AM Invited
Porosity Formation and Entrapment in Directed Energy Deposition Through Highspeed In-situ Imaging: *Samantha Webster*[1]; Kornel Ehmann[1]; Jian Cao[1]; [1]Northwestern University

9:10 AM
Correlation of Melt Strategy Parameters to Solidification Variables During Laser Fusion Processing of Ti-6Al-4V Alloy: An In-situ Dynamic Synchrotron X-ray Radiography Study: *Rakesh Kamath*[1]; Yuan Li[1]; Tao Sun[2]; Sudarsanam Babu[1]; Hahn Choo[1]; [1]University of Tennessee Knoxville; [2]Argonne National Laboratory

9:30 AM
Microstructure Development in Laser Powder Bed Fusion of Superalloys via Synchrotron Radiography and TriBeam Tomography: *Andrew Polonsky*[1]; Kira Pusch[1]; Toby Francis[1]; McLean Echlin[1]; Jonah Klemm-Toole[2]; Alec Saville[2]; Chandler Becker[2]; Benjamin Ellyson[2]; Yaofeng Guo[2]; Chloe Johnson[2]; Brian Milligan[2]; Niranjan Parab[3]; Kamel Fezzaa[3]; Tao Sun[3]; Amy Clarke[2]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Colorado School of Mines; [3]Argonne National Laboratory

9:50 AM
The Influence of Laser Modulation on Melt Pool Behavior in Laser Powder Bed Fusion Probed with In-situ X-ray Imaging: *Nicholas Calta*[1]; Aiden Martin[1]; Joshua Hammons[1]; Michael Nielsen[1]; Manyalibo Matthews[1]; Trevor Willey[1]; Jonathan Lee[1]; [1]Lawrence Livermore National Laboratory

10:10 AM Break

10:30 AM Invited
In-situ Characterization of Laser Additive Manufacturing Process Using High-speed Synchrotron X-ray Diffraction: *Chihpin Chuang*[1]; Peter Kenesei[1]; Jun-Sang Park[1]; Tao Sun[1]; Cang Zhao[1]; Niranjan Dilip Parab[1]; Yan Gao[2]; Xuan Zhang[1]; Anthony Rollett[3]; Jonathan Almer[1]; [1]Argonne National Laboratory; [2]GE Global Research; [3]Carnegie Mellon University

10:50 AM Invited
Quantitatively Revealing the Dynamics of Laser Powder Bed Fusion Additive Manufacturing Process by In-situ High-speed X-ray Imaging and Diffraction: *Lianyi Chen*[1]; [1]University of Wisconsin-Madison

11:10 AM
Multi-physics Modeling of Fluid and Powder Dynamics in Laser Powder Bed Fusion Process: *Xuxiao Li*[1]; Wenda Tan[1]; Cang Zhao[2]; Niranjan Parab[2]; Tao Sun[2]; [1]University of Utah; [2]Argonne National Laboratory

11:30 AM
Study of Gas Entrapment and Its Effects on Porosity in 17-4 PH Atomized Powder Laser Powder Bed Fusion (LPBF) Parts: *Ziheng Wu*[1]; Debomita Basu[1]; Robin Kuo[1]; Jack Beuth[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

11:50 AM
Quantification of the Effects of Deposition Parameters and Particle Size Distribution on Spatter Formation in Laser Powder Bed Fusion: *Yao Xu*[1]; Joe Pauza[2]; Anthony Rollett[2]; Sneha Narra[1]; [1]Worcester Polytechnic Institute; [2]Carnegie Mellon University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Alternative Processes (Beyond the Beam) — Emerging Additive Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Powder Materials Committee

Program Organizers: Paul Prichard, Kennametal Inc.; Matthew Dunstan, U.S. Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal; James Paramore, U.S. Army Research Laboratory

Tuesday AM | February 25, 2020
7A | San Diego Convention Ctr

Session Chair: Nihan Tuncer, Desktop Metals

8:30 AM
Characterization of 17-4 PH Processed via Bound Metal Deposition (BMD): Alexander Watson[1]; John Belding[1]; *Brett Ellis*[1]; [1]University of Maine

8:50 AM
Development of Tuned Composites Based on Metallic Particles for Advanced 3D-printing by Fused Deposition Modeling: *Ester Palmero*[1]; Daniel Casaleiz[1]; Javier de Vicente[1]; Juan Hernández-Vicen[2]; Silvia López-Vidal[2]; Emilio Ramiro[2]; Alberto Bollero[1]; [1]IMDEA Nanoscience; [2]RAMEM S.A.

9:10 AM
Additive Manufacturing of High-value Metal Parts Through Shaping-debinding-sintering: *Peter Felfer*[1]; Yvonne Thompson[1]; Joamin Gonzalez - Gutierrez[2]; Christian Kukla[2]; [1]Fau Erlangen-Nurnberg; [2]Montanuniversität Leoben

9:30 AM
Topology Optimization-based Design Customized for Alternative AM Processes: Julia Carroll[1]; Hak Yong Lee[1]; *James Guest*[1]; [1]Johns Hopkins University

9:50 AM
On the Interaction and Forms of Adhesion Between Various Substrate Materials and Molten Metal Droplets Produced by the Drop-on-demand Technology Metal Jet: *Nesma Aboulkhair*[1]; Marco Simonelli[1]; Mark East[1]; Richard Hague[1]; [1]University of Nottingham

10:10 AM Break

10:30 AM
3D-printing Bulk Metallic Glass Alloys with Ultrasonic Additive Manufacturing: *Adam Hehr*[1]; Mark Norfolk[1]; Evelina Vogli[2]; Scott Roberts[3]; [1]Fabrisonic LLC; [2]LM Group Holdings, Inc.; [3]Jet Propulsion Laboratory, California Institute of Technology

10:50 AM
A Novel Direct Writing Technology to Fabricate Aluminium Matrix Composite: *Xiaogang Hu*[1]; Qiang Zhu[1]; Zhong Li[1]; [1]Southern University of Science and Technology

11:10 AM
Integrated 3D Printing with Microwave Sintering: A Paradigm - Shifting Concept for Additive Manufacturing of Magnesium Alloys: Mojtaba Salehi[1]; *Mui Ling Sharon Nai*[2]; Saeed Maleksaeedi[2]; Manoj Gupta[1]; [1]NUS; [2]Simtech

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: ICME Gap Analysis — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Dongwon Shin, Oak Ridge National Laboratory; Richard Otis, Jet Propulsion Laboratory; Xin Sun, Oak Ridge National Laboratory; Greta Lindwall, KTH Royal Institute of Technology; Mei Li, Ford Motor Company; David Furrer, Pratt & Whitney

Tuesday AM | February 25, 2020
7B | San Diego Convention Ctr

Session Chairs: Dongwon Shin, Oak Ridge National Laboratory; Richard Otis, Jet Propulsion Laboratory

---

8:30 AM Introductory Comments

8:35 AM Invited
The Future of Additive Manufacturing, a Vision for NASA's Jet Propulsion Laboratory: *Andrew Shapiro*[1]; R. Peter Dillon[1]; Bryan McEnerney[1]; [1]Jet Propulsion Laboratory

9:10 AM Invited
Challenges in Modeling Microstructure Evolution During Additive Manufacturing Based on Phase-field Method: Yanzhou Ji[1]; Zhuo Wang[2]; Lei Chen[2]; *Long-Qing Chen*[1]; [1]Pennsylvania State University; [2]Mississippi State University

9:45 AM Invited
Utilization of Non-metallic Inclusion and Optimization of Alloy Compositions for AM Process: Jung-Wook Cho[1]; *In-Ho Jung*[2]; [1]Postech; [2]Seoul National University

10:20 AM Break

10:45 AM Invited
ICME and Additive Manufacturing Research in NSF's Advanced Manufacturing Program: *Khershed Cooper*[1]; Ralph Wachter[1]; [1]National Science Foundation

11:20 AM Invited
Challenges in Integration and Validation of a Coupled FEM and Phase Field Approach for Modeling Additive Manufacturing: *Daniel Lewis*[1]; Antoinette Maniatti[1]; [1]Rensselaer Polytechnic Institute

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Alloy Design- Aluminum Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Tuesday AM | February 25, 2020
6F | San Diego Convention Ctr

Session Chair: Hunter Martin, HRL Laboratories

8:30 AM Invited
Inoculant Enabled Alloy Design for High Strength Aluminum: *Mark O'Masta*[1]; Julie Miller[1]; Jacob Hundley[1]; Brennan Yahata[1]; Tobias Schaedler[1]; John Martin[1]; [1]HRL Laboratories LLC

9:00 AM
Evaluation of Hot Tearing During Laser Surface Melting of Aluminium Alloy 7150 with Rare Earth Additions: *Michael Benoit*[1]; Suming Zhu[2]; Trevor Abbott[3]; Mark Easton[1]; [1]School of Engineering, RMIT University; [2]RMIT University; [3]Magontec Ltd

9:20 AM
Enabling Additive Manufacturing of High Temperature Aluminum Alloys Utilizing Grain Refiners: *Julie Miller*[1]; [1]HRL Laboratories LLC

9:40 AM
Development of High Thermal Conductivity Aluminum Alloys Suitable for Additive Manufacturing: *Andrew Bobel*[1]; John Martin[2]; Julie Miller[2]; Brennan Yahata[2]; Jacob Hundley[2]; Justin Mayer[2]; [1]General Motors; [2]HRL Laboratories

10:00 AM
Addition of Nano-particles During Additive Manufacturing of AlSi10Mg Alloy: Catherine Dolly Clement[1]; *Abu Syed Kabir*[1]; [1]Carleton University

10:20 AM Break

10:35 AM Invited
Selective Laser Melting of Elemental Powder Blends to Manufacture Precipitation and Oxide-dispersion Strengthened Al Alloys: Jennifer Glerum[1]; Christoph Kenel[1]; *David Dunand*[1]; [1]MSE, Northwestern University

11:05 AM
Feedstock Material Composition Modifications for Improved Processability by Laser Powder-bed Fusion: A Case Study on Aluminium: *Nesma Aboulkhair*[1]; Marco Simonelli[1]; Ehab Salama[2]; Graham Rance[1]; Nigel Neate[1]; Christopher Tuck[1]; Amal Esawi[2]; Richard Hague[1]; [1]University of Nottingham; [2]The American University in Cairo

11:25 AM
Effect of Zr Alloying Content on the Printability and Property of Laser Powder Bed Fused Aluminum 5083 Alloys: *Le Zhou*[1]; Holden Hyer[1]; Sharon Park[1]; George Benson[1]; Yongho Sohn[1]; [1]University of Central Florida

11:45 AM
A20X and AlSi10Mg Aluminium Alloys: A Comparison: *Richard Sélo*[1]; Ian Maskery[1]; Ian Ashcroft[1]; Christopher Tuck[1]; [1]University of Nottingham

12:05 PM
Prospects of Application of New Aluminum Alloys for Selective Laser Melting: *Daria Daubarayte*[1]; Mann Viktor[2]; Alexander Krokhin[2]; Dmitriy Ryabov[2]; Vakhromov Roman[1]; Korolev Vladimir[1]; Alexander Seferyan[1]; [1]Light Materials and Technologies Institute; [2]RUSAL Management

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Solidification

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Tuesday AM | February 25, 2020
6E | San Diego Convention Ctr

Session Chair: Richard Fonda, Naval Research Laboratory

8:30 AM
Applying Computational Modeling to Non-equilibrium Solidification: *Eric Heikkenen*[1]; Sudarsanam Babu[1]; [1]The University of Tennessee

8:50 AM
Phase Field Modeling of Alloy Microstructure Formation in Rapidly Solidifying Melt Pools: *Joel Berry*[1]; Aurelien Perron[1]; Jean-Luc Fattebert[2]; Saad Khairallah[1]; Joseph McKeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory

9:10 AM
Phase-field Solidification Texture Model for Understanding the Microstructure in L-PBF Process: *Kamalnath Kadirvel*[1]; Guilherme Abreu Faria[1]; Xuesong Gao[1]; Antonio Rameriz[1]; Wei Zhang[1]; Yunzhi Wang[1]; [1]Ohio State University

9:30 AM
Phase Field Simulation of Solidification Behavior of AlSi10Mg Alloys Manufactured Through Direct Metal Laser Sintering: Hossein Azizi[1]; Alireza Ebrahimi[1]; Nana Ofori-Opoku[2]; Michael Greenwood[3]; Nikoas Provatas[4]; *Mohsen Mohammadi*[1]; [1]University of New Brunswick; [2]Canadian Nuclear Laboratories; [3]Natural Resources of Canada; [4]McGill University

9:50 AM
Multiscale Modeling of Metal Additive Manufacturing: Linking of Continuum Scale CFD and Mesoscale Phase-field Models: *Patrick O'Toole*[1]; Milan Patel[2]; Paulus Lahur[1]; Dayalan Gunasegaram[1]; Anthony Murphy[1]; Ivan Cole[2]; Chao Tamg[3]; Ming Gan[3]; Chee Wong[3]; [1]CSIRO; [2]RMIT University; [3]Nanyang Technological University

10:10 AM Break

10:30 AM
Integrated Simulation Framework for Additively Manufactured Metallic Alloys: *Rongpei Shi*[1]; Saad Khairallah[1]; Tae Wook Heo[1]; Tien Roehling[1]; John Roehling[1]; Joseph Mckeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

10:50 AM
Directional Solidification Microstructure of Inconel 718 Manufactured by Electron Beam Additive Manufacturing: *Changwoo Lee*[1]; Byoung Soo Lee[1]; Hyung Giun Kim[1]; Gun Hee Kim[1]; [1]Ki Tech

11:10 AM
Microstructural Evolution of Additively Manufactured Inconel 718: *Laura Farris*[1]; E. Lee[1]; Judy Schneider[1]; [1]University of Alabama in Huntsville

11:30 AM
Solidification and Grain Formation During Additive Manufacturing Process: A Grandpotential Based Phase Field Study: *Sudipta Biswas*[1]; Larry Aagesen[1]; [1]Idaho National Laboratory

---

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Dislocations and Planar Faults

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Tuesday AM | February 25, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: Benoit Merle, University Erlangen-Nuremberg (FAU); Meimei Li, Argonne National Laboratory

---

8:30 AM Invited
Deformation Mechanisms in Irradiated Materials Revealed by in situ High Energy Synchrotron X-rays: *Meimei Li*[1]; Xuan Zhang[1]; Jonathan Almer[1]; Jun-Sang Park[1]; Peter Kenesei[1]; [1]Argonne National Laboratory

9:00 AM
Simulated STEM-DCI Imaging of Dislocations in High-entropy Alloys: *Joseph Tessmer*[1]; Mulaine Shih[2]; Marc De Graef[1]; [1]Carnegie Mellon University; [2]The Ohio State University

9:20 AM
Influence of Plastic Deformation on the Disorder Order Transformation in 18 Carat Red Gold Alloys Studied by In-situ High-energy X-ray Diffraction: Marina Garcia Gonzales[1]; *Steven Van Petegem*[1]; Nadine Baluc[2]; Fanny Lalire[3]; Helena Van Swygenhoven[1]; [1]Paul Scherrer Institut; [2]Ecole Polytechnique Fédérale de Lausanne; [3]Varinor S.A.

9:40 AM
Avalanche Statistics and the Intermittent-to-smooth-transition in Microplasticity: Gregory Sparks[1]; Yinan Cui[2]; Giacomo Po[2]; Quentin Rizzardi[1]; Jaime Marian[2]; *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign; [2]University of California Los Angeles

10:00 AM Break

10:20 AM Invited
Influence of Grain Boundary Mediated Deformation on the Ductility of Freestanding Metallic Thin Films: *Benoit Merle*[1]; [1]University Erlangen (Fau)

10:50 AM
Dislocation Cross-slip in Precipitation Hardened Mg-Nd Alloys: *Zhihua Huang*[1]; Chaoming Yang[1]; Liang Qi[1]; John Allison[1]; Amit Misra[1]; [1]Universtiy of Michigan

11:10 AM
Solute Interaction with Dislocation Cores in a-iron: an Atom Scale Experimental Study: *Maxime Vallet*[1]; Estelle Meslin[1]; Michael Walls[2]; Lisa Ventelon[1]; [1]CEA - Saclay; [2]Laboratoire de Physique des Solides

11:30 AM
Size Effects in Dislocation-mediated Pore Growth: *Ashley Roach*[1]; Fulin Wang[1]; Jungho Shin[1]; Gyuseok Kim[2]; Irene Beyerlein[1]; Daniel Gianola[1]; Darby Luscher[3]; [1]UC Santa Barbara Materials Department; [2]University of Pennsylvania; [3]Los Alamos National Laboratory

11:50 AM
Revisiting the Wilkens Function: a Discrete Dislocation Dynamics-based Study of Strain Broadening in Diffraction Profiles: *Aaron Tallman*[1]; Darshan Bamney[2]; Douglas Spearot[2]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory; [2]University of Florida

---

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session I

Sponsored by: TMS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School Of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Tuesday AM | February 25, 2020
Mission Hills | Marriott Marquis Hotel

Session Chairs: Amy Clarke, Colorado School of Mines; Rachael Stewart, AK Steel

---

8:30 AM
A Novel High-strength Oxidization-resistant Press Hardening Steel Sheet Requiring No Al-Si Coating: *Shuoshuo Li*[1]; Haiwen Luo[1]; [1]University of Science and Technology Beijing

8:50 AM
An Energy Absorbing Medium Mn Steel for Industry: *Thomas Kwok*[1]; Xin Xu[1]; David Dye[1]; [1]Imperial College London

9:10 AM
Annealing Time Dependence of Tensile Properties of 8 wt% Mn Steel: *Xin Xu*[1]; Thomas Kwok[1]; David Dye[1]; [1]Dept of Materials, Imperial College London

9:30 AM
Microstructural Origins of Lüders Banding in Medium Manganese Steels: *Rama Srinivas Varanasi*[1]; Dirk Ponge[1]; Dierk Raabe[1]; [1]Max Planck Institute for Iron Research

9:50 AM
TBF Steels Produced by Partial Austenitization: *Ersoy Erisir*[1]; Oguz Gürkan Bilir[1]; Yunus Emre Sözer[2]; Özge Ararat[1]; [1]Kocaeli University; [2]Erdemir (Eregli Iron and Steel Works Co)

10:10 AM Break

10:30 AM
Effects of Prior Austenite Grain Size on Microstructure of Bainite and Retained Austenite in TRIP Steel: *Miku Watanabe*[1]; Goro Miyamoto[1]; Tadashi Furuhara[1]; [1]Tohoku University

10:50 AM
Improving Microstructure of Ferritic-bainitic Steel used in Automotive Industry: *Mostafa Tawfeek*[1]; Ayman Fathy[1]; Ahmed Abdelaziz[1]; [1]German University in Cairo

11:10 AM
End to End Simulation and Genetic Optimization for the Design of Medium Mn Steels: *John Aristeidakis*[1]; Gregory Haidemenopoulos[1]; [1]University of Thessaly, Department of Mechanical Engineering

11:30 AM
Effect of the Cooling Time on the Cross Tensile Strength of the Resistance Spot Welded Medium Manganese Steel: *Yuanfang Wang*[1]; Kai Ding[1]; Bingge Zhao[1]; Yuanheng Zhang[1]; Guanzhi Wu[1]; Tao Wei[1]; Hua Pan[2]; Yulai Gao[1]; [1]Shanghai University; [2]Baoshan Iron & Steel Co., Ltd.

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — High-energy Product Permanent Magnets

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Tuesday AM | February 25, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Matthew Kramer, AMES Laboratory; Alberto Bollero, IMDEA Nanociencia

---

8:30 AM Invited
Controlling and Describing Coercivity of Rare Earth Permanent Magnets: *Satoshi Hirosawa*[1]; [1]National Institute for Materials Science

9:00 AM Invited
Computational Design of Bulk Permanent Magnets: *Thomas Schrefl*[1]; Johann Fischbacher[1]; Alexander Kovacs[1]; [1]Danube University Krems

9:30 AM
Effects of Grain Size on Magnetic and Mechanical Properties of NdFeB Sintered Magnets: *Wei Tang*[1]; Gaoyuan Ouyang[1]; Baozhi Cui[1]; Matt Kramer[1]; Jun Cui[2]; Iver Anderson[1]; [1]Ames Lab; [2]Iowa State University

9:50 AM
Mechanically Strengthened Heterogeneous Sm-Co Sintered Magnets: *Baozhi Cui*[1]; Jun Cui[1]; [1]Ames Laboratory

10:10 AM Break

10:30 AM Invited
Application of Systems Level Modeling for Addressing Criticality in Rare Earth Magnets: *Cajetan Ikenna Nlebedim*[1]; [1]Ames Laboratory

11:00 AM Invited
Additive Manufacturing of Hard Magnets for Tailored Magnetic Fields: *Christian Huber*[1]; Martin Groenefeld[2]; Dieter Suess[1]; [1]University of Vienna; Christian Doppler Laboratory for Advanced Magnetic Sensing and Materials; [2]Magnetfabrik Bonn GmbH

11:30 AM
Anisotropy and Orbital Moment in Rare Earth - Cobalt Permanent Magnets: *Durga Paudyal*[1]; Renu Choudhary[1]; Ralph Skomski[2]; [1]Ames Laboratory; [2]University of Nebraska

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Energy Conversion with Emphasis on SOFC

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Tuesday AM | February 25, 2020
16B | San Diego Convention Ctr

Session Chairs: Jung Pyung Choi, Pacific Northwest National Laboratory; Hitoshi Takamura, Tohoku University

8:30 AM Invited
Preformed Oxide Scale Chemistry and Its Influence on Local Metal Loss during Dual Atmosphere Corrosion: *Michael Reisert*[1]; Ashish Aphale[1]; Yoed Tsur[2]; Prabhakar Singh[1]; [1]University of Connecticut; [2]Technion – Israel Institute of Technology

8:50 AM Invited
Enhancing Anodic Catalytic Activity in Solid Oxide Fuel Cells by Liquid Phase Infiltration: *Soumendra Basu*[1]; Yanchen Lu[1]; Paul Gasper[1]; Boshan Mo[1]; Srikanth Gopalan[1]; Uday Pal[1]; [1]Boston University

9:10 AM Invited
Minimizing Cr-evaporation from Balance of Plant Components by Utilizing Cost-Effective Alumina-Forming Austensic Steels: Zhipeng Zeng[1]; Lingfeng Zhou[1]; Yukinori Yamamoto[2]; Michael Brady[2]; *Xingbo Liu*[1]; [1]West Virginia University; [2]Oak Ridge National Laboratory

9:30 AM
Phase Field Simulation of Ni Coarsening in SOFC Anodes under Operating Conditions: *Yinkai Lei*[1]; Tianle Cheng[1]; Harry Abernathy[1]; Gregory Hackett[1]; Youhai Wen[1]; [1]National Energy Technology Laboratory

9:50 AM Invited
Reversal of Chromium Poisoning in Solid Oxide Fuel Cell Cathodes: Michelle Sugimoto[1]; Zhikuan Zhu[1]; Srikanth Gopalan[1]; Soumendra Basu[1]; *Uday Pal*[1]; [1]Boston University

10:10 AM Break

10:30 AM Invited
Effect of Aluminizing on the High-temperature Oxidation Behavior of an Alumina-forming Austenitic Stainless Steel and a Chromia-forming Ni Based Alloy: Sedigheh Rashidi[1]; Amit Pandey[1]; Jung Pyung Choi[2]; *Rajeev Gupta*[1]; [1]The University of Akron; [2]Pacific Northwest National Laboratory

10:50 AM Invited
Protonic Ceramic Fuel Cells: Materials and Device Development: *Kyle Brinkman*[1]; [1]Clemson University

11:10 AM Invited
Catalytic Activity of Cobalt-containing Oxides for the Cathodic Reaction of IT-SOFC: *Hitoshi Takamura*[1]; [1]Tohoku University

11:30 AM Invited
Rational Design of Diffusion-blocking Layer to Suppress Chemical Degradation of Solid Oxide Fuel Cells: *Kyung Joong Yoon*[1]; [1]Korea Institute of Science And Technology

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — Pb-free Solder Alloys I

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Tuesday AM | February 25, 2020
Palomar | Marriott Marquis Hotel

Session Chair: Mike Wolverton, Raytheon Company

8:30 AM Invited
The Relation Between the Microstructure and Properties of SnAgCu/SnBiAg Mixed Assemblies, and Thermal History: *Eric Cotts*[1]; Mohammed Genanu[1]; Faramarz Hadian[1]; [1]Binghamton University

8:50 AM
A Model Study of Bi Diffusion and Intermetallic Growth in Sn-Bi Low Temperature Soldering Systems: *Yaohui Fan*[1]; Yifan Wu[1]; John Blendell[1]; Nilesh Badwe[2]; Carol Handwerker[1]; [1]Purdue University; [2]Intel Corporation

9:10 AM
Reliability Behavior of Surface Mount Devices Assembled with Bismuth Bearing Low-melt Solder Pastes: *Luke Wentlent*[1]; Michael Meilunas[1]; Jim Wilcox[1]; [1]Universal Instruments Corp.

9:30 AM
Influence of Indium Addition on Microstructural Properties of Sn-rich Solder Joints: *Amey Luktuke*[1]; Kumar Ankit[1]; Nikhilesh Chawla[1]; [1]Arizona State University

9:50 AM Break

10:20 AM Invited
Achieving Collapse-free Joint in 3D-package by Hybrid Solder Alloy with Reducing Thermal Budget Usage: Tzu-Ting Chou[1]; Yu-Ching Wang[1]; *Jenq Gong Duh*[1]; [1]National Tsing Hua University

10:40 AM
Development of Low Temperature Sn-Bi based Solder Alloys: *Mehran Maalekian*[1]; Aranav Das[1]; Ludo Krassenburg[1]; Co van Veen[1]; Mo Biglari[1]; [1]Mat-Tech

11:00 AM
Effects of Geopolymer Ceramic Additions to The Properties of Sn–0.7Cu Lead–Free Solder: *Marliza Mostapha @Zakaria*[1]; Mohd Arif Anuar Mohd Salleh[1]; Mohd Mustafa Al Bakri Abdullah[1]; [1]Universiti Malaysia Perlis

CHARACTERIZATION

Advanced Real Time Imaging — Iron & Steelmaking

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Tuesday AM | February 25, 2020
Theater A-4 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Development of HT-LSCM Techniques for the In-situ Study of the Peritectic Phase Transition: *Rian Dippenaar*[1]; Dominic Phelan[1]; Mark Reid[1]; Stefan Griesser[2]; Suk-Chun Moon[1]; Dasith Liyanage[1]; [1]University of Wollongong; [2]Inteco

8:50 AM Invited
Sub-rapid Solidification Study of Silicon Steel by using Dip Test Technique: *Hairui Qian*[1]; Wanlin Wang[1]; [1]Central South University

9:10 AM
Observation of Spinel Growth for Application in High Al-containing Steel Mold Fluxes: *Il Sohn*[1]; [1]Yonsei University

9:30 AM Invited
A Novel Method of Research on Dissolution Kinetics of Alumina in Mold Flux Based on Hot Thermocouple Technique: *Fuhang Chen*[1]; Ping Tang[1]; Guanghua Wen[1]; [1]Chongqing University

9:50 AM Invited
Study on the Interaction Process between Mold Flux and TiN/TiO2 by Sessile Drop Method: *Zihang Pan*[1]; Lejun Zhou[1]; Wanlin Wang[1]; [1]Central South University

10:10 AM Break

10:30 AM Invited
MgO Dissolution Phenomena by using Hot Thermocouple Technique: *Yongsug Chung*[1]; Youngjo Kang[2]; [1]Korea Polytechnic University; [2]Dong-A University

10:50 AM Invited
Investigation on the Titanium Extraction from Ti-bearing Slags based on Crystallization Modifications: *Yongqi Sun*[1]; Zuotai Zhang[2]; [1]University of Queensland; [2]Southern University of Science and Technology

11:10 AM
Real-time Imaging of the Melting and Crystallization of Synthetic Ferronickel Slags with Varying B2O3 Content: *Shifan Dai*[1]; Wanlin Wang[1]; Lejun Zhou[1]; Tongsheng Zhang[1]; Jie Yu[1]; [1]Central South University

11:30 AM
HT-LSCM as a Tool for Indirect Determination of Precipitates by Real Time Grain Growth Observations: *Nora Fuchs*[1]; Christian Bernhard[1]; Susanne Michelic[1]; Rian Dippenaar[2]; [1]University of Leoben; [2]University of Wollongong

11:50 AM
In-situ High Temperature Confocal Laser Scanning Microscopy Study during Heat Treatment of Duplex Stainless Steels: *Wangzhong Mu*[1]; Niklas Pettersson[1]; Sohei Sukenaga[2]; Hiroyuki Shibata[2]; Peter Hedström[1]; [1]KTH Royal Institute of Technology; [2]Tohoku University

ADVANCED MATERIALS

Advanced Solid Phase Processing Symposium — Advanced Applications and Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, University of California, Riverside; Cynthia Powell, Pacific Northwest National Laboratory; Kester Clarke, Colorado School of Mines; Anthony Reynolds, University of South Carolina; Mostafa Hassani, Cornell University

Tuesday AM | February 25, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Cynthia Powell, Pacific Northwest National Laboratory; Kester Clark, Colorado School of Mines

8:30 AM Invited
Impulse for Solid-State Processing: *Glenn Daehn*[1]; Anupam Vivek[1]; Brian Thurston[1]; Bhuvi Nirudhoddi[1]; [1]Ohio State University

8:55 AM Invited
Structure-property Relationships in Solid Phase Processing and Emerging Applications: *Glenn Grant*[1]; Scott Whalen[1]; Vineet Joshi[1]; Xiao Li[1]; Mageshwari Komarasami[1]; Jorge Dos Santos[2]; [1]Pacific Northwest National Laboratory; [2]Helmholtz-Zentrum Geesthacht GmbH; Pacific Northwest National Laboratory

9:20 AM
Shear Assisted Solid Phase Processing of Aluminum Alloys: *Keerti Kappagantula*[1]; Jens Darsell[1]; Rajib Kalsar[1]; Nicole Overman[1]; Scott Whalen[1]; Glenn Grant[1]; Darrell Herling[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

9:40 AM
Microstructures and Mechanical Properties of Aluminum/Steel Dissimilar Joints Fabricated by Two-step Refilled Friction Stir Spot Welding: *Hyun-Joon Park*[1]; Jae-Ha Kim[1]; Seung-Boo Jung[1]; [1]Sungkyunkwan University

10:00 AM Break

10:20 AM Invited
Shear-induced Diffusion and Intermixing: Atomic-level Perspective from Molecular Dynamics Simulations: *Peter Sushko*[1]; Brianna Collins[2]; Tiffany Kaspar[1]; Junhui Tao[1]; Bharat Gwalani[1]; Arun Devaraj[1]; Tamas Varga[1]; Yang He[1]; Chongmin Wang[1]; Aashish Rohatgi[1]; Cynthia Powell[1]; Suveen Mathaudhu[3]; [1]Pacific Northwest National Laboratory; [2]Pacific Northwest National Laboratory; University of Minnesota ; [3]Pacific Northwest National Laboratory; University of California, Riverside

10:45 AM
A Computational Approach with Experimental Support to Study the Effect of Interfacial Characteristics on the Performance of Dissimilar Joints via Friction Stir Scribe Technique: Daniel Ramirez[1]; Panagiota Kitsopoulos[2]; *Varun Gupta*[3]; Piyush Upadhyay[3]; Tianhao Wang[3]; Erin Barker[3]; Darrell Herling[3]; [1]University of Texas, San Antonio; [2]Case Western Reserve University; [3]Pacific Northwest National Laboratory

11:05 AM
Dynamic Recrystallization Model under Large Deformation during Solid Phase Processing: *Yulan Li*[1]; Shenyang Hu[1]; Erin Barker[1]; Suveen Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California-Riverside

11:25 AM
MD Simulations of Deformation Mechanisms and Sub-grain Formation in Al-Si Alloys under High Shear Deformation: *Shenyang Hu*[1]; Suveen Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California, Riverside

---

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — Metal Oxide Thin Films

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Srinivasa Rao Singamaneni, University of Texas at El Paso; Amit Pandey, MicroTesting Solutions; Nuggehalli Ravindra, New Jersey Institute of Technology

Tuesday AM | February 25, 2020
Solana | Marriott Marquis Hotel

Session Chairs: Srinivasa Rao, University of Texas, El Paso; Ravindra Nuggehalli, NJIT

8:30 AM Invited
Controlling Functional Properties in Oxide Nanocomposites via Strain, Defects and Interfaces: *Aiping Chen*[1]; [1]Los Alamos National Lab

9:00 AM Invited
Stabilization of High-temperature Polymorphs of SrSnO3 at Room Temperature via Epitaxy: *Bharat Jalan*[1]; [1]University of Minnesota

9:20 AM Invited
Effect of Interfacial Strain on the Point-defect Energetics in LaNiOx: Kanishk Rawat[1]; Dillon Fong[2]; *Dilpuneet Aidhy*[1]; [1]University of Wyoming; [2]Argonne National Laboratory

9:50 AM
Dynamically Evolving Metastability in an Atomic Hourglass: Temporal Control of the Metal-insulator Transition of VO_2 by a Mobile Dopant: *Erick Braham*[1]; Diane Sellers[1]; Ruben Villarreal[1]; Raymundo Arroyave[1]; Patrick Shamberger[1]; Sarbajit Banerjee[1]; [1]Texas A&M University

10:10 AM Break

10:30 AM Invited
In-situ and Real Time Chemical Analysis of Complex Oxide Thin Film Surfaces using Pulsed Laser Deposition: *Jayakanth Ravichandran*

11:00 AM Invited
Recent Advances in Thin Film Thermoelectrics: SnSe and Beyond: *Ashutosh Tiwari*[1]; Shrikant Saini[1]; Paolo Mele[2]; [1]University of Utah; [2]Shibaura Institute of Technology

11:30 AM
Low Temperature, Metal Induced Crystallization Growth of SixGe1-X Films on Nanostructured Si Substrates: *Ayu Wazira Azhari*[1]; Kamaruzzaman Sopian[2]; Dewi Suriyani Che Halin[1]; Uda Hashim[1]; Saleem H Zaidi[3]; [1]Universiti Malaysia Perlis; [2]Universiti Kebangsaan Malaysia ; [3]Universiti Kebangsaan Malaysia

11:50 AM
Morphological Evolution of Phase-separated Domains in Vapor-deposited Polycrystalline Alloy Films: *Rahul Raghavan*[1]; William Farmer[1]; Kumar Ankit[1]; [1]Arizona State University

---

CHARACTERIZATION

Advances in Powder and Ceramic Materials Science — Ceramic Nanoparticles and Powder

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Sergio Monteiro, Military Institute of Engineering; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama

Tuesday AM | February 25, 2020
Theater A-6 | San Diego Convention Ctr

Session Chairs: Ruigang Wang, University of Alabama ; Sergio Monteiro , Military Institute of Engineering

---

8:30 AM Introductory Comments

8:35 AM
How We Can Produce Large Scale Nano-powder: *Habibollah Aminirastabi*[1]; [1]Xiamen University

8:55 AM
High Densification Rates (10^{-3} s^{-1}) in Nanocrystalline Oxides by CAPAD Processing: Effects of Water Absorption and Grain Size: *Darren Dewitt*[1]; Yasuhiro Kodera[1]; Javier Garay[1]; [1]University of California, San Diego

9:15 AM
Preparation of Rare Earth Stabilized Nanocrystalline Zirconia with Tunable Optical/Mechanical Properties: *Gottlieb Uahengo*[1]; Javier Garay[1]; Yasuhiro Kodera[1]; [1]University of California San Diego

9:35 AM
Pressure-less Processing of Alumina Ceramics with Controlled Elongated Grain Size and Orientation: *Hortense Le Ferrand*[1]; [1]Nanyang Technological University

9:55 AM Break

10:05 AM
Compressive Properties of Micron-sized, Spherical SiO_2 Particles: *Niko Hellsten*[1]; Antti Karttunen[1]; Charlotta Engblom[2]; Alexander Reznichenko[2]; Erika Rantala[2]; [1]Aalto University; [2]Borealis Polymers Oy

10:25 AM
Development of Shape-Controlled Oxide Nanopowders as Support Materials in Emission Control Catalysts: Zhongqi Liu[1]; *Ruigang Wang*[1]; [1]The University of Alabama

10:45 AM
Sintering Ability of Y-doped $BaZrO_3$ Refractory with Nano-CaCO3 and the Interaction with Ti2Ni Alloy: *Baobao Lan*[1]; Shihua Wang[1]; Yubin Xiao[1]; Guangyao Chen[1]; Xionggang Lu[1]; Chonghe Li[1]; [1]Shanghai University

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Processing – Casting, Forging, Heat Treatment

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Tuesday AM | February 25, 2020
11B | San Diego Convention Ctr

Session Chairs: Chantal Sudbrack, Consultant; Martin Detrois, National Energy Technology Laboratory

8:30 AM Introductory Comments

8:35 AM Keynote
Advancing The State of the Art of Superalloys by Balancing Performance with Repairability: *Eric Huron*[1]; [1]GE Aircraft Engines

9:15 AM Invited
Considerations for Homogenizing Alloys: *Paul Jablonski*[1]; Jeffery Hawk[1]; [1]National Energy Technology Laboratory

9:45 AM
Creep Resistant Cast INCONEL Alloy 740H using an Alternative Casting Technique: *Martin Detrois*[1]; Kyle Rozman[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

10:05 AM Break

10:25 AM Invited
Experimental Assessment and Numerical Simulation of Recrystallization Phenomena in Nickel based Superalloy Forgings: *Nathalie Bozzolo*[1]; Marc Bernacki[1]; [1]MINES ParisTech

10:55 AM
On the Formation of Heating and Cooling Precipitates from a Superalloy Powder: *David Collins*[1]; Neil D'Souza[2]; Chinnapat Panwisawas[3]; Paraskevas Kontis[4]; [1]University of Birmingham; [2]Rolls-Royce plc; [3]University of Oxford; [4]Max-Planck-Institut für Eisenforschung GmbH

11:15 AM
Microstructure Evolution in a P/M Ni-based Super Alloy: *Taisuke Sasaki*[1]; Akihiro Suzuki[2]; Motoki Okuno[3]; Daisuke Nagahama[3]; Masato Ohnuma[2]; Kazuhiro Hono[1]; [1]National Institute for Materials Science; [2]Hokkaido University; [3]Honda R&D Co.,Ltd.

11:35 AM
Optimising Creep Resistance of a Powder Metallurgy Nickel Superalloy via Tailoring of Precipitates Using Different Heat Treatments: *Chrysanthi Papadaki*[1]; Wei Li[2]; Alexander Korsunsky[1]; [1]University of Oxford; [2]Rolls-Royce plc

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Interatomic Potential Developments and Atomistic Modeling II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Tuesday AM | February 25, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Interatomic Potentials as Physically-informed Artificial Neural Networks: James Hickman[1]; Ganga P. Purja Pun[2]; Vesselin Yamakov[3]; *Yuri Mishin*[2]; [1]National Institute of Standarsd and Technology; [2]George Mason University; [3]National Institute of Airospace

9:00 AM
Development and Validation of Interatomic Potential for Tantalum using Physically-informed Artificial Neural Networks: *Yi-Shen Lin*[1]; Ganga Purja Pun[1]; Yuri Mishin[1]; [1]George Mason University

9:20 AM Invited
Machine-learned Interatomic Potentials for Alloy Modeling and Phase Diagrams: *Gus Hart*[1]; Conrad Rosenbrock[1]; Konstantin Gubaev[2]; Alexander Shapeev[2]; Livia Pártay[3]; Noam Bernstein[4]; Gábor Csányi[5]; [1]Brigham Young University; [2]Skolkovo Institute of Science and Technology; [3]University of Reading; [4]Naval Research Laboratory; [5]Cambridge University

9:50 AM
Physically-motivated Requirements of Machine Learning Potentials: *Jared Stimac*[1]; Jeremy Mason[1]; [1]University of California, Davis

10:10 AM Break

10:30 AM Invited
Molecular Simulations You can Trust and Reproduce: the OpenKIM Framework: *Ellad Tadmor*[1]; Ryan Elliott[1]; [1]University of Minnesota

11:00 AM
Scale Bridging from DFT to MD with Machine Learning: *Mitchell Wood*[1]; Mary Alice Cusentino[1]; Aidan Thompson[1]; [1]Sandia National Laboratories

11:20 AM
An Active Learning Approach for the Generation of Force Fields from DFT Calculations: *Nathan Wilson*[1]; Yang Yang[2]; Raymundo Arroyave[1]; Xiaofeng Qian[1]; [1]Texas A&M University; [2]Xi'an Jiaotong

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications VIII — Session I

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Hsin-jay Wu, National Chiao-tung University; Tiejun Zhu, Zhejiang University

Tuesday AM | February 25, 2020
Miramar | Marriott Marquis Hotel

Session Chairs: Hsin-jay Wu, National Chiao-tung University; Sinn-wen Chen, National Tsing Hua University

8:30 AM Introductory Comments

8:35 AM Invited
ZT Enhancement in Thermoelectric Nanowires: *Yang-Yuan Chen*[1]; [1]Academia Sinica

8:55 AM Invited
Novel Thermoelectric Materials for Power Generation: *Yaniv Gelbstein*[1]; [1]Ben-Gurion University of Negev

9:15 AM Invited
Recent Developments in Fe-based Thermoelectric Heusler Alloys: *Vladimir Khovaylo*[1]; [1]National University of Science and Technology "MISIS"

9:35 AM
Current Progress on Fabrication and Life Testing of Advanced Skutterudite Thermoelectric Materials in a Proposed Enhanced Multi-mission Radioisotope Thermoelectric Generator (eMMRTG) for Space Power Applications: Thierry Caillat[1]; Chen-Kuo Huang[1]; Jong-Ah Paik[1]; *Ike Chi*[1]; Stanley Pinkowski[1]; [1]Jet Propulsion Laboratory

9:55 AM
New Thermoelectric Zintl Phases with Defects and Interstitials: *Sheng-Qing Xia*[1]; [1]Shandong University

10:15 AM Break

10:35 AM Invited
Approaches to Manipulate p-n Conduction Transition and High Thermoelectric Performance in Ga-incorporated Bi2Te3: *Hsin-Jay Wu*[1]; Chun-han Lin[1]; Wan-ting Yen[1]; [1]National Chiao Tung University

10:55 AM Invited
Intrinsic Cu Vacancy Leading to High Thermoelectric Performance in CuBi3Se5: *Jian Wang*[1]; [1]Wichita State University

11:15 AM
Enhanced Averaged zT in n-type Bi_2Te_3 via Solubility Control: *Wan-Ting Yen*[1]; Hsin-jay Wu[1]; Pai-chun Wei[2]; [1]National Chiao Tung University; [2]King Abdullah University of Science and Technology

11:35 AM
Improving the Thermoelectric Properties of Atomized BiSbTe Alloy by Electroless Copper Coating: *Pathan Sharief*[1]; Madavali Babu[1]; Youhan Sohn[2]; Jun-Hyun Han[2]; Soon-Jik Hong[1]; [1]Kongju national university; [2]Chungnam national university

11:55 AM
Minor Ga Addition in ß-Zn_4Sb_3 Leads to Major Enhancement in Thermoelectric Performance: *I-Lun Jen*[1]; Hsin-Jay Wu[1]; [1]National Chiao Tung University

LIGHT METALS

Alumina and Bauxite — Bayer Process and Iron

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: James Vaughan, University of Queensland

Tuesday AM | February 25, 2020
2 | San Diego Convention Ctr

Session Chair: Hong Peng, University of Queensland

8:30 AM Introductory Comments

8:40 AM
Quantifying the Effect of Seeds on Gibbsite Crystallization – Mathematical Modelling of Particle Size Distribution: *Thiago Franco*[1]; Marcelo Seckler[2]; [1]CBA; [2]São Paulo University

9:00 AM
Experimental Study on Flow Field Characteristics in Seed Precipitation Tank and its Influence on Physical Properties of Al(OH)3 Products: *Xiangyu Zou*[1]; Yan Liu[1]; Xiaolong Li[1]; Zhang Tingan[1]; [1]Northeastern University

9:20 AM
Application of Advanced Oxidative Process for Organic Compounds Removal from Bayer Liquor: Miguel Soplin[1]; *Amilton Botelho Junior*[1]; Jorge Tenorio[1]; Marcela Baltazar[1]; Denise Espinosa[1]; [1]Universidade de Sao Paulo

9:40 AM
A review of comprehensive utilization of high-iron red mud of China: *Zhang Tingan*[1]; Kun Wang[1]; Yan Liu[1]; Guozhi Lv[1]; Xiaofei Li[1]; Xin Chen[1]; [1]Northeastern University

10:00 AM Break

10:20 AM
Conversion Behavior of Iron-containing Minerals in the Process of Dissolving High-iron Bauxite by Starch Hydrothermal Method: *Yongfei He*[1]; Yiyong Wang[1]; Jidong Li[1]; Xingyuan Wan[1]; Zhe Ning[1]; [1]Unverisity of Science and Technology Liaoning

10:40 AM
Extracting Iron Compounds from Calcined Bauxite Residue : Magnetic Separation using a Disc Separator: *Yoann Robert*[1]; Guy Simard[1]; Sebastien Fortin[2]; [1]Université du Quebec à Chicoutimi; [2]Rio Tinto

11:00 AM
Recovery of Iron from High-iron Bayer Red Mud by Smelting Reduction: *Kun Wang*[1]; Yan Liu[1]; Guozhi Lv[1]; Xiaofei Li[1]; Xin Chen[1]; Zhang Tingan[1]; [1]Northeastern University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — New and Optimized Aluminium Alloys I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Tuesday AM | February 25, 2020
1A | San Diego Convention Ctr

Session Chair: Shouxun Ji, Brunel University London

8:30 AM Introductory Comments

8:35 AM
Effect of Cooling Rate During Solidification of Aluminium-chromium Alloy: *Gautham Muthusamy*[1]; Samuel Wagstaff[2]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology; [2]Novelis Inc.

9:00 AM
Effects of Ni and Si Content on the Conductivity, Microhardness and Microstructure of Al-0.8Fe-0.5Mg Alloys: *Stephanie Kotiadis*[1]; Adam Zimmer[1]; Abdallah Elsayed[1]; Eli Vandersluis[2]; C. Ravindran[2]; [1]University of Guelph; [2]Ryerson University

9:25 AM
The Efficacy of Replacing Metallic Cerium in Aluminum-cerium Alloys with LREE Mischmetal: *Zachary Sims*[1]; David Weiss[2]; Orlando Rios[3]; Hunter Henderson[3]; Michael Kesler[3]; Scott McCall[4]; Michael Thompson[1]; Aurelien Perron[4]; Emily Moore[4]; [1]University of Tennessee; [2]Eck Industries; [3]Oak Ridge National Laboratory; [4]Lawrence Livermore National Laboratory

9:50 AM
Effects of Sc and Y on the As-cast Microstructure of AA6086: *Sandi Zist*[1]; Varuzan Kevorkijan[1]; Matej Steinacher[1]; Franc Zupanic[2]; [1]Impol d.o.o.; [2]Faculty of Mechanical Engineering

10:15 AM Break

10:30 AM
Ternary Interactions and Implications for Third Element Alloying Potency in Al-Ce-Based Alloys: *Hunter Henderson*[1]; David Weiss[2]; Zachary Sims[1]; Michael Thompson[3]; Emily Moore[4]; Aurélien Perron[4]; Fanqiang Meng[5]; Ryan Ott[5]; Orlando Rios[1]; [1]Oak Ridge National Laboratory; [2]Eck Industries, Inc.; [3]University of Tennessee, Knoxville; [4]Lawrence Livermore National Laboratory; [5]Ames Laboratory

10:55 AM
Development and Analysis of Al7075 Alloy Materials using Press and Sinter Processing: *Steven Johnson*[1]; Corey Clark[1]; Jason Alvarez[1]; [1]Central Connecticut State University

11:20 AM
Rare Earth Intermetallics Formation in Al-Cu Cast Alloys: *Mohamed Mahmoud*[1]; Agnes Samuel[2]; Herbert Doty[3]; Fawzy Samuel[2]; [1]Cairo University ; [2]Universite du Quebec a Chicoutimi; [3]General Motors

11:45 AM
Retrogression Forming and Reaging of AA7075-T6 Alclad to Produce Stampings with Peak Strength: *Katherine Rader*[1]; Louis Hector[2]; Jon Carter[2]; Eric Taleff[1]; [1]University of Texas at Austin; [2]General Motors

LIGHT METALS

Aluminum Reduction Technology — Reduction Cell Operation and Process Control

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Jayson Tessier, Alcoa

Tuesday AM | February 25, 2020
6D | San Diego Convention Ctr

Session Chair: Ali Jassim Banjab, Emirates Global Aluminium

8:30 AM Introductory Comments

8:35 AM
Study of Heat Distribution due to Acd Variations For Anode Setting: *Choon-Jie Wong*[1]; Yuchen Yao[1]; Jie Bao[1]; Maria Skyllas-Kazacos[1]; Barry Welch[1]; Ali Jassim[2]; [1]University of New South Wales; [2]Emirates Global Aluminum

8:55 AM
Anodic Incident Detection Through Multivariate Monitoring of Individual Anode Current Signals: *David LaJambe*[1]; Éric Poulin[1]; Carl Duchesne[1]; Jayson Tessier[2]; [1]Laval University; [2]Alcoa Primary Metals Smelting Center of Excellence

9:15 AM
Fault Detection and Diagnosis of Alumina Feeding System using Individual Anode Current Measurement: *Yuchen Yao*[1]; Jie Bao[1]; Maria Skyllas-Kazacos[1]; Barry Welch[1]; Ali Jassim[2]; [1]University of New South Wales; [2]Emirates Global Aluminum

9:35 AM
Change of Anode Operation Pattern from Single to Double Staircase at Albras: Camila Silva[1]; *Vanderlei Fernandes*[1]; Nilton Nagem[1]; Ivar Sousa[1]; [1]Albras - Alumínio Brasileiro S/A

9:55 AM
An Advanced Nonlinear Control Approach for Aluminum Reduction Process: *Jing Shi*[1]; Yuchen Yao[1]; Jie Bao[1]; Maria Skyllas-Kazacos[1]; Barry Welch[1]; Ali Jassim[2]; [1]University of New South Wales; [2]Emirates Global Aluminum

10:15 AM Break

10:30 AM
Model Based Approach for Online Monitoring of Aluminium Production Process: *Lucas Jose Da Silva Moreira*[1]; Gildas Besancon[1]; Francesco Ferrante[1]; Mirko Fiacchini[1]; Hervé Roustan[2]; [1]Univ. Grenoble Alpes, CNRS, Grenoble INP*, GIPSA-lab; [2]Rio Tinto

10:50 AM
Predictive Analytics for Enhancing Productivity of Reduction Cells: *Shanmukh Rajgire*[1]; Abhijeet Vichare[2]; Amit Gupta[1]; Devendra Pathe[3]; [1]Abstcpl; [2]Presently affiliated with Meritus Interlytics Private limited; [3]Hindalco Industries Limited

11:10 AM
Restart of Shutdown Pots - Troubles, Solutions and Comparison with Normal Pots to Improve Results: *Ved Prakash Rai*[1]; Vibhav Upadhyay[1]; [1]Hindalco Industries Limited

Biodegradable Materials for Medical Applications II — Polymers and Ceramics

Sponsored by: TMS Functional Materials Division, TMS: Biomaterials Committee

Program Organizers: Jaroslaw Drelich, Michigan Technological University; Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University; Jan-Marten Seitz, Syntellix AG; Petra Maier, Stralsund University of Applied Sciences; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California, Riverside

Tuesday AM | February 25, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Huinan Liu, University of California at Riverside; Jaroslaw Drelich, Michigan Technological University

8:30 AM Keynote
Fixing Broken Hearts:
Biodegradable Cardiovascular Implants: *Subbu Venkatraman*[1]; [1]Nanyang Technological University

9:05 AM
3D-printed Nanocomposites for Bone Repair: Chaoxing Zhang[1]; *Catherine Seo*[1]; Changlu Xu[1]; Jiajia Lin[1]; Edgar Villafana[1]; Hector Jimenez[1]; Huinan Liu[1]; [1]University of California at Riverside

9:25 AM
Tuning the Structure and Property of Silk Fibroin Scaffold for Optimized BMSC Behavior in Cartilage Repair: Zhinan Mao[1]; *Juan Guan*[1]; Sujun Wu[1]; [1]Beihang University

9:45 AM
Production of PLLA Membranes Incorporated with Antimicrobial Nanoparticles of Curcumin and Zinc Oxide for Medical Applications: Karla de Abreu Barbosa[1]; Isabella Caroline Pereira Rodrigues[1]; Leticia Tamborlim[1]; Augusto Ducati Luchessi[1]; Éder Sócrates Najar Lopes[1]; *Lais Pellizzer Gabriel*[1]; [1]University of Campinas

10:05 AM Break

10:20 AM
Synthesis of Absorable and Non-absorbable Sutures for Surgical Incisions and Wounds: *Muhammad Shoaib Butt*[1]; [1]National University of Science and Technology

10:40 AM
Ceramic Composites as Bone Tissue Scaffolds: Caitlin Guzzo[1]; *John Nychka*[1]; [1]University of Alberta

11:00 AM
Biocompatibility Study of Luminescent Hydroxyapatite: *Fabian Martinez*[1]; Ekaterina Novitskaya[1]; Manuel Herrera[2]; Karla Juarez-Moreno[2]; Olivia Graeve[1]; [1]University of California, San Diego; [2]Universidad Nacional Autónoma de México

Biological Materials Science — Biomaterials I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Tuesday AM | February 25, 2020
Leucadia | Marriott Marquis Hotel

Session Chairs: Jing Du, Penn State University; Steven Naleway, University of Utah

8:30 AM Invited
Merging Human-machine Intelligence with Soft Materials Technology: *Xuanhe Zhao*[1]; [1]Massachusetts Institute of Technology

9:00 AM
Novel Architectured Materials for Treating Heart Disease: *David Restrepo*[1]; Juan Rincon[1]; Hai-Chao Han[1]; [1]University of Texas at San Antonio

9:20 AM
Organic Plasma Processing (OPP) for Bio-interfacing Soft-matter Surfaces: *Vinoy Thomas*[1]; Vineeth Vijayan[1]; Bernabe Tucker[1]; Yogesh Vohra[1]; [1]University of Alabama at Birmingham

9:40 AM
Quick Setting Dental Pulp Capping Materials Made from Sodium Silicate and Calcium Phosphate Glasses: *Jerry Howard*[1]; Levi Gardner[1]; Zahra Saifee[1]; Isaac Nelson[1]; John Colombo[2]; Steven Naleway[1]; Krista Carlson[1]; Aladdin Geleil[1]; [1]University of Utah; [2]University of Las Vegas, Nevada

10:00 AM
Bone Growth at Breast Cancer Metastasis Evaluated using an In-vitro Cancer Metastasis Model: *Kalpana Katti*[1]; Sumanta Kar[1]; Haneesh Jasuja[1]; Dinesh Katti[1]; [1]North Dakota State University

10:20 AM Break

10:35 AM
Structural Analysis of Additively Manufactured Prosthetic Sockets using 360 Degree 3D-Digital Image Correlation: *Isaac Cabrera*[1]; Kaela Wong[1]; Victor Bourgin[2]; Win-Ying Zhao[1]; Patricia Castillo[1]; Connie Gean[1]; Pegah Bagheri[1]; Bryn Henning[1]; KiAsia Lawson[3]; Joseph Martin[1]; Samantha Fong[1]; Ramesh Rao[1]; Albert Lin[1]; Joanna McKittrick[1]; [1]University of California San Diego; [2]Imperial College London; [3]North Carolina A&T State University

10:55 AM
Long-term in vivo Cyclic Loading Upregulates the Effects of Osteoporosis Treatment: *James Rosenberg*[1]; Ursula Eberli[2]; Stephan Zeiter[2]; Vincent Stadelmann[3]; Claire Acevedo[1]; [1]University of Utah; [2]AO Research Institute Davos; [3]AO Research Institute Davos, Schutlthess Klinik

11:15 AM
Biomechanical Behaviors of Gingival-derived Mesenchymal Stem Cells (GMSCs) Treated Arthritis Mice Tibia: *Yuxiao Zhou*[1]; Junlong Dang[2]; Ye Chen[3]; Song Guo Zheng[3]; Jing Du[1]; [1]Pennsylvania State University; [2]Sun Yat-sen University; [3]Ohio State University

11:35 AM Invited
Mechanical Properties of Tough, Mechanochemically Active Hydrogels: *Jamie Kruzic*[1]; Yuwan Haung[1]; Bhakthi Jayathilaka[1]; Kristopher Kilian[1]; [1]University of New South Wales

LIGHT METALS

Cast Shop Technology — Melting and Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Tuesday AM | February 25, 2020
1B | San Diego Convention Ctr

Session Chair: Samuel Wagstaff, Novelis

8:30 AM Introductory Comments

8:35 AM
Dynamic Mold Shape Control for Direct Chill Ingot Casting: *Craig Cordill*[1]; [1]Wagstaff

9:00 AM
Continuous Monitoring of Butt Curl Development During DC Casting – Development and Application: Gerd-Ulrich Gruen[1]; *Werner Droste*[1]; Daniel Krings[1]; Mark Badowski[1]; Markus Hagen[1]; [1]Hydro Aluminium Rolled Products GmbH

9:25 AM
Constellium's Mold Technology for Al Alloy Slab DC Casting: *Philippe Jarry*[1]; Olivier Ribaud[1]; Laurent Jouët-Pastré[2]; Emmanuel Waz[1]; Pascal Delaire[1]; Pierre-Yves Menet[1]; Marc Bertherat[1]; Pierre Celle[1]; [1]Constellium C-TEC; [2]Constellium Neuf-Brisach

9:50 AM
Fluid Flow Analyses and Meniscus Behavior during the Horizontal Single Belt Casting (HSBC) of Aluminum Alloy AA6111 Strips: *Roderick Guthrie*[1]; Mihaiela Isac[1]; [1]McGill Metals Processing Centre

10:15 AM Break

10:30 AM
Effect of Water Flow Distribution on the Performance of Aluminum Small-form Ingot Continuous Castings: *Lei Pan*[1]; Eric Laplante[1]; Francis Breton[1]; [1]Rio Tinto

10:55 AM
Small Scale Oxidation Experiments on AlMg Alloys in Various Gas Fired Furnace Atmospheres: Anders Johansson[1]; Egil Solberg[2]; Magnus Skramstad[3]; Thomas Kvande[4]; Johannes Lodin[5]; *Nicholas Smith*[6]; Martin Syvertsen[6]; Anne Kvithyld[6]; [1]Granges; [2]Alcoa; [3]NTNU; [4]Hydro; [5]Linde; [6]SINTEF

11:20 AM
Study of the Oxidation of an Al-5Mg Alloy in Various Industrial Melting Furnace Atmospheres: *Johannes Lodin*[1]; Martin Syvertsen[2]; Anne Kvithyld[2]; Anders Johansson[3]; Egil Solberg[4]; Thomas Kvande[5]; [1]Linde; [2]SINTEF; [3]Gränges AB; [4]Alcoa; [5]Hydro Aluminium

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — 3D Characterization

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Tuesday AM | February 25, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Yunus Kalay, Middle East Technical University; Tomoko Sano, U.S. Army Research Laboratory

8:30 AM
From Fundamental Research to Engineered Components: Application to 3D Materials Science: *Jonathan Madison*[1]; Thomas Ivanoff[1]; Alex Hickman[1]; [1]Sandia National Laboratories

8:50 AM
In-Situ X-ray Tomography of Vapor Phase Alloying of Ni Wires via Pack Titanization: *Arun Bhattacharjee*[1]; Ashley Paz y Puente[1]; Dinc Erdeniz[2]; David Dunand[3]; [1]University of Cincinnati; [2]Marquette University; [3]Northwestern University

9:10 AM
Introducing 3D-LIBS, a Powerful Rapid Chemical Mapping Tool for Trace Elements in Complex Materials: *Carys Cook*[1]; Rajiv Soman[1]; Karol Putyera[1]; [1]EAG Eurofins

9:30 AM
Modeling the Anisotropic Mechanical Properties of Fused Deposition Modeling ABS using an Artificial Neural Network - Part 2: *Brian Kessler*[1]; Sarah Gladding[1]; Aric Harper[1]; [1]Colorado Mesa University

9:50 AM
Mapping Grain Morphology and Orientations by Laboratory Diffraction Contrast Tomography: *Hrishikesh Bale*[1]; Jun Sun[2]; Jette Oddershede[2]; Erik Lauridsen[2]; [1]Carl Zeiss Microscopy Inc.; [2]Xnovo Technology ApS

10:10 AM Break

10:25 AM
A New Characterization Tool for 3D Orientation Microscopy at Mesostructure Length Scales: Thomas Ales[1]; *Peter Collins*[1]; [1]Iowa State University

10:45 AM
Pore Network Modelling Analysis of 3D SEM Images of Nano-porous Gold: *S. Ali Shojaee*[1]; [1]Thermo Fisher Scientific

11:05 AM
Automated Serial Sectioning as a Method to 3D Map Inclusions in Structural Metals: *Veeraraghavan Sundar*[1]; Rachel Reed[1]; [1]UES Inc.

11:25 AM
3D Characterization of the Evolution of Crystal Mosaicity During Solidification of Single Crystal Ni-based Superalloys: *Felicitas Scholz*[1]; Daniel Kotzem[1]; Pascal Thome[1]; Jan Frenzel[1]; Gunther Eggeler[1]; [1]Ruhr-Universitaet Bochum

11:45 AM
Using Convolutional Neural Networks to Visualize Large Serial Sectioning Datasets: *Zach Thompson*[1]; Tiberiu Stan[1]; Peter Voorhees[1]; [1]Northwestern University

---

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Minerals Processing and Analysis II

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Tuesday AM | February 25, 2020
Theater A-8 | San Diego Convention Ctr

Session Chairs: Zhiwei Peng, Central South University; Chenguang Bai, Chongqing University

---

8:30 AM
Experimental Research on Pellet Production with Boron-containing Concentrate: *Tian Yunqing*[1]; Qing Gele[1]; [1]Research Institute of Technology, Shougang Group Corporation

8:50 AM
Nano-particle Products Extracted from the Low-grade Laterite Minerals: *Qiuju LI*[1]; [1]Shanghai University

9:10 AM
Study on the Influence of Limestone and Hydrated Lime on Pelletizing: *Gele Qing*[1]; Zhixing Zhao[1]; Minge Zhao[1]; Yunqing Tian[1]; Li Ma[1]; [1]Shougang Group

9:30 AM
Leaching of Platinum Group Metals from Automobile Spent Catalyst: *Sujun Lu*[1]; Dalin Chen[1]; Peng Zhang[1]; Guoju Chen[1]; Yan Zhang[1]; Yujun Pan[2]; Ruikang Wang[2]; Jinxi Qiao[2]; Xintao Sun[2]; Ailiang Chen[2]; [1]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization;Jinchuan Group Co. Ltd; [2]Central South University

9:50 AM
Characterization on the Behaviors of Ca and Si Constituents during the Consolidation of Ferruginous Manganese Ores: Bingbing Liu[1]; Ruijie Li[1]; Shengpeng Su[1]; Yuanbo Zhang[2]; [1]Zhengzhou University; [2]Central South University

10:10 AM Break

10:30 AM
Microscopic Appearance Transformation of Bornite During Acid Leaching and Bioleaching: *Hao Lin*[1]; Jun Wang[1]; Yuling Liu[1]; Yi Zhou[1]; [1]Central South University

10:50 AM
Pb(II) Removal from Acid Wastewater by Magnetic Manganese Ferrites Synthesized from Ferromanganese Ores: *Jia Wang*[1]; Zijian Su[1]; Manman Lu[1]; Juan Wang[1]; Yuanbo Zhang[1]; [1]Central South University

11:10 AM
Recovery of Valuable Metals from the Leaching Residue from the Arsenic-nickel/Cobalt-residue: *Jinxi Qiao*[1]; Ailiang Chen[1]; Xintao Sun[1]; Zhen Qian[2]; Yan Zhang[3]; Yutian Ma[3]; Yalin Ma[1]; [1]Central South University; [2]Changsha Research Institute of Mining Metallurgy Co.Ltd; [3]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization;Jinchuan Group Co. Ltd

---

CHARACTERIZATION

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification — Grain Boundary Descriptors

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee

Program Organizers: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, U.S. Army Research Laboratory; James Hogan, University of Alberta; Srikanth Patala, North Carolina State University; Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Tuesday AM | February 25, 2020
Theater A-3 | San Diego Convention Ctr

Session Chairs: Oliver Johnson, Brigham Young University; Srikanth Patala, North Carolina State University

---

8:30 AM Introductory Comments

8:35 AM Invited
Characterizing GB Atomic Structures at Multiple Scales: *Eric Homer*[1]; Derek Hensley[1]; Conrad Rosenbrock[1]; Andrew Nguyen[1]; Jonathan Priedeman[1]; Gus Hart[1]; [1]Brigham Young University

9:05 AM
Basis Functions for Quantifying Grain Boundary Texture in Polycrystalline Microstructures: *Srikanth Patala*[1]; Jeremy Mason[2]; [1]North Carolina State University; [2]University of California, Davis

9:25 AM
Microstructural Evolution Along Geodesics: *Ian Chesser*[1]; Toby Francis[2]; Marc DeGraef[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University; [2]University of California Santa Barbara

9:45 AM
The Grain Boundary Octonion: Metrics, Paths, and Fundamental Zones: *Toby Francis*[1]; Ian Chesser[2]; Saransh Singh[3]; Tresa Pollock[1]; Elizabeth Holm[2]; Marc De Graef[2]; [1]University of California, Santa Barbara; [2]Carnegie Mellon University; [3]Lawrence Livermore National Laboratory

10:05 AM Break

10:25 AM
GB Property Localization: Inference and Uncertainty Quantification of Grain Boundary Structure-property Models: Sterling Baird[1]; Christian Kurniawan[2]; David Fullwood[1]; Eric Homer[1]; *Oliver Johnson*[1]; [1]Brigham Young University; [2]Carnegie Mellon University

10:45 AM
Higher Order Spectral Terms in Grain Boundary Networks: *Christopher Adair*[1]; Oliver Johnson[1]; [1]Brigham Young University

11:05 AM
Investigating the Atomistic Nature of Grain Boundary Failure: *Jacob Tavenner*[1]; Christopher Weinberger[2]; Shawn Coleman[3]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]Colorado State University; [3]Army Research Laboratory

11:25 AM
Characterizing the Energetics and Structural Configurations of Silicon Carbide Grain Boundaries Using High-throughput Atomistic Techniques: *Matthew Guziewski*[1]; Dennis Trujillo[2]; Srikanth Patala[3]; Shawn Coleman[1]; [1]US Army Research Laboratory; [2]University of Connecticut; [3]North Carolina State University

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Session III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Tuesday AM | February 25, 2020
32B | San Diego Convention Ctr

Session Chair: Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

8:30 AM Invited
First-Principles Theory of Nonlinear Optical Responses in 2D Materials and Topological Materials: *Xiaofeng Qian*[1]; [1]Texas A&M University

9:00 AM
Effect of Spin-orbit Coupling on Magnetic Phase Transition of Anti-ferromagnetic Weyl-Semimetal: *Sugata Chowdhury*[1]; Kevin Garrity[1]; Angela Hight Walker[1]; Cindi Dennis[1]; Albert Davydov[1]; Francesca Tavazza[1]; [1]National Institute of Standards and Technology

9:20 AM
Data-driven Discovery of the Functional Form of the Superconducting Critical Temperature: Stephen Xie[1]; Gregory Stewart[2]; James Hamlin[2]; Peter Hirschfeld[2]; *Richard Hennig*[1]; [1]University of Florida, Department of Materials Science and Engineering; [2]University of Florida, Department of Physics

9:40 AM
High-throughput Discovery of Topologically Non-trivial Materials using Spin-orbit Spillage: Kamal Choudhary[1]; Kevin Garrity[1]; *Francesca Tavazza*[1]; [1]Umcp/Nist

10:00 AM
High Throughput Exploration of Two-dimensional Topological Artificial Lattices: *Srilok Srinivasan*[1]; Mathew Cherukara[1]; Subramanian Sankaranarayanan[1]; Pierre Darancet[1]; [1]Argonne National Laboratory

10:20 AM Break

10:35 AM Invited
Towards a First-principles Description of Stronger Correlations: Novel Superconductors to Topological Materials: *Arun Bansil*[1]; [1]Northeastern University

11:05 AM
Two-dimensional Functional Materials with Pentagonal Structure: *Lei Liu*[1]; Immanuella Kankam[1]; Houlong Zhuang[1]; [1]Arizona State University

11:25 AM
Computational Synthesis of 2D Materials: A High-throughput Approach to Materials Design: *Tara Boland*[1]; Arunima Singh[1]; [1]Arizona State University

11:45 AM
Exploring Van der Waals 2D Heterostructures using a Combined Machine Learning and Density Functional Theory Approach: *Daniel Willhelm*[1]; Nathan Wilson[1]; Tahir Cagin[1]; Raymundo Arroyave[1]; Ruth Pachter[2]; Xiaofeng Qian[1]; [1]Texas A&M University; [2]Air Force Research Laboratory

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Chemical Interactions and Modeling

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Tuesday AM | February 25, 2020
Theater A-9 | San Diego Convention Ctr

Session Chairs: Jaime Marian, UCLA; Mike Tonks, University of Florida

8:30 AM Invited
Corrosion of Silicon Carbide in Nuclear Environments: *Izabela Szlufarska*[1]; Jianqi Xi[1]; Cheng Liu[1]; Dane Morgan[1]; [1]University of Wisconsin-Madison

9:10 AM
Modeling of Interface Evolution during Zirconium Alloy Corrosion: *Natalia Tymiak Carlson*[1]; Richard Smith[1]; Bruce Kammenzind[1]; [1]Naval Nuclear Laboratory, Bettis Site

9:30 AM
Influence of Coordination Numbers on Representing Molten Salts for Nuclear Reactor Applications Using the Modified Quasi-Chemical Model (MQM): *Matthew Christian*[1]; Theodore Besmann[1]; [1]University of South Carolina

9:50 AM
Amorphous Zirconia: a Host for Excess Oxygen in Cladding Barrier Oxides?: *Simon Middleburgh*[1]; Michael Rushton[1]; Iuliia Ipatova[1]; Lee Evitts[1]; William Lee[1]; [1]Nuclear Futures Institute

10:10 AM Break

10:30 AM Invited
A Physical Model of Zircaloy Corrosion in Water for Simulating Nuclear Reactor Clad Response: *Jaime Marian*[1]; Qianran Yu[1]; Peng Wang[2]; Michael Reyes[1]; Asghar Aryanfar[3]; Gary Was[2]; [1]UCLA; [2]University of Michigan; [3]Bahçesehir University

11:10 AM
Atomistic Studies of Nuclear Materials with Temperature: Uranium Nitride and Thermocouples: *Ember Sikorski*[1]; Lan Li[1]; [1]Boise State University

11:30 AM
Stabilizing Gamma Hydrides in Zr through Mechanical Stress: *Jake Bair*[1]; Nicole Overman[1]; Shawn Riechers[1]; Ewa Ronnebro[1]; David Collins[1]; David Abrecht[1]; [1]Pacific Northwest National Laboratory

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Solid-Liquid Transformations and Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Tuesday AM | February 25, 2020
33C | San Diego Convention Ctr

Session Chair: Gilles Demange, University of Rouen

8:30 AM Invited
Phase-field Lattice Boltzmann Simulations of Dendrite Growth with Melt Flow: *Tomohiro Takaki*[1]; Shinji Sakane[1]; Munekazu Ohno[2]; Yasushi Shibuta[3]; [1]Kyoto Institute of Technology; [2]Hokkaido University; [3]The University of Tokyo

9:00 AM
Thermodynamics and Kinetics of Electrochemical Solid/Liquid Interfaces: Role of the Solvent: *Mira Todorova*[1]; Suhyun Yoo[1]; Sudarsan Surendralal[1]; Joerg Neugebauer[1]; [1]Max Planck Institut fur Eisenforschung

9:20 AM
Dendritic Growth of Ice on a Metallic Surface: *Gilles Demange*[1]; Helena Zapolsky[1]; Renaud Patte[1]; Marc Brunel[1]; [1]University of Rouen

9:40 AM Invited
Bridging Multi Scales for Predicting Structures and Properties in Solidification of Metals and Alloys: *Mohsen Asle Zaeem*[1]; [1]Colorado School of Mines

10:10 AM Break

10:30 AM Invited
Modeling Nucleation in the Phase-field and Phase-field Crystal Models: *Tamás Pusztai*[1]; Frigyes Podmaniczky[1]; Gyula Tóth[2]; László Gránásy[1]; [1]Wigner Research Centre For Physics; [2]Loughborough University

11:00 AM
Molecular Dynamics Simulations of Heterogeneous Nucleation from Undercooled Melt: *Takuya Fujinaga*[1]; Yasushi Shibuta[1]; [1]Japan

11:20 AM
Thermodynamic Insights into the Solvation of Potential Oxides, Cations, and Anions Emanating from the Martian Regolith Using Ionic Liquids: *Sasan Nouranian*[1]; Alireza Asiaee[1]; Farzin Rahmani[2]; Shan Jiang[1]; Alexander Lopez[1]; Hunain Alkhateb[1]; [1]University of Mississippi; [2]Rutgers University

11:40 AM
Calculating the Eutectic Coupled Zone in a Ternary System via Genetic Optimization: *George Lindemann*[1]; Ashwin Shahani[1]; [1]Department of Materials Science and Engineering, University of Michigan.

SPECIAL TOPICS

Current Trends in Magnetocaloric Materials: An FMD Symposium in Honor of Ekkes Brueck — Strain Enhanced Magnetocaloric, Barocaloric Materials, and Thermomagnetic Generators

Sponsored by: TMS Functional Materials Division

Program Organizers: Victorino Franco, Universidad de Sevilla; Frank Johnson, Niron Magnetics, Inc.

Tuesday AM | February 25, 2020
Marina Ballroom F | Marriott Marquis Hotel

Session Chair: Konstantin Skokov, TU Darmstadt

8:30 AM Invited
Tuning Magnetocaloric Materials with Stress: *Xavier Moya*[1]; [1]University of Cambridge

9:00 AM Invited
Under Pressure: Probing Magneto-structural Coupling in MCE Materials: *Luana Caron*[1]; Sanjay Singh[2]; Ekkes Brueck[3]; Claudia Felser[4]; [1]Bielefeld University; [2]Indian Institute of Technology (Banaras Hindu University), Varanasi; [3]TUDelft; [4]Max Planck Institute for Chemical Physics of Solids

9:30 AM Invited
Giant Barocaloric Effect at the Spin Crossover Transition of a Molecular Crystal: Steven Vallone[1]; Anthony Tantillo[1]; António dos Santos[2]; Jamie Molaison[2]; Rafal Kulmaczewski[3]; Antonin Chapoy[4]; Pezhman Ahmadi[4]; Malcolm Halcrow[3]; *Karl Sandeman*[1]; [1]The City University Of New York; [2]Oak Ridge National Laboratory; [3]University of Leeds; [4]Heriot-Watt University

10:00 AM Break

10:25 AM Invited
Energy Harvesting Using Thermomagnetic Generators with Magnetocaloric Materials: *Anja Waske*[1]; Dzekan[2]; Bruno Neumann[2]; Dietmar Berger[2]; Kai Sellschopp[3]; Alexander Stork[2]; Kornelius Nielsch[2]; Sebastian Fähler[2]; [1]Bundesanstalt für Materialforschung; [2]IFW Dresden; [3]Technische Universität Hamburg

10:55 AM Invited
Materials for Thermomagnetic Harvesting of Low Temperature Waste Heat: Daniel Dzekan[1]; Anja Waske[2]; Kornelius Nielsch[1]; *Sebastian Fähler*[1]; [1]Leibniz IFW Dresden; [2]Bundesanstalt für Materialforschung und –prüfung (BAM)

11:25 AM Invited
Rare-earth-free Permanent Magnets: The Past and Future: *J.Ping Liu*[1]; [1]University of Texas at Arlington

11:55 AM Concluding Comments

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Properties II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Tuesday AM | February 25, 2020
17B | San Diego Convention Ctr

Session Chairs: Peter Lee, University College London; Mark Easton, RMIT University

8:30 AM Invited
Refinement of Coarse Intermetallics in Hypereuectic Al-Si Alloys with High Fe, Mn Contents: Carmelo Todaro[1]; *Mark Easton*[1]; David StJohn[2]; Ma Qian[1]; [1]RMIT University; [2]University of Queensland

9:00 AM Invited
Modification of Al-Si Alloys with Rare Earth Elements: *Prakash Srirangam*[1]; [1]Wmg, University of Warwick

9:30 AM
The Influence of Ultrasound on the Microstructure Formation During the Solidification of A356 Ingots Processed via a 2-Zone Induction Melting Furnace: *Aqi Dong*[1]; Laurentiu Nastac[1]; [1]University of Alabama

9:50 AM
Effect of Zr Additions on Microstructure and Mechanical Properties of Gravity Die Cast AlSi7Mg0.4 Alloys: Yunxiang Zhang[1]; *Haidong Zhao*[1]; Changhai Li[2]; Lin Zhu[2]; [1]South China University of Technology; [2]CITIC Dicastal Co.,Ltd.

10:10 AM Break

10:30 AM
Ti Fading Effect in Primer and Seconder A356 Alloys and Melt Quality: *Ozen Gursoy*[1]; Eray Erzi[2]; Derya Dispinar[2]; [1]ITU; [2]Istanbul University

10:50 AM
Tensile Properties Limits of A356 Alloy by Porosity: Ozkan Kesen[1]; Selim Temel[1]; Okan Aydin[1]; Furkan Tezer[1]; Ozen Gursoy[1]; *Derya Dispinar*[2]; [1]ITU; [2]Istanbul University

11:10 AM
An Investigation on Wear Properties of A390 Alloy by Rare Alloying Elements: Giulio Timelli[1]; *Reza Haghayeghi*[2]; Alessandro De Mori[1]; [1]University of Padova; [2]Azad University

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Grain Boundary Effects at the Nanoscale

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Tuesday AM | February 25, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
Disconnection Mediated Grain Boundary Migration: *Scott Mao*[1]; [1]University of Pittsburgh

8:50 AM
Adsorption and Equilibrium Metal-ceramic Orientation Relationships: Hadar Nahor[1]; Ting Mao[1]; *Wayne Kaplan*[1]; [1]Technion - Israel Institute of Technology

9:10 AM
Ab Initio Study of a Highly Asymmetric Grain Boundary Superstructure in WC: *Chongze Hu*[1]; Zhiyang Yu[2]; Jian Luo[1]; [1]University of California San Diego; [2]Fuzhou University

9:30 AM
A Crystal Plasticity Model with Enhanced Interface Physics: *Jason Mayeur*[1]; [1]University of Alabama in Huntsville

9:50 AM Invited
Critical Assessment of Grain Boundary Role on the Magnetic Flux Trapping in Niobium: P Garg[1]; Thomas Bieler[2]; *Kiran Solanki*[1]; [1]Arizona State University; [2]Michigan State University

10:10 AM Break

10:30 AM
Mechanistic Transitions Underpinning Grain Boundary Segregation Strengthening in Nanocrystalline Alloys: *Jason Trelewicz*[1]; [1]Stony Brook University

10:50 AM
Screw Dislocation Transmission Across the S3{112} Twin Boundary in Face Centered Cubic Copper: *Tengfei Ma*[1]; Nithin Mathew[2]; Lei Cao[1]; Abigail Hunter[2]; [1]University of Nevada, Reno; [2]Los Alamos National Laboratory

11:10 AM
Evolution of Grain Boundary's Metastability in Metallic Nanocrystals Under External Stimuli: Zhitong Bai[1]; *Yue Fan*[1]; [1]University of Michigan

11:30 AM
Multiscale Simulation of the Dislocation-interface Reactions: Methodology, Mechanisms, and Applications: *Liming Xiong*[1]; Youping Chen[2]; [1]Iowa State University; [2]University of Florida

11:50 AM
Atomic Simulations on Properties of Twinning Dislocations in Copper: *DeAn Wei*[1]; Haidong Fan[2]; Xu Zhang[1]; [1]Southwest Jiaotong University; [2]Sichuan University

LIGHT METALS

Electrode Technology for Aluminum Production — Anode Production

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Duygu Kocaefe, University of Quebec at Chicoutimi

Tuesday AM | February 25, 2020
3 | San Diego Convention Ctr

Session Chair: Claude Lavoie, RTA

8:30 AM Introductory Comments

8:35 AM
Development of a Soft Sensor for Detecting Overpitched Green Anodes: *Adéline Paris*[1]; Carl Duchesne[1]; Éric Poulin[1]; Julien Lauzon-Gauthier[2]; [1]Laval University; [2]Alcoa Primary Metals Smelting Center of Excellence

9:00 AM
Diffusion Measurements of CO_2 within Carbon Anodes for Aluminium Smelting: Epma Putri[1]; *Geoffrey Brooks*[2]; Graeme Snook[3]; Lorentz Lossius[4]; Ingo Eick[4]; [1]CSIRO, Swinburne University of Technology; [2]Swinburne University of Technology; [3]CSIRO; [4]Hydro Aluminium

9:25 AM
Testing of SERMA Technology on Industrial Anodes for Quality Control in Aluminum Production: *Yasar Kocaefe*[1]; Duygu Kocaefe[1]; Dipankar Bhattacharyay[1]; Abderrahmane Benzaoui[1]; Jean-François Desmeules[1]; [1]University of Quebec at Chicoutimi

9:50 AM
Modelling of Gas Injection on Anode Baking Furnace and Application to Operations: *Sandra Besson*[1]; Solène Bache[1]; Arnaud Bourgier[1]; Jean-Philippe Schneider[1]; Thierry Conte[1]; [1]Rio Tinto

10:15 AM Break

10:30 AM
Higher Baking and Production Levels in Anode Baking Furnaces and Associated Challenges: *SyedArif Ali*[1]; Charles Lebel-Tremblay[1]; Pierre-Yves Brisson[1]; Alexandre Gagnon[1]; [1]Rio Tinto Aluminium

10:55 AM
Major Reconstruction of Central Casing of Open Top Baking Furnace with a View to Increase Its Lifespan and Reduce the Total Costs Comparing to Full Reconstruction: *Arnaud Bourgier*[1]; [1]Rio Tinto Aluminium

11:20 AM
Regulation & Management of Anode Baking Furnace Production Cycle During Green Anode Crisis: *Suryakant Nayak*[1]; Kalpataru Samal[1]; [1]Hindalco Industries Ltd.

MATERIALS PROCESSING

Electrometallurgy 2020 — Applications to Battery or Materials Synthesis

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Georges Houlachi, Hydro-Quebec; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp

Tuesday AM | February 25, 2020
14A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
A Low-cost Intermediate Temperature Molten Salt Battery for Grid-scale Energy Storage: *Xiaohui Ning*[1]; [1]Xi'an Jiao Tong University

8:50 AM
High-performance Composite Electrolyte Enhanced by Solid Plasticizer and Conductive Ceramic Filler for All-Solid-State Lithium Battery: *Fei Chen*[1]; [1]Wuhan University of Technology

9:10 AM
Study on High-temperature Liquid Lithium Battery with LiI-KI Electrolyte: *Hao Yu*[1]; Huimin Lu[1]; Neale Neelameggham[2]; [1]Beihang University; [2]IND LLC

ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management Symposium — Session III

Sponsored by: TMS Extraction and Processing Division, TMS: Energy Committee

Program Organizers: Xiaobo Chen, RMIT University; Yulin Zhong, Griffith University; Lei Zhang, University of Alaska Fairbanks; John Howarter, Purdue University; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology

Tuesday AM | February 25, 2020
17A | San Diego Convention Ctr

Session Chairs: Cong Wang, Northeastern University; Lihong Su, University of Wollongong

8:30 AM Keynote
An Overall Assessment of Welding Fluxes Geared Towards High Heat Input Applications: *Cong Wang*[1]; [1]Northeastern University

9:00 AM Invited
Achieving Controlled Surface Roughness of Ultra-thin Al Foils as Current Collector: *Lihong Su*[1]; [1]University of Wollongong

9:25 AM
Photocatalytic Hydrogenolysis to Convert Lignin-derivatives to Phenol Under Ambient Conditions: *Yun-Chung Shen*[1]; Jeffrey Wu[2]; [1]Institute of Nuclear Energy Research; [2]National Taiwan University

9:45 AM
Molecular Dynamics Simulation of CO_2 Absorption Behavior in Hydrotalcite and its Derived Oxides: *Hao Zhang*[1]; [1]Univ of Alberta

10:05 AM Break

10:25 AM
Theoretical and Experimental Research on the Mass Changes of Elements in Molten Steel with CO_2 Used as RH Lifting Gas: *Baochen Han*[1]; Rong Zhu[2]; Guangsheng Wei[1]; Chao Feng[1]; Jianfeng Dong[1]; [1]University of Science and Technology Beijing; [2]University of Science and Technology, Beijing

10:45 AM
Improved Physical Solvents for Pre-combustion CO_2 Capture: *Jeffrey Culp*[1]; Robert Thompson[1]; Wei Shi[1]; Surya Tiwari[1]; Kevin Resnik[1]; Nicholas Siefert[2]; David Hopkinson[2]; [1]National Energy Technology Laboratory / LRST; [2]National Energy Technology Laboratory

11:05 AM
Hydrogen as a Fuel and Ramifications: Ashok Khandkar[1]; *Neale Neelameggham*[2]; [1]University of Utah; [2]IND LLC

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Stress Corrosion Cracking I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Tuesday AM | February 25, 2020
Theater A-10 | San Diego Convention Ctr

Session Chairs: Gary Was, University of Michigan; John Scully, University of Virginia

8:30 AM Introductory Comments

8:40 AM Invited
Insights into Factors Controlling IASCC of Stainless Steels: *Gary Was*[1]; Drew Johnson[1]; Diana Farkas[2]; [1]University of Michigan; [2]Virginia Tech

9:20 AM
Effect of Triaxial Stress State on PWSCC Initiation Behavior of Nickel-based Alloy in Nuclear Power Plants: *Seung Chang Yoo*[1]; Kyoung Joon Choi[2]; Jong-Sung Kim[3]; Il Soon Hwang[1]; Ji Hyun Kim[1]; [1]UNIST; [2]Korea Atomic Energy Research Institute; [3]Sejong University

9:40 AM
Determining Reliability Over Time for Stainless Steels Susceptible to Chloride-induced Stress Corrosion Cracking: *Consuelo Guzman-leong*[1]; Joseph Cluever[1]; Stephen Gosselin[1]; [1]LPI, Inc.

10:00 AM Break

10:20 AM Invited
Mitigation of Intergranular Stress Corrosion Cracking in Al-Mg Alloys Through the Electrochemical and Chemical Effects of Metal Rich Primer Coatings Near Stationary and Propagating Cracks: Matthew McMahon[1]; *John Scully*[1]; James Burns[1]; [1]University of Virginia

11:00 AM
Sensitization, Loading Frequency, and Electrochemical Potential Effects on Corrosion Fatigue Kinetics of AA5456-H116: *David Schrock*[1]; Jenifer (Warner) Locke[1]; [1]The Ohio State University

11:20 AM
Evaluating Stress Corrosion Cracking Performance of 5083 H116 Aluminum as a Function of Material Microstructure: *William Golumbfskie*[1]; Matthew McMahon[1]; Emily Holcombe[1]; Mitra Taheri[2]; [1]Naval Surface Warfare Center - Carderock; [2]Drexel University

11:40 AM
Stress Corrosion Cracking of Welded AA5059 Alloy: Rajesh Yadav[1]; *Gajanan Chaudhari*[1]; [1]Indian Institute of Technology

MECHANICS & STRUCTURAL RELIABILITY

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Data-Driven Investigations of Fatigue

Sponsored by: TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University

Tuesday AM | February 25, 2020
11A | San Diego Convention Ctr

Session Chair: Ashley Spear, University of Utah

8:30 AM Break

8:50 AM Invited
Statistical Modeling of Censored Life Data: *D. Gary Harlow*[1]; [1]Lehigh University

9:10 AM
Probabilistic Approach to Minimum Fatigue Life Prediction with Mission Loading and Notch Effects in Ti-6Al-4V: *Patrick Golden*[1]; Sushant Jha[2]; Reji John[1]; [1]Air Force Research Laboratory; [2]University of Dayton Research Institute

9:30 AM
Marked 2-point Spatial Correlations of Microstructure Neighborhoods Surrounding Fatigue Hot-spots in Ti-6Al-4V: *Adrienne Muth*[1]; Surya Kalidindi[1]; Reji John[2]; Adam Pilchak[2]; David McDowell[1]; [1]Georgia Institute of Technology; [2]Air Force Research Laboratory

9:50 AM
Multi-scale Modeling and Uncertainty Quantification of Fatigue Crack Nucleation in Titanium Alloys with Parametrically Homogenized Constitutive Models: *Deniz Ozturk*[1]; Shravan Kotha[1]; Somnath Ghosh[1]; [1]Johns Hopkins University

10:10 AM Break

10:30 AM Invited
A Machine Learning Approach to Predict Fatigue Damage and Crack Initiation Sites in a BCC Steel Microstructure: Ali Riza Durmaz[1]; *Thomas Straub*[1]; Chris Eberl[1]; [1]Fraunhofer IWM

10:50 AM
Probabilistic Dwell Fatigue Life Prediction of Microtextured Ti-6Al-4V: *Sushant Jha*[1]; James Larsen[2]; Reji John[2]; Adam Pilchak[2]; [1]University of Dayton Research Institute; [2]US Air Force Research Laboratory

11:10 AM
Fatigue Crack Growth in Structural Cast Aluminum Alloys: Microstructural Mechanisms, Modeling Strategies, and Integrated Design: *Anthony Spangenberger*[1]; Diana Lados[1]; [1]Worcester Polytechnic Institute

11:30 AM
Variable Amplitude Fatigue Analysis Through an Approach based in the Equivalent Number of Cycles: *Hernan Pinto*[1]; Paola Moraga[1]; Matias Valenzuela[1]; Alvaro Pena[1]; Jose Garcia[1]; [1]Pontificia Universidad Catolica de Valparaiso

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Leveraging Materials in Topology Optimization — Session I

Program Organizer: Natasha Vermaak, Lehigh University

Tuesday AM | February 25, 2020
4 | San Diego Convention Ctr

8:30 AM Program to be announced

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Translating Innovation into Pioneering Technologies III

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Tuesday AM | February 25, 2020
Point Loma | Marriott Marquis Hotel

Session Chairs: Nasrin Hooshmand, Georgia Tech; Jaeyun Moon, University of Nevada Las Vegas

8:30 AM Invited
Multifunctional Flexible Optoelectronic Systems for Bio-interfacing: *Luyao Lu*[1]; [1]George Washington University

8:50 AM
On the Design of Novel 2D Particulates from MAB Phases: *Surojit Gupta*[1]; [1]University of North Dakota

9:10 AM Invited
Study on Photocatalytic Performance of Bi2MoO6/Ag3PO4 z-scheme Composites: *Jaeyun Moon*[1]; Kaleab Ayalew[1]; [1]University of Nevada Las Vegas

9:30 AM Keynote
Tailored Nanomaterials for Advanced Environmental Processes: *Sherine Obare*[1]; [1]UNC Greensboro

10:10 AM Break

10:30 AM Invited
Biomimetic Composites with Self-organized Aramid Nanofibers: *Lizhi Xu*[1]; [1]The University of Hong Kong

10:50 AM Invited
Biogenic Nanoparticles on Exoelectrogens: *Seokheun Choi*[1]; [1]State University of New York at Binghamton

11:10 AM Invited
Carrier Lifetime Dependence on Annealing Conditions in CuxOy Thin Films: A Transient Absorption Study: *Susanne Ullrich*[1]; Learnmore Tanaka Shenje[1]; [1]University of Georgia

11:30 AM Invited
Self-healable, Fully Recyclable and Malleable Electronic Skin based on Dynamic Covalent Thermoset Nanocomposite: *Jianliang Xiao*[1]; [1]University of Colorado Boulder

MATERIALS DESIGN

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering — Applications

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Michael Gao, National Energy Technology Laboratory; Wei Xiong, University of Pittsburgh

Tuesday AM | February 25, 2020
32A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Industrial Applications of Thermodynamic and Kinetics Modeling: *David Furrer*[1]; Dmitri Novikov[1]; Xuan Liu[1]; Sergei Burlatsky[2]; [1]Pratt & Whitney; [2]United Technologies Research Center

9:10 AM Invited
Application of Calphad-based Computational Tools to Alloy Development for Additive Manufacturing: *Greta Lindwall*[1]; Durga Ananthanarayana[1]; Chia-Ying Chou[1]; Niklas Holländer Pettersson[1]; [1]KTH Royal Institute of Technology

9:50 AM Invited
Calphad Applications and Challenges in Gas Turbine Coatings: *Carlos Levi*[1]; [1]University of California, Santa Barbara

10:30 AM Break

10:50 AM Invited
Phase Equilibria in High-entropy and Complex-concentrated Alloys: *Daniel Miracle*[1]; [1]Air Force Research Laboratory

11:30 AM Invited
Recent Progress in Constellium's Thermodynamic & Kinetics Simulation Approach: Christophe Sigli[1]; [1]Constellium Technology Center

ADVANCED MATERIALS

Innovations in High Entropy Alloys and Bulk Metallic Glasses: An SMD & FMD Symposium in Honor of Peter K. Liaw — High Entropy Alloys: Other Properties and Modeling

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee

Program Organizers: Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Yanfei Gao, University of Tennessee - Knoxville; Robert Maass, University of Illinois at Urbana-Champaign; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Soo Yeol Lee, Chungnam National University; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Liang Jiang, Yantai University

Tuesday AM | February 25, 2020
Marina Ballroom G | Marriott Marquis Hotel

Session Chairs: Veerle Keppens, University of Tennessee; Yanfei Gao, University of Tennessee

8:30 AM Invited
Defect Dynamics and Microstructure Evolution in High Entropy Alloys: *Yanwen Zhang*[1]; Takeshi Egami[2]; William Weber[2]; [1]Oak Ridge National Laboratory; [2]The University of Tennessee

8:50 AM Invited
Radiation Effects in High Entropy Alloys and Bulk Metallic Glasses: *Steven Zinkle*[1]; Congyi Li[1]; Tengfei Yang[1]; James Brechtl[1]; [1]University of Tennessee

9:10 AM Invited
Energy Dissipation and Damage Evolution in Irradiated Concentrated Solid Solution Alloys: *William Weber*[1]; Eva Zarkadoula[2]; Yanwen Zhang[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

9:30 AM Invited
High Entropy Alloys as Filler Metals: *Zhenzhen Yu*[1]; Benjamin Schneiderman[1]; Abdelrahman Abdelmotagaly[1]; Chihpin Chuang[2]; Jianxun Hu[3]; [1]Colorado School of Mines; [2]Argonne National Laboratory; [3]Honda R&D Americas, Inc.

9:50 AM Invited
Expanding High-entropy to Ceramics: Identifying High Entropy Oxides with Perovskite, Spinel, or Pyrochlore Structure: *Veerle Keppens*[1]; [1]University of Tennessee

10:10 AM Break

10:20 AM Invited
Tracer Diffusion in High-entropy Alloys: the Impact of Constituents and Composition: *Gerhard Wilde*[1]; [1]University of Muenster

10:40 AM Invited
High-throughput Predicting and Machine-learning Solid-solution Formation: *Michael Gao*[1]; Zongrui Pei[1]; Junqi Yin[2]; Jeffrey Hawk[1]; David Alman[1]; [1]National Energy Technology Laboratory; [2]Oak Ridge National Laboratory

11:00 AM Invited
Microstructure Evolution with Temperature in the Al-rich High-entropy Alloys: *Louis Santodonato*[1]; [1]Advanced Research Systems

11:20 AM Invited
Nature of Metallic Bonding in Bulk Metallic Glasses and High Entropy Alloys: *Wai-Yim Ching*[1]; [1]University of Missouri

11:40 AM Invited
Local Structure in Controlling Microstructure and Property of Lightweight High-entropy Alloys: *Rui Feng*[1]; Chuan Zhang[2]; Michael Gao[3]; Zongrui Pei[3]; Yan Chen[4]; Dong Ma[4]; Ke An[4]; Jonathan Poplawsky[4]; Fan Zhang[2]; Jeffery Hawk[3]; Peter Liaw[1]; [1]University of Tennessee; [2]Computherm, LLC; [3]National Energy Technology Laboratory; [4]Oak Ridge National Laboratory

LIGHT METALS

Magnesium Technology 2020 — Alloy Design and Solidification

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Tuesday AM | February 25, 2020
6C | San Diego Convention Ctr

Session Chairs: Mark Easton, RMIT University; Matthew Kasemer, The University of Alabama

8:30 AM Invited
Insights on Solidification of Mg and Mg-Al Alloys by Large Scale Atomistic Simulations: *Mohsen Asle Zaeem*[1]; Avik Mahata[2]; [1]Colorado School of Mines; [2]Missouri University of Science and Technology

9:00 AM
The Integrated Alloy Design of Anti-corrosion Magnesium Alloy: *Yuan Yuan*[1]; Jiawei Liu[1]; Tao Chen[1]; Jiajia Wu[1]; Li Yang[1]; Aitao Tang[1]; Fusheng Pan[1]; [1]Chongqing University

9:20 AM
CALPHAD Modeling and Microstructure Investigation of Mg-Gd-Y-Zn Alloys: *Janet Meier*[1]; Joshua Caris[2]; Alan Luo[1]; [1]The Ohio State University; [2]Terves LLC

9:40 AM
Intermetallic Phase Formation in Mg-Ag-Nd (QE) and Mg-Ag-Nd-Zn (QEZ) Alloys: *Rainer Schmid-Fetzer*[1]; Jian-Feng Nie[2]; Xiaojun Zhao[3]; Houwen Chen[3]; [1]Clausthal University of Technology; [2]Monash University; [3]Chongqing University

10:00 AM
Investigation of the Microstructure and Mechanical Properties of Mg–Gd–Nd Ternary Alloys: *Yuling Xu*[1]; Lixiang Yang[2]; Weili Liu[3]; Jingli Sun; Lu Xiao[3]; Xianquan Jiang[1]; Norbert Hort[4]; [1]Chongqing Academy of Science and Technology; [2]Shanghai Jiaotong University; [3]Shanghai Spaceflight Precision Machinery Institute; [4]Helmholtz Zeetrum Geesthacht

10:20 AM Break

10:40 AM
Recrystallization Effects on the Forming Behavior of Magnesium Alloy Sheets with Varied Calcium Concentration: *Jan Bohlen*[1]; Huu Chanh Trinh[2]; Klaus Rätzke[2]; Sangbong Yi[1]; Dietmar Letzig[1]; [1]Magic-Magnesium Innovation Ctr; [2]Christian-Albrechts-University

11:00 AM
Towards the Development of High Ductility Mg-Al Based Alloys Through Second-phase Refinement with Trace Yttrium Additions: *Konstantinos Korgiopoulos*[1]; Mihriban Pekguleryuz[1]; [1]Mining and Materials Engineering, McGill University

11:20 AM
Design of Heat Dissipating Mg–La–Zn Alloys based on Thermodynamic Calculations: *Hui Shi*[1]; Qun Luo[1]; Qian Li[1]; Jieyu Zhang[1]; Kuo-Chih Chou[1]; [1]State Key Laboratory of Advanced Special Steel & Shanghai Key Laboratory of Advanced Ferrometallurgy & School of Materials Science and Engineering, Shanghai University & Shanghai Institute of Materials Genome & Materials Genome Institute, Shanghai University

11:40 AM
Effects of Zn Additions on the Room Temperature Formability and Strength in Mg-1.2Al-0.5Ca-0.4Mn Alloy Sheets: *Zehao Li*[1]; Taisuke Sasaki[1]; Kazuhiro Hono[1]; Mingzhe Bian[1]; Taiki Nakata; Shigeharu Kamado[1]; Yu Yoshida[1]; Nozomu Kawabe[1]; [1]NIMS

CHARACTERIZATION

Material Behavior Characterization via Multi-Directional Deformation of Sheet Metal — Session III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Daniel Coughlin, Los Alamos National Laboratory; Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory; John Carsley, Novelis, Inc.

Tuesday AM | February 25, 2020
Theater A-1 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Modeling Anisotropic Plasticity Under Complex Loading Conditions: Effects of Loading Path Changes on Flow Stress, Springback and Formability of Sheet Metals: *Myoung-Gyu Lee*[1]; Hongjin Choi[1]; Jinwoo Lee[2]; Hyuk Jong Bong[2]; [1]Seoul National University; [2]Korea Institute of Materials Science

9:10 AM Invited
Modeling of Hole-expansion of Prestrained Sheets Using Distortional Hardening: *Yannis Korkolis*[1]; Jinjin Ha[1]; [1]Ohio State University

9:50 AM
Numerical Prediction of Ductile Fraction in Bi-axially Stretched Sheet Metal: *Ahmed Elshorbagy*[1]; [1]Enppi

10:10 AM Break

10:30 AM
A New Yield Criterion Accounting for Anisotropy and Anisotropic Asymmetry from Near Isotropy to Triclincity: *Zachary Brunson*[1]; Aaron Stebner[1]; [1]Colorado School of Mines

10:50 AM
Effects of Y Concentration on Mechanical Response of Mg-Y Alloys: *Xin Wang*[1]; Jiaxiang Wang[2]; Kehang Yu[1]; Timothy Rupert[1]; Subhash Mahajan[3]; Enrique Lavernia[1]; Irene Beyerlein[2]; Julie Schoenung[1]; [1]University of California Irvine; [2]University of California, Santa Barbara; [3]University of California, Davis

11:10 AM
Microstructure Control for Enhanced Multi-step Formability: *Menglei Jiang*[1]; Cemal Cem Tasan[1]; [1]Massachusetts Institute of Technology

11:30 AM
Production of Commercially Pure Aluminum Strips via a Single-Step, Machining-based Technique: *Mohammed Naziru Issahaq*[1]; Kevin Trumble[1]; Srinivasan Chandrasekar[1]; [1]Purdue University

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Tuesday AM | February 25, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Christopher Weinberger, Colorado State University; Shawn Coleman, Army Research Laboratory

8:30 AM
Modeling Deformation Twinning in BCC Transition Metals: *Anik Faisal*[1]; Christopher Weinberger[1]; [1]Colorado State University

8:50 AM
Uncovering the Nanoscale Mechanisms Governing Thermomechanical Properties in Solute-stabilized Nanocrystalline Alloys: Ankit Gupta[1]; Gregory Thompson[2]; *Garritt Tucker*[1]; [1]Colorado School of Mines; [2]University of Alabama

9:10 AM
Strong Strain Hardening in Ultrafast Melt-quenched Nanocrystalline Cu: the Role of Fivefold Twins: *Amir Hassan Zahiri*[1]; Pranay Chakraborty[1]; Yan Wang[1]; Lei Cao[1]; [1]University of Nevada Reno

9:30 AM
Investigating the Mechanical Behavior of Nano-architected Materials via Multiscale Discrete Defect Element Method: *Phu Cuong Nguyen*[1]; Ill Ryu[1]; [1]University of Texas at Dallas

9:50 AM
Dislocation-twinning Competitions in Body-centered Cubic Metallic Nanowires: *Chaoming Yang*[1]; Liang Qi[1]; [1]University of Michigan

10:10 AM Break

10:30 AM Invited
Atomistic Study of Ceramic Grain Boundary Deformation: *Shawn Coleman*[1]; Qi An[2]; Matthew Guziewski[1]; [1]CCDC Army Research Laboratory; [2]University of Nevada, Reno

11:10 AM
Superelasticity and Superplasticity in Shape Memory Ceramic Nanoparticles: *Ning Zhang*[1]; Mohsen Asle Zaeem[2]; [1]University of Alabama; [2]Colorado School of Mines

11:30 AM
Failure Mechanisms of Core-shell Nanostructures: *Raghuram Santhapuram*[1]; Arun Nair[1]; [1]University of Arkansas

MATERIALS DESIGN

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session I

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, MicroTesting Solutions; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Tuesday AM | February 25, 2020
33A | San Diego Convention Ctr

Session Chair: Saurabh Puri, Microstructure Engineering

8:30 AM Keynote
Acoustic Emission Measurements During In-situ Scanning Electron Microscopy Experiments to Quantifying Damage Accumulation and Crack Initiation in Microcrystals: Mostafa Omar[1]; Steven Lavenstein[1]; *Jaafar El-Awady*[1]; [1]Johns Hopkins University

9:10 AM
A Novel Fracture Observation in SiC-based Ceramics Through In-situ Double Torsion Testing: *Pania Newell*[1]; Robert Wheeler[2]; Matthew Dickerson[3]; [1]The Unviersity of Utah; [2]Microtesting Solutions LLC; [3]Air Force Research Laboratory

9:30 AM
Assessing Crack Propagation Along Brittle/Ductile Interfaces: *Daniel Kiener*[1]; Markus Alfreider[1]; Stefan Kolitsch[2]; Otmar Kolednik[2]; [1]University of Leoben; [2]Erich Schmid Institute

9:50 AM
Effect of Loading Rate on Fracture Behavior of Magnesium Alloys: *Arjun Sreedhar S*[1]; Suraj Ravindran[2]; Zev Lovinger[2]; G Ravichandran[2]; Narasimhan Ramarathinam[1]; [1]Indian Institute Of Science; [2]California Institute of Technology

10:10 AM Break

10:30 AM Keynote
Fracture Across Length Scales in Tungsten: A Combined Experimental and Predictive Approach: *Kevin Schmalbach*[1]; Rajaprakash Ramachandramoorthy[2]; Manish Jain[3]; Siddharta Pathak[3]; Johann Michler[2]; William Gerberich[1]; Nathan Mara[1]; [1]University of Minnesota; [2]Empa-Thun; [3]University of Nevada-Reno

11:10 AM Invited
Investigating Bulk Mechanical Properties on a Micro-scale: Micro-tensile Testing of Ultrafine Grained Ni-SiC Composite to Determine its Fracture Mechanism and Strain Rate Sensitivity: *Dhriti Bhattacharyya*[1]; Alan Xu[1]; Chao Yang[1]; Gordon Thorogood[1]; [1]Australian Nuclear Science and Technology Organization

11:40 AM
In-situ Micromechanical Characterization of Metallic Glass Microwires Under Torsional Loading: *Sufeng Fan*[1]; Yang Lu[1]; [1]City University of Hong Kong

MATERIALS DESIGN

Metal-Matrix Composites: Analysis, Modeling, Observations and Interpretations — Mechanical Properties and Performance

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys; William Harrigan, Gamma Alloys

Tuesday AM | February 25, 2020
31A | San Diego Convention Ctr

Session Chair: Nikhilesh Chawla, Arizona State University

8:30 AM Invited
In-situ Synthesis of Al/Al2O3 Nanocomposites via Spark Plasma Sintering of Nano-sized Al Powders: *Yaojun Lin*[1]; Zhigang Yan[2]; Zhibo Liu[1]; Fei Chen[1]; Enrique Lavernia[3]; [1]Wuhan University of Technology; [2]Yanshan University; [3]University of California, Irvine

9:00 AM Invited
The Microstructure and Mechanical Properties of Magnesium-based Composites: Role of Reinforcement and Processing: Sankaranarayanan Seetharaman[1]; Jayalakshmi Subramanian[2]; Arvind Singh[2]; *Srivatsan Tirumalai. S.*[3]; Manoj Gupta[3]; [1]Ansys Inc; [2]Wenzhou University; [3]The University of Akron

9:30 AM
The Effect of Solution Treatment Aging on Hardness Improvement of Ti-6Al-4V/TiC Metal Matrix Composite: *James Penney*[1]; Sergey Prikhodko[1]; Pavlo Markovsky[2]; Dmytro Savvakin[2]; Olek Stasuik[2]; [1]University of California, Los Angeles; [2]G.V. Kurdyumov Institute for Metal Physics NAS of Ukraine

9:55 AM Break

10:15 AM
Mechanical Properties of Al-based Metal Matrix Composites Produced by Constrained High Pressure Torsion: *Galiia Korznikova*[1]; Rinat Kabirov[1]; Konstantin Nazarov[1]; Rinat Khisamov[1]; Radik Mulyukov[1]; [1]IMSP RAS

10:40 AM
Effect of Prestrain on Tensile Property of TiNif/Mg Composite: *Chenri Jin*[1]; Suyuan Yang[1]; Yuyang He[1]; Dan Guo[1]; Xingwang Cheng[1]; [1]Beijing Institute of Technology

11:05 AM Invited
A 3D Multiple-Slip Crystal Plasticity Model for Precipitate Hardening in Additively Manufactured High-Strength Steels: Moustafa AbdelHamid[1]; *Tarek Hatem*[2]; [1]Nile University; [2]The British University in Egypt

MATERIALS DESIGN

Microstructural Template Consisting of a Face-Centered Cubic Matrix with Ordered Precipitates: Microstructural Evolution and Properties — Complex Concentrated Alloys/High Entropy Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Rajarshi Banerjee, University of North Texas; Eric Lass, University of Tennessee, Knoxville; Ashley Paz Y Puente, University of Cincinnati; Tushar Borkar, Cleveland State University; Keith Knipling, Naval Research Laboratory; Sophie Primig, University of New South Wales

Tuesday AM | February 25, 2020
30D | San Diego Convention Ctr

Session Chair: Eric Lass, University of Tennessee

8:30 AM Keynote
Elevated Temperature Microstructure Evolution and Properties of an Equiatomic CrCoNi Superalloy Containing Al,Ti: Connor Slone[1]; Easo George[2]; *Michael Mills*[1]; [1]The Ohio State University; [2]Oak Ridge National Laboratory; University of Tennessee

9:10 AM Invited
FCC High-entropy Alloys Strengthened with $L1_2$ Precipitates: Alloying Strategies and Highlights: *Jean-Philippe Couzinie*[1]; Thomas Rieger[1]; Jean-Marc Joubert[1]; Mathilde Laurent-Brocq[1]; Guy Dirras[2]; [1]Université Paris Est, ICMPE (UMR 7182) CNRS-UPEC; [2]Université Paris 13, Sorbonne Paris Cité, LSPM (UPR 3407) CNRS

9:40 AM
Novel Microstructural Template Based on Ordered Intermetallic Precipitation in FCC Based Complex Concentrated Alloys: *Sriswaroop Dasari*[1]; Vishal Soni[1]; Abhinav Jagetia[1]; Rajarshi Banerjee[1]; [1]University of North Texas

10:00 AM Break

10:30 AM Invited
High Temperature Mechanical Properties of a FCC High Entropy Alloy Containing Both Order and Disorder Strengthening Precipitates: *An-Chou Yeh*[1]; Yung-Ta Chen[1]; Yao-Jen Chang[1]; Hideyuki Murakami[2]; Taisuke Sasaki[2]; Kazuhiro Hono[2]; Chen-Wei Li[3]; Koji Kakehi[3]; [1]National Tsing Hua University; [2]National Institute for Materials Science; [3]Tokyo Metropolitan University

11:00 AM
Coarsening Kinetics and Mechanical Properties of fcc Compositionally Complex Alloys Strengthened by $L1_2$ Precipitates: *Thomas Rieger*[1]; Mathilde Laurent-Brocq[1]; Ivan Guillot[1]; Jean-Marc Joubert[1]; Loïc Perrière[1]; Didier Locq[2]; Zhao Huvelin[2]; Azziz Hocini[3]; Guy Dirras[3]; Jean-Philippe Couzinié[1]; [1]ICMPE, UMR 7182, CNRS - UPEC, F-94320, Thiais, France; [2]ONERA, Université Paris Saclay, F-92322 Châtillon – France; [3]Université Paris 13, LSPM (UPR 3407), F-93430 Villetaneuse, France

11:20 AM
A Nickel-based Superalloy Dual-reinforced by $L1_2$ Ni_3Al and DO_{22} Ni_3V Ordered-fcc Precipitates: *Alexander Knowles*[1]; Lucy Reynolds[2]; Vassili Vorontsov[3]; David Dye[2]; [1]University of Birmingham; [2]Imperial College London; [3]University of Strathclyde

11:40 AM
Coarsening and Creep Behavior of Co-Ni-Al-W-Ti-Ta-B Superalloy with High ' Solvus Temperature: *Fei Xue*[1]; Dingwen Chung[1]; Eric Lass[2]; David Seidman[1]; David Dunand[1]; [1]Northwestern University; [2]The University of Tennessee

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Lead and Zinc Current Challenges and Opportunities: Plenary Session

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday AM | February 25, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
Our Common Future in Metallurgy: *Maurits Van Camp*[1]; Elien Haccuria[1]; Tom Hennebel[1]; Christina Meskers[1]; [1]Umicore

9:00 AM
Material Stewardship for Zinc: *Sabina Grund*[1]; Eric Van Genderen[1]; [1]International Zinc Association (IZA)

9:30 AM Plenary
Liu Cheng[1]; [1]China ENFI Engineering Corporation

10:00 AM Question and Answer Period

10:30 AM Break

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — By-product Recovery I

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday AM | February 25, 2020
14B | San Diego Convention Ctr

Session Chair: To Be Announced

10:50 AM
Hydrometallurgical Recovery of Tin from Harris Dross: *Ryosuke Sato*[1]; Koichiro Hirata[1]; Fumito Tanaka[1]; [1]Mitsubishi Materials Corporation

11:10 AM
Pb & Other Impurities Recovery from Cu Smelting Residues in JX Nippon Mining & Metals: *Nobuaki Okajima*[1]; Takuma Takei[1]; Shojiro Usui[1]; [1]JX Nippon Mining & Metals Corporation

11:30 AM
Improving the Byproduct Availability in Zinc Production: an Alternative Extraction Process for Indium: Xinkai Fu[1]; Katrin Daehn[1]; Antoine Allanore[1]; *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

11:50 AM
Pyrometallurgical Recovery of Valuable Metals from Flue Dusts of Copper Smelter through Lead Alloy: Wenzhao Cui[1]; Mao Chen[2]; *Baojun Zhao*[2]; [1]Dongying Fangyuan Nonferrous Metals Co. Ltd; [2]University of Queensland

---

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Primary Zinc II

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday AM | February 25, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

10:50 AM
Resource Efficiency Evaluation of Pyrometallurgical Solutions to Minimize Iron-rich Residues in the Roast-leach-electrowinning Process: Alejandro Abadias Llamas[1]; Neill Bartie[2]; Magdalena Heibeck[2]; Michael Stelter[1]; *Markus Reuter*[2]; [1]TU Bergakademie Freiberg; [2]Helmholtz Institute Freiberg for Resource Technology

11:10 AM
Zinc Plant Expansion and Modification for Increased Metals Recovery: *Björn Saxen*[1]; Florentino Estrada[2]; Maciej Wrobel[1]; Marko Lahtinen[1]; [1]Outotec; [2]Met-Mex Peñoles

11:30 AM
Experience with Digital Process Optimization of Zinc Roasting Plants: Robert Schiemann[1]; Steffen Haus[1]; *Marcus Runkel*[1]; Jörg Hammerschmidt[1]; [1]Outotec

11:50 AM
Bulk Zn / Pb Concentrate Treatment with the Albion Process™ at Nordenham Zinc Refinery: *Paul Voigt*[1]; [1]Glencore Technology

---

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Zinc Leaching & Fe-control I

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday AM | February 25, 2020
15B | San Diego Convention Ctr

Session Chair: To Be Announced

10:50 AM
The Process Improvement Researches for Zinc in China: *Haibei Wang*[1]; Kaixi Jiang[1]; Yufang Wang[1]; Sanping Liu[1]; Chaozhen Zheng[1]; Shuchen Qin[1]; [1]BGRIMM Technology Group

11:10 AM
Smelting Jarosite and Sulphur Residue in a Plasma Furnace: *Justin Salminen*[1]; Jens Nyberg[2]; Matej Imris[3]; Bror Heegaard[3]; [1]Boliden Kokkola; [2]Boliden Smelters; [3]ScanArc

11:30 AM
Simulation of an Alternative Direct Leaching Process for High Iron Content Zinc Concentrates: *Caio Oliveira*[1]; Daniel Pereira[1]; [1]Nexa Resources

11:50 AM
Application of Hematite Iron Removal Process in Zinc Smelting Production: *Qin Mingxiao*[1]; Dai Jianghong[1]; [1]China ENFI Engineering Corporation

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIX — Phase Stability of Energy Materials

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hiroshi Nishikawa, Osaka University; Shi-Kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology, CAS; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; Song-Mao Liang, Clausthal University of Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH

Tuesday AM | February 25, 2020
Marina Ballroom E | Marriott Marquis Hotel

Session Chairs: Shih-Kang Lin, National Cheng Kung University; Shien Ping Feng, The University of Hong Kong

8:30 AM
Full Battery Design for Li-ion Batteries Using CALPHAD Technique: *Dajian Li*[1]; Song-Mao Liang[2]; Yuan Yuan[3]; Weibin Zhang[4]; [1]Karlsruhe Institute of Technology; [2]University of Wisconsin Madison; [3]Chongqing University; [4]Shandong University

8:50 AM
Challenges and Solutions for Experimental Investigation of Air and Moisture Sensitive Li Alloys: *Joel Fels*[1]; Thomas Reichmann[2]; Hans Flandorfer[3]; Hans Seifert[1]; [1]Karlsruhe Institute of Technology; [2]G-Technology GmbH; [3]University of Vienna

9:10 AM
An Ab-initio Study on the Structural and Electrochemical Propeties of Na3V2(PO4)2F3 as Cathode Materials for Hybrid-ion Batteries: *Kuei-Hsi Chen*[1]; Ngoc Thanh Thuy Tran[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

9:30 AM
Thermodynamic Modeling of the Cu-Mg-Si-Sn Quaternary System and Interpretation of $Mg_2(Si_{0.3}Sn_{0.7})$/Cu Thermoelectric Interconnections: *Silvana Tumminello*[1]; Sahar Ayachi[1]; Suzana Fries[2]; Eckhard Müller[1]; Johannes de Boor[1]; [1]German Aerospace Center (DLR); [2]ICAMS-Ruhr University Bochum

9:50 AM Break

10:20 AM
Study on the Phase Diagrams of Bi-Te Binary and Bi-Te-RE (Yb, La, Ce, Nd, Sm, Tb, Er) Ternary Systems: Cun Mao[1]; Mingyue Tan[1]; Libin Liu[1]; *Ligang Zhang*[1]; [1]Central South University

10:40 AM
CALPHAD-assisted Analyses of BOF Slag Modification and Reduction: *Han-Yu Wang*[1]; Wan-Yu Huang[1]; Yung-Chang Liu[2]; Kuan-Ju Lin[2]; Shih-Kang Lin[1]; [1]National Cheng Kung University; [2]China Steel Corporation

11:00 AM
High-throughput CALPHAD-type Calculation in Design of Coherent Precipitate-strengthening AlCuFeNiTi Multi-principal Element Alloys: *Shao-Yu Yen*[1]; Hao-Che Wang[1]; Shih-Kang Lin[1]; [1]National Cheng-Kung University

11:20 AM
Effects of Ge/Sb Intermixing on the Local Structures and Optical Properties of GeTe-Sb_2Te_3 Superlattice: *Gang Han*[1]; Furong Liu[1]; [1]Beijing University of Technology

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Microstructure and Precipitation I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Tuesday AM | February 25, 2020
33B | San Diego Convention Ctr

Session Chairs: Stoichko Antonov, University of Science and Technology Beijing; Duyao Zhang, RMIT University

8:30 AM
In-situ X-ray Diffraction Measurement during Deformation of Austenite above the Ae_3 Temperature: *Clodualdo Aranas*[1]; Samuel Rodrigues[2]; Fulvio Siciliano[3]; John Jonas[4]; [1]University of New Brunswick; [2]Federal Institute of Maranhao; [3]Dynamic Systems Inc; [4]McGill University

8:50 AM
Crystallographic Characteristics of γ'-Fe4N Formation Upon Nitriding of α-Fe: *Helge Schumann*[1]; Gunther Richter[2]; Andreas Leineweber[1]; [1]TU Bergakademie Freiberg; [2]Max Planck Institute for Intelligent Systems

9:10 AM
Atomic Structures and Processes in Al-Cu alloys: *Matthew Chisholm*[1]; Dongwon Shin[1]; Gerd Duscher[2]; Lawrence Allard[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee-Knoxville

9:30 AM
Controlling Microstructure of Nanotwinned Cu by Tuning the Electroplating Temperatures and Chemical Additives: *Kuan-Ju Chen*[1]; [1]National Chiao Tung University

9:50 AM
Morphological and Structural Instability of Iron-rich Precipitates in Cu-Fe-Co Alloys: *Gilles Demange*[1]; Kaixuan Chen[2]; Helena Zapolsky[1]; Renaud Patte[1]; Z.D. Wang[2]; [1]University Of Rouen; [2]School of Materials Science and Engineering, University of Science and Technology Beijing

10:10 AM Break

10:30 AM
Iron-rich Microstructures in Post-Detonation Nuclear Debris: *Timothy Genda*[1]; Kim Knight[2]; Zurong Dai[2]; Bethany Goldblum[1]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Lawrence Livermore National Laboratory

10:50 AM
Oscillated Cooling Method as an Alternative Crystal Growth Route to Control the Microstructure during Peritectic Solidification: *Babak Alinejad*[1]; Alberto Castellero[2]; Marcello Baricco[2]; [1]Ibaraki University; [2]Turin University

11:10 AM
Nanostructure of Fe0.65Cr0.35 Close to the Upper Limit of the Miscibility Gap: *Frederic Danoix*[1]; Alexander Dahlstrom[2]; Peter Hedstrom[2]; Joakim Odqvist[2]; Helena Zapolsky[3]; [1]CNRS; [2]KTH Royal Institute of Technology; [3]Normandy University

11:30 AM
Morphological Evolution Mechanisms in Phase-separating Polycrystalline Alloy Films Exposed to a Vapor Phase: *William Farmer*[1]; Rahul Raghavan[1]; Kumar Ankit[1]; [1]Arizona State University

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Nanostructured Metals III

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Tuesday AM | February 25, 2020
31B | San Diego Convention Ctr

Session Chairs: Timothy Rupert, University of California – Irvine; Jessica Krogstad, University of Illinois, Urbana-Champaign

8:30 AM Invited
Controlling Grain Boundaries (GBs) in Processing and Properties: From Computing GB Diagrams to Understanding Embrittlement and Stabilizing Nanoalloys: *Jian Luo*[1]; [1]University of California, San Diego

9:00 AM Invited
High-strength and Thermal Stability of Nanotwinned Al Alloys: Qiang Li[1]; Sichuang Xue[1]; Yifan Zhang[1]; Jian Wang[2]; Haiyan Wang[1]; *Xinghang Zhang*[1]; [1]Purdue University; [2]University of Nebraska, Lincoln

9:30 AM
Review of Thermal Stability of Nanocrystalline and Nanostructured Materials and Methods how to Control it: *Lilia Kurmanaeva*[1]; [1]INT, KIT (Germany); MSE, University of California, Davis (USA)

9:50 AM
Thermal Stability of Nanostructured Ferritic and Austenitic Stainless Steels: *Maalavan Arivu*[1]; Andrew Hoffman[1]; Jiaqi Duan[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

10:10 AM Break

10:30 AM Invited
Novel Microstructures from Non-equilibrium Processing of Metal Powder: *Kenong Xia*[1]; [1]University of Melbourne

11:00 AM Invited
Microstructures and Tensile Mechanical Properties of Ultrafine Grained Al and Cu Matrix Nanocomposites Fabricated by High Energy Mechanical Milling and Thermomechanical Powder Consolidation: *Deliang Zhang*[1]; Lei Cao[2]; Wei Zeng[2]; Wenjing Wang[2]; Jiamiao Liang[2]; Enrique Lavernia[3]; [1]Northeastern University; [2]Shanghai Jiao Tong University; [3]University of California, Irvine

11:30 AM
Electrodeposition of Nanostructured Nickel Foils: *Alan Jankowski*[1]; [1]Sandia National Laboratories

11:50 AM
Severe Plastic Deformation Enhanced Segregation and Precipitation in Nanostructured Steels: *Andrew Hoffman*[1]; Maalavan Arivu[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

MATERIALS DESIGN

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin — Titanium Alloys

Sponsored by: TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Ayman Salem, MRL Materials Resources LLC; Viola Acoff, University of Alabama; Nathan Levkulich, UES; Michael Glavicic, Rolls-Royce; Yufeng Zheng, University of Nevada, Reno; John Rotella, Purdue University

Tuesday AM | February 25, 2020
30E | San Diego Convention Ctr

Session Chairs: Adam Pilchak, Air Force Research Laboratory; Matthew Dunstan, US Army

8:30 AM Invited
Regulating Plastic Deformation by Structural Phase Transformations and Cice Vesa for Unprecedented Mechanical Properties: *Yunzhi Wang*[1]; [1]The Ohio State University

9:00 AM Invited
The Evolution of Abnormal Grains Structures during Beta Annealing of Ti-64 Wrought Products: Nicholas Byres[1]; Pratheek Shanthraj[1]; Benjamin Dod[2]; Jack Donoghue[3]; Alec Davis[1]; Joao Quinta da Fonseca[1]; *Philip Prangnell*[1]; [1]University of Manchester; [2]Airbus; [3]The University of Manchester

9:30 AM
Martensitic Variant Selection Under Applied Stress: A New Approach Applied to the ß Transformation in Titanium: Zachary Brunson1; Adam Pilchak2; Eric Payton2; Aaron Stebner1; 1Colorado School of Mines; 2United States Air Force Research Laboratory

9:50 AM
Manipulation of Microstructure and Microstructural Gradients through Dehydrogenation of Hydrogen-sintered Ti-6Al-4V: *Matthew Dunstan*[1]; James Paramore[1]; Z. Zak Fang[2]; Pei Sun[2]; [1]United States Army Research Laboratory; [2]University of Utah

10:10 AM Break

10:30 AM Invited
Transformations, Recrystallization, Microtexture and Plasticity in Titanium Alloys: *Dipankar Banerjee*[1]; [1]Indian Institute of Science

11:00 AM Invited
The Effects of Alpha-beta Interaction on the Texture Development of Zr and Ti Alloys during Hot Working: *Joao Quinta da Fonseca*[1]; Chi-Toan Nguyen[1]; Christopher Daniel[2]; Philip Prangnell[2]; Pratheek Shanthraj[2]; Benjamin Dod[3]; Peter Honniball[4]; [1]University Of Manchester; [2]University of Manchester; [3]Airbus; [4]Rolls-Royce

11:30 AM Invited
The Role of Plastic Rotation in the Breakdown of Colony Microstructures in Two Phase Titanium Alloys: S. Keith Markham[1]; Mayo Mizak[1]; Adam Pilchak[2]; *Victoria Miller*[3]; [1]North Carolina State University; [2]Air Force Research Laboratory; [3]University of Florida

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Irradiation of Fe-based Systems

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Tuesday AM | February 25, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Joel Ribis, Commissariat a l'Energie Atomic CEA; Phil Edmonson, Oak Ridge National Laboratory

8:30 AM Invited
Separate Effects to Integral Effects - All Things Radiation effects in FeCrAl: *Kevin Field*[1]; Maxim Gussev[1]; Xiang Chen[1]; Caleb Massey[1]; Dalong Zhang[2]; Samuel Briggs[3]; Janelle Wharry[4]; Kurt Terrani[1]; [1]Oak Ridge National Laboratory; [2]Pacific Northwest National Laboratory; [3]Oregon State University; [4]Purdue University

9:00 AM
Effects of Radiation Parameters on Defect Evolution in FeCrAl Alloys under Single-, Dual- and Triple-Ion Beam Irradiation: *Pengyuan Xiu*[1]; Li Jiang[1]; Chao Ye[1]; Lumin Wang[1]; [1]Department of Nuclear Engineering and Radiological Sciences, University of Michigan

9:20 AM
Irradiation Enhanced Alpha Prime Precipitation in 2nd Gen. FeCrAl Alloys After Neutron Irradiation to 7 dpa: *Caleb Massey*[1]; Kevin Field[1]; Philip Edmondson[1]; Steven Zinkle[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

9:40 AM
Data-driven Discrete Dislocation Dynamics Modeling of Yielding Behavior of Irradiated FeCrAl Steel: *Yash Pachaury*[1]; Sanjoy Mazumder[1]; George Warren[1]; Giacomo Po[2]; Janelle Wharry[1]; Anter El-Azab[1]; [1]Purdue University; [2]University of Miami

10:00 AM Break

10:20 AM
Radiation Response of Grade 92 Ferritic-martensitic Steel Irradiated up to 14.63 dpa at ~700°C: *Weicheng Zhong*[1]; Lizhen Tan[1]; [1]Oak Ridge National Laboratory

10:40 AM
Comparison of the Irradiated Microstructure Formed in 800H After Neutron Irradiation and Dual Beam Ion Irradiation: *Christopher Ulmer*[1]; Arthur Motta[1]; [1]The Pennsylvania State University

11:00 AM
Microstructural Investigation of Flux effect on Neutron-irradiated RPV Steels: *Auriane Etienne*[1]; Andreas Ulbricht[2]; Bertrand Radiguet[1]; [1]University Of Rouen; [2]Helmholtz-Zentrum Dresden-Rossendorf

11:20 AM
Influence of Alloying Elements on Microstructure Evolution in 21Cr32Ni Model Alloy Microstructure after In-situ Ion Irradiation: *Muhammet Ayanoglu*[1]; Christopher Ulmer[1]; Arthur Motta[1]; [1]The Pennsylvania State University

11:40 AM
Response of Solidification Cellular Structures in Additively Manufactured 316 Stainless Steel to Heavy Ion Irradiation: an In situ Study: *Zhongxia Shang*[1]; Cuncai Fan[1]; Sichuang Xue[1]; Jie Ding[1]; Jin Li[1]; Thomas Voisin[2]; Yinmin Wang[2]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Lawrence Livermore National Laboratory

MATERIALS PROCESSING

Rare Metal Extraction & Processing — PGM, Zn, V, Ti, U, Th, In, Ag, Fe

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Kerstin Forsberg, KTH Royal Institute of Technology; Alafara Baba, University of Ilorin

Tuesday AM | February 25, 2020
13 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Keynote
Electrodialysis in Hydrometallurgical Proceses: *Odne Burheim*[1]; Liyuan Deng[1]; Kerstin Forsberg[2]; Øivind Wilhelmsen[1]; Pauline Zimmermann[1]; [1]Norwegian University of Science and Technology; [2]KTH

9:00 AM
Leaching of Eudialyte – the Silicic Acid Challenge: *Dag Eriksen*[1]; Kurt Forrester[1]; Mark Saxon[1]; [1]Primus.inter.pares AS

9:20 AM
Co-precipitation of Impurity (Ti, Fe, Al, Zr, U, Th) Phases during the Recovery of $(NH_4)_3ScF_6$ from Strip Liquors by Anti-solvent Crystallization: *Edward Peters*[1]; Carsten Dittrich[2]; Bengi Yagmurlu[2]; Kerstin Forsberg[1]; [1]KTH Royal Institute of Technology; [2]MEAB Chemie Technik GmbH

9:40 AM
Impurity Uptake during Cooling Crystallization of Nickel Sulfate: *Ina Beate Jenssen*[1]; Seniz Ucar[1]; Oluf Bøckman[2]; Ole Morten Dotterud[2]; Jens-Petter Andreassen[1]; [1]Norwegian University of Science and Technology; [2]Glencore Nikkelverk AS

10:00 AM
Potential of a Nigerian Cassiterite Ore for Industrial Steel Coatings: *Alafara Baba*[1]; Abdulrasheed Yusuf[1]; Folahan Adekola[1]; Abdul Alabi[2]; Kuranga Ayinla[1]; Abdullah Ibrahim[1]; Christianah Adeyemi[3]; Mustapha Raji[1]; Sadisu Girigisu[3]; Rasaki Gbadamosi[1]; Aishat Abdulkareem[4]; [1]University of Ilorin; [2]Kwara State University, Malete; [3]Federal Polytechnic Offa; [4]National Mathematical Centre, Sheda-Kwali

10:20 AM Break

10:35 AM
The Iron Precipitate from Primary Zinc Production – A Potential Future Source for Indium and Silver: *Stefan Steinlechner*[1]; Lukas Höber[1]; [1]Montanuniversitaet Leoben

10:55 AM
Recovery of Platinum Group Metals from Secondary Sources by Selective Chlorination from Molten Salt Media: *Ana Maria Martinez*[1]; Karen Osen[1]; Anne Støre[1]; [1]Sintef

11:15 AM
Study on the Mechanisms for Vanadium Phases Transformation of Vanadium Slag Non-salt Roasting Process: Junfan Yuan[1]; Hao Du[2]; David Dreisinger[3]; Jiongtian Liu[1]; Guihong Han[1]; Yijun Cao[1]; *Meng Li*[1]; [1]Zhengzhou University; [2]Chinese Academy of Sciences; [3]University of British Columbia

11:35 AM
Reclamation of Precious Metals from Small Electronic Components of Computer Hard Disks: *Rekha Panda*[1]; Manis Kumar Jha[1]; Om Shankar Dinkar[1]; Devendra Deo Pathak[2]; [1]CSIR-National Metallurgical Laboratory; [2]Indian Institute of Technology (ISM)

ELECTRONIC MATERIALS

Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications — Printed Electronics II: Functional Materials and Devices

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Ravindra Nuggehalli, New Jersey Institute of Technology; Anming Hu, University of Tennessee; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Yong Lin Kong, University of Utah; Mariappan Paranthaman, Oak Ridge National Laboratory

Tuesday AM | February 25, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Anming Hu, The University of Tennessee, Knoxville; Yong Lin Kong, University of Utah

---

8:30 AM Invited
Nanomaterial Ink Development for Additive Manufacturing of Sensors: *David Estrada*[1]; [1]Boise State University

8:55 AM Invited
Hybrid Nanomanufacturing for Wearable Intelligence: *Wenzhuo Wu*[1]; [1]Purdue University

9:20 AM Invited
Direct-write & Precise Patterning of Functional Nanofibers on Non-planar Substrate: *Jiyoung Chang*[1]; [1]University of Utah

9:45 AM
Materials and Process Development for Passive and Active Gas Sensors: *Lydia Skolrood*[1]; Pooran Joshi[1]; Ilia Ivanov[1]; Eric Muckley[1]; Andrew Lupini[1]; Timothy McKnight[1]; Timothy McIntyre[1]; Christine Fisher[1]; Tolga Aytug[1]; [1]Oak Ridge National Laboratory

10:05 AM Break

10:25 AM
Fully Printed CNT-FET on a Flexible Substrate: Yongchao Yu[1]; Justine Valka[2]; Anming Hu[1]; Nance Ericson[2]; *Pooran Joshi*[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

10:45 AM Invited
Screen Printing to 3D Printing of Solar Cells- An Overview: *Vishal Mehta*[1]; Nuggehalli Ravindra[2]; [1]Ohio Northern University; [2]New Jersey Institute of Technology

11:10 AM
Peel-and-Stick Inkjet Printed Polyaniline Sensors for Ammonia Gas Sensing: *Christine Fisher*[1]; Pooran Joshi[1]; Vishaldeep Sharma[1]; Yongchao Yu[2]; Kai Li[1]; Tolga Aytug[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee, Knoxville

11:30 AM
Controlled Modulation of Gas Sensing in Printed Graphene: Nanoparticle Nucleation and Defect Engineering in Exfoliated Graphene Flakes: *Harrison Loh*[1]; Konstantinos Sierros[1]; [1]West Virginia University

---

BIOMATERIALS

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Functional Films and Coatings

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carrado, IPCMS - CNRS; Heinz Palkowski, Clausthal University of Technology; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Ramana Chintalapalle, University of Texas at El Paso; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington; Vikas Tomar, Purdue University

Tuesday AM | February 25, 2020
Oceanside | Marriott Marquis Hotel

Session Chair: Gerald Ferblantier, Icube Laboratory UNISTRA

8:30 AM Keynote
Growth and Characterization of Doped-silicon-based Nanomaterials for Optical Applications: *Hervé Rinnert*[1]; [1]Institut Jean Lamour - Université de Lorraine

9:10 AM Invited
3D Design of Multifunctionnal Plasmonic Nanoparticles Assemblies Embedded in Dielectrics: *Caroline Bonafos*[1]; Nicolas Chery[1]; Clément Majorel[1]; Meiling Zhang[1]; Nicolas Mallet[2]; Patrick Benzo[1]; Maxime Bayle[3]; Alessandro Pugliara[4]; Kremena Makasheva[5]; Béatrice Pécassou[1]; Enrique Navarro[6]; Christian Girard[1]; Anne-Sophie Royet[7]; Pablo Acosta Alba[7]; Sébastien Kerdilès[7]; Yohann Spiegel[8]; Frank Torregrosa[8]; Guilhem Larrieu[2]; Filadelfo Cristiano[2]; Hervé Rinnert[9]; Fabrice Gourbilleau[10]; Robert Carles[1]; Vincent Paillard[1]; [1]CEMES-CNRS; [2]LAAS-CNRS; [3]Université de Nantes; [4]UMS Raimond Castaing; [5]Université de Toulouse; [6]IPE-CSIC; [7]CEA-LETI; [8]IBS; [9]Université de Nancy; [10]CIMAP

9:40 AM
ZnSnO thin films as a good candidate for transparent and conducting oxides (TCO) applications.: *Gerald Ferblantier*[1]; Karima Bouras[1]; Guy Schmerber[2]; Abdelillah Slaoui[1]; [1]Icube Laboratory - Strasbourg University; [2]IPCMS-Strasbourg University

10:00 AM Break

10:30 AM
Elaboration and Characterization of Thin Films of SiP Lamellar Alloys: *Mathieu Stoffel*[1]; Sebastien Geiskopf[1]; Alix Valdenaire[1]; Xavier Devaux[1]; Erwan André[1]; Cedric Carteret[1]; Alexandre Bouché[1]; Michel Vergnat[1]; Hervé Rinnert[1]; [1]Université de Lorraine/Institut Jean Lamour

10:50 AM
Influence of Interface Chemistry on the Adhesion between Metallic Films and Polymer Substrates: *Megan Cordill*[1]; Marian Kennedy[2]; [1]Erich Schmid Institute; [2]Department of Materials Science and Engineering, Clemson University

11:10 AM Invited
Reparation and Characterization of Lutein Loaded Folate Conjugated Nanoparticles to Treat Hypoxic Ischemic Encephalopathy (HIE): *Jwala Renukuntla*[1]; [1]Fred Wilson School of Pharmacy

ENERGY & ENVIRONMENT

Recycling of Secondary, Byproduct Materials and Energy — Recycling of E-Waste

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Mingming Zhang, ArcelorMittal Global R&D; John Howarter, Purdue University; Elsa Olivetti, Massachusetts Institute of Technology; Alan Luo, Ohio State University; Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology

Tuesday AM | February 25, 2020
16A | San Diego Convention Ctr

Session Chairs: Elsa Olivetti, Massachusetts Institute of Technology; Ziqi Sun, Queensland University of Technology; Michael Free, University of Utah; Mark Strauss, Idaho National Laboratory

8:30 AM Introductory Comments

8:35 AM
A Novel Method for Extracting Cobalt, Lithium, Nickel and Manganese from Recycled Lithium-ion Batteries using Electrochemistry: *Mark Strauss*[1]; Luis Aldana[1]; David Reed[1]; Tedd Lister[1]; [1]Idaho National Laboratory

9:00 AM
Recycling of Crystalline Silicon Solar (PV) Panels: Technological Challenges, Economical Feasibility and Environmental Impact: *Jan-Philipp Mai*[1]; Neda Resay[1]; York Smith[2]; [1]JPM Technologies; [2]University of Utah

9:20 AM
Thermal Disengagement Technology: the Perspective of Microrecycling of Polymer-metal Multilayer Packaging Materials: *Md. Abdullah Al Mahmood*[1]; Rumana Hossain[1]; Veena Sahajwalla[1]; [1]University of New South Wales

9:40 AM
Efficient Recovery Processes for The Black Mass from Spent Lithium-ion Batteries: *Yaocai Bai*[1]; Rachid Essehli[1]; Jianlin Li[1]; Ilias Belharouak[1]; [1]Oak Ridge National Laboratory

10:00 AM Break

10:20 AM
A Potential Hydrometallurgical Treatment for Valuable Metal Recovery from E-waste: Bromine Leaching: *Hao Cui*[1]; Corby Anderson[1]; [1]Colorado School of Mines

10:40 AM
A Recycling System for Sustainable Management of Waste Solar Photovoltaic Panels in Taiwan: *Esher Hsu*[1]; Chen-Ming Kuo[2]; [1]National Taipei University; [2]I-Shou University

11:00 AM
Electrolysis Recovery Copper from Waste Printed Circuit Boards: *Juanjuan Hao*[1]; Yishu Wang[1]; Limin Ma[1]; Yufeng Wu[1]; Fu Guo[1]; [1]Beijing University of Technology

11:20 AM
Controllable Synthesis of Battery-grade Iron Oxalate with Waste Ferrous Sulfate from Titanium Dioxide Production: *Keyu Zhang*[1]; Yin Li[1]; Runhong Wei[1]; Yunke Wang[1]; Yongnian Dai[1]; Yaochun Yao[1]; [1]Kunming University of Science and Technology

ADVANCED MATERIALS

Refractory Metals 2020 — Refractory Metals Production and Processing

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee

Program Organizers: Eric Taleff, University of Texas at Austin; Gary Rozak, H.C. Starck Inc; Todd Leonhardt, Rhenium Alloys Inc.

Tuesday AM | February 25, 2020
Cardiff | Marriott Marquis Hotel

Session Chairs: Gary Rozak, H.C. Starck; Todd Leonhardt, Rhenium Alloys

8:30 AM
Pressureless Sintering and Microstructure Evolution of Ultrafine-grained Tungsten: *Yanhao Dong*[1]; Xingyu Li[2]; Lin Zhang[2]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]University of Science and Technology, Beijing

8:50 AM
Direct Production of Ta Powders: *Jawad Haidar*[1]; [1]Kinaltek Pty Ltd.

9:10 AM
Modifying Grain Boundary Cohesion in Ultra-fine Grained Tungsten and Tungsten-based Nanocomposites through Systematic Doping: *Michael Wurmshuber*[1]; Simon Doppermann[1]; Stefan Wurster[2]; Reinhard Pippan[2]; Daniel Kiener[1]; [1]Department of Materials Science, Montanuniversität Leoben; [2]Erich Schmid Institute, Austrian Academy of Sciences

9:30 AM
Mechanical Testing of Tungsten-Steel Laminate Composites for use in Fusion Applications: *Sara Wonner*[1]; Lauren Garrison[2]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory

9:50 AM
Refractory Alloys 3D Printing for Missile and Space Applications: *Youping Gao*[1]; John Porter[1]; Noah Philips[2]; Omar Mireles[3]; [1]Castheon Inc.; [2]ATI Specialty Alloys and Components ; [3]NASA Marshall Space Flight Center

10:10 AM Break

10:30 AM
Hot Isostatic Pressing of WC-3009 Niobium-Based Refractory Alloy: *Calvin Mikler*[1]; Benjamin Georgin[1]; Brian Welk[1]; Gopal Viswanathan[1]; Kevin Chaput[2]; Hamish Fraser[1]; [1]The Ohio State University; [2]Air Force Research Laboratory

10:50 AM
Performance of Niobium and Molybdenum Alloys for High Temperature Sensing Applications: *Scott Riley*[1]; Beck Perrine[1]; Ember Sikorski[1]; Lan Li[1]; Richard Skifton[2]; Brian Jaques[1]; [1]Boise State University; [2]Idaho National Laboratory

11:10 AM
Dislocation Multiplication from a Frank-Read Source in Six Body-centered Cubic Refractory Metals: *Shuozhi Xu*[1]; Yanqing Su[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara

PHYSICAL METALLURGY

Solid State Diffusion Bonding of Metals and Alloys — Solid State Diffusion Bonding of Metals and Alloys III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Mohamed Elbakhshwan, University of Wisconsin Madison; Mark Anderson, University of Wisconsin Madison; Todd Allen, University of Michigan ; Tasnim Hassan, North Carolina State University

Tuesday AM | February 25, 2020
19 | San Diego Convention Ctr

Session Chairs: Mohamed Elbakhshwan, UW-Madison; Tasnim Hassan, North Carolina State University; Heramb Mahajan, North Carolina State University

8:30 AM Invited
Multi-Scale Study Of Bonding Mechanism Between Immiscible Mg/Steel Alloys: *Jiahao Cheng*[1]; Xiaohua Hu[2]; Xin Sun[2]; Vivek Anupam[3]; Glenn Daehn[3]; David Cullen[3]; [1]Oak Ridge National Laboratory; [2]Oak Ridge National Laboratory; [3]The Ohio State University

9:00 AM
The Role of Interface Microstructure and Chemistry on the Bond Strength of Aluminum 6061 HIP-bonded Samples: *Rajib Kalsar*[1]; Brady McBride[2]; Rick Shimskey[1]; Kester Clarke[1]; Nicole Overman[1]; Curt Lavender[1]; Kenneth Johnson[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory; [2]Colorado School of Mines

9:20 AM
Microstructural Evolution and Mechanical Properties of Lap-jointed Ti-6Al-4V Plates by Pin-less Friction Stir Spot Welding: *Hyojin Park*[1]; Yong Chae Lim[2]; Hahn Choo[1]; Suhong Zhang[1]; Anming Hu[1]; Scott A Rose[3]; Zhili Feng[2]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory; [3]Boeing

9:40 AM
MTI Low Force Friction Welding: *Simon Jones*[1]; [1]MTI

10:00 AM Break

10:30 AM
Instant Copper Direct Bonding Using <111>-oriented Nanotwinned Cu Microbumps: *Kai Cheng Shie*[1]; Jing-Ye Juang[1]; Chih Chen[1]; [1]National Chiao Tung University

10:50 AM
Mechanical Performance of Diffusion Bonded 316 Stainless Steel for use in a Hybrid Compact Heat Exchanger: *Kyle Rozman*[1]; Venkata Saranam[2]; Brian Paul[2]; Ömer Dogan[1]; [1]National Energy Technology Laboratory; [2]Oregon State University

PHYSICAL METALLURGY

Thermal Transport in Crystalline and Non-crystalline Solids: Theory and Experiments — Electron Mediated Transport and Thermoelectrics

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Marat Khafizov, Ohio State University; Michael Manley, Oak Ridge National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Aleksandr Chernatynskiy, Missouri Science and Technology University

Tuesday AM | February 25, 2020
18 | San Diego Convention Ctr

Session Chairs: Krzysztof Gofryk, Idaho National Laboratory; Firoza Kabir, University of Central Florida

8:30 AM Invited
Enhanced Thermoelectric Performance of Heavy-fermion Compounds YbTM_2Zn_{20} (*TM* = Co, Rh, Ir) at Low Temperatures: *Ryan Baumbach*[1]; Kaya Wei[1]; [1]National High Magnetic Field Laboratory

9:00 AM
Thermal Transport Properties of Uranium Aluminides by First-principles: *Zhi-Gang Mei*[1]; Abdellatif Yacout[1]; [1]Argonne National Laboratory

9:20 AM
A Thermoreflectance Method for Simultaneous Micro-scale Characterization of Thermal Conductivity, Volumetric Specific Heat, and Latent Heat of Solid-solid Phase Change Materials: *Adam Wilson*[1]; Jacob Wright[1]; Jack Brody[1]; Darin Sharar[1]; Asher Leff[1]; [1]CCDC Army Research Laboratory

9:40 AM
Non-linear Thermal Resistance Trend with Increasing Bilayer Density: *Zachary McClure*[1]; Christopher Saltonstall[2]; Michael Abere[2]; David Guzman[3]; Samuel Reeve[4]; Alejandro Strachan[1]; David Adams[2]; Thomas Beechem[2]; [1]Purdue University; [2]Sandia National Laboratory; [3]Brookhaven National Laboratory; [4]Lawrence Livermore National Laboratory

10:00 AM
Active Peltier Cooler with Cu-Ni and Half-Heusler Alloys: *Mark Verosky*[1]; Joseph Heremans[1]; Mona Zebarjadi[2]; Tiejun Zhu[3]; Junjie Yu[3]; [1]The Ohio State University; [2]University of Virginia; [3]Zhejiang University

10:20 AM Break

10:40 AM
Investigations of the Thermal Conductivity of UN: *Barbara Szpunar*[1]; Linu Malakkal[1]; J.I. Ranasinghe[1]; J.A. Szpunar[1]; [1]University Of Saskatchewan

11:00 AM
Electronic Structure and Thermal Transport Measurement of $Gd_xSb_{2-x}Te_3$: *Firoza Kabir*[1]; Md. Mofazzel Hosen[1]; Gyanendra Dhakal[1]; Xiaxin Ding[2]; Narayan Poudel[2]; Arjun Pathak[3]; Yong Liu[3]; Jianxin Zhu[4]; Krzysztof Gofryk[2]; Madhab Neupane[1]; [1]University of Central Floida; [2]Idaho National Laboratory; [3]Ames Laboratory; [4]Los Alamos National Laboratory

11:20 AM
Nonlinear Stopping of Phonons in Thermoelectric Crystal PbSe: *Michael Manley*[1]; Olle Hellman[2]; Nina Shulumba[3]; Andrew May[1]; Paul Stonaha[4]; Jeffrey Lynn[5]; Vasile Garlea[1]; Ahmet Alatas[6]; Raphael Hermann[1]; Hsin Wang[1]; Brian Sales[1]; Austin Minnich[3]; [1]Oak Ridge National Laboratory; [2]Linköping University; [3]Caltech; [4]Idaho State University; [5]National Institute of Technology and Standards; [6]Argonne National Laboratory

11:40 AM
Structural, Transport, Magnetic, and Thermodynamic Studies of Delta-phase of Uranium: *Xiaxin Ding*[1]; Narayan Poudel[1]; Tiankai Yao[1]; Jason Harp[1]; Krzysztof Gofryk[1]; [1]Idaho National Laboratory

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Fundamentals

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Tuesday AM | February 25, 2020
Marina Ballroom D | Marriott Marquis Hotel

Session Chairs: Ruslan Valiev, UFA State Aviation Technical University; Lei Lu, Institute of Metal Research, Chinese Academy of Sciences; Nobuhiro Tsuji, Kyoto University; Xiaoxu Huang, Chongqing University

8:30 AM Invited
Design of Heterostructured Al-Cu-Mg Alloy via Heterogeneous Nucleation at Dislocations: Zongqing Feng[1]; Ran Yang[1]; Chengwei Lin[1]; Rui Fu[1]; Tianlin Huang[1]; Guilin Wu[1]; *Xiaoxu Huang*[1]; [1]Chongqing University

8:50 AM Invited
Unravelling the Strengthening Effects of Strain Gradient and Back Stress on Heterogeneous Materials: *Ting Zhu*[1]; Yin Zhang[1]; [1]Georgia Institute of Technology

9:10 AM
Deformation Behavior and Strengthening Mechanisms of Ultrafine-Grained Al-2.5mass%Mg Alloy: *Xiaodong Lan*[1]; Si Gao[1]; Myeong-heom Park[1]; Akinobu Shibata[1]; Nobuhiro Tsuji[1]; [1]Kyoto University

9:30 AM
In-situ Neutron Diffraction Study on the Tensile Deformation of an Ultrafine-grained Fe-Ni-Al-C steel Including B2 Phase: *Si Gao*[1]; Wenqi Mao[1]; Wu Gong[1]; Stefanus Harjo[2]; Akinobu Shibata[1]; Nobuhiro Tsuji[1]; [1]Kyoto University; [2]J-PARC Center, Japan Atomic Energy Agency

9:50 AM
Size Dependent Strengthening in High Strength Nanotwinned Al/Ti Multilayers: *Yifan Zhang*[1]; Sichuang Xue[1]; Qiang Li[1]; Jin Li[1]; Jie Ding[1]; Tongjun Niu[1]; Ruizhe Su[1]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University

10:10 AM Break

10:30 AM Invited
Enhanced Strength and Thermal Stability of Cu/Fe Nanolaminates: *Mathias Göken*[1]; Maher Ghanem[1]; Heinz Werner Höppel[1]; Benoit Merle[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

10:50 AM Invited
Incompatible Plastic Deformation of Dual Gradient Nanotwinned Cu: *Lei Lu*[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

11:10 AM
Slip Transmission in Ultra Fine Grain Materials: *Katerina Aifantis*[1]; Fei Shuang[1]; [1]University of Florida

11:30 AM
Effect of Interface Type on the Deformation Behavior of Nanostructured Metals: *Oliver Renk*[1]; Verena Maier-Kiener[2]; Daniel Kiener[2]; Reinhard Pippan[1]; [1]Erich Schmid Institute; [2]Montanuniversität Leoben

11:50 AM
Grain Boundary Design of Nanostructured Metals with Superior Mutlifunctional Properties: *Ruslan Valiev*[1]; Nariman Enikeev[1]; Maxim Murashkin[1]; [1]UFA State Aviation Technical University

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Strength in Metals

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Tuesday AM | February 25, 2020
5A | San Diego Convention Ctr

Session Chair: Avinash Dongare, University of Connecticut

8:30 AM Invited
Informing Flow Stress Models at High Strain-rates Through In-situ Imaging of Hole Closure under Dynamic Compression: *Jonathan Lind*[1]; A.K. Robinson[1]; M. Nelms[1]; Nathan Barton[1]; Mukul Kumar[1]; [1]Lawrence Livermore National Laboratory

9:10 AM
Modeling and Simulation of High Rate Plastic Deformation of bcc Materials: *Benoit Revil-Baudard*[1]; Geremy Kleiser[2]; Oana Cazacu[1]; [1]Univ. Of Florida / Reef; [2]AFRL / RW

9:30 AM
Predicting Dynamic Strain Rate Response using Model Reification: *Jaylen James*[1]; Manny Gonzales[1]; Eric Payton[1]; Raymundo Arroyave[2]; Douglas Allaire[2]; [1]Texas A&M University/Air Force Research Laboratory; [2]Texas A&M University

9:50 AM
Calibrating Empirical and Micromechanical Constitutive Models beyond 10^6 s^-1: Xuchen Wang[1]; *Mostafa Hassani*[1]; [1]Cornell University

10:10 AM Break

10:30 AM
Effects of Strain Rate on the Mechanical Properties and Fracture Mechanisms of AHSS Dual Phase Steels: Sukanya Sharma[1]; Shrikant Bhat[2]; Arun Gokhale[1]; *Naresh Thadhani*[1]; [1]Georgia Institute of Technology; [2]ArcelorMittal

10:50 AM
Alloying and Strain Rate Effects on the Deformation Mechanisms of CoCrNi MPEAs: *John Copley*[1]; Francisco Coury[2]; Jonah Klemm-Toole[1]; Yaofeng Guo[1]; Jinling Gao[3]; Kester Clarke[1]; Benjamin Ellyson[1]; Chandler Becker[1]; Brian Milligan[1]; Christopher Finfrock[1]; Niranjan Parab[4]; Kamel Fezzaa[4]; Tao Sun[4]; Wayne Chen[3]; Amy Clarke[1]; [1]Colorado School of Mines; [2]UFSCar; [3]Purdue University; [4]Argonne National Laboratory

11:10 AM
Characteristics of Texture Development in Al-Mg Alloy under High Strain Rate Tension: *Srinivasan Nagarajan*[1]; Nilesh Gurao[1]; Venkitanarayanan Parameswaran[1]; [1]Indian Institute of Technology Kanpur

11:30 AM
Brittle-ductile Failure Transition of Low-symmetry HCP Metal Beryllium under Dynamic Compression: *Nitin Daphalapurkar*[1]; Darby Luscher[1]; William Blumenthal[1]; Abigail Hunter[1]; [1]Los Alamos National Laboratory

---

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — High-Temperature Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Tuesday PM | February 25, 2020
12 | San Diego Convention Ctr

Session Chairs: Tao Jiang, Central South University; Ender Keskinkilic, Atilim University

---

2:00 PM Introductory Comments

2:15 PM
Effect of CO2 on Vanadium Extraction and Thermal Effect in Top-bottom Combined Blowing Converter: *Qi Lu*[1]; Pan Li[1]; Yu Wang[1]; [1]Chongqing University

2:35 PM
Control of the Distribution of Vacuum Arcs within Vacuum Arc Remelting with Externally Applied Magnetic Fields: *Paul King*[1]; Matthew Cibula[1]; Joshua Motley[1]; [1]Ampere Scientific

2:55 PM
High Temperature Processing of Tungsten Slag: Xu Wang[1]; Xiaodong Ma[2]; Chunfa Liao[1]; *Baojun Zhao*[2]; [1]Jiangxi University of Science and Technology; [2]University of Queensland

3:15 PM
Non-isothermal Kinetics of Carbothermic Reduction of Fayalite: *Zhi Li*[1]; Guojun Ma[1]; Xiang Zhang[1]; Wei Zhang[1]; [1]State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology

3:35 PM Break

3:50 PM
Upgrading Pilot-scale Facility at MINTEK to Evaluate the Effect of Pre-heating on Smelter Operations: *Joalet Steenkamp*[1]; Glen Denton[1]; Tertius Pieters[2]; [1]MINTEK; [2]Allied Furnace Consultants

4:10 PM
Preparation of Expanded Slag Ball with Blast Furnace Slag by Rotary Cup: *Feifei Pan*[1]; Xuewei Lv[1]; Wenchao He[1]; Guishang Pei[1]; [1]ChongQing University

4:30 PM
Ripening Behavior of Carbides in Low-carbon Low Alloy Steel FAS3420H During Spheroidizing Annealing Process: *Shuai Liu*[1]; Fuming Wang[1]; Zhanbing Yang[1]; Yongliang Li[1]; Xi Chen[1]; Lijuan Sun[1]; Wei Shen[1]; [1]University of Science and Technology Beijing

4:50 PM
Study on the Influence of the Angle Between the Bottom-blowing Elements on Dynamics Condition of the 300t Converter: *Liujie Yao*[1]; Rong Zhu[2]; Huixiang Yu[1]; Kai Dong[1]; Qiang Feng[1]; Yixing Tang[1]; [1]University of Science and Technology Beijing; [2]University of Science and Technology, Beijing

5:10 PM
Influence of Atmosphere on Melting Behaviour of Synthetic Slags from Ta Recycling: *Dominik Hofer*[1]; Stefan Luidold[1]; [1]Montanuniversitaet Leoben

---

NUCLEAR MATERIALS

Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling — Current and Advanced Nuclear Fuels

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Assel Aitkaliyeva, University of Florida; Peter Hosemann, University of California - Berkeley; Samuel Briggs, Oregon State University; David Frazer, Los Alamos National Laboratory

Tuesday PM | February 25, 2020
Theater A-8 | San Diego Convention Ctr

Session Chair: Assel Aitkaliyeva, University of Florida

2:00 PM
Alpha Self-Irradiation of Archive and Irradiated Fast Reactor Fuels: *Thierry Wiss*[1]; Oliver Dieste[1]; Emanuele De Bona[1]; Dragos Staicu[1]; [1]European Commission - Jrc

2:20 PM
Comparison of Radial Microstructural Changes in Fast Reactor MOX Fuels Across Varying Burnup Profiles: *Riley Parrish*[1]; Assel Aitkaliyeva[2]; [1]Sandia National Laboratory; [2]University of Florida

2:40 PM
Synthesis of Intermetallic UZr2+x and Its Phase Transformation: *Tiankai Yao*[1]; Michael Benson[1]; Jason Harp[1]; Lingfeng He[1]; Jian Gan[1]; [1]Idaho National Laboratory

3:00 PM
Testing of Nuclear Fuels and Materials in the Advanced Fuels Campaign: *Geoffery Beausoleil*[1]; Christopher Petrie[2]; Walt Williams[3]; [1]Idaho National Laboratory; [2]Oakridge National Laboratory; [3]Purdue University

3:20 PM
In-situ Neutron Characterization of Advanced Nuclear Fuels - The Road to a New Neutron Irradiation Testing Capability: *Edward Obbard*[1]; Claudia Gasparrini[1]; Patrick Burr[1]; Kyle Johnson[2]; Denise Lopes[2]; Clara Anghel[3]; Simon Middleburgh[3]; Daniel Gregg[4]; Klaus Dieter Liss[4]; Grant Griffiths[4]; Nicholas Scales[4]; Gordon Thorogood[4]; Greg Lumpkin[4]; [1]UNSW Sydney; [2]Kungliga Tekniska Hogskolan (KTH); [3]Westinghouse Electric Sweden AB; [4]ANSTO

3:40 PM Break

3:50 PM
Changes in the Starting Microstructures of U-Mo Fuels due to the Effects of Neutron Irradiation: *Dennis Keiser*[1]; Brandon Miller[1]; Jan-Fong Jue[1]; Adam Robinson[1]; Kelley Verner[1]; [1]Idaho National Laboratory

4:10 PM
In-situ Observation of Radiation-induced Phase Transformation in U-Mo: *Bei Ye*[1]; Weiying Chen[1]; Yinbin Miao[1]; Abdellatif Yacout[1]; Yipeng Gao[2]; [1]Argonne National Laboratory; [2]Idaho National Laboratory

4:30 PM
Impact of Ionization Effects and Defect Trapping on Microstructure Evolution in Light Ion Irradiated Uranium Dioxide: *Marat Khafizov*[1]; Yuzhou Wang[1]; M Riyad[1]; Janne Pakarinen[2]; Lingfeng He[3]; Anter El-Azab[4]; David Hurley[3]; [1]Ohio State University; [2]Belgian Nuclear Research Center (SCK•CEN); [3]Idaho National Laboratory; [4]Purdue University

4:50 PM
Diffusion Analysis of Metallic Fission Products in Tristructural-isotropic Coated Fuel Using Representative Diffusion Couples: *Rachel Seibert*[1]; Tyler Gerczak[1]; [1]Oak Ridge National Laboratory

5:10 PM
Microstructural and Micro-chemical Characterization of Safety Tested TRISO UCO Fuel Kernels Irradiated in the Advanced Test Reactor: *Zhenyu Fu*[1]; Lingfeng He[2]; Xiang Liu[2]; Isabella van Rooyen[2]; Yong Yang[1]; [1]University of Florida; [2]Idaho National Laboratory

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Processing-Structure-Property-Performance III

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Tuesday PM | February 25, 2020
10 | San Diego Convention Ctr

Session Chair: Mohsen Seifi, ASTM International

2:00 PM Invited
Fatigue and Interfacial Fracture Behavior of Cold Spray Deposited Material for Additive Repair: *Luke Brewer*[1]; William Story[1]; Benjamin White[1]; J Jordon[1]; [1]University of Alabama

2:30 PM
Expedited Optimization of AM Materials using Miniaturized Testing: *Jonathan Torres*[1]; Ali Gordon[2]; [1]Bucknell University; [2]University of Central Florida

2:50 PM Invited
Performance of Recycled Metal Machine Chips and Strips Through Solid Phase Additive Manufacturing: *Paul Allison*[1]; J. Brian Jordon[1]; Luke Brewer[1]; Kevin Doherty[2]; [1]University of Alabama; [2]US Army Research Lab

3:20 PM Invited
Fatigue Crack Growth Properties of Selective Laser Melting Produced Nickel and Titanium Based Alloys: *Jamie Kruzic*[1]; Halsey Ostergaard[1]; Tarik Hasib[1]; [1]University of New South Wales

3:50 PM Break

4:10 PM
Effects of Internal Porosity and Crystallographic Texture on Fatigue Crack Growth Rate of Electron Beam Melted (EBM) Titanium Alloy (Ti-6Al-4V): *Nik Hrabe*[1]; Jake Benzing[1]; Timothy Quinn[1]; Lucas Koepke[1]; Jolene Splett[1]; [1]National Institute of Standards and Technology - Boulder

4:30 PM
Fatigue Properties of Additively Manufactured Ti-6Al-4V-ELI Material Hot Isostatically Pressed at Temperatures Above the Material's Beta Transus Temperature: *Julius Bonini*[1]; Ho Mei Leung[1]; Kevin Knight[2]; Bruno La Razer[3]; Magnus Ahlfors[4]; [1]Lucideon; [2]JTL America, Inc.; [3]Zenith Tecnica; [4]Quintus Technologies

4:50 PM
Implementing Processing and Post-processing Strategies to Control Microstructure, Defect Content and Mechanical Properties of Electron Beam Melted Ti-6Al-4V: *Jake Benzing*[1]; Nikolas Hrabe[1]; Tim Quinn[1]; Enrico Lucon[1]; Magnus Ahlfors[2]; [1]National Institute of Standards and Technology; [2]Quintus Technologies

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications II — Modelling

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Tuesday PM | February 25, 2020
9 | San Diego Convention Ctr

Session Chairs: Indrajit Charit, University of Idaho; Wen Jiang, Idaho National Laboratory

---

2:00 PM Invited
Progress in Additive Manufacturing in South Africa: *Sisa Pityana*[1]; [1]CSIR Main Campus

2:30 PM
Multi-physics Simulation to Model Melt Pool in Directed Energy Deposition Process for Nuclear Fuels: *Wen Jiang*[1]; Jeong-Hoon Song[2]; Isabella Rooyen[1]; [1]Idaho National Laboratory; [2]University of Colorado Boulder

2:50 PM
Mechanical Response and Reduced-order Simulations of Additively Manufactured Metallic Lattice Structures: *Connie Dong*[1]; Sara Messina[1]; Matthew Begley[1]; [1]University of California, Santa Barbara

3:10 PM
Active Force Regimes in Powder Spreading: *Nicholas Cunningham*[1]; Noah Philips[1]; Yifei Ma[2]; T. Matthew Evans[2]; [1]Ati Specialty Alloys And Components; [2]Oregon State University

3:30 PM Break

3:50 PM
Digital Twins of Additive Manufacturing Processes for the Optimization and Control of Builds: *Dayalan Gunasegaram*[1]; Anthony Murphy[1]; Patrick O'Toole[1]; [1]CSIRO

4:10 PM
Numerical Simulation and High-speed Photography Characterization of Powder Delivery During LENS® Additive Manufacturing for Metal Matrix Composites: *Sen Jiang*[1]; Baolong Zheng[1]; James Haley[1]; Bingqing Chen[2]; Jiayu Liang[2]; Shuai Huang[2]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Beijing Institute of Aeronautical Materials

4:30 PM
Design of Efficient Additive-manufactured Heat Sinks via Conjugate Heat Transfer Modeling and Topology Optimization: *Basil Paudel*[1]; Mohammad Masoomi[2]; Scott Thompson[3]; [1]Auburn University; [2]ANSYS Inc.; [3]Kansas State University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — Residual Stress: Neutron, X-ray, and Other Measurements

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Tuesday PM | February 25, 2020
8 | San Diego Convention Ctr

Session Chair: Donald Brown, Los Alamos National Laboratory

2:00 PM Invited
Toward Validation of Residual Stress Predictions in Additively Manufactured Parts: Destructive and Non-destructive Characterization: *Kyle Johnson*[1]; Donald Brown[2]; Bjorn Clausen[2]; Phillip Reu[1]; Paul Farias[1]; Christopher D'Elia[3]; Michael Hill[3]; Michael Prime[3]; Bradley Jared[1]; Shaun Whetten[1]; Joseph Bishop[1]; [1]Sandia National Laboratories; [2]Los Alamos National Laboratory; [3]University of California Davis

2:30 PM
Neutron-based Research on Additive Manufactured Materials at the Paul Scherrer Institute: *Jan Capek*[1]; Efthymios Polatidis[1]; Manuel Morgano[1]; Pavel Trtik[1]; Markus Strobl[1]; [1]Paul Scherrer Institute

2:50 PM
Thermomechanical Model Residual Stress Prediction Assessment for Stainless Steel 316L Laser Powder Bed Fusion Components: *Nicholas Bachus*[1]; Donald Brown[2]; Robert Ferencz[3]; Rishi Ganeriwala[3]; Michael Hill[1]; Neil Hodge[3]; [1]University of California Davis; [2]Los Alamos National Laboratory; [3]Lawrence Livermore National Laboratory

3:10 PM
Geometric Influences on Residual Stresses in Components Manufactured by Directed Energy Deposition: *Christopher D'Elia*[1]; Michael Hill[1]; Nicholas Bachus[1]; Michael Stender[1]; Christopher San Marchi[1]; [1]University of California, Davis

3:30 PM Break

3:50 PM Invited
Residual Strain Characterization of Additively Manufactured IN625 and 15-5SS Using Energy Dispersive X-ray Diffraction: *Maria Strantza*[1]; Nicholas Bachus[2]; Bjorn Clausen[2]; Thien Phan[3]; Lyle Levine[3]; Darren Pagan[4]; John Okasinski[5]; Donald Brown[2]; [1]Lawrence Livermore National Laboratory; [2]Los Alamos National Laboratory; [3]National Institute of Standards and Technologies; [4]Cornell High Energy Synchrotron Source; [5]Advanced Photon Source

4:20 PM
Evaluating the Effectiveness of Compliant Substructures at Controlling Residual Stress in Additively Manufactured Components: *Donald Brown*[1]; Maria Strantza[2]; Bjorn Clausen[1]; Rishi Ganeriwala[2]; Lyle Levine[3]; Thien Phan[3]; Wayne King[2]; [1]Los Alamos National Laboratory; [2]Livermore National Laboratory; [3]National Institute of Standards and Technology

4:40 PM
Microscale Residual Stresses in Additively Manufactured Stainless Steel: *Yin Zhang*[1]; Ting Zhu[1]; Wen Chen[2]; Morris Wang[3]; [1]Georgia Institute of Technology; [2]University of Massachusetts, Amherst; [3]Lawrence Livermore National Laboratory, Livermore

5:00 PM
Investigating Local Microstructural Response During Short Fatigue Crack Growth in SLM IN718 Subjected to High Cycle Fatigue Loading: *Priya Ravi*[1]; Diwakar Naragani[1]; Jun-Sang Park[2]; Peter Kenesei[2]; Michael Sangid[2]; [1]Purdue University; [2]Argonne National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Alternative Processes (Beyond the Beam) — Sintering and Novel Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Powder Materials Committee

Program Organizers: Paul Prichard, Kennametal Inc.; Matthew Dunstan, U.S. Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal; James Paramore, U.S. Army Research Laboratory

Tuesday PM | February 25, 2020
7A | San Diego Convention Ctr

Session Chair: James Paramore, US Army Research Laboratory

2:00 PM
Gravity Influence on Sintering of 3D-printed Components: *Elisa Torresani*[1]; Randall German[1]; Eugene Olevsky[1]; [1]San Diego State University

2:20 PM
Sintering Kinetics of Particle-based Ink Extrusion 3D Printed Nickel Scaffolds: *Safa Khodabakhsh*[1]; Ashley Paz y Puente[1]; [1]University of Cincinnati

2:40 PM
Selective Sintering-based Fabrication of Fully Dense Complex Shape Parts: *Geuntak Lee*[1]; Charles Manière[1]; Maricruz Carrillo[1]; Eugene Olevsky[1]; [1]San Diego State University

3:00 PM
Development and Validation of Sub-scale Tensile Tests for Characterization of Additively Manufactured Metals: *Laura Moody*[1]; Ion Powell[1]; Daniel Lewis[2]; Brady Butler[1]; Ankit Srivastava[2]; Lara Draelos[2]; James Paramore[1]; [1]United States Army Research Laboratory; [2]Texas A&M University

3:20 PM
Experimental Demonstration of Additive Manufacturing and Assembly in Space by Thermal Vacuum Testing: *Derek Thomas*[1]; Paul Shestople[1]; Michael Snyder[1]; [1]Made In Space, Inc.

3:40 PM Break

4:00 PM
Novel Method in Additive Manufacturing of Metal Matrix Composites Reinforced by Carbon Particles: *Mahdi Yoozbashizadeh*[1]; [1]California State University Long Beach

4:20 PM
Additive Manufacturing of Photocatalytic Materials for Solar Water Disinfection: *Andrey Vyatskikh*[1]; Kai Liu[1]; Carlos Portela[1]; Akira Kudo[1]; Stephane Delalande[2]; Michael Hoffmann[1]; Julia Greer[1]; [1]California Institute of Technology; [2]PSA Group

4:40 PM
Portland 3D Printing of Portland Cement Pastes with Additions of Kaolin, Superplastificant, and Calcium Carbonate: Luis Vergara[1]; *Henry Colorado*[1]; [1]Universidad de Antioquia

5:00 PM
Beyond the Powder-bed: Fabricating Microscale Three-dimensional Metallic Structures Without Support Using Nanoparticle 3D Printing: Mohammad Sadeq Saleh[1]; *Rahul Panat*[1]; [1]Carnegie Mellon University

5:20 PM
Powder Casting: Producing Bulk Metal Components from Powder without Compaction: *James Paramore*[1]; Matthew Dunstan[1]; Brady Butler[1]; [1]U.S. Army Research Laboratory

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: ICME Gap Analysis — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Dongwon Shin, Oak Ridge National Laboratory; Richard Otis, Jet Propulsion Laboratory; Xin Sun, Oak Ridge National Laboratory; Greta Lindwall, KTH Royal Institute of Technology; Mei Li, Ford Motor Company; David Furrer, Pratt & Whitney

Tuesday PM | February 25, 2020
7B | San Diego Convention Ctr

Session Chairs: Greta Lindwall, KTH Royal Institute of Technology; David Furrer, Pratt & Whitney

---

2:00 PM Introductory Comments

2:05 PM Invited
Overview of DOE-BES Research and Strategic Planning: *Linda Horton*[1]; John Vetrano[1]; [1]US Department of Energy, Office of Basic Energy Sciences

2:40 PM Invited
Making Metal Additive Manufacturing Practical – What's Missing?: *Lyle Levine*[1]; Carelyn Campbell[1]; Mark Stoudt[1]; Greta Lindwall[2]; Eric Lass[1]; Fan Zhang[1]; Brandon Lane[1]; [1]National Institute of Standards and Technology; [2]KTH

3:15 PM Invited
Challenges to Predict the Microstructure and Properties of metallic AM components: *Carolin Korner*[1]; Matthias Markl[1]; Johannes Köpf[1]; Alexander Rausch[1]; Zerong Yang[1]; [1]University of Erlangen-Nuremberg

3:50 PM Break

4:15 PM Invited
CALPHAD-based ICME Design for Additive Manufacturing: Successes and Challenges: Wei Xiong[1]; [1]University of Pittsburgh

4:50 PM Invited
Efficient Mechanistic Modeling of Additive Manufacturing (AM) Processes: *Sergei Burlatsky*[1]; David Furrer[2]; [1]United Technologies Research Center; [2]Pratt & Whitney

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Alloy Design-Aluminum Alloys and Composites

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Tuesday PM | February 25, 2020
6F | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Application of Direct Aluminothermic Reduction to the Production of Al-Ce-based Alloys for Additive Manufacturing: *Scott McCall*[1]; Alexander Baker[1]; Hunter Henderson[2]; Zachary Sims[2]; Orlando Rios[2]; David Weiss[3]; Corby Anderson[4]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory; [3]Eck Industries; [4]Colorado School of Mines

2:30 PM
Additive Manufacturing of Al-10Ce Alloys by Laser Powder Bed Fusion of Gas Atomized Powders: *Le Zhou*[1]; Holden Hyer[1]; Sharon Park[1]; Thinh Huynh[1]; Brandon McWilliams[2]; Kyu Cho[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]US Army Research Laboratory

2:50 PM
CALPHAD Aided Design of Aluminum Alloys for Additive Manufacturing: *Emily Moore*[1]; Zachary Sims[2]; Orlando Rios[2]; Scott McCall[1]; Aurélien Perron[1]; [1]Lawrence Livermore National Laboratory; [2]Oakridge National Laboratory

3:10 PM
Design of Al-Fe-Si-based Additively Manufactured High Temperature Light Weight Alloys: *Sujeily Soto-Medina*[1]; Biswas Rijal[1]; Lilong Zhu[1]; Richard Hennig[1]; Michele Manuel[1]; [1]University of Florida

3:30 PM Break

3:45 PM Invited
Additive Manufacturing of Advanced Aluminum-cerium Alloys: *David Weiss*[1]; Orlando Rios[2]; Justen Schaefer[3]; Jessica Orr[3]; Hunter Henderson[2]; Zachary Sims[2]; Scott McCall[4]; Ryan Ott[5]; [1]ECK Industries Inc.; [2]Oak Ridge National Laboratory; [3]University of Dayton Research Institute; [4]Lawrence Livermore National Laboratory; [5]Ames Laboratory

4:10 PM
Selective Laser Melting and Mechanical Properties of Al-Ce-X Alloys: *Alex Plotkowski*[1]; Ryan Dehoff[1]; Kevin Sisco[2]; Amit Shyam[1]; Sumit Bahl[1]; Andres Rossy[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

4:30 PM
Development of High Strength Aluminium Alloys in Net Shape Through Selective Laser Melting: *Abirami Babu*[1]; Nick Birbilis[2]; Aijun Huang[1]; [1]Monash University; [2]Australian national university

4:50 PM
Additive Manufacturing of Immiscible Alloy Systems: *Brennan Yahata*[1]; Julie Miller[1]; Justin Mayer[1]; Stan Dudinski[1]; Eric Clough[1]; Toby Schaedler[1]; Hunter Martin[1]; Jacob Hundley[1]; Tresa Pollock[2]; [1]Hrl Laboratories, Llc; [2]University of California, Santa Barbara

5:10 PM
Additive Manufacture of Ti-6-4/SiC Metal Matrix Composites: *Colt Montgomery*[1]; Robin Pacheco[1]; Michael Brand[1]; Ching-Fong Chen[1]; [1]Los Alamos National Laboratory

5:30 PM
Nano-structured NiAl-Cr(Mo) In-situ Composites Processed by Additive Manufacturing: *Andreas Förner*[1]; Steffen Neumeier[1]; Abdullah Jamjoom[1]; Carolin Körner[1]; Mathias Göken[1]; [1]Friedrich-Alexander-Universität Erlangen

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Post Processing

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Tuesday PM | February 25, 2020
6E | San Diego Convention Ctr

Session Chair: Monnamme Tlotleng, University of Johannesburg

2:00 PM
Microstructural Influence on AM 316L Mechanical Properties and Corrosion Behavior: *Richard Fonda*[1]; Jerry Feng[1]; Krystaufeux Williams[1]; [1]Naval Research Laboratory

2:20 PM
Correlative Atomic-scale Analysis of Nano-scale Precipitate Evolution in Additively Manufactured Maraging Steel: *Pradeep Konda Gokuldoss*[1]; [1]Indian Institute of Technology Madras

2:40 PM
Carburization Heat Treatment of Selective Laser Melted 20MnCr5 Steel: *Mei Yang*[1]; Richard Sisson[1]; [1]Worcester Ploytechnic Institute

3:00 PM
Towards an Additively Manufactured, Wrought-comparable Precipitation-hardening Martensitic Stainless Steel: *Fan Zhang*[1]; Eric Lass[2]; Mark Stoudt[1]; Carelyn Campbell[1]; Souzan Hammadi[3]; Greta Lindwall[3]; Lyle Levine[1]; [1]National Institute of Standards and Technology; [2]University of Tennessee Knoxville ; [3]KTH Royal Institute of Technology

3:20 PM
Effects of Thermal Processing on the Microstructure and Mechanical Properties of Additively Manufactured AlSi10Mg Parts: *John Fite*[1]; Suhas Prameela[2]; John Slotwinski[1]; Timothy Weihs[2]; [1]Johns Hopkins University Applied Physics Laboratory; [2]Johns Hopkins University

3:40 PM Break

4:00 PM
Microstructural Development in Additively Manufactured and Heat Treated IN625: *Holden Hyer*[1]; Ryan Newell[2]; Daniel Matejczyk[3]; Sinsar Hsie[2]; Mason Anthony[2]; Le Zhou[1]; Catherine Kammerer[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]Aerojet Rocketdyne - WPB; [3]Aerojet Rocketdyne - CP

4:20 PM
Stimulating the Evolution of γ'/γ" Precipitates in the Inter-dendritic Regions of Additively Manufactured IN718 Due to Post-processing Heat Treatments: *Younggil Song*[1]; Bala Radhakrishnan[1]; Ranadip Acharya[2]; [1]Oak Ridge National Laboratory; [2]United Technologies Research Center

4:40 PM
Modified Post-processing Thermal Treatments Designed to Relieve Notch Sensitivity in SLM Inconel 718: *Tait McLouth*[1]; Julian Lohser[1]; David Witkin[1]; Glenn Bean[1]; Rafael Zaldivar[1]; [1]The Aerospace Corporation

5:00 PM
Study of Deformation Mechanisms in Various Heat-treated AM-IN718 Using Transmission Electron Microscopy: *Thomas Gallmeyer*[1]; Jack Dale[1]; Behnam Aminahmadi[1]; Aaron Stebner[1]; [1]Colorado School of Mines

5:20 PM
Effects of Post-heat Treatments on the Microstructure Evolutions, High Temperature Oxidation and Mechanical Properties of IN738LC Fabricated by Selective Laser Melting: *Kyu-Sik Kim*[1]; Myeong-Se Kim[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]Auratech Co. Ltd.

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Local Strain / Misorientation I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Tuesday PM | February 25, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: Wolfgang Pantleon, Technical University of Denmark; Todd Hufnagel, Johns Hopkins University

---

2:00 PM Invited
Quantitative X-ray Phase Contrast Imaging of Granular Media under Dynamic Impact: *Todd Hufnagel*[1]; A.F.T. Leong[1]; Vignesh Kannan[1]; Kaliat Ramesh[1]; [1]Johns Hopkins University

2:30 PM
The Critical Microstructural Conditions for Void Nucleation During Ductile Rupture: Dislocation Structures and Vacancy Condensation: *Philip Noell*[1]; Julian Sabisch[1]; Douglas Medlin[1]; Brad Boyce[1]; [1]Sandia National Laboratories

2:50 PM
3D Maps of Geometrically Necessary Dislocation Densities in FCC Polycrystalline IN718: *Wyatt Witzen*[1]; Andrew Polonsky[1]; Tresa Pollock[1]; Irene Beyerlein[1]; [1]University of California Santa Barbara

3:10 PM
A Continuum Mechanics Description of EBSD Misorientation Mapping: *Shao-Shi Rui*[1]; Shaolou Wei[1]; Hui-Ji Shi[2]; Cemal Tasan[1]; [1]Massachusetts Institute of Technology; [2]Tsinghua University

3:30 PM Break

3:50 PM
Cyclic Deformation in Tension and Compression of Pure Aluminium Monitored In-situ by High-resolution Reciprocal Space Mapping: Annika Diederichs[1]; Ulrich Lienert[2]; *Wolfgang Pantleon*[1]; [1]Department of Mechanical Engineering, Technical University of Denmark; [2]DESY Photon Science, Deutsches Elektronen Synchrotron

4:10 PM
In situ Synchrotron and EBSD Study of H-induced Local Stresses: *Jinwoo Kim*[1]; Haoxue Yan[1]; S. Mohadeseh Taheri-Mousavi[1]; C. Cem Tasan[1]; [1]Massachusetts Institute of Technology

4:30 PM
Connecting the Evolution of Grain-scale Stresses and Intragranular Lattice Orientations to Slip System Activity in a Deforming Ti-7Al Alloy Using High Energy X-ray Diffraction: *Kelly Nygren*[1]; Jean-Charles Stinville[2]; Marie-Agathe Charpagne[2]; Tresa Pollock[2]; Matthew Miller[3]; [1]Cornell High Energy Synchrotron Source; [2]University of California, Santa Barbara; [3]Cornell University

4:50 PM
Hierarchical Microstructure in Shear Bands of Pure Titanium: Xiaolong Ma[1]; Dexin Zhao[1]; Dinakar Sagapuram[1]; *Kelvin Xie*[1]; [1]Texas A&M University

5:10 PM
Characterizing Residual Stress Gradients Due to Shot Peening: Comparison Between X-ray and Nanoindentation Techniques: Siavash Ghanbari[1]; *David Bahr*[1]; [1]Purdue University

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session II

Sponsored by: *T*MS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Tuesday PM | February 25, 2020
Mission Hills | Marriott Marquis Hotel

Session Chairs: Ana Araujo, AK Steel; Kester Clarke, Colorado School of Mines

2:00 PM
In-situ Quantitative Assessment of the Role of Silicon During the Quenching and Partitioning of a 0.2C Steel: Pierre Huyghe[1]; Sylvain Dépinoy[2]; Cedric Georges[3]; Matteo Caruso[4]; *Stephane Godet*[2]; [1]AGC Research Center; [2]Université Libre de Bruxelles; [3]CRM Group; [4]Engie Laborelec

2:20 PM
Austenite Stability of an 1180 MPa Quenched-and-partitioned Steel: *Ana Araujo*[1]; Jun Hu[1]; Erik Pavlina[1]; [1]AK Steel Research and Innovation Center

2:40 PM
Influence of Prior Processing on the Response to Quenching & Partitioning: *Casey Gilliams*[1]; John Speer[1]; Kip Findley[1]; Richard Thiessen[2]; [1]Colorado School of Mines; [2]ThyssenKrupp Steel

3:00 PM
Toughening Mechanisms of Quenching and Partitioning Steels by Carbon Management: Zhou Wang[1]; *MingXin Huang*[1]; [1]University of Hong Kong

3:20 PM
The Influence of Transformation Induced Plasticity on Damage Development in Third Generation Advanced High Strength Steels: Javad Samei[1]; *Concetta Pelligra*[1]; David Wilkinson[1]; [1]McMaster University

3:40 PM Break

4:00 PM
Dual Effects of Retained Austenite for Third Generation Advanced High Strength Steels: *Xuejun Jin*[1]; Lianbo Luo[1]; Wei Li[1]; Yu Gong[1]; Qi Lu[2]; Charles Enloe[3]; Jason Coryell[3]; Jeff Wang[2]; [1]Shanghai Jiao Tong University; [2]General Motors China; [3]General Motors

4:20 PM
Effect of Strain Path on the Deformation Characteristics of Austenite-containing Advanced High Strength Steels: *Melissa Thrun*[1]; Amy Clarke[1]; Magnus Ahlfors[2]; Christopher Finfrock[1]; Kester Clarke[1]; [1]Colorado School of Mines; [2]Quintus Technologies

4:40 PM
Crystal Plasticity Finite Element Simulations of the Planar Anisotropy of Q&P Steels: *Deepika Tirumalasetty*[1]; Sankaran S[1]; Anand Kanjarla[1]; [1]Indian Institute of Technology Madras

5:00 PM
Development of Quenching and Partitioning Plate Steel Intended For Wear and Toughness Applications: *Travis Marsh*[1]; John Speer[1]; Rainer Fechte-Heinen[2]; Fred Fletcher[3]; Cory Alexander[4]; [1]Colorado School of Mines; [2]thyssenkrupp Steel Europe AG; [3]ArcelorMittal; [4]Deere & Company

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Magnetocalorics and Energy Harvesting

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Tuesday PM | February 25, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Daniel Salazar, BCMaterials; Senentxu Lanceros-Mendez, BCMaterials

2:00 PM Invited
Magnetic Shape Memory: Magnetomechanics – MSM Design – Microfluidics – Markets: *Peter Mullner*[1]; [1]Boise State University

2:30 PM Invited
Recent Developments in NiMn-based Martensitic Materials for Actuation and Energy: *Volodymyr Chernenko*[1]; [1]BCMaterials & University of the Basque Country (UPV/EHU)

2:55 PM
Engineering Built-in strain Gradients to Tune Magnetism in Two-phase Heusler Intermetallics: *Yolita Eggeler*[1]; Emily Levin[1]; Fulin Wang[1]; Ram Seshadri[1]; Tresa Pollock[1]; Daniel Gianola[1]; [1]University of California, Santa Barbara

3:15 PM Invited
Generating Electricity from Waste Heat using Magneto-structural Materials: *Ekkes Brueck*[1]; [1]Delft University of Technology

3:40 PM Break

4:00 PM Invited
Industrial Development of La-Fe-Si Magnetocaloric Alloys for Energy Conversion: *Alexander Barcza*[1]; [1]Vacuumschmelze GmbH & Co. KG

4:30 PM Invited
Magnetic Domains in Magnetostrictive Fe-Ga Alloys: *Yongmei Jin*[1]; Matthew Tianen[1]; [1]Michigan Technological University

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Functional Materials for Energy

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Tuesday PM | February 25, 2020
16B | San Diego Convention Ctr

Session Chairs: Jung Pyung Choi, Pacific Northwest National Laboratory; Sanjay Sampath, Stony Brook University

2:00 PM
Density Functional Theory Calculations of ZnO Nanopyramids: Crystal Growth and Improved Performance in Water Splitting: *Pegah Mirabedini*[1]; Taehoon Lim[1]; Alfredo Martinez-Morales[1]; P. Alex Greaney[1]; [1]University of California, Riverside

2:20 PM
Activated Alumina as Value-added Byproduct from the Hydrolysis of Hierarchical Nanoporous Aluminum with Pure Water to Generate Hydrogen Fuel: *Timothy Lee*[1]; Jintao Fu[1]; John Corsi[1]; Eric Detsi[1]; [1]University of Pennsylvania

2:40 PM Invited
Au-nanoparticle Incorporated Perovskites for Optical Sensing in High Temperature Gas Streams: *Paul Ohodnicki*[1]; Jeffrey Wuenschell[1]; Youngseok Jee[1]; Harry Abernathy[1]; Shiwoo Lee[1]; Gregory Hackett[1]; [1]National Energy Technology Laboratory

3:00 PM
Coupled Anelastic and Dielectric Relaxations in Doped Binary Oxides with Fluorite Structure: *Miladin Radovic*[1]; Peipei Gao[1]; Goran Brankovic[2]; Amy Bolon[1]; Zorica Brankovic[2]; Ke An[3]; Andrew Payzant[3]; [1]Texas A&M University; [2]University of Belgrade; [3]Oak Ridge National Laboratory

3:20 PM
Electrophoretic Deposition: A Promising Strategy for Fabricating Alkali-ion Rechargeable Cell Electrodes with Superior Electrochemical Properties: *Debasish Das*[1]; Arijit Mitra[2]; Sambedan Jena[1]; Saptarshi Das[3]; Subhasish Basu Majumder[3]; [1]School of Nano Science and Technology, Indian Institute of Technology Kharagpur; [2]Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur; [3]Materials Science Centre, Indian Institute of Technology Kharagpur

3:40 PM Break

4:00 PM
Highly Selective Liquid Oxide Membranes: Properties and Prospects: *Valery Belousov*[1]; [1]Baikov Institute of Metallurgy and Materials Science

4:20 PM
Ice-templated Sintered Metal Oxides with Directional Porosity and Characterization of Compressive Mechanical Properties: *Dipankar Ghosh*[1]; Rohan Parai[1]; Tessa Walters[1]; Sashanka Akurati[1]; Justine Marine[1]; Gary Koenig[2]; [1]Old Dominion University; [2]University of Virginia

4:40 PM
Utilizing Reversible Martensitic Transformations for the Mitigation of Thermal Transients: *Asher Leff*[1]; Jacob Wright[1]; Jack Brody[1]; Adam Wilson[1]; Darin Sharar[1]; [1]CCDC Army Research Laboratory

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — 3D Microelectronic Packaging and Emerging Interconnects I

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Tuesday PM | February 25, 2020
Palomar | Marriott Marquis Hotel

Session Chairs: David Yan, San Jose State University; Babak Arfaei, Ford Motor Co.

2:00 PM
Mechanical Reliability of Cu-filled Through Si via under Annealing and Thermal Cyclic Loading Conditions: *Dipali Sonawane*[1]; Praveen Kumar[1]; [1]Indian Institute of Science

2:20 PM
Different Electroplating Temperature Affecting on Mechanical Strength of Highly (111) Preferred Orientated Nanotwinned Copper (TMS 2020): *Fu Chian Chen*[1]; Chih Chen[1]; [1]National Chiao Tung University

2:40 PM
Formation of Cu-Cu Direct Bonding by Green Synthesized Approaches: *Wei Liu*[1]; Kuo-Shuo Huang[1]; Wen-Chih Lin[1]; Jim Wang[2]; Albert T. Wu[1]; [1]National Central University; [2]SHENMAO Technology Inc.

3:00 PM
Effect of Sn3.0 Ag 0.5Cu and Sn58Bi Solder Alloys on Through Silicon Via under Thermal Conditions: *Jiaojiao Wang*[1]; Limin Ma[1]; Fu Guo[1]; Yishu Wang[1]; Jianyu Feng[1]; [1]Beijing University of Technology

3:20 PM Break

3:40 PM
Effect of a Metallic Cap Layer on the Magnitude, Statistical Variation and Mechanism of Through-Silicon Via Extrusion: *Golareh Jalilvand*[1]; Tengfei Jiang[1]; [1]University of Central Florida

4:00 PM
Reducing Interfacial Voids in Cu/In/Cu Microbump with In-Sn-Cu Solder Alloy: *Rui Wen Song*[1]; Jenq Gong Duh[1]; [1]National Tsing Hua University

4:20 PM
Wetting Kinetics of Micro/nano-textured Surface Modified Copper Substrate during Soldering: *Siti Faqihah Roduan*[1]; Juyana A Wahab[1]; Mohd Arif Anuar Mohd Salleh[1]; [1]University of Malaysia Perlis

4:40 PM
Thermal Management through Networks of Highly Purified Boron Nitride Nanotubes: Mahmoud Amin[1]; David Kranbuehl[1]; *Hannes Schniepp*[1]; [1]The College of William & Mary

5:00 PM
Investigation to Micro Friction Stir Spot Welding Al and Cu Sheets to Foils for Automotive Lithium-ion Battery Cells Assembly: *Harry Chang*[1]; Jason Silberman[1]; Danny Ventura[1]; Kylie Dodge[1]; David Yan[1]; [1]San Jose State University

CHARACTERIZATION

Advanced Real Time Imaging — Bio-Nano Interfaces and Engineering Applications (Joint Session)

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Tuesday PM | February 25, 2020
Theater A-4 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Bone Replacement Materials Designed as Biosensors: *Sermin Utku*[1]; [1]Yeditepe University Biomedical Engineering

2:20 PM
New Biomarkers of Prostate and Breast Cancer Metastasis to Bone: *Kalpana Katti*[1]; Sumanta Kar[1]; Haneesh Jasuja[1]; MD Shahjahan Molla[1]; Dinesh Katti[1]; [1]North Dakota State University

2:40 PM
Micro-scale Imaging of Cancerous Tissues using High Frequency Ultrasound: Leila Ladani[1]; *Koushik Paul*[1]; [1]Arizona State University

3:00 PM
Inkjet Printed Electrochemical Aptasensor for Detection of Hg2+ in Organic Solvents: *Susana Diaz-Amaya*[1]; Li-Kai Lin[1]; Renee DiNino[1]; Carlos Ostos[2]; Lia Stanciu[1]; [1]Purdue University; [2]Universidad de Antioquia

3:20 PM
CVD-grown Graphene for the Detection of Glucose Oxidase (GOx): *Sangram Mazumder*[1]; Spencer Gellerup[1]; Anupama Kaul[1]; [1]University of North Texas

3:40 PM Break

4:00 PM Invited
Engineered Proteins as Modular Sensing and Imaging Probes: *Esra Yuca*[1]; [1]Yildiz Technical University

4:20 PM
Tunable Self Assembled Supramolecular Nanoprobes to Decipher Biomedical Events: *Mathew Jaeschke*[1]; Sarah VanOosten[1]; Philip Elrod[1]; Esra Yuca[1]; Candan Tamerler[1]; [1]University of Kansas

4:40 PM
Removal of Chromium (VI) from Water onto Activated Carbon by Adsorption in Dynamic Mode: *Naouel Hezil*[1]; Mamoun Fellah[1]; Alex Montagne[2]; Alain Iost[3]; Aleksei Obrosov[4]; Sabine Wiess[4]; [1]Abbes Laghrour Khenchela University, Algeria; [2]Ecole d'arts et metiers ; [3]Ecole d'arts et metiers; [4]Department of Physical Metallurgy and Materials Technology, Brandenburg Technical University

5:00 PM
Particle Size and Zeta Potential of CBD/THC Nano-emulsions Present in Commercial Beverages: *Vidumin Dahanayake*[1]; Vinod Radhakrishnan[1]; James Soulek[1]; [1]Anton Paar USA

ADVANCED MATERIALS

Advanced Solid Phase Processing Symposium — Additive Approaches

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, University of California, Riverside; Cynthia Powell, Pacific Northwest National Laboratory; Kester Clarke, Colorado School of Mines; Anthony Reynolds, University of South Carolina; Mostafa Hassani, Cornell University

Tuesday PM | February 25, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Mostafa Hassani, Cornell University; Paul Allison, University of Alabama

2:00 PM Invited
Fatigue Mechanisms of Aluminum Alloys Fabricated by Additive Friction Stir Deposition: Ben Ruthford[1]; Dustin Avery[1]; Luke Brewer[1]; Paul Allison[1]; *J. Brian Jordon*[1]; [1]University of Alabama

2:25 PM Invited
Smoothed Particle Hydrodynamic Simulations of Solid-phase AA6061 Additive Friction Stir Depositions: George Stubblefield[1]; Kirk Fraser[2]; B. J. Phillips[1]; D. Z. Avery[1]; N. Zhu[1]; Luke Brewer[1]; J. Brian Jordon[1]; *Paul Allison*[1]; [1]University of Alabama; [2]National Research Council Canada

2:50 PM
Microstructure and Mechanical Properties of Solid-State Additive Friction Stir Processed Alloy 600 on 304L Stainless Steel: Biswajit Dalai[1]; Jie Song[2]; Syeda Somaiya[2]; Benjamin Sutton[3]; Nicholas Mohr[3]; Seetha Mannava[2]; Matthew Steiner[2]; *Vijay Vasudevan*[2]; [1]Lulea University of Technology; [2]University of Cincinnati; [3]EPRI

3:10 PM
Advances in Deformation and Microstructure Evolution Understanding in Additive Friction Stir Deposition: *Robert Griffiths*[1]; Mackenzie Perry[1]; David Garcia[1]; Jenny Sietins[2]; Yunhui Zhu[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute; [2]Army Research Labs

3:30 PM Break

3:50 PM Invited
Elucidating the role of flash heating in ultrasonic consolidation of powder and foils: *Zachary Cordero*[1]; Austin Ward[1]; [1]Rice University

4:15 PM
In-situ Studies of Impact-Induced Deformation and Solid-State Bonding in Cold Spray: *Mostafa Hassani*[1]; David Veysset[2]; Keith Nelson[2]; Christopher Schuh[2]; [1]Cornell University; [2]MIT

4:35 PM
Designer Additive Manufacturing Powders for Solid State Additive Manufacturing Processing: *Kyle Tsaknopoulos*[1]; Jack Grubbs[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

4:55 PM
Laser Assisted Cold Spray of AISI 4340: *Dallin Barton*[1]; Venkata Satish Bhattiprolu[1]; Clio Batali[1]; Gregory Thompson[1]; Luke Brewer[1]; [1]University of Alabama

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — Nanocomposites

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Srinivasa Rao Singamaneni, University of Texas at El Paso; Amit Pandey, MicroTesting Solutions; Nuggehalli Ravindra, New Jersey Institute of Technology

Tuesday PM | February 25, 2020
Solana | Marriott Marquis Hotel

Session Chair: Srinivasa Rao, University of Texas, El Paso

2:00 PM Invited
Surface Chemistry Evolution in Ti-BNNT System Processed by SPS and its Correlation to Physico-chemical and Mechanical Properties: *Sudipta Seal*[1]; Tamil Selvan Sakthivel[1]; Jenniffer Bustillos[2]; Pranjal Nautiyal[2]; Aravind Agarwal[2]; [1]University of Central Florida; [2]Florida International University

2:30 PM Invited
Structural Transformation in Sn and CNT Reinforced Al-Cu-Fe Quasicrystalline Matrix Nanocomposite: Influence of Mechanical Milling and Cryomilling: *Nilay Mukhopadhyay*[1]; Yagnesh Shadangi[1]; Joysurya Basu[1]; Kausik Chattopadhyay[1]; Bhaskar Majumdar[2]; [1]Indian Institute of Technology (BHU) Varanasi; [2]DMRL- Hyderabad

3:00 PM
Enhanced Field Emission of CNT-W Nanowire Hierarchical Emitters: *Narasimha Pulagara*[1]; Gurjinder Kaur[1]; Indranil Lahiri[1]; [1]IIT Roorkee

3:30 PM
Metastable Silicon Nanocomposites via Plasma Synthesis and Spark Plasma Sintering: *Steven Herzberg*[1]; Devin Coleman[1]; Christian Roach[1]; Sabah Bux[2]; Suveen Mathaudhu[1]; Lorenzo Mangolini[1]; [1]University of California, Riverside; [2]Jet Propulsion Laboratory/California Institute of Technology

3:50 PM Break

4:10 PM
Heat Capacity and Free Energy of Ni-Fe Nanocrystals: *Stefan Lohaus*[1]; Michel Johnson[2]; Peter Ahnn[1]; Mary Anne White[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Dalhousie University

4:30 PM
Structure-dependent Optical and Electrical Properties of CeOx Coatings Growth by RF-MS and HIPIMS: *Santiago Vargas*[1]; Diana Galeano-Osorio[1]; Carlos Castano Londono[1]; [1]Virginia Commonwealth University

4:50 PM
Wetting Behavior of Ce-based Conversion Coatings on 7075 Aluminum Alloy: *Diana Galeano*[1]; Santiago Vargas[1]; Carlos Castano[1]; [1]Virginia Commonwealth University

CHARACTERIZATION

Advances in Powder and Ceramic Materials Science — Ceramic-based Composite Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Sergio Monteiro, Military Institute of Engineering; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama

Tuesday PM | February 25, 2020
Theater A-6 | San Diego Convention Ctr

Session Chairs: Huazhang Zhai, Beijing Institute of Technology; Bowen Li, Michigan Technological University

2:00 PM Introductory Comments

2:05 PM
Microwave Absorption Properties of Polymer-derived SiCN(Fe)/Si3N4 Ceramics: Xiao Lin[1]; *Hongyu Gong*[1]; Yujun Zhang[1]; Jianqiang Bi[1]; Yurun Feng[1]; Shan Wang[1]; [1]Shandong University, China

2:25 PM
High-temperature Microwave Dielectric Properties of Boron Nitride Polycrystalline Ceramics without Additives: *Huazhang Zhai*[1]; [1]Beijing Institute of Technology

2:45 PM
Microstructural Characteristics and Effective Applications of Andalusite-Mullite Phase Transformation: *Bowen Li*[1]; Minsheng He[2]; Huaguang Wang[1]; [1]Michigan Technological University; [2]R&D Center of Wuhan Iron & Steel Co

3:05 PM
Effect of Fe Doping on Structural, Optical and Dielectric Properties of $Sc_2W_3O_{12}$ Ceramics: *Mohan Raj Rajkumar*[1]; Mallesham Bandi[1]; Chintalapalle Ramana[1]; [1]The University of Texas at El Paso

3:25 PM Break

3:35 PM
Evaluation of a Three-chamber Algae-cathode Microbial Fuel Cell for Bioelectrochemical Recovery of Energy and Lead Metal: Yinta Li[1]; *Ling Xia*[2]; Shaoxian Song[2]; [1]Hubei Key Laboratory of Mineral Resources Processing and Environment; Wuhan University of Technology; Universidad Autonoma de San Luis Potosi; Weihai Ocean Vocational College; [2]Hubei Key Laboratory of Mineral Resources Processing and Environment; Wuhan University of Technology

3:55 PM
Mechanical Properties of Boron Nitride Nanosheets(BNNSs) Reinforced Si3N4 Composites: Guandong Liang[1]; *Jianqiang Bi*[1]; Guoxun Sun[1]; Yafei Chen[1]; Weili Wang[1]; [1]Shandong university

4:15 PM
Investigating Solid Solutions of Tungsten in Molybdenum Aluminium Boride MAB Phase Ceramics, for Use in Extreme Environments: *Peter Richardson*[1]; [1]University of Newcastle

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Ni-based Superalloys – Structure & Properties

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Tuesday PM | February 25, 2020
11B | San Diego Convention Ctr

Session Chairs: Katerina Christofidou, The University of Manchester; James Coakley, University of Miami

2:00 PM Invited
Design Approaches for Advanced High Temperature Structural Materials: *Sammy Tin*[1]; [1]Illinois Institute of Technology

2:30 PM
On the Effects of Chemistry Variations in New Nickel-based Superalloys for Industrial Gas Turbine Applications: *Sabin Sulzer*[1]; Hideyuki Murakami[2]; Roger Reed[1]; [1]University of Oxford; [2]National Institute for Materials Science

2:50 PM
Effect of 2%Re on Long-term Creep Behaviors of Ni-based Single Crystal Superalloys at 900 oC and 200-330 MPa: Fan Lu[1]; *Longfei Li*[1]; Stoichko Antonov[1]; Dong Wang[2]; Jian Zhang[2]; Qiang Feng[1]; [1]University of Science & Technology Beijing; [2]Institute of Metal Research, Chinese Academy of Sciences

3:10 PM
Segregation at Planar Defects in Model NiCo-based Superalloys: *Sae Matsunaga*[1]; Dongsheng Wen[1]; Michael Titus[1]; [1]Purdue University

3:30 PM Break

3:50 PM Invited
Factors Controlling VHCF Life of Ni-based Single Crystal Superalloys: Alice Cervellon[1]; Luciana Maria Bortoluci Ormastroni[1]; Satoshi Utada[1]; Phillipp Kürnsteiner[2]; Paraskevas Kontis[2]; Lorena Mataveli Suave[3]; Samuel Hemery[1]; Patrick Villechaise[1]; *Jonathan Cormier*[1]; [1]ENSMA - Institut Pprime - UPR CNRS 3346; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]SAFRAN Tech

4:20 PM
Effect of Stacking Fault Segregation and Local Phase Transformations on Creep Strength in Ni-base Superalloys: *Timothy Smith*[1]; Brian Good[1]; Tim Gabb[1]; Bryan Esser[2]; Ashton Egan[2]; Laura Evans[1]; David McComb[2]; Michael Mills[2]; [1]NASA Glenn Research Center; [2]The Ohio State University

4:40 PM
Is the Carbon Content Really an Issue for the LCF Durability of Forged γ/γ' Ni-based Disk Alloys?: *Adele Govaere*[1]; Anne-Laure Rouffié[2]; Florence Hamon[3]; Patrick Villechaise[3]; Jean-Michel Franchet[2]; Alexandre Devaux[4]; Coraline Crozet[4]; Paraskevas Kontis[5]; Jonathan Cormier[3]; [1]Ensma / Pprime Institute - Safran Tech; [2]Safran Tech; [3]Pprime Institute; [4]Aubert & Duval; [5]Max Planck Institute

5:00 PM
Investigating Deformation Mechanisms in a Coarsening Resistant Ni-base Superalloy with "Compact" γ'-γ" Coprecipitates: *Semanti Mukhopadhyay*[1]; Hariharan Sriram[1]; Richard DiDomizio[2]; Robert Hayes[3]; Christopher Zenk[1]; G.B. Vishwanathan[1]; Yunzhi Wang[1]; Michael Mills[1]; [1]Ohio State University; [2]GE Global Research Center, USA; [3]Materials Testing Inc, USA

5:20 PM
Microstructure and Mechanical Properties of a Cast Ni-based Alloy: *Govindarajan Muralidharan*[1]; Jonathan Charleston[1]; Donovan Leonard[1]; Jim Myers[2]; [1]Oak Ridge National Laboratory; [2]MetalTek International

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Machine Learning and Atomistic Algorithms

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Tuesday PM | February 25, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Bridging the Electronic, Atomistic and Mesoscopic Scales using Machine Learning: *Subramanian Sankaranarayanan*[1]; [1]Argonne National Laboratory

2:30 PM
Designing High-strength Carbon-nanotube Polymer Composites using Machine Learning Algorithms Integrated with Molecular Dynamics Simulations: *Aowabin Rahman*[1]; Prathamesh Deshpande[2]; Matthew Radue[2]; Michael Czabaj[1]; S Gowtham[2]; Susanta Ghosh[2]; Gregory Odegard[2]; Ashley Spear[1]; [1]University of Utah; [2]Michigan Technological University

2:50 PM
Monte Carlo Study of Paired-spin Kagome Artificial Spin Ice Lattices: David Friedman[1]; Frank Barrows[2]; Yue Li[2]; *Charudatta Phatak*[2]; [1]University of Illinois, Urbana-Champaign; [2]Argonne National Laboratory

3:10 PM
Functional Uncertainty Propagation with Bayesian Ensembles in Molecular Dynamics: *Saaketh Desai*[1]; Sam Reeve[2]; Alejandro Strachan[1]; [1]Purdue University; [2]Lawrence Livermore National Laboratory

3:30 PM
Nudged Elastic Band Method for Solid-solid Transition Under Finite Deformation: *Wei Gao*[1]; [1]University of Texas at San Antonio

3:50 PM Break

4:00 PM Invited
Charting Spaces of Materials Properties: *Luca Ghiringhelli*[1]; [1]Fritz Haber Institute of the Max Planck Society

4:30 PM
Applying Machine Learning to Identifying Packing Defects in Amorphous Materials: *Tina Mirzaei*[1]; P.Alex Greaney[1]; [1]University of California, Riverside

4:50 PM
Reduced-order Atomistic Method for Simulating Radiation Effects in Metals: Elton Chen[1]; Chaitanya Deo[2]; *Remi Dingreville*[1]; [1]Sandia National Laboratories; [2]Georgia Institute of Technology

5:10 PM
An Atomistic Framework to Understand Solute Grain Boundary Segregation in a Polycrystal: *Malik Wagih*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

5:30 PM
Quasiparticle Approach to Study Solute Segregation at Tilt grain Boundaries in Bcc Iron: *Helena Zapolsky*[1]; Antoine Vaugeois[1]; Renaud Patte[1]; [1]Gpm, Umr 6634

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications VIII — Session II

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Hsin-jay Wu, National Chiao-tung University; Tiejun Zhu, Zhejiang University

Tuesday PM | February 25, 2020
Miramar | Marriott Marquis Hotel

Session Chairs: Albert Wu, National Central University; Yoshisato Kimura, Tokyo Institute of Technology

2:00 PM Invited
Gradient Composition Layered Microstructure Development in Thermoelectric $Mg_2(Si,Sn)$ Alloys Based on Phase Equilibrium: *Yoshisato Kimura*[1]; Narumi Sakamoto[1]; Zhifang Zhou[1]; Yaw Wang Chai[1]; Yu Ikuta[2]; Yonghoon Lee[2]; [1]Tokyo Institute of Technology; [2]KELK Ltd.

2:20 PM Invited
Thermoelectric Properties of Amorphous ZnO_xN_y Thin Films at Room Temperature: Yasushi Hirose[1]; Masato Tsuchii[1]; Kei Shigematsu[2]; Yohei Kakefuda[3]; Takao Mori[3]; *Tetsuya Hasegawa*[1]; [1]University. of Tokyo; [2]Tokyo Tech.; [3]NIMS

2:40 PM
Heat Stability of Mg2Si1-xSnx as Affected by Heat Treatment Temperature and Duration: *Mahdi Mejri*[1]; Yohan Thimont[1]; Benoit Malard[2]; Claude Estournes[1]; [1]CIRIMAT, Université de Toulouse, CNRS; [2]CIRIMAT, Université de Toulouse, CNRS, INP-ENSIACET

3:00 PM
Transmission Electron Microscopy Study of Hole-selective Contacts Employed in Silicon Solar Cells: *Haider Ali*[1]; Geoffrey Gregory[1]; Kristopher Davis[1]; [1]University of Central Florida

3:20 PM Break

3:40 PM Invited
Thermoelectric Properties of p-type Mg Doped $CuMO_2$ Delafossite Thin Films and Modules: *Yohan Thimont*[1]; Inthuga Sinnarasa[1]; Antoine Barnabé[1]; Philippe Tailhades[1]; Lionel Presmanes[1]; [1]CIRIMAT, Universite de Toulouse, CNRS, Universite Toulouse 3 Paul Sabatier, 118 route de Narbonne, 31062 Toulouse Cedex 9, France

4:00 PM Invited
Interfacial Reactions Between Bi2Te3 Substrate with Cu, In, Sn and Ni: *Sinn-wen Chen*[1]; How-wei Shih[1]; Wei Wang[1]; [1]National Tsing Hua University

4:20 PM Invited
3D Printing of High-performance and Flexible Thermoelectric Materials and Devices using 2D Colloidal Nanocrystals: *Yanliang Zhang*[1]; [1]University of Notre Dame

4:40 PM
Assessment of Interface in Bi2Te3 and Sb2Te3 Thin Film Thermoelectric Modules: *Zhen-Wei Sun*[1]; Kai-Wen Cheng[1]; Albert T. Wu[1]; [1]National Central University

5:00 PM Invited
Synthesis, Processing and Characterizations of Functional Materials for Industrial Applications: *David Berthebaud*[1]; [1]LINK (CNRS - Saint Gobain - NIMS)

5:20 PM
High Reliability Package of Perovskite Solar Cell by SiNx Passivation Layer with Sn-Bi-In Low-melting Solder: *Chun Kai Huang*[1]; [1]National Central University

LIGHT METALS

Alumina and Bauxite — Residue Reuse and Remediation

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: James Vaughan, University of Queensland

Tuesday PM | February 25, 2020
2 | San Diego Convention Ctr

Session Chair: Michael Coley, The University of the West Indies

2:00 PM Introductory Comments

2:10 PM
Bayer Process Towards the Circular Economy – Metal Recovery from Bauxite Residue: Paula Araújo[1]; Patrícia Silva[2]; Andre do Carmo[2]; Fernando Gomes[2]; Alex dos Santos[2]; *Adriano Lucheta*[2]; Raphael Da Costa[3]; Caio de Melo[3]; Marcelo Montini[3]; [1]SENAI Innovation Institute ; [2]SENAI Innovation Institute; [3]Norsk Hydro Brasil

2:30 PM
Bayer Process Towards the Circular Economy – Soil Conditioners from Bauxite Residue: Roseanne Holanda[1]; Patrícia Silva[2]; Andre do Carmo[2]; Alice Cardoso[2]; *Adriano Lucheta*[2]; Raphael da Costa[3]; Caio de Melo[3]; Marcelo Montini[3]; [1]SENAI Innovation Institute ; [2]SENAI Innovation Institute; [3]Norsk Hydro Brasil

2:50 PM
Brazilian Bauxite Residue Physical-chemical Characterization and Acidic Neutralization Potential: Patrícia Silva[1]; Andre do Carmo[1]; Roseanne Holanda[1]; Fernando Gomes[1]; Emanuela Nogueira[1]; *Adriano Lucheta*[1]; Raphael da Costa[2]; Caio de Melo[2]; Marcelo Montini[3]; [1]SENAI Innovation Institute; [2]Norsk Hydro Brasil

3:10 PM Break

3:30 PM
Effect of Concentrations and Pressures of CO_2 on Calcification-Carbonation Treatment of Bauxite residue: *Xi Chao*[1]; Zhang Tingan[1]; Guozhi Lv[1]; Yang Chen[1]; [1]Northeastern University

4:10 PM
Comprehensive Utilization of Red Mud Through the Recovery of Valuable Metals and Reuse of the Residue: *Fei Lyu*[1]; Li Wang[1]; Jiande Gao[1]; Honghu Tang[1]; Wei Sun[1]; Yuehua Hu[1]; Runqing Liu[1]; Lei Sun[1]; [1]Central South University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Properties of Aluminium Alloys I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Tuesday PM | February 25, 2020
1A | San Diego Convention Ctr

Session Chair: Samuel Wagstaff, Novelis

2:00 PM Introductory Comments

2:05 PM
High Cycle Fatigue Properties of the Zr-modified Al-Si-Cu-Mg Alloy at Elevated Temperatures: *Shouxun Ji*[1]; Guangyu Liu[1]; Paul Blake[2]; [1]Brunel University London; [2]Jaguar Land Rover

2:30 PM
Effect of Mo on Elevated-temperature Low-cycle Fatigue Behavior of Al-Si 356 Cast Alloy: Sinan Chen[1]; *Kun Liu*[1]; X Grant Chen[1]; [1]University of Quebec at Chicoutimi

2:55 PM
State Parameter-based Simulation of Temperature- and Strain Rate Dependent Flow Curves of Al-alloys: *Bernhard Viernstein*[1]; Philipp Schumacher[2]; Benjamin Milkereit[2]; Ernst Kozeschnik[1]; [1]Institute of Materials Science and Technology, TU Wien,; [2]University of Rostock

3:20 PM
Coarsening-resistance of a Severely Deformed Al-0.2wt% Sc Alloy: *Yan Huang*[1]; [1]Brunel University London

3:45 PM Break

4:00 PM
The Effect of SIMA Process on the Microstructure and Mechanical Properties of Al-7Si Alloy: *Chandan Choudhary*[1]; Durbadal Mandal[1]; Kanai Sahoo[2]; [1]National Institute of Technology, Durgapur; [2]CSIR-National Metallurgical Laboratory, Jamshedpur

4:25 PM
Effect of Mg on Flow Behavior of Al-Mg Alloys and Its Constitutive Modelling Using Finite Element Analysis: *Shahin Ahmad*[1]; Vilas Tathavadkar[1]; Alankar Alankar[2]; K. Narasimhan[2]; [1]Aditya Birla Science & Technology Co. Pvt. Ltd.; [2]Indian Institute of Technology, Bombay

4:50 PM
Influence of Thermal Treatment and Design Parameters on the Fatigue Life of Automotive Control Arm Fabricated from A357 Semi-solid Alloy: *Mohamed Attia*[1]; Khaled Ragab[1]; Mohamed Bouazara[1]; X Grant Chen[1]; [1]Home

BIOMATERIALS

Biodegradable Materials for Medical Applications II — Zinc and Iron Implants

Sponsored by: TMS Functional Materials Division, TMS: Biomaterials Committee

Program Organizers: Jaroslaw Drelich, Michigan Technological University; Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University; Jan-Marten Seitz, Syntellix AG; Petra Maier, Stralsund University of Applied Sciences; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California, Riverside

Tuesday PM | February 25, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University

2:00 PM Keynote
Advances in Zinc and Its Alloys as Biodgradable Metals for Medical Applications: *Yufeng Zheng*[1]; [1]Peking University

2:35 PM Invited
Surface Engineering on Zinc for Better Biocompatibility: *Donghui Zhu*[1]; [1]Stony Brook University

3:00 PM Invited
Fe-based Alloys with Extreme Properties for Thinner Absorbable Devices: Sergio Loffredo[1]; Carlo Paternoster[1]; Nicolas Giguere[2]; Maurizio Vedani[3]; *Diego Mantovani*[1]; [1]Laval University; [2]Quebec Metallurgy Center; [3]Mechanics, Polytechnic of Milan

3:25 PM Invited
Additive Manufacturing of Biodegradable Fe-alloys for Orthopedic Applications: *Ali Gokhan Demir*[1]; Danilo Carluccio[2]; Chun Xu[2]; Qingsong Ye[2]; Matthew Dargusch[2]; Barbara Previtali[1]; [1]Politecnico di Milano; [2]University of Queensland

3:50 PM Break

4:05 PM
Different Approaches to Achieving the Appropriate Biodegradability for the Fe-Mn Alloy: *Matjaz Godec*[1]; Irena Paulin[1]; Crtomir Donik[1]; Jaka Burja[1]; Matej Hocevar[1]; Peter Gregorcic[2]; Aleksandra Kocijan[1]; [1]Institute of Metals and Technology; [2]Faculty of Mechanical Engineering

4:25 PM
Thermal Treatment of Zn-based Alloys for Vascular Stenting – Effect of Microstructure on Degradation Behavior and In-vivo Response: *Malgorzata Sikora-Jasinska*[1]; Ehsan Mostaed[1]; Roger J. Guillory II[1]; Jeremy Goldman[1]; Jaroslaw W. Drelich[1]; [1]Michigan Technological University

4:45 PM
Novel Zn-Fe Matrix Nanocomposite as Biodegradable Material: *Zeyi Guan*[1]; Jingke Liu[1]; Xiaochun Li[1]; [1]University of California, Los Angeles

5:05 PM Concluding Comments

BIOMATERIALS

Biological Materials Science — Biological and Natural Materials II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Tuesday PM | February 25, 2020
Leucadia | Marriott Marquis Hotel

Session Chairs: Wei Huang, University of California, Riverside; Maryam Hosseini, Purdue University; Jing Du, Penn State University

2:00 PM Invited
Hooves and Horns – How Do They Avoid Impact Damage?: Wei Huang[1]; Alireza Zaheri[2]; Nicholas Yaraghi[1]; Wen Yang[3]; Jae-Young Jung[3]; Zezhou Li[4]; Horacio Espinosa[2]; Robert Ritchie[4]; David Kisailus[1]; Susan Stover[5]; *Joanna McKittrick*[3]; [1]University of California, Riverside; [2]Northwestern University; [3]University of California, San Diego; [4]University of California, Berkeley; [5]University of California, Davis

2:30 PM
Bioinspired Routes to Damage Tolerant Materials: Unique Microstructure and Fracture Properties of Enamel in the Mammal-like Grinding Dentition of a the Hadrosaurid Dinosaur: *Soumya Varma*[1]; Manish Jain[1]; Yi Teng Lee[1]; Shane Johnson[1]; B. A. Krick[2]; G. M. Erickson[3]; Daniele Casari[4]; Johann Michler[4]; Jakob Schwiedrzik[4]; Shraddha Vachhani[5]; Sid Pathak[1]; [1]University of Nevada, Reno; [2]Lehigh University ; [3]Florida State University and National High Magnet Field Laboratory ; [4]EMPA - Swiss Federal Laboratories for Materials Science and Technology; [5]Bruker Nano Surfaces

2:50 PM
The Cholla Cactus: a New Model for Torsional Resilience in Biological Materials: *Albert Matsushita*[1]; Luca Devivo[1]; Daniel Kupor[1]; Josue Luna[1]; Doheon Lee[1]; Falko Kuester[1]; Joanna McKittrick[1]; [1]University of California, San Diego

3:10 PM
On the Strength Across the Hair Species and the Evolution of Hair Fracture: *Wen Yang*[1]; Robert Ritchie[2]; Marc Meyers[1]; [1]University of California, San Diego; [2]University of California, Berkeley

3:30 PM Break

3:45 PM
Impact-resistant Biological Coatings on the Mantis Shrimp Dactyl Club: *Wei Huang*[1]; Nicolas Guarin-Zapata[2]; Pablo Zavattieri[2]; David Kisailus[1]; [1]University of California Riverside; [2]Purdue University

4:05 PM
Toughness Enhancing 1-dimensional Metamaterials in the Webs of the Recluse Spider: Ben Skopic[1]; *Hannes Schniepp*[1]; [1]The College of William & Mary

4:25 PM
Structure and Mechanical Behavior of Regenerated Fish Scales: Sean Ghods[1]; Sarah Waddell[1]; Emily Weller[1]; Cameron Renteria[1]; H-Y Jiang[2]; SS Mao[3]; JM Janak[4]; Timothy Linley[4]; *Dwayne Arola*[1]; [1]University of Washington; [2]Southest University; [3]Shanghai University; [4]Pacific Northwest National Laboratory

4:45 PM
The Boxfish Carapace, a Simple Architecture to Control Crack Propagation: Maryam Hosseini[1]; Sean Garner[2]; Steven Naleway[3]; Joanna McKittrick[2]; *Pablo Zavattieri*[1]; [1]Purdue University; [2]University of California San Diego; [3]University of Utah

5:05 PM Invited
Multi-scale Elemental, Structural and Mechanical Characterization of the Influence of Different Medicines on the de novo Regeneration of Zebrafish Caudal Fin: Po-Yu Chen[1]; *Fabio Bohns*[1]; Yang-Rong Shih[1]; [1]National Tsing Hua University

LIGHT METALS

Cast Shop Technology — Melt Treatment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Tuesday PM | February 25, 2020
1B | San Diego Convention Ctr

Session Chair: Mark Badowski, Hydro

2:00 PM Introductory Comments

2:05 PM
Batscan, Constellium In-melt Ultrasonic Inclusion Detector: Industrial Performance: Jean-Louis Achard[1]; Nicolas Ramel[2]; Guido Beretta[1]; Pierre-Yves Menet[1]; Jocelyn Prigent[1]; *Pierre Le Brun*[1]; [1]Constellium C-TEC; [2]Constellium Neuf-Brisach

2:30 PM
Benchmark and Practical Application of State of the Art Hydrogen Monitoring: *Arnis Pelss*[1]; Johannes Morscheiser[1]; Sebastian Radwitz[1]; Jens Kremer[1]; Andreas Gilles[1]; [1]Aleris Rolled Products Germany GmbH

2:55 PM
Molten Aluminum Quality Evaluations for Thin Foil Products: *Ali Ulus*[1]; Çisem Dogan[2]; Ali Ulas Malcioglu[2]; Anil Özkaya[2]; Eren Toraman[2]; [1]Asas Aluminium ; [2]Asas Aluminium

3:20 PM
Industrial Verification of One- and Two-chamber Siphon Degassing: *Arild Hakonsen*[1]; Terje Haugen[1]; [1]Hycast AS

3:45 PM Break

4:00 PM
Evaluation of CFF and BPF in Pilot Scale Filtration Tests: *Martin Syvertsen*[1]; Inge Johansen[2]; Anne Kvithyld[1]; Britt Elin Gihleengen[3]; Shahid Akhtar[2]; Are Bergin[2]; Anders Johansson[4]; [1]SINTEF Industry; [2]Hydro Aluminium; [3]Hycast; [4]Gränges

4:25 PM
Dynaprime Filtration Technology Experience at Alcoa Baie-Comeau: Jean Francois Desmeules[1]; *Francis Caron*[2]; [1]Dynamic Concept; [2]Alcoa

4:50 PM
Improving Ultrasonic Melt Treatment Efficiency Through Flow Management: Acoustic Pressure Measurements and Numerical Simulations: *Tungky Subroto*[1]; Dmitry Eskin[1]; Christopher Beckwith[2]; Iakovos Tzanakis[3]; Georgi Djambazov[2]; Koulis Pericleous[2]; [1]Brunel University; [2]University of Greenwich; [3]Oxford Brookes University

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Mechanical Properties I

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Tuesday PM | February 25, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Rajiv Soman, Eurofins EAG Materials Science LLC; Donato Firrao, Politecnico di Torino

2:00 PM
Dynamic Mechanical Behavior and Microstructure Evolution of Quinary Cu-Mn-Ni-Zn-Al Alloys: John Lauria[1]; Kevin Laws[1]; *Juan Escobedo-Diaz*[1]; Hongxu Wang[1]; Zongjun Li[1]; Ali Ameri[1]; [1]University of New South Wales

2:20 PM
Temperature, Pressure, and Current Effects on Densification and Mechanical Properties of Nano-grained FeNiZr Consolidated via the Field Assisted Sintering Technology: *Sean Fudger*[1]; Tom Luckenbaugh[2]; A.J. Roberts[1]; Chad Hornbuckle[1]; Franklin Kellogg[3]; Chris Haines[1]; Kris Darling[1]; [1]U.S. Army Research Laboratory; [2]Bowhead Total Enterprise Solutions, LLC; [3]SURVICE Engineering Company

2:40 PM
Effect of Microstructure on Cleavage Fracture of Thick Section Quenched and Tempered S690 High Strength Steel: *Virginia M. Bertolo*[1]; Quanxin Jiang[1]; Carey L. Walters[2]; Vera Popovich[1]; [1]Delft University of Technology, Department of Materials Science and Engineering; [2]TNO, Structural Dynamics

3:00 PM
In-situ Investigation of Thermal Characteristics of Novel Flash Processing Technique for Production of Advanced High Strength Steel (AHSS): *Artem Trofimov*[1]; Hsin Wang[1]; Thomas Watkins[1]; Thomas Muth[1]; Sudarsanam Babu[2]; Gary Cola[3]; [1]Materials Science & Technology Division, Oak Ridge National Laboratory; [2]Department of Mechanical, Aerospace, and Biomedical Engineering, University of Tennessee; [3]SFP Works LLC

3:20 PM
Tensile Characterization of Austempered Ductile Iron in Aquatic and Gaseous Environments: *Dragan Rajnovic*[1]; Olivera Eric Cekic[2]; Leposava Sidjanin[1]; [1]University of Novi Sad, Faculty of Technical Sciences, Serbia; [2]University of Belgrade, Faculty of Mechanical Engineering, Innovation Centre, Serbia

3:40 PM Break

3:55 PM
Effect of Heat Treatment on Impact Toughness of Electron Beam Welded AISI 316 Stainless Steel: Arun Kumar[1]; *Sandeep Singh Sandhu*[1]; Beant Singh[2]; [1]Quest engineering college; [2]PCET lalru

4:15 PM
Connecting Dynamic Strain Aging to Deformation Processing in Magnesium-calcium-based Alloys: *Wesley Cuadrado-Castillo*[1]; Michele Manuel[1]; [1]University of Florida

4:35 PM
Microstructure Evolution During Tensile Deformation of Polycrystalline Cobalt: *Frantisek Chmelik*[1]; Michal Knapek[1]; Patrik Dobron[1]; Mayerling Martinez[2]; Eric Hug[2]; [1]Charles University; [2]Normandy University

4:55 PM
Deformation Behavior of Hexagonal Metals Investigated by the In-situ Acoustic Emission and Digital Image Correlation Techniques: *Michal Knapek*[1]; Patrik Dobron[1]; Frantisek Chmelik[1]; [1]Charles University

5:15 PM
Characterization of The Deformation Behavior of Selective Laser Melted Alsi10mg Samples Under Dynamic Impact Loading by Statistical Method: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

5:35 PM
Determining Bulk Elastic Properties of Transversely Isotropic Aluminum Using Resonant Ultrasound Spectroscopy: *Jordan Evans*[1]; Blake Sturtevant[1]; Fedor Balakirev[1]; Albert Migliori[1]; Boris Maiorov[1]; [1]Los Alamos National Laboratory

---

CHARACTERIZATION

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification — 3D Microstructure Descriptors & Uncertainty

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee

Program Organizers: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, U.S. Army Research Laboratory; James Hogan, University of Alberta; Srikanth Patala, North Carolina State University; Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Tuesday PM | February 25, 2020
Theater A-3 | San Diego Convention Ctr

Session Chairs: Francesca Tavazza, National Institute of Standards and Technology; James Hogan, University of Alberta

---

2:00 PM Introductory Comments

2:05 PM
X-Ray Computed Tomography of 3D Crack Lattices in Advanced Ceramics and their Effect on Mechanical Response: *James Hogan*[1]; Calvin Lo[1]; Haoyang Li[1]; Brendan Koch[1]; Tomoko Sano[2]; [1]University of Alberta; [2]CCDEVCOM Army Research Laboratory

2:25 PM
3D Morphological Characterization of Porous Cu by Vapor Phase Dealloying Zn-Cu Alloys: *Qingkun Meng*[1]; Kai Wang[1]; Changhang Zhao[2]; Lijie Zou[2]; Yibin Ren[3]; Mingyuan Ge[4]; Xianghui Xiao[4]; Wah-Keat Lee[4]; Yu-chen Karen Chen-Wiegart[2]; [1]China University of Mining and Technology; [2]Stony Brook University; [3]Shenyang Ligong University; [4]Brookhaven National Laboratory

2:45 PM
Automated Anomaly Detection in Unlabeled Computed Tomography Images: *Donald Loveland*[1]; Hyojin Kim[1]; T. Yong-Jin Han[1]; [1]Lawrence Livermore National Laboratory

3:05 PM
Deep Convolutional Networks for Image Reconstruction from 3D Coherent X-ray Diffraction Imaging Data: *Mathew Cherukara*[1]; Henry Chan[1]; Subramanian Sankaranarayanan[1]; Youssef Nashed[1]; Ross Harder[1]; [1]Argonne National Laboratory

3:25 PM
Uncertainty Quantification of Far-field HEDM Measurements: *Rachel Lim*[1]; Joel Bernier[2]; Anthony Rollett[1]; Paul Shade[3]; [1]Carnegie Mellon University; [2]Lawrence Livermore National Laboratory; [3]Air Force Research Laboratory

3:45 PM Break

4:05 PM
Uncertainty Quantification Techniques Applied to Ductile Damage Predictions in the 3rd Sandia Fracture Challenge: *James Sobotka*[1]; John McFarland[1]; [1]Southwest Research Institute

4:25 PM
Uncertainty Propagation in a Multiscale CALPHAD-reinforced Elastochemical Phase-field Model: *Vahid Attari*[1]; Pejman Honarmandi[1]; Thien Duong[1]; Daniel Sauceda[1]; Douglas Allaire[1]; Raymundo Arroyave[1]; [1]Texas A&M University

4:45 PM
Machine Learning Reinforced Crystal Plasticity Modeling of Titanium-Aluminum Alloys under Uncertainty: *Pinar Acar*[1]; [1]Virginia Tech

5:05 PM
Predicting Microstructure-sensitive Fatigue-crack Path in 3D Using a Machine Learning Framework: Kyle Pierson[1]; *Aowabin Rahman*[1]; Ashley Spear[1]; [1]University of Utah

---

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Session IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Tuesday PM | February 25, 2020
32B | San Diego Convention Ctr

Session Chair: Arunima Singh, Arizona State University

2:00 PM Invited
Predicting Functional Defects by Design in Energy and Quantum Materials: *Panchapakesan Ganesh*[1]; [1]Oak Ridge National Laboratory

2:30 PM
The Relationship Between Compositional Mixing and Phase Stability of Metal-halide Perovskites: Theoretical Study: *Ki-Ha Hong*[1]; [1]Hanbat National Univeristy/Department of Materials Science and Engineering

2:50 PM
First-Principles-based Hybrid Perovskite Materials Design for Memristor: *Donghwa Lee*[1]; Seong Hun Kim[1]; [1]Pohang University of Science and Technology (POSTECH)

3:10 PM
Discovery and Characterization of 1D Inorganic Polymers Through Datamining and Density Functional Theory: *Joshua Paul*[1]; Janet Lu[1]; Sohum Shah[1]; Stephen Xie[1]; Richard Hennig[1]; [1]University of Florida

3:30 PM Break

3:50 PM Invited
Toward Rational Design and Discovery of Metastable Materials: *Vladan Stevanovic*[1]; [1]Colorado School of Mines

4:20 PM
Predicting the Properties of Crystals with High Accuracy Using Deep Learning: *Weike Ye*[1]; Chi Chen[1]; Zhenbin Wang[1]; Iek-Heng Chu[1]; Yunxing Zuo[1]; Chen Zheng[1]; Shyue Ping Ong[1]; [1]University of California, San Diego

4:40 PM
Introducing the MEAM Interatomic Potential for NiTiHf Shape Memory Alloys: *Meghnath Jaishi*[1]; Garitt Tucker[1]; Aaron Stebner[1]; [1]Colorado School of Mines

5:00 PM
Density Functional Theory and Machine Learning Guided Prediction of Thermal Properties of Rare-earth Disilicates: *Mukil V. Ayyasamy*[1]; Prasanna Balachandran[1]; [1]University of Virginia

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Microstructure and Atomistic Simulations

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Tuesday PM | February 25, 2020
Theater A-9 | San Diego Convention Ctr

Session Chairs: Izabela Szlufarska, University of Wisconsin; Simon Middleburgh, Bangor University

2:00 PM Invited
Exploration of Fundamental Radiation Effects Phenomena in Materials: *Steven Zinkle*[1]; Ling Wang[1]; Yan-Ru Lin[1]; Yajie Zhao[1]; Arunodaya Bhattacharya[1]; [1]University of Tennessee

2:40 PM
First Principle Studies of Effects of Solute Segregation on Grain Boundary Strength in Ni-based X-750 Alloy: *Ziqi Xiao*[1]; Axel Seoane[1]; Xian-Ming Bai[1]; Lingfeng He[2]; [1]Virginia Tech; [2]Idaho National Laboratory

3:00 PM
Molecular Dynamics Simulations of Phosphorus Migration in a Grain Boundary of a-iron: *Ken-Ichi Ebihara*[1]; Tomoaki Suzudo[1]; [1]Jaea

3:20 PM
The Effect of Minor Additives on Radiation Induced Segregation in Austenitic Steel Alloys: *Yongfeng Zhang*[1]; Anus Manzoor[1]; Dilpuneet Aidhy[2]; Miao Song[3]; Xiaoyuan Lou[4]; lingfeng He[1]; [1]Idaho National Laboratory; [2]University of Wyoming; [3]University of Michigan ; [4]Auburn University

3:40 PM Break

4:00 PM Invited
DFT Calculations for Modeling Point Defect and Fission Gas Behavior in Nuclear Fuels: *David Andersson*[1]; [1]Los Alamos National Laboratory

4:40 PM
A First-principles Investigation on the Co-segregation Energetics of Chromium-helium at Grain Boundaries in a-Fe: *Sainyam Nagar*[1]; Pulkit Garg[1]; Nitin Muthegowda[1]; Mehul Bhatia[1]; Ilaksh Adlakha[1]; Kiran Solanki[1]; [1]Arizona State University

5:00 PM
DFT+U Point Defect Calculations of Uranium Mononitride: Bryant Jerome[1]; *Dilpuneet Aidhy*[1]; [1]University of Wyoming

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Defects and Kinetics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Tuesday PM | February 25, 2020
33C | San Diego Convention Ctr

Session Chairs: David Strubbe, University of California, Merced; Haixuan Xu, University of Tennessee

2:00 PM Invited
Thermodynamics and Kinetics of Defects in Perovskite Oxide Superlattices: *Haixuan Xu*[1]; Lipeng Zhang[2]; Valentino Cooper[3]; Paul Kent[3]; [1]University of Tennessee; [2]Beijing University of Chemical Technology; [3]Oak Ridge National Laboratory

2:30 PM
{11-21} Twin Nucleation in HCP Rhenium from < c+a > Edge Dislocations: *Lu Jiang*[1]; Velimir Radmilovic[2]; Julian Sabisch[3]; Liang Qi[4]; Andrew Minor[1]; Daryl Chrzan[1]; Mark Asta[1]; [1]University of California, Berkeley; [2]University of Belgrade; [3]Sandia National Laboratories; [4]University of Michigan

2:50 PM Invited
Molecular Dynamics Simulation of Diffusion, Dislocation and Grain Boundary Migration in Austenitic Steels: *Mikhail Mendelev*[1]; Valery Borovikov[1]; [1]Ames Laboratory

3:20 PM
Temperature-dependent Kinetic Pathways for Jog-pair Nucleation in FCC Metals: *Anas Abu-Odeh*[1]; Maeva Cottura[2]; Mark Asta[1]; [1]University of California, Berkeley; [2]Institut Jean Lamour, CNRS

3:40 PM Break

3:50 PM Invited
Atomistic and Mesoscale Modeling of Nanoscale Sintering: Applications to Additive Manufacturing: Maher Alghalayini[1]; *Fadi Abdeljawad*[1]; [1]Clemson University

4:20 PM Invited
Structure and Properties of Ni-doped MoS2: Phase Diagrams, Raman Spectra, and Solid Lubrication: *David Strubbe*[1]; [1]University of California, Merced

4:50 PM
A Phase-field Method for Modeling Solute Segregation at Interphase Boundary in Binary and Ternary Alloys: *Sourabh Kadambi*[1]; Srikanth Patala[1]; [1]North Carolina State University

5:10 PM
Revisiting the Early Stages of Precipitation in Al-Cu Alloys: *Kang Wang*[1]; William Soffa[1]; Bi-Cheng Zhou[1]; [1]University of virginia

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Porosity & Cracking

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Tuesday PM | February 25, 2020
17B | San Diego Convention Ctr

Session Chairs: Lang Yuan, University of South Carolina; Chu Lun Alex Leung, University College London

2:00 PM Invited
Resolving Pore Evolution Mechanisms During Laser Powder Bed Fusion Additive Manufacturing by Multi-modal Imaging: *Chu Lun Alex Leung*[1]; Sebastian Marussi[1]; Lorna Sinclair[1]; Samuel Clark[1]; Yunhui Chen[1]; Leigh Stanger[2]; Jon Willmott[2]; Robert Atwood[3]; Andrew Bodey[3]; Margie Olbinado[4]; Alexander Rack[4]; Peter Lee[1]; [1]University College London; [2]University of Sheffield; [3]Diamond Light Source Ltd; [4]European Synchrotron Radiation Facility

2:30 PM
Assessment of Grain Refinement on Hot-tearing of New Multicomponent Al-Cu Alloys: *Adrian Sabau*[1]; Seyed Mirmiran[2]; Christopher Glaspie[2]; Shimin Li[3]; Diran Apelian[3]; Amit Shyam[1]; Andres Rodriguez[4]; J. Haynes[1]; [1]Oak Ridge National Laboratory; [2]Fiat Chrysler Automobiles (FCA) North America, LLC.; [3]Worcester Polytechnic Institute; [4]Nemak Monterrey

2:50 PM
How to Prevent Gas Porosity Defects in Castings of Stator Housing in Grey Cast Iron: *Izudin Dugic*[1]; [1]Linnaeus University

3:10 PM
Bubble Induced Convection During Dendritic Solidification: *Seyed Amin Nabavizadeh*[1]; Mohsen Eshraghi[2]; Sergio Felicelli[1]; [1]University of Akron; [2]Department of Mechanical Engineering, California State University

3:30 PM Break

3:50 PM
Breakouts During Casting (The Big Casting Monster): Magdy Feshar[1]; *Mohmaed Abomossaes*[1]; [1]EZZ Dekhila Steel company

4:10 PM
Deformation Induced Crack Growth in Semi-solid Die Cast Aluminum Alloys: *Shishira Bhagavath*[1]; Zhixuan Gong[2]; Sara Nonni[2]; Tim Wigger[2]; Saurabh Shah[2]; Sebastian Marussi[2]; Neeraj Srivastava[1]; Shyamprasad Karagadde[1]; Peter Lee[2]; [1]Indian Institute of Technology Bombay; [2]University College London

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Grain Boundary Evolution

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Tuesday PM | February 25, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Phase Transitions in Grain Boundary Dynamics: Kongtao Chen[1]; Jian Han[1]; *David Srolovitz*[2]; [1]University of Pennsylvania; [2]City University of Hong Kong

2:20 PM
Grain Boundary Spinodals: The Role of the Interface Stiffness in Grain Boundary Dynamical Processes: *Fadi Abdeljawad*[1]; Robert Moore[1]; Timothy Beecroft[1]; [1]Clemson University

2:40 PM
A New Approach to Modeling Grain Boundary Motion with Strongly Anisotropic Boundary Energy: *Brandon Runnels*[1]; Vinamra Agrawal[2]; [1]University of Colorado Colorado Springs; [2]Auburn University

3:00 PM
An Atomistic Survey of Grain Boundary Migration Mechanisms in BCC Fe: *Ian Chesser*[1]; Sutach Ratanaphan[2]; Brandon Runnels[3]; Elizabeth Holm[1]; [1]Carnegie Mellon University; [2]King Mongkut's University of Technology Thonburi; [3]University of Colorado Colorado Springs

3:20 PM
Interrelationship Between How Grain Boundary Solute Segregation Influence Grain Coarsening, Initiation of Phase Transformations, and Impact Deformation Mechanisms of Metallic Alloys: *Arun Devaraj*[1]; Libor Kovarik[1]; Elizabeth Kautz[1]; Bharat Gwalani[1]; Aashish Rohatgi[1]; Wenbo Wang[2]; Jason Trelewicz[2]; Vineet Joshi[1]; Curt Lavender[1]; [1]Pacific Northwest National Laboratory; [2]Stony Brook University

3:40 PM Break

4:00 PM Invited
Pinning of a Grain Boundary Migration by Coherent Second Phase Particles: Nan Wang[1]; Youhai Wen[2]; *Long-Qing Chen*[3]; [1]Guangdong Technion-Israel Institute of Technology; [2]NETL; [3]Pennsylvania State University

4:20 PM
Stress State Dependence of Basal-prismatic Facet Structures in Mg: *Khanh Dang*[1]; Shujuan Wang[1]; Mingyu Gong[2]; Carlos Tomé[1]; Rodney McCabe[1]; Jian Wang[2]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory; [2]University of Nebraska-Lincoln

4:40 PM
Structure and Kinetics of Three-dimensional Defects on the {10-12} Twin Boundary in Magnesium: Atomistic and Phase-field Simulations: *Douglas Spearot*[1]; Vincent Taupin[2]; Khanh Dang[3]; Laurent Capolungo[3]; [1]University of Florida; [2]University de Lorraine CNRS; [3]Los Alamos National Laboratory

5:00 PM
Coarsening of Ferrite Lamellae Grains in Heavily Cold Drawn Pure Iron Wire: *Hanchen Feng*[1]; [1]Southeast University

LIGHT METALS

Electrode Technology for Aluminum Production — Spent Pot Lining (SPL) -Joint session with Aluminum Reduction Technology Symposium

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Duygu Kocaefe, University of Quebec at Chicoutimi

Tuesday PM | February 25, 2020
3 | San Diego Convention Ctr

Session Chairs: Kinnor Chattopadhyay, University of Toronto; Pernelle Nunez, International Aluminium Institute

2:00 PM Introductory Comments

2:05 PM
Sustainable Spent Pot Lining Management Guidance: *Pernelle Nunez*[1]; [1]International Aluminium Institute

2:30 PM
Purification of Graphite by Thermal Vacuum Treatment of Spent Potlining: *Kristin Sundby*[1]; Ulf Sjöström[2]; Ellen Myrvold[3]; Morten Isaksen[1]; [1]Hydro Aluminium; [2]Swerim; [3]Alcoa Mosjøen

2:55 PM
The LCL&L Process: A Sustainable Solution for the Treatment and Recycling of Spent Potlining: *Laurent Birry*[1]; Stephane Poirier[1]; [1]Rio Tinto

3:20 PM
Experimental Study on the Collecting Agent for Improvement of Spent Potlining Flotation Index: Nan Li[1]; Lei Gao[2]; *Kinnor Chattopadhyay*[3]; [1]College of Science, Hong He University; [2]Key Laboratory of Green-Chemistry Materials in University of Yunnan Province, Yunnan Minzu University; [3]Faculty of Applied Science and Engineering, Department of Materials Science and Engineering, Cross Appointed to Mechanical and Industrial Engineering, Process Metallurgy Research Labs, University of Toronto

3:45 PM Break

4:05 PM
Environmental Benefits of Using Spent Pot Lining (SPL) in Cement Production: *Mohammad Al Jawi*[1]; Chun Man Chow[2]; Srinivasa Pujari[2]; Michael Pan[2]; Tanvi Kulkarni[2]; Mohamed Mahmoud[1]; Heba Akasha[1]; Salman Abdulla[1]; [1]Emirates Global Aluminium; [2]Massachusetts Institute of Technology

4:30 PM
Characteristic Analysis of Hazardous Waste from Aluminum Reduction Industry: *Mingzhuang Xie*[1]; Han Lv[1]; Tingting Lu[1]; Hongliang Zhao[1]; Rongbin Li[1]; Fengqin Liu[1]; [1]University of Science and Technology Beijing

4:55 PM Panel Discussion

ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management Symposium — Session IV

Sponsored by: TMS Extraction and Processing Division, TMS: Energy Committee

Program Organizers: Xiaobo Chen, RMIT University; Yulin Zhong, Griffith University; Lei Zhang, University of Alaska Fairbanks; John Howarter, Purdue University; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology

Tuesday PM | February 25, 2020
17A | San Diego Convention Ctr

Session Chairs: Ziqi Sun, Queensland University of Technology; Xiaobo Chen, RMIT University

2:00 PM Invited
High temperature Tribological and Oxidation Behaviors of CoCrFeNi High Entropy Alloy: *Guanyu Deng*[1]; Kiet Tieu[1]; Xing Zhao[2]; Lihong Su[1]; Hongtao Zhu[3]; [1]Univ Of Wollongong; [2]Central South University China, Changsha, China; [3]University of Wollongong

2:25 PM Invited
Low Dimensional Nanomaterials and their Hybrids: Theoretical Study: *Ting Liao*[1]; [1]Queensland University of Technology

2:50 PM
Applying Biochar Composite Briquette for Energy Saving in Blast Furnace Ironmaking: *Huiqing Tang*[1]; [1]University of Science and Technology Beijing

3:10 PM
Properties and Microstructure of Copper and/or Nickel Supported on GO, rGO and NGO: Xiangyong Lv[1]; *Guangfen Liang*[1]; Yandong Li[2]; Huamei Duan[1]; Dengfu Chen[1]; Mujun Long[1]; [1]College of Materials Science and Engineering; [2]Laboratory of Extraordinary Bond Engineering and Advanced Materials Technology

3:30 PM Break

3:50 PM
Multifunctional Ga-containing Binary Conversion Coatings on Mg Alloys for Biomedical Applications: *Mingshi Song*[1]; Xiaobo Chen[1]; Ivan Cole[1]; [1]RMIT University

4:10 PM
Investigation of H2 Addition Effects on CO/CO2/H2-air Flames by a Combustion Diagnostic System Based on TDLAS: *Yu Liu*[1]; Jingsong Wang[1]; Haibin Zuo[1]; Qingguo Xue[1]; [1]University of Science and Technology Beijing

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Hydrogen Embrittlement I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Tuesday PM | February 25, 2020
Theater A-10 | San Diego Convention Ctr

Session Chairs: Reiner Kirchheim, Georg-August-Universität Göttingen; Ting Zhu, Georgia Institute of Technology

2:00 PM Invited
Accelerating Diffusion, Plasticity, Grain Growth and Crack Propagation by Hydrogen and Carbon: *Reiner Kirchheim*[1]; [1]University of Goettingen

2:40 PM
Effects of the Microstructure and Hydrogen Mobility on the Mechanical Behavior of Tempered Martensitic Steels: Livia Cupertino-Malheiros[1]; *Abdelali Oudriss*[1]; Daniella Guedes[2]; Stéphane Cohendoz[1]; Florent Decultieux[2]; Michel Piette[2]; Florian Thébault[2]; Jamaa Bouhattate[1]; Juan Creus[1]; Xavier Feaugas[1]; [1]Université de La Rochelle - Lasie; [2]Vallourec Research Center France

3:00 PM
Influence of Hydrogen on Mechanical Properties of Pure Titanium Alloys Under Cathodic Polarization in Artificial Seawater: A Local Approach to Fracture: Alexandre Poloni[1]; Abdelali Oudriss[1]; Juan Creus[1]; Egle Conforto[1]; Stéphane Cohendoz[1]; Jamaa Bouhattate[1]; Simon Frappart[2]; Aude Mathis[2]; Thierry Millot[2]; *Feaugas Xavier*[1]; [1]University of La Rochelle - Lasie; [2]Naval Group

3:20 PM Break

3:40 PM Invited
Multiscale Modeling of Hydrogen Embrittlement in Stainless Steel: *Ting Zhu*[1]; David McDowell[1]; [1]Georgia Institute of Technology

4:20 PM
Two-way Coupled Microstructure-sensitive Crystal Plasticity and Hydrogen Diffusion Near a Blunted Crack-tip for FCC Metals: *Tang Gu*[1]; Gustavo Castelluccio[2]; Ting Zhu[1]; David McDowell[1]; [1]Georgia Institute of Technology; [2]Cranfield University

4:40 PM
Influence of Hydrogen Partitioning on Deformation and Fracture Behavior in Al-Zn-Mg Alloys: *Kazuyuki Shimizu*[1]; Hiroyuki Toda[1]; Kyosuke Hirayama[1]; Hiro Fujihara[1]; Kentaro Uesugi[2]; Akihisa Takeuchi[2]; [1]Kyushu University; [2]JASRI

5:00 PM
Hydrogen Trapping and Bubble Formation in Nanovoids in BCC Metals: A Predictive Model: *Jun Song*[1]; Jie Hou[1]; [1]McGill University

MECHANICS & STRUCTURAL RELIABILITY

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multi-mechanical Interactions during Extreme Environment Fatigue Loading

Sponsored by: TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University

Tuesday PM | February 25, 2020
11A | San Diego Convention Ctr

Session Chair: Brian Wisner, Ohio University

2:00 PM Invited
The Effect of Molecular Transport on the Environmentally Assisted Fatigue Crack Growth Behavior of Aerospace Al-alloys in High Altitude Environments: *James Burns*[1]; Adam Thompson[1]; Luke Brown[1]; [1]University of Virginia

2:20 PM
A Multi-scale Characterization of the Effects of High Altitude Environments on the Damage Structure Evolution during Fatigue Loading of AA7075-T651: *Adam Thompson*[1]; Zachary Harris[1]; James Burns[1]; [1]University of Virginia

2:40 PM
Macrozones and Dwell Fatigue Failure on a Near-a Titanium Alloy: *Beatriz Fernandez-Silva*[1]; Bradley Wynne[1]; Martin Jackson[1]; Matthew Thomas[2]; Katharine Fox[3]; [1]University of Sheffield; [2]TIMET UK Limited; [3]Rolls Royce plc

3:00 PM
Impact of Temperature and Microstructure on Dwell Fatigue in Near-alpha Titanium Alloys: *Michelle Harr*[1]; Samantha Daly[2]; Adam Pilchak[3]; [1]University of Michigan; [2]University of California, Santa Barbara; [3]Air Force Research Laboratory

3:20 PM
Oxygen, α_2, Macrozones and Dwell Fatigue Initiation in α-Ti: *Felicity Dear*[1]; Paraskevas Kontis[2]; Baptiste Gault[2]; Jan Ilavsky[3]; Joel Bernier[4]; David Rugg[5]; David Dye[1]; [1]Imperial College London; [2]Max-Planck-Institut fur Eisenforschung; [3]Argonne National Laboratory; [4]Lawrence Livermore National Laboratory; [5]Rolls-Royce plc

3:40 PM Break

4:00 PM Invited
In-situ X-ray Microtomography to Elucidate Corrosion-fatigue Mechanisms in Aluminum Alloys: Arun Sundar[1]; Jason Williams[1]; Harsh Goyal[1]; Sridhar Niverty[1]; Sudhanshu Singh[1]; Tyler Stannard[1]; Xianghui Xiao[2]; *Nikhilesh Chawla*[1]; [1]Arizona State University; [2]Brookhaven National Laboratory

4:20 PM
Some Hardening and Softening Antagonist Processes Induced by Hydrogen on Cyclic Behavior of Nickel Singe Crystal: Guillaume Hachet[1]; Arnaud Metsue[1]; Abdelali Oudriss[1]; *Feaugas Xavier*[1]; [1]University Of La Rochelle - Lasie

4:40 PM
Mechanical and Actuation Fatigue in Ni-Rich NiTiHf High Temperature Shape Memory Alloys: *Behrouz Haghgouyan*[1]; Benjamin Young[1]; Ibrahim Karaman[1]; Dimitris Lagoudas[1]; [1]Texas A&M University

5:00 PM
Creep-fatigue Behavior of an Advanced Austenitic Stainless Steel (Alloy 709): *Zeinab Alsmadi*[1]; K.L. Murty[1]; [1]North Carolina State University

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Leveraging Materials in Topology Optimization — Session II

Program Organizer: Natasha Vermaak, Lehigh University

Tuesday PM | February 25, 2020
4 | San Diego Convention Ctr

2:00 PM Program to be announced

5:00 PM Poster Previews

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Translating Innovation into Pioneering Technologies IV

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Tuesday PM | February 25, 2020
Point Loma | Marriott Marquis Hotel

Session Chairs: Nasrin Hooshmand, Georgia Tech; Yong Lin Kong, University of Utah

2:00 PM Invited
2D-Materials-based Epidermal and Implantable Bioelectronics: *Nanshu Lu*[1]; [1]University of Texas at Austin

2:20 PM
Multiscale 3D Printing of Nanomaterials-based Biomedical and Functional Devices: *Yong Lin Kong*[1]; [1]University of Utah

2:40 PM Invited
Plasmonic Biosensors for Resource-limited Settings: *Limei Tian*[1]; [1]Texas A&M University

3:00 PM Invited
Soft, Spongy, and Conductive Materials for Human Motion Monitoring: *Zhengtao Zhu*[1]; [1]South Dakota School of Mines and Technology

3:20 PM Invited
Carbon Nanotube Nanoelectronics and Macroelectronics: *Chongwu Zhou*[1]; [1]University of Southern California

3:40 PM Break

4:00 PM Invited
Adding a New Sensing Dimension to Soft Electronics: from the Skin to Below the Skin: *Sheng Xu*[1]; [1]University of California, San Diego

4:20 PM Invited
Bioinspired Freeze-cast Nanostructured Materials Templated by Energized Fields: *Steven Naleway*[1]; Isaac Nelson[1]; Tony Yin[1]; Debora Lyn Porter[1]; Taylor Ogden[1]; Max Mroz[1]; Paul Wadsworth[1]; [1]University of Utah

4:40 PM
Mask-less Direct-write Lithography using Functional Micro/nanofibers on Flexible Substrate: Jonghyun Kim[1]; Dongwoon Shin[1]; *Jiyoung Chang*[1]; [1]University of Utah

5:00 PM Invited
Rubbery Electronics: Electronics Fully Made Out of Rubbery Materials: *Cunjiang Yu*[1]; [1]University of Houston

MATERIALS DESIGN

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering — CALPHAD Future Directions

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Michael Gao, National Energy Technology Laboratory; Wei Xiong, University of Pittsburgh

Tuesday PM | February 25, 2020
32A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Thermodynamics at Equilibrium and Non-equilibrium – Genomic Tools for Materials Design: *John Agren*[1]; [1]Royal Institute of Technology

2:40 PM Invited
Phase Equilibria and Interfacial Migration in Stressed Solids: Nicholas Weadock[1]; *Peter Voorhees*[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Northwestern University

3:20 PM Invited
Interaction of Moving Grain Boundaries with Solutes in Alloys: *Yuri Mishin*[1]; [1]George Mason University

4:00 PM Break

4:20 PM Invited
Computational Thermodynamics in Microstructure Modelling and Beyond: *Georg Schmitz*[1]; [1]Access E V

5:00 PM Invited
How Can the CALPHAD Method Do Better?: *Zi-Kui Liu*[1]; [1]Pennsylvania State University

ADVANCED MATERIALS

Innovations in High Entropy Alloys and Bulk Metallic Glasses: An SMD & FMD Symposium in Honor of Peter K. Liaw — Bulk Metallic Glasses and Other Materials

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee

Program Organizers: Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Yanfei Gao, University of Tennessee - Knoxville; Robert Maass, University of Illinois at Urbana-Champaign; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Soo Yeol Lee, Chungnam National University; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Liang Jiang, Yantai University

Tuesday PM | February 25, 2020
Marina Ballroom G | Marriott Marquis Hotel

Session Chairs: Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC

2:00 PM Invited
Melting of Metallic Glasses in the Limit of Ultra-high Liquid Fragility: *William Johnson*[1]; [1]California Institute of Technology

2:25 PM Invited
Glass Formation with Monodisperse Colloids: *Frans Spaepen*[1]; [1]Harvard University

2:50 PM Invited
Structure Modulation for Plasticity Enhancement of Metallic Glasses: *Jurgen Eckert*[1]; [1]Erich Schmid Institute of Materials Science; Montanuniversität Leoben

3:10 PM Invited
Serrated Flow and Beyond: Strain Localization in Metallic Glasses: *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign

3:30 PM Invited
The Structure and Deformation Behaviors of Annealed Cu-Zr Metallic Glasses: *Cang Fan*[1]; Xingxing Yue[2]; P. K. Liaw[3]; [1]YMT Simulations LLC; [2]Nanjing University of Science & Technology; [3]University of Tennessee

3:50 PM Break

4:00 PM Invited
Metallic Glasses: From Coatings to Their First-ever Nanotube Arrays: *Jinn Chu*[1]; [1]National Taiwan University of Science and Technology

4:20 PM Invited
Rejuvenation by Fatigue: *Takeshi Egami*[1]; [1]University of Tennessee

4:40 PM Invited
Mechanical Modeling and Plasticity of Bulk Metallic Glasses: *Hyoung Seop Kim*[1]; [1]Pohang University of Science and Technology

5:00 PM Invited
Serrated Yielding in an Iron-chromium-aluminum (FeCrAl) Alloy Tubing: *Mahmoud Hawary*[1]; Abdullah Alomari[1]; K. Murty[1]; [1]NCSU

5:20 PM Invited
Creep Resistance of a Hierarchical-precipitate-strengthened Ferritic Alloy: *Gian Song*[1]; Soon Jik Hong[2]; Jin Kyu Lee[2]; Sung Ho Song[2]; Sung Hwan Hong[3]; Ki Buem Kim[3]; Yanfei Gao[4]; Zhiqian Sun[4]; Peter Liaw[4]; [1]KongJu National University; [2]Kongju National University; [3]Sejong University; [4]University of Tennessee

LIGHT METALS

Magnesium Technology 2020 — Fundamentals, Mechanical Behavior, Twinning, Plasticity, and Texture I

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Tuesday PM | February 25, 2020
6C | San Diego Convention Ctr

Session Chairs: Mohsen Asle Zaeem, Colorado School of Mines; Dmytro Orlov, Lund University

2:00 PM Invited
An Investigation into the Role of Dislocation Climb During Intermediate Temperature Flow of Mg Alloys: Michael Ritzo[1]; Jishnu Bhattacharyya[1]; Ricardo Lebensohn[2]; *Sean Agnew*[1]; [1]University of Virginia; [2]Los Alamos National Laboratory

2:30 PM Invited
Deviations from Theoretical Orientation Relationship Along Tensile Twin Boundaries in Magnesium: *Brandon Leu*[1]; M Arul Kumar[2]; Yue Liu[3]; Irene Beyerlein[1]; [1]University of California Santa Barbara; [2]Los Alamos National Laboratory; [3]Shanghai Jiao Tong University

2:50 PM Invited
The Role of Faceting in {1012} Twin Nucleation in Magnesium: *Christopher Barrett*[1]; [1]Mississippi State University

3:10 PM Invited
In-situ TEM Investigation of <c+a> Dislocations in Magnesium: *Boyu Liu*[1]; Fei Liu[1]; Bin Li[2]; Jian-Feng Nie[3]; Zhi-Wei Shan[1]; [1]Xi'an Jiaotong University; [2]University of Nevada; [3]Monash University

3:30 PM Break

3:50 PM Invited
Full-field Crystal Plasticity Modeling of {10-12} Twin Nucleation: YubRaj Paudel[1]; Christopher Barrett[1]; *Haitham El Kadiri*[1]; [1]Mississippi State University

4:20 PM Invited
The Incorporation of Discrete Deformation Twins in a Crystal Plasticity Finite Element Framework: *Matt Kasemer*[1]; Paul Dawson[2]; [1]University of Alabama; [2]Cornell University

4:40 PM Invited
An Analysis of the Tensile Deformation Behavior of Commercial Die-cast Magnesium-aluminum-based Alloys: *Mark Easton*[1]; Hua Qian Ang[1]; Suming Zhu[1]; Trevor Abbott[2]; [1]RMIT University; [2]Magontec Ltd

5:00 PM Invited
On the Load Multiaxiality Effect on the Cyclic Behavior of Wrought Magnesium Alloys: A. Gryguc[1]; A. Karparvar[1]; D. Toscano[1]; Ali A. Roostaei[1]; Sugrib Shaha[1]; Behzad Behravesh[1]; *Hamid Jahed*[1]; [1]University of Waterloo

CHARACTERIZATION

Material Behavior Characterization via Multi-Directional Deformation of Sheet Metal — Session IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Daniel Coughlin, Los Alamos National Laboratory; Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory; John Carsley, Novelis, Inc.

Tuesday PM | February 25, 2020
Theater A-1 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
Formability of Textured Anisotropic Uranium Plate: *Ryan Mier*[1]; Daniel Coughlin[1]; Rodney McCabe[1]; Carolus Osborn[1]; [1]Los Alamos National Laboratory

2:20 PM
Grain Refinement and Texture Modification of Thin Mg-3Al-1Zn Sheets by ECAB Method: *Ming Cheng*[1]; Shi-hong Zhang[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

2:40 PM
In-situ Neutron Diffraction of Strain Path Change Effects in Cold-rolled MgAZ31B Sheet: Karl Sofinowski[1]; *Steven Van Petegem*[1]; Jan Capek[1]; Helena Van Swygenhoven[1]; [1]Paul Scherrer Institut

3:00 PM
Strain Localization and Damage in a α+ß Titanium Alloy: A Study of Microstructure Heterogeneity and Strain Path Effects: *Jiyun Kang*[1]; Ikuho Nakahata[2]; C. Cem Tasan[1]; [1]Massachusetts Institute of Technology; [2]Tokyo Institute of Technology

3:20 PM
The Effect of Texture on the Deformation Behavior of Cold Rolled Aluminium Under Shear-compression Loading: *Shibayan Roy*[1]; Ashoktaru Chakraborty[1]; [1]Indian Institute of Technology (IIT) Kharagpur

MATERIALS PROCESSING

Materials Processing Fundamentals — Nucleation, Crystallization, and Solidification

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Metal; Sam Wagstaff, Novelis Inc.; Antoine Allanore, Massachusetts Institute of Technology; Fiseha Tesfaye, Abo Akademi University

Tuesday PM | February 25, 2020
14A | San Diego Convention Ctr

Session Chairs: Fiseha Tesfaye, Åbo Akademi University; Jonghyun Lee, Iowa State University

2:00 PM Invited
Structural Study of a Levitated Salt Solution Using a Containerless Scattering Method: *Geun Woo Lee*[1]; [1]Korea Research Institute of Standards And Science

2:30 PM
Multiple Crystallization Pathways on Highly Supersaturated Aqueous Solutions: *Yong Chan Cho*[1]; Geun Woo Lee[1]; Sooheyong Lee[1]; Yun-Hee Lee[1]; [1]Korea Research Institute of Standards and Science

2:50 PM
Non-crystallographic Branching in Polymer Crystallization: a Molecular Picture of the Onset of Spherulite Formation: *Tongtong Shen*[1]; Chunyu Li[1]; Alejandro Strachan[1]; [1]Purdue University

3:10 PM
De-mineralization of a High Ash Coal in Acidic Salt Solution: *Adewale Adeleke*[1]; Lateef Jimoh[1]; Simeon Ibitoye[1]; [1]Obafemi Awolowo University

3:30 PM
Investigating Short-chain Alcohol Based Microemulsions as Viable Nanoparticle Synthesis Systems: Do Reverse Micelles Form in Ethanol/AOT/n-Heptane Systems?: *Robyn E. Ridley*[1]; Erick Alvarado[1]; Victor R. Vasquez[2]; Olivia Graeve[1]; [1]University of California, San Diego; [2]University of Nevada, Reno

3:50 PM Break

4:10 PM
Simulation for Solidification Structure of Continuous Casting Bloom Using Cellular Automaton-finite Element Model: *Yadong Wang*[1]; Dongbin Jiang[1]; Sha Ji[1]; Lifeng Zhang[1]; [1]University of Science and Technology Beijing

4:30 PM
The Effect of Undercooling on the Nucleation and Growth of Large-size TiC of High Titanium Low Alloy Steel via In-situ Observation: *Ji Cheng*; Chen Tianci[1]; Zhu miaoyong[1]; [1]Northeastern University School of Metallurgy

4:50 PM
Modified Gouy-Chapman-Stern Model of the Aqueous Na-AOT Reverse Micelle Sub-structure with the Addition of Salts: *Robyn E. Ridley*[1]; James P. Kelly[2]; Hoorshad Fathi-Kelly[2]; Victor R. Vasquez[3]; Olivia Graeve[1]; [1]University of California, San Diego; [2]Alfred University; [3]University of Nevada, Reno

5:10 PM
Effects of Al Substitution for Zn on the Non-equilibrium Solidification Behavior of Zn-3Mg Alloys: *Yeqing Wang*[1]; Jianrong Gao[1]; Ashwin Shahani[2]; [1]Northeastern University; [2]University of Michigan

5:30 PM
Radiographic Investigations of the Nucleation and Inoculation of Intermetallic Compounds Formed Directly from Liquid Aluminium Alloys: *Shikang Feng*[1]; Enzo Liotti[1]; Andrew Lui[1]; Patrick Grant[1]; [1]University of Oxford

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Tuesday PM | February 25, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Heny Ovri, Helmholtz Zentrum Geesthacht; Christopher Shumeyko, Army Research Laboratory

2:00 PM
The Effects of Supersonic Impacts on the Micromechanical Properties of Al6061 Cold Spray Deposits: *Tyler Flanagan*[1]; Benjamin Bedard[1]; Avinash Dongare[1]; Harold Brody[1]; Aaron Nardi[2]; Victor Champagne[2]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]Army Research Laboratory

2:20 PM
Small Scale Mechanical Testing of Nanoporous Tungsten: *Mingyue Zhao*[1]; Inas Issa[1]; Manuel Pfeifenberger[2]; Michael Wurmshuber[1]; Daniel Kiener[1]; [1]University of Leoben; [2]Erich Schmid Institute of Materials Science

2:40 PM Invited
On the Estimation of Thermal Activation Parameters for Portevin-Le Chatelier Effect from Nanoindentation Data: *Henry Ovri*[1]; Erica Lilleodden[1]; [1]Helmholtz Zentrum Geesthacht

3:20 PM
Intrinsic Deformation and Failure Response of Single Crystal MAX Phases: Zhiqiang Zhan[1]; Hemant Rathod[1]; Miladin Radovic[1]; *Ankit Srivastava*[1]; [1]Texas A&M University

3:40 PM Break

4:00 PM
Nanotwins and Grain Boundaries: Competing Roles on the Nucleation and Propagation of Dislocations Probed via Nanoindentation: Raheleh Rahimi[1]; Sichuang Xue[1]; Siavash Ghanbari[1]; Xinghang Zhang[1]; *David Bahr*[1]; [1]Purdue University

4:20 PM
Characterizing Near-surface Plasticity in Aluminum-carbon Hybrid Materials: *Christopher Shumeyko*[1]; Andrew Palughi[2]; Daniel Cole[1]; Christopher Klingshirn[3]; Xiaioxiao Ge[3]; Lourdes Salamanca-Riba[3]; [1]U.S. Army Research Laboratory; [2]Texas A&M University; [3]University of Maryland

4:40 PM
Bending Dominated Plasticity and Hardening in Au-Ag Nanoboxes: *Radhika Patil*[1]; David Doan[1]; Zachary Aitken[2]; Chen Shuai[2]; Mehrdad Kiani[1]; Yong-Wei Zhang[2]; Wendy Gu[1]; [1]Stanford University; [2]Institute of High Performance Computing

5:00 PM
Fundamental Investigation of Fatigue Behavior in Microstructurally-stable Nanocrystalline Cu-Ta Alloys: *Anqi Yu*[1]; Christian Roach[1]; Khalid Hattar[2]; Kiran Solanki[3]; Suveen Mathaudhu[1]; [1]University of California Riverside; [2]Sandia National Lab; [3]Arizona State University

MATERIALS DESIGN

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session II

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, MicroTesting Solutions; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Tuesday PM | February 25, 2020
33A | San Diego Convention Ctr

Session Chair: Amit Pandey, ANSYS

2:00 PM Introductory Comments

2:10 PM Invited
In-situ TEM Investigation on Pyramidal Dislocations in Magnesium: *Boyu Liu*[1]; Fei Liu[1]; Bin Li[2]; Jian-Feng Nie[3]; Zhi-Wei Shan[1]; [1]Xi'An Jiaotong University; [2]University of Nevada; [3]Monash University

2:40 PM
In-situ TEM Tensile Testing of a Tailored Bimodal Microstructured Metallic Films: *Rohit Berlia*[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

3:00 PM
Deformation Behavior of Additively Manufactured Cu-Fe Composites at Different Strain Rates: *Arya Chatterjee*[1]; Ethan Sprague[1]; Benjamin Derby[1]; Jyoti Mazumder[1]; Amit Misra[1]; [1]University of Michigan

3:20 PM
Development of TiAl Alloys for High Temperature Applications: *Seong-Woong Kim*[1]; Jae-Kwon Kim[1]; Jong-Hoon Kim[1]; Ji Young Kim[1]; Seung-Hwa Ryu[2]; Dongchan Jang[2]; Jae Keun Hong[1]; Seung Eon Kim[1]; [1]Korea Institute of Materials Science; [2]Korea Advanced Institute of Science and Technology

3:50 PM Break

4:10 PM Keynote
Core Structure and Mobility of <c+a> Dislocations in Alpha-Ti: *Satish Rao*[1]; Adam Pilchak[2]; Christopher Woodward[2]; [1]Ues Inc.; [2]Air Force Research Laboratory

4:50 PM
Ab-initio Predictions of Plastic Anisotropy in BCC Metals: *Lucile Dezerald*[1]; Antoine Kraych[2]; Emmanuel Clouet[3]; Bassem Ben Yahia[1]; Lisa Ventelon[3]; Francois Willaime[3]; David Rodney[2]; [1]Institut Jean Lamour; [2]Institut Lumiere Matiere; [3]CEA Saclay

5:10 PM
Combined In-situ Lattice Imaging and MD Modeling on Dislocation and Twinning Nucleation: *Scott Mao*[1]; [1]University of Pittsburgh

MATERIALS DESIGN

Metal-Matrix Composites: Analysis, Modeling, Observations and Interpretations — Analysis and Characterization Techniques

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys; William Harrigan, Gamma Alloys

Tuesday PM | February 25, 2020
31A | San Diego Convention Ctr

Session Chair: Tirumalai Srivatsan, The University of Akron

2:00 PM Invited
Volume Fraction Analysis of Alumina Reinforced Aluminum Composites: *William Harrigan*[1]; [1]Gamma Alloys

2:30 PM Invited
4D X-ray Tomography and Correlative Microscopy of Composite Materials: *Nikhilesh Chawla*[1]; [1]Arizona State University

3:00 PM
Synthesis and Characterization of In-situ Formed TiB_2 Particulate Reinforced Al-Si Alloy Composites: *Jimmy Karloopia*[1]; Shaik Mozammil[1]; Pradeep Jha[1]; [1]Indian Institute of Technology Roorkee

3:30 PM Break

3:50 PM
Processing and Microstructural Characterization of Novel Invar Syntactic Foams: *Justin Whetten*[1]; Arun Sundar[1]; Jason Williams[1]; Scott Roberts[2]; Nikhilesh Chawla[1]; [1]Center for 4D Materials Science, Arizona State University; [2]NASA/JPL

4:15 PM
Design of Steel Microstructures by Manipulation of Reinforcement Precipitates using Finite Element Methods: *Samuel Schwarm*[1]; [1]Naval Surface Warfare Center Carderock Division

4:40 PM
Mechanical Testing of Steel and Tungsten Fibers for Use in Composites for Fusion Applications: *Matthew Weinstein*[1]; Lauren Garrison[2]; Maxim Gussev[2]; Carol Lin[3]; Johann Riesch[4]; [1]University of Wisconsin-Madison; [2]Oak Ridge National Laboratory; [3]University of Illinois Urbana-Champaign; [4]Max-Planck-Institut für Plasmaphysik

5:05 PM
Lightweight Radiation Shielding Using Metal Matrix Composites: *Andrew O'Connor*[1]; Wesley Bolch[1]; Michele Manuel[1]; [1]University of Florida

MATERIALS DESIGN

Microstructural Template Consisting of a Face-Centered Cubic Matrix with Ordered Precipitates: Microstructural Evolution and Properties — Other FCC Based Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Rajarshi Banerjee, University of North Texas; Eric Lass, University of Tennessee, Knoxville; Ashley Paz Y Puente, University of Cincinnati; Tushar Borkar, Cleveland State University; Keith Knipling, Naval Research Laboratory; Sophie Primig, University of New South Wales

Tuesday PM | February 25, 2020
30D | San Diego Convention Ctr

Session Chair: Tushar Borkar, Cleveland State University

2:00 PM Invited
Novel fcc-Cu Matrix Based High Temperature Alloys Strengthened by Ordered Precipitates: Suman Sarkar[1]; Prafull Pandey[1]; Surendra Kumar Makineni[1]; *Kamanio Chattopadhyay*[1]; [1]Indian Institute of Science, Bangalore

2:30 PM
Enhanced Creep Resistance via Strain-induced Massive Nanoprecipitation in Alumina-forming Austenitic Stainless Steels: *Zhao Wuxin*[1]; Zhaoping Lu[1]; [1]University of Science and Technology Beijing

2:50 PM
Mapping the Mechanical Property Space of Al-Cu-Mn-Zr (ACMZ) Cast Aluminum Alloys with Superior Microstructural Stability: *Sumit Bahl*[1]; Jiahao Cheng[1]; Eric Hoar[1]; Xiaohua Hu[1]; Allen Haynes[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

3:10 PM Break

3:40 PM
Site Preference of the Alloying Additions on Mechanical Properties of $L1_2$ Ni_3Co Alloys: *Peng Liu*[1]; Dengfu Chen[1]; Pei Xu[1]; Mujun Long[1]; Huamei Duan[1]; [1]Chongqing University, China

4:00 PM
Stress Induced Sensitization in HAZ of 304 LN Austenitic Stainless Steel: *Nikki Barla*[1]; Sourav Das[1]; [1]IIT Roorkee

4:20 PM
Thermodynamic Simulation and Experimental Validation of Phase Stability in Ni-based Superalloys: *Kyle Ventura*[1]; David Beaudry[1]; Alex Aviles[1]; Gerhard Fuchs[1]; [1]University of Florida

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — PbZn Process Fundamentals II

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday PM | February 25, 2020
14B | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
An Overview of Technology Developments in Zinc Processing Around the World: R. Warner[1]; A.E.M. Warner[2]; *Phillip Mackey*[3]; [1]Nyrstar Sales & Marketing AG; [2]Worley; [3]P J Mackey Technology Inc.

2:20 PM
Lead and Zinc Extractive Metallurgy Research in the Kroll Institute for Extractive Metallurgy: *Patrick Taylor*[1]; [1]Colorado School of Mines

2:40 PM
Electrochemical Extraction of Pb And Zn from Mineral Raw Materials Using Sulfurgraphite Electrode: *Rustam Sharipov*[1]; Essen Suleimenov[1]; Ulpan Balgimbayeva[1]; [1]Kazakh-British Technical University

3:00 PM
The Latest Development of Lead Technology by Oxygen Bottom Blowing: *Weiguo Wu*[1]; Pengfei Xin[1]; Jianming Wang[1]; [1]China ENFI Engineering Corporation

3:20 PM
Leaching of Turkish Oxidized Pb-Zn Flotation Tails by Inorganic and Organic Acids: *Muammer Kaya*[1]; Sait Kursunoglu[2]; Shokrullah Hussaini[1]; Erkan Gul[1]; [1]Osmangazi University; [2]Abdullah Gul University

3:40 PM Break

4:00 PM
Numerical Simulation of Gas-particle Two-phase Chemical Reactions and Key Structure Optimization in the Lead Flash Smelting Furnace: *Kaile Tang*[1]; Ling Zhang[1]; Leru Zhang[1]; Fubing Tu[2]; [1]CINF; [2]Central South University

4:20 PM
Characterization of Phase Equilibria and Thermodynamics with Integrated Experimental and Modelling Approach for Complex Lead Primary and Recycling Processing: *Evgueni Jak*[1]; Maksym Shevchenko[1]; Denis Shishin[1]; Taufiq Hidayat[2]; Peter Hayes[1]; [1]Pyrosearch, The University of Queensland; [2]Formerly: Pyrometallurgy Innovation Centre, The University of Queensland; Currently: Department of Metallurgical Engineering, Bandung University of Science and Technology

4:40 PM
Effect of Alumina Ceramics Surface Condition on the Wetting of Liquid Lead: *Zhen Qi*[1]; Yuan Fu[1]; [1]University of Science and Technology Beijing

5:00 PM
Performance and Mechanism of Chlorine Removal in Wastewater by Combination of CuSO4 and Zero-valent Copper: Yongguang Luo[1]; Hongtao Qu[1]; Yunhao Xi[2]; Jingtian Zou[3]; Te Zhang[1]; *Jing Li*[2]; Tianqi Liao[2]; Libo Zhang[2]; [1]Kunming University of Science and Technology/Yunnan Chihong Zn&Ge CO., LTD; [2]Kunming University of Science and Technology/National Local Joint Laboratory of Engineering Application of Microwave Energy and Equipment Technology/Key Laboratory of Unconventional Metallurgy, Ministry of Education; [3]Kunming University of Science and Technology;National Local Joint Laboratory of Engineering Application of Microwave Energy and Equipment Technology;Key Laboratory of Unconventional Metallurgy; Ministry of Education

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — PbZn Sustainability

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday PM | February 25, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
Effect of Deposit Types, Mine Development and Industry Structure on Primary Lead and Zinc Economics in Australia, North America and Europe: *Hendrik Reemeyer*[1]; [1]Resourceful Paths Consulting

2:20 PM
Processing Technology of Zn-Al Alloys into Wires for Thermal Spray Applications: *Piotr Osuch*[1]; Monika Walkowicz[1]; Pawel Strzepek[1]; Beata Smyrak[1]; Andrzej Mamala[1]; Tadeusz Knych[1]; Tomasz Napiora[2]; Radoslaw Sokol[2]; Stanislaw Pawlicha[2]; [1]AGH University of Science and Technology; [2]ZM Silesia SA

2:40 PM
Opportunities for Concentrating Solar Thermal Energy in Pb and Zn Flowsheets: *Susanna Hockaday*[1]; Aphelele Sithole[1]; [1]MINTEK

3:00 PM
New Lead Cementation Equipment and Lead Recovery Process in Chloride Media Developed by Cobre Las Cruces: *Carlos Frias Gomez*[1]; Juan Pedro Soler[1]; Jorge Blanco[1]; Luis Pastor[1]; Natalia Moreno[1]; [1]Cobre Las Cruces S.A

3:20 PM Break

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Secondary Lead

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday PM | February 25, 2020
15B | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
A Review of Lead Producing Operations in North America: *Rick Leiby*[1]; Paul Queneau[2]; Camille Fleuriault[3]; Joseph Grogan[3]; [1]East Penn; [2]Colorado School of Mines; [3]Gopher Resource

2:20 PM
Operational Overview of RSR North America: *Timothy Ellis*[1]; [1]RSR Technologies

2:40 PM
Refractory Solutions by Laboratory Tests and Fieldworks for Lead Recycling Applications: *Katja Reinharter*[1]; Dean Gregurek[1]; Alfred Spanring[1]; Camille Fleuriault[2]; Joe Grogan[2]; [1]RHI Magnesita; [2]Gopher Resource

3:00 PM
Influence of Minor Elements in Waste Lead Battery Recycling: *Yusuke Sakata*[1]; [1]Chigirishima Refinery, TOHO ZINC Co.,Ltd.

3:20 PM Break

3:40 PM
The FAST Pb Process and its Impact on Secondary Lead Production: *Massimo Maccagni*[1]; Edoardo Guerrini[1]; [1]Engitec Technologies

4:00 PM
Side Submerged Combustion Bath Smelting Technology ——A New Process for Recovering Lead from Lead Paste of Waste Lead-acid Battery: *Zhang Ge*[1]; Yongfeng Qi[1]; [1]China ENFI Engineering Corporation

4:20 PM
Recent Improvements at Hosokura Lead Smelter and Refinery: *Hironobu Nakano*[1]; Shinichi Ito[1]; Shinji Abe[1]; Nozomu Hasegawa[1]; [1]Hosokura Metal Mining Co. LTD.

4:40 PM
Refractory Corrosion Comparison through a Rotary Drum Furnace Slag Test for the Lead Industry: *Daniela Mancini Fonseca*[1]; Alfred Spanring[1]; Felipe Terra Elias[1]; Geraldo Eduardo Gonçalves[1]; [1]RHI Magnesita GmbH

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Zinc Hydrometallurgy

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Tuesday PM | February 25, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

3:40 PM
Development of the New Zinc-separation Process for the Blast Furnace Dust: *Mariko Shinoda*[1]; Toyoshi Yamaguchi[1]; Ryota Murai[1]; Goro Okuyama[1]; Ikuhiro Sumi[2]; [1]JFE Steel Corporation; [2]JFE Holdings, Inc.

4:00 PM
Outotec Gypsum Removal Circuit and Outotec Cooling Tower Performance in Neutral Solution Cooling: *Tuomas Hirsi*[1]; Björn Saxen[1]; [1]Outotec

4:20 PM
Purification and Comprehensive Recovery Metal Values from Zinc Hydrometallurgical Solution: Yue Yang[1]; Shaole Song[1]; Honghu Tang[1]; Li Wang[1]; Wei Sun[1]; *Yuehua Hu*[1]; [1]Central South University

4:40 PM
Refining of Zinc Chloride by the Combination of Cementation Reaction and Vaccuum Distillation: *Gen Kamimura*[1]; Hiroyuki Matsuura[1]; [1]University of Tokyo

5:00 PM
The Mass Transfer Characteristics of Ozone Oxidation of Rare Scatted Metal Impurities in Zinc Sulfate Solution: Zhang Lihua[1]; Luo Yaoyao[1]; Wang Tian[1]; Qu Hongtao[2]; Zhang Jiale[1]; *Libo Zhang*[1]; Luo Yongguang[3]; [1]Key Laboratory of Unconventional Metallurgy/Kunming University of Science and Technology; [2]Yunnan Chihong Zn & Ge Co., LTD; [3]Key Laboratory of Unconventional Metallurgy/Kunming University of Science and Technology/Yunnan Chihong Zn & Ge Co., LTD

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIX — Advanced Electronic Interconnection

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hiroshi Nishikawa, Osaka University; Shi-Kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology, CAS; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; Song-Mao Liang, Clausthal University of Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH

Tuesday PM | February 25, 2020
Marina Ballroom E | Marriott Marquis Hotel

Session Chairs: Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology, CAS; Yee-Wen Yen, National Taiwan University of Science and Technology

2:00 PM Invited
Wafer Level SLID Bonding - Formation and Evolution of Microstructures: *Vesa Vuorinen*[1]; Glenn Ross[1]; Joseph Hotskiss[1]; Jani Pöllänen[1]; Mervi Paulasto-Kröckel[1]; [1]Aalto University

2:30 PM
A Transient Liquid Phase Bonding Process Using Sn/Cu Multiple Layers for Automotive Power Semiconductor: *Dong-Yurl Yu*[1]; Junhyuk Son[1]; Yong-Ho Ko[1]; Sehoon Yoo[1]; Dongjin Byun[2]; JungHwan Bang[1]; [1]Korea Institute of Industrial Technology; [2]Korea University

2:50 PM
Interfacial Stability between High-temperature Lead-free Solders and Substrates: *Shih-Kang Lin*[1]; Chih-han Yang[1]; Ming-yueh Tsai[1]; Bo-hsun Hsu[1]; [1]Department of Materials Science and Engineering, National Cheng Kung University

3:10 PM
Microstructure of Cu/Cu Joints using Sn-Coated Cu Particle Paste for High-temperature Application: *Hiroshi Nishikawa*[1]; Xiangdong Liu[1]; [1]Osaka University

3:30 PM Break

3:50 PM Invited
Fabrication of Highly Reliable Joint Based on Cu@Ni@Sn Double-layer Powder for High Temperature Application: *Ju Xu*[1]; Hongyan Xu[1]; [1]Institute of Electrical Engineering, Chinese Academy of Sciences

4:20 PM
Direct Bonding of Pure Al Die to Al Substrate with Ag Flake Paste: *Cai-Fu Li*[1]; Hao Zhang[2]; Zhi-Quan Liu[3]; Katsuaki Suganuma[2]; [1]Sun Yat-sen University; [2]Osaka University; [3]Shenzhen Institutes of Advanced Technology, CAS

4:40 PM
Investigation of Metal Filament Formation: *Chung-Yu Chiu*[1]; Cheng-Yi Liu[1]; [1]National Central University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Microstructure and Precipitation II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Tuesday PM | February 25, 2020
33B | San Diego Convention Ctr

Session Chairs: Yipeng Gao, Idaho National Laboratory; Yijia Gu, Missouri University of Science and Technology

2:00 PM
Linear Complexion Formation and their Effect on the Strength of Metallic Alloys: *Vladyslav Turlo*[1]; Timothy Rupert[1]; [1]University of California, Irvine

2:20 PM
Understanding the Role of Microwave Heating on the Crystallization Behavior, Microstructure Formation and Mechanical Response of ZrO2-Containing SiO2 – MgO - Al2O3 – K2O – B2O3 – F mica Glass-ceramics: *Shibayan Roy*[1]; Mrinmoy Garai[1]; [1]Indian Institute of Technology (IIT) Kharagpur

2:40 PM
Interphase Boundary Anisotropy Effects on the Microstructure Evolution in Three Phase ß(In) – In_2Bi – (Sn) Eutectic System: Samira Mohagheghi[1]; *Melis Serefoglu*[1]; [1]Koc University

3:00 PM
Mechanical Property Variation and Microstructure Evolution of Inconel Alloy Induced by Electric Current Stressing: *Wen-Jung Li*[1]; Kwang-Lung Lin[1]; [1]Department of Materials Science and Engineering,National Cheng Kung University

3:20 PM
Effect of Zirconium Addition to Wrought Al-Mg-Si Alloys on Microstructure: *Florian Schmid*[1]; Thomas Ebner[2]; Peter J. Uggowitzer[3]; Stefan Pogatscher[1]; [1]Christian Doppler Laboratory for Advanced Aluminum Alloys; [2]AMAG rolling GmbH; [3]Montanuiversitaet Leoben

3:40 PM Break

4:00 PM
Nitride Precipitation Induced by Nitrogen-solute Clustering in Ferrous Alloys: *Goro Miyamoto*[1]; Meng Zhu[1]; Yasuhiro Tateyama[1]; Tadashi Furuhara[1]; [1]Tohoku University

4:20 PM
Precipitate Nucleation Enhanced by Deformation through Dislocations in Mg-Al Alloys: *Peng Yi*[1]; Michael Falk[1]; [1]Johns Hopkins University

4:40 PM
(Al,Zn)3Zr Dispersoid-assisted ' Precipitation in a Model Al-Zn-Mg-Cu-Zr Alloy: *Huan Zhao*[1]; Yiqiang Chen[1]; Surendra K. Makineni[1]; Baptiste Gault[1]; Dirk Ponge[1]; Dierk Raabe[1]; [1]Max-Planck-Institut Fur Eisenforschung G

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Materials Design and Advanced Characterization

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Tuesday PM | February 25, 2020
31B | San Diego Convention Ctr

Session Chairs: Fei Chen, Wuhan University of Technology; Josh Yee, Sandia National Laboratory

2:00 PM Invited
Phase Separation in a Ni-Al-Cr-Re Alloy: Kinetics and Thermodynamics Coupled with Atom-probe Tomography: *David Seidman*[1]; [1]Northwestern University

2:30 PM Invited
Materials Genomics: Designing Systems Far from Equilibrium: *Gregory Olson*[1]; [1]Northwestern University

3:00 PM Invited
Structural and Chemical Disorder Towards Advanced Materials: *Horst Hahn*[1]; [1]Karlsruhe Institute of Technology

3:30 PM Break

3:50 PM Invited
New Electron Microscopy Techniques for Determination of Local Structural Features during Plastic Deformation: *Andrew Minor*[1]; [1]University of California, Berkeley

4:20 PM Invited
A Precise DSC-based Methodology to Pinpoint in situ Crystallinity Percent in Amorphous Systems: *Olivia Graeve*[1]; Arash Yazdani[1]; Günther W.H. Höhne[2]; Darren Dewitt[1]; Javier E. Garay[1]; [1]University of California, San Diego; [2]Ulm University

4:50 PM Invited
Hot Corrosion Degradation of Gas Turbine Materials Subject to Mixed-mode Thermal Exposures and Emerging Complex Corrosion Environments: Kliah Soto Leytan[1]; Kunthea Deng[1]; Maryam Zahiri Azar[1]; *Daniel Mumm*[1]; [1]University of California, Irvine

5:20 PM
Time-Resolved Characterization of Far-from-equilibrium Microstructure Evolution During Rapid Solidification: *Joseph McKeown*[1]; John Roehling[1]; Tian Li[1]; Alexander Baker[1]; Scott McCall[1]; Kai Zweiacker[2]; Amy Clarke[3]; Jörg Wiezorek[4]; [1]Lawrence Livermore National Laboratory; [2]Empa, Swiss Federal Laboratories for Materials Science and Technology; [3]Colorado School of Mines; [4]University of Pittsburgh

5:40 PM
3D Morphological Evolution of Bimodal Porous Copper Characterized by X-ray Nano-tomography: *Fei Chen*[1]; Lijie Zou[1]; Hao Wang[1]; Mingyuan Ge[2]; Chonghang Zhao[3]; Wah-Keat Lee[2]; Xianghui Xiao[2]; Karen Wiegart[3]; [1]Wuhan University Of Technology; [2]National Synchrotron Light Source-II, Brookhaven National Laboratory; [3]School of Materials Science and Chemical Engineering, The State University of New York at Stony Brook

6:00 PM
Computed Tomography: A New Frontier for Material Characterization: *Chen Dai*[1]; [1]Vj Technologies

MATERIALS DESIGN

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin — Modeling

Sponsored by: TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Ayman Salem, MRL Materials Resources LLC; Viola Acoff, University of Alabama; Nathan Levkulich, UES; Michael Glavicic, Rolls-Royce; Yufeng Zheng, University of Nevada, Reno; John Rotella, Purdue University

Tuesday PM | February 25, 2020
30E | San Diego Convention Ctr

Session Chairs: Marko Knezevic, University of New Hampshire; Michael Glavicic, Rolls Royce

2:00 PM Invited
Genomic Materials Design: Science-based Engineering: *Gregory Olson*[1]; [1]Northwestern University

2:30 PM Invited
A Road Map of Four Decade Journey to Modeling Thermo-mechanical Processes and Microstructure Evolution: *Ravi Shankar*[1]; Wei-Tsu Wu[1]; BK Chun[1]; Jaebong Yang[1]; Jin Yong Oh[1]; Tim Hanes[1]; [1]Scientific Forming Technologies Corporation

3:00 PM Invited
Application of the CALPHAD Method in the Framework of ICME: *Fan Zhang*[1]; Shuanglin Chen[1]; Weisheng Cao[1]; Chuan Zhang[1]; Duchao Lv[1]; Jun Zhu[1]; [1]CompuTherm LLC

3:30 PM
Development and Calibration of Numerical Meso-scale Models of Microstructure Evolution for Concurrent Recovery, Recrystallization, and Grain Growth with Zener Pinning: *Eric Payton*[1]; Austin Gerlt[1]; Matthew Krug[1]; Katelun Wertz[1]; [1]Air Force Research Laboratory

3:50 PM Break

4:10 PM Invited
Integrated Approaches to Alloy Industrialization Using Numerical Simulation and Physical Modeling: *Bruce Antolovich*[1]; John Foltz[1]; Ramesh Minisandram[1]; John Mantione[1]; [1]ATI Specialty Materials

4:40 PM
Hierarchical Multiscale Modeling of Microtextured Regions in Ti-6242 during Alpha/beta Processing: *Timothy Truster*[1]; [1]University of Tennessee

5:00 PM
Modeling Beta Phase Texture Evolution during Alpha+Beta Forging to Understand Precursors to Coarse ("Abnormal") Grain Formation: *Adam Pilchak*[1]; Austin Gerlt[1]; Eric Payton[1]; [1]Air Force Research Laboratory

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Chemical and Phase Stability under Irradiation

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Tuesday PM | February 25, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Mahmood Mamivand, Boise State University; Djamel Kaoumi, North Carolina State University

2:00 PM
BCC-FCC Interface Leading to Ni Precipitation under Irradiation in a FeNi Alloy: *Estelle Meslin*[1]; Lisa Belkacémi[1]; Brigitte Décamps[2]; Marie Loyer-Prost[1]; Maylise Nastar[1]; [1]CEA; [2]CSNSM Orsay University

2:20 PM
Enhanced Austenite Stability in Nanostructured Steels During Ion Irradiation: *Andrew Hoffman*[1]; Maalavan Arivu[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

2:40 PM
Solute Stabilization of Two-phase Microstructures in Irradiated Alloys: *Soumyajit Jana*[1]; Pascal Bellon[1]; Robert Averback[1]; [1]University of Illinois Urbana Champaign

3:00 PM
Alpha-alpha' Decomposition at Grain Boundaries in Annealed and Irradiated ODS Steels: *Joel Ribis*[1]; Amal Issaoui[1]; Joel Malaplate[1]; Marie Loyer-Prost[1]; Alexandre Legris[2]; [1]Commissariat a l'Energie Atomic CEA; [2]University of Lille

3:20 PM
Dose Rate and Temperature Effect on the Stability of Alpha Prime Precipitates in Ultra-high Purity Fe-Cr Alloys: *Yajie Zhao*[1]; Arunodaya Bhattacharya[2]; Philip Edmondson[2]; Caleb Massey[2]; Jean Henry[3]; Steven Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]CEA, DEN, Service de Recherches Métallurgiques Appliquées, Laboratoire d'Analyse Microstructurale des Matériaux, Université Paris-Saclay

3:40 PM Break

4:00 PM Invited
The Effect of Point Defects on the Thermodynamics and Kinetics of Irradiated Materials: *Thomas Schuler*[1]; Maylise Nastar[1]; [1]DEN-Service de Recherches de Métallurgie Physique, CEA, Université Paris-Saclay, F-91191 Gif-sur-Yvette, France

4:30 PM
Influence of an Addition of Titanium and Carbon on the Microstructural Evolution under Irradiation of Nickel as Model Alloy for Austenitic Steels: *Marie Loyer-Prost*[1]; Kan Ma[1]; Brigitte Décamps[2]; Robin Schaeublin[3]; Fréderic Prima[4]; [1]DEN-Service de Recherches de Métallurgie Physique, CEA; [2]CNRS, IN2P3, CSNSM; [3]ETH Zürich; [4]CNRS UMR 8247-Institut de Recherche de Chimie Paris

4:50 PM
Investigation of the Stability of Irradiation Induced MnNi Clusters by Post Irradiation Annealing: *Bertrand Radiguet*[1]; Milan Konstantinovic[2]; Philippe Pareige[1]; [1]University Of Rouen; [2]SCK-CEN

5:10 PM
Investigating the Influence of Cu Rich Precipitates (CRPs) on the Formation of Complex Mn-Ni-Si Rich Precipitate Phases using Density Functional Theory (DFT): *Alexander Garrett*[1]; Christopher Race[1]; [1]University of Manchester

MATERIALS PROCESSING

Rare Metal Extraction & Processing — V, Mn, Co, Zn, Mo, Cu, REEs

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Kerstin Forsberg, KTH Royal Institute of Technology; Alafara Baba, University of Ilorin

Tuesday PM | February 25, 2020
13 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Keynote
Secondary and Byproduct Sources of Rare Earth Metals: *Gabrielle Gaustad*[1]; Alexandra Leader[2]; Eric Williams[2]; Saptarshi Das[2]; [1]Alfred University; [2]Rochester Institute of Technology

2:20 PM
Study on Vanadium Phase Evolution Law in Vanadium Slag during the Interface Reaction Process of Sodium Roasting: *Dan-Qing Li*[1]; Yang Yang[1]; Bing Xie[1]; Hong-Yi Li[1]; [1]Chongqing University

2:40 PM
Indian Coal Ash: a Potential Alternative Resource for Rare Earth Metals (REMs): *Archana Kumari*[1]; Manis Kumar Jha[1]; Devendra Deo Pathak[2]; [1]CSIR-National Metallurgical Lab; [2]Indian Institute of Technology (Indian School of Mines)

3:00 PM
Recovery of Mn and Co from Discarded Batteries of Toys: *Pankaj Choubey*[1]; Manis Kumar Jha[1]; Devendra Deo Pathak[2]; [1]CSIR-National Metallurgical Lab; [2]Indian Institute of Technology (Indian School of Mines)

3:20 PM
Phosphate-intensified Alkali Leaching to Recover Molybdenum from a Volatilizing Residue: *Dapeng Shi*[1]; Li Guanghui[1]; Hu Sun[1]; Jun Luo[1]; Tao Jiang[1]; [1]Central South University

3:40 PM Break

3:55 PM
Zinc in Secondary Dust of Rotary Hearth Furnace was Recovered by Water Leaching and Acid Leaching: *Shuang Liang*[1]; Xiaoping Liang[1]; Minghu Wu[1]; Shilei Ren[1]; [1]Chongqing University

4:15 PM
Extraction of Rare and High-valued Metals from Blast Furnace Dust: *Xiong Xiao*[1]; Shengfu Zhang[1]; Hua Zhang[1]; Guibao Qiu[1]; Yuntao Xin[1]; Jintao Wang[1]; [1]Chongqing university

4:35 PM
Mechanism of Extraction of Vanadium from Vanadium Slag with MgO: *Cheng-Jie Wang*[1]; Yi-Heng Yuan[1]; Bing Xie[1]; Hong-Yi Li[1]; [1]Chongqing University

4:55 PM
Effect of Sulfuric Acid Concentration on Marmatite Dissolution in the Presence of Cupric Ions: *Xiaoyu Meng*[1]; [1]Central South University

5:15 PM
Recovery of Rare Earths from Waste Permanent Magnets Leach Liquors: *Rajesh Kumar Jyothi*[1]; Kyeong Woo Chung[1]; Chul-Joo Kim[1]; Ho-Sung Yoon[1]; [1]Korea Institute of Geoscience & Mineral Resources (KIGAM)

ELECTRONIC MATERIALS

Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications — Printed Electronics III: Functional Materials and Devices

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Ravindra Nuggehalli, New Jersey Institute of Technology; Anming Hu, University of Tennessee; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Yong Lin Kong, University of Utah; Mariappan Paranthaman, Oak Ridge National Laboratory

Tuesday PM | February 25, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Pooran Joshi, Oak Ridge National Laboratory; Tolga Aytug, Oak Ridge National Laboratory

2:00 PM Invited
Novel Wide Bandgap Gallium Oxide (Ga2O3) Based Power Electronic Devices: *Mariappan Paranthaman*[1]; Mihee Ji[1]; Tolga Aytug[1]; Fred List[1]; Pooran Joshi[1]; Ivan Kravchenko[1]; Burak Ozpineci[1]; [1]Oak Ridge National Laboratory

2:25 PM Invited
Formulation of UV Curable Resins Utilized in Vat Photo Polymerization for the Additive Manufacturing of Gun Propulsion Charge in 3d Printers (An Update): *David Bird*[1]; Elbert Caravaca[1]; Joseph Laquidara[1]; Ketih Luhmann[1]; Nuggehalli Ravindra[2]; [1]United States Army ARDEC; [2]New Jersey Institute of Technology

2:50 PM
Rare Earth Based Multifunctional Perovskite Ceramic Materials for Electronic and Magnetic Applications: *Dev Mahato*[1]; Digvijay Singh[1]; [1]National Institute of Technology, Patna

3:10 PM
Structural and Magnetic Properties of CoPd Alloys for Spintronic Applications: *Subhadra Gupta*[1]; Joseph Abugri[1]; Billy Clark[2]; Pieter Visscher[1]; [1]University of Alabama; [2]Intel Corporation

3:30 PM Break

3:50 PM
Coarsening of TiO_2 Foams and its Effects on 3D Printing: *Iole Pecora*[1]; Konstantinos A. Sierros[1]; [1]West Virginia University

4:10 PM
Design, Modeling and Simulation of Gas Sensors: *Patrick Dzisah*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

4:30 PM
Ultrafast X-ray Imaging Study of Ultrasonic Liquid Phase Exfoliation of 2D Advanced Functional Materials: *Ling Qin*[1]; [1]University of Hull

4:50 PM
Using In-situ X-ray Scattering to Identify the Mechanical Properties and Piezoelectric Properties of Electrospun P(VDF-TrFE) Nanofibers: *Chia-Yin Ma*[1]; Tu-Ngoc Lam[1]; Chun-Chieh Wang[2]; Wen-Ching Ko[1]; Wei-Tsung Chuang[2]; Chun-Jen Su[2]; Jyh-Ming Wu[3]; Sz-Nian Lai[3]; Mao-Yuan Lo[1]; Ying-Jhih Wang[1]; E-Wen Huang[1]; [1]National Chiao Tung University; [2]National Synchrotron Radiation Research Center; [3]National Tsing Hua University

5:10 PM
Synthesis of Silicon Nanowire and Crystalline Carbon Quantum Dot Hybrid Structures and Study of its Photoresponse and Photoluminescence Properties for Optoelectronic Device/Sensor Application: *Sourav Sarkar*[1]; Unmesha Ray[2]; Diptonil Banerjee[3]; Kalyan Kumar Chattopadhyay[1]; [1]Jadavpur University; [2]Indian Institute of Technology, Kharagpur; [3] Indian Institute of Engineering Science and Technology

BIOMATERIALS

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Functional Thin Films and Coatings I

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carrado, IPCMS - CNRS; Heinz Palkowski, Clausthal University of Technology; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Ramana Chintalapalle, University of Texas at El Paso; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington; Vikas Tomar, Purdue University

Tuesday PM | February 25, 2020
Oceanside | Marriott Marquis Hotel

Session Chair: Ravindra Nuggehalli, New Jersy Institute of Technology

2:00 PM Keynote
3D X-ray Tomography Studies on In-situ Al-Cu-TiB_2 Metal Matrix Composites: *Prakash Srirangam*[1]; [1]Wmg, University of Warwick

2:30 PM
Bi-continuous Pattern Formation in Thin Films via Solid-State Interfacial Dealloying: *Chonghang Zhao*[1]; Kim Kisslinger[2]; Xiaojing Huang[2]; Ming Lu[2]; Fernando Camino[2]; Cheng-Hung Lin[1]; Hanfei Yan[2]; Evgeny Nazaretski[2]; Yong Chu[2]; Bruce Ravel[3]; Mingzhao Liu[2]; Yu-chen Karen Chen-Wiegart[1]; [1]Stony Brook University; [2]Brookhaven National Laboratory; [3]National Institute of Standards and Technology

2:50 PM Invited
Comparative Study of Surface and Bulk Interfacial Stresses Effect on Radiative Recombination Emission in Silicon: *Sufian Abedrabbo*[1]; Anthony Fiory[2]; Nuggehalli Ravindra[2]; [1]Khalifa University; [2]New Jersey Institute of Technology

3:10 PM
Electrospun Nanofibers: Exploring the Production of Polymer Nanofiber Thin Films and their Applications for Biomedical Uses, Sensing and Filtration: *Lauren Finkenauer*[1]; James Kelly[1]; Bonnee Rubinfeld[1]; Mathew Lyman[1]; Jeffery Haslam[1]; [1]Lawrence Livermore National Laboratory

3:30 PM Keynote
Engineering Nonlinear Optical Materials by Magnetron Sputtering with In situ Ellipsometry, Optical Emission Spectroscopy and Machine Learning: *John Jones*[1]; Shawn Putnam[2]; Lirong Sun[3]; Cynthia Bowers[4]; Jake Carter[2]; Nanthakishore Makeswaran[5]; Ramana Chintalapalle[5]; Augustine Urbas[5]; [1]Air Force Research Laboratory; [2]University of Central Florida; [3]Azimuth Corporation; [4]Wright State University; [5]University of Texas at El Paso

4:00 PM Break

4:20 PM Invited
Antibacterial Effects of Photocatalytically Activated ZnO Nanoparticle Hydrogel Coatings: Carol Cleetus[1]; Gisel Fregoso[1]; Mauro Ruiz[1]; Juan Noveron[1]; *Binata Joddar*[1]; [1]University of Texas, El Paso

4:40 PM
Fabrication and Characterization of Mo-Ga Alloy Thin Films: *Nivedita Lalitha Raveendran*[1]; Ramana Chintalapalle[1]; [1]University of Texas

5:00 PM Invited
Magnetoelectric Coupling in Multiferroic NiTiO3 Thin Films: *Tamas Varga*[1]; [1]Pacific Northwest National Laboratory

5:30 PM
Optical Properties of Multilayered Thin Films: *Jessy Nemati*[1]; Jonathan Martinez[1]; Serlly Vega[1]; Deva Craig[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

5:50 PM
Oxidation Kinetics of Palladium: *Stephen Rubin*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

6:10 PM
Self-Assembled Monolayer on Liquid-Liquid Interface: *Kinnari Shah*[1]; Nuggehalli Ravindra[2]; [1]LaGuardia Community College–City University of New York; [2]New Jersey Institute of Technology

---

ENERGY & ENVIRONMENT

Recycling of Secondary, Byproduct Materials and Energy — Reducing EMbodied-energy and Decreasing Emissions (REMADE)

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Mingming Zhang, ArcelorMittal Global R&D; John Howarter, Purdue University; Elsa Olivetti, Massachusetts Institute of Technology; Alan Luo, Ohio State University; Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology

Tuesday PM | February 25, 2020
16A | San Diego Convention Ctr

Session Chair: Alan Luo, The Ohio State University

2:00 PM Invited
Thermodynamic Modeling and Experimental Validation of Iron-Containing Intermetallic Phase Formation in Recycled Cast Aluminum Alloys: Emre Cinkilic[1]; Colin Ridgeway[1]; Xinyan Yan[2]; *Alan Luo*[1]; [1]The Ohio State University; [2]Alcoa Technical Center

2:30 PM Invited
Low Cost Metal Recovery from E-Waste: Michael Free[1]; *Prashant Sarswat*[1]; [1]University of Utah

3:00 PM Invited
Sorting and Impurity Removal to Improve the Recycling of Steel Scrap from Auto Shredders: *Patrick Taylor*[1]; Sridhar Seetharaman[1]; Erik Spiller[1]; Zhijiang Gao[1]; [1]Colorado School of Mines

3:30 PM Invited
Carbon Black from Waste Tires: Purification Strategies and Recycle Potential: *York Smith*[1]; Marshall Boyton[1]; [1]University of Utah

4:00 PM Break

4:15 PM
Additive Manufacturing via the Direct Ink Writing Technique of Kaolinite-based Clay with Electric Arc Furnace Steel Dust (EAF dust): *Edisson Ordoñez*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

4:35 PM
An Environmental Impact and Economic Evaluation of using Alternative Feedstock Powders in Metal Additive Manufacturing: *Christopher Glaubensklee*[1]; Haoyang He[1]; Parnian Kiani[1]; Kaka Ma[2]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Colorado State University

4:55 PM
Recycling Technologies of Zn-C batteries: Review and Challenges for a Circular Economy in Colombia: *Natalia Cardona Vivas*[1]; Mauricio Correa[1]; Henry Colorado[1]; [1]Universidad de Antioquia

5:15 PM
The SPL-CYCLE Project; SPL–CYCLE Closing the Loop of the Spent Pot–line (SPL) in Al Smelting Process: *Panagiotis Angelopoulos*[1]; Maria Taxiarchou[1]; Anna Mladenovic[2]; [1]School of Mining and Metallurgical Engineering, NTUA; [2]Slovenian National Building and Civil Engineering Institute

5:35 PM
Thermodynamic Process Simulation for The Recovery of Spent Pot Linings (SPL) from Aluminum Production: *Burcak Ebin*[1]; Martina Petranikova[1]; Dusan Klinar[2]; Mateja Kosir[3]; Panagiotis Angelopoulos[4]; Karsten Grossman[5]; Roeland Geurts[6]; Miroslav Halilovic[7]; [1]Chalmers University of Technology; [2]Scientific Research Center BISTRA; [3]Slovenian National Building and Civil Engineering Institute; [4]Natinoal Technical University of Athens; [5]UVR-FIA GmbH; [6]VITO; [7]University of Ljubljana

---

PHYSICAL METALLURGY

Thermal Transport in Crystalline and Non-crystalline Solids: Theory and Experiments — Interfaces

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Marat Khafizov, Ohio State University; Michael Manley, Oak Ridge National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Aleksandr Chernatynskiy, Missouri Science and Technology University

Tuesday PM | February 25, 2020
18 | San Diego Convention Ctr

Session Chair: Cody Dennett, Idaho National Laboratory

2:00 PM Invited
Thermal Transport in Nanostructured Crystalline and Disordered Materials: *Renkun Chen*[1]; [1]University of California, San Diego

2:30 PM
Physics-guided Machine-Learning Design of Aperiodic Superlattices with Maximum Localization of Coherent Phonons: Pranay Chakraborty[1]; Tengfei Ma[1]; *Yan Wang*[1]; Lei Cao[1]; [1]University of Nevada, Reno

2:50 PM
Effects of Correlated Disorder on Phonon Transport across Random Interfaces: *Taishan Zhu*[1]; Giuseppe Romano[1]; Jeffrey Grossman[1]; [1]Massachusetts Institute of Technology

3:10 PM
Nano- and Micro-scale Thermal Transport in Swift heavy Ion Irradiated Oxides: *Azat Abdullaev*[1]; Vinay Chauhan[2]; Jacques O'Connel[3]; Vladimir Skuratov[4]; Arno van Vuuren[3]; Marat Khafizov[2]; Zhandos Utegulov[1]; [1]Nazarbayev University; [2]The Ohio State University; [3]Nelson Mandela University; [4]National Research Nuclear University

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Processing & Microstructure II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Tuesday PM | February 25, 2020
Marina Ballroom D | Marriott Marquis Hotel

Session Chairs: Zenji Horita, Kyushu Insitute of Technology; Hyoung Kim, Pohang University of Science and Technology; Kenong Xia, University of Melbourne; Megumi Kawasaki, Oregon State University

2:00 PM Invited
Effect of High-pressure Torsion on a Few Mechanical and Electrical Behaviors of Commercially Pure Cu: *Praveen Kumar*[1]; Ajay Rijal[1]; Shobhit Singh[1]; Jae-Kyung Han[2]; Megumi Kawasaki[3]; [1]Indian Institute of Science; [2]Oregon State University; [3]Oregon State University

2:20 PM Invited
Mechanical Properties and Residual Stress of Copper Processed Using Ultrasonic-nanocrystalline Surface Modification: *Hyoung Seop Kim*[1]; [1]; [1]Pohang University of Science and Technology

2:40 PM
Large Deformability of Mg Alloys Emerges from Spatial Confinement of Low Dimensionality: *Shan Gong*[1]; Jörg Wiezorek[1]; M. Ravi Shankar[1]; [1]University of Pittsburgh

3:00 PM
Mechanical Properties of Nanocrystalline High-entropy Alloys Produced By High-pressure Torsion: *Benjamin Schuh*[1]; [1]Erich Schmid Institute of Materials Science

3:20 PM
Microstructures and Mechanical Properties of Supersaturated Al-Mg Alloys Produced by Powder Consolidation using High-pressure Torsion: *Yongpeng Tang*[1]; Takahiro Masuda[2]; Shoichi Hirosawa[2]; Zenji Horita[3]; Yuji Higo[4]; Yoshinori Tange[4]; Yasuo Ohishi[4]; [1]Kyushu University; [2]Yokohama National University; [3]Kyushu Institute of Technology; [4]Japan Synchrotron Radiation Research Institute

3:40 PM Break

4:00 PM Invited
Microstructure and Microtexture of Gradient Metals Processed by Asymmetric Rolling: *Alexander Zhilyaev*[1]; Hailiang Yu[2]; Alexander Pesin[3]; [1]Magnitogorsk State Technical University; Institute for Metals Superplasticity Problems of Russian Academy of Science; [2]Central South University; [3]Magnitogorsk State Technical University

4:20 PM Invited
In-situ Observation of Ultrafine-grained Heterostructured Pure Titanium by Severe Plastic Deformation under High Pressure: *Zenji Horita*[1]; Daisuke Maruno[2]; Yukimasa Ikeda[2]; Keisuke Matsuo[2]; Makoto Arita[2]; Yuji Higo[3]; Yoshinori Tange[3]; Yasuo Ohishi[3]; [1]Kyushu Institute Technology; [2]Kyushu University; [3]JASRI

4:40 PM
Microscructure Evolution in CuZr Alloy and cp Ti Processed by a Novel Technique of Rotational Free Bending: *Tomáš Krajnák*[1]; Miloš Janecek[1]; Petr Harcuba[1]; Peter Minárik[1]; Cinthia Corrêa[1]; Jakub Cížek[1]; Arsenyi Raab[2]; Georgy Raab[2]; [1]Charles University; [2]Ufa State Aviation Technical University

5:00 PM
Heterostructured Titanium with Superior Tensile Properties through Hybridisation of Microstructures by Selective Laser Melting: *Kenong Xia*[1]; [1]University of Melbourne

5:20 PM
Heterogeneous Structure Controlled by Shear Bands in Partially Recrystallized Nano-laminated Copper: *Yao Jiang*[1]; [1]Nanjing University of Science and Technology

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Deformation in Metals

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Tuesday PM | February 25, 2020
5A | San Diego Convention Ctr

Session Chair: Darby Luscher, Los Alamos National Laboratory

2:00 PM
Slip vs Twinning vs Phase Transformations in Metallic Materials under Shock Loading Conditions: *Avanish Mishra*[1]; Ke Ma[1]; Marco Echeverria[1]; Avinash Dongare[1]; [1]University of Connecticut

2:20 PM
High-throughput Atomistic Investigations of Dynamic Defect responses in Crystalline Materials: *Lucas Hale*[1]; [1]National Institute of Standards and Technology

2:40 PM
Influence of Microstructural Change on the Anisotropic Mechanical Behavior of Shock Recovered AMX602 Mg Alloy: *Scott Turnage*[1]; Jonathan Ligda[1]; B. Hornbuckle[1]; Kristopher Darling[1]; Cyril Williams[1]; [1]U. S. Army Research Laboratory

3:00 PM
Twinning/Detwinning Behavior of Cu-Ta Trilayer Under Shock Loading Conditions at The Atomic Scale: *Marco Echeverria*[1]; Avinash Dongare[1]; [1]University of Connecticut

3:20 PM
Thermodynamic Theory of Crystal Plasticity – Formulation and Application to fcc Copper: *Charles Lieou*[1]; Curt Bronkhorst[2]; [1]Los Alamos National Laboratory; [2]University of Wisconsin-Madison

3:40 PM Break

4:00 PM
Structure / Property (Constitutive and Dynamic Strength / Damage)
Characterization of Additively Manufactured (AM) 316L SS: *George Gray*[1]; David Jones[1]; Veronica Livescu[1]; Colt Montgomery[1]; Daniel Martinez[1]; Michael Brand[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

4:20 PM
Laser Shock Wave Induced Mechanical Response on an Additive Manufacturing Ti6Al4V Alloy: *Bathusile Masina*[1]; [1]Council for Scientific and Industrial Research

4:40 PM
Mesoscale Modeling of Shock Loading Induced Twinning/De-twinning and Spall Failure Behavior of Ta Microstructures: *Sergey Galitskiy*[1]; Avinash Dongare[1]; [1]University of Connecticut

5:00 PM
Experimental Study on the Dynamic Behavior of Ti6AL4V ELI: *Tshifhiwa Maimela*[1]; Madindwa Mashinini[1]; Monnamme Tlotleng[2]; Bathusile Masina[2]; [1]University of Johannesburg; [2]CSIR

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Extraction and Recovery of Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Wednesday AM | February 26, 2020
12 | San Diego Convention Ctr

Session Chairs: Zhiwei Peng, Central South University; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

---

8:30 AM Introductory Comments

8:45 AM
Recovery of Chromium from Ferronickel Slag via Alkaline Roasting Followed by Water Leaching: Effect of Roasting Atmosphere: Foquan Gu[1]; *Yuanbo Zhang*[1]; Zhiwei Peng[1]; Huimin Tang[1]; Manman Lu[1]; Shuo Liu[1]; Zijian Su[1]; Mingjun Rao[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University

9:05 AM
Purification of Crude Selenium and Recovery of Gold and Silver by Vacuum Distillation: *Guozheng Zha*[1]; Xiangfeng Kong[1]; Daxin Huang[1]; Bin Yang[1]; Wenlong Jiang[1]; Dachun Liu[1]; Qinsong Mei[1]; [1]Kunming University of Science and Technology

9:25 AM
Effect of P2O5 on the Recovery of Ti from Ti-bearing Blast Furnace Slag by Super-gravity: *Yu Du*[1]; Jintao Gao[1]; Xi Lan[1]; Zhancheng Guo[1]; [1]University of Science and Technology Beijing

9:45 AM
A Study on Recovery of Iron from Red Mud by Solid State Reduction Followed by Magnetic Separation: *Said Eray*[1]; Ender Keskinkiliç[2]; Mustafa Varol[1]; Yavuz Topkaya[3]; Ahmet Geveci[3]; [1]Agri Ibrahim Çeçen University; [2]Atilim University; [3]Middle East Technical University

10:05 AM Break

10:20 AM
Self-reduction of Core-shell EAF Dust-biochar Composite Pellets under Microwave Irradiation: *Liancheng Wang*[1]; Zhiwei Peng[1]; Lei Yang[1]; Leixia Zheng[1]; Jie Wang[1]; Wenxing Shang[1]; Anton Anzulevich[2]; Mingjun Rao[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University; [2]Chelyabinsk State University

10:40 AM
Study of Properties and Mineralization of Cu-Ni Bearing Industry Sludge: *Mudan Liu*[1]; Yong Liu[1]; Zhiqiang Chen[1]; Haozi Lv[1]; Bo Li[1]; [1]Guangdong Institute of Resource Comprehensive Utilization; State Key Laboratory of Separation and Comprehensive Utilization of Rare Metals; Key Laboratory for Mineral Resources R&D and Comprehensive Utilization of Guangdong

11:00 AM
Effect of Additives on Semi-molten State Reduction for Titanium Slag Production from Ilmenite Concentrate: *Wei Lv*[1]; Shiyuan Liu[1]; Junyi Xiang[1]; Xuewei Lv[1]; Yindong Yang[2]; [1]Chongqing University; [2]University of Toronto

11:20 AM
Solid-state Reduction Studies for Recovery of Iron from Red Mud: *Ender Keskinkilic*[1]; Saeid Pournaderi[2]; Ahmet Geveci[3]; Yavuz A. Topkaya[3]; [1]Atilim University; [2]Agri Ibrahim Cecen University; [3]Middle East Technical University

11:40 AM
Separation of Vanadium from Iron in Vanadium-rich molten Iron: *Guangfen Liang*[1]; Xiangyong Lv[1]; Yandong Li[2]; Huamei Duan[1]; Dengfu Chen[1]; Mujun Long[1]; Song xu[3]; [1]College of Materials Science and Engineering; [2]College of Materials Science and Engineering, Yangtze Normal University, Chongqing 408100, China.; [3]Bekaert (Asia) R&D Center

---

NUCLEAR MATERIALS

Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling — Accelerated Materials Evaluation

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Assel Aitkaliyeva, University of Florida; Peter Hosemann, University of California - Berkeley; Samuel Briggs, Oregon State University; David Frazer, Los Alamos National Laboratory

Wednesday AM | February 26, 2020
Theater A-8 | San Diego Convention Ctr

Session Chair: Samuel Briggs, Oregon State University

8:30 AM
A Comparative Study of Two Nanoindentation Approaches for Assessing Mechanical Properties of Ion-irradiated Stainless Steel 316: *Dhriti Bhattacharyya*[1]; Michael Saleh[1]; Alan Xu[1]; Zain Zaidi[2]; Christopher Hurt[2]; Mihail Ionescu[1]; [1]Australian Nuclear Science and Technology Organization; [2]University of New South Wales

8:50 AM
A Comparison of Ring Pull and Axial Tensile Tests of HT-9 and 14YWT Thin-walled Tubes: *Thomas Nizolek*[1]; James Valdez[1]; Calvin Lear[1]; Cheng Liu[1]; Benjamin Eftink[1]; Tarik Saleh[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

9:10 AM
Small Scale Mechanical Testing of Ceramic Interfaces in Nuclear Materials: Characterizing the Impact of Elastic Mismatch on Stress Intensity and Property Extraction: *Joseph Kabel*[1]; Peter Hosemann[1]; [1]University of California, Berkeley

9:30 AM
Multiple Scale Mechanical Testing of Neutron Irradiated FeCrAl Alloys: *Benjamin Eftink*[1]; David Frazer[1]; Todd Steckley[1]; Matthew Quintana[1]; Paul Caccamise[1]; Tobias Romero[1]; Stuart Maloy[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

9:50 AM
In-situ Studies on the Mechanical Properties of He Ion Irradiated Nanotwinned Ag: *Tongjun Niu*[1]; Jin Li[1]; Jie Ding[1]; Yifan Zhang[1]; Ruizhe Su[1]; Jaehun Cho[1]; Sichuang Xue[1]; Zhongxia Shang[1]; Di Chen[2]; Yongqiang Wang[3]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]University of Houston; [3]Los Alamos National Laboratory

10:10 AM Break

10:20 AM
A Virtual Experiment Approach to Positron Annihilation Spectroscopy: *Aaron Kohnert*[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

10:40 AM
Rapid Investigation of Irradiation Temperature Sensitivity Using Charged Particles: *Andrew London*[1]; Chris Hardie[1]; Joven Lim[1]; Tonci Tadic[2]; [1]UK Atomic Energy Authority; [2]Ruder Boškovic Institute, Croatia

11:00 AM
Direct Measurement of Radiation Damage Through the Energy Stored in Defects: Simulations and Experiments: *Charles Hirst*[1]; Penghui Cao[2]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]University of California, Irvine

11:20 AM
Recent Applications of Ex-situ Transient Grating Spectroscopy to the Study of Radiation-induced Degradation of Nuclear Materials: *Sara Ferry*[1]; Cody Dennett[2]; Angus Wylie[1]; Pär Olsson[3]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Idaho National Laboratory; [3]KTH Royal Institute of Technology

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Processing-Structure-Property-Performance IV

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Wednesday AM | February 26, 2020
10 | San Diego Convention Ctr

Session Chairs: Nik Hrabe, National Institute of Standards and Technology; Jake Benzing, National Institute of Standards and Technology

8:30 AM Invited
Processing and Performance: Oxide Formation in AlSi10Mg and IN718 Builds: *P. Chris Pistorius*[1]; Lonnie Smith[1]; Tomio Ohtsuki[1]; [1]Carnegie Mellon University

9:00 AM
Cyclic Material Behavior of Additively Manufactured Inconel 718 Produced Under Different Oxygen Concentrations: *Matilde Scurria*[1]; Benjamin Möller[1]; Rainer Wagener[1]; Thilo Bein[1]; Kai Dietrich[2]; Dominik Bauer[3]; [1]Fraunhofer Lbf; [2]Linde Aktiengesellschaft, Universität Duisburg-Essen; [3]Linde Aktiengesellschaft

9:20 AM
The Impact of Multi-laser Stitching on the High Cycle Fatigue Performance of Metal Alloys Printed Using LPBF: *Jacob Rindler*[1]; Edward Herderick[1]; David Schick[2]; Connor Slone[1]; Antonio Ramirez[1]; Michael Groeber[1]; [1]The Ohio State Univeristy; [2]Proto Precision Additive

9:40 AM
Fracture and Fatigue Behavior of Laser Powder Bed Fusion of AlSi10Mg Using a Common Process Specification: *Brett Conner*[1]; John Rapp[1]; Ken Meinert[2]; Jim Dobbs[3]; [1]Youngstown State University; [2]Pennsylvania State University Applied Research Lab; [3]Boeing

10:00 AM Break

10:20 AM Invited
Structural Integrity of Fe- and Ni-base Alloys Processed by Additive Manufacturing – On The Impact of Microstructure: *Thomas Niendorf*[1]; [1]Universitaet Kassel

10:50 AM
The Role of Surface Condition in High-cycle Fatigue Behavior in Laser Powder Bed Fusion Materials: *David Witkin*[1]; Thomas Albright[1]; Dhruv Patel[1]; Tait McLouth[1]; Glenn Bean[1]; [1]The Aerospace Corporation

11:10 AM
Improving Fatigue Life by Decreasing Roughness of Additively Manufactured Parts: *Thomas Kozmel*[1]; Abhinav Saboo[1]; [1]QuesTek Innovations LLC

11:30 AM
On the Effect of the Applied Stress-ratio on the Fatigue Properties of Ti6Al4V Specimens Produced by Laser Powder Bed Fusion: *Antonio Cutolo*[1]; Chola Elangeswaran[1]; Nicolas Lammens[2]; Hunor Erdelyi[2]; Gokula Muralidharan[3]; Brecht Van Hooreweder[1]; [1]KU Leuven; [2]Siemens Industry Software NV; [3]3D Systems Leuven

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications II — Characterization I

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Wednesday AM | February 26, 2020
9 | San Diego Convention Ctr

Session Chairs: Subhashish Meher, Idaho National Laboratory; Bharat Gwalani, Pacific Northwest National Laboratory

8:30 AM Invited
Influence of Prior EBM Alloy 718 Microstructure on Build Properties after Varied Thermal Post-treatments: Sneha Goel[1]; Johannes Gårdstam[2]; Jonas Olsson[1]; Uta Klement[3]; *Shrikant Joshi*[1]; [1]University West; [2]Quintus Technologies AB; [3]Chalmers University of Technology

8:50 AM
Mechanical and Thermal Properties of Electron Beam Melting Additively Manufactured Tungsten for Fusion Energy Applications: *John Echols*[1]; Lauren Garrison[1]; Elizabeth Ellis[1]; Yutai Katoh[1]; Michael Kirck[1]; Ryan Dehoff[1]; Timothy Horn[2]; Christopher Rock[2]; Christopher Ledford[2]; Sillivan Figurskey[2]; [1]Oak Ridge National Laboratory; [2]North Carolina State University

9:10 AM
Mechanical Testing of 3D Printed Materials: *Nicole Wagner*[1]; Dika Handayani[1]; Victor Okhuysen[1]; Kyle Garibaldi[1]; Michael Seitz[1]; [1]California State Polytechnic University, Pomona

9:30 AM
Study Of Transition In Mechanical Properties Of A356/316L Additively Manufactured Interpenetrating Phase Composites: *Jiahao Cheng*[1]; Xiaohua Hu[1]; Maxim Gussev[1]; Derek Splitter[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

9:50 AM Break

10:10 AM
Microstructural Characterization and Thermomechanical Behavior of Additively Manufactured AlSi10Mg Material and Architected Cellular Structures: Alya Alhammadi[1]; Kamran Khan[1]; Oraib Al-Ketan[1]; *Mohamed Hassan*[1]; Reza Rowshan[2]; Rashid Abu Al-Rub[1]; [1]Khalifa University of Science and Technology; [2]New York University - Abu Dhabi

10:30 AM
Microstructure of the Ferritic-martensitic Steels From Simulated Additive Manufacturing Heat Treatment: *Weicheng Zhong*[1]; Lizhen Tan[1]; Kevin Field[2]; Niyanth Sridharan[1]; Ying Yang[1]; Kurt Terrani[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan, Ann Arbor

10:50 AM
Tailoring Laser Direct Deposited High Purity Alumina Ceramics via Dopants: John Pappas[1]; Aditya Thakur[1]; *Xiangyang Dong*[1]; [1]Missouri University of Science and Technology

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Functional and Energy Materials — Energy Materials

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Sneha Prabha Narra, Worcester Polytechnic Institute; Markus Chmielus, University of Pittsburgh; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University

Wednesday AM | February 26, 2020
7B | San Diego Convention Ctr

Session Chair: Sneha Narra, Worcester Polytechnic Institute

8:30 AM Invited
3D Printed Lithium Ion Batteries and Other Functional Devices: Mohammad Sadeq Saleh[1]; Jie Li[2]; Jonghyun Park[2]; *Rahul Panat*[1]; [1]Carnegie Mellon University; [2]Missouri University of Science and Technology

9:00 AM
High Performance Zn-ion Batteries by Additive Manufacturing: *Sanket Bhoyate*[1]; Marcus Young[1]; Wonbong Choi[1]; [1]University of North Texas

9:20 AM
Multiscale-controlled Three-dimensional Electrodes for Lithium-ion Batteries: *Jonghyun Park*[1]; [1]Missouri University of Science and Technology

9:40 AM
Porous Lithium Ion Battery Cathodes Prepared Using Selective Laser Sintering Exhibit Complex Microstructure and Dual Phase State: *Katherine Acord*[1]; Alexander Dupuy[1]; Umberto Scipioni Bertoli[1]; Baolong Zheng[1]; William West[2]; Qian Chen[2]; Andrew Shapiro[2]; Julie Schoenung[1]; [1]Department of Materials Science and Engineering, University of California, Irvine; [2]Jet Propulsion Laboratory, California Institute of Technology

10:00 AM Break

10:20 AM Invited
Laser Processing of Bismuth Telluride Thermoelectric Materials for Solid-state Energy Conversion: *Saniya Leblanc*[1]; Haidong Zhang[1]; Ryan Welch[1]; George Nolas[2]; Yohann Thimont[3]; [1]George Washington University; [2]University of South Florida; [3]Universite Paul SABATIER CIRIMAT

10:50 AM Invited
3D Ink Printing of Thermoelectric Materials: Christoph Kenel[1]; *David Dunand*[1]; [1]Northwestern University

11:20 AM
Solid-state Additively Manufactured Thermal Energy Storage Materials: *Darin Sharar*[1]; Asher Leff[1]; Adam Wilson[1]; Kadri Atli[1]; Alaa Elwany[2]; Ibrahim Karaman[2]; [1]US Army Research Laboratory; [2]Texas A&M

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — Industrial Applications and Perspectives

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Wednesday AM | February 26, 2020
8 | San Diego Convention Ctr

Session Chairs: Yan Gao, GE Global Research; Amit Pandey, ANSYS

8:30 AM Invited
In-situ X-ray, IR, and Diffraction Measurements of Automotive Grade Steel During Laser Powder Bed Fusion: *Andrew Bobel*[1]; Louis Hector[1]; Benjamin Gould[2]; Sarah Wolff[2]; [1]General Motors; [2]Argonne National Laboratory

8:55 AM Invited
Practical Use of Neutron Facility VULCAN and NRSF2 for Residual Stress Analysis of Additive Manufactured Large Automobile Parts: *Tomohiro Ikeda*[1]; Satoshi Hirose[1]; Hisao Uozumi[1]; Ke An[2]; Chen Yan[2]; Andrew Payzant[2]; Jeffrey Bunn[2]; Christopher Fancher[2]; Alan Seid[3]; [1]Honda R&D Co., Ltd.; [2]Oak Ridge National Laboratory; [3]Honda R&D Americas Inc.

9:20 AM Invited
In Operando Characterization of 3D Printed Composite Resins via X-ray Photon Correlation Spectroscopy and SAXS: *Hilmar Koerner*[1]; [1]Air Force Research Laboratory

9:45 AM
4D Nanoscale Imaging of Powder Feedstock Processing for Additive Manufacturing: *Stephen Kelly*[1]; Kyle Tsaknopoulos[2]; Jordan Kone[1]; Danielle Cote[2]; [1]Carl Zeiss X-ray Microscopy; [2]Worcester Polytechnic Institute

10:05 AM Break

10:25 AM Panel Discussion: The panelists are experts from industry, national labs and university, including Thomas Broderick (AFRL), Ed Glaessgen (NASA), Lyle Levine (NIST), Ade Makinde (GE), and Tony Rollett (CMU).

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Alternative Processes (Beyond the Beam) — Solid State Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Powder Materials Committee

Program Organizers: Paul Prichard, Kennametal Inc.; Matthew Dunstan, U.S. Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal; James Paramore, U.S. Army Research Laboratory

Wednesday AM | February 26, 2020
7A | San Diego Convention Ctr

Session Chair: Peeyush Nandwana, Oak Ridge National Laboratory

8:30 AM
Additive Friction Stir Deposition for Solid-state Additive Manufacturing of Metals and Metal Matrix Composites: *Hang Yu*[1]; [1]Virginia Polytechnic Institute and State University

8:50 AM
Additive Manufacturing of Aluminium Using Friction Stir Deposition: *Mohamed Ahmed*[1]; Ebtessam Elfishawy[2]; Mohamed Elsayed Seleman[3]; [1]The British University in Egypt; [2]The American University in Egypt; [3]Suez University

9:10 AM
Additive Friction Stir Deposition: Microstructural Control Sensitivity: *Robert Griffiths*[1]; David Garcia[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute

9:30 AM
Impacts of Friction Stir Processing on Microstructure and Corrosion Properties of DMLS-AlSi10Mg: Mehran Rafieazad[1]; Mohsen Mohammadi[2]; Adrian Gerlich[3]; *Ali Nasiri*[1]; [1]Memorial University of Newfoundland; [2]Marine Additive Manufacturing Centre of Excellence (MAMCE), University of New Brunswick; [3]Centre for Advanced Materials Joining, Department of Mechanical and Mechatronics Engineering, University of Waterloo

9:50 AM
Mechanical Property and Characterization of Anodized AA6061 After Additive Friction Stir-deposition: *Ning Zhu*[1]; Dustin Avery[1]; Brandon Phillips[1]; Ryan Kinser[1]; Paul Allison[1]; James Jordon[1]; Luke Brewer[1]; [1]University of Alabama Tuscaloosa

10:10 AM Break

10:30 AM
Effect of Counter-gravity 3D Printing on PLA Interlayer Fracture Energy: *Hadi Noori*[1]; Cole Lytle[2]; [1]Oklahoma State University; [2]Tinker Air Force Base

10:50 AM
Effects of Post-processing Treatments on ABS FDM Parts: *Jonathan Torres*[1]; [1]Bucknell University

11:10 AM
3D-printing via Binder Jetting and Consolidation of Nano Alumina Bone Scaffold Prototypes: *Maricruz Carrillo*[1]; Geuntak Lee[1]; Eugene Olevsky[1]; [1]San Diego State University

11:30 AM
Effects of Zener-Hollomon Parameter and Strain on the Heterogeneous Microstructual Evolution of Cold-sprayed Coatings: *Yu Zou*[1]; Hongze Wang[1]; Zhiying Liu[1]; Michel Hache[1]; Eric Irissou[2]; [1]University of Toronto; [2]National Research Council Canada (NRC)

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Alloy Design-High Temperature and Fe based Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Wednesday AM | February 26, 2020
6F | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Design of "Dynamic Alloys" for Additive Manufacturing: Jinyeon Kim[1]; *Atieh Moridi*[1]; [1]Cornell University

9:00 AM
Rapid Exploration of Compositionally Complex Alloys via Additive Manufacturing and Molecular Dynamics: *Andrew Kustas*[1]; Michael Melia[1]; Eric Schindelholz[1]; Shaun Whetten[1]; Joseph Michael[1]; Nicolas Argibay[1]; Michael Chandross[1]; [1]Sandia National Laboratories

9:20 AM
High Entropy Alloy Design and Selection for Additive Manufacturing & Extreme Environment Applications: *Emma White*[1]; Duane Johnson; Nikolai Zarkevich[1]; Andrew Kustas[2]; Nicolas Argibay[2]; Michael Chandross[2]; Iver Anderson[1]; [1]Ames Laboratory; [2]Sandia National Laboratories

9:40 AM
Alloy Design of Promising Highly Alloyed Metals by Using Elemental Powders in Laser Powder Bed Fusion: *Simon Ewald*[1]; Fabian Kies[2]; Johannes Schleifenbaum[3]; [1]RWTH Aachen University - Digital Additive Production; [2]RWTH Aachen University - Steel Institute; [3]RWTH Aachen University - Digital Additive Production, Fraunhofer Institute for Laser Technology

10:00 AM
Additively Manufacturing of Gas Atomized CoCrFeNiMn High-entropy Alloy Powder: *Pan Wang*[1]; Mui Ling Sharon Nai[1]; Jun Wei[1]; [1]Singapore Institute of Manufacturing Tech (SIMTech)

10:20 AM Break

10:35 AM Keynote
ICME-based Design of γ'-strengthened Co-based Superalloys for Additive Manufacturing: *Eric Lass*[1]; Michael Katz[2]; Richard Ricker[2]; [1]University of Tennessee, Knoxville; [2]National Institute of Standards and Technology

11:05 AM
Laser Powder Bed Fusion of a CoNi-base Superalloy for Advanced Components in Extreme Environments: *Kira Pusch*[1]; Sean Murray[1]; Andrew Polonsky[1]; Chris Torbet[1]; Peeyush Nandwana[2]; Michael Kirka[2]; Ryan Dehoff[2]; Ning Zhou[3]; Stephane Forsik[3]; William Slye[3]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory; [3]Carpenter Technology

11:25 AM
Understanding Microstructure Development of Additively Manufactured Ni-based Superalloys by Combining In-situ/Ex-situ Characterization and Computational Modeling: *Jonah Klemm-Toole*[1]; Alec Saville[1]; Chandler Becker[1]; Benjamin Ellyson[1]; Yaofeng Guo[1]; Chloe Johnson[1]; Brian Milligan[1]; Andrew Polonsky[2]; Kira Pusch[2]; Kester Clarke[1]; Niranjan Parab[3]; Kamel Fezzaa[3]; Tao Sun[3]; Damien Tourret[4]; Tresa Pollock[2]; Amy Clarke[1]; [1]Colorado School of Mines; [2]University of California Santa Barbara; [3]Advanced Photon Source; [4]IMDEA Materials Institute

11:45 AM
Understanding Printability of Steels from Computational Modeling of Microstructural Evolution: *Jiayi Yan*[1]; Hamed Ravash[1]; Martin Walbrühl[1]; [1]QuesTek Europe AB

12:05 PM
Site-specific Alloying of Low Carbon Steel Through Binder Jet Additive Manufacturing: *Karl Davidson*[1]; Po-Ju Chiang[1]; Lihua Zhao[2]; Matteo Seita[1]; [1]HP-NTU Digital Manufacturing Corporate Lab; [2]HP Labs for 3D Printing and Digital Manufacturing

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Process Variables II

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday AM | February 26, 2020
6E | San Diego Convention Ctr

Session Chair: Joy Gockel, Wright State University

8:30 AM
Additive Manufacturing of Crack-prone Materials: A Process-and material-based Approach to Parameter Development: *Austin Dicus*[1]; [1]Carpenter Technology

8:50 AM
Eliminating Micro-cracking in Inconel 713ELC Fabricated by a Powder-bed-fusion Additive Manufacturing with Electron Beam: *Yuchao Lei*[1]; Kenta Aoyagi[1]; Dong-Soo Kang[2]; Kosuke Kuwabara[2]; Kinya Aota[2]; Akihiko Chiba[1]; [1]Institute for Materials Research, Tohoku University; [2]Global Research & Innovative Technology Center (GRIT), Hitachi Metals, Ltd.

9:10 AM
Selective Laser Melting Fabrication of Ultra-high Strength Martensitic Steel: *Raiyan Seede*[1]; David Shoukr[1]; Bing Zhang[1]; Austin Whitt[1]; Sean Gibbons[2]; Philip Flater[2]; Alaa Elwany[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University; [2]Air Force Research Laboratory

9:30 AM
Surface Roughness of Hastelloy-X Components Manufactured by Selective Laser Melting: *Yang Tian*[1]; Dacian Tomus[1]; Aijun Huang[1]; Xinhua Wu[1]; [1]Monash University

9:50 AM
Gas Atomization and Powder Bed Fusion Optimization Studies for the Al10SiMg Alloy: *Sharon Park*[1]; George Benson[1]; Thinh Huynh[1]; Holden Hyer[1]; Le Zhou[1]; Edward Dein[1]; Yongho Sohn[1]; [1]University of Central Florida

10:10 AM Break

10:30 AM
Towards an Integrated Experimental and Computational Framework for Large-scale Metal Additive Manufacturing: *Xiaohua Hu*[1]; Andrzej Nycz[1]; Yousub Lee[1]; Benjamin Shassere[1]; Srdjan Simunovic[1]; Mark Noakes[1]; Yang Ren[2]; Xin Sun[1]; [1]Oak Ridge National Laboratory; [2]Argonne National Laboratory

10:50 AM
Quantification of Powder Packing Density in the Powder Bed and its Influence on As-built Quality and Tensile Properties of Ti-6Al-4V by Selective Laser Melting: Joe Elambasseril[1]; *Ma Qian*[1]; Edward Lui[1]; Tingting Song[1]; Sanka Mendis[1]; Milan Brandt[1]; [1]RMIT University

11:10 AM
3D Characterization of Alpha Phase Morphology and Variant Selection in EBM Ti-6Al-4V: *Ryan DeMott*[1]; Phillip Stephenson[1]; Peter Collins[2]; Nima Haghdadi[1]; Xiaozhou Liao[3]; Simon Ringer[3]; Sophie Primig[1]; [1]UNSW Sydney; [2]Iowa State University; [3]University of Sydney

11:30 AM
The Microstructures and Mechanical Properties at Different Forming Positions of A Box-shaped Ti-6Al-4V Alloy Part Fabricated by Selective Laser Melting: *Jingbo Gao*[1]; Deliang Zhang[1]; [1]Northeastern University

11:50 AM
Study the Effect of Thermal Signatures on Microstructural Variation of EBM Additively Manufactured Ti-6Al-4V Builds: *Meiyue Shao*[1]; Chris Blackwell[1]; Sriram Vijayan[1]; Sabina Kumar[2]; Sudarsanam Babu[2]; Joerg Jinschek[1]; [1]the Ohio State University; [2]University of Tennessee

---

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Local Strain / Misorientation II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Wednesday AM | February 26, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: C. Cem Tasan, Massachusetts Institute of Technology; Sandra Korte-Kerzel, RWTH Aachen University

---

8:30 AM Invited
Large-area, High-resolution Characterization of Damage in DP Steels Using Deep Learning: On the Effect of Strain Path and 3D Microstructure: Carl Kusche[1]; Setareh Medghalchi[1]; Tom Reclik[1]; Martina Freund[1]; Martin Diehl[2]; Felix Pütz[1]; Dierk Raabe[2]; Sebastian Münstermann[1]; Talal Al-Samman[1]; Ulrich Kerzel[3]; *Sandra Korte-Kerzel*[1]; [1]RWTH Aachen University; [2]MPI für Eisenforschung Düsseldorf; [3]International University Bad Honnef

9:00 AM
Revealing the Role of Microstructure Architecture on Strength and Ductility of Ni Microwires by In-situ Synchrotron X-ray Diffraction: *Ludovic Thilly*[1]; Ravi Purushottam[1]; Céline Gerard[2]; Loic Signor[3]; Atul H. Chokshi[4]; [1]University of Poitiers; [2]CNRS - Institut Pprime; [3]ENSMA - Institut Pprime; [4]IISc - Bangalore

9:20 AM
Elastic and Plastic Field Measurement During Deformation of Polycrystalline Metallic Materials by Heaviside Digital Image Correlation: *Jean-Charles Stinville*[1]; Patrick Callahan[2]; M. P. Echlin[1]; Marie-Agathe Charpagne[1]; Patrick Villechaise[3]; Jonathan Cormier[3]; D. Texier[4]; Valery Valle[5]; T. M. Pollock[1]; [1]University of California, Santa Barbara; [2]Naval Research Laboratory; [3]Institut P' - UPR 3346, CNRS - Université de Poitiers - ENSMA; [4]Institut Clément Ader - UMR CNRS 5312; [5]Université de Poitiers

9:40 AM
Integrating Thermal Desorption Spectroscopy and Scanning Electron Microscopy: *Haoxue Yan*[1]; Jinwoo Kim[1]; Kenshiro Ichii[2]; Motomichi Koyama[2]; C. Cem Tasan[1]; [1]Massachusetts Institute Of Technology; [2]Kyushu University

10:00 AM Break

10:20 AM
Combined EBSD and HRDIC Study of Strain Gradients in the Presence of Grain Boundaries: *David Fullwood*[1]; Ryan Sperry[1]; Josh Tsai[1]; Landon Hansen[1]; Eric Homer[1]; Robert Wagoner[1]; joao Quinta da Fonseca[1]; [1]Brigham Young University

10:40 AM
Understanding Functional Fatigue with 3D In-situ Grain Map Reconstructions Using High-energy Diffraction Microscopy: *Ashley Bucsek*[1]; Lee Casalena[2]; Darren Pagan[3]; Michael Mills[4]; Aaron Stebner[5]; [1]University of Michigan; [2]Thermo Fisher Scientific; [3]Cornell High Energy Synchrotron Source; [4]The Ohio State University; [5]Colorado School of Mines

11:00 AM
3D Statistics of Slip Localization: Analysis of Dual HR-DIC / 3D-EBSD Experiments: *Toby Francis*[1]; Jean-Charles Stinville[1]; Marie-Agathe Charpagne[1]; Andrew Polonsky[1]; McLean Echlin[1]; Jonathan Hestroffer[1]; Valéry Valle[2]; Irene Beyerlein; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Université de Poitiers

11:20 AM
3D In-situ Characterization of the Deformation of Open-cell Aluminum Foam Using High Energy X-ray Diffraction Microscopy and Micro-Computed Tomography: *Quinton Johnson*[1]; Kris Matheson[1]; Jayden Plumb[1]; Peter Kenesei[2]; Hemant Sharma[2]; Jun-Sang Park[2]; Ashley Spear[1]; [1]University of Utah; [2]Argonne National Laboratory

11:40 AM
Effect of Creep Deformation on the Strain Heterogeneities Localization Inside Complex Microstructures Found within Centrifugally Cast HP40Nb Reformer Tubes: *Thibaut Dessolier*[1]; Wouter Hamer[2]; Martin Church[2]; Ben Britton[1]; [1]Imperial College London; [2]Shell

12:00 PM
Evaluation of the Serration Behavior Characterized as Strain Localization in High-Mn Austenitic Steel: *Sukyoung Hwang*[1]; Myeong-Heom Park[2]; Yu Bai[1]; Akinobu Shibata[1]; Nobuhiro Tsuji[1]; [1]Kyoto University; [2]Elements Strategy Initiative for Structural Materials (ESISM), Kyoto University

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session III

Sponsored by: *T*MS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Wednesday AM | February 26, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Tilmann Hickel, Max Planck Institute; Cem Tasan, Massachusetts Institute of Technology

8:30 AM
Austenitization of a Cold-rolled Dual-phase Steel: Interaction with Recrystallization and Influence of Cementite Composition: Marc Moreno[1]; *Julien Teixeira*[1]; Sébastien Allain[1]; Carla Oberbillig[2]; Frédéric Bonnet[2]; [1]Institute Jean Lamour; [2]ArcelorMittal Global Research and Development

8:50 AM
Effect of High Temperature Processes on Dual Phase Steel Manufacture: *Bharath Bandi*[1]; Joost Krevel[2]; Sukalpan Nandi[3]; Prakash Srirangam[1]; [1]Warwick Manufacturing Group (WMG), University of Warwick, Coventry, CV4 7AL, UK.; [2]Tata Steel, Research and Development, 3H36, IJmuiden, The Netherlands.; [3]Vellore Institute of Technology.

9:10 AM
Increased Damage in Dual Phase Steels under Dynamic Strain Aging Conditions: Merve Cobanoglu[1]; Rasim Ertan[2]; Caner Simsir[2]; *Mert Efe*[1]; [1]Middle East Technical University; [2]Atilim University

9:30 AM
High-performance Full-field Crystal Plasticity with Dislocation-based Hardening and Slip System Backstress Laws: Application to Modeling Deformation of Dual-phase Steels: *Adnan Eghtesad*[1]; Marko Knezevic[1]; [1]University of New Hampshire

9:50 AM
Effect of Pre-straining on High Cycle Fatigue and Fatigue Crack Propagation Behaviors of CP (Complex Phase) Steel: *Sumin Kim*[1]; Taejin Song[2]; Hyokyung Sung[1]; Jehyun Lee[3]; Sangshik Kim[1]; [1]Gyeongsang National University; [2]POSCO/Technical Research Laboratories; [3]Changwon National University

10:10 AM Break

10:30 AM
Examination of Cementite+Austenite+Ferrite Multiphase Steel Produced by ART Annealing: *Oguz Gurkan Bilir*[1]; Ersoy Erisir[1]; Kemal Davut[2]; [1]Kocaeli University; [2]Atilim University, Metal Forming Centre of Excellence, Golbasi, Ankara, Turkey

10:50 AM
In-situ Observation of the Peritectic Reaction and Transformation in a Commercial HSLA Steel: *Tao Liu*[1]; Dengfu Chen[1]; Songyuan Ai[1]; Pingmei Tang[1]; Mujun Long[1]; Jie Yang[1]; [1]Chongqing University

11:10 AM
Process Design and Genetic Optimization of HSLA Steels Using Mean-field and Multi-phase Field Modeling: *Maria-Ioanna Tzini*[1]; Gregory Haidemenopoulos[1]; [1]University of Thessaly

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Structures and Modelling of Soft Magnetic Materials

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Wednesday AM | February 26, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Hunter Henderson, Oak Ridge National Laboratory; Michael McHenry, Carnegie Mellon University

8:30 AM Invited
Characterization of Surface Oxidation and Multi-phase Nanocrystallization in Soft Magnetic FeNi-based Metal Amorphous Nanocomposite Alloys: *Paul Ohodnicki*[1]; Kevin Byerly[1]; John Baltrus[1]; Ruishu Wright[1]; James Egbu[1]; Natan Aronhime[2]; Yuval Krimer[2]; Michael McHenry[2]; Elizabeth Kautz[3]; Arun Devaraj[3]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University; [3]Pacific Northwest National Laboratory

9:00 AM
Preparation of Fe-NC Soft Magnetic Material (Minnealloy) in Bulk Form with High Saturation Magnetization, Low Coercivity, and High Electrical Resistivity: *Guannan Guo*[1]; Jinming Liu[1]; Bin Ma[1]; Jian-Ping Wang[1]; [1]University of Minnesota

9:20 AM
Structure and Magnetic Properties of Novel High-magnetization Fe-Mn Powders Synthesized by Hydrogen Reduction of Nanoferrites: *Tatsuya Kon*[1]; Nobuyoshi Imaoka[1]; Kimihiro Ozaki[1]; [1]National Institute of Advanced Industrial Science and Technology

9:40 AM
Tunable Magnetic Properties in High-entropy FeCoNiAlxSix (0.2 < x < 0.5) Alloys: Kathem Bazzi[1]; Ramasis Goswami[2]; *Tanjore Jayaraman*[1]; [1]University of Michigan-Dearborn; [2]Naval Research Laboratory

10:00 AM Break

10:15 AM
Prediction of Good Glass Forming Ability in Amorphous Soft Magnetic Alloys by Thermocalc Simulation and Experimental Validation: *Yuval Krimer*[1]; Natan Aronhime[2]; Paul Ohodnicki[3]; Michael McHenry[1]; [1]Carnegie Mellon University; [2]Carpenter Technologies; [3]National Energy Technology Laboratory

10:35 AM
Electronic Structure of Nano-crystalline and Amorphous Soft Magnetic Materials: A Computational Methodology: *Minyeong Choi*[1]; Yang-Ki Hong[1]; Hoyun Won[1]; Woncheol Lee[2]; Seok Bae[3]; Dong-Hyeok Choi[3]; Seong-Gon Kim[4]; [1]The University of Alabama; [2]Samsung Electro-Mechanics; [3]LG Innotek; [4]Mississippi State University

10:55 AM
Relationship Between Magnetic Properties and Microstructure of Fe-Si-Al-P Soft Magnet Composites with Various Oxide Insulating Layers: *MInwoo Lee*[1]; Hyeongjin Lee[1]; Taesuk Jang[2]; Hwijun Kim[1]; [1]Korea Institute of Industrial Technology; [2]SunMoon University

11:15 AM
Thermal stability, Crystallization and Magnetic Properties of High Induction Metallic Ribbons Fe67Co20B13: *Przemyslaw Zackiewicz*[1]; Lukasz Hawelek[1]; Patryk Wlodarczyk[1]; Marek Hreczka[1]; Magdalena Steczkowska-Kempka[1]; Aleksandra Kolano-Burian[1]; [1]Lukasiewicz Research Network - Insitute of Non-Ferrous Metals

11:35 AM
Production of Strips of Low-loss Soft Magnetic Alloys by Cutting Processes: *B. Stiven Puentes*[1]; James Mann[2]; Srinivasan Chandrasekar[1]; Kevin Trumble[1]; [1]Purdue University; [2]University of West Florida

11:55 AM
Low Temperature Synthesis of Superparamagnetic Fe3O4 Morphologies Tuned Using Oleic Acid as Crystal Growth Modifier: Stanley Omorogbe[1]; Aireguamen Aigbodion[1]; Hilary Ifijen[1]; Nosa Ogbeide-Ihama[2]; Aline Simo[3]; *Esther Ikhuoria*[4]; [1]Rubber Research Institute of Nigeria; [2]Guinness Nigeria PLC ; [3]iThemba Labs,; [4]University of Benin

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Energy Storage with Emphasis on Batteries I

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Wednesday AM | February 26, 2020
16B | San Diego Convention Ctr

Session Chairs: Partha Mukherjee, Purdue University; Daiwon Choi, Pacific Northwest National Laboratory

8:30 AM Invited
Stochasticity at Scales Leads to Thermo-electrochemical Extremes: *Partha Mukherjee*[1]; Venkatesh Kabra[1]; Mukul Parmananda[1]; [1]Purdue University

8:50 AM Invited
Multiscale Modeling of Graphite Microstructures to Understand the Limitations of Fast Charge of Lithium Ion Batteries: *Srikanth Allu*[1]; [1]Oak Ridge National Laboratory

9:10 AM Keynote
Predicting the Influence of Manufacturing Parameters on Lithium Ion Battery Performance: the ARTISTIC Project: *Alejandro Franco*[1]; [1]Universite de Picardie Jules Verne - LRCS - CNRS

9:40 AM Invited
Stress-enhanced Reaction Non-uniformity in Lithium Intercalation Compounds: Kaiqi Yang[1]; Youtian Zhang[1]; Fan Wang[1]; *Ming Tang*[1]; [1]Rice University

10:00 AM Break

10:20 AM Invited
Impact of Inter-particle Interactions on Electrochemical Performance of Lithium-ion Battery Electrodes: *Scott Roberts*[1]; Dan Bolintineanu[1]; Mark Ferraro[1]; Jeremy Lechman[1]; David Noble[1]; Ishan Srivastava[1]; Bradley Trembacki[1]; [1]Sandia National Laboratories

10:40 AM Invited
Mesoscale Separator Design to Mitigate Dendrite Formation in Lithium Batteries: *Emily Ryan*[1]; Andrew Cannon[1]; [1]Boston University

11:00 AM Invited
A Durable, Inexpensive Oxygen Reduction Reaction Electrocatalyst: *Rohan Mishra*[1]; Sung Cho[2]; Cheng He[1]; Arashdeep Thind[1]; Shrihari Sankarasubramanian[1]; Vijay Ramani[1]; [1]Washington University in St. Louis; [2]Korea Institute of Ceramic Engineering and Technology

11:20 AM Invited
Reliability Testing of Li-ion Batteries for Stationary Application: *Daiwon Choi*[1]; Alasdair Crawford[1]; Vilayanur Viswanathan[1]; Nimat Shamim[1]; Edwin Thomsen[1]; David Reed[1]; Vincent Sprenkle[1]; [1]Pacific Northwest National Laboratory

11:40 AM Invited
Sulfide Based Solid Electrolyte for Lithium-sulfur Batteries: *Dongping Lu*[1]; Zhaoxin Yu[1]; Jie Xiao[1]; Jun Liu[1]; [1]Pacific Northwest National Laboratory

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — Pb-free Solder Alloys II

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Wednesday AM | February 26, 2020
Palomar | Marriott Marquis Hotel

Session Chairs: Arif Salleh, Universiti Malaysia Perlis; Mehran Maalekian, Mat-Tech, Netherlands

8:30 AM Invited
Micro-mechanical Testing of Grain Boundary Sliding in a Tin Alloy: Junnan Jiang[1]; Richard Todd[1]; *Angus Wilkinson*[1]; [1]University of Oxford

8:50 AM
Micropillar Compression Test of Tin-solder Microstructural Units to Reveal Slip Activity: *Tianhong Gu*[1]; Finn Giuliani[1]; Ben Britton[1]; [1]Imperial College London

9:10 AM
Determination of ß-tin Slip Properties Using Micro-pillar Tests and Crystal Plasticity Modelling: *Yilun Xu*[1]; Tianhong Gu[1]; Ben Britton[1]; Fionn Dunne[1]; [1]Imperial College London

9:30 AM
Molecular Dynamics Study of the Effect of Ultrasonic Vibration on Evolution of Crystal Defects: *Milad Khajehvand*[1]; Henri Seppa¨nen[2]; Panthea Sepehrband[1]; [1]Santa Clara University; [2]Kulicke & Soffa Industries, Inc.

9:50 AM Break

10:10 AM Invited
Effects of Bismuth, Antimony, and Indium Alloying Elements on Microstructure of High Reliability Pb-Free Solders Alloys: *Richard Coyle*[1]; Babak Arfaei[2]; Christopher Gourlay[3]; Sergey Belyakov[3]; Keith Sweatman[4]; Keith Howell[4]; [1]Nokia Bell Laboratories; [2]Binghamton University; [3]Imperial College London; [4]Nihon Superior, Co. Ltd.

10:30 AM
Compression Creep Behavior of Sn-Ag-Cu-Bi Pb-Free Solder Alloy: Andre Delhaise[1]; Juan Tupac-Yupanqui Cardoso[2]; *Fae Azhari*[2]; Doug Perovic[2]; [1]Celestica; [2]University of Toronto

10:50 AM
A Preliminary Study of the Dissolution of Bi in ß-Sn Using In Situ Scanning Electron Microscopy: *Andre Delhaise*[1]; Peter Banh[2]; Dian Yu[2]; Hong Ran Wang[2]; Jason Tam[2]; Jane Howe[2]; Doug Perovic[2]; [1]Celestica; [2]University of Toronto

11:10 AM
Modification of Traditional Pb-free Solders with Bi, Sb and In for Improved Reliability: *Sergey Belyakov*[1]; Tetsuro Nishimura[2]; Keith Sweatman[2]; Jingwei Xian[1]; Christopher Gourlay[1]; [1]Imperial College London; [2]Nihon Superior Co., Ltd

---

CHARACTERIZATION

Advanced Real Time Imaging — Mechanical

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Wednesday AM | February 26, 2020
Theater A-4 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
In-situ Observation of Plastic Deformation for Crystalline Materials: *Masaki Tanaka*[1]; [1]Kyushu University

8:50 AM Invited
In-situ Imaging of Nanocomposite Deformation: The influence of 3-D Interfacial Structure and Morphology on Mechanical Response: *Nathan Mara*[1]; Youxing Chen[2]; Justin Cheng[1]; Kevin Schmalbach[1]; Zhao Wang[1]; Nan Li[3]; Jon Baldwin[3]; R. Lee Penn[1]; David Poerschke[1]; Andreas Stein[1]; William Gerberich[1]; Irene Beyerlein[4]; [1]University of Minnesota, Twin Cities; [2]University of North Carolina, Charlotte; [3]Los Alamos National Laboratory; [4]University of California, Santa Barbara

9:10 AM
In-situ Synchrotron 3D X-ray Imaging of Damage Initiation in CMC's Due to Oxidation Corrosion at High Temperature: *Hrishikesh Bale*[1]; Aly Badran[2]; David Marshall[2]; Robert Ritchie[3]; [1]Carl Zeiss Microscopy Inc.; [2]University of Colorado Boulder; [3]University of California Berkeley

9:30 AM
Real Time Imaging of Deformation Mechanisms in Boron Nitride Nanotube-metal Matrix Composites at Multiple Length Scales: *Pranjal Nautiyal*[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

9:50 AM
Surface Analysis of Selective Laser Melted Aluminum Samples Deformed by Pendulum Impact Testing: *Md Salah Uddin*[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

10:10 AM Break

10:30 AM Invited
In Situ TEM Characterizations on Mechanical Properties and Deformation of Metals: *Qian Yu*[1]; Xiaoqing Fu[1]; Qingqing Ding[1]; [1]Zhejiang University

10:50 AM Invited
Non-destructive Multi-property Determination under Extreme Conditions with Transient Grating Spectroscopy: *Cody Dennett*[1]; [1]Massachusetts Institute of Technology

11:10 AM
Using the Digital Image Correlation Technique in Non-traditional Ways: *Carl Cady*[1]; Cheng Liu[1]; [1]Los Alamos National Laboratory

---

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Co-based Superalloys – Structure & Properties

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Wednesday AM | February 26, 2020
11B | San Diego Convention Ctr

Session Chairs: Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, The University of Manchester

---

8:30 AM Invited
Understanding of Alloying Element Effects for the Design of Multicomponent '-strengthened Co-based Superalloys: *Qiang Feng*[1]; Wendao Li[1]; Song Lu[1]; Longfei Li[1]; Stoichko Antonov[1]; [1]University of Science & Technology Beijing

9:00 AM
Advancing Characterization of Co/Ni-based Superalloys with Statistics using Correlative Electron Diffraction and X-ray Spectroscopy: Tom McAuliffe[1]; Alex Foden[1]; Chris Bilsland[1]; Dafni Daskalaki Mountanou[1]; David Dye[1]; *Thomas Britton*[1]; [1]Imperial College London

9:20 AM
Grain Boundary Chemistry and Mechanical Properties of a Multicomponent Co-based L12–ordered Intermetallic Alloy: Francesca Long[1]; Sung Il Baik[1]; Ding Wen Chung[1]; *Fei Xue*[1]; Eric Lass[2]; David Seidman[1]; David Dunand[1]; [1]Northwestern University; [2]The University of Tennessee

9:40 AM
Optimising the γ/γ' Microstructure and Increasing the High Temperature Strength of a Co-base Superalloy: *Daniel Hausmann*[1]; Cecilia Solís[2]; Lisa Freund[1]; Andre Heinemann[2]; Mathias Göken[1]; Ralph Gilles[2]; Steffen Neumeier[1]; [1]Department Werkstoffwissenschaften WW1; [2]Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II)

10:00 AM Break

10:20 AM Invited
From Co-Al-W-alloys to Advanced CoNi-base Superalloys: *Steffen Neumeier*[1]; Mathias Göken[1]; [1]University of Erlangen-Nürnberg

10:50 AM
Very High Cycle Fatigue of a Polycrystalline Co-base Superalloy: *Alice Cervellon*[1]; Sean Murray[1]; Chris Torbet[1]; Tresa Pollock[1]; [1]University of California Santa Barbara

11:10 AM
First-principles Study of Displacive-diffusive Phase Transformations during High Temperature Creep: from Ni- to Co-based Superalloys: *Dongsheng Wen*[1]; Sae Matsunaga[1]; Michael Titus[1]; [1]Purdue University

11:30 AM
Deformation Mechanisms of Co-Cr-W-Ni Alloys at Ambient Temperature: *Shaolou Wei*[1]; Sabrina Hernandez[1]; Matt Bender[2]; Andy Martinez[2]; Cemal Tasan[1]; [1]Massachusetts Institute of Technology; [2]ATI Flat Rolled Products

---

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Algorithms and Machine Learning Approaches for Microscale

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Wednesday AM | February 26, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
Generative Deep Neural Networks for Inverse Materials Design using Backpropagation and Adaptive Learning: *Grace Gu*[1]; Chun-Teh Chen[1]; [1]University of California, Berkeley

8:50 AM
Development of an Evolutionary Deep Neural Net for Materials Research: *Nirupam Chakraborti*[1]; Swagata Roy[1]; [1]Indian Institute of Technology

9:10 AM
Persistent Homology: Unveiling the Topological Features in Materials Data: *Chaitali Patil*[1]; Lucas Magee[1]; Supriyo Chakraborty[1]; Yusu Wang[1]; Stephen Niezgoda[1]; [1]The Ohio State University

9:30 AM
Inverse Solutions based on Reduced-order Process-structure-property Linkages using Markov Chain Monte Carlo Sampling Algorithms: *Yuksel Yabansu*[1]; Almambet Iskakov[1]; Anna Kapustina[2]; Sudhir Rajagopalan[3]; Surya Kalidindi[1]; [1]Georgia Institute of Technology; [2]Siemens AG; [3]Siemens Corporate Technology

9:50 AM
Calibrating Strength Model Parameters Using Multiple Types of Data: *Jeffrey Florando*[1]; Jason Bernstein[1]; Amanda Muyskens[1]; Matthew Nelms[1]; David Rivera[1]; Kathleen Schmidt[1]; Nathan Barton[1]; Ana Kupresanin[1]; [1]Lawrence Livermore National Laboratory

10:10 AM Break

10:30 AM
Advances in a Phase Field Dislocation Dynamics Model to Account for Various Gamma-surfaces of Hexagonal Close Packed Crystallography: *Claire Weaver*[1]; Abigail Hunter[2]; Anil Kumar[2]; Irene Beyerlein[1]; [1]University of California Santa Barbara; [2]Los Alamos National Laboratory

10:50 AM
Hierarchical Integration of Atomistically-derived Dislocation Mobility Laws into Discrete Dislocation Dynamics Simulations: *Darshan Bamney*[1]; Khanh Dang[2]; Laurent Capolungo[2]; Douglas Spearot[1]; [1]University of Florida; [2]Los Alamos National Laboratory

11:10 AM
A Multi-GPU Implementation of a Full-field Crystal Plasticity Solver for Efficient Modeling of High-resolution Microstructures: *Adnan Eghtesad*[1]; Kai Germaschewski[1]; Ricardo A Lebensohn[2]; Marko Knezevic[1]; [1]University of New Hampshire; [2]Los Alamos National Laboratory

11:30 AM
A Self-consistent Parametric Homogenization Framework for Fatigue in Ni-based Superalloys: *George Weber*[1]; Somnath Ghosh[1]; Maxwell Pinz[1]; [1]Johns Hopkins University

---

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications VIII — Session III

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Hsin-jay Wu, National Chiao-tung University; Tiejun Zhu, Zhejiang University

Wednesday AM | February 26, 2020
Miramar | Marriott Marquis Hotel

Session Chairs: Takao Mori, National Institute for Materials Science; Philippe Jund, Université de Montpellier

---

8:30 AM Invited
Ab initio Calculations of Thermoelectric Materials: *Laurent Chaput*[1]; [1]University De Lorraine

8:50 AM Invited
Ab-initio Study of TiMSn (M= Ni, Pt, Pd) Alloys using the CRYSTAL Ab-initio Package: *Lorenzo Maschio*[1]; Atreyi Dasmahapatra[1]; Loredana Daga[1]; Antti Karttunen[2]; Silvia Casassa[1]; [1]University of Torino; [2]Aalto University

9:10 AM Invited
Defect Formation Energies and Effective Masses in the Mg2(Si,Sn) Solid Solutions via DFT Calculations: *Philippe Jund*[1]; Alexandre Berche[1]; Johannes de Boor[2]; [1]Montpellier University; [2]DLR Köln

9:30 AM
Using Energy Filtering to Change the Thermoelectric Design Paradigm: Seyed Aria Hosseini[1]; Jackson R. Harter,[2]; Devin Coleman[1]; Lorenzo Mangolini[1]; *Alex Greaney*[1]; [1]University of California, Riverside; [2]Oregon State University

9:50 AM
Accelerated Discovery of Efficient Solar-cell Materials using Quantum and Machine-learning Methods: *Kamal Choudhary*[1]; Francesca Tavazza[1]; [1]Umcp/Nist

10:10 AM Break

10:30 AM Invited
Utilizing Magnetism and Dilute Magnetic Semiconductors to Enhance Thermoelectric Performance: *Takao Mori*[1]; [1]National Institute for Materials Science

10:50 AM Invited
Multi-band Electronic and Thermal Transport in Fe2VAl Based Full Heusler Thin Films: *Ernst Bauer*[1]; Bernhard Hinterleitner[1]; Alexander Riss[1]; Takao Mori[2]; Xingqiu Chen[3]; [1]Vienna University of Technology; [2]National Institute for Materials Science, Tsukuba; [3]Shenyang National Laboratory for Materials Science, Shenyang

11:10 AM
Portable Nanostructured Magneto-Thermoelectric Bi-Sb Alloys at Cryogenic Temperatures: *Joseph Poon*[1]; [1]University of Virginia

11:30 AM
Phase Diagrams of Ag-Cu-Te Ternary System and Ag2Te/Cu Interfacial Reaction: *Yohanes Hutabalian*[1]; Sinn-wen Chen[1]; [1]National Tsing Hua University

11:50 AM
Optimization of Thermoelectric Performance of Nitrogen- and Boron-doped Carbon Nanotubes: *Manaho Matsubara*[1]; Kenji Sasaoka[1]; Takahiro Yamamoto[1]; [1]Tokyo University of Science

12:10 PM
Thermoelectric Films Deposited by Pulsed Magnetron Sputtering: *Elzbieta Godlewska*[1]; Krzysztof Mars[1]; Kinga Majewska-Zawadzka[1]; Wojciech Sznajder[1]; [1]AGH UST

LIGHT METALS

Aluminum Alloys, Processing and Characterization — New and Optimized Aluminium Alloys II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Wednesday AM | February 26, 2020
1A | San Diego Convention Ctr

Session Chairs: Mehdi Lalpoor, Aleris; Alexis Miroux, Aleris

8:30 AM Introductory Comments

8:35 AM Invited
The Formation of Fe-rich Phases in Al-Mg Die Cast Alloy and Its Strengthening Effect: *Xiangzhen Zhu*[1]; Shouxun Ji[1]; [1]Brunel University London

9:00 AM
Spark Plasma Sintering of Graphene Nanoplatelets Reinforced Aluminium 6061 Alloy Composites: Mahmood Khan[1]; Rafi Ud Din[2]; Abdul Wadood[1]; Shahid Akhtar[3]; Syed Wilayat Husain[1]; *Ragnhild Aune*[4]; [1]Institute of Space Technology, Islamabad; [2]Pakistan Institute of Science and Technology; [3]Norsk Hydro, Karmøy Primary Production; [4]Norwegian University of Science and Technology (NTNU)

9:25 AM
Effects of Mn and Mo Micro-additions on Al-Zr-Sc-Er-Si Mechanical Properties: *Shipeng Shu*[1]; Anthony De Luca[1]; David Seidman[1]; David Dunand[1]; [1]Northwestern University

9:50 AM
Nanotreating High-zinc Al-Zn-Mg-Cu Alloy by TiC Nanoparticles: *Jie Yuan*[1]; Min Zuo[2]; Maximilian Sokoluk[3]; Gongcheng Yao[1]; Shuaihang Pan[3]; Xiaochun Li[3]; [1]Department of Materials Science and Engineering, University of California, Los Angeles; [2]University of Jinan; [3]Department of Mechanical and Aerospace Engineering, University of California, Los Angeles

10:15 AM Break

10:30 AM
Microstructure and Mechanical Response of Artificially Aged Al-Mg-Si Alloys: Experiments and Modeling: *Yoojin Kim*[1]; Sharvan Kumar[1]; [1]Brown University

10:55 AM
Effect of Zn Additions on the Mechanical Properties of High Strength Al-Si-Mg-Cu Alloys: *Sung su Jung*[1]; Soo Been Hwang[1]; Byung Joo Kim[1]; Yong Ho Park[2]; Young Cheol Lee[1]; [1]KITECH(Korea Institute of Industrial Technology); [2]Pusan National University

11:20 AM
Utilization of 3D Printed Materials in Expendable Pattern Casting Process: *Dika Handayani*[1]; Nicole Wagner[1]; Victor Okhuysen[1]; Michael Seitz[1]; Kyle Garibaldi[1]; [1]Cal Poly Pomona

---

LIGHT METALS

Aluminum Reduction Technology — Fundamental

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Jayson Tessier, Alcoa

Wednesday AM | February 26, 2020
6D | San Diego Convention Ctr

Session Chair: Gurdun Arnbjorg Saevarsdottir, Reykjavik University

---

8:30 AM Introductory Comments

8:35 AM
Electrochemical Behavior of Cu-Al Oxygen-evolving Anodes in Low-temperature Fluoride Melts and Suspensions: *Andrey Yasinskiy*[1]; Sai Krishna Padamata[1]; Peter Polyakov[1]; Aleksandr Samoilo[1]; Andrey Suzdaltsev[2]; Andrey Nikolaev[2]; [1]Siberian Federal University; [2]Institute of High-Temperature Electrochemistry, UB RAS

8:55 AM
Alumina Concentration Measurements in Cryolite Melts: *Luis Bracamonte*[1]; Espen Sandnes[1]; Christian Rosenkilde[2]; Karoline Nilsen[1]; [1]Norwegian University of Science and Technology; [2]Hydro Aluminium

9:15 AM
The Influence of Polarization on the Wetting of Graphite in Cryolite-alumina Melts: Henrik Åsheim[1]; Ingrid Andersen Eidsvaag[1]; Asbjørn Solheim[2]; Henrik Gudbrandsen[2]; Geir Haarberg[1]; *Espen Sandnes*[1]; [1]Norwegian University of Science and Technology, NTNU; [2]SINTEF Industry, Metal Production and Processing

9:35 AM
Oxidation Study of Zinc sulfite on the Removal of Sulfur Dioxide from Aluminum Electrolysis Flue Gas by Zinc Oxide: *Xuejiao Cao*[1]; Zhang Tingan[1]; Yan Liu[1]; Weiguang Zhang[1]; Simin Li[1]; [1]Northeastern University

9:55 AM Break

10:10 AM
Electrolysis of Low-temperature Suspensions: an Update: *Andrey Yasinskiy*[1]; Andrey Suzdaltsev[2]; Sai Krishna Padamata[1]; Petr Polyakov[1]; Yuriy Zaikov[2]; [1]Siberian Federal University; [2]Institute of High-Temperature Electrochemistry UB RAS

10:30 AM
Adapting Modern Industrial Operation Parameters in a Standardized Laboratory Cell for Measuring Current Efficiency for Aluminium Deposition, Unexpected Challenges and Lessons Learned: *Rauan Meirbekova*[1]; Omar Awayssa[2]; Geir Haarberg[2]; Gudrun Saevarsdottir[1]; [1]Reykjavik University; [2]Norwegian University of Science and Technology

10:50 AM
Aluminium Smelter Crust – Phase Distribution and Structure Analysis of Top Zone Layer: *Shanghai Wei*[1]; Jingjing Liu[1]; George Allan[2]; Tania Groutso[3]; John Chen[2]; Mark Taylor[1]; [1]NZ Product Accelerator, Department of Chemical & Materials Engineering; [2]Department of Chemical & Materials Engineering; [3]University of Auckland

11:10 AM
Influence of Anode Cover Material Particle Size on Its Physical Property and Insulation Performance: *Changlin Li*[1]; Junqing Wang[1]; Yunfeng Zhou[1]; Bin Fang[1]; Yanfang Wang[1]; Qingguo Jiao[1]; [1]Zhengzhou Nonferrous Metals Research Institute Ltd of Chalco; China National Engineering and Technology Research Centre for Aluminium

CHARACTERIZATION

Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials III — General Methods and Development

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; David Seidman, Northwestern University; Keith Knipling, Naval Research Laboratory; Gregory Thompson, University of Alabama; Simon Ringer, University of Sydney; Arun Devaraj, Pacific Northwest National Laboratory; Gang Sha, Nanjing University of Science and Technology

Wednesday AM | February 26, 2020
Theater A-1 | San Diego Convention Ctr

Session Chairs: David Seidman, Northwestern University; Haiming Wen, Missouri University of Science and Technology

8:30 AM Invited
A Review of Atom Probe Tomography Technology: The Present and Future: *David Larson*[1]; [1]CAMECA Instruments Inc.

9:00 AM Invited
APT for Atomic-scale Insights to the Origins of Materials Properties: *Michael Moody*[1]; Paul Bagot[1]; Tom Lapington[1]; David Tweddle[1]; Benjamin Jenkins[1]; [1]University of Oxford

9:30 AM Invited
Atom Probe Characterisation of Hydrogen in Iron and Steels: *Peter Felfer*[1]; Valentin Dalbauer[1]; [1]Fau Erlangen-Nurnberg

10:00 AM Break

10:15 AM Invited
Nanoparticle Sample Preparation for Atom Probe Tomography: Chemical Fixation and Cryo-Fixation: Leigh Stephenson[1]; Se-Ho Kim[1]; Joohyun Lim[1]; Olga Kasian[2]; Pyuck-Pa Choi[3]; Christina Scheu[1]; Dierk Raabe[1]; *Baptiste Gault*[1]; [1]Max Planck Institut Iron & Steel Research; [2]Helmholtz Zentrum Berlin; [3]KAIST

10:45 AM Invited
Compositional Dependencies of Ni- and Fe-oxides to Experimental Parameters in Atom Probe Tomography: *Daniel Schreiber*[1]; Ann Chiaramonti[2]; Karen Kruska[1]; [1]Pacific Northwest National Laboratory; [2]National Institute of Standards and Technology

11:15 AM Invited
Morphological Classification of Dense Objects in Atom Probe Tomography Data: *Iman Ghamarian*[1]; Emmanuelle Marquis[1]; [1]University of Michigan

11:45 AM
Quantifying Compositional Uncertainty Arising from Peak Overlaps: *Andrew London*[1]; [1]UK Atomic Energy Authority

12:05 PM
Post-morten Selected Area Analysis for Optimized Statistical Analysis of APT Data: *Frederic Danoix*[1]; Alexander Dahlstrom[2]; Begonia Gomez Ferrer[3]; Cristelle Pareige[3]; [1]Cnrs; [2]KTH Royal Institute of Technology; [3]Normandy University

BIOMATERIALS

Bio-Nano Interfaces and Engineering Applications — Bio-Nano Interfaces I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Wednesday AM | February 26, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder

8:30 AM Keynote
Engineered Biomolecules for Enhanced Function and Stability: Joseph Slocik[1]; Zhifeng Kuang[1]; Kristi Singh[1]; Patrick Dennis[1]; *Rajesh Naik*[1]; [1]Air Force Research Laboratory

9:00 AM Keynote
Peptides as Modulators of Materials Properties: Case Study MOFS and Composites based on ZnO: *Carole Perry*[1]; [1]Nottingham Trent University

9:30 AM
Molecular Mechanisms in Metal Oxide Nanoparticle Interactions with Biomolecules: *Vadim Kessler*[1]; [1]SLU

10:00 AM Keynote
Enabling Manufacturing at the Bio-Nano Interface using Gyratory Forming: *Mohan Edirisinghe*[1]; Ayda Afshar[1]; [1]University College London

10:30 AM Break

10:45 AM Invited
Chiral Inorganic Nanostructures: *Nickolas Kotov*[1]; [1]University of Michigan

11:15 AM Invited
Biological Crystallization of Ultrahard Teeth and Translation to Multi-functional Materials: Anna Pohl[1]; Taifeng Wang[1]; Wei Huang[1]; Michiko Nemoto[2]; *David Kisailus*[1]; [1]University of California Riverside; [2]Okayama University

BIOMATERIALS

Biological Materials Science — Biomaterials II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Wednesday AM | February 26, 2020
Leucadia | Marriott Marquis Hotel

Session Chairs: David Restrepo, University of Texas at San Antonio; Claire Acevedo, University of Utah

8:30 AM
Reinforcement of Low Cost Additively Manufactured Prosthetic Sockets to Create Resilient Laminate Materials: *Isaac Cabrera*[1]; Joseph Martin[1]; Samantha Fong[1]; KiAsia Lawson[2]; Ramesh Rao[1]; Albert Lin[1]; Joanna McKittrick[1]; [1]University of California San Diego; [2]North Carolina A&T State University

8:50 AM
Corrosion Behaviour of Modern Ti-based Biomedical Materials in the Simultaneous Presence of Albumin and Hydrogen Peroxide: *Agata Sotniczuk*[1]; Donata Kuczynska-Zemla[1]; Halina Garbacz[1]; [1]Warsaw University of Technology

9:10 AM
Micro-scratch of Irradiated Compression Molded Ultra High Molecular Weight Polyethylene (UHMWPE) based Nanocomposites: *Chinmayee Nayak*[1]; Ariharan S[2]; Vamsi Krishna Bhalla[3]; Kantesh Balani[1]; [1]Indian Institute of Technology, Kanpur; [2]Indian Institute of Technology Madras; [3]University of Louisville

9:30 AM
Processing, Microstructure Characterization and Biological Response of Cold Sprayed Biocomposite Coatings: *Eden Bhatta*[1]; Grant Crawford[1]; [1]South Dakota School of Mines and Technology

9:50 AM Invited
Decussation Patterns in Mammalian Teeth Across Bite Force Regimes: *Dwayne Arola*[1]; Juliana Fernández-Arteaga[2]; Cameron Renteria[1]; Carli Marsico[1]; E. Alex Ossa[2]; [1]University of Washington; [2]Universidad Eafit

10:20 AM Break

10:35 AM
Effect of Nanoclay Reinforcement on the Property of Rubber Seed Oil Polyurethane Nancomposites: *Efosa Obazee*[1]; Felix Okieimen[2]; Prem Felix[3]; Aireguamen Aigbodion[1]; Isiaka bakare[1]; [1]Rubber Research Institute of Nigeria; [2]University of Benin, Benin City; [3]Indian Institute of Technology Mandi

10:55 AM
In-situ AFM Identification of Mechanical Properties of Collagen Fibrils and Extrafibrillar Matrix in Bone: *Wei Gao*[1]; Xiaodu Wang[1]; Heber Barron[1]; [1]University of Texas at San Antonio

11:15 AM
Rate and Stress-state Dependent Calibration of FlexiForce Sensors for Injury Biomechanics Research: *Andrew Brown*[1]; Alexandra Vest[1]; Karin Rafaels[1]; [1]U.S. Army Research Laboratory

11:35 AM
Mechanisms of Co-ion Release from Titanium-cobalt Hip Implants Revealed by Atomic Scale Correlative Microscopy: *Shanoob Balachandran Nair*[1]; Zita Zachariah[1]; Alfons Fischer[1]; David Mayweg[1]; Markus Wimmer[2]; Dierk Raabe[1]; Michael Herbig[1]; [1]Max-Planck-Institut fuer Eisenforschung; [2]Rush University Medical Center

SPECIAL TOPICS

Bladesmithing 2020 — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Michael West, South Dakota School of Mines & Technology; Roxana Ruxanda, Emerson Climate Technologies Inc.; David Sapiro, Naval Surface Warfare Center

Wednesday AM | February 26, 2020
2 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
Aluminum Bronze Cast Khopesh: *Megan Burrill*[1]; Kathy Ho[1]; [1]Illinois Institute of Technology

8:50 AM
Fabrication of A Historical Seax Using Historical Methods: *Austin Hernandez*[1]; Charles Meyer[1]; Hugo Heredia[1]; Stephen Stafford[1]; Christopher Bradley[1]; [1]University of Texas, El Paso

9:10 AM
The University of Texas at Austin's ASME Design Team Bowie Knife Proposal Abstract: *Grace Young*[1]; [1]UT ASME Design

9:30 AM
Forging the Future: *Albert Ostlind*[1]; [1]New Mexico Institute of Mining & Technology

9:50 AM
Boridized AISI 1045 Carbon Steel for "Mortuary Sword" Bladesmithing: *David Flores*[1]; Karen Miroslava[1]; Orlando Castro[1]; Gerardo Salinas[1]; Enrique Duque[1]; Simon De La Rosa[1]; [1]Universidad Autónoma de Nuevo León

10:10 AM Break

10:30 AM
Titanium Bonding to High Carbon Steel through Vanadium for Bladesmithing: *Ryan Mier*[1]; [1]Los Alamos National Laboratory

10:50 AM
Comparing Mechanical and Microstructural Properties of a Damascus Steel Forge Welded with and without Flux: *Al Medrano*[1]; Fernando Robledo[1]; Jason Lin[1]; Sam Lee[1]; Jordan Tran[1]; Natalie Wu-Woods[1]; Calvin Belcher[1]; Tucker Parris[1]; [1]University of California, Irvine

11:10 AM
Decapigator: Devin Ritter[1]; *Brandon Capellini*[1]; [1]University of Florida

11:30 AM
Investigating Chemical and Mechanical Inhomogeneity in Pattern Welded Steel: *Cullen Pearson*[1]; [1]University of Tennessee Knoxville

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Alloy Development and Application I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM | February 26, 2020
Cardiff | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
Rapid Discharge Forming of Metallic Glasses: A Novel Metals Manufacturing Platform: *Marios Demetriou*[1]; Kyung Hee Han[1]; Jong Hyun Na[1]; Maximilien Launey[1]; William Johnson[1]; [1]Glassimetal Technology

8:50 AM Invited
Structure-property-processing Relationships in Bulk Metallic Glasses Suggest a High, but Narrow Path to Success: *Jan Schroers*[1]; [1]Yale University

9:10 AM Invited
An Overview of BMG Additive Manufacturing Activities and Future Directions at NASA JPL: *Douglas Hofmann*[1]; Punnathat Bordeenithikasem[1]; [1]NASA JPL/Caltech

9:30 AM Invited
Synthesis and Properties of BMG Type Nanoglasses by Thin Film Vapour Deposition: *Hans Fecht*[1]; [1]Ulm University

9:50 AM Invited
Research Progress in Ti-based Bulk Metallic Glasses: *Ke-Fu Yao*[1]; Jia-Lun Gu[1]; [1]Tsinghua University

10:10 AM Break

10:30 AM Invited
Formation of New Metallic Glass States by Melt-quenching Under High Pressure: *Qiaoshi Zeng*[1]; [1]Hpstar

10:50 AM Invited
Comparison of Excess Entropy in Strong and Fragile Glasses: *Hillary Smith*[1]; Marios Demetriou[2]; Brent Fultz[2]; [1]Swarthmore College; [2]California Institute of Technology

11:10 AM Invited
Glass-forming Liquids Processed Under Ultrahigh Gravitational Accelerations: *Mihai Stoica*[1]; Jörg Löffler[1]; [1]ETH Zurich

11:30 AM Invited
Catalytic Metallic Glasses for Clean Energy Applications: Vahid Hasannaeimi[1]; Shristy Jha[1]; Maryam Sadeghilaridjani[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

LIGHT METALS

Cast Shop Technology: Recycling and Sustainability Joint Session — Recycling and Sustainability Joint Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Wednesday AM | February 26, 2020
1B | San Diego Convention Ctr

Session Chair: Mertol Gökelma, NTNU Trondheim

8:30 AM Introductory Comments

8:35 AM
Constellium R&D Approach in Recycling from Lab to Industrial Scale: *Anne Pichat*[1]; Alain Vassel[1]; Pierre-Yves Menet[1]; Laurent Jouët-Pastre[2]; [1]Constellium Technology Center; [2]Constellium Neuf Brisach plant

8:55 AM
Representative Sampling, Fractionation and Melting of Al-scrap: *Stefan Wibner*[1]; Helmut Antrekowitsch[1]; Barbara Falkensammer[2]; [1]Montanuniversitaet Leoben; [2]Hütte Klein-Reichenbach

9:15 AM
Recycling of Aluminium Waste from Mixed Household Waste: Sigvart Eggen[1]; Kurt Sandaunet[2]; Leiv K Kolbeinsen[1]; *Anne Kvithyld*[1]; [1]NTNU; [2]SINTEF

9:35 AM
An Assessment of Recyclability of Used Aluminium Coffee Capsules: *Mertol Gökelma*[1]; Fabian Diaz[2]; Ilayda Elif Öner[3]; Bernd Friedrich[2]; Gabriella Tranell[1]; [1]Norwegian University of Science and Technology; [2]RWTH Aachen University; [3]Istanbul Technical University

9:55 AM Break

10:10 AM
Fractional Solidification for Purification of Recycled Aluminium Alloys: *Susanna Venditti*[1]; Dmitry Eskin[1]; Alain Jacot[1]; [1]Bcast Brunel University

10:30 AM
A Rapid Method of Determining Salt Flux Melting Point and Composition: *Ray Peterson*[1]; [1]Real Alloy

10:50 AM
Automatic Skimming Procedure for Reducing Aluminium Losses and Maintaining the Uniform Quality of the Molten Metal: *Varuzan Kevorkijan*[1]; Uroš Kovacec[2]; Sandi Žist[1]; [1]Impol R in R d.o.o.; [2]Impol LLT d.o.o.

11:10 AM
Evaluation of the Effect of CO_2 Cover Gas on the Rate of Oxidation of an AlMgSi Alloy: *Cathrine Solem*[1]; Kai Erik Ekstrøm[1]; Gabriella Tranell[1]; Ragnhild Aune[1]; [1]Norwegian University of Science and Technology (NTNU)

11:30 AM
Recovery of Aluminium Metal Using Ultrasonic Technique and Production of Al-Si Hypereutectic Alloys from 6063 Alloy's Black Dross Using Silicon Lumps and Flux: *Ahmed Aadli*[1]; [1]Aluminium Company of Egypt

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Mineral Processing and Analysis III

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Wednesday AM | February 26, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Jiann-Yang Hwang, Michigan Technological University; Andrew Brown, Army Research Laboratory

8:30 AM
Preparation and Photocatalytic Properties of Mo-doped TiO2@fly Ash Cenospheres for Degradation of Methylene Blue: *Yongfeng Cai*[1]; Bin Xu[1]; Li Guanghui[1]; Min Li[1]; Mingjun Rao[1]; Jun Luo[1]; Zhiwei Peng[1]; Pengxu Cao[1]; [1]Central South University

8:50 AM
Removing Arsenic from the NiSO4 Solution Using Modified D301 Resin: Ailiang Chen[1]; *Xintao Sun*[1]; Jinxi Qiao[1]; Zhen Qian[1]; Yan Zhang[2]; Yutian Ma[3]; Zhiqiang Liu[4]; Lixue Shi[1]; [1]Central South University; [2]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization; [3]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization;Jinchuan Group Co. Ltd; [4]Guangdong Research Institute of Rare Metals;State Key Laboratory of Rare Metals Separation and Comprehensive Utilization

9:10 AM
Natural Illite-based Ultrafine Cobalt Oxide with Abundant Oxygen Vacancy for Highly Efficient Fenton-like Catalysis: *Zhiming Sun*[1]; Xiongbo Dong[1]; Chunquan Li[1]; Shuilin Zheng[1]; [1]China University of Mining and Technology(Beijing)

9:30 AM
Activated Carbon Prepared from Bituminous Coal/poplar Blends by Direct KOH Activation: *Xiaohu Zhou*[1]; Shengfu Zhang[1]; Yuyang Wei[1]; Xiong Xiao[1]; Weiyi Chen[1]; [1]Chongqing University

9:50 AM Break

10:10 AM
Preparation of Thermal Insulation Materials from Ferronickel Slag with Addition of Fly Ash Cenosphere: *Lei Yang*[1]; Zhiwei Peng[1]; Yawen Huang[2]; Liancheng Wang[1]; Leixia Zheng[1]; Mingjun Rao[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University; [2]School of Materials Science and Engineering, Southwest University of Science and Technology

10:30 AM
Effect of Acidic Attack on the Structural Characteristics of Sepiolite from Nevada, USA: *Huaguang Wang*[1]; Bowen Li[1]; [1]Michigan Technological University

10:50 AM
Effect of Na_2CO_3 and/or K_2CO_3 Addition on the Thermal Stability of Solar Salt and Hitec: *Xianwei Hu*[1]; Guojun Che[1]; Jiangyu Yu[1]; Zhongning Shi[1]; Bingliang Gao[1]; Zhaowen Wang[1]; [1]Northeastern University

11:10 AM
Leaching of Copper, Cobalt and Nickel from Complex Ore Leaching: *Yotamu Hara*[1]; Douglas Musowoya[1]; Golden Kaluba[1]; Choolwe Muchindu[1]; Haggai Simfukwe[1]; Kennedy Kennedy[1]; Stephen Parirenyatwa[1]; Tinah Chanda[1]; [1]Copperbelt University

CHARACTERIZATION

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification — Diffraction, Microscopy & Machine Learning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee

Program Organizers: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, U.S. Army Research Laboratory; James Hogan, University of Alberta; Srikanth Patala, North Carolina State University; Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Wednesday AM | February 26, 2020
Theater A-3 | San Diego Convention Ctr

Session Chairs: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, CCDC Army Research Laboratory

8:30 AM Introductory Comments

8:35 AM
100 Years of Scherrer Modifications: Demystifying Diffractogram Width Analyses for Nanocrystalline Materials: *Cody Kunka*[1]; Brad Boyce[1]; Stephen Foiles[1]; Remi Dingreville[1]; [1]Sandia National Laboratories

8:55 AM
Machine Learning Approach for On-the-fly Crystal System Classification from Powder X-ray Diffraction Pattern: *Yuta Suzuki*[1]; Hideitsu Hino[2]; Takafumi Hawai[1]; Kotaro Saito[3]; Kanta Ono[1]; [1]High Energy Accelerator Research Organization; [2]The Institute of Statistical Mathematics; [3]Paul Scherrer Institute

9:15 AM
Indexing of Electron Back-Scatter Diffraction Patterns Using a Convolutional Neural Network: *Zihao Ding*[1]; Elena Pascal[1]; Marc De Graef[1]; [1]Carnegie Mellon University

9:35 AM
Machine Learning and Electron Backscatter Diffraction: Alessandro Previero[1]; Guillaume de Certaines[1]; Alex Foden[1]; *Thomas Britton*[1]; [1]Imperial College London

9:55 AM Break

10:15 AM Invited
Large-scale Defect Contrast Simulations for Scanning and Transmission Electron Microscopy: *Marc De Graef*[1]; [1]Carnegie Mellon University

10:45 AM Invited
Parametric Models for Crystallographic Texture: Estimation and Uncertainty Quantification: *Stephen Niezgoda*[1]; James Matuk[1];

Oksana Chkrebtii[1]; [1]The Ohio State University

11:15 AM Invited
A New Crystallographic Defect Quantification Workflow via Advanced-microscopy-based Deep Learning: *Yuanyuan Zhu*[1]; Graham Roberts[1]; Rajat Sainju[1]; Colin Ophus[2]; Brian Hutchinson[3]; Danny Edwards[4]; Mychailo Toloczko[4]; [1]University of Connecticut; [2]Lawrence Berkeley National Laboratory; [3]Western Washington University; [4]Pacific Northwest National Laboratory

CORROSION

Coatings and Surface Engineering for Environmental Protection II — Corrosion Control Session I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Arif Mubarok, PPG; Raul Rebak, GE Global Research; Rajeev Gupta, University of Akron; Tushar Borkar, Cleveland State University; Brian Okerberg, PPG Industries; Michael Mayo, PPG Industries

Wednesday AM | February 26, 2020
19 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Chloride Susceptibility Index (CSI) : An Ab initio Based Corrosion Resistance Indicator: *Huibin Ke*[1]; Pin Lu[2]; Christopher Taylor[1]; [1]The Ohio State University; [2]QuesTek

8:50 AM
A Study of the Effects of Laser Shock Peening (LSP) on the Susceptibility of Sensitized 304L Stainless Steel to Intergranular Corrosion: *Richard Chiang*[1]; Harsha Naralasetty[1]; Seetha Mannava[1]; Matthew Steiner[1]; Vijay Vasudevan[1]; [1]University of Cincinnati

9:10 AM
Contact Resistance and Corrosion Response of Non-chromate Passivations on ZnNi Coatings: *Kevin Foster*[1]; William Fahrenholtz[1]; Matthew O'Keefe[2]; James Claypool[1]; [1]Missouri University of Science and Technology; [2]The University of Mississippi

9:30 AM
Corrosion Phenomena in Powder-processed Icosahedral-phase-strengthened Aluminum Alloys: *Sarshad Rommel*[1]; Hannah Leonard[1]; Mingxuan Li[1]; Thomas Watson[2]; Tod Policandriotes[3]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

9:50 AM
Effect of Surface Coating on Corrosion Product Deposition Behavior in PWR Fuel Cladding: *Junhyuk Ham*[1]; Yunju Lee[1]; Seung Chang Yoo[1]; Ji Hyun Kim[1]; [1]UNIST

10:10 AM Break

10:20 AM
Electrochemical Impedance Spectroscopic Study of Oxide Scales on Pure Iron in Liquid Lead-bismuth Eutectic: *Jie Qiu*[1]; Peter Hosemann[1]; Digby Macdonald[1]; John Scully[1]; [1]University of California at Berkeley

10:40 AM
Electrochemical Impedance Study of Brazing Cu-Ag Alloy in Deionized Water in the Presence of Benzotriazole: *Hooman Rahmani*[1]; Efstathios Meletis[1]; [1]University of Texas at Arlington

11:00 AM
Estimating the Effect that Interactions between Chemical Reactions and Environmental Influences have on the Corrosivity of the Electrolyte: *Steven Policastro*[1]; Rachel Anderson[1]; Carlos Hangarter[1]; [1]Naval Research Laboratory

11:20 AM
Evaluation of Surface Characteristics of Cr-coated Zr-4 Accident Tolerant Fuel Cladding Material after Critical Heat Flux Testing under Atmospheric Pressure: *Rajnikant Umretiya*[1]; Jessika Rojas[1]; Mark Anderson[2]; Barret Elward[2]; Raul Rebak[3]; Sama Bilbao y Leon[1]; [1]Virginia Commonwealth University; [2]University of Wisconsin-Madison; [3]GE Global Research

11:40 AM
Elucidating the Degradation Mechanisms of Ti-6Al-4V Dental Implants: *Xin Chen*[1]; Kumar Shah[1]; Shiqi Dong[1]; Lars Peterson[1]; Erika La Plante[1]; Gaurav Sant[1]; [1]UCLA

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Defects and Modeling

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Wednesday AM | February 26, 2020
Theater A-9 | San Diego Convention Ctr

Session Chairs: Kai Nordlund, University of Helsinki; Mike Tonks, University of Florida

8:30 AM Invited
The Use of Molecular Dynamics Simulations for Modeling Gas - Point Defect Interaction Behavior in Nuclear Materials: *Brian Wirth*[1]; [1]University of Tennessee

9:10 AM
Density Functional Theory Study of He/H Effect in W-Ni-Fe Composite for Plasma Facing Material: *Wahyu Setyawan*[1]; [1]Pacific Northwest National Laboratory

9:30 AM
Ab-initio Molecular Dynamics Simulations of bcc U and U-Zr Alloys: *Benjamin Beeler*[1]; David Andersson[2]; Yongfeng Zhang[1]; [1]Idaho National Laboratory; [2]Los Alamos National Laboratory

9:50 AM
Diffusion and Interaction of Prismatic Dislocation Loops in Stochastic Dislocation Dynamics: Yang Li[1]; *Max Boleininger*[2]; Christian Robertson[1]; Laurent Dupuy[1]; Sergei Dudarev[2]; [1]DEN-Service de Recherches Métallurgiques Appliquées; [2]Culham Centre for Fusion Energy

10:10 AM Break

10:30 AM Invited
Development and Testing of Machine Learning Interatomic Potentials for Radiation Damage Calculations: *Kai Nordlund*[1]; Ali Hamedani[1]; Jesper Byggmästar[1]; Flyura Djurabekova[1]; [1]University of Helsinki

11:10 AM
Molecular Dynamics Simulations of Mixed Materials in Tungsten: *Mary Alice Cusentino*[1]; Mitchell Wood[1]; Aidan Thompson[1]; [1]Sandia

National Laboratories

11:30 AM
Plasticity of Zirconium Hydrides: an Edge and Screw Planar Discrete Dislocation Model: *Luca Reali*[1]; Daniel Balint[1]; Mark Wenman[1]; Adrian Sutton[1]; [1]Imperial College London

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Diffusion, Excitations and Rare Events I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Wednesday AM | February 26, 2020
33C | San Diego Convention Ctr

Session Chairs: Marco Bernardi, California Institute of Technology; Chelsey Hargather, New Mexico Institute of Mining and Technology

8:30 AM Invited
Where do Thermodynamics and Transport Kinetics Meet?: *Zi-Kui Liu*[1]; Yi Wang[1]; Irina Belova[2]; Graeme Murch[2]; [1]Pennsylvania State University; [2]University of Newcastle

9:00 AM
Free Energy Calculation of Mechanically Unstable but Dynamically Stabilized Phases: *Sara Kadkhodaei*[1]; Axel van de Walle[2]; [1]University of Illinois at Chicago; [2]Brown University

9:20 AM
A First-principles Investigation of the Importance of Various Calculation Parameters on Self-diffusion Coefficient Calculations in FCC Metals: John O'Connell[1]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology

9:40 AM Invited
Features of Defects Diffusion in Concentrated Alloys: Percolation, Sluggish and Chemically Biased Atomic Transport: *Osetskiy Yury*[1]; Alexander Barashev[2]; Laurent Béland[3]; Yanwen Zhang[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan; [3]Queen's University

10:10 AM Break

10:30 AM Invited
Advances in Computing Charge Carrier Dynamics and Electron Interactions from First Principles: *Marco Bernardi*[1]; [1]California Institute of Technology

11:00 AM
State-dependent Force Constants for Anharmonicity: *Jorge Munoz*[1]; [1]The University of Texas at El Paso

11:20 AM
The Temperature Dependence of Electron-phonon Interactions in Vanadium: *Brent Fultz*[1]; Fred Yang[1]; Olle Hellman[1]; [1]California Institute of Technology

11:40 AM
Thermal Properties of Disordered Alloys from Density Functional Theory Calculations: *Pavel Korzhavyi*[1]; [1]KTH Royal Institute of Technology, Stockholm, Sweden

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Cast Iron & Steel

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Wednesday AM | February 26, 2020
17B | San Diego Convention Ctr

Session Chairs: Charles Monroe, The University of Alabama at Birmingham; Simon Lekakh, Missoury University of Science and Technology

8:30 AM Invited
Micro CT 3D Analysis of Structure and Micro-porosity in Spherical Graphite Cast Iron: *Simon Lekakh*[1]; [1]Missouri University of Science and Technology

9:00 AM
In-situ Synchrotron Examination of the Evolution and Transition of Nodular, Compacted and Laminar Graphite During Solidification of Cast Iron: Chaoling Xu[1]; Mohammed Azeem[2]; *Tim Wigger*[3]; Tito Andriollo[1]; Samuel Clark[3]; Zhixuan Gong[2]; Zhixuan Gong[3]; Robert Atwood[4]; Peter Lee[3]; Niels Tiedje[1]; [1]Technical University of Denmark; [2]University of Leicester; [3]University College London; [4]Diamond Light Source

9:20 AM
The 3D Correlation of Si Segregation to Nodules Size, Nodules Spatial Distribution and Local Mechanical Strain in Ductile Cast Iron: Chaoling Xu[1]; *Tito Andriollo*[1]; Yubin Zhang[1]; Fengxiang Lin[2]; Juan-Carlos Hernando[2]; Jesper Hattel[1]; Niels Tiedje[1]; [1]Technical University of Denmark; [2]Jönköping University

9:40 AM
Influence of Composition on the Solidification and Weldability of Cast Austenitic Stainless Steels: *Sean Orzolek*[1]; John DuPont[1]; [1]Lehigh University

10:00 AM Break

10:20 AM
Characterization of Cast Iron Alloys Used in the Automotive Industry: *Cem Uluc*[1]; Ozen Gursoy[2]; Ozkan Kesen[2]; Derya Dispinar[3]; Nuri Solak[2]; [1]Erkunt Dokum; [2]ITU; [3]Istanbul University

10:40 AM
Study on the Dendrite Arm Spacing of S50C Steel Produced by CSP: *Kai Liu*[1]; Shusen Cheng[1]; Jipeng Li[1]; Yongping Feng[2]; Ming Zou[3]; Jian Xie[2]; [1]School of Metallurgical and Ecological Engineering, University of Science and Te; [2]Gansu Jiu Steel Group Hongxing Iron

& Steel Co.,Ltd; [3]Gansu Jiu Steel Group Hongxing Iron & Steel Co.

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Grain Boundary-Dislocation Interactions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Wednesday AM | February 26, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Atomistic Simulations of Grain Boundary-dislocation Interactions in Mg and Mg Alloys: *Liang Qi*[1]; Chaoming Yang[1]; Mingfei Zhang[1]; Yong-Jie Hu[1]; [1]University of Michigan

8:50 AM
Inhibiting Twin Transfer in Magnesium Alloys with Grain Boundary Particles: *Benjamin Anthony*[1]; Brandon Leu[2]; Wai Tse[3]; Zhenhuan Wang[4]; Irene Beyerlein[2]; Victoria Miller[1]; [1]University of Florida; [2]University of California Santa Barbara; [3]University of New South Wales Sydney; [4]North Carolina State University

9:10 AM
Manipulating Twin Morphology in Mg Alloys by Varying Solute Concentration: *Yang Hu*[1]; Vladyslav Turlo[1]; Irene Beyerlein[2]; Subhash Mahajan[3]; Enrique Lavernia[1]; Julie Schoenung[1]; Timothy Rupert[1]; [1]University of California, Irvine; [2]University of California, Santa Barbara; [3]University of California, Davis

9:30 AM
Estimation of Misfit Dislocation Density in Hexagonal Titanium Using Microbeam X-Ray Diffraction and the Frank Bilby Equation: *Harsha Phukan*[1]; Thomas Bieler[1]; Chen Zhang[2]; Ruqing Xu[3]; Philip Eisenlohr[1]; Martin Crimp[1]; Carl Boehlert[1]; [1]Michigan State University; [2]Carnegie Mellon University; [3]Argonne National Laboratory

9:50 AM Invited
Interactions Between Slip Bands and Grain Boundaries in Ti-6Al-4V: *Samuel Hemery*[1]; Christophe Tromas[2]; Patrick Villechaise[1]; [1]Institut Pprime - ISAE-ENSMA; [2]Institut Pprime - Uinversité de Poitiers

10:10 AM Break

10:30 AM Invited
Grain Boundary Sliding and Slip Transmission in High Purity Aluminum: Marissa Linne[1]; Thomas Bieler[2]; *Samantha Daly*[3]; [1]University of Michigan; [2]Michigan State University; [3]University of California, Santa Barbara

10:50 AM Invited
On the Effect of Slip Transfer and Grain Boundary Sliding on the Deformation Mechanisms of FCC Polycrystals: Eugenia Nieto[1]; Sarra Haouala[2]; Alberto Orozco-Caballero[3]; Thomas Bieler[4]; *Javier Llorca*[1]; [1]IMDEA Materials Institute & Technical University of Madrid; [2]IMDEA Materials Institute; [3]Technical University of Madrid; [4]Michigan State University

11:10 AM
Fatigue-induced Slip from Type II Twin Boundary Motion of Shape Memory Alloys: *Ahmedsameerkhan Mohammed*[1]; Huseyin Sehitoglu[1]; [1]University of Illinois Urbana-Champaign

11:30 AM
Quantifying the Plastic Deformation Behavior of Grain Boundaries in Additive Manufactured Ta: *Nan Li*[1]; jordan Weaver[2]; Yuchi Cui[3]; David Jones[1]; Nathan Mara[4]; Saryu Fensin[1]; Curt Bronkhorst[5]; Amit Misra[3]; Rusty Gray[1]; [1]Los Alamos National Laboratory; [2]National Institute of Standards and Technology; [3]University of Michigan, Ann Arbor; [4]University of Minnesota-Twin Cities; [5]University of Wisconsin - Madison

11:50 AM
Investigation of Dislocation Interactions in a Bicrystalline Micropillar Through an Atomistically-informed Discrete Dislocation Dynamics Model: *Nicole Aragon*[1]; Jamie Gravell[1]; Ill Ryu[1]; [1]University of Texas at Dallas

LIGHT METALS

Electrode Technology for Aluminum Production — Anode Assembly and Cathodes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Duygu Kocaefe, University of Quebec at Chicoutimi

Wednesday AM | February 26, 2020
3 | San Diego Convention Ctr

Session Chair: Houshang Darvishi Alamdari, Laval University

8:30 AM Introductory Comments

8:40 AM
Energy Saving in Hall-Héroult Cell by Optimization of Anode Assembly Design: *AbdulMageed Shamroukh*[1]; S. A. Salman[2]; William Berends[3]; W. Abdel-Fadeel[4]; G.T Abdel-Jaber[5]; [1]Aluminium compny of Egypt (Egyptalum); [2]Mining and Metallurgy Engineering Division, Faculty of Engineering, Al-Azhar University, Cairo, Egypt; [3]AluCellTech Inc. Canada; [4]Faculty of Energy Engineering, Aswan, Egypt; [5]Faculty of Engineering, Mechanical Design and Production Dept. South Valley University, Egypt

9:05 AM
High Temperature Creep Behaviour of Carbon-based Cathode Material for Aluminum Electrolysis: *Wei Wang*[1]; Kai Sun[1]; [1]Henan University of Science and Technology

9:30 AM
Redesigning of Current Carrying Conductor - The Energy Reduction Initiative in Low Amperage Hall-Héroult Cell: Ved Prakash Rai[1]; *Vibhav Upadhyay*[1]; [1]Hindalco Industries Limited

9:55 AM Break

10:15 AM
Ready-to-use Cathodes for the Hall-Héroult Process: *Markus Pfeffer*[1]; Louis Bugnion[2]; Laure Von Kaenel[2]; Oscar Vera Garcia[1]; [1]COBEX GmbH; [2]NOVALUM

10:40 AM
Mechanism Understanding of Sodium Penetration into Anthracite Cathodes: A Perspective from Diffusion Coefficients: *Jiaqi Li*[1]; Hongliang Zhang[1]; Jingkun Wang[1]; Yunrui Wang[1]; [1]Central South University

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Innovative Techniques in Corrosion Research

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Wednesday AM | February 26, 2020
Theater A-10 | San Diego Convention Ctr

Session Chairs: Khalid Hattar, Sandia National Laboratories; Nikhilesh Chawla, Arizona State University

8:30 AM Invited
History and Future of In-situ Transmission Electron Microscopy Corrosion Experiments: *Khalid Hattar*[1]; [1]Sandia National Laboratories

9:10 AM Invited
Relating Corrosion Susceptibility to Microstructure via Multiscale Electron Microscopy: *Josh Kacher*[1]; Jordan Key[1]; Jahnavi Desai[1]; [1]Georgia Institute of Technology

9:50 AM
In situ Study of Room Temperature Hydride Formation in Ti6Al4V and Its Effect on Damage Mechanisms: *Jinwoo Kim*[1]; C. Cem Tasan[1]; [1]Massachusetts Institute of Technology

10:10 AM Break

10:30 AM Invited
Probing Mechanisms of Corrosion Damage in Aluminum Alloys by Correlative Tomography and Microscopy: *Nikhilesh Chawla*[1]; [1]Arizona State University

11:10 AM
Quantifying Environmentally-assisted Cracking In-situ in Ar and s-CO2 Environments: *Andrew Brittan*[1]; Camila Toledo Torres[1]; Peter Beck[1]; Lucas Teeter[1]; Samuel Briggs[1]; Guillaume Mignot[1]; Sebastien Teysseyre[2]; Julie Tucker[1]; [1]Oregon State University; [2]Canadian Nuclear Laboratories

11:30 AM
Combinatorial Studies of Stress Corrosion Sensitivity of Alloy Films: *Kewei Gao*[1]; Youpeng Song[1]; [1]Beijing University of Science and Technology

MECHANICS & STRUCTURAL RELIABILITY

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multiscale Modeling Approaches to Improve Fatigue Predictions

Sponsored by: TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University

Wednesday AM | February 26, 2020
11A | San Diego Convention Ctr

Session Chair: Jean-Briac le Graverend, Texas A&M University

8:30 AM Invited
Advances in Modeling of Fatigue Thresholds: *Huseyin Sehitoglu*[1]; [1]University of Illinois

8:50 AM
3D Discrete Dislocation Dynamic Modeling on Cyclic Behavior of Cu: *Fanshi Meng*[1]; Marc Fivel[1]; Emilie Ferrie[1]; Christophe Depres[2]; [1]University Grenoble Alpes, CNRS, Grenoble INP, SIMaP; [2]Laboratory SYMME, Université de Savoie, Annecy-Le-Vieux Cedex

9:10 AM
Atomistic and Dislocation Dynamics Simulations of The Interaction of Dislocations with Twin Boundaries in FCC Alloys: *Satish Rao*[1]; Maxime Dupraz[2]; Jafaar El-Awady[3]; Christopher Woodward[4]; [1]Ues Inc.; [2]European Synchrotron Radiation Facility; [3]Johns Hopkins University; [4]Air Force Research Laboratory

9:30 AM
Effects of Surface Roughness on Microstructure-sensitive Computations of Fatigue Crack Formation Driving Force in Duplex Ti-6Al-4V and Al 7075-T6: *Krzysztof Stopka*[1]; David McDowell[1]; [1]Georgia Institute of Technology

9:50 AM
Exploring the Fundamental Role of Dislocation-twin Boundary Interactions in Fatigue: *Orcun Koray Celebi*[1]; Ahmed Sameer Khan Mohammed[1]; Francisco Andrade Chavez[1]; Jessica Anne Krogstad[1]; Huseyin Sehitoglu[1]; [1]University of Illinois at Urbana Champaign

10:10 AM Break

10:30 AM
Micromechanical Modeling of Copper under Very High Cycle Fatigue: *Vahid Tari*[1]; Michael Fitzka[2]; Herwig Mayer[2]; Jason W. Carroll[1]; [1]Eaton Corporation Research & Technology; [2]University of Natural Resource and Life Science

10:50 AM
Micromechanics-based Effect of Defects Models for Ellipsoidal Anomalies: *James Sobotka*[1]; R. Craig McClung[1]; Michael Enright[1]; [1]Southwest Research Institute

11:10 AM
The Dislocation Configurational Energy for the Prediction of Fatigue Crack Nucleation: An Integrated Experimental and Computational Study: *Nikoletta Prastiti*[1]; Fionn Dunne[1]; Daniel Balint[1]; [1]Imperial College London

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Translating Innovation into Pioneering Technologies V

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Wednesday AM | February 26, 2020
Point Loma | Marriott Marquis Hotel

Session Chairs: Yong Lin Kong, University of Utah; Nasrin Hooshmand, Georgia Tech

8:30 AM Invited
From Functional Nanomeshes to Advanced Soft Microsystems: *Hui Fang*[1]; Kyung Jin Seo[1]; [1]Northeastern University

8:50 AM Invited
Metallic Nanoparticle Assemblies for Tunable Nanoscale Sensors: *Nasrin Hooshmand*[1]; [1]Georgia Institute of Technology

9:10 AM Invited
Capillary Crumpling of 2D Nanomaterials Toward 3D Architected Structures: *Baoxing Xu*[1]; [1]University of Virginia

9:30 AM Invited
Materials and Mechanics for 3D Stretchable Structures and Electronics: *Xueju Wang*[1]; [1]University of Missouri-Columbia

9:50 AM Invited
Developing Nanomaterials for Separations That Improve Biomass Processing to Biofuels/Chemicals: *Michael Hu*[1]; [1]Oak Ridge National Laboratory

10:10 AM Break

10:30 AM Invited
Vapor-phase Infiltration Synthesis of Organic-inorganic Hybrid Nanocomposite Resists for Next Generation Lithography: Nikhil Tiwale[1]; Ashwanth Subramanian[2]; Kim Kisslinger[1]; Ming Lu[1]; Jiyoung Kim[3]; Aaron Stein[1]; *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory; [2]Stony Brook University; [3]University of Texas at Dallas

10:50 AM
Engineering Mesoporous Silica for Superior Optical and Thermal Properties: *Danielle Butts*[1]; Patricia McNeil[1]; Sarah Tolbert[2]; Yongjie Hu[3]; Laurent Pilon[3]; Bruce Dunn[1]; [1]Department of Materials Science and Engineering, University of California, Los Angeles; [2]Department of Chemistry and Biochemistry, University of California, Los Angeles; [3]Department of Mechanical and Aerospace Engineering, University of California, Los Angeles

11:10 AM Invited
Flash NanoPrecipitation as a Continuous and Scalable Platform for the Production of Functional Nanocolloids: *Jie Feng*[1]; [1]University of Illinois at Urbana-Champaign

11:30 AM Invited
In-situ Grown Metal Nanoparticle Catalysts: Properties and Control: *Tae-Sik Oh*[1]; [1]Auburn University

ADVANCED MATERIALS

High Entropy Alloys VIII — Alloy Development and Applications

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM | February 26, 2020
Mission Hills | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
High-throughput Experiments for Structural Materials – a Current Status: *Daniel Miracle*[1]; [1]Air Force Research Laboratory

8:50 AM Invited
Multicomponent and High-entropy Cantor Alloys: *Brian Cantor*[1]; [1]University of Bradford

9:10 AM Invited
How High are the Entropies of High Entropy Alloys?: Kaituo Huo[1]; Qikai Li[1]; *Mo Li*[2]; [1]University of Science and Technology Beijing; [2]Georgia Institute of Technology; University of Science and Technology Beijing,

9:30 AM Invited
High Entropy Alloys for Magnetocaloric Effect Applications: *Michael McHenry*[1]; Alice Perrin[1]; [1]Carnegie Mellon University

9:50 AM
Decoding Early Candidacy of High Entropy Alloys for Nuclear Application using the Advanced Test Reactor through Predictive Methods: *Geoffery Beausoleil*[1]; Jeffrey Aguiar[1]; Seongtae Kwon[1]; Eric Eyerman[2]; [1]Idaho National Laboratory; [2]California Nanotechnologies

10:10 AM Break

10:30 AM Invited
Latest Developments in High Entropy Brasses & Bronzes: *Kevin Laws*[1]; Peter Nicholson[1]; Patrick Conway[2]; David Miskovic[1]; Lori Bassman[3]; Warren McKenzie[4]; [1]University of New South Wales; [2]Jönköping University; [3]Harvey Mudd College; [4]Advanced Alloy Holdings

10:50 AM
Design of High-strength and Ductile High-entropy Steels: *Zhangwei Wang*[1]; Wenjun Lu[1]; Huan Zhao[1]; Dirk Ponge[1]; Dierk Raabe[1]; Zhiming Li[1]; [1]Max-Planck-Institut für Eisenforschung

11:10 AM Invited
High-Entropy Ceramics: Selected Recent Studies and Future Opportunities: *Jian Luo*[1]; [1]University of California, San Diego

11:30 AM
Designing Ductile Refractory High-entropy Alloys Guided by Natural Mixing: *Shaolou Wei*[1]; Sang Jun Kim[2]; Yongjie Zhang[3]; Goro Miyamoto[3]; Tadashi Furuhara[3]; Eun Soo Park[2]; Cemal Tasan[1]; [1]Massachusetts Institute of Technology; [2]Seoul National University; [3]Tohoku University

11:50 AM
Nanomolding Far and Close to Equilibrium: *Naijia Liu*[1]; Sungwoo Sohn[1]; Jan Schroers[1]; Arindam Raj[1]; Guannan Liu[1]; [1]Yale University

12:10 PM Invited
Phenomenological Approach to Multi-principal-element Structural Materials: *Joseph Poon*[1]; Qi Jie[1]; John Scully[1]; Sean Agnew[1]; [1]University of Virginia

MATERIALS DESIGN

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering — Building CALPHAD Databases: Essential Experiments

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Michael Gao, National Energy Technology Laboratory; Wei Xiong, University of Pittsburgh

Wednesday AM | February 26, 2020
32A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Improvement of a CALPHAD Database for the Development of Next Generation TiAl Alloys by Targeted Key Experiments on High-temperature Phase Equilibria – The EU Project Advance: *Frank Stein*[1]; Benedikt Distl[1]; Zahra Kahrobaee[1]; Martin Palm[1]; Katja Hauschildt[2]; Marcus Rackel[2]; Florian Pyczak[2]; Svea Mayer[3]; Yang Yang[4]; Hai-Lin Chen[4]; Anders Engström[4]; [1]Max-Planck-Institut fuer Eisenforschung; [2]Helmholtz-Zentrum Geesthacht; [3]Montanuniversität Leoben; [4]Thermo-Calc Software AB

9:10 AM Invited
Measurements of Thermophysical Properties of Metals and Alloys as Input for Computational Thermodynamics: *Erhard Kaschnitz*[1]; [1]Austrian Foundry Research Institute

9:50 AM Break

10:20 AM Invited
The Application of Metastable Equilibria in the Analysis of Transformation Behavior: *John Perepezko*[1]; [1]University of Wisconsin-Madison

11:00 AM Invited
Selected Observations of Microstructural Development in Additively Manufactured Metallic Alloys: *Yongho Sohn*[1]; Le Zhou[1]; [1]University of Central Florida

MATERIALS DESIGN

ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology; Raymundo Arroyave, Texas A&M University

Wednesday AM | February 26, 2020
30D | San Diego Convention Ctr

Session Chairs: Raymundo Arroyave, Texas A&M; James Saal, Citrine Informatics

8:30 AM Invited
The MGI and ICME: *James Warren*[1]; [1]National Institute of Standards and Technology

9:10 AM Invited
Polymer Informatics: Current Status & Critical Next Steps: Rampi Ramprasad[1]; *Chiho Kim*; [1]Georgia Institute of Technology

9:50 AM
Artificial Intelligence for Material and Process Design: *Marius Stan*[1]; Noah Paulson[1]; Elise Jennings[1]; Joseph Libera[1]; Richard Otis[2]; Brandon Bocklund[3]; Aaron Kusne[4]; James Warren[4]; Zi-Kui Liu[3]; Gregory Olson[5]; [1]Argonne National Laboratory; [2]Jet Propulsion Laboratory; [3]Pennsylvania State University; [4]National Institute of Standards and Technology; [5]QuesTek Innovations LLC

10:10 AM Break

10:30 AM Invited
Gaps, Limitations, and Pitfalls of Materials Informatics: *Taylor Sparks*[1]; [1]University of Utah

11:10 AM Invited
View on Data Ecosystem of Materials: *Zi-Kui Liu*[1]; [1]Pennsylvania State University

LIGHT METALS

Magnesium Technology 2020 — Thermomechanical Processing

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Wednesday AM | February 26, 2020
6C | San Diego Convention Ctr

Session Chairs: Christopher Barrett, Mississippi State University; Vineet Joshi, Pacific Northwest National Laboratory

8:30 AM Invited
Deformation Driven Precipitation in Binary Mg Alloys: *Timothy Weihs*[1]; Suhas Eswarappa Prameela[1]; [1]Johns Hopkins University

9:00 AM
Effect of Second Phase Particle Size on the Recrystallized Microstructure of Mg-Al Alloys Following ECAE Processing: *Suhas Eswarappa Prameela*[1]; Peng Yi[1]; Vance Liu[1]; Beatriz Medeiros[1]; Laszlo Kecskes[1]; Michael Falk[1]; Timothy Weihs[1]; [1]Johns Hopkins University

9:20 AM
Relating Texture and Thermomechanical Processing Variables in Mg-Zn-Ca Alloys: *Tracy Berman*[1]; John Allison[1]; [1]University of Michigan

9:40 AM
Variation of Extrusion Process Parameter for the Magnesium Alloy ME21: *Gerrit Kurz*[1]; Maria Nienaber[1]; Jan Bohlen[1]; Dietmar Letzig[1]; Kainer Karl Ulrich[1]; [1]Magic-Magnesium Innovation Centre

10:00 AM Break

10:20 AM Invited
Fundamental Deformation Mechanisms During Solid Phase Processing of Mg Alloys: *Suveen Mathaudhu*[1]; [1]University of California, Riverside

10:50 AM
Asymmetric Rolling of TZ73 Magnesium Alloy to Improve Its Ductility: Krishna Verma[1]; Satyam Suwas[1]; *Subodh Kumar*[1]; [1]Indian Institute of Science

11:10 AM
Friction Stir Processing of Magnesium Alloy with Spiral Tool Path Strategy: *Abhishek Kumar*[1]; Aarush Sood[1]; Nikhil Gotawala[1]; Sushil Mishra[1]; Amber Shrivastava[1]; [1]Indian Institute of Technology Bombay

11:30 AM Invited
Joining Magnesium and Polymer by Friction Stir Technologies: Tianhao Wang[1]; Scott Whalen[1]; Piyush Upadhyay[1]; *Keerti Kappagantula*[1]; [1]Pacific Northwest National Laboratory

---

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Corrosion I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Stephen Raiman, Oak Ridge National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory

Wednesday AM | February 26, 2020
Theater A-6 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
The Department of Energy Molten Salt Reactor Development Overview: *Lou Qualls*[1]; [1]Oak Ridge National Laboratory

9:00 AM
Investigation of the Mechanism Behind Proton Irradiation Decelerated Corrosion in Molten Fluorides: *Weiyue Zhou*[1]; Yang Yang[2]; Lingfeng He[3]; Andrew Minor[2]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Lawrence Berkeley National Laboratory; [3]Idaho National Laboratory

9:20 AM
Effect of Salt Additives and Impurities on Flowing Commercial Chloride Salt Compatibility: *Bruce Pint*[1]; Dino Sulejmanovic[1]; J Kurley[1]; [1]Oak Ridge National Laboratory

9:40 AM
Effects of Ionizing Radiation on Molten Chloride Salts.: Ruchi Gakhar[1]; Gregory Horne[1]; Jay LaVerne[2]; James Wishart[3]; *Simon Pimblott*[1]; [1]Idaho National Laboratory; [2]University of Notre Dame; [3]Brookhaven National Laboratory

10:00 AM
Europium Induced Alloy Corrosion and Cracking in Molten Chloride Salt: Shaoqiang Guo[1]; *Jinsuo Zhang*[1]; [1]Virginia Polytechnic Institute and State University

10:20 AM Break

10:40 AM
Salt Processing for Corrosion Mitigation in Concentrated Solar Power Systems: *Jicheng Guo*[1]; Nathaniel Hoyt[1]; Mark Williamson[1]; [1]Argonne National Laboratory

11:00 AM
Performance of Corrosion Resistant Claddings on 316H Stainless Steel in Molten Fluoride Salt: *Adrien Couet*[1]; William Doniger[1]; Cody Falconer[1]; Evan Buxton[1]; Mohamed Elbakhshwan[1]; Chuan Zhang[2]; Cem Topbasi[3]; Kumar Sridharan[1]; [1]University of Wisconsin-Madison; [2]Computherm, LLC; [3]Electric Power Research Institute

11:20 AM
Molten Chloride Salt Corrosion in Ni based Vs Fe based Alloys: *Brendan Dsouza*[1]; Weiqian Zhuo[1]; Jinsuo Zhang[1]; [1]Virginia Polytechnic Institute and State University

11:40 AM
Controlling Alloy Corrosion in Molten Chloride Salts: What Matters and What Doesn't?: *Stephen Raiman*[1]; Dino Sulejmanovic[1]; Bruce Pint[1]; Jake McMurray[1]; Richard Mayes[1]; Kristian Myhre[1]; Matt Kurley[1]; William Ponder[2]; Jacob Startt[3]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]Georgia Institute of Technology

---

MATERIALS DESIGN

Materials Design Approaches and Experiences V — High Entropy Alloys and High Temperature Alloys

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Akane Suzuki, GE Research; Ji-Cheng Zhao, University of Maryland; Michael Fahrmann, Haynes International; Qiang Feng, University of Science and Technology Beijing; Michael Titus, Purdue University

Wednesday AM | February 26, 2020
33A | San Diego Convention Ctr

Session Chairs: Martin Heilmaier, Karlsruhe Institute of Technology; Akane Suzuki, GE Research

---

8:30 AM Invited
Design Principles for Complex, Concentrated Alloys (CCAs): *Daniel Miracle*[1]; [1]Air Force Research Laboratory

9:00 AM Invited
Oxidation Resistant Refractory Metal High Entropy Alloys for Ultrahigh Temperature Structural Applications: Bronislava Gorr[1]; Steven Schellert[1]; Franz Mueller[1]; Stephan Laube[2]; Hans Chen[2]; Alexander Kauffmann[2]; Hans-Juergen Christ[1]; *Martin Heilmaier*[2]; [1]University of Siegen; [2]KIT Karlsruhe

9:30 AM Invited
Materials Parameters in Designing FCC High-entropy Alloys: *Haruyuki Inui*[1]; Koudai Niitsu[1]; Kyosuke Kishida[1]; Easo George[2]; [1]Kyoto University; [2]University of Tennessee

10:00 AM
Design of Ni-Co-Ru Multi-principal Elements Alloys: *Marie-Agathe Charpagne*[1]; K. Vamsi[1]; Carolina Frey[1]; Yolita Eggeler[1]; Sean Murray[1]; Tresa Pollock[1]; [1]University of California, Santa Barbara

10:20 AM Break

10:40 AM Invited
Development of HAYNES® 233® Alloy: *Lee Pike*[1]; S. Srivastava[1]; [1]Haynes International

11:10 AM
Accelerated Design of High-temperature Alloys with Data Analytics and Supercomputing: *Jian Peng*[1]; Andrew Williams[2]; Sangkeun Lee[1]; Yukinori Yamamoto[1]; J. Haynes[1]; Dongwon Shin[1]; [1]Oak Ridge National Laboratory; [2]Cornell University

11:30 AM
Materials Discovery and Design using Heritage Data: *Amit Verma*[1]; Jeffrey Hawk[2]; Vyacheslav Romanov[3]; Jennifer Carter[1]; [1]Case Western Reserve University; [2]NETL, Albany; [3]NETL, Pittsburgh

11:50 AM
Application of Computational Tools in Designing Ni-base Single-crystal Superalloys: *Akane Suzuki*[1]; Chen Shen[1]; Natarajan Chennimalai Kumar[1]; [1]GE Research

MATERIALS PROCESSING

Materials Processing Fundamentals — Thermomechanical Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Metal; Sam Wagstaff, Novelis Inc.; Antoine Allanore, Massachusetts Institute of Technology; Fiseha Tesfaye, Abo Akademi University

Wednesday AM | February 26, 2020
13 | San Diego Convention Ctr

Session Chairs: Yunbo Wang, Caterpillar Inc.; Samuel Wagstaff, Novelis Inc.

8:30 AM
The Effect of Thermomechanical Processing on the Microstructural Evolution of Nickel-based Alloy 625: *Christopher Martin*[1]; Eric Palmiere[2]; Andrew Barrow[3]; Jason Swan[3]; Grace Burke[1]; [1]The University of Manchester; [2]The University of Sheffield; [3]Rolls-Royce

8:50 AM
Observation of Recrystallization Behavior of Nb-microalloyed Wide Flange Beams during Hot Rolling: *Bon Seung Koo*[1]; Jae Chang Song[1]; [1]Hyundai Steel

9:10 AM
The Impact of Inclusions on the Formability of Multiphase Hot-rolled Advanced High Strength Steels: *Samaneh Alibeigi*[1]; Emmanuel Lucas[1]; [1]Global R&D, ArcelorMittal Maizières-Les-Metz, FRANCE

9:30 AM
Effects of Heat Treatment Method on Microstructure and Mechanical Properties of Internal Crack Healing in SA 508-3 Steel: *Yao Qiu*[1]; Ruishan Xin[2]; Jianbin Luo[1]; Qingxian Ma[1]; [1]Tsinghua University; [2]HBIS Group Technology Research Institute

9:50 AM
Hot Deformation Behavior and Processing Maps of 9Cr1Mo Rotor Steel: *Sumit Kumar*[1]; Sumeer Nath[1]; [1]IIT Roorkee

10:10 AM Break

10:30 AM
Coarsening of Ferrite Lamella in Heavily Cold Drawn Pearlitic Steel Wire: *Feng Fang*[1]; Lichu Zhou[1]; Jianku Shang[2]; Jianqing Jiang[1]; [1]Southeast University; [2]University of Illinois at Urbana-Champaign

10:50 AM
The Effects of Press Ram Vibrations on the Product Quality: *Oliver Commichau*[1]; Bernd-Arno Behrens[1]; Richard Krimm[1]; [1]Institute of Forming Technology and Machines

11:10 AM
Teaching Metal-forming Processes Using a Laboratory Micro-extrusion Press: *Adi Benartzy*[1]; Snir Ben Ze'ev[1]; Nahum Frage[1]; [1]Ben Guriyon University

11:30 AM
Investigation and Numerical Modeling of Aluminum Alloys Depending on Different Thermomechanical Processes: *Bedirhan Guraydin*[1]; Metehan Dinçer[1]; Sadik Kaan Ipek[2]; Halenur Konbul[3]; Derya Dispinar[4]; Ahmet Karaaslan[1]; [1]YTU; [2]Teknik Alüminyum NPD (New Product Development) and Process Development Department ; [3]TEI; [4]ITU

MATERIALS PROCESSING

Materials Research in Reduced Gravity — Programmatics and Facility Status; Thermophysical Properties I

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Robert Hyers, University of Massachusetts; Douglas Matson, Tufts University; Michael Sansoucie, NASA MSFC; Shaun McFadden, Ulster University; Jonghyun Lee, Iowa State University; Wilhelmus Sillekens, European Space Agency; Takehiko Ishikawa, JAXA

Wednesday AM | February 26, 2020
18 | San Diego Convention Ctr

Session Chairs: Michael SanSoucie, NASA MSFC; Takehiko Ishikawa, JAXA

8:30 AM
Space for Science: ESA's Microgravity Research Programme on Materials Science: *Wilhelmus Sillekens*[1]; [1]European Space Agency

8:55 AM
Current and Future Experiment Capabilities On-board the ISS for Materials Sciences: *Wolfgang Soellner*[1]; Marc Haeming[1]; Winfried Aicher[1]; Michael Gehlen[1]; [1]Airbus Defence and Space

9:20 AM
Experiment Preparation and Operation of the Electromagnetic Levitator EML on the ISS: *Stephan Schneider*[1]; Mitja Beckers[1]; Angelika Diefenbach[2]; [1]DLR Institut für Materialphysik im Weltraum; [2]DLR MUSC

9:45 AM
Thermophysical Property Measurements of High Temperature Melts Using the Electrostatic Levitation Furnace in the ISS: *Takehiko Ishikawa*[1]; Chihiro Koyama[1]; Hideki Saruwatari[1]; Hirohisa Oda[1]; [1]JAXA

10:10 AM Break

10:40 AM
Surface Oscillation of Molten Oxides Under Microgravity Using Electrostatic Levitation Furnace in ISS: *Masahito Watanabe*[1]; [1]Gakushuin University

11:00 AM
Effects of Oxygen Partial Pressure on the Surface Tension of Liquid Aerospace Alloys: *Michael Sansoucie*[1]; Gwendolyn Bracker[2]; Elizabeth Hodges[2]; Madeline Scott[2]; Robert Hyers[2]; [1]NASA MSFC; [2]University of Massachusetts

11:20 AM
Thermophysical Properties of Bulk Metallic Glasses Measured in the Liquid Phase on Board the International Space Station: Markus Mohr[1]; Rainer Wunderlich[1]; *Hans Fecht*[1]; [1]Ulm University

11:40 AM
Modelling Liquid Droplet Oscillation and Laminar Damping in Reduced Gravity Conditions: *Valdis Bojarevics*[1]; [1]University of Greenwich

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — In-Situ Testing I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Wednesday AM | February 26, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Ben Beake, Micro Materials; Khalid Hattar, Sandia National Laboratories

8:30 AM
Ductile-to-Brittle Transition of Micron-sized Niobium at Cryogenic Temperature: *Gyuho Song*[1]; Seok-Woo Lee[1]; [1]University of Connecticut

8:50 AM
Nanomechanical Properties of Pristine and Heavy Ion Irradiated Nanocrystalline Tungsten: *Jonathan Gigax*[1]; Osman El-Atwani[1]; Matthew Chancey[1]; Jon Baldwin[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

9:10 AM
Exploring the Extremes of Mechanical Behavior Through In-situ Electron Microscopy: *Khalid Hattar*[1]; Christopher Barr[1]; Gowtham Jawaharram[2]; Nathan Heckman[1]; Brad Boyce[1]; Shen Dillon[2]; [1]Sandia National Laboratories; [2]Univeristy of Illinois

9:30 AM Invited
What Controls Damage Tolerance in Repetitive Nano- and Micro-scale Impact Testing of Thin Films?: *Ben Beake*[1]; Sam McMaster[2]; Luis Isern[3]; Tomasz Liskiewicz[4]; Jose Endrino[3]; [1]Micro Materials Ltd.; [2]University of Leeds; [3]Cranfield University; [4]Manchester Metropolitan University

10:10 AM Break

10:30 AM
Extending the Range of Constant Strain Rate Nanoindentation Testing: *Benoit Merle*[1]; George Pharr[2]; [1]University Erlangen-Nuremberg (FAU); [2]Texas A&M University

10:50 AM
Plasticity in Small-scale bcc Fe-based Materials: *Marta Pozuelo*[1]; Katherine Jiang[1]; Jaime Marian[1]; [1]University of California, Los Angeles

11:10 AM
Improving Ductility of Magnesium Through Reversible Phase Transformation in bcc Mg/Nb Nanolaminates: *Youxing Chen*[1]; Nan Li[2]; Satyesh Yadav[3]; Xiang-yang Liu[2]; Jian Wang[4]; Nathan Mara[5]; [1]University of North Carolina at Charlotte; [2]Los Alamos National Laboratory; [3]Indian Institute of Technology Madras; [4]University of Nebraska, Lincoln; [5]University of Minnesota, Twin Cities

11:30 AM
Recent Innovation in In-situ Extreme Mechanics at the Micro and Nanoscale: *Nicholas Randall*[1]; Damian Frey[1]; Jean-Marc Breguet[1]; Rajaprakash Ramachandramoorthy[2]; Jakob Schwiedrzik[2]; Johann Michler[2]; [1]Alemnis AG; [2]EMPA

MATERIALS DESIGN

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session III

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, MicroTesting Solutions; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Wednesday AM | February 26, 2020
32B | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Keynote
Microstructure-driven Mechanical Properties of Explosives Quantified with In-situ Tomography: *John Yeager*[1]; Brian Patterson[1]; Lindsey Kuettner[1]; Amanda Duque[1]; Virginia Manner[1]; Caitlin Woznick[1]; Darla Thompson[1]; David Walters[1]; [1]Los Alamos National Laboratory

9:10 AM Keynote
A Novel X-ray Diffraction Simulation Framework for Rapid Thermo-mechanical Processes: *Darren Pagan*[1]; Thien Phan[2]; Joel Bernier[3]; [1]Cornell High Energy Synchrotron Source; [2]NIST; [3]Lawrence Livermore National Laboratory

9:50 AM
Understanding Pseudomorphic bcc Mg Under Extreme Conditions of Pressure, Temperature and High Strain Rates: *Manish Jain*[1]; Rajaprakash Ramachandramoorthy[2]; Marko Knezevic[3]; Nenad Velisavljevic[4]; Nathan Mara[5]; Irene Beyerlein[6]; Johann Michler[2]; Siddhartha Pathak[1]; [1]University of Nevada Reno; [2]EMPA; [3]University of New Hampshire; [4]Argonne National Laboratory; [5]University of Minnesota, Minneapolis; [6]University of California, Santa Barbara

10:10 AM Break

10:30 AM
High Throughput Creep Data Acquisition by Cantilever Bending Coupled to Digital Image Correlation: Syed Jalali[1]; Praveen Kumar[1]; *Vikram Jayaram*[1]; [1]Indian Institute of Science

10:50 AM
Mixed-mode Fracture Behavior of Magnesium Alloys: *Vaishakh K V*[1]; Rajvardhan Vilasrao Sarnobat[1]; Narasimhan Ramarathinam[1]; Satyam Suwas[1]; [1]Indian Institute of Science

11:10 AM
Quantifying Deformation Mechanics of High Temperature Alloys using In-situ and Digital Imaging Correlation (DIC) Testing Techniques: *James Parkin*[1]; Soran Birosca[1]; Ross Buckingham[2]; [1]ISM; [2]Rolls-Royce

11:30 AM
Dislocation-grain Boundary Interaction Investigations Using In-situ DIC and EBSD: *Joshua Tsai*[1]; [1]Brigham Young University

---

MATERIALS DESIGN

Metastable Phases and Phase Equilibria: Towards Designing the Next Generation of Alloys — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Bij-Na Kim, Carpenter Additive; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama; Eric Lass, University of Tennessee, Knoxville; Mohsen Asle Zaeem, Colorado School of Mines; Mark Aindow, University of Connecticut; Peeyush Nandwana, Oak Ridge National Laboratory; Dinc Erdeniz, Marquette University; Andrew Bobel, General Motors

Wednesday AM | February 26, 2020
31A | San Diego Convention Ctr

Session Chairs: Bij-Na Kim, Carpenter Additive; Raj Banerjee, University of North Texas; Peeyush Nandwana, Oak Ridge National Laboratory

---

8:30 AM Keynote
New Strain-transformable Titanium Alloys Displaying Unprecedented Combination of Mechanical Properties: from Design Approaches to Deformation Mechanisms: *Frederic Prima*[1]; [1]Chimie ParisTech

9:10 AM Invited
Exploration of Nano-scaled Metastable Phases in Metastable Beta Titanium Alloys Using Advanced Electron Microscopy and Atom Probe Tomography: *Yufeng Zheng*[1]; Dong Wang[2]; Stoichko Antonov[3]; Dipankar Banerjee[4]; Rajarshi Banerjee[5]; Yunzhi Wang[6]; Hamish Fraser[6]; [1]University of Nevada, Reno; [2]Xi'an Jiaotong University; [3]University of Science and Technology Beijing; [4]Indian Institute of Science; [5]University of North Texas; [6]Ohio State University

9:40 AM
Tuning Strength in TRIP Titanium alloys: *Benjamin Ellyson*[1]; Amy Clarke[1]; Jonah Klemm-Toole[1]; Kester Clarke[1]; Yoafeng Guo[1]; [1]Colorado School of Mines

10:00 AM
Precipitation Kinetics and Mechanical Behavior of Oxygen-stabilized Metastable Beta Ti-Nb Alloys: *Kathleen Chou*[1]; Emmanuelle Marquis[1]; [1]University of Michigan

10:20 AM Break

10:40 AM
The Intrinsic Coupling Between Twinning Plasticity and Transformation Plasticity in Metastable ß Titanium Alloys: *Yipeng Gao*[1]; Yufeng Zheng[1]; Yunzhi Wang[1]; [1]The Ohio State University

11:00 AM
Towards Work-hardenability of Ti-6Al-4V Through a Quenching and Partitioning Approach: *Odeline Dumas*[1]; Benjamin Hary[1]; Guilhem Martin[2]; Fan Sun[3]; Charlotte de Formanoir[4]; Frédéric Prima[3]; Stéphane Godet[1]; [1]Université Libre de Bruxelles - 4MAT; [2]SIMaP - CNRS; [3]Chimie ParisTech-CNRS, Institut de Recherche de Chimie Paris, Université de recherche PSL; [4]KU Leuven, Department. of Mechanical Engineering

11:20 AM
Composition, Processing, and Property Relationships in Fe and Al Modified Ti-12Cr Alloys: *Joann Ballor*[1]; Elizabeth Kautz[2]; Bharat Gwalani[2]; Masahiko Ikeda[3]; Jane Howe[4]; Takeshi Sunaoshi[5]; Arun Devaraj[2]; Carl Boehlert[1]; [1]Michigan State University; [2]Pacific Northwest National Laboratory; [3]Kansai University; [4]Toronto University; [5]Hitachi

11:40 AM
Shape Memory Response of High Temperature NiTiHfPd: Soheil Saedi[1]; *Guher Pelin Toker*[2]; Ehsan Saghaian[2]; Dipak Banerjee[1]; Haluk Karaca[2]; [1]University of Arkansas Little Rock; [2]University of Kentucky

---

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Nanocomposites VI: Nanoscience and Nanotechnology in Advanced Composites — Processing and Fabrication of Nanocomposites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Manoj Gupta, National University of Singapore

Wednesday AM | February 26, 2020
Solana | Marriott Marquis Hotel

Session Chair: Tirumalai Srivatsan, The University of Akron

8:30 AM Invited
Processing, Properties and Potential Applications of Magnesium Alloy-based Nanocomposites: A Review: *Sravya Tekumalla*[1]; Manoj Gupta[1]; [1]Department of Mechanical Engineering

9:00 AM Invited
Nano Layer Surface Phase Change in Self Healing Materials: *Rahul Basu*[1]; [1]VTU

9:30 AM
Nanocomposites Fabricated from Alkaline and Zn-C Batteries: *Henry Colorado*[1]; Carlos Castaño Londoño[2]; Natalia Cardona Vivas[1]; [1]Universidad de Antioquia; [2]Virginia Commonwealth University

9:55 AM
Highly-porous Zn-C Sponges Made from Nanopowders of Recycled Batteries: Sajjad Ghobadi[1]; Henry Colorado[2]; *Carlos Castano Londono*[1]; [1]Virginia Commonwealth University; [2]Universidad de Antioquia

10:20 AM Break

10:40 AM
Nanoparticle-enabled Phase Modification (Nano-Treating) of CuZrSi Pseudo-binary Alloy: *Gongcheng Yao*[1]; Shuihang Pan[1]; Chezheng Cao[1]; Maximilian Sokoluk[1]; Xiaochun Li[1]; [1]University of California Los Angeles

11:05 AM
In-situ Mechanical Tests of Aluminum-carbon Nanotubes Composite Under Transmission Electron Microscopy: *Kangpyo So*[1]; Michael Short[1]; Ju Li[1]; Sidney Yip[1]; [1]Massachusetts Institute of Technology

11:30 AM
Nanolayered Metallic Glass-crystalline Composites with High Strength and Wear Resistance: *Sezer Ozerinc*[1]; [1]Middle East Technical University

11:55 AM
Facile Low-temperature Sintering of Nano-bio-ceramic Composite with 2D Reinforcement: Muhmood ul Hassan[1]; Ahmad Raza[1]; S.C. Yoo[1]; *Ho Jin Ryu*[1]; [1]Kaist

SPECIAL TOPICS

Nix Award and Lecture Symposium: Mechanistic Understanding of Mechanical Behavior Across Length Scales — Session I

Program Organizers: Michael Mills, The Ohio State University; Kevin Hemker, Johns Hopkins University

Wednesday AM | February 26, 2020
4 | San Diego Convention Ctr

Session Chair: Michael Mills, The Ohio State University

8:30 AM Keynote
Nix Award Lecture: Damage Tolerance in Materials: *Robert Ritchie*[1]; [1]University of California Berkeley and Lawrence Berkeley National Laboratory

9:30 AM Invited
Mechanical Properties of High Entropy Alloys: *Easo George*[1]; [1]Oak Ridge National Laboratory and University of Tennessee

10:00 AM Break

10:30 AM Invited
Hybrid Nanocomposites at the Extreme Limits of Molecular-scale Confinement: *Reinhold Dauskardt*[1]; [1]Stanford University and the Stanford School of Medicine

11:00 AM Invited
Amorphization: A New Dislocationless Deformation Mechanism?: *Marc Meyers*[1]; S Zhao[2]; Eric Hahn[1]; Boya Li[1]; Bruce Remington[3]; Chris Wehrenberg[3]; Hye-Sook Park[3]; [1]University of California San Diego; [2]Lawrence Berkeley National Laboratory; [3]Lawrence Livermore National Laboratory

11:30 AM Invited
Toughening and Energy Dissipation in Metamaterials: *Brad Boyce*[1]; K. Conway[1]; Ben White[1]; Anthony Garland[1]; [1]Sandia National Laboratories

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — By-product Recovery II

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday AM | February 26, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

11:00 AM
The Importance of Lead in the Supply Chain of Antimony: *Hilde Goovaerts*[1]; [1]Campine

11:20 AM
The Recovery of Pb and Zn in Antimony Smelting Slag: *Pengfei Xin*[1]; Junyan Wei[2]; Weiguo Wu[1]; Liang Xu[1]; Dailong Lan[2]; [1]China ENFI Engineering Corporation; [2]Guangxi Raw Antimony Rich Polytron Technologies Inc

11:40 AM
Studies on the Formation of Intermetallic Compound Layers in Co(W)-Zn Diffusion Couples: *Tamara Ebner*[1]; Nadine Körbler[1]; Stefan Luidold[1]; Christoph Czettl[2]; Christian Storf[2]; [1]CDL-TM Montanuniversitaet Leoben; [2]CERATIZIT Austria GmbH

12:00 PM
Effect of Oxidation of Zinc Powder on Purification of High-Cobalt and High-Germanium Zinc Sulfate Solutions: *Leixia Zheng*[1]; Zhiwei Peng[1]; Liancheng Wang[1]; Lei Yang[1]; Jie Wang[1]; Wenxing Shang[1]; Mingjun Rao[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Environmental & Safety Practices

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday AM | February 26, 2020
15B | San Diego Convention Ctr

Session Chair: To Be Announced

11:00 AM
ILTEC Technology – New Pathways Towards Safe and Effective Cooling: *Andreas Filzwieser*[1]; Martina Hanel[2]; Hans-Jörg Krassnig[3]; Rolf Degel[4]; Tim Lux[5]; Alexander Bergs[5]; [1]Mettop GmbH/PolyMet Solutions GmbH; [2]Mettop GmbH; [3]PolyMet Solutions GmbH; [4]SMS Group GmbH/PolyMet Solutions GmbH; [5]SMS Group GmbH

11:20 AM
CORE™ – Advances in Sulfuric Acid Technology: *Herbert Lee*[1]; Claudia Araya[1]; [1]Chemetics Inc.

11:40 AM
Review of Waste Water Treatment Technologies used in Lead Recycling: *James Dahlstrom*[1]; Joseph Grogan[1]; Benjamin Rodrigue[1]; [1]Gopher Resource

12:00 PM
Optimization of Arsenic Removal Process in Waste Acid from Zinc Smelting Plant Based on Orthogonal Experiment Experiment Experiment: Tianqi Liao[1]; *Yongguang Luo*[2]; Hongtao Qu[2]; Te Zhang[2]; Jing Li[1]; Yunhao Xi[1]; Jingtian Zou[3]; Libo Zhang[1]; Kaihui Cui[1]; [1]Kunming University of Science and Technology/National Local Joint Laboratory of Engineering Application of Microwave Energy and Equipment Technology/Key Laboratory of Unconventional Metallurgy, Ministry of Education; [2]Kunming University of Science and Technology/Yunnan Chihong Zn&Ge Co., Ltd; [3]Kunming University of Science and Technology;National Local Joint Laboratory of Engineering Application of Microwave Energy and Equipment Technology;Key Laboratory of Unconventional Metallurgy; Ministry of Education

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Lead and Zinc Sustainability and Social License: Plenary Session

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday AM | February 26, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Plenary
The Global Zinc Market - Facts, Forecasts and Fundamentals: *Paul White*[1]; [1]International Lead and Zinc Study Group

9:00 AM Plenary
Developing a Sustainable Global Lead Battery Value Chain: *Andy Bush*[1]; [1]International Lead Association

9:30 AM Plenary
Regional Changes in Refined Zinc Output and Demand: *Claire Hassall*[1]; [1]CHR Metals Ltd

10:00 AM Question and Answer Period

10:30 AM Break

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Mineral Processing

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday AM | February 26, 2020
14B | San Diego Convention Ctr

Session Chair: To Be Announced

11:00 AM
Recovery of Zinc From Oxide-sulphide Zinc Ore through Oxidation and Chelation: Kun Yang[1]; Likun Shuo[2]; Hongtao Qu[2]; Yongguang Luo[2]; *Libo Zhang*[1]; [1]Kunming University of Science and Technology/National Local Joint Laboratory of Engineering Application of Microwave Energy and Equipment Technology; [2]Kunming University of Science and Technology/Yunnan Chihong Zn&Ge CO., LTD

11:20 AM
A New Innovative Method of Flotation Separation for High Sulfur Lead–zinc Sulfide Ore: Changtao Wang[1]; Runqing Liu[1]; Wei Sun[1]; *Yuehua Hu*[1]; Zhangyuan Ni[1]; [1]Central South University

11:40 AM
Review on (bio)Hydrometallurgy of Sphalerite: Xiaoyu Meng[1]; *Xin Lv*[1]; [1]Central South University

12:00 PM
A Novel Collector 5-(butylthio)-1,3,4-thiadiazole-2-thiol: Synthesis and Improved Flotation of Galena and Sphalerite from Pyrite: Wanjia Zhang[1]; Zhiyong Gao[1]; *Yuehua Hu*[1]; Jian Cao[1]; Wei Sun[1]; [1]Central South University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Phase Transformations in Ferrous Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Wednesday AM | February 26, 2020
33B | San Diego Convention Ctr

Session Chairs: Hao Chen, Tsinghua University; Cong Wang, Northeastern University

8:30 AM
Coupled Grain Structure and Carbide Evolution during Rapid Thermal Cycling of an Fe-Cr-C Steel: *Bala Radhakrishnan*[1]; Younggil Song[1]; Gary Cola[2]; [1]Oak Ridge National Laboratory; [2]SFP Works, LLC

8:50 AM
Pearlite in Multicomponent Steels: Phenomenological Steady-state Modeling: *Jiayi Yan*[1]; John Ågren[1]; Johan Jeppsson[1]; [1]Thermo-Calc Software AB

9:10 AM
Novel Alloy Design Strategies for High Strength Car Body Parts Manufactured by Superplastic Forming: *Lukas Stemper*[1]; Paul Oberhauser[2]; Peter Uggowitzer[1]; Stefan Pogatscher[1]; [1]Montanuniversitaet Leoben; [2]AMAG Rolling GmbH

9:30 AM
Effect of Microstructural Evolution and Mechanical Properties on G115/Sanicro25 Dissimilar Steel Welded Joint under Different Aging Conditions: *Maohong Yang*[1]; Zheng Zhang[1]; Yanrong Liu[1]; [1]Beihang University

9:50 AM
Microstructural and Mechanical Characterization of Cast Austenitic Stainless Steel Alloyed with Si: *Prince Setia*[1]; R Sarvesha[1]; Aditya Gokhale[2]; Thomas Tharrian[3]; T Venkateswaran[3]; Sudhanshu Shekhar Singh[1]; Shashank Shekhar[1]; [1]Indian Institute of Technology Kanpur; [2]Indian Institute of Technology Delhi; [3]Indian Space Research Organization

10:10 AM Break

10:30 AM
Development of Single Phase Bimodal Microstructure in Bulk Ultrafine-grained Low Carbon Steel: *Raj Bahadur Singh*[1]; Rampada Manna[2]; N. K. Mukhopadhyay[2]; G V S Sastry[2]; [1]G H Raisoni Institute of Engineering and Management, Jalgaon Maharashtra, India; [2]IIT BHU Varanasi

10:50 AM
Rapid Solidification of Austenitic Stainless Steels by Splat Quenching
: *Sydney Morales*[1]; Zachary Hasenbusch[1]; Luke Brewer[1]; Laurentiu Nastac[1]; Andrew Deal[2]; Ben Brown[2]; [1]University of Alabama Tuscaloosa; [2]Kansas City National Security Campus

11:10 AM
Formation of Retained Delta-ferrite and Martensite in the Coarse Grained Heat-affected Zone of P91 Heat-resistant Steel: *Yang Shen*[1]; Cong Wang[1]; [1]Northeastern University

11:30 AM
Analysis by Dilatometry and Nanoindentation in an Experimental Medium-carbon Steel during the Martensite Isothermal Tempering: *Eliuth Barrera-Villatoro*[1]; Octavio Vázquez-Gómez[1]; Perla Díaz-Villaseñor[1]; Alexis Gallegos-Perez[1]; Héctor Vergara-Hernández[1]; Bernardo Campillo-Illanes[2]; [1]Tecnológico Nacional de México / I.T. Morelia; [2]Universidad Nacional Autónoma de México

ENERGY & ENVIRONMENT

Powder Materials for Energy Applications — Ceramic Powder Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday AM | February 26, 2020
17A | San Diego Convention Ctr

Session Chairs: Kathy Lu, Virginia Tech; Eugene Olevsky, San Diego State University

8:30 AM
Advanced Skutterudite-based Thermoelectric Unicouples by Near Net Shape Powder-based Fabrication for Future Space Power Applications: Michell Aranda[1]; *Sutinee Sujittosakul*[1]; George Nakatsukasa[1]; Vilupanur Ravi[2]; Ike Chi[1]; [1]Jet Propulsion Laboratory (NASA/JPL); [2]California State Polytechnic University, Pomona

8:50 AM Invited
Bulk Supercrystalline Nanocomposites with Enhanced Mechanical Properties for Multifunctional Applications: *Diletta Giuntini*[1]; Elisa Torresani[2]; Kyle Chan[3]; Lucien Saviot[4]; Büsra Bor[1]; Berta Domènech[1]; Malte Blankenburg[5]; Meir Shachar[3]; Martin Müller[5]; Eugene Olevsky[2]; Javier Garay[3]; Gerold Schneider[1]; [1]Hamburg University of Technology; [2]San Diego State University; [3]University of California San Diego; [4]Laboratoire Interciplinaire Carnot de Bourgnogne - Université de Bourgogne - Franche Comté; [5]Helmholtz-Zentrum Geesthacht

9:20 AM
Cubic Sub-micron $BiFeO_3$ Powders for Improved Electrical Properties: *Jenna Metera*[1]; Olivia Graeve[1]; [1]University of California, San Diego

9:40 AM
Energy Concentration Joining of Nuclear-grade SiC/SiC Composites for Next Generation Nuclear Reactors: *Geuntak Lee*[1]; Shirley Chan[1]; Eugene Olevsky[1]; [1]San Diego State University

10:00 AM
Fabrication of Complex Shape Components by Spark-plasma Sintering Utilizing 3D-printed Controllable Interface: *Elisa Torresani*[1]; Charles Maniere[2]; Eugene Olevsky[1]; [1]San Diego State University; [2]Laboratoire CRISMAT

10:20 AM Break

10:40 AM Invited
As-sintered Long Porous Inconel 625 Tubes for Hot Gas Filtration for the Production of High-purity Silicon: Qiang Bing Wang[1]; Hui Ping Tang[1]; *Ma Qian*[2]; [1]State Key Laboratory of Porous Metal Materials, Northwest Institute for Nonferrous Metal Research; [2]Royal Melbourne Institute of Technology

11:10 AM Invited
Synthesis, Sintering, and Electrochemical Properties of Lithium Conducting Garnets from Molten Salt Fluxes for All-Solid-State Lithium Batteries: Jon Weller[1]; *Candace Chan*[1]; [1]Arizona State University

11:40 AM
Superelastic Zirconia Powder for Shockwave Dissipation in Energy Infrastructure: *Hunter Rauch*[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute and State University

MATERIALS PROCESSING

Process Metallurgy and Electrochemistry of Molten Salts, Liquid Metal Batteries, and Extra-terrestrial Materials Processing: An EPD Symposium in Honor of Don Sadoway — Prof. Sadoway Honorary Session I

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Yasuhiro Fukunaka, JAXA/Waseda University

Wednesday AM | February 26, 2020
14A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM Invited
Better Living through Electrochemistry: A Career of Scientific Solutions and Pragmatism: *Luis Ortiz*[1]; [1]LAO Consulting

8:50 AM Invited
Electrolytic Metals/alloys for Liquid Metal Batteries: Xianyang Li[1]; *Huayi Yin*; [1]Northeastern University

9:10 AM Invited
Fluid Mechanics of Liquid Metal Batteries: Overview and Outlook: *Douglas Kelley*[1]; [1]University of Rochester

9:30 AM Invited
Liquid Metal Batteries: From Concept to Commercialization: *David Bradwell*[1]; [1]Ambri Inc.

9:50 AM Break

10:05 AM Invited
Know Your Audience: Four Decades of Educational Innovation: *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

10:20 AM Invited
Lithium Metal Battery for Future Energy Storage: *Y. Shirley Meng*[1]; [1]University of California, San Diego

10:40 AM Invited
Titanium Extraction from Industrial Raw Material to Metal through Carbothermic Reduction and Molten Salts Electrolysis: *Hongmin Zhu*[1]; Shuqiang Jiao[2]; Jun Zhu[2]; Jiusan Xiao[2]; [1]Thohoku University; [2]University of Science and Technology, Beijing

11:00 AM Invited
Study of Electrode Performance Improvement with Infiltration of Electronic and Mixed-conducting Nanoparticles Employing Electrochemical Impedance Spectroscopy and I-V Measurements: *Uday Pal*[1]; Paul Gasper[1]; Yanchen Lu[1]; Srikanth Gopalan[1]; Soumendra Basu[1]; [1]Boston University

11:20 AM Invited
Low Cost Aqueous Zn-based Batteries for Energy Storage: *Kai Jiang*[1]; Kangli Wang[1]; [1]Huazhong University of Science and Technology

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Wednesday AM | February 26, 2020
31B | San Diego Convention Ctr

Session Chairs: Noam Eliaz, Tel-Aviv University; Lorenzo Valdevit, University of California – Irvine

8:30 AM Invited
High-throughput Alloy Design of Advanced Materials Using Additive Manufacturing: *Dan Thoma*[1]; [1]University of Wisconsin, Madison

9:00 AM Invited
Compositional and Structural Evolution of Passivation Layers in Heat- and Humidity-treated Aluminum Powder for Cold Spray Applications: Cameron Crook[1]; Maryam Azar[1]; Diran Apelian[2]; Daniel Mumm[1]; *Lorenzo Valdevit*[1]; Jasper Zebulon Lienhard[3]; Christopher Schuh[3]; [1]University of California, Irvine; [2]University of California, Irvine; Worcester Polytechnic Institute; [3]Massachusetts Institute of Technology

9:30 AM Invited
Micro-structure and Mechanical Behavior of Metallic Parts Made using Powder Bed Process Additive Manufacturing: *Leila Ladani*[1]; [1]Arizona State University

10:00 AM Break

10:20 AM Invited
Formation of Non-Equilibrium Phases by Electrodeposition and a Novel Additive Manufacturing Process of Meniscus-confined Electrodeposition: *Noam Eliaz*[1]; [1]Tel-Aviv University

10:50 AM Invited
Microstructure-property Development During Directed Energy Deposition of Austenitic Stainless Steels: *Chris San Marchi*[1]; Thale Smith[2]; Josh Sugar[1]; Julie Schoenung[3]; [1]Sandia National Laboratories; [2]Nanocore 3D; [3]University of California, Irvine

11:20 AM
Microstructure of Additively Manufactured and Laser Melted 316L Stainless Steel: *Thomas Devine*[1]; Yoon Hwa[1]; Joshua Yee[2]; Nancy Yang[2]; [1]University of California; [2]Sandia National Laboratories

11:40 AM Invited
Research on Laser Additive Manufacturing Technology of TiC Particles Reinforced Inconel 718 Composites: *Chen Bingqing*[1]; [1]Beijing Institute of Aeronautical Materials

MATERIALS DESIGN

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin — Enhanced Properties via Thermomechanical Processing

Sponsored by: TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Ayman Salem, MRL Materials Resources LLC; Viola Acoff, University of Alabama; Nathan Levkulich, UES; Michael Glavicic, Rolls-Royce; Yufeng Zheng, University of Nevada, Reno; John Rotella, Purdue University

Wednesday AM | February 26, 2020
30E | San Diego Convention Ctr

Session Chairs: Rongpei Shi, Lawrence Livermore National Laboratory; Nathan Levkulich, UES

8:30 AM Invited
Engineered Residual Stress Optimization and Utilization: *David Furrer*[1]; Robert Goetz[1]; Jean Philippe Thomas[1]; Vasisht Venkatesh[1]; [1]Pratt & Whitney

9:00 AM Invited
Heterogeneous Deformation during Forming of Pure Niobium and its Influence on Superconducting Radio Frequency Cavity Performance: *Thomas Bieler*[1]; Mingmin Wang[1]; Di Kang[1]; Mengge Zhao[1]; Kaige Zheng[1]; Maria Terol; Ricardo Rodriguez[2]; Eureka Pai[1]; Philip Eisenlohr[2]; [1]Michigan State University; [2]Universidad Polytechnica Madrid

9:30 AM
Austenite Transformation Behavior during Tensile Deformation of Quenched and Partitioned Steels: Christopher Finfrock[1]; Chandler Becker[1]; Trevor Ballard[1]; Grant Thomas[2]; Amy Clarke[1]; *Kester Clarke*[1]; [1]Colorado School of Mines; [2]AK Steel

9:50 AM Invited
Pushing the Performance Limits of Metallic Alloys through Severe Plastic Deformation Processing: *Rajiv Mishra*[1]; [1]University of North Texas

10:20 AM Break

10:40 AM Invited
Processing Heterostructured Materials for Superior Mechanical Properties: *Yuntian Zhu*[1]; Hao Zhou[2]; Yusheng Li[2]; Xiaolei Wu; Xiaolei Wu[3]; [1]North Carolina State University; [2]Nanjing University of Science and Technology; [3]Institute of Mechanics, CAS

11:10 AM
On the Mechanical Behavior of Keyhole-free Friction Stir Welded Copper-Aluminum Spot Joints: Isam Jabbar Ibrahim[1]; *Guney Yapici*[1]; [1]Ozyegin University

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Mechanical Assessment of Irradiated Microstructures

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Wednesday AM | February 26, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Peter Hosemann, University of California Berkeley; Maria Okuniewski, Purdue University

8:30 AM Invited
A New Numerical Method to Simulate Dislocation Self-climb: Fengxian Liu[1]; *Edmund Tarleton*[1]; Alan Cocks[1]; [1]University of Oxford

9:00 AM
Three Dimensional Rate Theory Models of Radiation Damage with Mechanical Fields: *Aaron Kohnert*[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

9:20 AM
Characterizing Self-ion Irradiated Tungsten: Nano-indentation, Multi-technique Microscopy and Crystal-plasticity Modeling: *Suchandrima Das*[1]; Hongbing Yu[1]; Kenichiro Mizohata[2]; Edmund Tarleton[1]; Felix Hofmann[1]; [1]University of Oxford; [2]University of Helsinki

9:40 AM
Nanoscale Characterisation of Re/Os Precipitation and Mechanical Degradation In Neutron Irradiated Tungsten: Matthew LLoyd[1]; Duc Nguyen[1]; Michael Moody[1]; Paul Bagot[1]; Robert Abernethy[1]; *David Armstrong*[1]; [1]University of Oxford

10:00 AM Break

10:20 AM Invited
High Temperature Small Scale Mechanical Testing and Nanoindentation of Advanced Accident Tolerant Fuels: *David Frazer*[1]; Joshua White[1]; Tarik Saleh[1]; Darrin Byler[1]; [1]Los Alamos National Laboratory

10:50 AM
Studies of High dpa Ion Beam Irradiation fcc-bcc Duplex Steel 2205: Micromechanical Testing and Nanoindentation Examination of Hardness Variations: *Michael Saleh*[1]; Alan Xu[1]; Paul Munroe[2]; Dhriti Bhattacharyya[1]; [1]ANSTO; [2]School of Material Science and Engineering, University of NSW

11:10 AM
Comprehensive Evaluation of the Degradation of Duplex Stainless Steels in Light Water Reactor Systems: *Timothy Lach*[1]; Shawn Riechers[1]; David Collins[1]; William Frazier[1]; Arun Devaraj[1]; Emily Barkley[1]; Thak Sang Byun[1]; [1]Pacific Northwest National Laboratory

11:30 AM
Mechanical Properties of Irradiated Cladding Material from BOR-60 Irradiations: *Tarik Saleh*[1]; Benjamin Eftink[1]; Stuart Maloy[1]; Gary Was[2]; [1]Los Alamos National Laboratory; [2]University of Michigan

11:50 AM
Comparison of In-situ Micro- and Ex-situ Meso-scale Tensile Testing of As-fabricated HT-9 Steels: *Tanvi Ajantiwalay*[1]; Assel Aitkaliyeva[1]; Peter Hosemann[2]; [1]University of Florida; [2]University of California, Berkeley

12:10 PM
Effects of Irradiation Defect and Strain on the Morphology and Kinetics Evolution of Nanoscale Phase: *Yongsheng Li*[1]; Zhengwei Yan[1]; Xinwen Tong[1]; Dong Wang[1]; [1]Nanjing University of Science and Technology, Nanjing

BIOMATERIALS

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Functional Thin Films and Coatings II

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carrado, IPCMS - CNRS; Heinz Palkowski, Clausthal University of Technology; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Ramana Chintalapalle, University of Texas at El Paso; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington; Vikas Tomar, Purdue University

Wednesday AM | February 26, 2020
Oceanside | Marriott Marquis Hotel

Session Chairs: Ravindra Nuggehalli, New Jersy Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso

8:30 AM Keynote
Tailoring the Thermal, Mechanical, and Acoustic Properties of Sub-surfaces through Ion Beam Modification: *Khalid Hattar*[1]; [1]Sandia National Laboratories

9:10 AM Invited
The Effect of Combined Electrical and Thermal Loading on the Mechanical Behavior of Resistive Switching HfO_2 Nanofilm: A Molecular Dynamics Study: *Ashfaq Adnan*[1]; Md Kayser[1]; [1]University of Texas at Arlington

9:30 AM
Tailoring Optical and Structural Properties of Metal-dielectric Composite Thin Films: *Lirong Sun*[1]; John Grant[1]; John Jones[1]; Neil Murphy[1]; Jonathan Vernon[1]; [1]Air Force Research Laboratory

9:50 AM
Structure, Morphology and Electrical Properties of Nanocrystalline Niobium Films: Nivedita Lalitha Raveendran[1]; *Avery Haubert*[2]; Ramana Chintalapalle[1]; [1]University of Texas; [2]University of California, Santa Barbara

10:10 AM
Sputtered Coating Optimization for Architected Structures: *Alina Garcia Taormina*[1]; Chantal Kurpiers[2]; Ruth Schwaiger[2]; Andrea Hodge[1]; [1]University of Southern California; [2]Karlsruhe Institute of Technology

10:30 AM
Pulsed-Laser Deposition and Characterization of ß-Ga2O3 Thin Films: *Vishal Zade*[1]; Mallesham Bandi[1]; Ramana Chintalapalle[1]; [1]University of Texas at El Paso

ENERGY & ENVIRONMENT

Recycling of Secondary, Byproduct Materials and Energy — Environmental and Energy Aspects

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Mingming Zhang, ArcelorMittal Global R&D; John Howarter, Purdue University; Elsa Olivetti, Massachusetts Institute of Technology; Alan Luo, Ohio State University; Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology

Wednesday AM | February 26, 2020
16A | San Diego Convention Ctr

Session Chairs: Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology; Chengguang Bai, Chongqing University

8:30 AM Introductory Comments

8:35 AM
To Recycle or not to Recycle – Critical Row Materials in Extreme Conditions – European Union Perspective and Challenges: *Dragan Rajnovic*[1]; [1]University of Novi Sad, Faculty of Technical Sciences, Serbia

8:55 AM
Mechanical Beneficiation of End-of-Life Lithium-Ion Battery Components: *Haruka Pinegar*[1]; York Smith[1]; [1]University of Utah

9:15 AM
Engineered Carbon Products from Sustainable Lignin Feedstocks for Energy Applications: *Valerie Garcia-Negron*[1]; David Harper[1]; David Keffer[2]; Orlando Rios[3]; [1]Center for Renewable Carbon; [2]University of Tennessee, Knoxville; [3]Oak Ridge National Laboratory

9:35 AM
Assessing the Techno-economic Feasibility of Solvent-based, Critical Material Recovery from Uncertain, End-of-life Battery Feedstock: *Chukwunwike Iloeje*[1]; Yusra Khalid[1]; Joe Cresko[2]; Diane Graziano[1]; [1]Argonne National Laboratory; [2]United States Department of Energy

9:55 AM
Thermal Route of Synthesis of Different Metal Oxide Nanoparticles from Spent Zn-C Battery and its Application as a Catalysts in Internet of Things: *Kamrul Hassan*[1]; Rifat Farzana[1]; Veena Sahajwalla[1]; [1]SMaRT@UNSW

10:15 AM Break

10:30 AM
Metal Extraction from Municipal Solid Waste Incineration Fly Ash and Immobilization of Toxic Metals in Residue: *Burcak Ebin*[1]; Britt-Marie Steenari[1]; [1]Chalmers University of Technology

10:50 AM
Thermodynamic Analysis and Reduction of Anosovite with Methane at Low Temperature: *Run Zhang*[1]; Gangqiang Fan[1]; Mingbo Song[1]; Chaowen Tan[1]; Jie Dang[2]; [1]College of Materials Science and Engineering, Chongqing University; [2]State Key Laboratory of Advanced Processing and Recycling of Non-ferrous Metals, Lanzhou University of Technology

11:10 AM
Development of a Carbo-granulation Process for the Manufacture of Artificial Aggregates using Mining Residues and Carbon Dioxide: *Elisabeth Viry*[1]; Lan Huong Tran[1]; Jean-François Blais[1]; Guy Mercier[1]; Louis-César Pasquier[1]; [1]INRS - ETE

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Processing, Microstructure & Property

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Wednesday AM | February 26, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Xiuyan Li, Institute of Metal Research, Chinese Academy of Sciences; Timothy Rupert, University of California, Irvine; Kenneth Vecchio, University of California, San Diego; Boris Straumal, MPI Intelligent Systems

8:30 AM Invited
Diffusive and Displacive Phase Transformations Driven by High Pressure Torsion: *Boris Straumal*[1]; [1]Institute of Solid State Physics and Cherngolovka Scientific Center, Russian Academy of Sciences

8:50 AM
Mechanical Properties Optimization via Microstructural Control of a Metastable ß-type Ti-Nb Gum Metal: Sumin Shin[1]; *Kenneth Vecchio*[1]; [1]University of California, San Diego

9:10 AM
SPD-induced Synthesis of Archimats: a New Paradigm in Materials Design: *Roman Kulagin*[1]; Yan Beygelzimer[2]; Yuri Estrin[3]; Brigitte Baretzky[1]; [1]Karlsruhe Institute of Technology (KIT) Institute of Nanotechnology (INT); [2]Donetsk Institute for Physics and Engineering; [3]Monash University / The University of Western Australia

9:30 AM
Strain Partitioning by Recurrent Shear Localization during Equal-channel Angular Pressing: *Philipp Frint*[1]; Martin Wagner[1]; [1]Institute of Materials Science and Engineering, Technische Universität Chemnitz

9:50 AM Invited
Hierarchical Microstructure in Additively Manufactured Ti-6Al-4V and its Effect on Mechanical Properties: Jinyeon Kim[1]; Jenniffer Bustillos[1]; *Atieh Moridi*[1]; [1]Cornell University

10:10 AM Break

10:30 AM Invited
Making Strong, Tough, Thermally-stable, and Radiation Tolerant Nanocrystalline Materials in Bulk Form: *Timothy Rupert*[1]; [1]University of California, Irvine

10:50 AM Invited
Stabilizing Nano Grains of Pure Cu with Rapidly Heating Induced Grain Boundary Relaxation: *Xiuyan Li*[1]; Xin Zhou[1]; Ke Lu[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

11:10 AM
Evaluation of Misorientation and Local Deformation in Bimodal Harmonic Structured Stainless Steel by Hybrid Imagings of Diffraction and Refraction Contrast Using Synchrotron Radiation X-ray: *Yoshikazu Nakai*[1]; Shoichi Kikuchi[2]; Daiki Shiozawa[1]; Kenji Nonaka[1]; Takumi Hase[1]; Yuki Nakagawa[1]; Kei Ameyama[3]; [1]Kobe University; [2]Shizuoka University; [3]Ritsumeikan University

11:30 AM Invited
Mesoscale Modeling of Deformation Behavior of Fe-Based Ultrafine-grained Microstructures: *Avinash Dongare*[1]; Ke Ma[1]; [1]University of Connecticut

11:50 AM
Superior Thermal Stability of the Extremely Fined Nanocrystalline Steel: *Fei Yin*[1]; Shan Hu[2]; [1]Wuhan University of Technology; [2]Purdue University

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Metals/HE Interactions -- ejecta and frag

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Wednesday AM | February 26, 2020
5A | San Diego Convention Ctr

Session Chair: David Jones, Los Alamos National Laboratory

8:30 AM
A Non-RMI Source of Substantial Quantities of Ejecta Mass Due to Cavitation Bubble Collapse: *Garry Maskaly*[1]; Saryu Fensin[1]; Thomas Hartsfield[1]; Gerald Stevens[2]; Brandon La Lone[2]; Dale Turley[2]; [1]Los Alamos National Laboratory; [2]Mission Support and Test Services

9:10 AM
The Role of Heterogeneities in Ejecta Production via MD Simulations: *Rachel Flanagan*[1]; Timothy Germann[2]; Marc Meyers[1]; Saryu Fensin[3]; [1]University of California, San Diego; [2]T-1, Los Alamos National Laboratory; [3]MST-8, Los Alamos National Laboratory

9:30 AM
Experimental and Computational Studies of Laser-driven Shocks through Metal Surface Perturbations and Planar Grooves: *Fady Najjar*[1]; Alison Saunders[1]; Camelia Stan[1]; Hye-Sook Park[1]; Suzanne Ali[1]; Jon Eggert[1]; [1]Lawrence Livermore National Laboratory

9:50 AM
On Design Of High-throughput Compact High-explosive Ejecta Source Platform: Fady Najjar[1]; *Jose Sinibaldi*[1]; [1]Lawrence Livermore National Laboratory

10:10 AM Break

10:30 AM Invited
A Continuum Mesoscale Perspective of the Dynamic Response of Metals and Explosives: *Darby Luscher*[1]; Cindy Bolme[1]; Marc Cawkwell[1]; Saryu Fensin[1]; Abigail Hunter[1]; Nisha Mohan[1]; Thao Nguyen[2]; Kyle Ramos[1]; R Scharff[3]; Justin Wilkerson[2]; Milovan Zecevic[1]; [1]Los Alamos National Laboratory; [2]Texas A&M University; [3]Nevada National Security Site

11:10 AM
Computational Prediction of the Damage to a Military Vehicle Composite Armor due to Ballistic Impact: *Jagadeep Thota*[1]; Mohamed Trabia[2]; Brendan O'Toole[2]; [1]University of Wisconsin - Green Bay; [2]University of Nevada, Las Vegas

11:30 AM
Mechanisms of Deformation and Fracture in Solids with Defects under Dynamic and Shock Wave Loading: *Yuriy Bayandin*[1]; Natalia Saveleva[1]; Dmitry Bilalov[1]; Oleg Naimark[1]; [1]Institute of Continuous Media Mechanics UB RAS

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Process Optimization

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Wednesday PM | February 26, 2020
12 | San Diego Convention Ctr

Session Chairs: Baojun Zhao, University of Queensland; Ender Keskinkilic, Atilim University

2:00 PM Introductory Comments

2:15 PM
The Effect of La Content on Inclusions and Microstructure of C-Mn Steel Treated by Ti-Mg-Ca: *Lei Wang*[1]; Bo Song[1]; Zhen Liu[1]; Xiaokang Cui[1]; Longfei Li[1]; [1]University of Science and Technology Beijing

2:35 PM
Research on Database Construction of Furnace Material Consume in EAF Steelmaking Process: *Botao Xue*[1]; Lingzhi Yang[1]; Yufeng Guo[1]; Feng Chen[1]; Fu-qiang Zheng[1]; Jinlai Zhang[1]; Hongguo Yao[1]; Xiaolei Hou[1]; [1]Central South University

2:55 PM
Experimental Study on Water Model of Continuous Smelting Reduction Reactor: *Haijuan Li*[1]; Yan Liu[1]; Xiaolong Li[1]; Zhang Tingan[1]; [1]Northeastern University

3:15 PM
Theoretical Analysis and Experimental Verification of Formation of As-bearing Rare Earth inclusions in Steel: *bin bai*[1]; Hongpo Wang[1]; Silu Jiang[1]; Lifeng Sun[1]; Yu Wang[1]; [1]Chongqing University

3:35 PM Break

3:50 PM
Parameters Affecting on the Phosphorus Distribution Between Slag and Liquid Metal in BOF: *Abdelrhman Hassan*[1]; [1]Tabbin Institute for Metallurgical Studies

4:10 PM
Precipitation Behavior of B2O3 Addition on CaO-Al2O3-Sc2O3 Slag System Through In-situ Observation: *Fei Wang*[1]; Wenke Zhi[1]; Ling Zhang[2]; Zhuangzhuang Liu[2]; Bin Yang[1]; Muxing Guo[2]; [1]Kunming University of Science and Technology; [2]KU Leuven

SPECIAL TOPICS

2020 Institute of Metals Lecture/Robert Franklin Mehl Award — 2020 Institute of Metals Lecture/Robert Franklin Mehl Award

Wednesday PM | February 26, 2020
Carlsbad | Marriott Marquis Hotel

12:15 PM Introductory Comments

12:20 PM Keynote
Heterostructured Materials: A New Paradigm for Superior Mechanical Properties: *Yuntian Zhu*[1]; [1]North Carolina State University; Nanjing University of Science and Technology

NUCLEAR MATERIALS

Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling — Current and Advanced Structural Materials I

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Assel Aitkaliyeva, University of Florida; Peter Hosemann, University of California - Berkeley; Samuel Briggs, Oregon State University; David Frazer, Los Alamos National Laboratory

Wednesday PM | February 26, 2020
Theater A-8 | San Diego Convention Ctr

Session Chair: David Frazer, Los Alamos National Laboratory

2:00 PM
Microstructure of HT-9 Cladding After fuel-cladding Chemical Interaction with an Annular U-10Zr Fuel Irradiated to 3.3% FIMA: *Xiang Liu*[1]; Luca Capriotti[1]; Tiankai Yao[1]; Jason Harp[1]; Lingfeng He[1]; [1]Idaho National Laboratory

2:20 PM
Interphase Distribution Behavior of Oxide Nanoparticles Triggered by Isothermal Ferrite Transformation in 9Cr ODS Steels: *Xiaosheng Zhou*[1]; Hao Chen[1]; [1]Tsinghua University

2:40 PM
Development of Advanced Low N-12Cr (wt.%) Ferritic/Martensitic Steel for Reactor Applications: *Connor Rietema*[1]; Tarik Saleh[2]; Benjamin Eftink[2]; Stuart Maloy[2]; Osman Anderoglu[3]; Md Mehadi Hassan[3]; Amy Clarke[1]; Kester Clarke[1]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory; [3]University of New Mexico

3:00 PM
Promotion and Suppression of the G-phase in Steels: *Daniel King*[1]; Thomas Whiting[1]; Mark Wenman[1]; [1]Imperial College London

3:20 PM
Temperature Shift Evaluation for G-phase Clustering in Ferritic-martensitic Alloys: *Matthew Swenson*[1]; Saheed Adisa[1]; [1]University of Idaho

3:40 PM Break

3:50 PM
Linking Defect Structure and Property Evolution in Ion-irradiated Tungsten: A Multi-facetted View: *Felix Hofmann*[1]; Suchandrima Das[1]; Hongbing Yu[1]; Mohamed Abdallah Reza[1]; Daniel Mason[2]; Sergei Dudarev[2]; [1]University of Oxford; [2]Culham Centre for Fusion Energy

4:10 PM
Effective Defect Sinks in Metallic Composite with Nanodispersoids: In situ Ion Radiation Transmission Electron Microscopy and Position Annihilation Lifetime Spectroscopy: *Kangpyo So*[1]; Ming Liu[2]; Mohammad Shahin[1]; Myles Stapelberg[1]; So Yeon Kim[1]; Michael Short[1]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]North Carolina State University

4:30 PM
On a Theory Based Accelerated Testing Methodology for Swelling: *Michael Fluss*[1]; [1]University of California, Berkeley, Department of Nuclear Engineering

4:50 PM
Controlling Helium Morphology in Pure Metals: Toward Uniform Samples for the Accelerated Measurement of Bulk Irradiated Properties: *Calvin Lear*[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

5:10 PM
Defect Evolution and Radiation Resistance of Advanced Fusion Materials Under Heavy Ion and Low Energy Helium Irradiation: *Osman El-Atwani*[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Joint Session with Fatigue in Materials Symposium - Microstructure-based Fatigue Studies on Additive-Manufactured Materials

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Wednesday PM | February 26, 2020
10 | San Diego Convention Ctr

Session Chairs: Garrett Pataky, Clemson University; Nik Hrabe, National Institute of Standards and Technology

---

2:00 PM Invited
Fracture and Fatigue Issues for (Metal) Additive Manufacturing: *John Lewandowski*[1]; [1]Case Western Reserve University

2:30 PM Invited
Fatigue Crack Growth Mechanisms and Design-qualification Considerations in Ti-6Al-4V Alloys Fabricated by Three Powder-based Additive Manufacturing Technologies: Yuwei Zhai[1]; Haize Galarraga[1]; Robert Warren[1]; *Diana Lados*[1]; [1]Worcester Polytechnic Institute

3:00 PM Invited
Microstructure-oriented Studies of Fatigue Damage in Additive Manufacturing Using Combined Enhanced Measurement Techniques: *Frank Walther*[1]; [1]TU Dortmund University

3:30 PM Break

3:50 PM Invited
Relating Additive Manufacturing Processing Conditions to Surface Roughness, Porosity and Microstructure Influencing Fatigue Life: *Joy Gockel*[1]; Luke Sheridan[2]; Eric Tatman[1]; Dino Celli[2]; Wesley Eidt[1]; [1]Wright State University; [2]Air Force Research Laboratory

4:20 PM Invited
An Investigation into Property-performance Relationships in Additive Manufacturing: *Nima Shamsaei*[1]; [1]Auburn University

4:50 PM Invited
Effect of 'As-built' Surfaces in SLM AlSi10Mg: Experiments and Computational Models: *Stefano Beretta*[1]; [1]Politecnico Di Milano Mechanical Enginer

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications II — Nuclear

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Wednesday PM | February 26, 2020
9 | San Diego Convention Ctr

Session Chairs: Nilesh Kumar, University of Alabama; Indrajit Charit, University of Idaho

---

2:00 PM Invited
Printing In-pile Instrumentations for Nuclear Test Reactors: *Kunal Mondal*[1]; David Estrada[2]; Kiyo Fujimoto[2]; Yanliang Zhang[3]; Troy Unruh[1]; Michael Mcmurtrey[1]; [1]Idaho National Laboratory; [2]Boise State University; [3]University of Notre Dame

2:30 PM
Texture Management in EBM Tungsten Plasma-facing Components for Fusion Reactors: *Elizabeth Ellis*[1]; Michael Kirka[1]; John Echols[1]; Lauren Garrison[1]; Christopher Ledford[2]; Sullivan Figurskey[2]; Chris Rock[2]; Timothy Horn[2]; Yutai Katoh[1]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory; [2]North Carolina State University

2:50 PM
Performance Analysis of a Novel Radiation Hard Temperature Sensor: *Al-Amin Ahmed Simon*[1]; Shah Mohammad Rahmot Ullah[1]; Lyle Jones[1]; Bahareh Badamchi[1]; Isabella Van Rooyen[1]; Harish Subbaraman[1]; Maria Mitkova[1]; [1]Boise State University

3:10 PM
Design and Evaluation of an Additively Manufactured Plastic Scintillation Detector: Bradford Baker[1]; *Peter Joyce*[1]; Marshall Millett[1]; [1]US Naval Academy

3:30 PM Break

3:50 PM Invited
Transforming Nuclear Reactor Core Manufacturing via Additive Techniques: *Kurt Terrani*[1]; [1]Oak Ridge National Laboratory

4:20 PM
Manufacturing Oxide Dispersion Strengthened (ODS) Steel Fuel Cladding Tubes by Cold Spray Technology: *Hwasung Yeom*[1]; Mia Lenling[1]; Tyler Dabney[1]; Jeff Graham[2]; Peter Hosemann[2]; David Hoelzer[3]; Stuart Maloy[4]; Kumar Sridharan[1]; [1]University of Wisconsin Madison; [2]University of California-Berkeley; [3]Oak Ridge National Laboratory; [4]Los Alamos National Laboratory

4:40 PM
Irradiation Damage of 316L Stainless Steel Fabricated by Directed Energy Deposition: *Ching-Heng Shiau*[1]; Cheng Sun[1]; Michael McMurtrey[1]; Randall Scott[1]; Robert O'Brien[1]; [1]Idaho National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Functional and Energy Materials — Shape Memory Alloys

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Sneha Prabha Narra, Worcester Polytechnic Institute; Markus Chmielus, University of Pittsburgh; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University

Wednesday PM | February 26, 2020
7B | San Diego Convention Ctr

Session Chair: Saniya LeBlanc, The George Washington University

2:00 PM Invited
Additive Manufacturing of NiTi Shape Memory Materials: *Steven Storck*[1]; Morgan Trexler[1]; Andrew Lennon[1]; Ian McCue[1]; Tim Montalbano[1]; Douglas Trigg[1]; Ryan Carter[1]; [1]Johns Hopkins Applied Physics Laboratory

2:30 PM
Additive Manufacturing of Nitinol with Post Heat Treatment Characteristics: Jeongwoo Lee[1]; *Yung Shin*[1]; [1]Purdue University

2:50 PM
Microstructure-property Correlations of LENS Processed NiTi: Sujith S[1]; Lakhindra Marandi[1]; Mitun Das[2]; *Indrani Sen*[1]; [1]Academic; [2]Government National Research Lab

3:10 PM
Fabrication and Functional Properties of Selectively Laser Melted NiTi Lattice Structures Using Point Scanning Strategies: *Tobias Gustmann*[1]; Hannes Korn[1]; Peter Koch[2]; Ralph Stelzer[2]; Welf-Guntram Drossel[1]; [1]Fraunhofer IWU; [2]TU Dresden

3:30 PM Break

3:50 PM Invited
The Next Generation of NiTi-based Shape Memory Alloys: Developed for Additive Manufacturing: Behnam Amin-Ahmadi[1]; Sen Liu[1]; Sean Mills[1]; Branden Kappes[1]; Ronald Noebe[2]; *Aaron Stebner*[1]; [1]Colorado School of Mines; [2]NASA Glenn Research Center

4:20 PM Invited
Complexity and Opportunities in Additive Manufactured NiTi-based Shape Memory Alloys: *Ibrahim Karaman*[1]; Lei Xue[1]; Bing Zhang[1]; Kadri Atli[1]; Alaa Elwany[1]; Raymundo Arroyave[1]; [1]Texas A&M University

4:50 PM
Selective Laser Melting of Co-Ni-Ga Shape Memory Alloys: *Philipp Krooss*[1]; Christian Lauhoff[1]; Julia Richter[1]; Florian Brenne[1]; Thomas Niendorf[1]; [1]University of Kassel

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — Structure and Microstructure

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Wednesday PM | February 26, 2020
8 | San Diego Convention Ctr

Session Chair: Fan Zhang, National Institute of Standards and Technology

2:00 PM Invited
Non-destructive Quality Evaluation of Additively Manufactured Metal Components: Sam Yang[1]; *Leon Prentice*[1]; Tony Murphy[1]; Sherry Mayo[1]; Clement Chu[1]; Anna Paradowska[2]; [1]CSIRO; [2]ANSTO

2:25 PM Invited
Unsupervised Learning of Dislocation Motion: *Darren Pagan*[1]; Thien Phan[2]; Jordan Weaver[2]; Austin Benson[3]; Armand Beaudoin[1]; [1]Cornell High Energy Synchrotron Source; [2]NIST; [3]Cornell University

2:50 PM
In Operando X-ray Diffraction during Laser 3D Printing: *Samy Hocine*[1]; Helena Van Swygenhoven[1]; Steven Van Petegem[1]; Cynthia Sin Ting Chang[1]; Tuerdi Maimaitiyili[1]; Gemma Tinti[1]; Dario Ferreira Sanchez[1]; Daniel Grolimund[1]; Nicola Casati[1]; [1]Paul Scherrer Institut

3:10 PM
In-situ TEM Heating Experiments to Study the Effect of Thermal Gradients on Additively Manufactured Ti-6Al-4V Builds: *Sriram Vijayan*[1]; Meiyue Shao[1]; Chris Blackwell[1]; Sabina Kumar[2]; Sudarsanam Babu[2]; Joerg Jinschek[1]; [1]The Ohio State University; [2]University of Tennessee, Knoxville

3:30 PM
Observing the Phase Evolution During Selective Laser Melting of a High-Fe β-Ti Alloy from Elemental Powders via In-Situ Synchrotron X-Ray Diffraction: *Farheen Ahmed*[1]; Samuel Clark[2]; Chu Lun Alex Leung[2]; Yunhui Chen[2]; Lorna Sinclair[2]; Sebastian Marussi[2]; Veijo Honkimaki[3]; Noel Haynes[4]; Peter Lee[2]; Hatem Zurob[1]; André Phillion[1]; [1]McMaster University; [2]University College London; [3]European Synchrotron Radiation Facility; [4]Collins Aerospace

3:50 PM Break

4:10 PM Invited
Combining Atom-probe Tomography and Synchrotron Methods to Investigate In-situ Precipitation in AM-produced Alloys: *Eric Jaegle*[1]; Philipp Kürnsteiner[1]; Pere Barriobero-Vila[2]; Markus Wilms[3]; Frederic De Geuser[4]; Dierk Raabe[1]; [1]Max-Planck-Institut Fuer Eisenforschung; [2]German Aerospace Center DLR; [3]Fraunhofer-Institute for Laser Technology; [4]SIMAP - Univ. Grenoble Alpes

4:35 PM
In-situ TEM Thermal Cycling of AM Steel: *Manas Upadhyay*[1]; Eva Héripré[2]; Lluís Cardona[2]; Alexandre Tanguy[1]; Simon Hallais[1]; Sylvain Durbecq[1]; Thien-Nga Lê[1]; [1]École Polytechnique; [2]CentraleSupélec

4:55 PM
Detection of Early Crack Formation of Fatigued, Additively Manufactured Stainless Steel using Neutron Dark-field Imaging: Adam Brooks[1]; *Daniel Hussey*[2]; Hong Yao[3]; Ali Haghshenas[3]; Jumao Yuan[3]; Jacob LaManna[2]; David Jacobson[2]; Caroline Lowery[3]; Shengmin Guo[3]; Michael Khonsari[3]; Leslie Butler[3]; [1]EWI; [2]NIST; [3]Louisiana State University

5:15 PM
Machine Learning Applications for In-situ Synchrotron X-ray Diffraction Measurements of Thermo-Mechanical Behaviors of Additively Manufactured 17-4 Stainless Steel: *Thien Phan*[1]; Darren Pagan[2]; [1]National Institute of Standards and Technology; [2]Cornell High Energy Synchrotron Source

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Alloy Design- Titanium Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Wednesday PM | February 26, 2020
6F | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Additive Manufacturing of Commercially Available Metastable ß-Ti Alloys: Mohan Sai Kiran Kumar Yadav Nartu[1]; David Flannery[1]; Eugene Ivanov[2]; Srinivas Aditya Mantri[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]Tosoh SMD Inc.

2:30 PM
Selective Laser Melting of Beta-type Ti-Nb Alloys for Bone Implants: *Stefan Pilz*[1]; Holger Schwab[1]; Patrick Langhelm[1]; Uta Kühn[1]; Annett Gebert[1]; [1]Institute for Complex Materials, Leibniz IFW Dresden, Helmholtzstr. 20, 01069 Dresden, Germany

2:50 PM
Ti-Nb Alloy with Location-dependent Properties Using Laser Additive Approach: *Wenhao Lin*[1]; Ji Ma[1]; [1]University of Virginia/ MSE Department

3:10 PM
Hybrid Ti with High Work Hardening Rate and Ductile Martensitic Ti: Novel Alloy Concepts Delivered by Selective Laser Melting: *Kenong Xia*[1]; [1]University of Melbourne

3:30 PM
Design of New Titanium Alloy for Additive Manufacturing with the CALPHAD Method: *Zhi Liang*[1]; Richard Ricker[1]; Ursula Kattner[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

3:50 PM Break

4:05 PM Invited
Microstructural Control for Additive Manufacturing of Metal Alloys—an Advanced Microscopy Approach: *Simon Ringer*[1]; [1]University of Sydney

4:35 PM
Development of New Ti-64 Modified Alloys for Additive Manufacturing with Columnar to Equiaxed Transition: *Nevin Taylor*[1]; Hamish Fraser[1]; Brian Welk[1]; Zachary Kloenne[1]; Andrew Baker[2]; [1]Ohio State University; [2]Boeing

4:55 PM
Application of a Thermodynamics-informed Materials Design Simulator for Microstructure Control During AM: *Aurelien Perron*[1]; John Roehling[1]; Tien Roehling[1]; Nicholas Calta[1]; Bey Vrancken[1]; Joel Berry[1]; Thejaswi Tumkur Umanath[1]; Patrice Turchi[1]; Vincenzo Lordi[1]; Joseph McKeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

5:15 PM
Alloy-dilution Effects and Mechanical Response in Wire-arc Additively-manufactured Alloy-alloy Composites Built Using Ti-6Al-4V and Commercially-pure Titanium: *Alec Davis*[1]; Cameron Breheny[1]; Jonathon Fellowes[1]; Uzoma Nwankpa[2]; Filomeno Martina[2]; Jialuo Ding[2]; Thays Machry[3]; Philip Prangnell[1]; [1]The University of Manchester; [2]Cranfield University; [3]Airbus

5:35 PM
Nitrogen Solid-solution Strengthened Titanium Materials Fabricated by SLM Process: *Katsuyoshi Kondoh*[1]; Ammarueda Issariyapat[1]; Patama Visuttipitukul[2]; Tingting Song[3]; Junko Umeda[1]; Ma Qian[3]; [1]Osaka University; [2]Chulalongkorn University; [3]RMIT

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Al-alloys and Other Materials

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday PM | February 26, 2020
11A | San Diego Convention Ctr

Session Chairs: Hang Yu, Virginia Polytechnic Institute and State University; Emma White, Ames Laboratory

---

2:00 PM
Phase Transformations in Al-Ce-X Alloys: *Kevin Sisco*[1]; Alex Plotkowski[2]; Kurt Sickafus[1]; Claudia Rawn[1]; Ryan Dehoff[2]; Lawrence Allard[2]; Sumit Bahl[2]; Amit Shyam[2]; Andres Rossy[2]; Sudarsanam Babu[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

2:20 PM
Directed Energy Deposition of AlSi10Mg: Single Track Nonscalability and Bulk Properties: *Parnian Kiani*[1]; Alexander Dupuy[1]; Kaka Ma[2]; Julie Schoenung[1]; [1]University Of California, Irvine; [2]Colorado State University

2:40 PM
Low Surface Roughness Additively Manufactured AlSi10Mg: The Impacts on Corrosion and Water Repellency Properties: Parisa Fathi[1]; Mohsen Mohammadi[2]; *Ali Nasiri*[1]; [1]Memorial University of Newfoundland; [2]Marine Additive Manufacturing Centre of Excellence (MAMCE), University of New Brunswick

3:00 PM
Fabrication Defects and Limitations in Additive Manufacturing of AlSi10Mg Lattice Structures: *Enrico Ossola*[1]; Andre Pate[2]; Samad Firdosy[2]; Andrew Shapiro[2]; Scott Roberts[2]; Eugenio Brusa[1]; Raffaella Sesana[1]; [1]Politecnico di Torino; [2]Jet Propulsion Laboratory, California Institute of Technology

3:20 PM
Microstructure and Micro-mechanical Property Evolution of Cold Sprayed Al 6061 Coatings with Isothermal Heat-treatment: *Benjamin Bedard*[1]; Tyler Flanagan[1]; Aaron Nardi[2]; Avinash Dongare[1]; Harold Brody[1]; Victor Champagne[2]; Seok-Woo Lee[1]; Mark Aindow[1]; [1]University of Connecticut; [2]U.S. Army Research Laboratory, Weapons and Materials Research Directorate

3:40 PM Break

4:00 PM
Selective Laser Melting (SLM) Additive Repair of Duramold-2 Substrate Using AlSi10Mg: *Edward Cyr*[1]; Amir Hadadzadeh[1]; Babak Shalchi Amirkhiz[1]; Joshua Kelly[1]; Mohsen Mohammadi[1]; [1]Marine Additive Manufacturing Centre of Excellence

4:20 PM
Microstructure Distribution, Phase Identification, and Texture of Selective Laser Melted GRCop-84 in As-built and HIPed Conditions: *Robert Minneci*[1]; Claudia Rawn[1]; Sudarsanam Babu[1]; Michael Haines[1]; Jeffrey Bunn[1]; [1]University of Tennessee

4:40 PM
Effect of Cyclic Rapid Thermal Loadings on the Microstructural Evolution of a Cantor Alloy During Selective Laser Melting Processes: *Hao Wang*[1]; Zhiguang Zhu[2]; Hansheng Chen[1]; Sharon Mui Ling Nai[2]; Rongkun Zheng[3]; Sophie Primig[4]; Sudarsanam Babu[5]; Simon Ringer[1]; Xiaozhou Liao[1]; [1]School of Aerospace, Mechanical and Mechatronic Engineering, The University of Sydney; [2]Singapore Institute of Manufacturing Technology; [3]School of Physics, The University of Sydney; [4]School of Materials Science & Engineering, UNSW; [5]Department of Mechanical, Aerospace and Biomedical Engineering, The University of Tennessee, Knoxville

5:00 PM
Ultrahigh-properties TiNi Shape Memory Alloys by 4D Printing: *Haizhou Lu*[1]; Chao Yang[1]; [1]South China University of Technology

5:20 PM
Experimental Evaluation of Additively Manufactured Continuous Fiber Reinforced Nylon Composites: *Mahdi Mohammadizadeh*[1]; Ismail Fidan[1]; [1]Tennessee Technological University

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Residual Stress and Texture

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday PM | February 26, 2020
6E | San Diego Convention Ctr

Session Chair: Hang Yu, Virginia Polytechnic Institute and State University

---

2:00 PM
Interface Texture Development of Additively Manufactured Materials: *David Rowenhorst*[1]; Aeriel Murphy-Leonard[1]; Richard Fonda[1]; [1]U.S. Naval Research Laboratory

2:20 PM
Grain Boundary Engineering of Additively Manufactured Stainless Steel: *Gao Shubo*[1]; Hu Zhiheng[2]; Chin Kai Siang[1]; Song Xu[2]; Matteo Seita[1]; [1]Nanyang Technological University; [2]Singapore Institute of Manufacturing Technology

2:40 PM
Understanding the Effects of Process Parameter Modifications on Grain Structure and Texture Development Using Monte Carlo Potts Models: *Joseph Pauza*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

3:00 PM
Crystallographic Texture Control in Additively Manufactured Stainless Steel: *Sudharshan Raman*[1]; Bernard Gaskey[1]; Ekta Jain[1]; Shubo Gao[1]; Kishore Venkatesan[2]; David Ritchie[3]; Darren Fraser[3]; Sri Lathabai[3]; Matteo Seita[1]; [1]Nanyang Technological Unviersity; [2]CSIRO ; [3]CSIRO

3:20 PM
Crystallographic Texture Evolution in Additive Manufactured Metals as a Function of Build Height and Strategy: *Alec Saville*[1]; Jonah Klemm-Toole[1]; Sven Vogel[2]; Adam Creuziger[3]; Sudarsanam Babu[4]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory; [3]National Institute of Standards and Technology; [4]Oak Ridge National Laboratory/University of Tennessee-Knoxville

3:40 PM Break

4:00 PM
Controlling Residual Stress and Phase Transformations During Laser Powder Bed Fusion Through large-area Surface Heating: *John Roehling*[1]; William Smith[1]; Tien Roehling[1]; Gabriel Guss[1]; Bey Vrancken[1]; Joseph McKeown[1]; Michael Hill[2]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory; [2]University of California, Davis

4:20 PM
Influence of Selective Laser Melting Strategies and Post Treatment on the Residual Stresses and Microstructure of Alloy 718: *Jan Capek*[1]; Efthymios Polatidis[1]; Robert Pederson[2]; Christophe Lyphout[3]; Markus Strobl[1]; [1]Paul Scherrer Institute; [2]University West; [3]Research Institute of Sweden

4:40 PM
Residual Stress and Distortion Modeling of a LENS Ti-6Al-4V Thin Wall Using the Evolving Microstructural Model of Inelasticity: *Matthew Dantin*[1]; Matthew Priddy[1]; [1]Mississippi State University

5:00 PM
Evaluation of Additively Manufactured Functionally Graded Titanium Alloys Tailored for Thermal Expansion Applications: *Skyler Hilburn*[1]; Timothy Simpson[1]; Todd Palmer[1]; [1]Pennsylvania State University

5:20 PM
Residual Stress Prediction in Metal Additive Manufacturing: Numerical Simulation and Experimental Validation: *Tao Wu*[1]; Thomas Niendorf[1]; [1]University of Kassel

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Plasticity Modeling / Experiments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Wednesday PM | February 26, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: Nathan Mara, University of Minnesota; George Pharr, Texas A&M University

2:00 PM Invited
High-throughput Elevated Temperature Nanomechanical Mapping of Fe-based Alloys: *Nathan Mara*[1]; Youxing Chen[2]; Eric Hintsala[3]; Bartosz Nowakowski[3]; Douglas Stauffer[3]; [1]University of Minnesota; [2]University of North Carolina, Charlotte; [3]Bruker Nano Surfaces Division

2:30 PM
Microstructure Evolution During Dynamic Compression in Titanium Characterized with the XFEL at LCLS-2: *Sven Vogel*[1]; Cindy Bolme[1]; Donald Brown[1]; Ellen Cerreta[1]; Joseph Mang[1]; Benjamin Morrow[1]; Kyle Ramos[1]; Igor Usov[1]; Suzanne Ali[2]; Damian Swift[2]; Eric Galtier[3]; Arianna Gleason[3]; Eduardo Granados[3]; Amy Lazicki[2]; Philip Heimann[3]; Despina Milathianaki[3]; Bob Nagler[3]; Luca Lutterotti[4]; [1]Los Alamos National Laboratory; [2]Lawrence Livermore National Laboratory; [3]SLAC; [4]Universita di Trento

2:50 PM
Combining X-ray Diffraction Contrast Tomography and Topo-tomography to Study In-situ the Mechanics of Polycrystalline Materials: *Henry Proudhon*[1]; Wolfgang Ludwig[2]; Jean-Charles Stinville[3]; Patrick Callahan[3]; [1]Mines Paristech Centre Des Materiaux; [2]Université de Lyon; [3]University of California Santa Barbara

3:10 PM
Investigation of Residual Stress Using High Resolution XRD and Localized Lattice Rotation Under Fatigue Loading: *Ramasis Goswami*[1]; [1]Naval Research Laboratory

3:30 PM Break

3:50 PM Invited
Measurement of Power Law Creep Parameters by Nanoindentation: *George Pharr*[1]; Zhiyuan Liang[1]; [1]Texas A&M University

4:20 PM
Measurement of the Thermal Expansion of Ti-7Al Using High Energy X-ray Diffraction Microscopy: *Rachel Lim*[1]; Darren Pagan[2]; Joel Bernier[3]; JY Peter Ko[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Cornell High Energy Synchrotron Source; [3]Lawrence Livermore National Laboratory

4:40 PM
Critical Resolved Shear Stresses (CRSS) of Hexagonal Titanium from Nanoindentation Optimization: *Zhuowen Zhao*[1]; Jon Molina-Aldareguia[2]; Thomas Bieler[1]; Philip Eisenlohr[1]; [1]Michigan State University; [2]IMDEA Materials

5:00 PM
Effects of the Orientation of the a/ß Interphase on the Time-dependent Fatigue Behavior of Ti-6Al-4V: Kartik Kapoor[1]; Priya Ravi[1]; Jun-Sang Park[2]; Ryan Noraas[3]; Vasisht Venkatesh[3]; *Michael Sangid*[1]; [1]Purdue University; [2]Argonne National Laboratory; [3]Pratt & Whitney

5:20 PM
Measurement of Strain Rate Sensitivity by the Constant Load and Hold Indentation Method: A Case Study in Calcium Fluoride: *Zhiyuan Liang*[1]; George Pharr[1]; [1]Texas A&M University

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Wednesday PM | February 26, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Mary O'Brien, Colorado School of Mines; MingXin Huang, University of Hong Kong

2:00 PM
Effect of Si on Microstructure and Mechanical Properties of FeMnAlC Lightweight Steels: *Zhangwei Wang*[1]; Wenjun Lu[1]; Junyang He[1]; Dirk Ponge[1]; Dierk Raabe[1]; Zhiming Li[1]; [1]Max-Planck-Institut für Eisenforschung

2:20 PM
Understanding the Effect of Nickel on the Microstructure of Low Density FeMnAl Steels: Laura Bartlett[1]; *Michael Piston*[1]; Ronald O'Malley[1]; Krista Limmer[2]; Daniel Field[2]; [1]Missouri University of Science & Technology; [2]CC DEVCOM Army Research Laboratory

2:40 PM
Low-Density Steels: Microstructure Evolution and Tensile Behavior in Novel FE-MN-AL-C Steels: *Tomas Scuseria*[1]; Kelcey Garza[2]; Dean Pierce[3]; Amrinder Gill[2]; Erik Pavlina[2]; Jerry Arnold[2]; Amy Clarke[1]; Kester Clarke[1]; Omar Garcia[4]; Fred Fletcher[5]; [1]Colorado School of Mines; [2]AK Steel; [3]Oak Ridge National Laboratory; [4]Ternium; [5]Arcelor Mittal

3:00 PM
Effect of Al Content and Solution Treatment on Tensile and Corrosion Resistance of Fe-Mn-Al-C Low Density Steel: *Tao Ma*[1]; Huirong Li[1]; Jianxin Gao[1]; Yungang Li[1]; [1]North China University of Science and Technology

3:20 PM
Effect of Composition on Properties of Age-hardenable Fe-Mn-Al-C Alloys: *Krista Limmer*[1]; Daniel Field[1]; Laura Bartlett[2]; Katherine Sebeck[3]; [1]CCDC Army Research Laboratory; [2]Missouri S&T; [3]CCDC Ground Vehicle Systems Center

3:40 PM Break

4:00 PM
Effect of Alloying on Adhesive Strength of Interfaces Between Matrix and Transition Metal Carbide and Nitride Precipitates in Austenitic Steels: First-principles Approach: *Oleg Kontsevoi*[1]; Gregory Olson[1]; [1]Northwestern University

4:20 PM
Austenitic Stainless Steel with Superior Corrosion Resistance and Excellent Mechanical Properties: *Kaiping Yu*[1]; Peng Yu[2]; Mingxin Huang[1]; [1]The University of Hong Kong; [2]Southern University of Science and Technology

4:40 PM
TRIP-Maraging Nanolaminate Stainless Steel: *Hyunseok Oh*[1]; Shaolou Wei[1]; Jaclyn Leigh Cann[1]; Cemal Cem Tasan[1]; [1]Massachusetts Institute of Technology

5:00 PM
Multi-scale Models and Study of Hydrogen Embrittlement in Advanced High Strength Steels: *Tarek Hatem*[1]; [1]The British University in Egypt

---

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Wednesday PM | February 26, 2020
Mission Hills | Marriott Marquis Hotel

Session Chairs: Mary O'Brien, Colorado School of Mines; MingXin Huang, University of Hong Kong

---

2:00 PM
Effect of Si on Microstructure and Mechanical Properties of FeMnAlC Lightweight Steels: *Zhangwei Wang*[1]; Wenjun Lu[1]; Junyang He[1]; Dirk Ponge[1]; Dierk Raabe[1]; Zhiming Li[1]; [1]Max-Planck-Institut für Eisenforschung

2:20 PM
Understanding the Effect of Nickel on the Microstructure of Low Density FeMnAl Steels: Laura Bartlett[1]; *Michael Piston*[1]; Ronald O'Malley[1]; Krista Limmer[2]; Daniel Field[2]; [1]Missouri University of Science & Technology; [2]CC DEVCOM Army Research Laboratory

2:40 PM
Low-Density Steels: Microstructure Evolution and Tensile Behavior in Novel FE-MN-AL-C Steels: *Tomas Scuseria*[1]; Kelcey Garza[2]; Dean Pierce[3]; Amrinder Gill[2]; Erik Pavlina[2]; Jerry Arnold[2]; Amy Clarke[1]; Kester Clarke[1]; Omar Garcia[4]; Fred Fletcher[5]; [1]Colorado School of Mines; [2]AK Steel; [3]Oak Ridge National Laboratory; [4]Ternium; [5]Arcelor Mittal

3:00 PM
Effect of Al Content and Solution Treatment on Tensile and Corrosion Resistance of Fe-Mn-Al-C Low Density Steel: *Tao Ma*[1]; Huirong Li[1]; Jianxin Gao[1]; Yungang Li[1]; [1]North China University of Science and Technology

3:20 PM
Effect of Composition on Properties of Age-hardenable Fe-Mn-Al-C Alloys: *Krista Limmer*[1]; Daniel Field[1]; Laura Bartlett[2]; Katherine Sebeck[3]; [1]CCDC Army Research Laboratory; [2]Missouri S&T; [3]CCDC Ground Vehicle Systems Center

3:40 PM Break

4:00 PM
Effect of Alloying on Adhesive Strength of Interfaces Between Matrix and Transition Metal Carbide and Nitride Precipitates in Austenitic Steels: First-principles Approach: *Oleg Kontsevoi*[1]; Gregory Olson[1]; [1]Northwestern University

4:20 PM
Austenitic Stainless Steel with Superior Corrosion Resistance and Excellent Mechanical Properties: *Kaiping Yu*[1]; Peng Yu[2]; Mingxin Huang[1]; [1]The University of Hong Kong; [2]Southern University of Science and Technology

4:40 PM
TRIP-Maraging Nanolaminate Stainless Steel: *Hyunseok Oh*[1]; Shaolou Wei[1]; Jaclyn Leigh Cann[1]; Cemal Cem Tasan[1]; [1]Massachusetts Institute of Technology

5:00 PM
Multi-scale Models and Study of Hydrogen Embrittlement in Advanced High Strength Steels: *Tarek Hatem*[1]; [1]The British University in Egypt

---

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Developments in Rare-earth Free Permanent Magnets

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Wednesday PM | February 26, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Thomas Schrefl, Danube University Krems; Cajetan Ikenna Nlebedim, AMES Laboratory

---

2:00 PM Invited
A Brief Review of MnBi-based Hard Magnetic Materials: *Jun Cui*[1]; [1]Iowa State University

2:30 PM Invited
Magnetic Properties, Microstructure and Phase Formation in Rare Earth Free MnAl-C Alloys: *Thomas G. Woodcock*[1]; [1]IFW Dresden

3:00 PM
The Effect of Ti and Zr Additions on the Magnetic Properties and Microstructure of MnAl-C Alloys: *Le Feng*[1]; Kornelius Nielsch[1]; Thomas Woodcock[1]; [1]Leibniz IFW Dresden

3:20 PM
Investigation of the Long-Term Thermal Stability of the $L1_0$ Phase in Ternary Mn-Al-Ga Alloys: *Torsten Mix*[1]; Thomas Woodcock[1]; [1]Leibniz IFW Dresden

3:40 PM Break

4:00 PM Invited
Mn-based Permanent Magnets: from Thin Film Micromagnets to Bulk Magnets Obtained by Hot-pressing of Gas-atomized Powder: Carla Muñoz-Rodríguez[1]; Melek Villanueva[1]; Le Feng[2]; Elena H. Sánchez[3]; Javier Rial[1]; Julio Camarero[1]; Cristina Navío[1]; Ester M. Palmero[1]; Torsten Mix[2]; Thomas Woodcock[2]; Peter S. Normile[3]; José A. De Toro[3]; *Alberto Bollero*[1]; [1]IMDEA Nanociencia; [2]IFW Dresden, Institute of Metallic Materials; [3]Instituto Regional de Investigación Científica Aplicada (IRICA) and Departamento de Física Aplicada, Universidad de Castilla-La Mancha

4:30 PM Invited
Development of Enhanced Magnetic and Mechanical Properties of Alnico as a Rare Earth-free Permanent Magnet by Final-shape Powder Processing: *Iver Anderson*[1]; Emily Rinko[1]; Emma White[1]; Aaron Kassen[2]; Wei Tang[1]; Lin Zhou[1]; Timothy Prost[1]; Matthew Kramer[1]; [1]Iowa State University / Ames Laboratory; [2]Carpenter Technology Corporation

5:00 PM Invited
Processing and Calorimetry of Alnico in High Magnetic Fields: *Michael Kesler*[1]; Xubo Liu[2]; Ikenna Nlebedim[2]; Matthew Kramer[2]; Orlando Rios[1]; Michael Mcguire[1]; [1]Oak Ridge National Laboratory; [2]Ames Laboratory

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Energy Storage with Emphasis on Batteries II

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Wednesday PM | February 26, 2020
16B | San Diego Convention Ctr

Session Chairs: Eric Detsi, University of Pennsylvania; Corey Love, US Naval Research Laboratory

2:00 PM Invited
Structure-property-performance Relationship and Durability of Advanced Lithium-ion Electrode Architectures: *David Wood*[1]; Marissa Wood[1]; Ritu Sahore[1]; Jianlin Li[1]; Zhijia Du[1]; Ilias Belharouak[1]; [1]Oak Ridge National Laboratory

2:20 PM Invited
X-ray Imaging of Metallic Anodes for Lithium Ion Batteries and Beyond: Hernando Gonzalez Malabet[1]; *George Nelson*[1]; [1]University of Alabama in Huntsville

2:40 PM Invited
Investigating the Phase Evolution of Nanostructured Metal Oxides and Sulfides Using In Situ Biasing in the Transmission Electron Microscope (TEM): Ahamed Ullah[1]; Chloe Porter[1]; Melonie Thomas[1]; Manisha De Alwis Goonatilleke[1]; *Beth Guiton*[1]; [1]University of Kentucky

3:00 PM Invited
Mechanics of Metallic Lithium and Sodium Anodes: *Matt Pharr*[1]; Cole Fincher[1]; [1]Texas A&M University

3:20 PM Invited
In-situ X-ray Absorption Studies of Transition Metal Layered Structures for Zn-ion Batteries: *Christopher Patridge*[1]; [1]D'Youville College

3:40 PM Break

4:00 PM Invited
In-situ Measurement of Stresses and their Effect on Diffusion in High Energy Density Electrode Materials: *Siva Nadimpalli*[1]; [1]New Jersey Institute Of Technology

4:20 PM Invited
Ions, Electrons, and Phonons: on the Movement of Charge Through Solids: *Brent Melot*[1]; [1]University of Southern California

4:40 PM Invited
Long Cycle-life and High-rate Magnesium-ion Battery Anode Enabled By Self-healing Through Near-room-temperature Solid-liquid Phase Transition: *Eric Detsi*[1]; Lin Wang[1]; [1]University of Pennsylvania

5:00 PM Invited
Synchrotron X-ray Science to Understand Structural and Physical Transformations in Solid State Batteries: *Kelsey Hatzell*[1]; Marm Dixit[1]; [1]Vanderbilt University

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — 3D Microelectronic Packaging and Emerging Interconnects II

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Wednesday PM | February 26, 2020
Palomar | Marriott Marquis Hotel

Session Chairs: Chris Gourlay, Imperial College London; Tianhong Gu, Imperial College London

2:00 PM Invited
Mechanisms of Electromigration in Bicrystal Sn Solder Joint by Correlative X-ray Tomography and Microscopy: Marion Branch Kelly[1]; *Nikhilesh Chawla*[1]; [1]Arizona State University

2:20 PM
Effect of Solder Joint Geometry on Electromigration Failure Mechanism in Micro Solder Joint: *Hossein Madanipour*[1]; Yi Ram Kim[1]; Allison Osmonson[1]; Choong-Un Kim[1]; [1]UT Arlington

2:40 PM
Modeling and Simulation of Pore Electromigration in Tin Solders: *Zachary Morgan*[1]; Yongmei Jin[1]; Vahid Attari[2]; Raymundo Arroyave[2]; [1]Michigan Technological University; [2]Texas A&M University

3:00 PM
A Comprehensive Approach on Understanding Electromigration Failure Kinetics with Varying UBM Thickness and Joint Geometry in WCSP Solder Interconnects: *Allison Osmanson*[1]; Yi Ram Kim[1]; Hossein Madanipour[1]; Choong-Un Kim[1]; Patrick Thompson[2]; Qiao Chen[2]; [1]University of Texas at Arlington; [2]Texas Instruments

3:20 PM Break

3:40 PM
Study on the UBM Thickness and Current Flow Configuration Effects on Electromigration Failure Mechanism in Solder Interconnects: *Yi Ram Kim*[1]; Allison Osmanson[1]; Hossein Madanipour[1]; Choong-Un Kim[1]; Patrick Thompson[2]; Qiao Chen[2]; [1]University of Texas at Arlington; [2]Texas Instruments, Inc.

4:00 PM
Role of Grain Boundaries in Electromigration and Thermomigration Related Failure : A Phase Field Simulation Study: *Supriyo Chakraborty*[1]; Praveen Kumar[2]; Abhik Choudhury[2]; [1]Ohio State University; [2]Indian Institute of Science

4:20 PM
Microstructure Evolution and Interfacial Growth of Intermetallic Compound for Cu/In/Cu Structure under Thermomigration: *Chen-Wei Lee*[1]; Jou Hsuan Lee[1]; Fan-Yi Ouyang; [1]National Tsing Hua University

4:40 PM Invited
Effects of Grain Number and Intermetallic Compounds on Electromigration of Sn-based Solder Joint: Yu Tian[1]; Yishu Wang[1]; Limin Ma[1]; *Fu Guo*[1]; [1]Beijing University of Technology

CHARACTERIZATION

Advanced Real Time Imaging — Energy & Environment

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Wednesday PM | February 26, 2020
Theater A-4 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
In-operando Non-invasive Optical Visualization of Battery Reactions and Processes: *Nian Liu*[1]; Yutong Wu[1]; Yamin Zhang[1]; [1]Georgia Institute of Technology

2:20 PM Invited
In-situ Transmission Electron Microscopy Characterization of Advanced Nuclear Materials during Single and Dual Beam Irradiation: *Osman El-Atwani*[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

2:40 PM
In-operando Investigation on Sequential Stages for Redox-triggered Phase Transformation of Natural Hematite Particles: *Anna Nakano*[1]; Jinichiro Nakano[1]; James Bennett[2]; [1]U.S. Department of Energy National Energy Technology Laboratory/ Leidos Research Support Team; [2]US Department of Energy National Energy Technology Laboratory

3:00 PM Concluding Comments

3:30 PM Break

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Ni-based Superalloys – Modeling Structure & Properties

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Wednesday PM | February 26, 2020
11B | San Diego Convention Ctr

Session Chairs: James Coakley, University of Miami; Victoria Miller, University of Florida

2:00 PM
Revisiting Precipitation Hardening in Ni- and Co-based Superalloys: Compositional and Microstructural Effects: *Vassili Vorontsov*[1]; Hikmatyar Hasan[2]; Peter Haynes[2]; [1]University of Strathclyde Glasgow; [2]Imperial College London

2:20 PM
Phase-field-informed Modeling of ' Rafting in 3D during High-temperature Creep in Ni-based Single Crystal Superalloys: *Jean-Briac le Graverend*[1]; Rajendran Harikrishnan[1]; [1]Texas A&M University

2:40 PM
Modeling the Dependence of Microstructural Evolution on the Crystallographic Orientation in Ni-based Single Crystal Superalloys: *Harikrishnan Rajendran*[1]; Jean- Briac le Graverend[1]; [1]Texas A&M University

3:00 PM
Competitive Mechanisms of Fatigue Crack Initiation Around Non-metallic Inclusions of a Polycrystalline Ni-base Superalloy: *Alexander Bergsmo*[1]; Fionn Dunne[1]; [1]Imperial College London

3:20 PM
Competing Mode of Failure Predictions in a Ni-based Superalloy using Crystal Plasticity Finite Element Simulations: *Ritwik Bandyopadhyay*[1]; Michael Sangid[1]; [1]Purdue University

3:40 PM Break

4:00 PM
On the Temperature Limits of Ni-based Superalloys: *Daniel Barba*[1]; Ashton Egan[2]; Michael Mills[2]; Roger Reed[1]; [1]University of Oxford; [2]Ohio State University

4:20 PM
Low and Intermediate Temperature Shear Mechanisms of Co-precipitates in IN718: *Christopher Zenk*[1]; Longsheng Feng[1]; Don McAllister[1]; Yunzhi Wang[1]; Michael Mills[1]; [1]The Ohio State University

4:40 PM
The Origin and Stability of Nanostructural Hierarchy in Nickel-base Superalloys: *Subhashish Meher*[1]; Larry Aagesen[1]; [1]Idaho National Laboratory

5:00 PM
Numerical Calculation of Antiphase Boundary Energy of Ni-superalloys: *Mohammad Dodaran*[1]; Ali Hemmasian Ettefagh[1]; Shengmin Guo[1]; Shuai Shao[1]; [1]Louisiana State University

5:20 PM
Nano-twinning in a\y' Precipitate Strengthened Ni-based Superalloy: *Yong Zhang*[1]; Shengyun Yuan[1]; Zhihao Jiang[1]; Jizi Liu[1]; Yizhe Tang[2]; [1]Nanjing University of Science and Technology; [2]Shanghai University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Models and Algorithms for Microscale

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Wednesday PM | February 26, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
"Sintering" Models and Measurements: Data Assimilation for Microstructure Prediction of Nylon Component SLS Additive Manufacturing: *William Rosenthal*[1]; Francesca Grogan[1]; Yulan Li[1]; Erin Barker[1]; Josef Christ[1]; Timothy Pope[1]; Tamas Varga[1]; Chris Barrett[1]; Mathew Thomas[1]; Noah Oblath[1]; Kevin Fox[1]; Malachi Schram[1]; Marvin Warner[1]; Amra Peles[1]; [1]Pacific Northwest National Laboratory

2:20 PM
Multi-scale Modeling of Solidification Microstructure during Powder Bed Fusion: Ryan Lenart[1]; Antonio Magana[1]; *Mohsen Eshraghi*[1]; [1]California State University, Los Angeles

2:40 PM
Large Scale 3D Phase-field Sintering Simulations: Robert Termuhlen[1]; *Hui-Chia Yu*[1]; [1]Michigan State University

3:00 PM
Phase Field Modeling of Microstructure Evolution During Selective Laser Sintering and Post Aging: *Yulan Li*[1]; Erin Barker[1]; William Rosenthal[1]; Francesca Grogan[1]; Amra Peles[1]; [1]Pacific Northwest National Laboratory

3:20 PM
A New Phase-field Model with Anisotropic Interface Width for the Highly Anisotropic Growth of Ice Dendrites: *Gilles Demange*[1]; Renaud Patte[1]; Helena Zapolsky[1]; [1]University Of Rouen

3:40 PM Break

4:00 PM
Direct Consideration of Vacancies in CALPHAD Modelling of Zirconium Carbide: *Theresa Davey*[1]; Ying Chen[1]; [1]Tohoku University

4:20 PM
Multi-scale Modelling of Coarsening Process in the Ag-Cu Alloy: *Bence Gajdics*[1]; Helena Zapolsky[2]; Zoltán Erdélyi[1]; Gilles Demange[2]; János Tomán[1]; [1]University of Debrecen; [2]University of Rouen

4:40 PM
PRISMS-Plasticity: An Open-source Crystal Plasticity Finite Element Software: *Mohammadreza Yaghoobi*[1]; Sriram Ganesan[2]; Srihari Sundar[2]; Aaditya Lakshmanan[2]; Aeriel Murphy-Leonard[1]; Shiva Rudraraju[3]; John Allison[1]; Veera Sundararaghavan[2]; [1]Materials Science and Engineering, University of Michigan, Ann Arbor; [2]Aerospace Engineering, University of Michigan, Ann Arbor; [3]Mechanical Engineering, University of Michigan, Ann Arbor

5:00 PM
Robust and Accurate Self-consistent Homogenization of Elasto-viscoplastic Polycrystals: *Miroslav Zecevic*[1]; Ricardo Lebensohn[1]; [1]Los Alamos National Laboratory

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications VIII — Session IV

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Hsin-jay Wu, National Chiao-tung University; Tiejun Zhu, Zhejiang University

Wednesday PM | February 26, 2020
Miramar | Marriott Marquis Hotel

Session Chairs: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen

2:00 PM Invited
Thermoelectric Half Heusler Systems {Nb,Ta}FeSb - Ti1+xFe1.33-xSb: *Peter Rogl*[1]; Andrij Grytsiv[2]; Vitaliy Romaka[2]; Ali Tavassoli[2]; Gerda Rogl[2]; Ernst Bauer[2]; [1]Institute of Materials Chemistry, Universitaet Wien; [2]Universitaet Wien

2:20 PM Invited
Polar Tintermetallics as High Temperature Thermoelements: *Franck Gascoin*[1]; [1]CRISMAT-UNICAEN-CNRS

2:40 PM Invited
Thermal Storage Effect on Thermoelectric Module: *Albert T. Wu*[1]; Chun-Hsien Wang[1]; Yu-Chien Wang[1]; [1]National Central University

3:00 PM
Black Phosphorus and Semiconducting Transition Metal Dichalcogenides in Contact with Transparent Conductive Oxides for High Efficiency Solar Cells: *Ravindra Mehta*[1]; Avra Bandyopadhyay[1]; Anupama Kaul[1]; [1]University of North Texas

3:20 PM Invited
Laser Additive Manufacturing of Bismuth Telluride and Silicide Thermoelectric Materials: *Saniya Leblanc*[1]; Haidong Zhang[1]; Ryan Welch[1]; George Nolas[2]; Yohann Thimont[3]; [1]George Washington University; [2]University of South Florida; [3]Universite Paul SABATIER CIRIMAT

3:40 PM Break

4:00 PM Invited
Lattice Hardening Due to Vacancy Diffusion in $(GeTe)_mSb_2Te_3$ Alloys: *Alexandra Zevalkink*[1]; Wanyue Peng[1]; David Smiadak[1]; Michael Boehlert[1]; Spencer Mathers[1]; Jared Williams[1]; Donald Morelli[1]; [1]Michigan State University

4:20 PM
Realizing the Compositional Homogeneity in GeTe-based Thermoelectric Materials and Phase Transition Behavior: *Yi-Fen Tsai*[1]; Pai-chun Wei[2]; Hsin-Jay Wu[1]; [1]National Chiao-Tung University; [2]Computer, Electrical, and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST)

4:40 PM
Optimizing Power Factor in Rare Earth-free CoSb3-Skutterudite Thin Films: *Cédric Bourgès*[1]; Isao Ohkubo[1]; Naohito Tsujii[1]; Takao Mori[1]; [1]NIMS

5:00 PM
Severe Plastic Deformation (SPD) via High Pressure Torsion (HPT) a Perfect Tool not Only to Enhance ZT of Thermoelectric Materials but Also to Produce Them: *Gerda Rogl*[1]; Ernst Bauer[2]; Michael Zehetbauer[3]; Peter Rogl[3]; [1]CDL University of Vienna; [2]TU Wien; [3]University of Vienna

5:20 PM Concluding Comments

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Properties of Aluminum Alloys II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Wednesday PM | February 26, 2020
1A | San Diego Convention Ctr

Session Chair: Kumar Sundaram, Novelis

2:00 PM Introductory Comments

2:05 PM
Hemming Evolution of 6xxx Aluminum Alloys in the Course of Natural Aging Following the Continuous Annealing: Mehdi Lalpoor[1]; Ellen Lambrechts[2]; *Alexis Miroux*[1]; Christian Bollmann[3]; Chengchao Yu[4]; [1]Aleris Aluminum Duffel BVBA; [2]Gent University; [3]Aleris Rolled Products Germany GmbH; [4]RWTH Aachen University

2:30 PM
The Effect of Deformation Mode and Microstructure on the IGC Susceptibility of Al Mg Si Cu Alloys for Automotive Applications: *Roland Mueller-Jena*[1]; Joachim Becker[2]; Tobias Beyer[3]; Thomas Hentschel[4]; Marcel Rosefort[3]; Andreas Stieben[2]; Daniela Zander[1]; [1]RWTH Aachen University; [2]Otto Fuchs KG; [3]TRIMET Aluminium SE; [4]Hydro Aluminium Rolled Products GmbH

2:55 PM
Evolution of Grain Refinement in AA5083 Sheet Metal Processed by ECAP: *Christian Illgen*[1]; Philipp Frint[1]; Maximilian Gruber[2]; Wolfram Volk[2]; Martin Wagner[1]; [1]Institute of Materials Science and Engineering, Technische Universität Chemnitz; [2]Chair of Metal Forming and Casting, Technische Universität München

3:20 PM
Mechanical and Micro-structural Behavior of Dissimilar AA2014-T6 and AA7075-T6 Aluminium Alloys Joined by Friction Stir Welding.: Mohammad Adil[1]; *Jyoti Mukhopadhyay*[2]; [1]31, Adad Urdu Mohalla; [2]IIT Gandhinagar

3:45 PM Break

4:00 PM
High Strength Nanotreated Filler Material for TIG Welding of AA6061: *Maximilian Sokoluk*[1]; Gongcheng Yao[1]; Shuaihang Pan[1]; Chezheng Cao[1]; Xiaochun Li[1]; [1]University of California Los Angeles

4:25 PM
Optimization of Thermo-mechanical Processes for Continuous Casting Products using High Aluminum - Magnesium Alloys in Automotive Industry Applications: *Ali Ulus*[1]; Görkem Demir[1]; Ali Ulas Malcioglu[1]; Sümbüle Sagdiç[1]; [1]Asas Aluminium

4:50 PM
Plastic Flow of AA6013-T6 at Elevated Temperatures and Subsequent Reaging to Regain Full Strength: *Katherine Rader*[1]; Louis Hector[2]; Jon Carter[2]; Eric Taleff[1]; [1]University of Texas at Austin; [2]General Motors

---

LIGHT METALS

Aluminum Reduction Technology — Alumina: Transport Systems, Feeding and Dissolution

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Jayson Tessier, Alcoa

Wednesday PM | February 26, 2020
6D | San Diego Convention Ctr

Session Chair: Kristian Etienne Einarsrud, Norwegian University of Science and Technology

---

2:00 PM Introductory Comments

2:05 PM
Lab Scale Experiments on Alumina Raft Formation: *Sindre Engzelius Gylver*[1]; Åste Hegglid Follo[1]; Henrik Gudbrandsen[2]; Asbjørn Solheim[2]; Kristian Etienne Einarsrud[1]; [1]Norwegian University of Science and Technology; [2]SINTEF Industry

2:25 PM
Mass- and Heat Transfer During Dissolution of Alumina: *Asbjorn Solheim*[1]; Egil Skybakmoen[1]; [1]SINTEF Industry

2:45 PM
The Rate of HF Formation During Addition of Alumina to Cryolite Melts
: *Karen Osen*[1]; Dian Mughni Felicia[2]; Christian Rosenkilde[3]; Camilla Sommerseth[4]; Ole Kjos[1]; [1]Sintef; [2]Tenth of November Institute of Technology; [3]Norsk Hydro ASA; [4]SINTEF Helgeland

3:05 PM
Validation of the Gravimetric Method to Properly Follow Alumina Dissolution in Cryolithic Bath: *Jonathan Alarie*[1]; Thomas Roger[1]; László Kiss[1]; Sándor Ponsák[1]; Sébastien Guérard[2]; Jean-François Bilodeau[2]; [1]University of Quebec at Chicoutimi; [2]Rio Tinto

3:25 PM
Development of a Mathematical Model to Simulate Raft Rormation: *Thomas Roger*[1]; Laszlo Kiss[1]; Sandor Poncsak[1]; Kirk Fraser[2]; Sébastien Guérard[3]; Jean-François Bilodeau[3]; [1]Universite Du Quebec A Chicoutimi; [2]National Research Council Canada; [3]Rio Tinto Aluminium

3:45 PM Break

4:00 PM
Efficient Alumina Handling: Arne Hilck[1]; *Jan Paepcke*[1]; Michael Altmann-Rinck[1]; Andrej Meinhardt[1]; [1]Claudius Peters Projects GmbH

4:20 PM
Status Analysis of Particle Size Distribution and Attrition Index of the Smelter Grade Alumina: *Youjian Yang*[1]; Xiaojuan Pang[1]; Junfeng Qi[1]; Wenju Tao[1]; Zhaowen Wang[1]; Fengguo Liu[1]; Aimin Liu[1]; Jiangyu Yu[1]; Bingliang Gao[1]; Zhongning Shi[1]; Xin Shu[2]; [1]Northeastern University; [2]Hunan Aerospace TianLu Advanced Material Testing Co., Ltd.

4:40 PM
The Effect of Hard Grey Scale Deposition on the Wall Heat Flux of a Cold Finger: *Daniel Clos*[1]; Petter Neksså[2]; Sverre Johnsen[3]; Ragnhild Aune[1]; [1]Norwegian University of Science and Technology; [2]SINTEF Energy; [3]SINTEF Industry

5:00 PM
The Application of the "Intelligent Breaking & Feeding Technology" for Aluminum Pot Line: *Hong Bo*[1]; Tian Qinghong[1]; Chen Zhiyang[1]; Tan Xiaotian[1]; Yu Shiping[1]; [1]Guiyang Aluminum Magnesium Design & Research Institute Co Ltd

---

CHARACTERIZATION

Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials III — Applications in Alloys and Ceramics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; David Seidman, Northwestern University; Keith Knipling, Naval Research Laboratory; Gregory Thompson, University of Alabama; Simon Ringer, University of Sydney; Arun Devaraj, Pacific Northwest National Laboratory; Gang Sha, Nanjing University of Science and Technology

Wednesday PM | February 26, 2020
Theater A-1 | San Diego Convention Ctr

Session Chairs: Keith Knipling, U.S. Naval Research Laboratory; Arun Devaraj, Pacific Northwest National Laboratory

---

2:00 PM Invited
Material Alterations in Intense Mechanical and Chemical Contacts: Shanoob Balachandran Nair[1]; David Mayweg[1]; Yu Qin[1]; Ebrahim Norouzi[1]; Lutz Morsdorf[1]; Alfons Fischer[1]; Dierk Raabe[1]; *Michael Herbig*[1]; [1]Max-Planck-Institut fuer Eisenforschung

2:30 PM Invited
Coupled APT and TEM Investigation of Cu Assisted Nucleation of L12 Precipitates in FCC-based High Entropy Alloys: Bharat Gwalani[1]; Sriswaroop Dasari[1]; Vishal Soni[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas

3:00 PM
Atom Probe Tomography of Refractory High Entropy Alloys: *Patrick Callahan*[1]; David Beaudry[1]; Noah Philips[2]; Keith Knipling[1]; [1]Naval Research Laboratory; [2]ATI Specialty Alloys and Components

3:20 PM
Understanding Early Stages of Nanoscale Hydriding and Oxidation Mechanisms in Metallic Systems via Atom Probe Tomography and Multimodal Chemical Imaging: *Elizabeth Kautz*[1]; Sten Lambeets[1]; Bharat Gwalani[1]; Daniel Perea[1]; Daniel Schreiber[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory - PNNL

3:40 PM Break

4:00 PM
Elucidating Solute Clustering and Precipitation of Al-Cu-Mg-Ag-Si Model Alloys: *Jiehua Li*[1]; Zhiehng An[2]; Fredrik Hage[3]; Quentin Ramasse[3]; Gang Sha[2]; [1]University of Leoben; [2]Nanjing University of Science and Technology; [3]SuperSTEM Laboratory

4:20 PM
Elemental Re-distribution Inside Shear Bands Revealed by Correlative Atom-probe Tomography and Electron Microscopy in a Deformed Metallic Glass: *Shanoob Balachandran Nair*[1]; Jiri Orava[2]; Mathias Köhler[1]; Andrew Breen[1]; Ivan Kaban[2]; Dierk Raabe[1]; Michael Herbig[1]; [1]Max Planck Institute for Iron Research; [2]IFW Dresden

4:40 PM
Atom Probe Tomography Study of Fission Products in Neutron Irradiated U-Mo Fuel: *Maalavan Arivu*[1]; Andrew Hoffman[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

5:00 PM
Evolution of Multi-phase Microstructure and Mechanical Properties of 12Cr-10Ni-Mo-Ti Maraging Stainless Steel: *Honglin Zhang*[1]; Mingyue Sun[1]; Bin Xu[1]; Dianzhong Li[1]; [1]Institute of Metal Research

5:20 PM
Characterization of Mechanical Properties of the A356 Cast Aluminum Alloy in Accordance with the Cluster Formation Behaviors at Different Aging Temperatures: *Won Sang Shin*[1]; Kyo Jin Hwang[1]; Dong-Hyuk Jung[1]; Yoon-Jun Kim[1]; [1]Inha University

5:40 PM
APT-based Stoichiometry Measurements of Single Crystal ThO_2: *Amrita Sen*[1]; Mukesh Bachhav[2]; Janelle Wharry[1]; [1]Purdue University; [2]Idaho National Laboratory

---

BIOMATERIALS

Bio-Nano Interfaces and Engineering Applications — Bio-Nano Interfaces II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Wednesday PM | February 26, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University

---

2:00 PM Keynote
Advances in Printing of Polymers at Small Length Scales: *Roger Narayan*[1]; [1]University of North Carolina

2:30 PM Invited
Bioinspired Mineralization of Natural Polymers for Biomedical Applications: *Conrado Aparicio*[1]; [1]University Of Minnesota

3:00 PM Invited
Biomimetic Nanointerface Functionalized Microchip for Highly Selective and Efficient Enrichment of Circulating Tumor Cells: *Chaoyong Yang*[1]; Lingling Wu[2]; [1]Xiamen University; [2]Shanghai Jiao Tong University

3:30 PM Break

3:45 PM Invited
Cancer Cell Mechanics: The Role of Actin: *Dinesh Katti*[1]; Sharad Jaswandkar[1]; H M Nasrullah Faisal[1]; Kalpana Katti[1]; [1]North Dakota State University

4:15 PM Invited
The Internal Nano-interfaces of Spider Silk: Finding the Molecular-scale Origins of its Strength: Qijue Wang[1]; *Hannes Schniepp*[1]; [1]The College of William & Mary

4:45 PM Invited
Engineering Peptides for Nanomaterials: *Handan Acar*[1]; [1]University of Oklahoma

5:15 PM
Molecular Recognition and Assembly of Biomaterials: Computational and Data Science Tools for Property Predictions: *Hendrik Heinz*[1]; [1]University of Colorado Boulder

BIOMATERIALS

Biological Materials Science — Bioenabled Materials

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Wednesday PM | February 26, 2020
Leucadia | Marriott Marquis Hotel

Session Chairs: Claire Acevedo, University of Utah; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); Isaac Nelson, Sandia National Laboratories

2:00 PM
Biomimetic Design Principles for Honeycomb Design: A Comparative Study of Honeybee and Wasp Nest Geometry: *Derek Goss*[1]; Clint Penick[2]; Alex Grishin[3]; Sridhar Niverty[1]; Dhruv Bhate[1]; Nikhilesh Chawla[1]; [1]Arizona State University; [2]Kennesaw State University; [3]Phoenix Analysis & Design Technologies, Inc.

2:20 PM
Hierarchical Architecture in Jamming Technology for Soft Robotics: *Albert Matsushita*[1]; Luis Garcia[1]; Zida Liu[1]; Jennifer Doan[1]; Joanna McKittrick[1]; [1]University of California, San Diego

2:40 PM
Characterization of Soft Actuation Through Ultrasonic Atomization: *Han-Joo Lee*[1]; Kenneth Loh[1]; [1]University of California, San Diego

3:00 PM
Microstructure and Nanomechanical Properties of the Ironclad Beetle's Exoskeleton: *Nayeon Lee*[1]; Vina Nguyen[1]; Parker Berthelson[1]; Robert Moser[2]; Raj Prabhu[1]; [1]Mississippi State University; [2]Engineer Research and Development Center

3:20 PM
Active Metamaterial Skins for Friction Coefficient Control: *Yujin Park*[1]; Kenneth Loh[1]; [1]University of California, San Diego

3:40 PM Break

3:55 PM
Electrochemical Studies of Titanium Alloys for Dental Implants: *Jaewan Bae*[1]; Jacob Benoun[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

4:15 PM
Mechanical Behaviors and Toughening Mechanisms of the Natural Bamboo with Gradient Hierarchical Fibers and Water Contents: *Guowei Chen*[1]; Jun Luo[2]; [1]Technion – Israel Institute of technology; [2]Beihang University

4:35 PM
Biocorrosion and Biocompatibility of Advanced Titanium Alloys: *Vilupanur Ravi*[1]; [1]California State Polytechnic University, Pomona

4:55 PM
Measurement of Moisture-dependent Ion Diffusion Constants in Wood Cell Wall Layers using Time-lapse Micro X-ray Fluorescence Microscopy: *Joseph Jakes*[1]; Samuel Zelinka[1]; Christopher Hunt[1]; Peter Ciesielski[2]; Charles Frihart[1]; Danielle Yelle[1]; Leandro Passarini[1]; Sophie-Charlotte Gleber[3]; David Vine[3]; Stefan Vogt[3]; [1]USDA FS Forest Products Laboratory; [2]National Renewable Energy Laboratory; [3]Advanced Photon Source, Argonne National Laboratory

5:15 PM
Phase Stability and Mechanical Properties of the Metastable Beta Ti Alloys with High Oxygen Content and Various Amount of Several Beta Stabilizing Elements: *Dalibor Preisler*[1]; Josef Strasky[1]; Jiri Kozlik[1]; Tereza Kretkova[1]; Lucie Bodnarova[2]; Michaela Janovska[2]; Milos Janecek[1]; [1]Charles University; [2]Czech Academy of Sciences

SPECIAL TOPICS

Bladesmithing 2020 — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Michael West, South Dakota School of Mines & Technology; Roxana Ruxanda, Emerson Climate Technologies Inc.; David Sapiro, Naval Surface Warfare Center

Wednesday PM | February 26, 2020
2 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
Crucible Steel Processing Methods: *Neha John*[1]; Maddox Dockins[1]; Spencer Gellerup[1]; Bryce Freeman[1]; Jordyn Ward[1]; Marcus Young[1]; [1]University of North Texas

2:20 PM
SDSM&T Bladesmithing – British Infantry Sword – Historical Aspects: Austin Holmes[1]; Isaac Hammer[1]; *Jack Carpenter*[1]; George Bernard[1]; Cody Marshall[1]; [1]SDSM&T

2:40 PM
A Higonokami Style Knife: *Thomas Tran*[1]; [1]University of California, Los Angeles

3:00 PM
A Look into a Hirazukuri Tanto, Forged from W2 Steel, Following Differential and Cryogenic Hardening: *Evan Raeker*[1]; [1]University of Michigan

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Structures and Mechanical Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday PM | February 26, 2020
Cardiff | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
Relaxation Phenomena in Severely Deformed Bulk Metallic Glasses: *Jurgen Eckert*[1]; [1]Erich Schmid Institute of Materials Science; Montanuniversität Leoben

2:20 PM Invited
A Quantitative Connection Between Shear Band Mediated Plasticity and Fracture Initiation Toughness of Metallic Glasses: *Ramamurty Upadrasta*[1]; [1]NTU

2:40 PM Invited
Toward Tunable Superelastic Bulk Metallic Glass Composite: Wook Ha Ryu[1]; Hyun Seok Oh[1]; Ji Young Kim[1]; *Eun Soo Park*[1]; [1]Seoul National University

3:00 PM Invited
Stress Breaks Universal Aging Behavior in a Metallic Glass: Amlan Das[1]; Peter Derlet[2]; Chaoyang Liu[1]; Eric Dufresne[3]; *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign; [2]Paul Scherrer Institute; [3]Argonne National Laboratory

3:20 PM Invited
Behaviors of Disordered Alloys Under Various Temperatures and Pressures: *Jianzhong Jiang*[1]; X.D. Wang[1]; Q.P. Cao[1]; D.Z. Zhang[1]; [1]Zhejiang University

3:40 PM Break

4:00 PM Invited
Structural Modifications and their Effect on the Mechanical Properties of a Zr-based Metallic Glass: *Bernd Gludovatz*[1]; Lisa Krämer[2]; Bosong Li[1]; Amir Monfared[1]; Keita Nomoto[3]; Anna Ceguerra[3]; Christoph Gammer[4]; Anton Hohenwarter[2]; Simon Ringer[3]; Jürgen Eckert[4]; Jamie Kruzic[1]; [1]UNSW Sydney; [2]University of Leoben; [3]The University of Sydney; [4]ESI-Leoben

4:20 PM Invited
Small-scale Mechanical Behavior of Metallic Glasses and their Composites: Shristy Jha[1]; Nandita Ghodki[1]; Vahid Hasannaeimi[1]; Maryam Sadeghilaridjani[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

4:40 PM
Evolution of Material Properties in Fragile Bulk Metallic Glasses: *Sydney Corona*[1]; Jong Hyun Na[2]; William Johnson[1]; [1]California Institute of Technology; [2]Glassimetal Technology

5:00 PM Invited
Anelastic Relaxation as a Probe of Structural Evolution of Metallic Glasses: *Michael Atzmon*[1]; Tianjiao Lei[1]; [1]University of Michigan

LIGHT METALS

Cast Shop Technology — Grain Refinement and Cast Structure

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Wednesday PM | February 26, 2020
1B | San Diego Convention Ctr

Session Chair: Philippe Jarry, Constellium

2:00 PM Introductory Comments

2:05 PM
Impact of TiB2 Particle Size Distribution on Grain Refining Effectiveness: *Akihiro Minagawa*[1]; [1]UACJ Corporation/National Institute of Advanced industrial Science and Technology

2:30 PM
Effect of Nucleant Particle Size Distribution on the Grain Refining Efficiency of 7xxx Alloys: *Georges Salloum-Abou-Jaoude*[1]; Philippe Jarry[1]; Pierre Celle[1]; Emmanuelle Sarrazin[1]; [1]Constellium C-Tec

2:55 PM
Impact of Transition-metal Elements on Grain Refiner Performance in AA6061: *Elli Tindall*[1]; Samuel Wagstaff[1]; Kathleen Bennett[1]; [1]Novelis

3:20 PM Break

3:35 PM
Application Ultrasonic Technology Processing for Aluminum Treatment While Casting Slabs on Industrial Equipment of UC RUSAL: *Igor Kostin*[1]; Aleksander Krokhin[1]; Viktor Frolov[1]; Aleksey Startsev[1]; Sergei Bochvar[2]; Igor Bobkov[1]; Nikita Lashchukhin[1]; [1]UC RUSAL; [2]IMET RAS

4:00 PM
Influence of Liquid Jet Stirring and In-situ Homogenization on the Intermetallics Formation During DC Casting of a 6xxx Al Alloy Rolling Ingot: *Kumar Sundaram*[1]; Jocie Cracroft[1]; Robert Wagstaff[1]; [1]Novelis

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Corrosion Resistance

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Wednesday PM | February 26, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Ramasis Goswami, Naval Research Laboratory; Donato Firrao, Politecnico di Torino

2:00 PM
Characterization of Corrosion Product Deposits on Fuel Cladding Surface Under Various Heat Flux Conditions: *Yunju Lee*[1]; Junhyuk Ham[1]; Seung Chang Yoo[1]; Ji Hyun Kim[1]; [1]UNIST

2:20 PM
Effect of Dual-phase Stabilization via Varying Ti/Nb Ratios on the Pitting Behavior of AISI 347 Welds: *Amandeep Shahi*[1]; Dikshant Malhotra[1]; [1]SLIET, Longowal

2:40 PM
Effects of Cooling Rate and Ti Addition on Microstructure, Mechanical Properties and Corrosion Characteristics of Laser Deposited Ti-6Al-4V Alloy: *Olawale Fatoba*[1]; Esther Akinlabi[2]; Stephen Akinlabi[2]; Fredeick Mwema[2]; [1]Kent State University; [2]University of Johannesburg

3:00 PM
The Effect of Radiation Damage and Radiolysis on the Corrosion of SiC with and without Corrosion-mitigation Coatings: *Peter Doyle*[1]; Takaaki Koyanagi[2]; Caen Ang[1]; Yutai Kato[2]; Steven Zinkle[1]; David Carpenter[3]; Stephen Raiman[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]Massachusetts Institute of Technology

3:20 PM Break

3:35 PM
Measuring the Thermal Conductivity of Molten Salts Using a Frequency-domain Hot-wire Technique: *Andrew Zhao*[1]; Matthew Wingert[1]; Yasuhiro Kodera[1]; Stephen Obrey[2]; Javier Garary[1]; [1]University of California, San Diego; [2]Los Alamos National Laboratory

3:55 PM
Investigation of Stress Corrosion Crack Initiation Sites in Alloy 600 using 3D EBSD and Local Model: *Naganand Saravanan*[1]; Phani Karamched[1]; Theo Simonet[2]; Emilien Burger[2]; Thierry Couvant[2]; Sergio Lozano-Perez[1]; [1]Department of Materials, University of Oxford; [2]EDF

CHARACTERIZATION

Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification — Microscopy & Machine Learning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee

Program Organizers: Shawn Coleman, CCDC Army Research Laboratory; Tomoko Sano, U.S. Army Research Laboratory; James Hogan, University of Alberta; Srikanth Patala, North Carolina State University; Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Wednesday PM | February 26, 2020
Theater A-3 | San Diego Convention Ctr

Session Chairs: Oliver Johnson, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

2:00 PM Introductory Comments

2:05 PM Invited
Neural Networks for Real-time Processing of Scanning Transmission Electron Microscopy Data: *James LeBeau*[1]; [1]MIT

2:35 PM
Influence of SEM Data Acquisition Parameters on Microstructural Metrics Derived from Machine Learning Image Segmentation in Multi-Phase Ceramics: *Anthony DiGiovanni*[1]; Christian Gobert[2]; William Shoulders[1]; [1]US Army Research Lab; [2]Oak Ridge Associated Universities

2:55 PM
Application of Machine Learning to Microstructure Quantification and Understanding: *Ryan Noraas*[1]; Greg Levan[1]; Asa Fry[1]; Iuliana Cernatescu[1]; [1]Pratt & Whitney

3:15 PM
Adversarial Networks for Microstructure Generation and Modeling Phase Transformation Kinetics: *Wufei Ma*[1]; Elizabeth Kautz[2]; Arun Devaraj[2]; Saumyadeep Jana[2]; Vineet Joshi[2]; Daniel Lewis[1]; Bulent Yener[1]; [1]Rensselaer Polytechnic Institute; [2]Pacific Northwest National Laboratory

CORROSION

Coatings and Surface Engineering for Environmental Protection II — Corrosion Control Session II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Arif Mubarok, PPG; Raul Rebak, GE Global Research; Rajeev Gupta, University of Akron; Tushar Borkar, Cleveland State University; Brian Okerberg, PPG Industries; Michael Mayo, PPG Industries

Wednesday PM | February 26, 2020
19 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Corrosion Study on CFRP-AZ31B Spot Joined by Friction Self-pierce Rivet: *Yong Chae Lim*[1]; Jiheon Jun[1]; Jian Chen[1]; Michael Brady[1]; Donovan Leonard[1]; Charles Warren[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

2:20 PM
Corrosion Challenges in Dissimilar Joint Structures for Automotive Lightweighting: *Hyun Wook Ro*[1]; Egle Puodziukynaite[1]; Loubna Pagnotti[1]; Fuduo Ma[1]; Brian Okerberg[1]; [1]Coating Innovation Center, PPG Industries Inc.

2:40 PM Invited
Corrosion Behavior of Ultrasonic-welded AZ31B and Dual-phase Steel with and without Galvanized Layer: *Jiheon Jun*[1]; Chen Jian[1]; Yong Chae Lim[1]; Michael Brady[1]; Donovan Leonard[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

3:00 PM Invited
First-principles Search for Alloying Elements that Increase Corrosion Resistance of Mg with Transition Metal Impurities: Mingfei Zhang[1]; Louis Hector Jr.[2]; Yang Guo[3]; Ming Liu[3]; *Liang Qi*[1]; [1]University of Michigan; [2]GM Global Technical Center; [3]General Motors R&D China Science Laboratory

3:20 PM
Multi-action Self-healing Coatings for Corrosion Protection: *Dawei Zhang*[1]; Yao Huang[1]; Hongchang Qian[1]; Xiaogang Li[1]; [1]University of Science and Technology Beijing

3:40 PM Break

3:50 PM
Mechanisms of Corrosion Inhibition Afforded by Exfoliated Graphite Nanocomposites: Can Exfoliated Graphite Compete with Graphene?: *Rachel Davidson*[1]; Sarbajit Banerjee[1]; [1]Texas A&M University

4:10 PM
Surface Characterization of FeCrAl Accident Tolerant Fuel Cladding Material After Flow Boiling Testing Under Atmospheric Pressure: *Rajnikant Umretiya*[1]; Jessika Rojas[1]; Mark Anderson[2]; Barret Elward[2]; Raul Rebak[3]; Sama Bilbao y Leon[1]; [1]Virginia Commonwealth University; [2]University of Wisconsin-Madison; [3]GE Global Research

4:30 PM
Ceramic Oxide Coatings for Water Reactors: Corrosion Protection in High Temperature Pressurized Water: *Mattia Cabrioli*[1]; Erkka Frankberg[1]; Matteo Vanazzi[1]; Koba Van Loo[2]; Jef Vleugels[2]; Konstantina Lambrinou[3]; Fabio Di Fonzo[1]; [1]Center for Nano Science and Technology @PoliMi, Istituto Italiano di Tecnologia; [2]KU Leuven, Dept. of Materials Engineering; [3]SCK•CEN

4:50 PM
Fatigue Corrosion Behavior of NiTi Shape Memory Alloy: *Mahdi Mohajeri*[1]; Dimitris C Lagoudas[1]; Homero Castaneda[1]; [1]Texas A&M University

5:10 PM
Can Proteins Secreted by Barnacles Corrode Marine-grade Steel?: *Vinod kumar Murugan*[1]; Harini Mohanaram[1]; Maja Budanovic[1]; Arvind Latchou[1]; Richard Webster[1]; Enrico Marsili[2]; Ali Miserez[1]; Matteo Seita[1]; [1]Nanyang Technological University; [2]Nazarbayev University

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Thermomechanical Properties and Modeling

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Wednesday PM | February 26, 2020
Theater A-9 | San Diego Convention Ctr

Session Chairs: Mahmood Mamivand, Boise State; Kelvin Xe, TAMU; Patrick Burr, UNSW

2:00 PM Invited
Thermochemical and Phase Equilibria (CALPHAD) Modeling of Nuclear Fuel Materials: A Constant in Reactor Development: *Theodore Besmann*[1]; [1]University of South Carolina

2:40 PM
Recent Development of Thermochimica for Simulations of Nuclear Materials: *Max Poschmann*[1]; Bernard Fitzpatrick[1]; Srdjan Simunovic[2]; Markus Piro[1]; [1]University of Ontario Institute of Technology; [2]Oak Ridge National Laboratory

3:00 PM
Thermodynamic Properties at the Rim in High Burnup UO_2 Fuels: *Dillon Frost*[1]; Jessica Veliscek-Carolan[2]; Conor Galvin[1]; Edward Obbard[1]; Michael Cooper[3]; Patrick Burr[1]; [1]UNSW; [2]ANSTO; [3]Los Alamos National Laboratory

3:20 PM
Atypical Melting Behaviour of (Th,U)O2, (Th,Pu)O2 and (Pu,U)O2 Mixed Oxides: Conor Galvin[1]; *Patrick Burr*[2]; Michael Cooper[3]; Paul Fossati[4]; Robin Grimes[5]; [1]UNSW + Imperial; [2]UNSW Sydney; [3]Los Alamos National Laboratory; [4]CEA Gif-sur-Yvette; [5]Imperial College London

3:40 PM Break

4:00 PM Invited
Developing Capabilities to Investigate the Effect of Curvature on the Radiation Response of Solid-state Interfaces: Sisi Xiang[1]; Thien Duong[1]; Emmeline Sheu[1]; Michael Demkowicz[1]; *Kelvin Xie*[1]; [1]Texas A&M University

4:40 PM
Analyzing U-Zr Experimental Data Using Quantitative Phase-field Simulation and Sensitivity Analysis: *Michael Tonks*[1]; Jacob Hirschhorn[1]; Assel Aitkaliyeva[1]; Cynthia Adkins[2]; [1]University of Florida; [2]Idaho National Laboratory

5:00 PM
Mesoscale Modeling and Experiments for Predicting the Thermal Conductivity of UZr Fuels: *Karim Ahmed*[1]; Sean Mcdeavitt[1]; Mitchell Meyer[2]; [1]Texas A&M University; [2]Idaho National Laboratory

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Diffusion, Excitations and Rare Events II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Wednesday PM | February 26, 2020
33C | San Diego Convention Ctr

Session Chairs: Claire Saunders, California Institute of Technology; Camille Bernal, California Institute of Technology

2:00 PM Invited
Thermodynamics of Solids with Chemical, Magnetic and Displacive Degrees of Freedom: *Anton Van Der Ven*[1]; [1]University of California, Santa Barbara

2:30 PM
Anharmonicity in BCC Chromium: *Camille Bernal*[1]; Hillary Smith[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Swarthmore College

2:50 PM
An Exact Formalism for Thermotransport in Liquid and Solid Alloys: *Graeme Murch*[1]; Irina Belova[1]; Tanvir Ahmed[1]; Rafal Kozubski[2]; Zi-Kui Liu[3]; William Wang[4]; Andreas Meyer[5]; [1]University of Newcastle; [2]Jagiellonian University; [3]Pennsylvania State University; [4]Northwestern Polytechnical University; [5]German Aerospace Center

3:10 PM Invited
Direct Solution to the Space-time Dependent Peierls-Boltzmann Transport Equation using an Eigendecomposition Method: *Chengyun Hua*[1]; Lucas Lindsay[1]; Austin Minnich[2]; [1]Oak Ridge National Laboratory; [2]California Institute of Technology

3:40 PM Break

4:00 PM Invited
Non-equilibrium Molecular Dynamics Studies of Shock-induced Phase Transitions: *Ramon Ravelo*[1]; [1]University of Texas El Paso

4:30 PM
Phonons at High Pressure in FeTi: *Bethuel Khamala*[1]; Jorge Munoz[1]; Brent Fultz[2]; [1]The University of Texas at El Paso; [2]California Institute of Technology

4:50 PM
Interplay Between Chemical Bonding and Anharmonicity in Cu_2O: *Claire Saunders*[1]; Dennis Kim[2]; Olle Hellman[3]; Hillary Smith[4]; Douglas Abernathy[5]; Brent Fultz[1]; [1]California Institute of Technology; [2]University of California, Los Angeles; [3]Linköping University ; [4]Swarthmore College; [5]Oak Ridge National Laboratory

5:10 PM
The Anharmonic Origin of the Large Thermal Expansion of NaBr: *Yang Shen*[1]; Claire Saunders[1]; Camille Bernal[1]; Douglas Abernathy[2]; Michael Manley[2]; Brent Fultz[1]; [1]California Institute Of Technology; [2]Oak Ridge National Laboratory

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Continuous Casting

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Wednesday PM | February 26, 2020
17B | San Diego Convention Ctr

Session Chairs: Brian Thomas, Colorado School of Mines; Pavel Ramirez Lopez, Swerim

2:00 PM Invited
Advances on Inspection and Numerical Modelling of Surface Defects During Continuous Casting of Steel: *Pavel Ernesto Ramirez Lopez*[1]; [1]SWERIM AB

2:30 PM Invited
Multiphase Flow-related Defects in Continuous Casting of Steel Slabs: *Seong-Mook Cho*[1]; Mingyi Liang[1]; Hamed Olia[1]; Lipsa Das[1]; Brian Thomas[1]; [1]Colorado School of Mines

3:00 PM
Influence of Various Cast Defects in Fe-Al-Cr-Zr Intermetallics on the High Temperature Oxidation Behavior: *René Pütz*[1]; Emir Subašic[2]; Alexander Gußfeld[2]; Daniela Zander[1]; [1]RWTH Aachen University; [2]Access e.V.

3:20 PM Break

3:40 PM
Analysis of Solidification and Thermal-mechanical Behaviors in Continuous Casting: John Lawrence[1]; Matthew Moore[1]; Xiang Zhou[1]; Haibo Ma[1]; Armin Silaen[1]; *Chenn Zhou*[1]; [1]Purdue University Northwest

4:00 PM
Numerical Simulation of Macrosegregation Behavior of Billet During Continuous Casting: *Yaoguang Li*[1]; Yanhui Sun[1]; Xuesong Bai[1]; Ruimei Chen[1]; Xinxin Lu[1]; [1]University of Science & Technology Beijing

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Grain Boundary Decohesion and Fracture

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Wednesday PM | February 26, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
Microstructural Predictions of Thermo-mechanical Fracture of Hydrided HCP Alloys: *T. Hassan*[1]; I. Mohamed[1]; Mohammed Zikry[1]; [1]North Carolina State University

2:20 PM
Atomic Scale Modeling of Microstructure Effects on the Nucleation, Growth of Voids During Spall Failure of Nanocrystalline Ta: *Shayani Parida*[1]; Jie Chen[1]; Avinash Dongare[1]; [1]University of Connecticut

2:40 PM
Understanding the Evolution of Defects Under Extreme Conditions in BCC Tantalum: *Sumit Suresh*[1]; Avinash Dongare[1]; [1]University of Connecticut

3:00 PM
Modeling Growth of Voids in Various Grain Neighborhoods Using Crystal Plasticity Theory: *Paul Christodoulou*[1]; Toby Francis[1]; Ricardo Lebensohn[2]; Tresa Pollock[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

3:20 PM Invited
Understanding Fracture Initiation Under Bending Conditions in AA6451 Using a Multiscale and Multimodal Electron Microscopy Approach: *Josh Kacher*[1]; Yung Suk Jeremy Yoo[1]; Sazol Das[2]; [1]Georgia Institute of Technology; [2]Novelis

3:40 PM Break

4:00 PM Invited
Fatigue-crack Healing in Pure Nanocrystalline Pt Enabled by Boundary Evolution: Christopher Barr[1]; Ta Duong[2]; Daniel Bufford[1]; Nathan Heckman[1]; Michael Demkowicz[2]; Khalid Hattar[1]; *Brad Boyce*[1]; [1]Sandia National Laboratories; [2]Texas A&M University

4:20 PM
In-situ Investigation of Intergranular Crack Initiation in Hydrogen Embrittled Inconel 725: *Mengying Liu*[1]; Lai Jiang[1]; Emmeline Sheu[1]; Michael Demkowicz[1]; [1]Texas A&M University

4:40 PM
Atomistic Modeling of Effects of Alloy Element and Impurity Segregation on Grain Boundary Embrittlement in BCC Fe: *Axel Seoane*[1]; Ziqi Xiao[1]; Xian-Ming Bai[1]; [1]Virginia Polytechnic Institute and State University

5:00 PM
Stress Induced Fracture Transition in High-temperature 9%Cr-CrMoV Dissimilar Welded Joint: *Tao Wei*[1]; Kai Ding[1]; Bingge Zhao[1]; Yuanheng Zhang[1]; Guanzhi Wu[1]; Yuanfan Wang[1]; Yulai Gao[1]; [1]Shanghai University

LIGHT METALS

Electrode Technology for Aluminum Production — Raw Materials

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Duygu Kocaefe, University of Quebec at Chicoutimi

Wednesday PM | February 26, 2020
3 | San Diego Convention Ctr

Session Chair: Maia Hunt, Rain Carbon

2:00 PM Introductory Comments

2:10 PM
Anhydrous Carbon Pellets – An Engineered CPC Raw Material: *Les Edwards*[1]; [1]Rain Carbon Inc.

2:35 PM
Influence of Particle Shape and Porosity on the Bulk Density of Anode Grade Petroleum Coke: Frank Cannova[1]; *Mike Davidson*[1]; Barry Sadler[2]; [1]BP; [2]Net Carbon Consulting Pty Ltd

3:00 PM
An EXAFS and XANES Study of V, Ni, and Fe Speciation in Cokes for Anodes Used in Aluminum Production: *Gøril Jahrsengene*[1]; Hannah Wells[2]; Camilla Sommerseth[3]; Arne Petter Ratvik[3]; Lorentz Petter Lossius[4]; Katie Sizeland[5]; Peter Kappen[5]; Ann Mari Svensson[1]; Richard Haverkamp[2]; [1]Norwegian University of Science and Technology; [2]Massey University - School of Engineering and Advanced Technology; [3]SINTEF Industry; [4]Hydro Aluminium AS, Primary Metal, Technology; [5]ANSTO

3:25 PM Break

3:45 PM
Additive Selection for Coal Tar Pitch Modification in Aluminum Industry: *Julie Bureau*[1]; Armita Rastegari[1]; Duygu Kocaefe[1]; Yasar Kocaefe[1]; Hans Darmstadt[2]; [1]University of Quebec at Chicoutimi; [2]Rio Tinto

4:10 PM
Charcoal and Use of Green Binder for Use in Carbon Anodes in the Aluminium Industry: *Camilla Sommerseth*[1]; Ove Darell[1]; Barte Øye[1]; Anne Støre[1]; Stein Rørvik[1]; [1]SINTEF Industry

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Perspective, Challenges and Opportunities of Additively Manufactured Alloys in Corrosive Environments / High Temperature Oxidation and Corrosion

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Luke Brewer, University of Alabama; Sebastien Dryepondt, Oak Ridge National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Xiaoyuan Lou, Auburn University

Wednesday PM | February 26, 2020
7A | San Diego Convention Ctr

Session Chairs: Kinga Unocic, Oak Ridge National Laboratory; Sebastien Dryepondt, Oak Ridge National Laboratory

2:00 PM Keynote
Examples of and Opportunities for Tailoring Corrosion Behavior of Materials via Additive Manufacturing: *Kurt Terrani*[1]; [1]Oak Ridge National Laboratory

2:35 PM Invited
Segregation and Microstructural Factors Affecting the Oxidation Behavior of IN 625 Made by Additive Manufacturing: *Brian Gleeson*[1]; Grace Venessa de Leon Nope[1]; Guofeng Wang[1]; [1]University of Pittsburgh

3:00 PM
High Temperature Air Oxidation Behavior of Haynes 282 Processed by Electron Beam Melting (EBM): *Marie Romedenne*[1]; Rishi Pillai[1]; Sebastien Dryepondt[1]; Padraig Stack[2]; [1]Oak Ridge National Laboratory; [2]Akron University

3:20 PM
High Temperature Corrosion of Additively Manufactured Inconel 625: Gouri Bhasale[1]; *Aarush Sood*[1]; Shashi Singh[1]; Amit Pandey[2]; Amber Shrivastava[1]; [1]Indian Institute of Technology Bombay; [2]Ansys Inc.

3:40 PM Break

4:00 PM
High Temperature Oxidation Behavior of Additively Manufactured Inconel 625 Superalloy in Two Directions: *Sedigheh Rashidi*[1]; Amit Pandey[2]; Rajeev Kumar Gupta[1]; [1]University of Akron; [2]Ansys, Inc

4:20 PM Invited
High Temperature Oxidation and Phase Transformations in -TiAl Produced by Additive Manufacturing: *Radoslaw Swadzba*[1]; [1]Research Network LUKASIEWICZ Institute for Ferrous Metallurgy, Poland

4:45 PM
High Temperature Oxidation Behavior of 316L Austenitic Stainless Steel Manufactured by the Selective Laser Melting: *Zhyuan Liang*[1]; [1]Xi'an Jiaotong University

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Stress Corrosion Cracking II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Wednesday PM | February 26, 2020
Theater A-10 | San Diego Convention Ctr

Session Chairs: Yong Yang, University of Florida; Yiren Chen, Argonne National Laboratory

2:00 PM Invited
Comparison of Stress Corrosion Cracking Behavior Between the Addictively Manufactured 316L and Wrought 316 L Stainless Steels: *Yong Yang*[1]; [1]University of Florida

2:40 PM
On the Stress Corrosion Cracking Behavior of a Precipitation-hardened Martensitic Stainless Steel under Atmospheric Exposure Conditions: *Zachary Harris*[1]; Keiko Amino[1]; Patrick Steiner[1]; James Burns[1]; [1]University of Virginia

3:00 PM
Understanding the Effect of Anodic Polarization on SCC Resistance of AA6111-T8 used for Automotive Applications: *Katrina Catledge*[1]; Mark Nichols[2]; Gerald Frankel[1]; Jenifer (Warner) Locke[1]; [1]The Ohio State University; [2]Ford Research and Advanced Engineering

3:20 PM Break

3:40 PM Invited
Cracking of Reactor Core Internal Materials in LWR Environments: *Yiren Chen*[1]; [1]Argonne National Laboratory

4:20 PM
Stress Corrosion Cracking Behavior of Austenitic Stainless Steel SS304 for Dry Storage Canisters in Simulated Sea-water: *Nilesh Kumar*[1]; Leonardi Tjayadi[2]; Korukonda Murty[2]; [1]University of Alabama, Tuscaloosa; [2]NC State University

4:40 PM
Pitting Corrosion Analysis on Austenitic Stainless Steel Welds in Brine for Understanding of Chloride-induced Stress Corrosion Cracking of Spent Nuclear Fuel Dry Storage Canisters: Seunghyun Kim[1]; *Gidong Kim*[1]; Chang-Young Oh[1]; Ji Hyun Kim[2]; Sang-Woo Song[1]; [1]Korea Institute of Materials Science; [2]Ulsan National Institute of Science and Technology

5:00 PM
Mechanistic Studies of Intergranular Stress Corrosion Cracking in Al-Mg Alloys under Atmospheric Exposure Conditions: *Patrick Steiner*[1]; James Burns[1]; [1]University of Virginia

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Translating Innovation into Pioneering Technologies VI

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Wednesday PM | February 26, 2020
Point Loma | Marriott Marquis Hotel

Session Chairs: Ning Zhang, University of Alabama; Jaeyun Moon, University of Nevada Las Vegas

2:00 PM Invited
Metastable Phase Transformation and Deformation Twinning Induced Hardening-stiffening Mechanism in Silicon Nanoparticles: Yu Hong[1]; *Ning Zhang*[2]; Mohsen Asle Zaeem[1]; [1]Colorado School of Mines; [2]University of Alabama

2:20 PM
Synthesis of Micro-encapsulated Phase Change Materials using Chain Transfer Agent via Emulsion Polymerization and its Chemical, Optical and Thermal Characterization: *Sun Choi*[1]; [1]KIST

2:40 PM
The Microstructural Evolution of Nanotwinned Nickel Superalloys: *Joel Bahena*[1]; Andrea Hodge[1]; [1]University of Southern California

3:00 PM
Synthesis of Tailored Nanostructures: *Andrea Hodge*[1]; [1]University of Southern California

3:20 PM Break

3:40 PM
Programmable Self-Assembly of 3D Printed Particles: *David Doan*[1]; Xun Gu[1]; [1]Stanford University

4:00 PM
Electrically Functional Three-dimensional ZnO Nanomesh Architectures Directly Derived from Vapor-phase Infiltration of ZnO in Hierarchically Self-assembled Block Copolymer Thin Film Templates: *Ashwanth Subramanian*[1]; Gregory Doerk[2]; Kim Kisslinger[2]; Daniel Yi[1]; Robert Grubbs[1]; Chang-Yong Nam[2]; [1]Stony Brook University; [2]Brookhaven National Laboratory

4:20 PM
Synthesis and Growth Mechanism of Bismuth Nanoflowers and Their Application for Electrochemical Sensing: *Edward Fratto*[1]; Mary Joens[1]; Jirui Wang[1]; Zhiyong Gu[1]; [1]University of Massachusetts Lowell

4:40 PM
Trade of Technological Advances in the Field of Nanomaterials: *Shah Ashraf*

ADVANCED MATERIALS

High Entropy Alloys VIII — Structures and Mechanical Properties

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday PM | February 26, 2020
Mission Hills | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
Unique Elastic and Plastic Deformation Behavior of a Ductile Refractory High-entropy Alloy at Room and Elevated Temperatures: Chanho Lee[1]; Gian Song[2]; Yi Chou[3]; George Kim[4]; Wei Chen[4]; Ke An[5]; Yi-Chia Chou[3]; *Peter K. Liaw*[1]; [1]University of Tennessee; [2]Kongju National University; [3]National Chiao Tung University; [4]Illinois Institute of Technology; [5]Oak Ridge National Laboratory

2:20 PM Invited
Microstructure and Mechanical Property of FCC HEA with L12 -strengthened Between Cryogenic and Elevated Temperatures: *Che-Wei Tsai*[1]; Chia-Ming Kuo[1]; [1]National Tsing Hua University

2:40 PM Invited
Phase Stability and Deformation Behaviors of CrFeCoNiMox (x=0 – 0.3) High-entropy Alloys: M Naeem[1]; Haiyan He[1]; Bing Wang[1]; *Xun-li Wang*[1]; [1]City University of Hong Kong

3:00 PM Invited
Non-equiatomic, Multi-phase TRIP/TWIP Multi-principal Element Alloys: *Amy Clarke*[1]; Francisco Coury[2]; John Copley[1]; Yaofeng Guo[1]; Jonah Klemm-Toole[1]; Benjamin Ellyson[1]; Jinling Gao[3]; Chandler Becker[1]; Brian Milligan[1]; Christopher Finfrock[1]; Chloe Johnson[1]; Kester Clarke[1]; Wayne Chen[3]; Niranjan Parab[4]; Tao Sun[4]; Kamel Fezzaa[4]; Michael Kaufman[1]; [1]Colorado School of Mines; [2]Universidade Federal de São Carlos; [3]Purdue University; [4]Advanced Photon Source, Argonne National Laboratory

3:20 PM
Microstructural Characterizations and Mechanical Properties of CrFeNiMn and NbTaTiV High Entropy Alloys: *Mohamed Elbakhshwan*[1]; Michael Moorehead[1]; Calvin Parkin[1]; Bo-Shiuan Li[2]; David Armstrong[2]; Angus Wilkinson[2]; Xuan Zhang[3]; Chuan Zhang[4]; Kumar Sridharan[1]; Adrien Couet[1]; [1]University of Wisconsin Madison; [2]University of Oxford; [3]Argonne National Laboratory; [4]CompuTherm LLC.

3:40 PM Break

4:00 PM Invited
High-cycle Fatigue Mechanism in a Body-centered Cubic HfNbTaZrTi High Entropy Alloy: *Weidong Li*[1]; [1]The Goodyear Tire and Rubber Comany

4:20 PM Invited
Enhanced MIC Resistance of AlCoCrFeNiCux High-entropy Alloys by Copper Regulation: *Yunzhu Shi*[1]; Ying Zhao[1]; Tao Liang[1]; Peter Liaw[2]; Bin Yang[3]; [1]Chinese Academic of Sciences, Shenzhen Institute of Advanced Technology; [2]The University of Tennessee; [3]University of Science and Technology Beijing

4:40 PM Invited
Dynamic Behavior of CrMnFeCoNi High-entropy Alloy: *Marc Meyers*[1]; Zezhou Li[1]; Shiteng Zhao[2]; Carlos Ruestes[3]; Bingfeng Wang[4]; Yong Liu[4]; Peter Liaw[5]; Wen Yang[1]; Robert Ritchie[2]; [1]University of California San Diego; [2]Lawrence Berkeley Laboratory; [3]CONICET & Universidad Nacional de Cuyo; [4]Central South University; [5]The University of Tennessee

5:00 PM Invited
On the Damage Tolerance of TRIP, TWIP and Dual-phase High-entropy Alloys: *Bernd Gludovatz*[1]; Hyun Seok Oh[2]; Eun Soo Park[2]; Robert Ritchie[3]; [1]UNSW Sydney; [2]Seoul National University; [3]Lawrence Berkeley National Laboratory

5:20 PM Invited
Studies on Microstructure, Hardness and Corrosion Behavior of the Cu-Fe-Ti-Zr-Nix High Entropy Alloys: *Po-Cheng Kuo*[1]; William Yu[1]; Hsien-Ming Hsiao[2]; Satoshi Iikubo[3]; Yee-Wen Yen[4]; [1]Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei 10672, Taiwan, R.O.C.; [2]Institute of Nuclear Energy Research, Taoyuan 32546, Taiwan, R.O.C.; [3]Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu 808-0196, Japan; [4]National Taiwan University of Science and Technology

MATERIALS DESIGN

Hume-Rothery Symposium: Thermodynamics, Phase Equilibria and Kinetics for Materials Design and Engineering — CALPHAD Thermodynamic and Diffusion Database Development

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Michael Gao, National Energy Technology Laboratory; Wei Xiong, University of Pittsburgh

Wednesday PM | February 26, 2020
32A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Developing CALPHAD Databases for Thermophysical Properties of Metals and Alloys: Hailin Chen[1]; Masoomeh Ghasemi[1]; *Qing Chen*[1]; [1]Thermo-Calc Software AB

2:40 PM Invited
Development of a Comprehensive Diffusion (mobility) Database for Lightweight Magnesium Alloys: *Wei Zhong*[1]; Ji-Cheng Zhao[1]; [1]University of Maryland

3:20 PM Invited
Thermodynamic Assessment of the Fe-B and Fe-B-C- Systems: *Katsunari Oikawa*[1]; Nobufumi Ueshima[1]; [1]Tohoku University

4:00 PM Break

4:20 PM Invited
CALPHAD Databases for Co-based Alloys: *Peisheng Wang*[1]; Ursula Kattner[2]; Carelyn Campbell[2]; Gregory Olson[1]; [1]Northwestern University; [2]National Institute of Standards and Technology

5:00 PM Invited
Diffusion Mobilities in Co-Ni-Al-Cr System: *Kil-Won Moon*[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

MATERIALS DESIGN

ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology; Raymundo Arroyave, Texas A&M University

Wednesday PM | February 26, 2020
30D | San Diego Convention Ctr

Session Chairs: Carelyn Campbell, National Institute of Standards and Technology; James Saal, Citrine Informatics

2:00 PM Invited
Gaps and Barriers to the Successful Integration and Adoption of Practical Materials Informatics Tools and Workflows: *David McDowell*[1]; [1]Georgia Institute of Technology

2:40 PM Invited
Combining Machine Learning and ICME for Alloy Development: *Bryce Meredig*[1]; [1]Citrine Informatics

3:20 PM
Magicmat (MAterials Genome and Integrated Computational MAterials Toolkit) and Its Application for Thermoelectric Materials Design: *Changning Niu*[1]; Ramya Gurunathan[1]; Abhinav Saboo[1]; Jiadong Gong[1]; [1]QuesTek Innovations LLC

3:40 PM Break

4:00 PM Invited
A Bayesian Framework for Materials Knowledge Systems: *Surya Kalidindi*[1]; [1]Georgia Institute of Technology

4:40 PM Invited
Deep Materials Informatics: Illustrative Applications of Deep Learning in Materials Science: *Ankit Agrawal*[1]; [1]Northwestern University

LIGHT METALS

Magnesium Technology 2020 — Corrosion

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Wednesday PM | February 26, 2020
6C | San Diego Convention Ctr

Session Chairs: Bin Li, University of Nevada; Domonkos Tolnai, Helmholtz-Zentrum Geesthacht

2:00 PM Invited
Anomalous Hydrogen Evolution on Magnesium: Aline Gabbardo[1]; *Gerald Frankel*[1]; [1]Ohio State University

2:30 PM
Numerical Investigation of Micro-galvanic Corrosion in Mg Alloys: Role of the Cathodic Intermetallic Phase Size and Spatial Distributions: *Vikrant Beura*[1]; Pulkit Garg[1]; Vineet Joshi[2]; Kiran Solanki[1]; [1]Arizona State University; [2]Pacific Northwest National Laboratory

2:50 PM
The Corrosion Behavior of High Purity Mg According to Process History: Sang Kyu Woo[1]; Byeong-Chan Suh[2]; Nam Ryong Kim[1]; Ha Sik Kim[2]; *Chang Dong Yim*[2]; [1]University of Science and Technology; [2]Korea Institute of Materials Science

3:10 PM
Design of the Magnesium Composite with High Corrosion Resistance and High Deformability: *Yuecun Wang*[1]; Boyu Liu[1]; Zhiwei Shan[1]; [1]Center for Advancing Materials Performance from the Nanoscale, Xian Jiaotong University

3:30 PM Break

3:50 PM Invited
Advanced Immersion Testing of Model Mg Alloys for Biomedical Applications: *Dmytro Orlov*[1]; Lars Wadsö[1]; Andrea Ojdanic[2]; Erhard Schafler[2]; Jelena Horky[3]; Michael Zehetbauer[2]; [1]Lund University; [2]University of Vienna; [3]AIT Austrian Institute of Technology

4:20 PM
Effect of 2 wt % Ag Addition on Corrosion Properties of ZK40 for Biodegradable Applications: *Marwa AbdelGawad*[1]; Bilal Mansoor[1]; Matthew Vaughan[2]; Ibrahim Karaman[2]; [1]Texas A&M University at Qatar; [2]Texas A&M University

4:40 PM
Study of In-vitro Biodegradation Behavior of Mg-2.5Zn-xES Composite: *Srinivasan Murugan*[1]; Paul Okonkwo[1]; Ahmed Bahgat[2]; Gururaj Parande[3]; Aboubakr M. Abdullah[2]; Manoj Gupta[3]; [1]Dhofar University; [2]Qatar University; [3]National University of Singapore

5:00 PM
Corrosion Behavior of Squeeze Cast Mg Alloy AM60-based Hybrid Nanocomposite: *Hongfa Hu*[1]; [1]University of Windsor

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Salt Properties and Fundamental Science

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Stephen Raiman, Oak Ridge National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory

Wednesday PM | February 26, 2020
Theater A-6 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
In-situ Spectro-electrochemistry of Molten Chloride Salts: *Ruchi Gakhar*[1]; William Phillips[1]; Steven Frank[1]; [1]Idaho National Laboratory

2:20 PM
X-ray Absorption Studies to Elucidate Structure and Speciation of Metals in Molten Salt Systems: *Simerjeet Gill*[1]; Jiahao Huang[2]; Julia Mausz[3]; Kotaro Sasaki[1]; Mehmet Topsakal[1]; Ruchi Gakhar[4]; William Phillips[4]; Lingfeng He[4]; Shannon Mahurin[5]; Phillips Halstenberg[6]; Lynne Ecker[1]; Anatoly Frenkel[2]; [1]Brookhaven National Lab; [2]Stony Brook University; [3]University of Montpellier; [4]Idaho National Laboratory; [5]Oak Ridge National Laboratory; [6]The University of Tennesse

2:40 PM
Thermophysical-properties Characterization of a Quaternary Novel Salt based on Na+/K+ and NO3-/Cl- System: *Matias Castro*[1]; Daniel Faundez[1]; Carlos Lopez[2]; Alvaro Videla[1]; [1]Pontificia Universidad Católica de Chile; [2]Salmag, Albemarle

3:00 PM
Kinetic Properties of Fe^{2+}/Fe, Ni^{2+}/Ni, Cr^{2+}/Cr and Cr^{3+}/Cr Reactions in Molten $MgCl_2$-KCl-NaCl Salt: *Qiufeng Yang*[1]; Jinsuo Zhang[1]; [1]Virginia Tech

3:20 PM Break

3:40 PM
Molten Salt Property Determination and Corrosion Characterization Using Transient Grating Spectroscopy: *Sean Robertson*[1]; Michael Short[1]; [1]MIT

4:00 PM
Thermochemical Modeling and Development of the MSTDB Database for Simulating Molten Salt Reactors: *Theodore Besmann*[1]; Kaitlin Johnson[1]; Johnathan Ard[1]; Jacob Yingling[1]; Vancho Kocevski[1]; Matthew Christian[1]; Jacob McMurray[2]; Stephen Utlak[2]; Markus Piro[3]; [1]University of South Carolina; [2]Oak Ridge National Laboratory; [3]Ontario Tech

4:30 PM
Development of Experimental Vehicle Technology for the Versatile Test Reactor to Investigate the Effects of Fast Neutron Irradiation on Molten Salts: *adam burak*[1]; Sheng Zhang[1]; Xiaodong Sun[1]; [1]University of Michigan

MATERIALS DESIGN

Materials Design Approaches and Experiences V — Light Metals

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Akane Suzuki, GE Research; Ji-Cheng Zhao, University of Maryland; Michael Fahrmann, Haynes International; Qiang Feng, University of Science and Technology Beijing; Michael Titus, Purdue University

Wednesday PM | February 26, 2020
33A | San Diego Convention Ctr

Session Chairs: Amit Shyam, Oak Ridge National Laboratory; Michael Titus, Purdue University

2:00 PM Invited
Microstructural Design for Advanced Aluminium and Magnesium Alloys: *Jian-Feng Nie*[1]; [1]Monash University

2:30 PM
Strength Prediction in a Quaternary Mg Alloy System Using a Multi-scale Optimization Framework: *Stephen Dewitt*[1]; Brian Puchala[1]; Qianying Shi[1]; Anirudh Raju Natarajan[2]; Chaoming Yang[1]; Anton Van der Ven[2]; Liang Qi[1]; John Allison[1]; [1]University of Michigan; [2]University of California, Santa Barbara

2:50 PM Invited
Titanium Alloy and Process Design: Gaining Insights Through Multi-scale Computation and Comparison with Experiments: *Yang Rui*[1]; [1]Institute of Metal Research Ca

3:20 PM Break

3:40 PM Invited
On the Use of Multiscale Modeling Strategies to Design Precipitation-hardened Al Alloys: Sha Liu[1]; Ioannis Papadimitriou[1]; Bárbara Bellón[2]; Hong Liu[3]; Gustavo Esteban-Manzanares[1]; Rodrigo Santos-Güemes[2]; *Javier Llorca*[2]; [1]IMDEA Materials Institute; [2]IMDEA Materials Institute & Technical University of Madrid; [3]Katholieke Universiteit Leuven

4:10 PM
Non-equilibrium Interfacial Solute Segregation as a Thermal Stabilization Mechanism in Al-Cu Alloys: *Amit Shyam*[1]; Dongwon Shin[1]; Jonathan Poplawsky[1]; James Morris[2]; Patrick Shower[3]; Lawrence Allard[1]; Matthew Chisholm[1]; Thomas Watkins[1]; Sumit Bahl[1]; Allen Haynes[1]; [1]Oak Ridge National Laboratory; [2]Ames Laboratory; [3]GE Global Research

MATERIALS PROCESSING

Materials Processing Fundamentals — Thermodynamic Modeling

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Metal; Sam Wagstaff, Novelis Inc.; Antoine Allanore, Massachusetts Institute of Technology; Fiseha Tesfaye, Abo Akademi University

Wednesday PM | February 26, 2020
13 | San Diego Convention Ctr

Session Chairs: Guillaume Lambotte, Boston Metal; Fiseha Tesfaye, Åbo Akademi University

2:00 PM Invited
Thermodynamic Modeling of as Oxide in the Na2O-CaO-MgO-SiO2 System and its Application to as Oxide Stabilization Process using Glass Formation: Jun-hyung Lee[1]; Sunyong Kwon[1]; Pierre Hudon[1]; *In-Ho Jung*[2]; [1]McGill University; [2]Seoul National University

2:40 PM
Structure-thermodynamics Interrelation for the GeO2 and PdO Containing MgO-saturated Ferrous Calcium Silicate (FCS) Slag Relevant to E-waste Processing: Mohammad Hasan[1]; *M Akbar Rhamdhani*[1]; Mohammad Shuva[2]; Geoffrey Brooks[1]; [1]Swinburne University of Technology; [2]PF Metals

3:00 PM
A Model for the Interaction of Fe with MgO-14.5 wt. % C Refractory Under Flash Ironmaking Conditions: *Rahul Sarkar*[1]; Hong Yong Sohn[1]; [1]University of Utah

3:20 PM
Process of Thermal Decomposition of Lithium Carbonate: *Lei Shi*[1]; Tao Qu[1]; Dachun Liu[1]; Yong Deng[1]; Bin Yang[1]; Yongnian Dai[1]; [1]Kunming University of Science And Technology

3:40 PM Break

4:00 PM
Thermodynamic Modeling of Metal Distribution in Electrolytic Extraction: *Mary Elizabeth Wagner*[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

4:20 PM
The Chemical Stability of MoS_2 in Chloride Eutectic Molten Salt: *Cheng Lv*[1]; Jianxun Song[1]; Yusi Che[1]; Yongchun Shu[1]; Jilin He[1]; [1]Zhengzhou University

4:40 PM
Printed Circuit Board Leach Residue as a Substitute Reducing Agent in Pyrometallurgical Processes: *Desmond Attah-Kyei*[1]; Guven Akdogan[2]; Daniel Lindberg[1]; Christie Dorfling[2]; [1]Aalto University; [2]Stellenbosch University

MATERIALS PROCESSING

Materials Research in Reduced Gravity — Solidification I

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Robert Hyers, University of Massachusetts; Douglas Matson, Tufts University; Michael Sansoucie, NASA MSFC; Shaun McFadden, Ulster University; Jonghyun Lee, Iowa State University; Wilhelmus Sillekens, European Space Agency; Takehiko Ishikawa, JAXA

Wednesday PM | February 26, 2020
18 | San Diego Convention Ctr

Session Chairs: Olga Shuleshova, IFW Dresden; Douglas Matson, Tufts University

2:00 PM
Pattern Formation in Bulk Al-Al2Cu Eutectics: Results from a Recent Microgravity Experiment: *Ulrike Hecht*[1]; Sabine Bottin-Rousseau[2]; Silvère Akamatsu[2]; Melis Serefoglu[3]; Victor Witusiewicz[1]; [1]Access e.V.; [2]Sorbonne University; [3]Koc University

2:20 PM
Nucleation Fronts Growing in Al-Ni Melts Under Reduced Gravity: *Marcus Reinartz*[1]; Stefan Burggraf[2]; Matthias Kolbe[2]; Peter Galenko[1]; Dieter M. Herlach[2]; Markus Rettenmayr[1]; [1]Friedrich Schiller University Jena; [2]German Aerospace Center (DLR)

2:40 PM
Numerical Modeling of Columnar to Equiaxed Transition During Directional Solidification of Al-7wt%Si Alloys in Reduced Gravity: Amirhossein Tabrizi[1]; Chih-Hung Chen[2]; *Alain Karma*[1]; [1]Northeastern University; [2]National Taiwan University

3:00 PM
In-situ Dynamics of Hybrid Eutectic Growth Front Morphologies: the Transparent Alloys Project: *Silvere Akamatsu*[1]; Sabine Bottin-Rousseau[2]; Victor Witusiewicz[3]; Ulrike Hecht[3]; [1]Cnrs; [2]Sorbonne University; [3]Access e.V.

3:20 PM
Chill-cooling of D2 Tool Steel Under Reduced Gravity Conditions: *Jonas Valloton*[1]; Thomas Volkmann[2]; Hani Henein[1]; [1]University Of Alberta; [2]Deutsches Zentrum für Luft- und Raumfahrt (DLR)

3:40 PM Break

4:10 PM
An Overview of a Proposed NASA Flight Experiment on W-heavy Glass-forming Alloy Composites: *Douglas Hofmann*[1]; Scott Roberts[1]; [1]NASA JPL/Caltech

4:30 PM
Kinetics of Solidification in Glass Forming Alloys Under Microgravity Conditions: *Stefanie Koch*[1]; Manoel da Silva Pinto[2]; Gerhard Wilde[2]; Peter Galenko[1]; [1]University Jena; [2]University Muenster

4:50 PM
Metastable Phase Formation in Peritectic Systems Under Terrestrial and Reduced Gravity Conditions: *Olga Shuleshova*[1]; Wolfgang Löser[1]; Thomas Volkmann[2]; Douglas Matson[3]; [1]IFW Dresden, Germany; [2]Institute of Materials Physics in Space, DLR, Germany; [3]Tufts University

5:10 PM
Effect of Convection on Co-Si Solidification Pathway: Insights from Advanced Photon Source Synchrotron XRD: *Evan Baker*[1]; Sangho Jeon[1]; Douglas Matson[1]; [1]Tufts University

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — In-Situ Testing II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Wednesday PM | February 26, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Gregory Thompson, University of Alabama; Scott Mao, University of Pittsburgh

2:00 PM Invited
Influence of Mechanical Loading on Nanocrystalline Stabilized Alloys: *Gregory Thompson*[1]; Jonathan Priedeman[1]; Thomas Koenig[1]; Xuyang Zhou[1]; B. Chad Hornbuckle[2]; Kris Darling[3]; Sean Fudger[3]; Ankit Gupta[4]; Garritt Tucker[4]; [1]University of Alabama; [2]Army Research Laboratory; [3]Army Research Laboratory; [4]Colorado School of Mines

2:40 PM
Extraordinary Tension-compression Asymmetry in Submicron-sized Amorphous Silicon: *Yuecun Wang*[1]; Lin Tian[2]; Evan Ma[3]; Zhiwei Shan[1]; [1]Center for Advancing Materials Performance from the Nanoscale, Xian Jiaotong University; [2]Institute of Materials Physics, University of Göttingen; [3]Department of Materials Science and Engineering, Johns Hopkins University

3:00 PM
Quantitative Analysis on Deformation of a Cu/Cu45Zr55 Multilayered Structure Combining In-Situ Transmission Electron Microscopy and a Finite Element Model: *Yucong Gu*[1]; Qianying Guo[1]; Gregory Thompson[1]; Lin Li[1]; [1]University of Alabama

3:20 PM
Probing the Deformation Mechanisms of Al-matrix Composites with Small-scale Mechanical Testing: *Olivia Donaldson*[1]; Jenna Wardini[1]; Timothy Rupert[1]; [1]University of California, Irvine

3:40 PM Break

4:00 PM
Effects of Microstructures on Superelasticity of CaFe2As2 Single Crystal: *Shuyang Xiao*[1]; John Sypek[1]; Sriram Vijayan[1]; Paul Canfield[2]; Mark Aindow[1]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]Ames Laboratory & Department of Physics and Astronomy

4:20 PM
Ductile Deformation of Nearly Monoatomic Metallic Glass: *Mehrdad Kiani*[1]; Wendy Gu[1]; [1]Stanford University

4:40 PM
Microstructure Characterization and Micro-mechanical Properties of 14YWT Processed With Different Methods: *Cayla Harvey*[1]; Osman El-Atwani[2]; Stuart Maloy[2]; Sid Pathak[1]; [1]University of Nevada, Reno; [2]Los Alamos National Laboratory

5:00 PM
Small Scaled Plasticity in Reversed Hall-patch Region: *Scott Mao*[1]; Xiang Wang[1]; [1]University of Pittsburgh

MATERIALS DESIGN

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, MicroTesting Solutions; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Wednesday PM | February 26, 2020
32B | San Diego Convention Ctr

Session Chair: Saurabh Puri, Microstructure Engineering

2:00 PM Introductory Comments

2:10 PM Keynote
On Crystallographic and Material Hardening Aspects in Ductile Damage of Hexagonal Close Packed Metals: *Shailendra Joshi*[1]; [1]University of Houston

2:50 PM
Microstructure and Micromechanical Field Evolution During Dynamic Recrystallization: A Crystal Plasticity-phase Field Simulation Study: *Supriyo Chakraborty*[1]; Chaitali Patil[1]; Yunzhi Wang[1]; Stephen Niezgoda[1]; [1]Ohio State University

3:10 PM
Synergy Between In-situ HR-DIC and Crystal Plasticity Simulations to Understand Strain Localization in AM 316L Steel: *Manas Upadhyay*[1]; Yanis Balit[1]; Eric Charkaluk[1]; Andrei Constantinescu[1]; [1]École Polytechnique

3:30 PM
Shape Fidelity and Mechanical Response in Micro Pattern Replication by Molding: Bin Zhang[1]; *Mohammad Dodaran*[1]; Shuai Shao[1]; Junseo Choi[1]; Sunggook Park[1]; wenjin Meng[1]; [1]Louisiana State University

3:50 PM Break

4:10 PM Keynote
Numerical Study of Plastic Deformation Mechanisms in a New Generation Fe-TiB2 Steel Composite Using a FFT-based Model: *Julien Genee*[1]; Stephane Berbenni[1]; Nathalie Gey[1]; Julien Guyon[1]; Frederic Bonnet[2]; [1]Laboratoire d'Étude des Microstructures et de Mécanique des Matériaux (LEM3), UMR 7239, CNRS / Université de Lorraine; Laboratory of Excellency DAMAS, Design of Alloy Metals for low-mAss Structures; [2]Research & Development Automotive Products, AcelorMittal Maizières

4:50 PM
Multiscale Modeling to Determine Bulk Material Property from Miniature Specimen Testing: *Farhan Rahman*[1]; Tasnim Hassan[1]; [1]North Carolina State University

5:10 PM
Experimental and Numerical Investigation into Mechanical Degradation of Polymers and Polymer Composites: *Vinamra Agrawal*[1]; Asha-Dee Celestine[1]; Brandon Runnels[2]; [1]Auburn University; [2]University of Colorado Colorado Springs

MATERIALS DESIGN

Metastable Phases and Phase Equilibria: Towards Designing the Next Generation of Alloys — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Bij-Na Kim, Carpenter Additive; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama; Eric Lass, University of Tennessee, Knoxville; Mohsen Asle Zaeem, Colorado School of Mines; Mark Aindow, University of Connecticut; Peeyush Nandwana, Oak Ridge National Laboratory; Dinc Erdeniz, Marquette University; Andrew Bobel, General Motors

Wednesday PM | February 26, 2020
31A | San Diego Convention Ctr

Session Chairs: Mohsen Zaeem, Colorado School of Mines; Andrew Bobel, General Motors; Dinc Erdeniz, Marquette University

2:00 PM Invited
Deformation Mode, Strain Path, and Strain Rate Effects on Austenite to Martensite Transformation in Gen 3 Steels: *Louis Hector*[1]; [1]General Motors R&D Labs

2:30 PM
Resetting Mechanical Property of 9Cr Steel by Segregation Engineering: *Min Seok Kim*[1]; Sang Jun Kim[1]; Ji Won Kim[2]; Eun Soo Park[1]; [1]Seoul National University; [2]Case Western Reserve University

2:50 PM
Deformation Mechanisms in Metastable Fcc Alloys: *Mulaine Shih*[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

3:10 PM Invited
Modeling of Metastable Phase Formation for Sputtered Ti1-xAlxN Thin Films: Sida Liu[1]; Keke Chang[2]; Stanislav Mráz[1]; Xiang Chen[1]; Marcus Hans[1]; Denis Music[1]; Daniel Primetzhofer[3]; *Jochen Schneider*[1]; [1]RWTH Aachen University; [2]RWTH Aachen University; NIMTE, Chinese Academy of Sciences; [3]Uppsala University

3:40 PM Break

4:00 PM
Thermal Decomposition of Quasicrystals in Powder-processed Icosahedral-phase-strengthened Aluminum Alloys: *Hannah Leonard*[1]; Sarshad Rommel[1]; Mingxuan Li[1]; Thomas Watson[2]; Tod Policandriotes[3]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

4:20 PM
Pseudo-in situ Characterization of Phase Transformation in an Al-Cu-Mn-Zr Alloy using Atom Probe Tomography: *Bharat Gwalani*[1]; Elizabeth Kautz[1]; Amit Shyam[2]; Jonathan Poplawsky[2]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Oak Ridge National Laboratory

4:40 PM
Harnessing the Stability of '-Al2Cu at Unprecedented High Temperatures: Dongwon Shin[1]; Amit Shyam[1]; Larry Allard[1]; Matthew Chisholm[1]; Jon Poplawsky[1]; J. Haynes[1]; [1]Oak Ridge National Laboratory

5:00 PM
Formation of Metastable Spiral Patterns during Directional Eutectic Solidification: Saman Moniri[1]; *Ashwin Shahani*[1]; [1]University of Michigan

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Nanocomposites VI: Nanoscience and Nanotechnology in Advanced Composites — Microstructure and Properties of Nanocomposites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Manoj Gupta, National University of Singapore

Wednesday PM | February 26, 2020
Solana | Marriott Marquis Hotel

Session Chair: Manoj Gupta, National University of Singapore

2:00 PM Invited
On the Role of Processing on Microstructural Development and Mechanical Response of Magnesium-based Nanocomposites: Sankaranarayanan Seetharaman[1]; Jayalakshmi Subramanian[2]; Arvind Singh[2]; *Srivatsan Tirumalai. S.*[3]; Manoj Gupta[4]; [1]Ansys Inc; [2]Wenzhou University; [3]The University of Akron; [4]National University of Singapore

2:30 PM Invited
Mechanical Properties of Low Dimensional and Bio-inspired Composites: *Arun Nair*[1]; [1]University of Arkansas

3:00 PM Invited
Microstructure and Mechanical Properties of AA5083-Al_2O_3 Bulk Nanocomposites Produced by Two-step Ultrasonic Casting Technique: *Vishwanatha Hire Math*[1]; Sudipto Ghosh[2]; Cheruvu Kumar[2]; [1]Manipal Institue of Technology Manipal; [2]Indian Institute of Technology Kharagpur

3:30 PM Break

3:50 PM Invited
The Mechanical and Thermal Response of Shape Memory Alloy-reinforced Aluminum Nanocomposites: *Penchal Reddy Matli*[1]; Vyasaraj Manakari[1]; Gururaj Parande[1]; RA Shakoor[2]; T. S. Srivatsan[3]; Manoj Gupta[1]; [1]National University of Singapore; [2]Qatar University; [3]The University of Akron

4:20 PM
Hierarchical 3D Nanolayered Duplex-phase Zr with High Strength, Strain Hardening, and Ductility: *Jie-Wen Zhang*[1]; Wei-Zhong Han[1]; [1]Xi'an Jiaotong University

4:45 PM
Electrical Performance of Bulk Al-ZrB2 Nanocomposites from 2K to 300K: *Shuaihang Pan*[1]; Gongcheng Yao[1]; Jie Yuan[1]; Xiaochun Li[1]; [1]University of California-Los Angeles

5:10 PM Invited
Bioresorbable Nano Hydroxyapatite Reinforced Magnesium Alloplastic Bone Substitute for Biomedical Applications: A Study: *Somasundaram Prasadh*[1]; Vyasaraj Manakari[1]; Gururaj Parande[1]; Srivatsan Tirumalai[2]; Raymond Wong[1]; Manoj Gupta[1]; [1]National University of Singapore; [2]The University of Akron

SPECIAL TOPICS

Nix Award and Lecture Symposium: Mechanistic Understanding of Mechanical Behavior Across Length Scales — Session II

Program Organizers: Michael Mills, The Ohio State University; Kevin Hemker, Johns Hopkins University

Wednesday PM | February 26, 2020
4 | San Diego Convention Ctr

Session Chairs: Seung Min Han, Korea Advanced Institute of Science and Technology; Wendelin Wright, Bucknell University

2:00 PM Invited
Measurement of Mechanical Properties by Nanoindentation: Recent Innovations in Testing Methodology: P Phani[1]; Benoit Merle[2]; Warren Oliver[3]; *George Pharr*[4]; [1]International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI); [2]Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU); [3]Nanomechanics, Inc.; [4]Texas A&M University

2:30 PM Invited
The Role of Solutes and Short Range Order (SRO) in the Deformation of α-Ti Alloys: Ruopeng Zhang[1]; Shiteng Zhao[1]; Yan Chong[1]; Max Poschmann[2]; Eric Rothchild[2]; Colin Ophus[3]; John Morris[2]; Daryl Chrzan[1]; Mark Asta[2]; *Andrew Minor*[1]; [1]University of California Berkeley and Lawrence Berkeley National Laboratory; [2]University of California Berkeley; [3]Lawrence Berkeley National Laboratory

3:00 PM Break

3:30 PM Invited
The Dynamics of Precipitate Shearing in fcc/$L1_2$ Alloys: *Jean-Charles Stinville*[1]; Michael Titus[1]; Daniel Gianola[1]; Tresa Pollock[1]; [1]University of California Santa Barbara

4:00 PM Invited
Early Nanoscale Dislocation Processes and Two Creep Rate Minima in SX Ni-base Superalloys: *Gunther Eggler*[1]; [1]Ruhr-University Bochum

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Lead Refining

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday PM | February 26, 2020
14B | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
Driving Innovation in Lead Acid Batteries: The Focus of the Consortium of Battery Innovation: *Matthew Raiford*[1]; [1]CBI

2:20 PM
The Removal of Arsenic from Lead Bullion via Vacuum Distillation: *Evody Tshijik Karumb*[1]; Patrick Taylor[1]; [1]Colorado School of Mines

2:40 PM
New Technology Copper Removal from Lead by Application of Aluminium - Practical Problems: *Andrzej Cybulski*[1]; [1]LUKASIEWICZ Research Network - Institute of Non-Ferrous Metals Gliwice

3:00 PM
Processing of Polymetallic Materials Requires Flexible and Capable Downstream Refining Technology – Aurubis Lead Refinery as Economic, Modern and Well Integrated Plant at the Site Hamburg: *Christoph Zschiesche*[1]; Ino Bauer[1]; [1]Aurubis AG

3:20 PM Break

3:40 PM
Tin Treatment in Kosaka Lead Smelting: *Kohei Miwa*[1]; Eiji Yamaguchi[1]; Shigeki Satoh[1]; [1]Kosaka Smelting & Refining Co., Ltd.

4:00 PM
True Traceability Enabled by In-line Laser Marking of Lead and Zinc Ingots: *Alex Fraser*[1]; Jean-Michaël Deschênes[1]; [1]Laserax Inc

4:20 PM
Advanced Technologies Reliant on the Properties of Lead: Batteries and More: *Timothy Ellis*[1]; [1]RSR Technologies

4:40 PM
Nucleation and Growth of Lead Sulfate Nanoparticles: *Michael Wall*[1]; Jesse Smith[1]; Marcus Young[1]; Tim Ellis[2]; [1]University of North Texas; [2]RSRT

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Secondary Zinc II

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday PM | February 26, 2020
15A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
The EZINEX® Process for Secondary Zinc Bearing Materials: Massimo Maccagni[1]; *Edoardo Guerrini*[1]; [1]Engitec Technologies

2:20 PM
Technologies for Treatment of Zinc-containing Waste from Metallurgy in KCM AD: Stefan Stoychev[1]; Emil Minchev[1]; Alexander Kyurkchiev[1]; *Georgi Radonov*[1]; Ivan Dobrev[1]; [1]KCM AD

2:40 PM
Zinc Reduction/Vaporization Behavior from Metallurgical Wastes: *Timothy Kerry*[1]; Alexander Peters[1]; Evangelos Georgakopoulos[1]; Ashkan Hosseini[1]; Erik Offerman[1]; Yongxiang Yang[1]; [1]TU Delft

3:00 PM
Recycling of Zinc from Galvanized Steel Scrap: *Shafiq Alam*[1]; V.I. Lakshmanan[2]; R. Sridhar[2]; [1]University of Saskatchewan; [2]Process Research ORTECH Inc.

3:20 PM
Advanced Concept "Poly Metallurgical Refinery" Developed by Cobre Las Cruces: *Carlos Frias Gomez*[1]; Joaquin Gotor[1]; Francisco Sanchez[1]; Jorge Blanco[1]; Natalia Moreno[1]; Edward Vera[1]; [1]Cobre Las Cruces S.A

3:40 PM Break

4:00 PM
Shape and Size Modification of Galvanized Steel Scrap for Introduction to the "HIsarna" Furnace: *Evangelos Georgakopoulos*[1]; Timothy Kerry[1]; Ashkan Hosseini[1]; Erik Offerman[1]; Yongxiang Yang[1]; [1]TU Delft

4:20 PM
Two Step Dust Recycling – A Modern Recycling Technology for High Zinc Containing EAF-dusts: *Michael Auer*[1]; Juergen Antrekowitsch[1]; [1]Montanuniversität Leoben

4:40 PM
Effect of Reducing Agent on Zinc Recovery from Primary Battery Waste in High Temperature Recycling Process: *Burcak Ebin*[1]; Martina Petranikova[1]; Britt-Marie Steenari[1]; Christian Ekberg[1]; [1]Chalmers University of Technology

5:00 PM
Production and Application of Comprehensive Recovery Process of Regenerated Zinc: *Zhao Pengfei*[1]; Dai Jianghong[1]; [1]China ENFI Engineering Corporation

---

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Zinc Leaching & Fe-control II

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon LLC; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China ENFI Engineering Corporation; Etsuro Shibata, Tohoku University

Wednesday PM | February 26, 2020
15B | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM
A New Route for Treating Neutral Leaching Residue: *Caio Oliveira*[1]; Daniel Pereira[1]; Felipe Mendes[1]; [1]Nexa Resources

2:20 PM
Zinc Extraction from Industrial Waste Residue by Conventional Acid Leaching: *Tingfang Xie*[1]; Chenyu Sun[2]; Yongguang Luo[2]; Guojiang Li[1]; Aiyuan Ma[3]; [1]Yunnan Chihong Zn & Ge Co., Ltd; [2]Kunming University of Science and Technology,Yunnan Chihong Zn & Ge Co., Ltd; [3]Liupanshui Normol University

2:40 PM
Study of a Novel Chloride Volatilization Process for the Treatment of Jarosite Residue: *Haibei Wang*[1]; [1]BGRIMM Technology Group

3:00 PM
Magnetic Separation of Iron Ion from Leaching Solution by Magnetic Seeding in Hydrometallurgy: Tong Yue[1]; Haisheng Han[1]; *Wei Sun*[1]; Yuehua Hu[1]; [1]Central South University

3:20 PM Break

3:40 PM
Experimental Study on Pressure Leaching of Zinc Sulfide Concentrate and Discussion on the Latest Relevant Progress: *Haibei Wang*[1]; [1]BGRIMM Technology Group

4:00 PM
Recent Operational Improvements of Hematite Plant at Akita Zinc Co.,Ltd: *Dai Matsuura*[1]; Yasuo Usami[1]; Kenji Ichiya[1]; [1]Akita Zinc Co.,Ltd

4:20 PM
Microwave Drying Behavior of Zinc Leaching Residue: *Xuemei Zheng*[1]; Chenyu Sun[2]; Yongguang Luo[2]; Aiyuan Ma[1]; Song Li[1]; [1]Liupanshui Normal University; [2]Kunming University of Science and Technology

4:40 PM
The Analysis of Fe Behavior in the Zinc Pressure Leaching: *Longyi Chen*[1]; [1]CINF Engineering Co., Ltd.

5:00 PM
Separation of Zinc from Metallurgical Residue in NH3–(NH4)2SO4–H2O System: *Ma Aiyuan*[1]; Chenyu Sun[2]; Yongguang Luo[2]; Guojiang Li[3]; Tingfang Xie[3]; Xuemei Zheng[1]; [1]Liupanshui Normol University; [2]Kunming University of Science and Technology,Yunnan Chihong Zn & Ge Co., Ltd; [3]Yunnan Chihong Zn & Ge Co., Lt

---

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Phase Transformations in Non-Ferrous Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Wednesday PM | February 26, 2020
33B | San Diego Convention Ctr

Session Chairs: Yufeng Zheng, University of Nevada, Reno; Leslie Mushongera, University of Nevada, Reno

---

2:00 PM
Defect Assisted Growth of Fine Scale Alpha in Titanium Alloys: *Abigail Ackerman*[1]; Benjamin Savitzky[2]; Colin Ophus[2]; Mohsen Danaie[3]; Phani Karamched[4]; Angus Wilkinson[4]; David Rugg[5]; David Dye[1]; [1]Imperial College, London; [2]National Center for Electron Microscopy; [3]Electron Physical Sciences Imaging Centre (ePSIC); [4]University of Oxford; [5]Rolls-Royce plc.

2:20 PM
Structural Phase Transformation in Single Crystal Titanium during Dynamic Loading: *Curt Bronkhorst*[1]; Biao Feng[2]; Benjamin Morrow[3]; Ellen Cerreta[3]; [1]University of Wisconsin, Madison; [2]Kimberly-Clark Corporation; [3]Los Alamos National Laboratory

2:40 PM
Tailoring the Microstructure and Mechanical Properties of Metastable Titanium Alloys for Biomedical Applications: *Athos Plaine*[1]; Vitor Pinotti[2]; Murilo da Silva[2]; Claudemiro Bolfarini[2]; [1]State University of Santa Catarina; [2]Federal University of São Carlos

3:00 PM
Effect of Heat Treatments on Microstructures and Mechanical Properties of Ti-5553 Alloy: Ritupurna Sahoo[1]; *Abu Syed Kabir*[1]; [1]Carleton University

3:20 PM
In-situ Investigation of Phase Transformation in Ti-Mo Alloy: *Xiaoqian Fu*[1]; Qian Yu[1]; [1]Zhejiang University

3:40 PM Break

4:00 PM
Effect of Alloying Content on the Discontinuous Precipitation of d Phase in Ni-base Superalloys: *Stoichko Antonov*[1]; Qiang Feng[1]; [1]University of Science and Technology Beijing

4:20 PM
The Impact of the Cooling Rate on Controlling the Grain Boundary Morphology and the Mechanical Properties of Nickel-based Superalloys: *Bader Alabbad*[1]; Sammy Tin[1]; [1]Illinois Institute of Technology

4:40 PM
Synthesis and Properties of Aligned Plate Intermetallic Nanostructures in Ni-based Alloys: *Yang Zhou*[1]; Philip Nash[2]; Fei Zhou[1]; Jun Wang[1]; [1]Shanghai Jiao Tong University; [2]Illinois Institute of Technology

5:00 PM
Phase Field Study of Co-evolution of Gamma Prime , Gamma Double Prime and Delta Precipitates in IN718: Robert Laskowski[1]; Wang Kun[1]; *Rajeev Ahluwalia*[1]; Kewu Bai[1]; Guglielmo Vastola[1]; Yong Wei Zhang[1]; [1]Institute of High Performance Computing

---

ENERGY & ENVIRONMENT

Powder Materials for Energy Applications — Metal Powder Systems

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday PM | February 26, 2020
17A | San Diego Convention Ctr

Session Chairs: Hang Yu, Virginia Tech; Somayeh Pasebani, Oregon State University

---

2:00 PM Invited
Flash Sintering: From Fundamental Science to Energy-saving Materials Processing: *Jian Luo*[1]; [1]University of California, San Diego

2:30 PM
Cold Spray Deposition of 304L Stainless-steel Powder on Used Fuel Dry Cask Storage Systems to Control Potential Stress Corrosion Cracking: *Hwasung Yeom*[1]; Kenneth Ross[2]; John Kessler[3]; Gary Cannell[4]; Jay Rozzi[5]; Frank Pfefferkorn[1]; Kumar Sridharan[1]; [1]University of Wisconsin Madison; [2]Pacific Northwest Research Laboratory; [3]J Kessler and Associates; [4]Fluor Corporation; [5]Creare LLC

2:50 PM
Effect of Particle Spreading Dynamics on Powder Bed Quality: *Yousub Lee*[1]; Kate Gurnon[2]; Srdjan Simunovic[1]; [1]Oak Ridge National Laboratory; [2]GE Global Research

3:10 PM
Fabrication of Uniform-sized Hemispherical Mesopores on Gold-coated Silver Nanocubes for Enzyme Immobilization: *Seongcheol Choi*[1]; Olivia Graeve[1]; [1]University of California, San Diego

3:30 PM
Influence of Powder Microstructure on Cold Spray Deposited Cr Coatings for High Temperature Oxidation Resistance: *Tyler Dabney*[1]; Hwasung Yeom[1]; Greg Johnson[1]; Ben Maier[1]; Mia Lenling[1]; Kumar Sridharan[1]; [1]University of Wisconsin Madison

3:50 PM Break

4:10 PM Invited
Toward New Flash and Energy Efficient Fabrication Processes based on Sintering: *Charles Maniere*[1]; Geuntak Lee[2]; Elisa Torresani[2]; Sylvain Marinel[1]; Lise Durand[3]; Claude Estournès[4]; Eugene A. Olevsky[2]; [1]CRISMAT Laboratory; [2]Powder Technology Laboratory; [3]CEMES; [4]CIRIMAT

4:40 PM
Investigation of the Powder Processing of Near-final Shape AlNiCo Magnets for Eventual Use in Electric Drive Motors: *Emily Rinko*[1]; Iver Anderson[2]; Emma White[2]; Wei Tang[2]; Lin Zhou[2]; Matthew Kramer[2]; [1]Iowa State University; [2]Ames Laboratory

---

MATERIALS PROCESSING

Process Metallurgy and Electrochemistry of Molten Salts, Liquid Metal Batteries, and Extra-terrestrial Materials Processing: An EPD Symposium in Honor of Don Sadoway — Prof. Sadoway Honorary Session II

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Yasuhiro Fukunaka, JAXA/Waseda University

Wednesday PM | February 26, 2020
14A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM
Application of Electronically Mediated Metallothermic Reductions in Molten Salts to Nuclear Materials: *Michael Simpson*[1]; Prashant Bagri[2]; Jarom Chamberlain[1]; [1]University of Utah; [2]Oak Ridge National Laboratory

2:25 PM Invited
Development of a New Electrodeposition Process based on Liquid Metal Electrochemical Technologies in Molten Salt Electrolytes: *Takanari Ouchi*[1]; Shuang Wu[1]; Toru Okabe[1]; [1]The University of Tokyo

2:45 PM Invited
Electrodeposition of Titanium from Alkali Fluoride-Chloride Molten Salts: Yutaro Norikawa[1]; Makoto Unoki[1]; Kouji Yasuda[1]; Koma Numata[2]; Mitsuyasu Ogawa[2]; Masatoshi Majima[2]; *Toshiyuki Nohira*[1]; [1]Kyoto University; [2]Sumitomo Electric Industries, Ltd.

3:05 PM Invited
History of Inventions and Innovations for Aluminum Production: *Michel Reverdy*[1]; Vinko Potocnik[2]; [1]Emirates Global Aluminium; [2]Vinko Potocnik Consultant Inc

3:25 PM Break

3:45 PM Invited
Open-circuit Explosions and Basement Thermite Fires Threaten Aluminum Potlines: *Alton Tabereaux*[1]; [1]Consultant

4:05 PM Invited
Study on Electronically Mediated Reaction (EMR), and What I Learned from Professor Sadoway: *Toru Okabe*[1]; [1]University of Tokyo

4:25 PM Invited
Thermodynamics of Electrode Reactions for Energy Storage, Separation, and Corrosion: *Hojong Kim*[1]; [1]Pennsylvania State University

4:45 PM Invited
Trends and Challenges for Electrowinning of Aluminium and Magnesium from Molten Salt Electrolytes: *Geir-Martin Haarberg*[1]; [1]Norwegian University of Science & Technology

5:05 PM Invited
Extraction of Magnesium from Aluminum Scrap Melts by Molten Salt Electrorefining: *John Hryn*[1]; Subodh Das[2]; Boyd Davis[3]; [1]Argonne National Laboratory; [2]Phinix; [3]Kingston Process Metallurgy

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — High-entropy Alloys

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Wednesday PM | February 26, 2020
31B | San Diego Convention Ctr

Session Chairs: Haiming Wen, Missouri University of Science and Technology; Yaojun Lin, Wuhan University of Technology

2:00 PM Invited
Predictive Multiphase Evolution in Al-containing High-entropy Alloys: Louis Santodonato[1]; *Peter Liaw*[2]; Raymond Unocic[3]; Hongbin Bei[3]; James Morris[4]; [1]Advanced Research Systems; [2]The University of Tennessee; [3]Oak Ridge National Laboratory; [4]Ames Laboratory

2:30 PM Invited
Hierarchical Microstructural Paradigms for Simultaneous Enhancement of Strength and Ductility: *Rajiv Mishra*[1]; [1]University of North Texas

3:00 PM
Microstructure and Mechanical Properties of a Nanostructured High Entropy Alloy Processed via Cryogenic Rolling: *Yaojun Lin*[1]; Zhigang Yan[2]; Fei Chen[1]; [1]Wuhan University of Technology; [2]Yanshan University

3:20 PM
Microstructural Evolution and Mechanical Behavior of an AlCoCrCuFeNi High Entropy Alloy during Non-equilibrium Powder Metallurgical Processing: *Baolong Zheng*[1]; Benjamin MacDonald[1]; Zhiqiang Fu[1]; Yizhang Zhou[1]; Enrique Lavernia[1]; [1]University of California, Irvine

3:40 PM Break

4:00 PM Invited
Spray Formed High Entropy Alloys: *Patrick Grant*[1]; David Armstrong[1]; Zhouran Zhang[1]; [1]University of Oxford

4:30 PM Invited
Experimental Observations of CALPHAD Predicted Phases in High-entropy Alloys: *Reza Abbaschian*[1]; Nicholas Derimow[1]; Benjamin MacDonald[1]; Enrique Lavernia[1]; [1]University of California

5:00 PM
Development of New Magnesium Based Medium Entropy Alloys: Microstructure and Mechanical Properties: Khin Tun[1]; *Tirumalai S. Srivatsan*[2]; Amit Kumar[3]; Manoj Gupta[1]; [1]National University of Singapore (NUS); [2]The University of Akron; [3]Glocal University

5:20 PM
AlFeNiTi Compositionally Complex Alloys: *Daniel Goodelman*[1]; Andrea Hodge[1]; [1]University of Southern California

MATERIALS DESIGN

Purveyors of Processing Science and ICME: A SMD Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin — Advances and Challenges in ICME

Sponsored by: TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Ayman Salem, MRL Materials Resources LLC; Viola Acoff, University of Alabama; Nathan Levkulich, UES; Michael Glavicic, Rolls-Royce; Yufeng Zheng, University of Nevada, Reno; John Rotella, Purdue University

Wednesday PM | February 26, 2020
30E | San Diego Convention Ctr

Session Chairs: Viola Acoff, University of Alabama; Noah Phillips, ATI

2:00 PM Invited
Microstructure Underpins Processing: *Anthony Rollett*[1]; [1]Carnegie Mellon University

2:30 PM Invited
Integrated Materials Development and Manufacturing Process Simulation for Aerospace Applications: *Austin Mann*[1]; Rogie Rodriguez[1]; DeeAnn Deles-Stagner[1]; Colin Wright[1]; Bruno Zamorano Senderos[1]; Ali Yousefiani[1]; [1]Boeing Research & Technology

3:00 PM Invited
Modeling Pore Closure in Titanium Alloys: *Michael Gram*[1]; [1]Titanium Metals Corporation, Henderson, NV

3:30 PM Break

3:50 PM Invited
The Challenges of Refractory Alloy Processing: A Case Study in a Refractory Complex Concentrated Alloy: *Noah Philips*[1]; [1]ATI

4:20 PM
Zoning Thermomechanical Process History Data Using Unsupervised Machine Learning: *Sean Donegan*[1]; Dennis Dimiduk[2]; Michael Groeber[2]; [1]Air Force Research Laboratory; [2]The Ohio State University

4:50 PM Concluding Comments: Adam Pilchak

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Irradiation of Welds & Irradiation of High Entropy Alloys

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Wednesday PM | February 26, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Khalid Hattar, Sandia National Laboratory; Dane Morgane, University of Wisconsin

2:00 PM Invited
Irradiation Effects in Weld Repairs of Irradiated Stainless Steel: *Janelle Wharry*[1]; Keyou Mao[1]; Emmanuel Perez[2]; Yaqiao Wu[3]; Aaron French[4]; Paula Freyer[5]; Lin Shao[4]; Frank Garner[4]; [1]Purdue University; [2]Idaho National Laboratory; [3]Boise State University; [4]Texas A&M University; [5]Westinghouse Electric Company, LLC

2:30 PM
Microstructural Characterization of the Through-wall Thickness Pressure Vessel Weldment of the Zion NPP: *Philip Edmondson*[1]; Thomas Rosseel[1]; Mikhail Sokolov[1]; [1]Oak Ridge National Laboratory

2:50 PM
Irradiation of 14YWT Solid State Capacitive Discharge Welds: *Calvin Lear*[1]; Benjamin Eftink[1]; Stu Maloy[1]; Thomas Lienert[2]; [1]Los Alamos National Laboratory; [2]T.J. Lienert Consulting, LLC

3:10 PM Invited
Reassessment of TRIM Simulations for Damage Production in Materials: *William Weber*[1]; Yanwen Zhang[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

3:40 PM Break

4:00 PM Invited
High Irradiation Resistance of Nanocrystalline W-based High Entropy Alloy: *Enrique Martinez Saez*[1]; Osman El-Atwani[1]; Duc Nguyen-Manh[2]; Matthew Schneider[1]; Nan Li[1]; Meimei Li[3]; Arun Devaraj[4]; Kevin Baldwin[1]; Damian Sobieraj[5]; Jan Wrobel[5]; Stuart Maloy[1]; [1]Los Alamos National Laboratory; [2]CCFE; [3]Argonne National Laboratory; [4]Pacific Northwest National Laboratory; [5]Warsaw University of Technology

4:30 PM
Suppressing Void Swelling in NiCoFeCr-based High Entropy Alloys via Selective Doping: *Zhe Fan*[1]; Yang Tong[1]; Shijun Zhao[1]; Gihan Velisa[1]; Fuxiang Zhang[1]; Hongbin Bei[1]; Yanwen Zhang[1]; [1]Oak Ridge National Laboratory

4:50 PM
Effects of Chemical Complexity and Radiation Parameters on Defect Evolution in Nickel-based Concentrated Solid Solution Alloys: *Pengyuan Xiu*[1]; Li Jiang[1]; Yanwen Zhang[2]; Lumin Wang[1]; [1]Department of Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor; [2]Materials Science and Technology Division, Oak Ridge National Laboratory

5:10 PM
Advanced Electron Microscopy Characterization of Ion Radiation Damage in Bulk Metallic Glass and High Entropy Alloys: *Yang Yang*[1]; Qin Yu[1]; Jun Ding[1]; Ruopeng Zhang[2]; Colin Ophus[1]; Mark Asta[1]; Robert Ritchie[1]; Andrew Minor[1]; [1]Lawrence Berkeley National Laboratory; [2]University of California, Berkeley

5:30 PM
Irradiation Damage Behavior in Novel High-entropy Carbide Ceramics: Fei Wang[1]; Xueliang Yan[1]; Tianyao Wang[2]; Lin Shao[2]; Yaqiao Wu[3]; Michael Nastasi[1]; *Bai Cui*[1]; [1]University of Nebraska-Lincoln; [2]Texas A&M University; [3]Center for Advanced Energy Studies

---

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Fundamentals & Processing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Wednesday PM | February 26, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Kei Ameyama, Ritsumeikan University; Anton Hohenwarter, University of Leoben; Klaus-Dieter Liss, Guangdong Technion - Israel Institute of Technology ; Megumi Kawasaki, Oregon State University

---

2:00 PM Invited
Role of UFG-shell Network on Improving Mechanical Properties in Harmonic Structure Materials: *Kei Ameyama*[1]; [1]Ritsumeikan University

2:20 PM Invited
Testing Old & New Ideas to Address Unresolved Questions in UFGs: *Elias Aifantis*[1]; [1]Aristotle University of Thessaloniki

2:40 PM
Fracture and Ductility of Nanostructured Molybdenum–copper Composites: *Anton Hohenwarter*[1]; Katharina Schwarz[2]; Julian Rosalie[2]; Stefan Wurster[2]; Reinhard Pippan[2]; [1]University of Leoben; [2]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

3:00 PM
Some Features of the Ductile and Gray Iron Micrustructures Providing Increase of their Impact Resistance: *Igor Tkachenko*[1]; Kostyantin Tkachenko[1]; Victoria Miroshnichenko[1]; [1]Priazovskyi State Technical University

3:20 PM
Homogeneous Distribution of Coarse Grain in a Tri-modal Al-based Composites: *Chuandong Wu*[1]; Guoqiang Luo[2]; Qiang Shen[2]; Zhanghua Gan[1]; Jing Liu[1]; Lianmeng Zhang[1]; [1]Wuhan University of Science and Technology; [2]Wuhan University of Technology

3:40 PM Break

4:00 PM Invited
Synchrotron X-ray and Neutron Diffraction – Opportunities for Ultrafine-grained and Hetero-structured Materials: *Klaus-Dieter Liss*[1]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT)

4:20 PM
Strain-Rate Dependence of Flow Stress Hardened by Annealing and Softened by Deformation in Nanostructured Aluminum Processed by Accumulative Roll-Bonding: *Takahiro Kunimine*[1]; Si Gao[2]; Ryoichi Monzen[1]; Nobuhiro Tsuji[2]; [1]Kanazawa University; [2]Kyoto University

4:40 PM
Synthesis of an Ultrafine-grained Metastable Al Alloy through Mechanical Bonding by High-pressure Torsion: *Megumi Kawasaki*[1]; Jae-Kyung Han[1]; Terence Langdon[2]; [1]Oregon State University; [2]University of Southampton

5:00 PM
The Influence of Severe Plastic Deformation on Phase Transformations in a Metastable Beta Titanium Alloy Ti15Mo: *Milos Janecek*[1]; Kristina Bartha[1]; Josef Strasky[1]; Anna Veverkova[2]; Pere Barrioberro Vila[3]; Jozef Vesely[1]; Peter Minarik[1]; Jakub Cizek[1]; Irina Semenova[2]; Veronika Polyakova[2]; [1]Charles University; [2]Ufa State Aviation Technical University; [3]German Aerospace Center

5:20 PM
Heterogeneous Lamella Phases Make 2205 Stainless Steel with Superior Strength and Ductility: *Peiqing La*[1]; Yu Shi[1]; [1]Lanzhou University of Technology

---

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Equation of State

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Wednesday PM | February 26, 2020
5A | San Diego Convention Ctr

Session Chair: Jie Chen, Los Alamos National Laboratory

2:00 PM
On the hcp-bcc Phase Transformation in Magnesium Shock Compressed up to 60 GPa: *Cyril Williams*[1]; Nicholas Lorenzo[1]; [1]US Army Research Laboratory

2:20 PM
Low-stress Shock Hugoniot of Additively Manufactured 304L Stainless Steel: *Sarah Thomas*[1]; M. Cameron Hawkins[1]; Robert Hixson[1]; [1]MSTS

2:40 PM Invited
Meso-scale Topology Effects on the Shock Compression Response of Reactive Powder Mixtures: *Manny Gonzales*[1]; Lauren Poole[2]; Austin Gerlt[3]; Zachary Cordero[4]; [1]Materials and Manufacturing Directorate, Air Force Research Laboratory, WPAFB, OH 45433; [2]Materials Department, University of California at Santa Barbara, Santa Barbara; [3]Materials and Processes Division, UES, Inc.; [4]Materials Science and NanoEngineering, Rice University

3:00 PM
Determination of Equation of State in Polyurea Elastomers via Reverberation and Hydrodynamic Instability Experiments: *Tyler Eastmond*[1]; Elizabeth Fortin[1]; Zak Wilde[2]; Kirk Bohlen[1]; Jay Oswald[1]; Pedro Peralta[1]; [1]Arizona State University; [2]Los Alamos National Laboratory/Arizona State University

3:20 PM
Observation of Metal Particle Deformation inside a Shock Compressed Polymer: *David Bober*[1]; Moono Rhee[1]; Nathan Barton[1]; Mukul Kumar[1]; [1]Lawrence Livermore National Laboratory

3:40 PM Break

4:00 PM
Mechanical Behavior and Deformation Mechanisms of Mg in Shear Using In-situ Synchrotron Radiation X-Ray Diffraction: *Christopher Meredith*[1]; Jeffrey Lloyd[1]; Daniel Magagnosc[1]; [1]Army Research Laboratory

4:20 PM
Effect of Heat Treatment on Adiabatic Shear Band Microstructures and Internal Strains using HR-EBSD in Segmented Ti-6Al-4V Chips from Turning: *Jiawei Lu*[1]; Thomas Bieler[1]; Patrick Kwon[1]; [1]Michigan State University

4:40 PM
On the Evolution of Adiabatic Shear Bands in the Beta Titanium Alloy Ti-10V-2Fe-3Al: *Mario Scholze*[1]; Philipp Frint[1]; Sven Winter[2]; Martin Wagner[1]; [1]Institute of Materials Science and Engineering, Technische Universität Chemnitz; [2]Fraunhofer Institute for Machine Tools and Forming Technology

5:00 PM
Transient State Rheological Behavior of Poly(ethylene glycol) Diacrylate Hydrogels at High Shear Strain Rates: Ke Luo[1]; Kshitiz Upadhyay[1]; Ghatu Subhash[1]; *Douglas Spearot*[1]; [1]University of Florida

---

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Preparation of Alloys and Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Thursday AM | February 27, 2020
12 | San Diego Convention Ctr

Session Chairs: Onuralp Yücel, Istanbul Technical University; Xuewei Lv, Chongqing University

---

8:30 AM Introductory Comments

8:45 AM
Effect of Intercritical Heat Treatment on Microstructure and Mechanical Properties of Sn Bearing 33MnCrB5 Steel: *Lijuan Sun*[1]; Fuming Wang[1]; Zhanbing Yang[1]; Changrong Li[1]; Wei Shen[1]; Shuai Liu[1]; [1]University of Science and Technology Beijing

9:05 AM
Production of A Cobalt Nickel Iron Alloy from Low Grade Ore: *Yotamu Hara*[1]; Shadreck Chama[1]; Stephen Parirenyatwa[1]; Kennedy Chikontwe[1]; Douglas Musowoya[1]; Haggai Simfukwe[1]; Choolwe Muchindu[1]; Golden Kaluba[1]; [1]Copperbelt University

9:25 AM
Combining Discrete Element Method and Artificial Neural Network to Predict the Particle Segregation Behaviors at Bell-less Top Blast Furnace: *Zhehan Liao*[1]; Chengfeng Sun[1]; Yang Xu[1]; Muyang Wu[1]; Yizhang Yang[1]; Chao Wang[1]; Jian Xu[1]; [1]Chongqing University

9:45 AM
A New Approach for the Production of Li4SiO4 Powder: Kagan Benzesik[1]; Ahmet Turan[2]; *Onuralp Yücel*[1]; [1]Istanbul Technical University; [2]Yalova University

10:05 AM Break

10:20 AM
Flow Field in a Continuous Casting Tundish with a Novel Single-induction Heater: *Hong Xiao*[1]; Shuo Zhang[1]; Jinwen Liu[1]; Haiying Yao[2]; Haiyan Tang[1]; Jiaquan Zhang[1]; [1]University of Science and Technology Beijing; [2]Hunan Zhongke Electric Co., Ltd

10:40 AM
Preparation of Transition Metal Nitrides via Reduction-nitridation with Ammonia: *Yongjie Liu*[1]; Yu Zhang[1]; Zhixiong You[1]; Xuewei Lv[1]; [1]Chongqing University

---

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Sintering and Pelletizing

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Thursday AM | February 27, 2020
16A | San Diego Convention Ctr

Session Chairs: Guanghui Li, Central South University; Mingming Zhang, ArcelorMittal Global R&D

8:30 AM Introductory Comments

8:45 AM
Magnetite Carbon-free Sintering Process based on Electromagnetic Induction: *Xuangeng Zhou*[1]; Xuewei lv[1]; Zhongci Liu[1]; Mingrui Yang[1]; Gang Li[1]; Zihang Deng[1]; Yongda Li[1]; Linpei Li[1]; [1]ChongQing Unversity

9:05 AM
Preparation of Metallized Pellets from Blast Furnace Dust and Electric Arc Furnace Dust Based on Microwave Impedance Matching: *Lei Ye*[1]; Zhiwei Peng[1]; Qing Ye[1]; Liancheng Wang[1]; Robin Augustine[2]; Lee Joonho[3]; Yong Liu[4]; Mudan Liu[4]; Mingjun Rao[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University; [2]Uppsala University; [3]Korea University; [4]Guangdong Provincial Key Laboratory of Development and Comprehensive Utilization of Mineral Resources

9:25 AM
Effect of Distributor Structure on the Uniformity of Multiphase System in Fluidized Ironmaking Process: *Tao Wang*[1]; Yan Liu[1]; Xiaolong Li[1]; Xuejiao Cao[1]; Zhang Tingan[1]; [1]Northeastern University

9:45 AM
Prediction of Iron Ore Sinter Strength Using Statistical Technique: *Zhongci Liu*[1]; Xuangeng Zhou[1]; Gang Li[1]; Shanshan Wu[1]; Xuewei Lv[1]; [1]Chongqing University

10:05 AM
Reduction Behavior of In-flight Fine Hematite Ore Particles by CO+H2 Mixtures in a High-temperature Drop Tube Furnace: *Liyong Xing*[1]; Yingxia Qu[1]; Fanchao Meng[1]; Chunsong Wang[1]; Zongshu Zou[1]; [1]Northeastern University

NUCLEAR MATERIALS

Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling — Current and Advanced Structural Materials II

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Assel Aitkaliyeva, University of Florida; Peter Hosemann, University of California - Berkeley; Samuel Briggs, Oregon State University; David Frazer, Los Alamos National Laboratory

Thursday AM | February 27, 2020
Theater A-8 | San Diego Convention Ctr

Session Chair: Peter Hosemann, University of California - Berkeley

8:30 AM
Fabrication and Characterization of Massive Crack-free Delta Phase-zirconium Hydride for High-performance Moderator Application: *Xunxiang Hu*[1]; Wei Tang[1]; Kurt Terrani[1]; [1]Oak Ridge National Laboratory

8:50 AM
Neutron Irradiation Damage and Fission Product Transport in the SiC Layer of TRISO Fuel Particles: *Subhashish Meher*[1]; Isabella van Rooyen[1]; Chao Jiang[1]; [1]Idaho National Laboratory

9:10 AM
Three-dimensional Analysis of the IPyC/SiC Interface in Irradiated TRISO Fuel Particles: *Tyler Gerczak*[1]; Rachel Seibert[1]; [1]Oak Ridge National Laboratory

9:30 AM
Behaviors of Implanted Xe and Kr Gas Bubbles in CeO2 After Annealing and Rapid Heating Test: *Jaejoon Kim*[1]; Ho Jin Ryu[1]; [1]Kaist

9:50 AM
Microstructural Changes and Corrosion of Proton-pre-irradiated Hastelloy N in FLiNaK Molten Salt: *Andres Morell-Pacheco*[1]; Lingfeng He[2]; Ruchi Gakhar[2]; Yachun Wang[3]; Adam Gabriel[1]; Lin Shao[1]; [1]Texas A&M University; [2]Idaho National Laboratory; [3]Rensselaer Polytechnic Institute

10:10 AM Break

10:20 AM
On the Role of Heterogeneity in Concentrated Solidsolution Alloys in Enhancing their Irradiation Resistance: *Shijun Zhao*[1]; [1]City University of Hong Kong

10:40 AM
Diffusion of Fission Products in Virgin Nuclear Graphite: *Kevin Graydon*[1]; Mikhail Klimov[1]; Edward Dein[1]; Kevin Coffey[1]; Yongho Sohn[1]; [1]University of Central Florida

11:00 AM
Irradiation Behavior of Mechanically Processed Zr-Nb Multilayers at Very High Doses: *Madhavan Radhakrishnan*[1]; Daniel Savage[2]; Marko Knezevic[2]; John Watt[3]; Yongqiang Wang[3]; Katherine Jungjohann[4]; Nathan Mara[5]; Osman Anderoglu[1]; [1]University of New Mexico; [2]University of New Hampshire; [3]Los Alamos National Laboratory; [4]Sandia National Laboratory; [5]University of Minnesota

11:20 AM
High-Throughput Synthesis and Ion Irradiation of High-Entropy Alloys using Additive Manufacturing: *Michael Moorehead*[1]; Michael Niezgoda[1]; Calvin Parkin[1]; Chuan Zhang[2]; Phalgun Nelaturu[1]; Mohamed Elbakhshwan[1]; Kumar Sridharan[1]; Dan Thoma[1]; Adrien Couet[1]; [1]University of Wisconsin - Madison; [2]Computherm LLC

11:40 AM
Kinetic Study on the Evolution of Nano-ceramic Coatings Under Heavy Ions Irradiation: *Matteo Vanazzi*[1]; Luca Ceseracciu[2]; Gaelle Gutierrez[3]; Celine Cabet[3]; Marco G. Beghi[4]; Fabio Di Fonzo[1]; [1]Center for Nano Science and Technology (CNST) - IIT; [2]IIT; [3]CEA; [4]Politecnico di Milano

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Property Prediction I

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Thursday AM | February 27, 2020
10 | San Diego Convention Ctr

Session Chair: Nima Shamsaei, Auburn University

8:30 AM Invited
Fatigue and Fracture Analysis of Additive Manufactured Metals for Critical Applications: *Ali Fatemi*[1]; [1]University of Memphis

9:00 AM
Improvement of Fatigue Strength in Lightweight Selective Laser Melted Alloys By In-situ and Ex-situ Composition and Heat Treatment: *Mustafa Awd*[1]; Jan Johannsen[2]; TSZ Tung Chan[3]; Mohamed Merghany[3]; Claus Emmelmann[2]; Frank Walther[1]; [1]Department of Materials Test Engineering (WPT), TU Dortmund University; [2]Fraunhofer Research Institution for Additive Manufacturing Technologies (IAPT); [3]TU Dortmund University

9:20 AM
Parametrically Homogenized Constitutive Models for Predicting Ductile Fracture in Polycrystalline Microstructures of Ti Alloys by Additive Manufacturing: *Qingcheng Yang*[1]; Max Pinz[1]; George Weber[1]; Steven Storck[1]; Morgana Trexler[1]; Somnath Ghosh[1]; [1]Johns Hopkins University

9:40 AM
A Zone-based, Probabilistic Damage Tolerance Framework for AM Components: *James Sobotka*[1]; R. Craig McClung[1]; Michael Enright[1]; Jonathan Moody[1]; Yi-Der Lee[1]; Vikram Bhamidipati[1]; [1]Southwest Research Institute

10:00 AM Break

10:20 AM Invited
A Fatigue Life Approach for Additively Manufactured Structures: *Rainer Wagener*[1]; Benjamin Möller[1]; Matilde Scurria[1]; Thilo Bein[1]; [1]Fraunhofer Lbf

10:50 AM
Additive Manufacturing of Fatigue Resistant Austenitic Stainless Steels: *Jonathan Pegues*[1]; Michael Roach[2]; Nima Shamsaei[1]; [1]Auburn University; [2]University of Mississippi Medical Center

11:10 AM
Deriving the Structural Fatigue Behavior of Additive Manufactured Components: *Rainer Wagener*[1]; Matthias Hell[1]; Matilde Scurria[1]; Thilo Bein[1]; [1]Fraunhofer Lbf

11:30 AM
Additive Manufacturing-enhanced Durability Prediction Supported by a Machine-learning Based Material Model: *Nicolas Lammens*[1]; Matthias Schulz[1]; Stefan Straesser[1]; Hunor Erdelyi[1]; [1]Siemens Industry Software NV

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications II — Heat Transfer Components and Joining

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Thursday AM | February 27, 2020
9 | San Diego Convention Ctr

Session Chairs: Michael Kirka, Oakridge National Laboratory; Tim Horn, North Carolina State University

---

8:30 AM Invited
In-situ Qualification of AM 316L for Energy Applications: *Federico Sciammarella*[1]; [1]Northern Illinois University

9:00 AM
Additive Manufacturing of Heat Pipes for Microreactor Applications: *Donna Guillen*[1]; Clayton Turner[1]; Adrian Wagner[1]; Patrick Moo[1]; [1]Idaho National Laboratory

9:20 AM Invited
Joining Technologies for Metal Additive Manufacturing in the Energy Industry: *Edward Herderick*[1]; Jacob Rindler[1]; David Schick[2]; Nate Ames[1]; [1]Ohio State University; [2]Proto Precision Additive

9:50 AM
High-temperature Mechanical Behavior of Additively-manufactured Mini-channel-embedded Inconel 718 Specimens: *Scott Thompson*[1]; Aref Yadollahi[2]; Jasmin Ahmed[3]; [1]Kansas State University; [2]Mississippi State University; [3]Auburn University

10:10 AM Break

10:30 AM
Mechanical Properties of Additively Manufactured Inconel 718 at High-temperature: *Abhijeet Dhiman*[1]; Hao Wang[1]; Vikas Tomar[1]; [1]Purdue University

10:50 AM
Fatigue Strength Prediction of As-built Ti-6Al-4V Components, Produced by Electron Beam Melting (EBM) Technology: *Jamal Mian*[1]; Leila Ladani[1]; [1]Arizona State University

11:10 AM
Additive Manufacturing Research for the Energy Sector: *Hani Henein*[1]; Ahmed Qureshi[1]; Tonya Wolfe[2]; [1]University of Alberta; [2]InnoTech Alberta

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Functional and Energy Materials — Magnetic Materials

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Sneha Prabha Narra, Worcester Polytechnic Institute; Markus Chmielus, University of Pittsburgh; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University

Thursday AM | February 27, 2020
7B | San Diego Convention Ctr

Session Chair: Markus Chmielus, University of Pittsburgh

8:30 AM Invited
When Additive Manufacturing Meets Magnetic Materials: Advanced Processing for Green Technologies: *Daniel Salazar*[1]; [1]BCMaterials

9:00 AM
Effect of Post-process Heat Treatment on Microstructure and Properties of a Ni-Mn-Ga Alloy Deposited Using Laser Powder Bed Fusion: *Ville Laitinen*[1]; Alexei Sozinov[1]; Andrey Saren[1]; Antti Salminen[1]; Kari Ullakko[1]; [1]LUT University

9:20 AM
Advanced Additive Manufacturing for Functional Magnetic Materials: *Markus Chmielus*[1]; Pierangeli Rodriguez De Vecchis[1]; Aaron Acierno[1]; Danielle Brunetta[1]; Tyler Paplham[1]; Runbo Jiang[1]; Katerina Kimes[1]; Erica Stevens[1]; Jakub Toman[1]; [1]University of Pittsburgh

9:40 AM
Experimental Investigation of Melt Pool Geometry, Microstructure, and Texture in NiMnGa Fabricated via Laser Powder Bed Fusion: *Yao Xu*[1]; Sneha Narra[1]; [1]Worcester Polytechnic Institute

10:00 AM Break

10:20 AM
Additive Manufacturing of Rare Earth Bonded Permanent Magnets: Prospects and Challenges: *Mariappan Paranthaman*[1]; [1]Oak Ridge National Laboratory

10:40 AM
Mechanical Properties of 3D Printed Ni-Mn-Ga Magnetic Shape Memory Alloy: *C. Virgil Solomon*[1]; Yash Trivedi[1]; Jae Joong Ryu[1]; Matt P. Caputo[2]; [1]Youngstown State University; [2]Penn State Shenango

11:00 AM
Microstructural Characterization of Alnico Alloy Fabricated by Selective Laser Melting: *Paul Rottmann*[1]; Andrew Polonsky[2]; McLean Echlin[2]; Michael Krispin[3]; Gotthard Rieger[3]; Stefan Lampenscherf[3]; Tresa Pollock[2]; Carlos Levi[2]; [1]University of Kentucky; [2]University of California, Santa Barbara; [3]Siemens AG, Corporate Technology

11:20 AM
Additive Manufacturing of Magnetic Materials for Advanced and Transparent Electronic Applications: *Pedro Martins*[1]; Rita Policia[1]; Ana Catarina Lima[1]; Nélson Pereira[1]; Esther Calle[2]; Manuel Vázquez[2]; Senetxu Lanceros-Mendez[3]; [1]Universidade do Minho; [2]Instituto de Ciencia de Materiales de Madrid, CSIC; [3]BCMaterials, Basque Center for Materials, Applications and Nanostructures, UPV/EHU Science Park

11:40 AM
Additive Manufacturing of Soft Magnetic Alloys: *Mohan Sai Kiran Nartu*[1]; Varun Chaudhary[2]; Sriswaroop Dasari[3]; Srinivas Aditya Mantri[3]; Raju V. Ramanujan[2]; Rajarshi Banerjee[3]; [1]University of North Texas; [2]Nanyang Technological University; [3]University of North Texas

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — In Situ Monitoring and Diagnostics: Directed Energy Deposition

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Thursday AM | February 27, 2020
8 | San Diego Convention Ctr

Session Chair: Sneha Narra, Worcester Polytechnic Institute

8:30 AM Invited
On In-situ Monitoring of Geometry, Temperature, and Plume Behavior in Laser-based, Powder-blown Directed Energy Deposition Additive Manufacturing: *Abdalla Nassar*[1]; Christopher Stutzman[1]; Edward Reutzel[1]; Dustin Seltzer[2]; Jeffrey Schiano[2]; Stephen Brown[1]; Wesley Mitchell[1]; [1]Applied Research Lab at Penn State; [2]Pennsylvania State University

8:55 AM
In-situ Synchrotron X-ray Imaging of Titanium Alloy Powder Sintering during Laser Blown Powder Directed Energy Deposition: *Lorna Sinclair*[1]; Yunhui Chen[1]; Sebastian Marussi[1]; Samuel Clark[1]; Chu Lun Alex Leung[1]; Saurabh Shah[1]; Robert Atwood[2]; Thomas Connolley[2]; Martyn Jones[3]; Gavin Baxter[3]; Peter Lee[1]; [1]University College London; [2]Diamond Light Source Ltd.; [3]Rolls-Royce plc.

9:15 AM
Capturing Marangoni Flow via Synchrotron Imaging of Laser Blown Powder Directed Energy Deposition: *Samuel Clark*[1]; Yunhui Chen[1]; Lorna Sinclair[1]; Chu Lun Alex Leung[1]; Sebastian Marussi[1]; Robert Atwood[2]; Martyn Jones[3]; Gavin Baxter[3]; Peter Lee[1]; [1]University College London; [2]Diamond Light Source Ltd; [3]Rolls-Royce plc

9:35 AM Invited
In-situ Process Monitoring and Diagnosis via Machine Learning of Thermal Imaging Streams: *Linkan Bian*[1]; [1]Mississippi State University

10:00 AM
In-situ and Operando X-ray Imaging of the Laser Blown Powder Directed Energy Deposition Process: *Yunhui Chen*[1]; Samuel Clark[1]; Lorna Sinclair[1]; Chu Lun Alex Leung[1]; Sebastian Marussi[1]; Robert Atwood[2]; Martyn Jones[3]; Gavin Baxter[3]; Peter Lee[1]; [1]University College London; [2]Diamond Light Source; [3]Rolls-Royce plc

10:20 AM Break

10:40 AM Invited
In-situ 3D Digital Image Correlation and Thermal Imaging for Process Monitoring in Laser Directed Energy Deposition (L-DED): *James Haley*[1]; Brian Jordan[1]; Ross Cortino[1]; Ryan Dehoff[1]; Vincent Paquit[1]; [1]Oak Ridge National Laboratory

11:05 AM
In-process Monitoring of Porosity in Additive Manufacturing: Bin Zhang[1]; Shunyu Liu[1]; *Yung Shin*[1]; [1]Purdue University

11:25 AM
In-situ Synchrotron Measurements of Microstructure Development at Fusion Boundary in Wire Feed AM of Ti-6Al-4V: *Nathan Johnson*[1]; Donald Brown[2]; John Carpenter[2]; Aaron Stebner[1]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory

11:45 AM
High-speed X-ray Imaging of Powder Deposition of Composite Materials in Additive Manufacturing: *Sarah Wolff*[1]; Niranjan Parab[1]; Benjamin Aronson[2]; Benjamin Gould[1]; Aaron Greco[1]; Tao Sun[1]; [1]Argonne National Laboratory; [2]Penn State University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Alloy Design-Accelerated Development and Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Thursday AM | February 27, 2020
6F | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Keynote
Alloy Prototyping Techniques for Powder-based Additive Manufacturing: *Eric Jaegle*[1]; Dierk Raabe[1]; [1]Max-Planck-Institut Fuer Eisenforschung

9:00 AM
A Rapid Screening Benchmark Test Methodology for Accelerated AM Alloy Design: *Ralph Napolitano*[1]; Timothy Prost[2]; Shubhra Jain[1]; Emma White[2]; Iver Anderson[2]; [1]Iowa State University; [2]Ames Laboratory

9:20 AM
Accelerated Development of Alloys via Direct Laser Metal Deposition: *Husam Alrehaili*[1]; Praveen Sreeramagiri[1]; Ajay Bhagavatam[1]; Guru Dinda[1]; [1]Wayne State University

9:40 AM
Efficient Material and Processing Parameter Optimization in Laser Powder Bed Fusion Through Novel Amalgamation of Computational Modeling, Non-destructive Evaluation, and Material Characterization: *Chris Peitsch*[1]; Steven Storck[1]; Ian McCue[1]; Joseph Sopcisak[1]; Morgan Trexler[1]; [1]JHU/APL

10:00 AM
Modeling Hot Cracking in Metal Additive Manufacturing: *Eric Clough*[1]; Brennan Yahata[1]; Mark O'Masta[1]; Hunter Martin[1]; Matthew Begley[2]; [1]HRL Laboratories; [2]UC Santa Barbara

10:20 AM Break

10:35 AM Invited
Assessing the Printability of Metal Alloys for Additive Manufacturing: *Raymundo Arroyave*[1]; Luke Johnson[1]; Raiyan Seede[1]; Mohamad Mahmoudi[1]; Bing Zhang[1]; Alaa Elwany[1]; Ibrahim Karaman[1]; [1]Texas A&M University

11:00 AM
Composition Control in Laser Powder Bed Fusion Additive Manufacturing Through Differential Evaporation: *Meelad Ranaiefar*[1]; Ibrahim Karaman[1]; Alaa Elwany[1]; Raymundo Arroyave[1]; [1]Texas A&M University

11:20 AM
Computational Design of Compositionally Graded Alloys for Monotonic Property Gradients: *Tanner Kirk*[1]; Olga Eliseeva[1]; Richard Malak[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University

11:40 AM
Microsegregation Analysis, Modeling, and Correlation to Cracking Behaviors in AM: *Timothy Prost*[1]; Emma White[1]; Shubhra Jain[2]; Ralph Napolitano[2]; Iver Anderson[2]; [1]Ames Laboratory; [2]Ames Laboratory/Iowa State University

12:00 PM
Rapid Process Parameter Discovery for Functionally Graded Heterogeneous Materials Using Machine Learning and High Throughput Experiments: *Behzad Rankouhi*[1]; Salman Jahani[1]; Ankur Agrawal[1]; Gabriel Meric de Bellefon[1]; Dan Thoma[1]; Frank Pfefferkorn[1]; [1]University of Wisconsin-Madison

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Porosity

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Thursday AM | February 27, 2020
6E | San Diego Convention Ctr

Session Chairs: Emma White, Ames Laboratory; Jayme Keist, Pennsylvania State University

---

8:30 AM
Synchrotron Validated Simulations of Pore Formation During Laser Powder Bed Fusion of Nickel Superalloys: *Chu Lun Alex Leung*[1]; Dawid Luczyniec[2]; Enyu Guo[3]; Sebastian Marussi[1]; Robert Atwood[4]; Benjamin Saunders[2]; Peter Lee[1]; [1]University College London; [2]Rolls Royce plc.; [3]Dalian University of Technology; [4]Diamond Light Source Ltd

8:50 AM
Effect of Process Parameters on the Porosity of IN718 Produced by Laser Powder Bed Fusion: *Lonnie Smith*[1]; P. Chris Pistorius[1]; [1]Carnegie Mellon University

9:10 AM
Effect of Static Magnetic Field on the Porosity and Microstructure of Selective Laser Melting Inconel 718 Alloys: *Dafan Du*[1]; Anping Dong[2]; Da Shu[2]; Baode Sun[2]; Enrique Lavernia[3]; [1]Shanghai Jiao Tong University; University of California, Irvine; [2]Shanghai Jiao Tong University; [3]University of California, Irvine

9:30 AM
Contouring Strategies to Improve the Surface Roughness and Mechanical Properties of EBM Made Inconel 625: *Xiaoyu Zhao*[1]; Sasan Dadbakhsh[1]; Amir Rashid[1]; [1]KTH Royal Institue of Technology

9:50 AM
Optimization of Pore-free Additive Manufacturing of Composites Utilizing Selective Laser Melting: *Eugene Olevsky*[1]; Andrey Maximenko[1]; [1]San Diego State University

10:10 AM Break

10:30 AM
Physics and Comparison of Complex Melt Flow and Defect Formation During Pulsed and Continuous Selective Laser Melting: *Ian McCue*[1]; Steven Storck[1]; Morgan Trexler[1]; [1]Johns Hopkins University Applied Physics Lab

10:50 AM
Quantification of Porosity and Topology Influences on the Mechanical Behavior of Additively Manufactured Metallic Lattice Structures: *Behzad Bahramibabamiri*[1]; Joe Indeck[1]; Kavan Hazeli[1]; [1]University of Alabama in Huntsville

11:10 AM
Microstructure and Mechanical Properties of Porous Mg Scaffolds Fabricated by Additive Manufacturing for Biomedical Applications: Muzi Li[1]; Thomas Derra[2]; Alexander Kopp[2]; Jon M. Molina-Aldareguía[1]; *Javier Llorca*[3]; [1]IMDEA Materials Institute; [2]Meotec; [3]IMDEA Materials Institute & Technical University of Madrid

11:30 AM
From Single Scan Tracks to 3D Samples: Effect of Process Parameters on Quality of Ti-6Al-4V Produced by Means of Direct Energy Deposition: *Alessandro Carrozza*[1]; Alberta Aversa[1]; Federico Mazzucato[2]; Abdollah Saboori[1]; Giulio Marchese[1]; Anna Valente[2]; Mariangela Lombardi[1]; Paolo Fino[1]; Sara Biamino[1]; [1]Politecnico di Torino; [2]SUPSI

11:50 AM
Study on Multiple Beam Interaction for Laser Powder Bed Fusion: *Wenxuan Zhang*[1]; Luc Deike[1]; Craig Arnold[1]; [1]Princeton University

---

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Thursday AM | February 27, 2020
Theater A-2 | San Diego Convention Ctr

Session Chairs: M Arul Kumar, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory

---

8:30 AM
Advanced Analysis of Acoustic Emission Response of the Main Deformation Mechanisms in Mg: *Daria Drozdenko*[1]; Jan Bohlen[2]; Alexei Vinogradov[3]; Petr Harcuba[4]; František Chmelík[4]; Pavel Lukáč[4]; Patrik Dobron[1]; [1]Charles University; Nuclear Physics Institute, CAS; [2]Helmholtz-Zentrum Geesthacht; [3]Norwegian University of Science and Technology - NTNU; [4]Charles University

8:50 AM
4D Integrated X-ray Imaging and Modeling of Nanoscale Dynamics: *Mathew Cherukara*[1]; Kiran Sasikumar[2]; Subramanian Sankaranarayanan[1]; Ross Harder[1]; [1]Argonne National Laboratory; [2]Avant-garde Materials Simulation

9:10 AM
Micromechanical Characterization of Single-crystalline Silicon at Elevated Temperature: *Kosuke Takagi*[1]; Yoji Mine[1]; Jun Fujise[2]; Bonggyun Ko[2]; Toshiaki Ono[2]; Kazuki Takashima[1]; [1]Kumamoto University; [2]SUMCO Corporation

9:30 AM
Low Strain Grain Boundary Deformation and Damage: *Veronica Livescu*[1]; Ramon Martinez[1]; Cheng Liu[1]; George Gray III[1]; [1]Los Alamos National Laboratory

9:50 AM
Discrete Dislocation Dynamics Investigation of Partial Dislocation interaction with ' Precipitates in Nickel- and Cobalt-based Superalloy: *Dylan Madisetti*[1]; Jaafar El-Awady[1]; [1]Dylan Madisetti

10:10 AM Break

10:30 AM
Strain Hardening of Al-Cu Alloys Investigated with In-situ Neutron Diffraction: *Brian Milligan*[1]; Dong Ma[2]; Amit Shyam[2]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Oak Ridge National Laboratory

10:50 AM
Characterization of Transient State Deformation in Chips Produced by Modulation-assisted machining: *Indrani Biswas*[1]; James Mann[2]; Srinivasan Chandrasekar[1]; Kevin Trumble[1]; [1]Purdue University; [2]University of West Florida

11:10 AM
Single Crystal Elastic-plastic Properties of Alpha Phase in Ti Alloys: *Natalia Millan-Espitia*[1]; Soumya Mohan[1]; Adam Pilchak[2]; Surya Kalidindi[1]; [1]GEORGIA INSTITUTE OF TECHNOLOGY; [2]Air Force Research Laboratory

11:30 AM
The Effects of Defects on the Mechanical Properties of Au Microparticles: *Tyler Flanagan*[1]; Oleg Kovalenko[2]; Eugen Rabkin[2]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]Technion-Israel Institute of Technology

11:50 AM
Assessing the Variation in Localized Deformation During Hydrogen Environment-assisted Cracking in Peak-aged Monel K-500: *Zachary Harris*[1]; Adam Thompson[1]; James Burns[1]; [1]University of Virginia

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session V

Sponsored by: TMS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Thursday AM | February 27, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Ana Araujo, AK Steel; Rachael Stewart, AK Steel

8:30 AM
Effect of Strain Rate on Thinning and Failure Behavior of 22MnB5 Steel During Hot Stamping Condition: *Amajeet Singh*[1]; K Narasimhan[1]; [1]IIT Bombay

8:50 AM
Flash Stamping by Using Multistep Partitioning: *Oguz Gurkan Bilir*[1]; ERSOY ERISIR[1]; [1]Kocaeli University

9:10 AM
Global Forming Capacity Index for Advanced High Strength Steel Selections of Automotive Components: *Lu Huang*[1]; Guofei Chen[1]; Ming Shi[1]; [1]United States Steel Corp.

9:30 AM
Microscale Insight into Deformation and Fracture of Ultra-high Strength Martensitic Steels: *Xinzhu Zheng*[1]; Hassan Ghassemi-Armaki[2]; Ankit Srivastava[1]; [1]Texas A&M University; [2]ArcelorMittal Global R&D - East Chicago

9:50 AM
Measurement and Prediction of the Transformation Strain in High Strength Steels: *Francesco Maresca*[1]; Efthymios Polatidis[2]; Miroslav Smid[2]; Helena Van Swygenhoven[2]; William Curtin[1]; [1]Ecole Polytechnique Federale de Lausanne (EPFL); [2]Paul Scherrer Institut (PSI)

10:10 AM Break

10:30 AM
The Relevance of Interfacial Segregation for Controlling Second Phase Precipitation in Advanced High Strength Steels: *Alisson Da Silva*[1]; Ponge Dirk[1]; Baptiste Gault[1]; Dierk Raabe[1]; [1]Max-Planck Institut Fur Eisenforschung

10:50 AM
Investigation of Simultaneous Precipitation and Recrystallization Behavior in Isothermally Annealed Cold Rolled Ti-V High Strength Low Alloy Steel: *Xukai Zhang*[1]; Chrysoula Ioannidou[2]; Johannes Tjepkema[1]; Winfried Kranendonk[3]; Jean Campaniello[3]; Robert M. Dalgliesh[4]; Gert H. ten Brink[1]; S. Erik Offerman[2]; Bart J. Kooi[1]; [1]University of Groningen; [2]Delft University of Technology; [3]Tata Steel, IJmuiden; [4]ISIS, Rutherford Appleton Laboratory

11:10 AM
Physically-based Model for Coupled Recovery and Recrystallization of Ferritic Steels: *Sebastien Allain*[1]; Marc Moreno[1]; Julien Teixeira[1]; Guillaume Geandier[1]; Hatem Zurob[2]; Frédéric Bonnet[3]; [1]Institut Jean Lamour; [2]McMaster University; [3]ArcelorMittal Maizières Research SA

11:30 AM
Nanoscale Investigation of Austenite/Ferrite Interfaces in Medium Carbon Fe-Mn-C Steels at Different Inter-critical Temperatures: *Olha Nakonechna*[1]; Mohamed Gouné[2]; Didier Huin[3]; Nicolas Charbonnier[3]; Helena Zapolsky[1]; Frederic Danoix[1]; [1]University of Rouen Normandy; [2]ICMCB, UPR CNRS 9048, University of Bordeaux; [3]ArcelorMittal research SA, voie romaine, 57 280 Maizières Les Metz

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Advances in Characterization and Design of Emerging Permanent Magnetic Materials

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Thursday AM | February 27, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Konstantin Skokov, Technische Universität Darmstadt; Satoshi Hirosawa, National Institute for Materials Science

8:30 AM Invited
In-Situ and Ex-Situ Observations of Phase Selection in Magnet Alloys: *Matthew Kramer*[1]; A.C. Chaung[2]; Iver Anderson[1]; Pratik Ray[3]; E.M.H. White[1]; T. Prost[1]; E. Rinko[1]; [1]Ames Laboratory; [2]Argonne National Laboratory; [3]Indian Institute of Technology Ropar

9:00 AM Invited
Optimizing the Magnetic Performance of Tetragonal $ReFe_{12-x}M_x$ Phases using ab initio Computational Methods: *Heike Herper*[1]; Olga Vekilova[1]; [1]Uppsala University

9:30 AM
Cerium-based Gap Magnets Recent Advances in Understanding and Optimization: *Andriy Palasyuk*[1]; Savannah Downing[2]; Olena Palasyuk[1]; Tae-Hoon Kim[1]; Matthew Lynn[1]; Lin Zhou[1]; Matthew Kramer[1]; Sergey Bud'ko[1]; Paul Canfield[1]; [1]Ames Laboratory; [2]Iowa State University

9:50 AM
The Mechanical and Magnetic Properties of Mn-Al-C-Cu Alloys: *Florian Jürries*[1]; Kornelius Nielsch[1]; Thomas Woodcock[1]; [1]Leibniz IFW Dresden

10:10 AM Break

10:30 AM Invited
Low-dimensional Hard Magnetic Materials: *J.Ping Liu*[1]; [1]University of Texas at Arlington

11:00 AM Invited
Synthesis of a-Fe16N2 Foils for Bulk Rare-earth-free a-Fe16N2 Permanent Magnet and its Potential Applications: *Jian-Ping Wang*[1]; [1]University of Minnesota, Twin Cities

11:30 AM Invited
Visualizing the 2D and 3D Magnetic Domain Evolution Processes in Nd-Fe-B Sintered Magnet by Advanced X-ray Microscopy: *Motohiro Suzuki*[1]; Kentaro Toyoki[1]; Tetsuya Nakamura[2]; [1]JASRI; [2]ESICMM

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Energy Conversion and Storage III

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Thursday AM | February 27, 2020
16B | San Diego Convention Ctr

Session Chairs: Zheng Chen, University of California San Diego; Steven DeCaluwe, Colorado School of Mines

8:30 AM
Oxidation of Nickel Coated AISI 430 Alloy for High Temperature Electrochemical Systems: *Manoj Mahapatra*[1]; Mark King[1]; [1]University of Alabama at Birmingham

8:50 AM
Solid State Modification via Activated Reactive Consolidation for Fabrication of Mg2Si Thermoelectric Generators: *Babak Alinejad*[1]; Yuma Yamamoto[1]; Teruyuki Ikeda[1]; [1]Ibaraki University

9:10 AM
Toward Multivalent Zinc-ion Batteries: A Look at Zinc and $Na_3V_2(PO_4)_3$: *Jesse Ko*[1]; Partha Paul[1]; Natalie Seitzman[2]; Ryan DeBlock[3]; Bruce Dunn[3]; Johanna Nelson Weker[1]; [1]SLAC National Accelerator Laboratory; [2]Colorado School of Mines; [3]University of California, Los Angeles

9:30 AM
Understand Behavior of Spinel Cathodes using Thermodynamic Modelling Technique: Weibin Zhang[1]; *Dajian Li*[2]; Keke Chang[3]; Yuan Yuan[4]; Hans Seifert[2]; [1]Shandong University; [2]Karlsruhe Institute of Technology; [3]Ningbo Institute of Materials Technology and Engineering; [4]Chongqing University

9:50 AM
Alloying Iron Foams with Nickel to Mitigate Kirkendall Microporosity Formation during Redox Cycling at 800°C: *Stephen Wilke*[1]; Andrew Geltmacher[2]; Patrick Callahan[2]; David Rowenhorst[2]; David Dunand[1]; [1]Northwestern University; [2]U.S. Naval Research Laboratory

10:10 AM Break

10:30 AM
Study on Oxygen Lance Injection Technology of High Nickel Ternary Cathode Material Roasting Process in Roller Hearth Furnace: *Zhong-Ling (Rocky) Wei*[1]; Joachim Von Scheele[1]; Zhang Gang[2]; Qian Xu[2]; [1]Linde Technology & Innovation Asia Pacific; [2]Zhongtian Energy Materials Co., Ltd.

10:50 AM Invited
Leveraging Reversible Chemistry for Materials Sustainability in Energy Storage: *Zheng Chen*[1]; [1]University of California, San Diego

11:10 AM
Mechanistic Understanding of Ion Intercalation and Phase Transformation Behavior in layered Materials at Atomic Scales: *Shayani Parida*[1]; Jie Chen[1]; Hetal Patel[1]; Avanish Mishra[1]; Arthur Dobley[2]; Barry Carter[3]; Avinash Dongare[1]; [1]University of Connecticut; [2]EaglePicher Technologies LLC; [3]Sandia National Laboratories

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Young Investigator and Energy Conversion and Storage II

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Thursday AM | February 27, 2020
17B | San Diego Convention Ctr

Session Chairs: Partha Mukherjee, Purdue University; Amit Pandey, Granta Design / ANSYS

8:30 AM Invited
Structuring Oxides from Atomistic to Mesoscale Dimensions to Mitigate Diffusion Limitations: Perspectives for Li-ion and "Beyond Li" Energy Storage: *Sarbajit Banerjee*[1]; [1]Texas A&M University

8:50 AM Invited
Understanding Heterogeneous Electrocatalysis of Lithium Polysulfides: *Leela Arava*[1]; [1]Wayne State University,

9:10 AM Invited
Uncovering Structure-composition-property Relationships in Early Transition Metal Oxides for High Rate Energy Storage: *Megan Butala*[1]; [1]Materials Science & Engineering

9:30 AM Invited
Analytical Transport Network Theory for the Characterization and Design of Materials for Energy Storage Applications: *Alex Cocco*[1]; Kyle Grew[1]; [1]U.S. Army Combat Capabilities Development Command

9:50 AM Invited
Crystallographic Engineering of Battery Materials: *Ananya Renuka Balakrishna*[1]; [1]University of Minnesota

10:10 AM Break

10:30 AM Invited
Fast Charging of Li-ion Batteries: Aging and Diagnostics: *Marco Rodrigues*[1]; Daniel Abraham[1]; [1]Argonne National Laboratory

10:50 AM Invited
On Spatiotemporal Nonuniformity of Lithium Electrodeposition: *Aashutosh Mistry*[1]; Venkat Srinivasan[1]; [1]Argonne National Laboratory

11:10 AM Invited
Solid-state Divalent Ion Conductivity: *Kimberly See*[1]; Andrew Martinolich[1]; [1]Caltech

11:30 AM
Direct Visualization of Reversible Discharge and Charge Reactions in A Na-O2 Battery: *Meng Gu*[1]; [1]Southern University of Science and Technology

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — Solder Joint Intermetallics

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Thursday AM | February 27, 2020
Palomar | Marriott Marquis Hotel

Session Chairs: Kazuhiro Nogita, The University of Queensland; Sergey Belyakov, Imperial College London

8:30 AM
The Growth and Coarsening Kinetics of Ag3Sn in SAC305 Solders: *Jingwei Xian*[1]; Sergey Belyakov[1]; Christopher Gourlay[1]; [1]Imperial College London

8:50 AM
Potential for Improving Sn-Cu Alloys as High-temperature Solders by the Suppression of Cu3Sn Phase: *Syeda Umama Mehreen*[1]; Kazuhiro Nogita[1]; Stuart McDonald[1]; David StJohn[1]; Hideyuki Yasuda[2]; [1]The University of Queensland; [2]Kyoto University

9:10 AM
Effects of Secondary Reflow on Solder Joint Microstructure and Lifetime: *Alyssa Yaeger*[1]; Travis Dale[1]; Ganesh Subbarayan[1]; John Blendell[1]; Carol Handwerker[1]; [1]Purdue University

9:30 AM
Intermetallic Compound Analyses Provide Interfacial Reliability for Solder Connections in Electronics: *Mike Wolverton*[1]; [1]Raytheon

9:50 AM Break

10:10 AM
Influence of Substrates and Microalloying Additions on the Primary Intermetallic Growth of Lead-free Solder Joints: *Mohd Arif Mohd Salleh*[1]; Kazuhiro Nogita[2]; Mohd Izrul Izwan Ramli[1]; Flora Somidin[2]; Yasuda Hideyuki[3]; [1]Universiti Malaysia Perlis; [2]University of Queensland; [3]Kyoto University

10:30 AM
Effect of Bi and Zn Addition to the Properties of Sn-0.7Cu and Sn-0.7Cu-0.05Ni Solder Coating: *Mohd Izrul Izwan Ramli*[1]; Mohd Arif Anuar Mohd Salleh[1]; Hideyuki Yasuda[2]; Kazuhiro Nogita[3]; [1]Universiti Malaysia Perlis; [2]Kyoto University; [3]University of Queensland

BIOMATERIALS

Advances in Biomaterials for 3D Printing — Advances in Biomaterials for 3D Printing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Biomaterials Committee

Program Organizers: Changxue Xu, Texas Tech University; Jun Yin, Zhejiang University; Zhengyi Zhang, Huazhong University of Science and Engineering; Yifei Jin, University of Florida

Thursday AM | February 27, 2020
Oceanside | Marriott Marquis Hotel

Session Chairs: Changxue Xu, Texas Tech University; Yifei Jin, University of Nevada, Reno

8:30 AM
Guided Cell Migration on a Graded Micropillar Substrate: *Srikumar Krishnamoorthy*[1]; Zhengyi Zhang[2]; Changxue Xu[1]; [1]Texas Tech University; [2]Huazhong University of Science and Technology

8:50 AM
Additively Manufactured Functionally Graded Biodegradable Porous Zinc: *Yageng Li*[1]; Prathyusha Pavanram[2]; Jie Zhou[1]; Karel Lietaert[3]; Marius Leeflang[1]; Holger Jahr[2]; Amir Zadpoor[1]; [1]Delft University of Technology; [2]University Hospital RWTH Aachen; [3]3D Systems - LayerWise NV

9:10 AM
Design of Metallic Lattices for Bone Implants by Additive Manufacturing: *Daniel Barba*[1]; Roger Reed[1]; Enrique Alabort[2]; [1]University of Oxford; [2]OxMet Technologies

9:30 AM
Biomimetic 3D printed Chitosan-hydroxyapatite Scaffold for Bone Tissue Engineering: *Wei Huang*[1]; Julian Cutler[1]; David Kisailus[1]; [1]University of California Riverside

9:50 AM
Effects of Photoinitiators on Cell Viability in 3D Bioprinting: *Jazzmin Casillas*[1]; Heqi Xu[1]; Changxue Xu[1]; [1]Texas Tech University

10:10 AM Break

10:30 AM
Investigation of Cell Sedimentation in Inkjet-based Bioprinting of Cell-Laden Bioink: *Heqi Xu*[1]; Jazzmin Casillas[1]; Srikumar Krishnamoorthy[1]; Changxue Xu[1]; [1]Texas Tech University

10:50 AM
From Microstructural Design to Surface Engineering: A Tailored Approach for Improving Fatigue Life of Additively Manufactured Lattice Titanium: *V. A. Popovich*[1]; S.M. Ahmadi[2]; [1]Delft University of Technology; [2]Amber Implants

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Welding, Joining, Rejuvenation, Surface Treatment

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Thursday AM | February 27, 2020
11B | San Diego Convention Ctr

Session Chairs: Martin Detrois, National Energy Technology Laboratory; Chantal Sudbrack, Consultant

8:30 AM Invited
Welding and Weldability Assessment of Ni-based Superalloys: *Joel Andersson*[1]; [1]University West

9:00 AM Invited
Recent Advances in Inertia Friction Welding of Dissimilar Ni-base Superalloys: *Oleg Senkov*[1]; David Mahaffey[1]; S. Lee Semiatin[1]; [1]Air Force Research Laboratory

9:30 AM
Structural and Chemical Features of Borides Precipitated within the Transient Liquid (TLP) Bonded Superalloys: *Xiaobing Hu*[1]; Vinayak Dravid[1]; [1]Northwestern University

9:50 AM
On the Rejuvenation of Crept Ni-base Single Crystal Superalloys (SX) by Hot Isostatic Pressing (HIP): *Oliver Horst*[1]; Benjamin Ruttert[1]; David Bürger[1]; Larissa Heep[1]; Hongcai Wang[1]; Antonín Dlouhý[2]; Werner Theisen[1]; Gunther Eggeler[1]; [1]Ruhr-Universitaet Bochum; [2]Academy of Sciences of the Czech Republic

10:10 AM Break

10:30 AM
Heat Treatment Behavior and Microstructure Evolution of Ni-Cr-Mo-W (Haynes 244) Alloy after Surface Treatment by Ultrasonic Nanocrystalline Surface Modification (UNSM) and Laser Shock Peening (LSP): *Jie Song*[1]; Anurag Sharma[1]; Boateng Twum Donkor[1]; Vijay Vasudevan[1]; [1]University of Cincinnati

10:50 AM
Effect of Ultrasonic Nanocrystalline Surface Modification (UNSM) on the Oxidation Behavior of Alloy 800HT in a Supercritical Carbon Dioxide (SCO2) Environment: *Richard Chiang*[1]; Sebastien Teysseyre[2]; Jeffery Aguiar[3]; Lucas Teeter[4]; Julie Tucker[4]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]Canadian Nuclear Laboratories; [3]Idaho National Laboratory; [4]Oregon State University

11:10 AM
Elevated Temperature Tribological Behavior of Alloys 800HT and 617 for High Temperature Gas-cooled Reactor Applications: Valentin Pauly[1]; Carter Tesch[1]; Joseph Kern[1]; Malcolm Clark[1]; David Grierson[1]; Oyelayo Ajayi[2]; Dileep Singh[2]; *Kumar Sridharan*[1]; [1]University of Wisconsin-Madison; [2]Argonne National Laboratory

11:30 AM
Friction Stir Welding of Inconel 825 Alloy: Hrishikesh Das[1]; Mounarik Mondal[1]; Jiwoo Lee[2]; Hoon-Hwe Cho[2]; *Sung-Tae Hong*[1]; [1]University of Ulsan; [2]Hanbat National University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Microscale Experiments and Machine Learning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Thursday AM | February 27, 2020
31C | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
Monte Carlo Studies of EBSPs Spectroscopy: *Elena Pascal*[1]; Patrick Callahan[2]; Saransh Singh[3]; Marc De Graef[1]; [1]Carnegie Mellon University; [2]Naval Research Lab; [3]Lawrence Livermore National Laboratory

8:50 AM
New Workflow for High-throughput Feature Extraction of Deforming Open Cell Foams: *Steve Petruzza*[1]; Attila Gyulassy[1]; Samuel Leventhal[1]; John Baglino[1]; Michael Czabaj[1]; Ashley Spear[1]; Valerio Pascucci[1]; [1]University of Utah

9:10 AM
Microstructure Image Analysis using Deep Convolutional Neural Networks: *Bo Lei*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

9:30 AM
Development of Virtual Resonant Ultrasound Spectroscopy Methods for use in Quantifying Defect Content: *John Graham*[1]; Ricardo Lebensohn[1]; Boris Maiorov[1]; Paul Lafourcade[2]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory; [2]Commissariat a l'Energie Atomique

9:50 AM
Relating 2D Experimental Information to 3D Simulations using Surface Structure Conserving 3D Microstructure Generation: *Theron Rodgers*[1]; Coleman Alleman[1]; Hojun Lim[1]; [1]Sandia National Laboratories

10:10 AM Break

10:30 AM
Microstructure Reconstruction of Additive Manufactured Metallic Materials with Markov Random Fields: *Arulmurugan Senthilnathan*[1]; Pinar Acar[1]; Marc De Graef[2]; [1]Virginia Tech; [2]Carnegie Mellon University

10:50 AM
Real-time Analysis of Diffraction Data for Enabling In-situ Measurements: *Anup Pandey*[1]; John Andrew Redwig Catillo Castilo[2]; Surya Khalidindi[2]; Reeju Pokharel[1]; [1]Los Alamos National Laboratory; [2]Georgia Tech

11:10 AM
Material Parameters Identification, Modeling and Experimental Verification of the New Smart Material Vacuum Packed Particles: *Piotr Bartkowski*[1]; Robert Zalewski[1]; [1]Warsaw University of Technology

11:30 AM
Machine Learning Exploration and Optimization of Flame Spray Pyrolysis: *Noah Paulson*[1]; Joseph Libera[1]; Marius Stan[1]; [1]Argonne National Laboratory

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Processing of Aluminium Alloys

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Thursday AM | February 27, 2020
1A | San Diego Convention Ctr

Session Chair: Dimitry Sediako, University of British Columbia

8:30 AM Introductory Comments

8:35 AM
Influence of Chemical Composition and Pre-deformation on the Age-hardening Response of Al-Mg-Si Alloys: *Alexander Wimmer*

9:00 AM
Hot Deformation and Die-quenching of 6000-series Alloys - the Effect of Quench-interruption Temperature: *Tanja Pettersen*[1]; Benedikte Jørgensen Myrold[2]; Calin Marioara[1]; Ola Jensrud[2]; [1]SINTEF Industry; [2]SINTEF Manufacturing

9:25 AM
Descriptors and Predictors: New Tools for the Predictive Modelling of Production Paths and the Properties of Aluminum-based End-products: *Varuzan Kevorkijan*[1]; [1]Impol R in R d.o.o.

9:50 AM
Effects of Different Extrusion Parameters on Microstructural and Mechanical Properties of EN AW 6063: *Mehmet Güner*[1]; Cem Mehmetalioglu[1]; Osman Halil Çelik[1]; Murat Konar[1]; Görkem Özçelik[1]; [1]ASAS Aluminium

10:15 AM Break

10:30 AM
Simulation Study on Equal Channel Right Angular Extrusion Process of Aluminum Alloy 6061: *Wenhuan Jiang*[1]; Liangying Wen[1]; Huan Yang[1]; Jiahuan Jiang[1]; [1]Chongqing University

10:55 AM
Characterization of Dynamic Material Property of AlSi10Mg Aluminum Alloy Under High Strain Rate Compressive Loading: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

11:20 AM
Current Efficiency for Direct Production of an Aluminium- titanium Alloy by Electrolysis in a Laboratory Cell: *Omar Awayssa*[1]; Rauan Meirbekova[2]; Gudrun Saevarsdottir[2]; Gudjon Atli Audunsson[3]; Geir Martin Haarberg[1]; [1]Norwegian University of Science and Technology; [2]Reykjavik University; [3]Innovation Center Iceland

LIGHT METALS

Aluminum Reduction Technology — Environment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Jayson Tessier, Alcoa

Thursday AM | February 27, 2020
6D | San Diego Convention Ctr

Session Chair: David Wong, Light Metals Research Centre

8:30 AM Introductory Comments

8:35 AM
Reducing the Carbon Footprint: Aluminum Smelting with Changing Energy Systems and the Risk of Carbon Leakage: *Gudrun Saevarsdottir*[1]; Halvor Kvande[2]; Barry Welch[3]; [1]Reykjavik University; [2]Consultant; [3]The University of Auckland

8:55 AM
Measurement System for Fugitive Emissions in Primary Aluminium Electrolysis: *Hakon Olsen*[1]; Thor Anders Aarhaug[2]; Gabriella Tranell[1]; [1]Norwegian University of Science & Technology; [2]SINTEF

9:15 AM
Validation of QCL CF4 Gas Analyzer for Sensitivity and Selectivity: *Thor Anders Aarhaug*[1]; [1]SINTEF

9:35 AM
A Laboratory Study of the HF Generation Potential of Particulate Fluorides from Cell Emissions: *Jenny Hung*[1]; James Metson[2]; [1]Light Metals Research Centre; [2]School of Chemical Sciences, University of Auckland

9:55 AM
Method Development to Estimate Total Low Voltage and High Voltage PFC Emissions: *Luis Espinoza-Nava*[1]; Christine Dubois[2]; Eliezer Batista[1]; [1]Alcoa Technical Center; [2]Alcoa Deschambault

10:15 AM Break

10:30 AM
Update on SO2 Scrubbing Applied in Primary Aluminium Smelters: *Stephan Broek*[1]; [1]Hatch Ltd.

10:50 AM
Optimization of a Gas Treatment Center Equipped with Extended Surface Bag Filters: *Julie Dontigny*[1]; Stephan Broek[1]; Mario Dion[2]; Raymond Emond[2]; Philippe Martineau[3]; [1]Hatch Ltd.; [2]Rio Tinto; [3]Fives Solios

11:10 AM
Update on the Abart Gas Treatment and Alumina Handling at the Karmøy Technology Pilot: *Anders Sorhuus*[1]; Sivert Ose[1]; Eivind Holmefjord[1]; Håvard Olsen[1]; Bent Nilsen[1]; [1]GE Power

BIOMATERIALS

Bio-Nano Interfaces and Engineering Applications — Bio-Nano Interfaces III

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Thursday AM | February 27, 2020
Vista | Marriott Marquis Hotel

Session Chairs: Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines

8:30 AM Invited
Functional Nanomaterials and Their Applications in the Therapy of Cancer and Infectious Diseases: Hanene Belkahlac[1]; Rym Boudjemaab[2]; John Lomas[3]; Olivier Micheauc[1]; Claire Wilhelm[4]; Hyacinthe Randriamahazaka[3]; *Miryana Hemadi*[3]; [1]Université de Bourgogne Franche-Comté; [2]Abbelight; [3]Université de Paris - ITODYS Laboratory; [4]Université de Paris

9:00 AM
AMP-loaded Mesoporous Strontium Silicates with Improved Bioactivity and Antibacterial Capability: *Isha Mutreja*[1]; Kami Hogan[1]; Dhiraj Kumar[2]; Conrado Aparicio[1]; [1]Minnesota Dental Research Center for Biomaterials and Biomechanics; [2]Division of Pediatric Dentistry, University of Minnesota

9:20 AM
Antimicrobial Metallopeptides from Design to on Site Delivery: *Katie Zimmerman*[1]; Kyle Boone[1]; Candan Tamerler[1]; [1]University of Kansas

9:35 AM Break

9:50 AM Invited
Nano-engineered DNA based Hydrogel as a New Injectable Drug Delivery Platform: *Arghya Paul*[1]; Sayantani Basu[2]; Settimio Pacelli[2]; [1]The University of Western Ontario; [2]University of Kansas

10:20 AM
Application of Titanium Dioxide Nanotubes and Lattice Light-sheet Microscopy in Establishing Early-stage Cellular Response Mechanisms: *Jevin Meyerink*[1]; Scott Wood[1]; Jeremy Mercuri[2]; Robert Anderson[1]; Brandon Scott[1]; Grant Crawford[1]; [1]South Dakota School of Mines & Technology; [2]Clemson University

10:35 AM
Attachment Surface Energy as an Indicator for Adhesion of Nitrifying Bacteria: *Ting-Ting Chang*[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

10:55 AM Invited
Biological Fate of Engineered Nanomaterials: Tracing Aggregation/degradation and Nanomaterial Dose In-vitro and In-vivo: *Sergio Moya*[1]; [1]CIC biomaGUNE

11:25 AM Invited
Enzymes Grafted on Electrodes for Biofuel Cells: Lessons from Multiscale Modeling Approaches: *Sophie Sacquin-Mora*[1]; Nicolas Bourassin[1]; Marc Baaden[1]; [1]Laboratoire de Biochimie Théorique, CNRS UPR9080;Institut de Biologie Physico-Chimique-Fondation Edmond de Rothschild, PSL Research University

11:55 AM
Inkjet Printed Nano-patterned Aptamer-based Sensors for Improved Optical Detection of Foodborne Pathogens: *Susana Diaz-Amaya*[1]; Min Zhao[1]; Li-Kai Lin[1]; Carlos Ostos[2]; Jan Allebach[1]; George Chiu[1]; Amanda Deering[1]; Lia Stanciu[1]; [1]Purdue University; [2]Universidad de Antioquia

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Alloy Development and Application II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | February 27, 2020
Cardiff | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
Thin Film Metallic Glass Broad-spectrum Mirror Coatings: Tatiana tefanov[1]; Harsha Maraka[1]; Wim Sillekens[2]; *David Browne*[1]; [1]University College Dublin; [2]European Space Agency

8:50 AM
Atomic Dynamics Evidence for Configuration Memory in Metallic Glasses: *Xiaodong Wang*[1]; Tianding Xu[1]; Qing Yu[1]; Qingping Cao[1]; Jianzhong Jiang[1]; [1]Zhejiang University

9:10 AM
Biocompatible Porous Ti-based Bulk Metallic Glasses: *Guoqiang Xie*[1]; Zhenwei Wu[1]; Hiroyasu Kanetaka[2]; Wei Wang[3]; [1]Harbin Institute of Technology (Shenzhen); [2]Tohoku University; [3]Tokyo Medical and Dental University

9:30 AM
Effect of Tool Speeds on Joint Characteristics in Friction Stir Spot Joining Zr-based BMG to Al Alloy: *Jason Silberman*[1]; Harry Chang[1]; Danny Ventura[1]; Kylie Dodge[1]; David Yan[1]; [1]San Jose State University

9:50 AM
Measuring Metallic Glass Viscosities Over Wide Composition Ranges: *Sebastian Alexander Kube*[1]; Will Polsky[1]; Rodrigo Miguel Ojeda Mota[1]; Kevin Ryan[1]; Jan Schroers[1]; [1]Yale University

10:10 AM Break

10:30 AM Invited
Solvent-rich magnesium-based Bulk Metallic Glasses in the Mg–Pd–Ca and Mg–Pd–Yb Alloy Systems: *Sidra Jilani*[1]; David Miskovic[1]; Kevin Laws[1]; [1]University of New South Wales

10:50 AM
Metallic Glasses for Space Mechanism Applications: *Andrew Murphy*[1]; Rik Stewart[2]; Zahari Zlatev[2]; Martin Humphries[3]; Andrew Norman[4]; David Browne[1]; [1]University College Dublin; [2]Reliance Precision Limited; [3]SpaceMech; [4]European Space Agency

11:10 AM
Near-net Forming Complex Shaped Zr-based Bulk Metallic Glasses by High Pressure Die Casting: *LeHua Liu*[1]; [1]South China University of Technology

11:30 AM
Nucleation of Shear Bands in Al-based Metallic Glasses and Their Composites: *Wan Kim*[1]; Guen Hee Yoo[1]; Eun Soo Park[1]; John Perepezko[2]; [1]Seoul National University; [2]University of Wisconsin-Madison

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Structures and Modeling

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | February 27, 2020
Marina Ballroom G | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
Correlating Structural Heterogeneity to Properties of Metallic Glasses using Mesoscale Deformation Simulation Incorporating 4D-STEM: Pengyang Zhao[1]; Soohyun Im[1]; Geun Hee Yoo[2]; Eun Soo Park[2]; *Jinwoo Hwang*[1]; Yunzhi Wang[1]; [1]The Ohio State University; [2]Seoul National University

8:50 AM Invited
Theoretical Strength and Prediction of Structural Defects in Metallic Glasses: Zhukun Zhou[1]; Hao Wang[2]; *Mo Li*[3]; [1]Central South University; Georgia Institute of Technology; [2]Shenzhen University; [3]Georgia Institute of Technology,

9:10 AM
Local Structural Signature Underlying Thermally Activated Events in Metallic Glasses: *Jun Ding*[1]; Mark Asta[2]; Robert Ritchie[2]; [1]Lawrence Berkeley National Lab; [2]University of California,Berkeley

9:30 AM Invited
The Physics of an Elemental Ag Glass: First Order Glass Transition and Melting: *Qi An*[1]; William Johnson[2]; Konrad Samwer[3]; Sydney Corona[2]; William Goddard[2]; [1]University of Nevada, Reno; [2]Caltech; [3]University of Goettingen

9:50 AM
Molecular Dynamics Simulations of Iron-based Metallic Glasses during Spark Plasma Sintering: *Jordan Campbell*[1]; Carlos Ruestes[2]; Tod Pascal[1]; Olivia Graeve[1]; [1]University of California, San Diego; [2]National University of Cuyo

10:10 AM Break

10:30 AM
Pressure Induced Amorphization in Alloys: *Hongbo Lou*[1]; Qiaoshi Zeng[1]; [1]Center for High Pressure Science and Technology Advanced Research

10:50 AM
Unraveling the Atomistic Origin of Non-monotonic Ageing in Metallic Glasses: Chaoyi Liu[1]; *Yue Fan*[1]; [1]University of Michigan

11:10 AM
Is Atomic Size-mismatch a Sufficient Condition to Yield Fragility in Bulk Metallic Glass Forming Liquids?: *Tina Mirzaei*[1]; Zhichao Yu[2]; Jamie J.Kruzic[3]; P.Alex Greaney[1]; [1]University of California, Riverside; [2]Oregon State University; [3]UNSW

11:30 AM
The Intriguing Structure of Marginal Glass Forming Alloys: Tolga Han Ulucan[1]; Ilkay Kalay[2]; *Yunus Kalay*[1]; [1]Middle East Technical University; [2]Çankaya University

11:50 AM
Effect of Ni-Nb Metallic Glass on Moderating the Shock Damage in Crystalline Ni-amorphous Ni62Nb38 Nanocomposite Structure: A Molecular Dynamics Study: *K Vijay Reddy*[1]; Snehanshu Pal[1]; [1]National Institute of Technology Rourkela

LIGHT METALS

Cast Shop Technology — Virtual Cast Shop and Specialties

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Thursday AM | February 27, 2020
1B | San Diego Convention Ctr

Session Chair: Arnis Pelss, Aleris

8:30 AM Introductory Comments

8:35 AM
Digital Manufacturing for Foundries 4.0: Prateek Saxena[1]; *Michail Papanikolaou*[1]; Emanuele Pagone[1]; Konstantinos Salonitis[1]; Mark Jolly[1]; [1]Cranfield University

9:00 AM
Integrating Fluid Simulation with Virtual Die Casting Machine for Industry 4.0 and Operator Training: *John Moreland*[1]; John Estrada[1]; Edwin Mosquera[1]; Kyle Toth[1]; Armin Silaen[1]; Chenn Zhou[1]; [1]Purdue University Northwest

9:25 AM
Numerical Simulation of Wire Rod Casting of AA1370 and AA6101 Alloys: *Dag Lindholm*[1]; Shahid Akhtar[2]; Dag Mortensen[1]; [1]Institute for Energy Technology; [2]Hydro Aluminium

9:50 AM
Influence of Nozzle Shape on Near-surface Segregation Formation During Twin-roll Casting of Aluminum Strips: *Olexandr Grydin*[1]; Mykhailo Stolbchenko[1]; Mirko Schaper[1]; [1]Materials Science, Paderborn University

10:15 AM Break

10:30 AM
Effect of Ultrasonic Treatment on the Eutectic Phase and Cu Content in the Al Matrix of Large-scale 2219 Al Alloy Ingots: *Li Zhang*[1]; Xiaoqian Li[1]; Ripeng Jiang[1]; Ruiqing Li[1]; Lihua Zhang[1]; [1]Central South University

10:55 AM
Influence of Alloying Additives on the Electrochemical Behavior of Cast Al-5Zn Alloy: Mohamed Moussa[1]; Hoda Hussien[1]; *Shimaa El-Hadad*[1]; Madiha Shoeib[1]; [1]Cmrdi -Central Metallurgical Research In

11:20 AM
Thermal Analysis and Microstructure of Al-12%Si-2.5%Cu-0.4%Mg Cast Alloy with Ce and/or La Rare Earth Metals: *Mahmoud Tash*[1]; Waleed Khalifa[1]; Iman ElMahallawi[1]; [1]Cairo University

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Electronic and Magnetic Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Thursday AM | February 27, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Shadia Ikhmayies, Al Isra University; Andrew Brown, Army Research Laboratory

8:30 AM
Using Thermo-Calc Software to Produce the Phase Diagram of Zn-Te System: *Shadia Ikhmayies*[1]; [1]Al Isra University

8:50 AM
Epsilon to Tau Phase Transformation in MnAl Alloys: Ozgun Acar[1]; Merve Genc Unalan[1]; Ilkay Kalay[2]; *Yunus Kalay*[1]; [1]Middle East Technical University; [2]Çankaya University

9:10 AM
Structural and Magnetic Characterization of Magnetic Nanostructures in C_{2v} Thin Films Exhibiting the Anisotropic Dzyaloshinskii-Moriya Interaction: *Michael Kitcher*[1]; Tim Mewes[2]; Claudia Mewes[2]; Marc De Graef[1]; Vincent Sokalski[1]; [1]Department. of Materials Science and Engineering, Carnegie Mellon University; [2]MINT Center/Department. of Physics & Astronomy, University of Alabama

9:30 AM
Influence on the Structural and Magnetic Properties of the Pre-alloyed Gas-atomized Maraging Steel Powder During Mechanical Milling: Ganesh Varma Thotakura[1]; Ramasis Goswami[2]; *Tanjore Jayaraman*[1]; [1]University of Michigan-Dearborn; [2]Naval Research Laboratory

9:50 AM Break

10:05 AM
Bending Fatigue Testing for Electronic Connectors: *David Snyder*[1]; Larry Wojnicz[1]; Michael Gedeon[2]; Chad Finkbeiner[2]; Chen Jidong[3]; [1]Molex LLC; [2]Materion Corp.; [3]Ningbo Powerway Alloy Material Co.

10:25 AM
Precipitate Characterization and Evolution in Grain Oriented Electrical Steel During High Temperature Coil Annealing: *Xukai Zhang*[1]; Jamo Momand[1]; Stefan Melzer[2]; Winfried Kranendonk[2]; Gert H. ten Brink[1]; Bart J. Kooi[1]; [1]University of Groningen; [2]Tata Steel, IJmuiden

10:45 AM
Phase Diagram of In-P Binary System: *Shadia Ikhmayies*[1]; [1]Al Isra University

11:05 AM
Temperature Dependence of Elastic Properties of Beryllium: *Boris Maiorov*[1]; Jon Betts[1]; Sky Sjue[1]; Angus Lawson[1]; Albert Migliori[1]; [1]Los Alamos National Laboratory

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Polymers and Composites I

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Thursday AM | February 27, 2020
Theater A-4 | San Diego Convention Ctr

Session Chairs: Sergio Monteiro, Military Institute of Engineering; Bowen Li, Michigan Technological University

8:30 AM
Quasi-plastic Zone Characterization of Regular and Si-doped Boron Carbide: Sisi Xiang[1]; *Kelvin Xie*[1]; [1]Texas A&M University

8:50 AM
Synthesis and Characterization of Ultra-hard Ceramic AlMgB14-based Materials Obtained from AlxMgy Intermetallic Powder and Boron Powder by the Spark Plasma Sintering: Ilya Zhukov[1]; *Pavel Nikitin*[1]; Alexander Vorozhtsov[1]; Maxim Boldin[2]; [1]Tomsk State University; [2]Lobachevsky State University of Nizhni Novgorod

9:10 AM
Microstructure Evolution of Additively Manufactured TiC Reinforced Graded Metal Matrix Composite: *Jianshen Wang*[1]; Juan Escobedo-Diaz[1]; Evgeny Morozov[1]; Daniel East[2]; Kun Yang[2]; [1]University of New South Wales; [2]Commonwealth Scientific and Industrial Research Organisation (CSIRO)

9:30 AM
Compressive Response of Ice-templated Ceramic-polymer Composites in Relation to Composition, Microstructure and Loading Orientation: *Dipankar Ghosh*[1]; Sashanka Akurati[1]; Justine Marine[1]; [1]Old Dominion University

9:50 AM Break

10:05 AM
A Bibliometric Analysis of the Strategy and Performance Measurement of the Polymer Matrix Nanomaterials Development Scenario Globally and the Participation of Brazil: *Robson Costa*[1]; Esperidiana Moura[1]; [1]Nuclear and Energy Research Institute

10:25 AM
Evaluation of Biodiesel Obtained from Waste Cooking Oil Purified with A Modified Clay: *Christiano Gianesi Bastos Andrade*[1]; Melissa Rigue Shimba[1]; Gabriela Souza Freitas[1]; Leticia Mayumi Kobayashi[1]; Samuel Marcio Toffoli[1]; Francisco Rolando Valenzuela Diaz[1]; [1]Polytechnic School - University of Sao Paulo

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Surface, Thin Films and Coatings

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Thursday AM | February 27, 2020
11A | San Diego Convention Ctr

Session Chairs: Pasquale Spena, Politecnico di Torino; John Carpenter, Los Alamos National Laboratory

8:30 AM
Fatigue Resistance of Low Pressure Nitrided Cr-Mo Low Alloy Steels: *Donato Firrao*[1]; Enrico Morgano[2]; Graziano Ubertalli[1]; Angelo Brunelli[3]; Davide Sabena[3]; [1]Politecnico di Torino; [2]Centro Ricerche Fiat; [3]Tra.Ind

8:50 AM
Unloading Analysis for Indentation Fracture in Molecular Crystals: *Alexandra Burch*[1]; John Yeager[2]; David Bahr[1]; [1]Purdue University; [2]Los Alamos National Laboratory

9:10 AM
Growth and Characterization of Metal Nanowhiskers: *Gunther Richter*[1]; Wenting Huang[1]; [1]Max Planck Institute for Intelligent Systems

9:30 AM
Three-Dimensional Characterization of Microstructure and Elemental Segregation of Thermal Spray Coatings: *Thomas Ivanoff*[1]; Jonathan Madison[1]; Nathan Moore[1]; Aaron Olson[1]; [1]Sandia National Laboratories

9:50 AM
Advanced Approach in Investigating the Effects of Hydrogen Trapping on Fish-scaling Resistance of Enameled Steels: *Yi-Ting Lin*[1]; Hung-Wei Yen[1]; Lung-Ren Chiang[2]; [1]National Taiwan University; [2]Iron and Steel R&D Department, China Steel Corporation

10:10 AM
A Differential Scanning Calorimetry Study of the Combustion Synthesis of Metal Hexaborides: *C. Ingram Vargas Consuelos*[1]; Felix Monge[1]; Arash Yazdani[1]; Olivia Graeve[1]; [1]University of California, San Diego

10:30 AM Break

10:45 AM
Thermodynamic Investigations at High Temperatures of the ZrO_2-$YTaO_4$ Quasibinary for Thermal Barrier Coating Applications: *Maren Lepple*[1]; Sergey Ushakov[2]; Kristina Lilova[2]; Chandra Macauley[3]; Carlos Levi[4]; Alexandra Navrotsky[2]; [1]DECHEMA Forschungsinstitut; [2]University of California, Davis; [3]Friedrich-Alexander-Universitaet, Erlangen-Nuernberg; [4]University of California, Santa Barbara

11:05 AM
Microstructure Dependent Thermal Conductivity Measurement of Zircaloy-4 using an Extended Raman Thermometry Method: Hao Wang[1]; *Abhijeet Dhiman*[1]; Vikas Tomar[1]; [1]Purdue University

11:25 AM
Unravel the Structure of a Ti-TiB-TiC Intergrowth Phase: a Coupled Ab-initio/HRTEM Investigation: *Qi An*[1]; Lujun Huang[1]; Shaolou Wei[2]; Atieh Moridi[3]; Lin Geng[1]; [1]Harbin Institute of Technology; [2]Massachusetts Institute of Technology; [3]Cornell University

CORROSION

Coatings and Surface Engineering for Environmental Protection II — Corrosion Control Session III

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Arif Mubarok, PPG; Raul Rebak, GE Global Research; Rajeev Gupta, University of Akron; Tushar Borkar, Cleveland State University; Brian Okerberg, PPG Industries; Michael Mayo, PPG Industries

Thursday AM | February 27, 2020
19 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Microstructure and Electrochemistry of Al-Rich Primer: *Shanshan Wang*[1]; Xi Wang[1]; Siva Palani[2]; Alan Rose[2]; Gerald Frankel[1]; [1]The Ohio State University; [2]Corrdesa

8:50 AM Invited
The Effect of Surface Treatment and Heat Treatment on the Performance of a Zirconium-based Conversion Coating on AA7075 Automotive Alloys for Protection Against Filiform Corrosion: *Carol Glover*[1]; Mary Lyn Lim[2]; John Scully[1]; [1]University of Virginia; [2]PPG Industries

9:10 AM Invited
Improved Corrosion Resistance of a Commercial Mg Alloy through Laser Assisted Surface Processing: *Saumyadeep Jana*[1]; Zihua Zhu[1]; Mark Engelhard[1]; Danny Edwards[1]; Aashish Rohatgi[1]; Hongtao Ding[2]; [1]Pacific Northwest National Laboratory; [2]The University of Iowa

9:30 AM Invited
Towards Designing and Discovering Novel Corrosion Inhibitors for Solution and Coating Applications: *Gavin Collis*[1]; [1]CSIRO Manufacturing

9:50 AM
Understanding the Impact of Pigment Selection on the Properties of Electrodeposited Coatings: *Kevin Sylvester*[1]; Corey DeDomenic[1]; Egle Puodziukynaite[1]; Fuduo Ma[1]; [1]PPG Industries

10:10 AM Break

10:20 AM Invited
Phase-Field Modeling of Microstructural Effects on the Corrosion of Mg Alloys: *David Montiel*[1]; Stephen DeWitt[1]; Alexander Chadwick[2]; Katsuyo Thornton[1]; [1]University of Michigan; [2]Northwestern University

10:40 AM
Oxidation Behavior of TiAl Alloys and its Optimization by Deposition of Al-rich Coatings via Pack Aluminizing: *Lukas Mengis*[1]; Anke Ulrich[1]; Alexander Donchev[1]; Mathias Galetz[1]; [1]DECHEMA Research Institute

11:00 AM
Oxidation Behavior of Cold Spray Chromium Coatings on Zircaloy-4 in Steam Environments in 1100 °C to 1300 °C Temperature Range: *Hwasung Yeom*[1]; Benjamin Maier[1]; Greg Johnson[1]; Tyler Dabney[1]; Mia Lenling[1]; Kumar Sridharan[1]; [1]University of Wisconsin Madison

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Session V

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Thursday AM | February 27, 2020
32B | San Diego Convention Ctr

Session Chair: Houlong Zhuang, Arizona State University

8:30 AM Invited
Design of Metastable Materials: Heterostructural Alloys and Novel Nitrides: *Stephan Lany*[1]; [1]National Renewable Energy Laboratory

9:00 AM
From Pentagonal Geometries to Two-dimensional Materials: *Houlong Zhuang*[1]; Lei Liu[1]; Duo Wang[1]; [1]Arizona State University

9:20 AM
Computational Methodological Study of Mn(taa) Spin Crossover Compound: *Eric Fonseca*[1]; Daniel Rodriguez[1]; Samuel Trickey[1]; Richard Hennig[1]; [1]University of Florida

9:40 AM
First-principles Investigation of Dopants, Defects, and Defect Complexes in 2D Transition Metal Dichalcogenides: *Anne Marie Tan*[1]; Christoph Freysoldt[2]; Richard Hennig[1]; [1]University of Florida; [2]Max-Planck-Institut für Eisenforschung GmbH

10:00 AM
Machine Learned Models for Transition Metal Dichalcogenide: *Henry Chan*[1]; Mathew Cherukara[1]; Badri Narayanan[2]; Subramanian Sankaranarayanan[1]; [1]Argonne National Laboratory; [2]University of Louisville

10:20 AM Break

10:35 AM Invited
Predicting Physical Properties of SiO_2-based Glasses by Machine Learning: Yong-Jie Hu[1]; Ge Zhao[2]; Bo Liu[1]; Yang Chen[1]; Kerby Shedden[1]; *Liang Qi*[1]; [1]University of Michigan; [2]Pennsylvania State University

11:05 AM
Stable Structures of 2D Materials, Thin Films, and Surface Reconstructions on Substrates Using an Evolutionary Algorithm Approach: *V S Chaitanya Kolluru*[1]; Pushkar Ghanekar[2]; Jeffrey Greeley[2]; Richard Hennig[1]; [1]University of Florida; [2]Purdue University

11:25 AM
Landscape Study of Deformation Effects (cleave/shear) and Vacancies on the Structural, Electronic and Mechanical Properties of MAX Phase Alloys: *Daniel Sauceda*[1]; Prashant Singh[1]; Raymundo Arroyave[1]; [1]Texas A&M University

11:45 AM
Tuning Mechanical Behavior of Graphene: From Microscopic Defect Modeling to Macroscopic Property Prediction: *Bowen Zheng*[1]; Grace Gu[1]; [1]University of California, Berkeley

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Multiscale Modeling I

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Thursday AM | February 27, 2020
Theater A-9 | San Diego Convention Ctr

Session Chairs: Alfredo Correa, LLNL; Dilpuneet Aidhy, University of Wyoming

8:30 AM Invited
Electron-phonon Coupling Effects in Ion Irradiation of Metallic Systems: *Eva Zarkadoula*[1]; German Samolyuk[1]; William Weber[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

9:10 AM
First Principles Modeling of Ion Ranges in Self-irradiated Tungsten: Andrea Sand[1]; *Rafi Ullah*[2]; Alfredo Correa[2]; [1]University of Helsinki; [2]Lawrence Livermore National Laboratory

9:30 AM
First-principles Cluster Expansion Study of Fe and Mo Effects on Atomic Ordering in Ni-Cr Alloys: *Jia-Hong Ke*[1]; Julie D. Tucker[1]; [1]Oregon State University

9:50 AM
Modeling the Fracture of Zirconium at an Atomic Level and Analyzing the Effects of Temperature and Strain Rate on the Deformation Mechanisms: *Vlad Podgurschi*[1]; Kailan Luo[1]; Mark Wenman[1]; [1]Imperial College London

10:10 AM Break

10:30 AM Invited
First Principles Modelling of the Role of Electrons in Collision Cascades in Solids: Artur Tamm[1]; Magdalena Caro[2]; A. Caro[3]; *Alfredo Correa*[1]; [1]Lawrence Livermore National Laboratory; [2]Virginia Tech; [3]George Washington University

11:10 AM
A Machine Learning Approach to Thermal Conductivity Modelling of Irradiated Nuclear Fuels: *Elizabeth Kautz*[1]; Alexander Hagen[1]; Jesse Johns[1]; Douglas Burkes[1]; [1]Pacific Northwest National Laboratory - PNNL

11:30 AM
Phase-field Simulation of Intergranular Fission Gas Bubble Growth in Uranium Silicide: *Larry Aagesen*[1]; David Andersson[2]; Benjamin Beeler[1]; Michael Cooper[2]; Kyle Gamble[1]; Yinbin Miao[3]; Giovanni Pastore[1]; Cody Permann[1]; Michael Tonks[4]; [1]Idaho National Laboratory; [2]Los Alamos National Laboratory; [3]Argonne National Laboratory; [4]University of Florida

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Data and High Throughput Methods I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Thursday AM | February 27, 2020
33C | San Diego Convention Ctr

Session Chairs: Timothy Hartnett, University of Virginia; Munekazu Ohno, Hokkaido University,

8:30 AM Invited
Exploring 2D Materials using Machine Learning Force Fields: *Xiaofeng Qian*[1]; [1]Texas A&M University

9:00 AM
Bayesian Interference of Solid-liquid Interface Properties Out of Equilibrium Based on Phase-field and Molecular Dynamics Simulations: *Munekazu Ohno*[1]; Yukimi Oka[1]; Shinji Sakane[2]; Tomohiro Takaki[2]; Yasushi Shibuta[3]; [1]Hokkaido University; [2]Kyoto Institute of Technology; [3]The University of Tokyo

9:20 AM
Thermal Phenomena in Covalently Bonded Systems Modeled via Physically Informed Neural Network Potentials
: *James Hickman*[1]; Ganga Purja Pun[2]; Francesca Tavazza[1]; Yuri Mishin[2]; [1]National Institute of Standards and Technology; [2]George Mason University

9:40 AM Invited
Materials Design in High Dimensional Chemical and Structural Configuration Spaces: *Joerg Neugebauer*[1]; Jan Janssen[1]; Liam Huber[1]; Yuji Ikeda[1]; Fritz Koermann[1]; Blazej Grabowski[2]; Tilmann Hickel[1]; Alexander Shapeev[3]; [1]Max-Planck-Institut fuer Eisenforschung; [2]University of Stuttgart; [3]Skoltech

10:10 AM Break

10:20 AM Invited
Multi Cell Monte Carlo Method for Phase Prediction: *Maryam Ghazisaeidi*[1]; You Rao[1]; Wolfgang Windl[1]; Changning Niu[2]; [1]Ohio State University; [2]QuesTek Innovations LLC

10:50 AM
Prediction of Formable Apatites using Machine Learning and Density Functional Theory: *Timothy Hartnett*[1]; Mukil Ayyasamy[1]; Prasanna Balachandran[1]; [1]University of Virginia

11:10 AM
First-principles Methods to Elucidate the High-temperature Thermodynamics of Multicomponent Alloys: *Anirudh Raju Natarajan*[1]; Pavel Dolin[1]; Anton Van der Ven[1]; [1]University of California, Santa Barbara

11:30 AM Invited
MS-CRADLE: A Tool for Developing Corrosion Resistant HEAs for Molten Salt Technologies: *Thien Duong*[1]; Xiaoli Yan[2]; Santanu Chaudhuri[1]; [1]Argonne National Laboratory; [2]University of Illinois at Chicago

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Mesoscale Characterization and Simulation of Polycrystal Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Thursday AM | February 27, 2020
5B | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM
Bridging the Gap Between Grain Boundary Experiments and Simulations via Engineered Oligocrystals: *Zachary Cordero*[1]; Logan Ware[1]; [1]Rice University

8:50 AM
Characterization of Strain at Twin Boundaries in Ni-base Superalloys via Dark Field X-ray Microscopy: *Sven Gustafson*[1]; Wolfgang Ludwig[2]; Paul Shade[3]; Diwakar Naragani[1]; Darren Pagan[4]; Michael Sangid[1]; [1]Purdue University; [2]European Synchrotron Radiation Facility; [3]Air Force Research Laboratory; [4]Cornell High Energy Synchrotron Source

9:10 AM
Slip bands in Ni-base Superalloys: A Crystal Plasticity Study Informed by Digital Image Correlation: *Marat Latypov*[1]; Jean-Charles Stinville[1]; Jonathan Hestroffer[1]; Marie-Agathe Charpagne[1]; Tresa Pollock[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara

9:30 AM
Relationship Between Microstructure and Mechanical Properties of Super Duplex Stainless Steel: *Mohammed Ali Lakhdari*[1]; Hugo Van-landeghem[2]; Florent Krajcarz[3]; Guilhem Martin[2]; Laurent Delanny[4]; Jean-Denis Mithieux[3]; Muriel Veron[2]; [1]Aperam / SIMaP; [2]SIMaP; [3]Aperam; [4]Université catholique de louvain

9:50 AM
Strain Localization and Martensitic Transformations at Shear Bands in a Low Stacking Fault Energy Austenitic Stainless Steel: *Douglas Medlin*[1]; J. Sabisch[1]; C. San Marchi[1]; J. Ronevich[1]; [1]Sandia National Laboratories

10:10 AM Break

10:30 AM
Influence of Crystal Orientation and Berkovich Tip Rotation on the Mechanical Characterization of Grain Boundaries in Molybdenum: *Verena Maier-Kiener*[1]; Severin Jakob[1]; Helmut Clemens[1]; Reinhard Pippan[2]; [1]Montanuniversität Leoben; [2]Austrian Academy of Sciences

10:50 AM
Anisotropy Grading Effects on Strength and Ductility: *S. Mohadeseh Taheri-Mousavi*[1]; Dingshun Yan[2]; C. Cem Tasan[1]; [1]MIT; [2]Chinese Academy of Sciences

11:10 AM
A Multiphysics, Mesoscale Framework to Predict the Creep-fatigue Life of Engineering Polycrystalline Alloys: *Andrea Rovinelli*[1]; Mark Messner[1]; David Parks[2]; T.L. Sham[1]; [1]Argonne National Laboratory; [2]Massachusetts Institute of Technology

11:30 AM
Characterization and Modeling of the Microstructure-scale Strain Distributions in an Aluminum Alloy Under Multiple Strain Paths: Baran Guler[1]; Ulke Simsek[1]; Tuncay Yalcinkaya[1]; *Mert Efe*[1]; [1]Middle East Technical Univ

11:50 AM
A Crystal-plasticity Modeling Framework to Study Effect of Grain Size on Mechanical Response of Open-cell Aluminum Foam: *Dongfang Zhao*[1]; Kristoffer Matheson[1]; Brian Phung[1]; Michael Czabaj[1]; Ashley Spear[1]; [1]University of Utah

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Environmental Assisted Cracking, Material Degradation in Irradiated Environments

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Luke Brewer, University of Alabama; Sebastien Dryepondt, Oak Ridge National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Xiaoyuan Lou, Auburn University

Thursday AM | February 27, 2020
7A | San Diego Convention Ctr

Session Chairs: Michael Kirka, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University

8:30 AM Invited
Stress Corrosion Cracking and Corrosion-fatigue Behavior of Additively Manufactured 17-4PH: *James Burns*[1]; Trevor Shoemaker[1]; [1]University of Virginia

8:55 AM
Stress Corrosion Cracking Growth Behavior of Additively Manufactured Alloy 800H in High Temperature Water: *Jingfan Yang*[1]; Miao Song[2]; Raul Rebak[3]; Xiaoyuan Lou[1]; [1]Auburn University; [2]University of Michigan Ann Arbor; [3]GE Global Research

9:15 AM
Stress Corrosion Cracking Susceptibility of Additively Manufactured 2xxx-series Aluminum Alloys Produced by Selective Laser Melting (SLM): *Kevin Chasse*[1]; Preet Singh[2]; Jamshad Mahmood[2]; Crosby Owens[1]; [1]Northrop Grumman Systems Corporation; [2]Georgia Institute of Technology

9:35 AM
On the Implication of Strain Localization on the Fatigue Crack Propagation Under Hydrogen Pressure of LBM Inconel 718: *Abdelali Oudriss*[1]; Simon Puydebois[2]; Pierre Bernard[3]; Laurent Briottet[2]; Xavier Feaugas[1]; [1]Université de La Rochelle - Lasie; [2]CEA LITEN; [3]ArianeGroup

9:55 AM
Environmental Effects on the Stress Corrosion Cracking Behavior of an Additively Manufactured Stainless Steel: *Jonathan Pegues*[1]; Michael Roach[2]; Nima Shamsaei[1]; [1]Auburn University; [2]University of Mississippi Medical Center

10:15 AM Break

10:35 AM Invited
SCC and IASCC of Printed 316L for Use in the Nuclear Industry: *Michael Mcmurtrey*[1]; Xiaoyuan Lou[2]; Gary Was[3]; [1]Idaho National Laboratory; [2]Auburn University; [3]University of Michigan

11:00 AM Invited
Additive Manufacturing (AM) of Steels for Extreme Environments-Opportunities and Challenges: *Niyanth Sridharan*[1]; Theresa Mary Green[2]; Stephen Taller[2]; Kevin Field[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan Ann arbor

11:25 AM
Comparison of Voids Swelling in Additively Manufactured and Cold-worked 316L SSs After Self-ion Irradiations at Elevated Temperatures: *Miao Song*[1]; Li Jiang[1]; Youxing Chen[2]; Xiaoyuan Lou[3]; [1]University of Michigan; [2]University of North Carolina, Charlotte; [3]Auburn University

---

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Environmental Embrittlement, Fracture, and Fatigue

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Thursday AM | February 27, 2020
2 | San Diego Convention Ctr

Session Chairs: Jenifer Locke, The Ohio State University; Matthew Steiner, University of Cincinnati

---

8:30 AM Invited
Effects of Complex Atmospheric Environments on the Corrosion Fatigue of AA7085-T7451: Brandon Free[1]; Sarah Galyon Dorman[2]; Jason Niebuhr[2]; *Jenifer Locke*[1]; [1]Fontana Corrosion Center, The Ohio State University; [2]SAFE Inc.

9:10 AM
Microstructural Relationships to both Directional and Bulk Sensitization Responses in 5XXX Series Aluminum Alloys: *Matthew Steiner*[1]; Likun Sun[1]; [1]University of Cincinnati

9:30 AM
Corrosion and Interstitial Triggered Grain Boundary Embrittlement of Al Alloys: *Quanmei Guan*[1]; Jing Sun[1]; Haisheng Wang[1]; Chengxiong Zou[2]; William Yi Wang[2]; Jijun Ma[1]; [1]CRRC Tangshan Co., Ltd; [2]Northwestern Polytechnical University

9:50 AM
Tribocorrosion Resistance of Aluminum Alloys: The Effects of Scratching Frequency and Anodic Polarization: *Jia Chen*[1]; Wenjun Cai[1]; [1]Virginia Polytechnic Institute and State University

10:10 AM Break

10:30 AM
Role of Chloride on the Fracture Behaviour of Micro-alloyed Steel in E20 Simulated Fuel Ethanol Environment: *Olufunmilayo Joseph*[1]; John Ade Ajayi[2]; Cleophas Loto[1]; Seetharaman Sivaprasad[3]; Himadri Bar[3]; [1]Covenant University; [2]Federal University of Technology, Akure; [3]CSIR-National Metallurgical Laboratory

10:50 AM
Microstructure Dependent Penetration and Recrystallization of Zinc by Gallium Based Liquid Metal Alloys: *Justin Norkett*[1]; Alec Chu[2]; Courtney Wiley[2]; Kit Manchette[2]; Victoria Miller[1]; [1]University of Florida; [2]NC State University

11:10 AM
Environmental Assisted Deterioration Modeling of Large Glass Fiber Reinforced Polymer Composite Structures/Systems: *Zhiye Li*[1]; Michael Lepech[1]; [1]Stanford University

11:30 AM
Stress Corrosion Cracking Assisted by Oxygen Embrittlement in Ti-6246: *Yitong Shi*[1]; Sudha Joseph[1]; Paraskevas Kontis[2]; Yanhong Chang[2]; Baptiste Gault[2]; David Dye[1]; [1]Imperial College London; [2]Max Planck Institute for Iron Research

---

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Hydrogen Embrittlement II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Thursday AM | February 27, 2020
Theater A-10 | San Diego Convention Ctr

Session Chairs: Joshua Kacher, Georgia Institute of Technology; Kaila Bertsch, Lawrence Livermore National Laboratory

---

8:30 AM Invited
Mechanistic Model for Fatigue Crack Growth in the Presence of Hydrogen: *Seyedehzahra Hosseinisarani*[1]; Mohsen Dadfarnia[2]; Masanobu Kubota[3]; Akihide Nagao[3]; Brian Somerday[3]; Petros Sofronis[1]; Robert Ritchie[4]; [1]Kyushu University; University of Illinois at Urbana-Champaign; [2]Kyushu University; Seattle University; [3]Kyushu University; [4]Kyushu University; University of California, Berkeley

9:10 AM
First-principles Investigation of Hydrogen Trapping in Chemistry Dependent Vacancies of Fe Cr Ni Alloys: *Patrick Thomas*[1]; Benjamin Sikora[1]; [1]Honeywell

9:30 AM
Crystal Plasticity Modeling of Hydrogen Concentration Ahead of a Crack Tip in FCC Steel: *Theodore Zirkle*[1]; Tang Gu[1]; Ben Anglin[2]; Clint Geller[3]; David McDowell[1]; [1]Georgia Tech; [2]Naval Nuclear Laboratory ; [3]Naval Nuclear Laboratory

9:50 AM
Effect of Local Austenite-to-martensite Transformation on Hydrogen Embrittlement of Cold-rolled Medium Mn Steel: *Jun Zhang*[1]; Zhigang Yang[1]; Chi Zhang[1]; Hao Chen[1]; [1]Tsinghua University

10:10 AM Break

10:30 AM
Elucidating the Loading Rate Dependence of Hydrogen Environment-assisted Cracking Behavior in a Ni-Cu Superalloy: *Zachary Harris*[1]; Erin Dubas[1]; Allison Popernack[1]; Brian Somerday[2]; James Burns[1]; [1]University of Virginia; [2]Independent Consultant

10:50 AM
Comparison of Fracture Morphologies and Hydrogen States Present in Vicinity of Fracture Surface Obtained by Different Methods of Evaluating Hydrogen Embrittlement of DP and TRIP Steels: *Daichi Asari*[1]; Kenichi Takai[1]; Satoshi Mizokami[2]; Mitsugi Fukahori[2]; [1]Sophia University; [2]Mazda Motor Corporation

11:10 AM
Comparison Study on the Hydrogen Embrittlement Susceptibility of High Hardness Steels: *William Williams*[1]; David Salley[1]; Haley Doude[1]; Wilburn Whittington[1]; David Wipf[2]; Krista Limmer[3]; Daniel Field[3]; Kevin Doherty[3]; Hongjoo Rhee[1]; [1]Center for Advanced Vehicular Systems; [2]Mississippi State University; [3]US Army Research Lab

11:30 AM
Crack Initiation and Propagation Analyses of Hydrogen-related Fracture Surfaces of Tempered Martensitic Steel: *Takahiro Chiba*[1]; Takashi Yasukawa[1]; Kenichi Takai[1]; [1]Sophia University

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Machine Learning and Autonomous Researchers for Materials Discovery and Design — Session I

Program Organizer: Keith Brown, Boston University

Thursday AM | February 27, 2020
4 | San Diego Convention Ctr

8:30 AM Invited
Adaptive Machine Learning for Efficient Navigation of Materials Space: *Prasanna Balachandran*[1]; [1]University of Virginia

9:10 AM Invited
Unraveling Hierarchical Materials using Autonomous Research Systems: *Keith Brown*[1]; [1]Boston University

9:50 AM Break

10:10 AM Invited
Combining Simulation and Autonomous Experimentation for Mechanical Design: *Aldair Gongora*[1]; [1]Boston University

10:50 AM Invited
Closing the Loop in Autonomous Materials Development: *Kristofer Reyes*[1]; [1]University at Buffalo- the State University of New York

11:30 AM Invited
Bayesian Methods for Concrete Creep Prediction and Learning Optimized Concrete Microstructure Design: *Mija Helena Hubler*[1]; [1]University of Colorado Boulder

ADVANCED MATERIALS

High Entropy Alloys VIII — Modeling and Machine Learning

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | February 27, 2020
Marina Ballroom E | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
Atomistic Simulations of Dislocations and Deformation in FCC Ni-based Binary Concentrated Alloys: *Haixuan Xu*[1]; Liubin Xu[1]; Jaswanth Bommidi[1]; [1]University of Tennessee Knoxville

8:50 AM Invited
Machine-learning Driven Efficient Exploration of the High Entropy Alloy Phase Space: *Raymundo Arroyave*[1]; [1]Texas A&M University

9:10 AM Invited
Characteristics of Edge Dislocations and their Glide in FCC NiCoFe and NiCoFeCu Equiatomic Solid Solution Alloys: *Wei Li*[1]; Satish Rao[1]; Jaafar El-Awady[1]; [1]Johns Hopkins University

9:30 AM
Origin of High Cr Cation Fractions in Passive Oxide of Ni38Fe20CrxMn21-0.5xCo21-0.5x High Entropy Alloys: *Junsoo Han*[1]; Angela Gerard[1]; Xuejie Li[2]; James Saal[3]; Pin Lu[3]; Wolfgang Windl[4]; Kevin Ogle[2]; Gerald Frankel[4]; John Scully[1]; [1]University of Virginia; [2]Chimie ParisTech; [3]Questek; [4]The Ohio State University

9:50 AM
Unravelling Sluggish Diffusion of High-entropy Alloys through Machine Learning Methods: *S. Mohadeseh Taheri-Mousavi*[1]; S. Sina Moeini-Ardakani[1]; Ryan Penny[1]; Ju Li[1]; A. John Hart[1]; [1]MIT

10:10 AM Break

10:30 AM Invited
Machine Learning Alloy Design Compositions and Hardness for High Entropy Alloys: Yao-Jen Chang[1]; Chia-Yung Jui[2]; Wen-Jay Lee[2]; *An-Chou Yeh*[1]; [1]National Tsing Hua University; [2]National Center for High-Performance Computing

10:50 AM
Nanoscale Deformation Twinning in CrCoNi Medium-entropy Alloy Investigated by Molecular Dynamics Simulation: *Jun Ding*[1]; Mark Asta[2]; Robert Ritchie[2]; [1]Lawrence Berkeley National Lab; [2]UC Berkeley

11:10 AM Invited
Materials Fingerprint Classification: *Vasileios Maroulas*[1]; Adam Spannaus[1]; David Keffer[1]; Kody Law[2]; Farzana Nasrin[1]; Cassie Micucci[1]; Peter Liaw[1]; Piotr Luszczek[1]; Louis Santodonato[3]; [1]University of Tennessee; [2]University of Manchester; [3]Advanced Research Systems, INC

11:30 AM Invited
Machine Learning for Accelerating the Design of Additively-manufactured Turbine Blades Yielding Ultra-high Energy Efficiency: Xuesong Fan[1]; *Baldur Steingrimsson*[2]; Duckbong Kim[3]; Peter Liaw[1]; [1]University of Tennessee; [2]Imagars LLC; Portland State University; [3]Tennessee Tech University

11:30 AM Invited
Quantifying Short-range Ordering in Refractory High-entropy Alloys: *Wei Chen*[1]; George Kim[1]; Chanho Lee[2]; Peter Liaw[2]; [1]Illinois Institute of Technology; [2]University of Tennessee

ADVANCED MATERIALS

High Entropy Alloys VIII — Structures and Modeling I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | February 27, 2020
Mission Hills | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
First-principles Methods of Calculating Stacking Fault Energies in Refractory BCC High-entropy Alloys: *Chelsey Hargather*[1]; Joshua Strother[1]; [1]New Mexico Institute of Mining and Technology

8:50 AM Invited
Compositional Design and Deformation Behavior in Ni-based Concentrated/HEA Alloys: *Ridwan Sakidja*[1]; Wai-Yim Ching[2]; [1]Missouri State University; [2]University of Missouri-Kansas City

9:10 AM Invited
Emerging Computational Tools for Exploring the Refractory Compositionally Complex Alloys: *Christopher Woodward*[1]; Satish Rao[2]; Edwin Antillon[2]; Brahim Akdim[2]; Triplicane Parthasarathy[2]; Daniel Miracle[1]; Oleg Senkov[2]; [1]Air Force Research Laboratory; [2]UES Inc.

9:30 AM
Ab Initio Phase Stabilities of High Entropy and Chemically Complex Alloys: Yuji Ikeda[1]; Prashanth Srinivasan[2]; Biswanath Dutta[2]; Jörg Neugebauer[1]; Blazej Grabowski[3]; Tatiana Kostiuchenko[4]; Alexander Shapeev[4]; *Fritz Koermann*[2]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Tu Delft; [3]University of Stuttgart; [4]Skoltech

9:50 AM
Deformation-induced Crystalline to Amorphous Phase Transformation in High-entropy Alloys: *Dengke Chen*[1]; Yin Zhang[1]; Hao Wang[2]; Xiaozhou Liao[2]; Ting Zhu[1]; [1]Georgia Institute of Technology; [2]The University of Sydney

10:10 AM Break

10:30 AM Invited
Small-scale Mechanical Behavior of Single Phase and Complex High Entropy Alloys: Saideep Muskeri[1]; Vahid Hasannaeimi[1]; Maryam Sadeghilaridjani[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

10:50 AM
Stability of Al-Li-Ti-Sc-Mg High Entropy Alloys from Monte Carlo Simulations: James Morris[1]; *Eva Zarkadoula*[2]; M. Claudia Troparevsky[2]; Andreas Kulovits[3]; [1]Ames Laboratory; [2]Oak Ridge National Laboratory; [3]Arconic Inc.

11:10 AM Invited
Atomistic Simulations of the fcc-to-hcp Phase Transformation in the Equiatomic CoCrFeMnNi Alloy under High Compression: *Chin-Lung Kuo*[1]; [1]National Taiwan University

11:30 AM Invited
Data-driven Design of High-entropy Alloys: *Houlong Zhuang*[1]; Wenjiang Huang[1]; Duo Wang[1]; [1]Arizona State University

11:50 AM Invited
The Stacking Fault Energies of FCC High-entropy Alloys: An ab initio Study: *Zongrui Pei*[1]; Jeffrey Hawk[1]; David Alman[1]; Michael Gao[1]; [1]National Energy Technology Laboratory

ADVANCED MATERIALS

High Entropy Alloys VIII — Synthesis and Alloy Development

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | February 27, 2020
Marina Ballroom F | Marriott Marquis Hotel

Session Chair: To Be Announced

8:30 AM Invited
Theory for Yield Strength of BCC HEAs: *William Curtin*[1]; Francesco Maresca[1]; [1]Epfl Sti Igm Lammm

8:50 AM Invited
High Entropy Alloy Nanomaterials as Filler Materials for Brazing Ni-based Superalloys: *Anming Hu*[1]; Benjamin Nielsen[1]; Denzel Bridges[1]; Raymond Xu[1]; Zhili Feng[1]; Peter Liaw[1]; [1]University of Tennessee

9:10 AM Invited
Formability Enhancement of High-entropy Alloy by Manipulation of Stacking Fault Energy: Jeong-Won Yeh[1]; Chanyang Kim[1]; Kook Noh Yoon[1]; Hyun Seok Oh[1]; Myoung-Gyu Lee[1]; *Eun Soo Park*[1]; [1]Seoul National University

9:30 AM Invited
Exceptional Strength-ductility Combination in an FCC Based High Entropy Alloy: *Bharat Gwalani*[1]; Sriswaroop Dasari[2]; Vishal Soni[2]; Shivakant Shukla[2]; Abhinav Jagetia[2]; Priyanshi Agrawal[2]; Rajiv Mishra[2]; Rajarshi Banerjee[2]; [1]Pacific Northwest National Laboratory; [2]University of North Texas

9:50 AM Invited
Electronic Descriptors for Designs of Chemically Complex Transition-metal Alloys: Yong-Jie Hu[1]; Xiaofeng Qian[2]; *Liang Qi*[1]; [1]University of Michigan; [2]Texas A&M University

10:10 AM Break

10:30 AM Invited
Integrating Theory and Experiment in the Design of Multiprincipal Element Alloys: Mu Li[1]; Zhaohan Zhang[1]; Arashdeep Thind[1]; Rohan Mishra[1]; *Katharine Flores*[1]; [1]Washington University in St. Louis

10:50 AM Invited
Electroplating Nanocrystalline Medium and High-entropy Alloys: Lianbo Wang[1]; Michel Hache[1]; *Yu Zou*[1]; [1]University of Toronto

11:10 AM Invited
Alloy Design Strategy for Enhancing High Temperature Strength and Room Temperature Ductility in BCC HEAs: *Il Hwan Kim*[1]; Hyun Seok Oh[2]; Eun Soo Park[1]; [1]Seoul National University; [2]Massachusetts Institute of Technology

11:30 AM Invited
Thermal Transport Calculation of High Entropy Alloys for Thermoelectric Applications: *Seungha Shin*[1]; Md Abdullah Al Hasan[1]; Jiaqi Wang[1]; Yu-Kai Weng[1]; Dustin Gilbert[1]; [1]University of Tennessee

11:50 AM Invited
Theory of Formation of High Entropy Alloys for Biomedical Applications: *Wai-Yim Ching*[1]; Saro San[1]; Jamieson Brechtl[2]; Ridwan Sakidja[3]; Miqin Zhang[4]; Peter Liaw[2]; [1]University of Missouri; [2]University of Tennessee; [3]Missouri State University; [4]University of Washington

MATERIALS DESIGN

ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design — Session III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology; Raymundo Arroyave, Texas A&M University

Thursday AM | February 27, 2020
30D | San Diego Convention Ctr

Session Chair: James Saal, Citrine Informatics

8:30 AM Invited
Machine Learning to Predict Oxidation Behavior of High-temperature Alloys: *Dongwon Shin*[1]; Rishi Pillai[1]; Jian Peng[1]; Marie Romedenne[1]; Bruce Pint[1]; J. Haynes[1]; [1]Oak Ridge National Laboratory

9:10 AM Invited
Discovering and Navigating Gaps and Connections in Data for Materials Design: *Krishna Rajan*[1]; [1]University at Buffalo- State University of New York

9:50 AM
Machine Learning for Materials Science: Open, Online Tools in NanoHUB: *Juan Verduzco*[1]; Saaketh Desai[1]; Alejandro Strachan[1]; Tanya Faltens[1]; [1]Purdue University

10:10 AM Break

10:30 AM
Automated Data Curation for Electron Microscopy Using the Materials Data Facility: *Charudatta Phatak*[1]; Jonathon Gaff[2]; Ian Foster[1]; Ben Blaiszik[2]; [1]Argonne National Laboratory; [2]University of Chicago

10:50 AM
Uncertainty Quantification and Propagation in ICME Enabled by ESPEI: *Brandon Bocklund*[1]; Richard Otis[2]; Zi-Kui Liu[1]; [1]Pennsylvania State University; [2]Jet Propulsion Laboratory, California Institute of Technology

11:10 AM
Computational Classification, Generation and Time-evolution Prediction of Alloy Microstructures with Deep Learning: *Fei Zhou*[1]; [1]LLNL

11:30 AM
Predicting Electronic Density of States of Nanoparticles by Principal Component Analysis and Crystal Graph Convolutional Neural Network: Kihoon Bang[1]; Byung Chul Yeo[2]; Doosun Hong[1]; Donghun Kim[2]; Sang Soo Han[2]; *Hyuck Mo Lee*[1]; [1]Korea Advanced Institute of Science and Technology; [2]Korea Institute of Science and Technology

LIGHT METALS

Magnesium Technology 2020 — Solidification and Production of Magnesium

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Thursday AM | February 27, 2020
6C | San Diego Convention Ctr

Session Chairs: Neale Neelameggham, IND LLC; Yuan Yuan, Chongqing University

8:30 AM Invited
Thermodynamic Description and Thermophysical Properties of Mg-Gd Alloys and Quantitative Phase-field Simulation of their Solidification Process: *Lijun Zhang*[1]; [1]Central South University

9:00 AM
Investigation and Modeling of the Influence of Cooling Rates on the Microstructure of AZ91 Alloys: Sarkis Gavras[1]; Muhammad Umer Bilal[1]; Domonkos Tolnai[1]; *Norbert Hort*[1]; [1]Magic, Helmholtz-Zentrum Geesthacht

9:20 AM
The Independent Effects of Cooling Rate and Na Addition on Hydrogen Storage Properties in Hypo-eutectic Mg Alloys: *Manjin Kim*[1]; Yahia Ali[1]; Stuart McDonald[1]; Trevor Abbott[2]; Kazuhiro Nogita[1]; [1]The University of Queensland; [2]Magontec Ltd.; The University of Queensland

9:40 AM
Al8Mn5 Particle Clustering on Oxide Films in Liquid AZ80 Magnesium Alloys: Liuqing Peng[1]; Te-Cheng Su[1]; Kazuhiro Nogita[2]; Hideyuki Yasuda[3]; *Christopher Gourlay*[1]; [1]Imperial College London; [2]The University of Queensland; [3]Kyoto University

10:00 AM Break

10:20 AM
Producing High Purity Magnesium (99.99%) Directly by Pidgeon Process: *Bo Yang*[1]; Fei Liu[1]; Bo-Yu Liu[1]; Zhi-Min Chang[1]; Lu-Yao Mao[1]; Jiao Li[1]; Zhi-Wei Shan[1]; [1]Xi'an Jiaotong University

10:40 AM
Research on Properties of Prefabricated Pellets of Silicothermic Process After Calcination in Flowing Argon Atmosphere: *Junhua Guo*[1]; Zhang Tingan[1]; Daxue Fu[1]; Jibiao Han[1]; Zonghui Ji[1]; Zhihe Dou[1]; [1]Northeastern University

11:00 AM
Producing Pure Magnesium Through Silicothermic Under the Atmospheric Pressure: *Fei Liu*[1]; Bo Yang[1]; Bo-Yu Liu[1]; Jiao Li[1]; Zhi-Min Chang[1]; Zhi-Wei Shan; [1]Xi'an Jiaotong University

11:20 AM
Effect of Temperature on Magnesium Vapor Condensation in Inert Carrier Gas: *Jibiao Han*[1]; Zhang Tingan[1]; Daxue Fu[1]; Junhua Guo[1]; Zonghui Ji[1]; Zhihe Dou[1]; [1]Northeastern University

11:40 AM
Thermodynamic Descriptions of the Quaternary Mg-Al-Zn-Sn System and their Experimental Validation: *Ting Cheng*[1]; Lijun Zhang[1]; [1]Central South University

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Corrosion II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Stephen Raiman, Oak Ridge National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory

Thursday AM | February 27, 2020
Theater A-6 | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Invited
Materials and Chemistry Research for Fluoride Cooled High Temperature Reactors: *Alan Kruizenga*[1]; Micah Hackett[1]; George Young[1]; Michael Hanson[1]; Augustus Merwin[1]; Francesco Carotti[1]; [1]Kairos Power

9:00 AM
Effect of Europium Fission Product on Chromium Solubility in Molten KCl-$MgCl_2$ Salt: *Dino Sulejmanovic*[1]; Stephen Raiman[1]; James Kurley[1]; [1]Oak Ridge National Laboratory

9:20 AM
Non-galvanic Mass Transport in Molten Fluoride Salt Isothermal Corrosion Cells: *Cody Falconer*[1]; William Doniger[1]; Evan Buxton[1]; Mohamed Elbakshwan[1]; Kumar Sridharan[1]; Adrien Couet[1]; [1]University of Wisconsin - Madison

9:40 AM
First Principles Investigation of Surface Behavior in Ni-Cr Alloy in Molten Salt Systems: *Jacob Startt*[1]; Stephen Raiman[2]; Chaitanya Deo[1]; [1]Georgia Insitiute of Tech; [2]Oak Ridge National Laboratory

10:00 AM
Advanced Characterization of Corrosion Behavior of Metals in Molten Chloride Salts: *Lingfeng He*[1]; Arthur Ronne[2]; Simerjeet Gill[3]; Kotaro Sasaki[3]; Yi Xie[1]; Yachun Wang[1]; Phillip Halstenberg[4]; Dmitriy Dolzhnikov[4]; Yu-chen Karen Chen-Wiegart[2]; Shannon Mahurin[4]; [1]Idaho National Laboratory; [2]Stony Brook University; [3]Brookhaven National Laboratory; [4]Oak Ridge National Laboratory

10:20 AM Break

10:40 AM
Technology Development of In-Situ Corrosion Kinetics and Salt Property Measurements: *Li Liu*[1]; Jinghua Feng[1]; Kemal Ramic[1]; [1]Rensselaer Poletechnic Institute

11:00 AM
Improving the Corrosion Resistance of Ferritic-martensitic Steels in Molten Nitrate Salt via Diffusion Coatings for Concentrated Solar Power Applications: *Ceyhun Oskay*[1]; Tobias Meißner[1]; Benjamin Grégoire[1]; Alexander Bonk[2]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut; [2]German Aerospace Center (DLR)

11:20 AM
First Steps Towards Predicting the Corrosion Rates of Structural Materials in Molten Salts: *Rishi Pillai*[1]; Stephen Raiman[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

11:40 AM
Mechanistic Understanding Of Molten Salt Corrosion Using Electron Paramagnetic Resonance: *James Kurley*[1]; Juho Lehmusto[2]; Dino Sulejmanovic[1]; James Keiser[1]; Stephen Raiman[1]; [1]Oak Ridge National Laboratory; [2]Abo Akademi University

MATERIALS DESIGN

Materials Design Approaches and Experiences V — Ferrous Alloys I

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Akane Suzuki, GE Research; Ji-Cheng Zhao, University of Maryland; Michael Fahrmann, Haynes International; Qiang Feng, University of Science and Technology Beijing; Michael Titus, Purdue University

Thursday AM | February 27, 2020
33A | San Diego Convention Ctr

Session Chairs: Matthias Militzer, University of British Columbia; Govindarajan Muralidharan, Oak Ridge National Laboratory

8:30 AM Invited
Genomic Materials Design: Making CyberSteels Fly: *Gregory Olson*[1]; [1]Northwestern University

9:00 AM Invited
Development of Cast Alumina-forming Austenitic Stainless Steels and their Implementation In High Temperature Industrial Applications: *Govindarajan Muralidharan*[1]; Yukinori Yamamoto[1]; Michael Brady[1]; Donovan Leonard[1]; Roman Pankiw[2]; Jim Myers[3]; Tanya Ros[4]; Stanley Fauske[5]; Ben Church[6]; [1]Oak Ridge National Laboratory; [2]Duraloy Technologies; [3]Metaltek International; [4]Arcelor Mittal Global R & D; [5]Arcelor Mittal Coatesville; [6]University of Wisconsin-Milwaukee

9:30 AM
Synergistic Nano-precipitation in Mn-stabilized Austenitic Steels: *Colin Stewart*[1]; Richard Fonda[2]; Keith Knipling[2]; [1]National Research Council Associate at the U.S. Naval Research Laboratory; [2]U.S. Naval Research Laboratory

9:50 AM
Strong and Ductile Steel Designed by Dislocation Engineering: *MingXin Huang*[1]; [1]University of Hong Kong

10:10 AM Break

10:30 AM Invited
Interface based Alloy Design: *Matthias Militzer*[1]; Mariana Mendes[1]; Ayush Suhane[1]; Nicolas Romualdi[1]; Hariharan Umashankar[1]; [1]University of British Columbia

11:00 AM Invited
Alloying Element Effects on Migrating Interfaces in Steels: A Phase-field Study: *Hao Chen*[1]; Cong-Yu Zhang[1]; Wenbo Liu[2]; Geng Liu[1]; Chi Zhang[1]; Zhi-Gang Yang[1]; [1]Tsinghua University; [2]Xi'an Jiaotong University

Materials Processing Fundamentals — Steelmaking Process Modeling and Composites

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Metal; Sam Wagstaff, Novelis Inc.; Antoine Allanore, Massachusetts Institute of Technology; Fiseha Tesfaye, Abo Akademi University

Thursday AM | February 27, 2020
13 | San Diego Convention Ctr

Session Chairs: Allie Anderson, Gopher Resource; Jonghyun Lee, Iowa State University

8:30 AM
Numerical Simulation of Heat Transfer Between Roller and Slab during Medium Thickness Slab Continuous Casting: *Shuang Liu*[1]; Mujun Long[1]; Pei Xu[1]; Pingmei Tang[1]; Dengfu Chen[1]; Huamei Duan[1]; [1]Chongqing University

8:50 AM
Mathematical Simulation on the Influence of Melting Rate and Melting Current on Droplet Behavior during Electroslag Remelting Process: *Tianjie Wen*[1]; Xiujie Li[1]; Anjun Xu[1]; Lifeng Zhang[1]; [1]University of Science and Technology Beijing

9:10 AM
Numerical Simulation on the Multiphase Flow During the KR Process Using the Eulerian-Eulerian Modeling: Yanyu Zhao[1]; Wei Chen[1]; *Lifeng Zhang*[1]; [1]University of Science and Technology Beijing

9:30 AM
Numerical Simulation of the Flow Behavior of Liquid Steel in Continuous Slab Caster Mold: *Amiy Srivastava*[1]; Donghui Li[1]; Kinnor Chattopadhyay[1]; [1]University of Toronto

9:50 AM
Mathematical Modeling of Strip Slipping on Bridle Roll of Skin Pass Mill During Speed-up Process: *Yongqiang Wang*[1]; Yanglong Ll[1]; Hui Wang[1]; Wei Guo[1]; Jie Wen[1]; Meng Yu[1]; [1]Research Institute of Technology of Shougang Group Co., Ltd.

10:10 AM Break

10:30 AM
Preliminary Research into the Effects of Electric Field & Current on Reactive Processing of Ni 3 Al-CNT Composites: *Crystal Gama*[1]; Kevin Yokota[1]; Raj Kumar Rachapudi[1]; Mohammed Shahid Islam[1]; Alberto Ricciulli[1]; Khaled Morsi[1]; [1]SDSU

10:50 AM
Preliminary Research into the Electrically Activated Reactive Synthesis (EARS) & Wear Properties of Aluminide Nanocomposites: *Alberto Ricciulli*[1]; Mohammed Shahidul Islam[1]; Gregory Essayan[1]; Kaitlin Kehl[1]; Crystal Gama[1]; Raj Kumar Rachapudi[1]; Saman Sharifi[1]; Khaled Morsi[1]; [1]San Diego State University

11:10 AM
Exploratory Research into Reactive Processing & Properties of Ni3Al-CNT Composites: *Mohammed Shahidul Islam*[1]; Crystal Gama[1]; Raj Kumar Rachapudi[1]; Alberto Ricciulli[1]; Saman Sharifi[1]; Gregory Essayan[1]; Kaitlin Kehl[1]; Khaled Morsi[1]; [1]San Diego State University

Materials Research in Reduced Gravity — Thermophysical Properties II

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Robert Hyers, University of Massachusetts; Douglas Matson, Tufts University; Michael Sansoucie, NASA MSFC; Shaun McFadden, Ulster University; Jonghyun Lee, Iowa State University; Wilhelmus Sillekens, European Space Agency; Takehiko Ishikawa, JAXA

Thursday AM | February 27, 2020
18 | San Diego Convention Ctr

Session Chairs: Jonghyun Lee, Iowa State University; Markus Mohr, U. Ulm

8:30 AM
Effect of External Force on Surface Oscillation Damping of Levitated High-temperature Droplet: *Masahito Watanabe*[1]; [1]Gakushuin University

8:50 AM
Viscosity Measurement of Liquid Alloys in Microgravity and Experiment Parameters Optimization: *Xiao Xiao*[1]; Douglas Matson[2]; [1]DLR; [2]Tufts University

9:10 AM
Containerless Measurement of Thermophysical Properties of Ni-based Superalloys LEK94, MC2 and CMSX-10 in the Liquid Phase on Board the International Space Station: *Markus Mohr*[1]; Rainer Wunderlich[1]; Hans Fecht[1]; [1]Ulm University

9:30 AM
Modeling Magnetohydrodynamics in Microgravity Electromagnetic Levitation Experiments: *Gwendolyn Bracker*[1]; Robert Hyers[1]; [1]University of Massachusetts

9:50 AM
Effect of Inert Gas Atmosphere on Evaporation Losses and Density Measurement for Electromagnetically Levitated Superalloys: *Jannatun Nawer*[1]; Stéphane Gossé[2]; Michael SanSoucie[2]; Douglas Matson[1]; [1]Tufts University; [2]CEA Saclay

10:10 AM Break

10:40 AM
Thermophysical Properties of SiGe Melts Measured on Board the ISS: *Yuansu Luo*[1]; Bernd Damaschke[1]; Georg Lohöfer[2]; Konrad Samwer[1]; [1]I.Physics Institute University Goettingen; [2]Institut für Materialphysik im Weltraum, Deutsches Zentrum für Luft- und Raumfahrt (DLR), D-51170 Cologne, Germany

11:00 AM
Thermo-physical Properties of Fe-Si Alloys Under Microgravity: *Antonia Betzou*[1]; Markus Mohr[2]; Rainer Wunderlich[2]; Begona Santillana[3]; Hans Fecht[2]; Sridhar Seetharaman[4]; Prakash Srirangam[1]; [1]Wmg, University Of Warwick; [2]University of Ulm; [3]TaTa Steel Europe; [4]Colarado School of Mines

11:20 AM
Computational Fluid Dynamics Modeling of Oscillation Damping of Compound Liquid Droplets: Ali Rabeh[1]; Makrand Khanwale[1]; Baskar Ganapathysubramian[1]; Robert Hyers[2]; *Jonghyun Lee*[1]; [1]Iowa State University; [2]University of Massachusetts

11:40 AM
Liquid Phase Separation and Core-shell Formation in Drop-tube Processed Co-Cu Melts: *Andrew Mullis*[1]; Oluwatoyin Jegede[1]; [1]University Of Leeds

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Dislocations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Thursday AM | February 27, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Limeng Xiong, Iowa State University; Megan Cordill, Austrian Academy of Sciences

8:30 AM Invited
Examining the Kink-controlled Dislocation Dynamics in High-Peierls-barrier Materials from the Atomistic to the Microscale: *Liming Xiong*[1]; [1]Iowa State University

9:10 AM
c+a Dislocation Glide in Zirconium: *Thomas Soyez*[1]; Emmanuel Clouet[1]; Fabien Onimus[1]; [1]CEA Saclay

9:30 AM
An Experimental-numerical Approach to Investigate Hydrogen Enhanced Localized Plasticity (HELP): *S. Mohadeseh Taheri-Mousavi*[1]; Motomichi Koyama[2]; Haxoue Yan[1]; Jinwoo Kim[1]; Benjamin Cameron[1]; S. Sina Moeini-Ardakani[1]; Ju Li[1]; C. Cem Tasan[1]; [1]Massachusetts Institute of Technology; [2]Tohoku University;

9:50 AM
Theory of Dislocation-precipitate Bypass: *Ben Szajewski*[1]; Joshua Crone[1]; Jaroslaw Knap[1]; [1]Army Research Laboratory

10:10 AM Break

10:30 AM
Influence of Laser Machining on the Nanomechanical Behavior of Nickel Titanium Shape Memory Alloy: *Albert Lin*[1]; Kevin Schmalbach[1]; Kaci Gwilt[1]; Julia Hoffmann[1]; Dhiraj Catoor[2]; Markus Reiterer[2]; Nathan Mara[1]; [1]University of Minnesota - Twin Cities; [2]Medtronic

10:50 AM
Atomistic Calculations of the Peierls Stress in Nb-Based Multi-principal Element Alloys: *Shuozhi Xu*[1]; Emily Hwang[2]; Jun Xu[3]; Yanqing Su[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Harvey Mudd College; [3]University of Pennsylvania

11:10 AM
Dislocation Nucleation-mediated Plasticity of FCC Defect-scarce Nanowires: *Jungho Shin*[1]; Zhuocheng Xie[2]; Gunther Richter[3]; Erik Bitzek[4]; Daniel Gianola[1]; [1]University of California, Santa Barbara; [2]Friedrich-Alexander Universität Erlangen-Nürnberg; [3]MPI IS Stuttgart; [4] Friedrich-Alexander Universität Erlangen-Nürnberg

11:30 AM
Dislocation Dominated Plasticity at the Nanometer: *Darcy Hughes*[1]; [1]Sandia National Labs (ret.)

MATERIALS DESIGN

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session V

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, MicroTesting Solutions; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Thursday AM | February 27, 2020
32A | San Diego Convention Ctr

Session Chair: Robert Wheeler, Microtesting Solutions LLC

8:30 AM Keynote
Microtensile Testing of (fcc) Copper and (hcp) Titanium at Elevated Temperatures: *Robert Wheeler*[1]; Adam Shiveley[2]; Amit Pandey[3]; Jiashi Miao[4]; Michael Mills[4]; [1]Microtesting Solutions LLC; [2]Shiveley Technologies; [3]Ansys Inc.; [4]The Ohio State University

9:10 AM
A Novel Experimental Methodology and Theoretical Framework for Enabling Macroscopic-like Deformation at the Microscale: *Hi Vo*[1]; Evan Still[1]; Kiet Lam[1]; Aljaž Drnovšek[2]; Laurent Capolungo[3]; Stuart Maloy[3]; Peter Chou[4]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Jožef Stefan Institute; [3]Los Alamos National Laboratory; [4]Electric Power Research Institute

9:30 AM
Fabrication of Microscale Specimens via Additive Manufacturing for In-situ Mechanical Testing: *Soheil Daryadel*[1]; Majid Minary[2]; [1]University of Illinois at Urbana-Champaign; [2]University of Texas at Dallas

9:50 AM
In-situ Dynamic Stress Field Detection using 2D Mechanical Raman Spectroscopy: *Abhijeet Dhiman*[1]; Hao Wang[1]; Vikas Tomar[1]; [1]Purdue University

10:10 AM Break

10:30 AM Keynote
Micropillar Compression Testing with In-situ Raman Spectroscopy to Study Plastic Deformation in Vitreous Silica: *Shefford Baker*[1]; Zachary Rouse[1]; Praveena Manimunda[2]; Nicole Wiles[1]; S.A. Syed-Asif[2]; [1]Cornell University; [2]Bruker Nano Surfaces

11:10 AM
Temperature Effects in the Microscale Deformability of Yttria Stabilized Zirconia Prepared by Spark Plasma Sintering: *Jaehun Cho*[1]; Jin Li[1]; Qiang Li[1]; Jie Ding[1]; Han Wang[1]; Sichuang Xue[1]; Amiya Mukherjee[2]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]University of California, Davis

11:30 AM
Synchronized Indentation and Raman Spectroscopy for Crystal Engineering: *Praveena Manimunda*[1]; Manish Kumar Mishra[2]; Syed Asif[1]; [1]Bruker; [2]University of Minnesota

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Nanocomposites VI: Nanoscience and Nanotechnology in Advanced Composites — Processing-Properties-Performance of Nanocomposites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Manoj Gupta, National University of Singapore

Thursday AM | February 27, 2020
Solana | Marriott Marquis Hotel

Session Chair: Simona Murph, Savannah River National Laboratory

8:30 AM Invited
Investigating and Understanding the Mechanical and Tribological Properties of A Magnesium Hybrid Metal-ceramic Nanocomposite: Arvind Singh R[1]; Jayalakshmi Subramanian[1]; Sankaranarayanan Seetharaman[2]; Xizhang Chen[1]; Sergey Konovalov[3]; *Srivatsan T.S.*[4]; Manoj Gupta[5]; [1]Wenzhou University; [2]ANSYS Software Private Ltd; [3]Samara National Research University; [4]The University of Akron; [5]National University of Singapore

9:00 AM
State-of-the-Art NanoMaterials at SRNL: From Innovation to Marketplace; Fabrication of Silver-rhodium Nanomaterials for Chemical Sensing Applications: *Simona Hunyadi Murph*[1]; [1]Savannah River National Laboratory / University of Georgia

9:25 AM
New Electron Beam Equipment and Technologies for Production of Advanced Materials Using Vacuum Melting and Evaporation Methods Developed in SPE "Eltekmash": *Alexander Manulyk*[1]; Nikolayi Grechanyuk[1]; Pavel Kucherenko[1]; Alexey Melnik[1]; [1]Synergy Antech Services Inc.

9:50 AM
Role of Rare Earth Oxide Reinforcements in Enhancing the Mechanical, Damping and Ignition Resistance of Magnesium: *Milli Suchita Kujur*[1]; Vyasaraj Manakari[2]; Gururaj Parande[2]; Mrityunjay Doddamani[3]; Ashis Mallick[1]; Manoj Gupta[2]; [1]Indian Institute of Technology (Indian School of Mines), Dhanbad; [2]National University of Singapore; [3]National Institute of Technology Karnataka

10:15 AM Break

10:35 AM
Ordered Colloidal Crystals Fabrication and Studies on the Properties of Poly(Styrene-Butyl-Acrylate-Acrylic Acid) and Polystyrene Latexes: Ikhazuagbe Ifijen[1]; Esther Ikhuoria[2]; Stanley Omorogbe[1]; *Aireguamen Aigbodion*[1]; [1]Rubber research institute of Nigeria; [2]University of Benin, Benin City, Nigeria

11:00 AM
Magnetic Field-assisted Electrodeposition of Nickel Composite Coatings: *Denise Yin*[1]; Heather Murdoch[1]; Efrain Hernández-Rivera[1]; Anit Giri[1]; [1]CCDC Army Research Laboratory

11:25 AM
Nanomechanical and Tribocorrosion Performance of Al-based Multilayered Thin Films: *Wenbo Wang*[1]; Wenjun Cai[1]; [1]Virginia Polytechnic Institute and State University

11:50 AM
Nanolayered Thin Film Metallic Glass with Modulated Composition: Ali Behboud[1]; Gökhan Tarman[2]; Amir Motallebzadeh[3]; *Sezer Ozerinc*[1]; [1]Middle East Technical University; [2]Tobb University of Economics and Technology; [3]Koç University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — General Topics I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Thursday AM | February 27, 2020
33B | San Diego Convention Ctr

Session Chairs: Pankaj Kumar, University of Nevada, Reno; Fulin Wang, University of California, Santa Barbara

8:30 AM
Kinetics Evolution of L12-typed '-Co3(Al, W) Phase in a Medium Supersaturation Co-Al-W Alloy: *Yongsheng Li*; Shujing Shi[1]; Dong Wang[1]; [1]Nanjing University of Science and Technology

8:50 AM
Precipitation Kinetics and Evaluation of the Interfacial Mobility of Precipitates in an AlSi7Cu0.5Mg0.3 Cast Alloy: Pierre Heugue[1]; *Daniel Larouche*[1]; Francis Breton[2]; Rémi Martinez[3]; X Grant Chen[4]; Denis Massinon[5]; [1]Laval University; [2]Rio Tinto; [3]Linamar Corporation; [4]University of Quebec at Chicoutimi; [5]Montupet Laigneville

9:10 AM
Neutron Diffraction-based Assessment of Eutectoid Phase Transformation Kinetics in U-10Mo Alloys with Minor Ternary Alloying Additions of Cr, Co, and Ni: *Nathan Peterson*[1]; Daniel Malta[1]; Saumyadeep Jana[2]; Vineet Joshi[2]; Sean Agnew[1]; [1]University of Virginia; [2]Pacific Northwest National Laboratory

9:30 AM
Thermodynamic and Kinetic Study of the fcc-B2 Phase Transformation and Consecutive Microstructural Evolution in the Ag-Cu-Pd System: *Solène Iruela*[1]; Yannick Champion[1]; Annie Antoni-Zdziobek[1]; Fabien Volpi[1]; Christine Bourda[2]; Vincent Jarry[2]; [1]SIMaP; [2]Metalor Technologies Electrotechnics France

9:50 AM
Fabrication of Gamma Prime Strengthened Ni-Cr-Al-Ti Microtubes via Gas-phase Deposition and the Kirkendall Effect: *Haozhi Zhang*[1]; Ashley Paz y Puente[1]; [1]University of Cincinnati

10:10 AM Break

10:30 AM
Exploring Phase Transformations in the Au-Zn-Al System: *Taylor Jacobs*[1]; Seth Imhoff[1]; Meghan Gibbs[1]; Clarissa Yablinsky[1]; [1]Los Alamos National Laboratory

10:50 AM
Barrier-free Nucleation at Grain-boundary Triple Junctions During Solid-state Phase Transformations: *Huajing Song*[1]; Jeff.J. Hoyt[2]; [1]Los Alamos National Laboratory; [2]McMaster University

11:10 AM
Formation and Stability of Ni-Y Clusters in Mg85Y9Ni6 Alloys: *Hiroshi Okuda*[1]; Mikito Ito[1]; Michiaki Yamasaki[2]; Yoshihito Kawamura[2]; [1]Kyoto University; [2]Kumamoto University

ENERGY & ENVIRONMENT

Powder Materials for Energy Applications — Additive Manufacturing and Harsh Environment Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University

Thursday AM | February 27, 2020
17A | San Diego Convention Ctr

Session Chairs: Somayeh Pasebani, Oregon State University; Kathy Lu, Virginia Tech

8:30 AM Invited
Is Additive Manufacturing a Competition or Complimentary Technology to Current Processing of Metals?: *Wojciech Misiolek*[1]; [1]Lehigh University

9:00 AM Invited
Novel Additive Manufacturing Process Design for U3Si2 Fuel: *Isabella Van Rooyen*[1]; [1]Idaho National Laboratory

9:30 AM
Microstructural Evolution of a Nanostructured Ferritic Alloy Composite during In-situ Ion Irradiation: *Kathy Lu*[1]; Kaustubh Bawane[1]; David Bai[1]; Jing Hu[2]; Meimei Li[2]; [1]Virginia Polytechnic Institute and State University; [2]Argonne National Laboratory

9:50 AM Break

10:10 AM Invited
Materials for Nuclear Applications Produced by Powder-based Techniques: *Stuart Maloy*[1]; Ben Eftink[1]; Tarik Saleh[1]; Osman El-Atwani[1]; John Carpenter[1]; Eda Aydogan[2]; Thomas Lienert[3]; Mychailo Toloczko[4]; Thak Sang Byun[4]; Curt Lavender[4]; George Odette[5]; David Hoelzer[6]; [1]Los Alamos National Laboratory; [2]Sabanci University; [3]Optomec Corporation; [4]PNNL; [5]University of California, Santa Barbara,; [6]Oak Ridge National Laboratory

10:40 AM Invited
Processing and Characteristics of Nanostructured Ferritic Alloys for Nuclear Reactor Applications: *Thak Sang Byun*[1]; David Hoelzer[1]; [1]Oak Ridge National Laboratory

11:10 AM
Microstructural Evolution of NFA and Cr_3C_2@SiC-NFA Composite during Ion Irradiation: *Kathy Lu*[1]; Kaustubh Bawane[1]; David Bai[1]; Meimei Li[2]; [1]Virginia Polytechnic Institute and State University; [2]Argonne National Laboratory

11:30 AM
Synthesis and Characterization of Lanthana Based ODS Steel for Nuclear Reactor Applications: *Ashwani Kumar*[1]; Krishanu Biswas[1]; Sudhanshu Singh[1]; [1]IIT Kanpur

MATERIALS PROCESSING

Process Metallurgy and Electrochemistry of Molten Salts, Liquid Metal Batteries, and Extra-terrestrial Materials Processing: An EPD Symposium in Honor of Don Sadoway — Prof. Sadoway Honorary Session III

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Yasuhiro Fukunaka, JAXA/Waseda University

Thursday AM | February 27, 2020
14A | San Diego Convention Ctr

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM Invited
Electrochemical Processing under Extreme Conditions: *Yasuhiro Fukunaka*[1]; [1]Kyoto University

8:55 AM Invited
The Application of the FFG Molten Salt Cycle on the Separation of the Refractory Metals: *Georges Kipouros*[1]; [1]Dalhousie University

9:15 AM Invited
Innovative Ways to Chemically Process Rare-earth Waste Materials: *Prabhat Tripathy*[1]; [1]Batelle Energy Alliance (Idaho National Laboratory)

9:35 AM
Metallic Inert Anodes for Molten Carbonates Electrolysis Process: *Kaifa Du*[1]; Peilin Wang[1]; Dihua Wang[1]; [1]Wuhan University

9:55 AM Break

10:10 AM Invited
Recovery of Metal Values from "Wastes": Aida Abbasalizadeh[1]; Rajiv Shekhar[2]; *Seshadri Seetharaman*[3]; [1]TATA Steel, Imuijden, Holland; [2]Indian Institute of Technology (Indian School of Mines), Dhanbad; [3]Royal Institute of Technology

10:30 AM Invited
Study on the Molten Salt CO2 Capture and Electrochemical Transformation (MSCC-ET) Process: *Dihua Wang*[1]; [1]Wuhan University

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Synthesis and Mechanical Behavior

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Thursday AM | February 27, 2020
31B | San Diego Convention Ctr

Session Chairs: Kaka Ma, Colorado State University; Kyung-Tae Park, Hanbat National University

8:30 AM Invited
Amorphization of Covalently-bonded Solids in Laser-induced Shock: A New Deformation Mechanism in Extreme Loading: *Marc Meyers*[1]; Shiteng Zhao[2]; Bruce Remington[3]; Chris Wehrenberg[3]; Hye-Sook Park[3]; Eric Hahn[4]; [1]University of California, San Diego; [2]Lawrence Berkeley National Laboratory; [3]Lawrence Livermore National Laboratory; [4]Los Almos National Laboratory

9:00 AM Invited
Design, Fabrication and Characterization of FeAl-based Metallic-Intermetallic Laminate (MIL) Composites: Haoren Wang[1]; *Kenneth Vecchio*[1]; [1]University of California, San Diego

9:30 AM Invited
Effects of Processing and Grain size on Very High Strain Rate Deformation of Cu: *Kyung-Tae Park*[1]; Keunho Lee[2]; Seok Bong Kim[2]; LeeJu Park[2]; Seong Lee[2]; [1]Hanbat National University; [2]Agency for Defense Development

10:00 AM
Nanomechanical Testing of Spark Plasma Sintered Stainless Steel Parts: *Alexander Preston*[1]; Kaka Ma[1]; [1]Colorado State University

10:20 AM Break

10:30 AM Invited
Fabrication of Oxides and Semiconductors with Non Equilibrium Phase Content: A. Y. Fong[1]; G Uahengo[1]; Y Kodera[1]; *Javier Garay*[1]; [1]University of California, San Deigo

11:00 AM
Direct Observation of Dendritic Fragmentation in Deeply Undercooled Melts: *Andrew Mullis*[1]; Nafisul Haque[2]; [1]University of Leeds; [2]NEDUET

11:20 AM
Achieving Ultrahigh Hardness in Electrodeposited Nanograined Ni-based Binary Alloys: *Yinong Shi*[1]; Xiangui Zheng[1]; Jian Hu[2]; Jiongxian Li[1]; [1]Imr Cas; [2]School of Materials Science and Engineering, East China JiaoTong University

11:40 AM
An Advanced MCrAlY with TGO Self Repair Ability: *Jianhong He*[1]; [1]Oerlikon Metco

12:00 PM
From Waste Recovery to Printed Device Through Process of Cryomilling under Inert Atmosphere: *Kamanio Chattopadhyay*[1]; Hemaprabha Elangovan[1]; Chandrasekhar Tiwari[2]; [1]Indian Institute of Science; [2]Indian Institute of Technology

12:20 PM
A Novel Processing Route for Fe-TiB2 High Modulus Steel by Nano-treating and Regular Casting: *Shiqi Zheng*[1]; Xiaochun Li[1]; [1]University of California, Los Angles

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Irradiation of Ceramics and Uranium Fuels

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Thursday AM | February 27, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Geoffrey Beausoleil, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida

8:30 AM
Microstructural Changes in Graphite and the Corresponding Bulk Property Evolution: *Anne Campbell*[1]; José Arregui-Mena[1]; [1]Oak Ridge National Laboratory

8:50 AM
Microstructural Characterization of Nuclear Graphite Irradiated at Temperatures below 230°C: *Jose Arregui-Mena*[1]; Wenjing Li[2]; Lori Walters[2]; Philip Edmondson[1]; Cristian Contescu[1]; [1]Oak Ridge National Laboratory; [2]Canadian Nuclear Laboratories

9:10 AM
Near-surface Disorder in 4H-SiC Induced by MeV light Ion Irradiation: *John Demaree*[1]; Noel Guardala[2]; Zois Tsinas[3]; Eaman Karim[3]; Mohamad Al-Sheikhly[3]; [1]CCDC Army Research Laboratory; [2]The George Washington University; [3]University of Maryland

9:30 AM
Neutron Irradiation Induced Intergranular Fission Product Precipitation in SiC Layer of TRISO Fuel: *Isabella Van Rooyen*[1]; Subhashish Meher[1]; Thomas Lillo[1]; [1]Idaho National Laboratory

9:50 AM Break

10:10 AM Invited
Investigation of High Burnup Ceramic Fuel Microstructure at Idaho National Laboratory: *Fabiola Cappia*[1]; Geoffrey Beausoleil[1]; Alex Winston[1]; Daniel Murray[1]; Brandon Miller[1]; LingFeng He[1]; Fei Teng[1]; [1]Idaho National Laboratory

10:40 AM
Gas Bubble Evolution in UO2 - A Phase Field Study: *Yafeng Wang*[1]; Sanqiang Shi[1]; [1]The Hong Kong Polytechnic University

11:00 AM
Defects Generation during Irradiation-induced Alpha/gamma Phase Transformation in Uranium Alloys: *Yipeng Gao*[1]; Benjamin Beeler[1]; Yongfeng Zhang[1]; [1]Idaho National Laboratory

11:20 AM
Three Dimensional Radiation Effects in Neutron Irradiated Uranium-Molybdenum Fuel: *Maria Okuniewski*[1]; Alejandro Figueroa[1]; Jonova Thomas[1]; Sri Tapaswi Nori[1]; Peter Kenesei[2]; Jonathan Almer[2]; [1]Purdue University; [2]Argonne National Laboratory

11:40 AM Invited
Radiation Effects on Phonon Transport in UO2 and ThO2: Tiankai Yao[1]; Vinay Chauhan[2]; Maniesha Singh[3]; Amey Khanolkar[1]; Zilong Hua[1]; Marat Khafizov[2]; Matthew Mann[4]; Thierry Wiss[5]; Anter El-Azab[3]; Jian Gan[1]; David Hurley[1]; *Lingfeng He*[1]; [1]Idaho National Laboratory; [2]The Ohio State University; [3]Purdue University; [4]Air Force Research Laboratory; [5]European Commission, Joint Research Centre

---

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Processing & Property

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Thursday AM | February 27, 2020
Carlsbad | Marriott Marquis Hotel

Session Chairs: Huajian Gao, Brown University; Yi Li, Institute of Metal Research, Chinese Academy of Sciences; Deliang Zhang, Northeastern University; Caizhi Zhou, Missouri University of Science and Technology

---

8:30 AM Invited
Powder Metallurgy Fabrication, Microstructure and Mechanical Properties of Heterogeneous Structured Al: *Deliang Zhang*[1]; Lei Cao[2]; Jiamiao Liang[2]; [1]Northeastern University; [2]Shanghai Jiao Tong University

8:50 AM
Transition from Source- to Stress-controlled Plasticity in Nanotwinned Materials below a Softening Temperature: *S. Mohadeseh Taheri-Mousavi*[1]; Haofei Zhou[2]; Guijin Zou[2]; Huajian Gao[2]; [1]Massachusetts Institute of Technology; [2]Brown University

9:10 AM
Tailoring Strength of 6082 Aluminium Alloy via Combination of Rolling and Heat Treatment: *Witold Chrominski*[1]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology

9:30 AM
Bulk nc-Dissolvable Alloys Enable Design of Retrievable Sensors for Oil & Gas: *Ting Roy*[1]; Indranil Roy[2]; Ram Shenoy[2]; Jing Zhou[3]; [1]SET Laboratories; [2]WellDiver; [3]Rice University

9:50 AM
Heterogeneous Materials Under Shear:Interlinking Surface Deformation Mechanisms and Friction: *Xiang Chen*[1]; Zhong Han[2]; Xiuyan Li[2]; Christian Greiner[3]; Peter Gumbsch[3]; Ke Lu[2]; [1]Nanjing University of Science and Technology; [2]Institute of Metal Research, Chinese Academy of Sciences; [3]Karlsruhe Institute of Technology

10:10 AM Break

10:30 AM Invited
Grain Refinement-induced Plasticity in Heterostructured Brass: Xiaolei Wu[1]; *Yuntian Zhu*[2]; [1]Laboratory of Nonlinear Mechanics, Chinese Academy of Sciences; [2]North Carolina State University

10:50 AM
Ultra-uniformity in Nanocrystalline Materials: Implications from Generalized LSW Growth Theory and Validations: *Yanhao Dong*[1]; Hongbing Yang[2]; Jiangong Li[2]; I-Wei Chen[3]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]Lanzhou University; [3]University of Pennsylvania

11:10 AM
Atomistic Analysis of the Effect of Internal Defects on the Deformation of Nanocrystalline Metals: *Caizhi Zhou*[1]; Sixie Huang[1]; [1]Missouri University of Science and Technology

11:30 AM
Ultrafine Grained 3003 Aluminium Alloy Plates with Low Anisotropy and the Capabilities to Deep Drawing: *Malgorzata Lewandowska*[1]; Marta Ciemiorek[1]; Witold Chrominski[1]; Lech Olejnik[1]; [1]Warsaw University of Technology

11:50 AM
Searching for the Optimized Design in Heterogeneous Structure: *Jie Pan*[1]; Yan Lin[1]; Ruqing Cao[1]; Xiaoyi Cuan[1]; Yunli Lu[1]; Yi Li[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

---

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Composites and Brittle Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Thursday AM | February 27, 2020
5A | San Diego Convention Ctr

Session Chair: Benjamin Morrow, LANL

8:30 AM
Micromechanical Methods for Parameterizing Ceramic Failure Models: *Daniel Magagnosc*[1]; Andrew Tonge[1]; [1]US Army Research Laboratory

8:50 AM
Observation and Analysis of Amorphization-induced Fragmentation in Boron Carbide: *Jerry LaSalvia*[1]; C. Marvel[1]; Kristopher Behler[1]; M.P. Harmer[1]; [1]ARL (SURVICE Engineering)

9:10 AM
On the Structural Characterization of Amorphous Phase Recovered from Laser Shock Compression: *Shiteng Zhao*[1]; Marc Meyers[2]; [1]University of California, Berkeley; [2]University of California, San Diego

9:30 AM
Thermodynamics of Pressure-induced Amorphization in Boron Carbide- Unraveling the Mystery through Molecular Dynamic Simulations: *Ghatu Subhash*[1]; Amnaya Awasthi[1]; Matthew DeVries[1]; [1]University of Florida

9:50 AM
Sub-surface Observations and Analysis of Indented Polycrystalline Hot-pressed Boron Suboxide (B_6O): *Kristopher Behler*[1]; Jerry LaSalvia[1]; C.J. Marvel[1]; S.D. Walck[1]; M.P. Harmer[1]; [1]ARL (SURVICE Engineering)

10:10 AM Break

10:30 AM
Response of Hybrid Ceramic-polymer Body Armour under Projectile Impact: *Prasenjit Khanikar*[1]; Sanjeev Sahoo[1]; [1]Indian Institute of Technology Guwahati

10:50 AM
Modelling the Effect of Microstructure on Elastic Wave Propagation in Platelet-reinforced Composites and Ceramics: *Hortense Le Ferrand*[1]; [1]Nanyang Technological University

11:10 AM
Mechanical Response and Deformation Modes during High-rate Loading of Multiphase Metal Materials: *Avery Samuel*[1]; Zachary Levin[2]; Carl Trujillo[3]; Saryu Fensin[3]; Tresa Pollock[1]; Irene Beyerlein[1]; Frank Zok[4]; [1]University Of California, Santa Barbara; [2]Texas A&M University; [3]Los Alamos National Laboratory; [4]University of California, Santa Barbara

11:30 AM
In-situ Measurement of Dynamic Stress due to Hyper-velocity Impact using Nanosecond Resolved Raman Spectroscopy: *Abhijeet Dhiman*[1]; Hao Wang[1]; Vikas Tomar[1]; [1]Purdue University

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Ironmaking and Steelmaking

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Thursday PM | February 27, 2020
16A | San Diego Convention Ctr

Session Chairs: Onuralp Yücel, Istanbul Technical University; Zhongliang Tian, Central South University

2:00 PM Introductory Comments

2:15 PM
Influences of Li2O on the Properties of Ultrahigh-basicity Mold Fluxes for Continuous Casting of Peritectic Steel: *Min Li*[1]; Yuan Bing Wu[1]; Sheng Ping He[1]; Qiang Qiang Wang[1]; Qian Wang[1]; [1]Chong Qing University

2:35 PM
Optimization of Process Parameters for the Synthesis of Mo_2C on an Activated Carbon Matrix: *Grant Wallace*[1]; Jerome Downey[1]; Jannette Chorney[1]; Katie Schumacher[1]; [1]Montana Technological University

2:55 PM
Effect of Refining Slag Composition on the Cleanliness of 25Cr2Ni4MoV Rotor Steel: *Chao Zhuo*[1]; Yimin Zhang[1]; Yanhui Sun[1]; Ruimei Chen[1]; Sicheng Song[1]; [1]University of Science and Technology Beijing

3:15 PM
Prediction Model of End-point Molten Steel Temperature in RH Refining Based on PCA-CBR: *Maoqiang Gu*[1]; Anjun Xu[1]; Dongfeng He[1]; Hongbing Wang[1]; Kai Feng[1]; [1]University of Science and Technology Beijing

3:35 PM Break

3:50 PM
Characterization and Formation Mechanism of Oxide Inclusions in Low Aluminum Non-oriented Electrical Steels: Zhiyuan Hu[1]; Qiang Ren[1]; Yan Luo[1]; *Lifeng Zhang*[1]; [1]University of Science and Technology Beijing

4:10 PM
FactSage-based Design Calculations for the Production of High Carbon Ferromanganese on Pilot-scale: *Joalet Steenkamp*[1]; [1]MINTEK

4:30 PM
Numerical Simulation and Optimization of Temperature Field in the Baking of RH Vessel: *Fei Yuan*[1]; Peiling Zhou[2]; Xiao Sun[1]; Shuai Deng[1]; [1]University of Science and Technology Beijing; [2]Tsinghua University

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Utilization of Complex Ores

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Thursday PM | February 27, 2020
12 | San Diego Convention Ctr

Session Chairs: Jerome Downey, Montana Technological University; Jiann-Yang Hwang, Michigan Technological University

2:00 PM Introductory Comments

2:15 PM
Ni Recovery from Nickeliferous Pyrrhotite Concentrates via a Thermal Concentration Process: Effects of Heat Treatment Time: *Feng Liu*[1]; Mansoor Barati[1]; [1]University of Toronto

2:35 PM
Method to Quantify the Effect of Temperature and Rotational Speed on the Decrepitation of South African Manganese Ores in a Rotary Kiln: *Samuel Moholwa*[1]; Joalet Steenkamp[1]; Hillary Rutto[2]; [1]Mintek; [2]Vaal University of Technology

2:55 PM
Production of High Carbon Ferrochromium by Carbothermal Reduction of Vanadium Extraction Tailings with High Chromium Content: *Gaung Wang*[1]; Jiang Diao[1]; Liang Liu[1]; Bing Xie[1]; [1]Chongqing University

3:15 PM
Utilization of Ground Sinter Feed for Oxidized Pellet Production and Its Effect on Pellet Consolidation and Metallurgical Properties: *Hongyu Tian*[1]; Jian Pan[1]; Deqing Zhu[1]; Dingzheng Wang[1]; Yuxiao Xue[1]; [1]Central South University

3:35 PM
Strengthening Sintering of Limonitic Nickel Laterite by Substituting Ferronickel Tailings for Sintering Fluxes: *Yuxiao Xue*[1]; Deqing Zhu[1]; Jian Pan[1]; Congcong Yang[1]; Hongyu Tian[1]; Dingzheng Wang[1]; Zhengqi Guo[1]; [1]Central South University

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Property Prediction II

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Thursday PM | February 27, 2020
10 | San Diego Convention Ctr

Session Chairs: Nik Hrabe, National Institute of Standards and Technology; Jake Benzing, National Institute of Standards and Technology

2:00 PM Invited
Fatigue Behavior of Additive Manufactured Ni and Ti Alloys Through Coupled Modeling and In-situ Experiments.: *Michael Sangid*[1]; [1]Purdue University

2:30 PM
Maximizing the Fatigue Lifetime by Choosing the Best Build Orientation: *Amin S. Azar*[1]; Magnus Reiersen[2]; Even W. Hovig[3]; Mikkel M. Pedersen[4]; [1]SINTEF; [2]University of Oslo; [3]Norwegian University of Science and Technology (NTNU); [4]Aarhus University

2:50 PM
Micromechanical Modeling Driven Design of Fatigue Resistant Metal Additive Manufacturing Solutions: *Anssi Laukkanen*[1]; Matti Lindroos[1]; Tatu Pinomaa[1]; Tom Andersson[1]; Tomi Suhonen[1]; [1]VTT Technical Research Center of Finland

3:10 PM
Prediction of Mechanical Properties of Additively Manufactured Ti6Al4V Based on the Microstructure and Porosity Distribution: Mohamed Elkhateeb[1]; *Yung Shin*[1]; [1]Purdue University

3:30 PM Break

3:50 PM Invited
Surface Morphology, Stress Concentrations, Micromechanical Modeling and Fatigue Life in 3D Printed Metals: *Anthony Rollett*[1]; Christopher Kantzos[1]; [1]Carnegie Mellon University

4:20 PM
Prediction of Fatigue Life of Flight-critical Metallic Components Fabricated by Additive Manufacturing: Xuesong Fan[1]; *Baldur Steingrimsson*[2]; Duckbong Kim[3]; Peter Liaw[1]; [1]University of Tennessee; [2]Imagars LLC; Portland State University; [3]Tennessee Tech University

4:40 PM
Coupling Damage Models to Multiscale Modeling of the Selective Laser Melting Process for Metals: *Patcharapit Promoppatum*[1]; Sabeur Msolli[1]; Jerry Siu Sin[1]; Mark Jhon[1]; [1]Institute of High Performance Computing

5:00 PM
Fatigue Life Prediction of Additive Manufactured IN718 Superalloys: *Wenye Ye*[1]; Pankaj Kumar[1]; Leslie Mushongera[1]; [1]University of Nevada, Reno

Additive Manufacturing for Energy Applications II — Characterization II

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Thursday PM | February 27, 2020
9 | San Diego Convention Ctr

Session Chairs: Subhashish Meher, Idaho National Laboratory; Bharat Gwalani, Pacific Northwest National Laboratory

2:00 PM
Additive Manufacturing of Oxide Dispersion Strengthened 304L Stainless Steel via Hybrid Laser Cladding: *Kijoon Lee*[1]; Milad Ghayoor[1]; Yujuan He[1]; Chih-hung Chang[1]; Somayeh Pasebani[1]; Brian K. Paul[1]; [1]Oregon State University

2:20 PM
Additive Manufacturing of YSZ Ceramics by Laser Engineered Net Shaping: Xueliang Yan[1]; Yan Chen[2]; Fei Wang[1]; Cody Kanger[1]; Michael Sealy[1]; *Bai Cui*[1]; [1]University of Nebraska-Lincoln; [2]Oak Ridge National Laboratory

2:40 PM
Sensitization of Alloy 800H Made by Laser Powder Bed Fusion: *Jingfan Yang*[1]; Xiang Liu[2]; Miao Song[3]; Lingfeng He[2]; Bart Prorok[1]; Xiaoyuan Lou[1]; [1]Auburn University; [2]Idaho National Laboratory; [3]University of Michigan Ann Arbor

3:00 PM
Influence of Nickel Particle Sizes on the Spark Plasma Sintered NiCrCoTiAlW-Ta Superalloy Powder: *Olugbenga Ogunbiyi*[1]; [1]Tshwane University of Technology

3:20 PM Break

3:40 PM
Structural and Material Changes of Inkjet Printed Ge-Se based Chalcogenide Glasses under UV Irradiation: *Shah Mohammad Rahmot Ullah*[1]; Al-Amin Ahmed Simon[1]; Henri Kunold[1]; Lyle Jones[1]; Maria Mitkova[1]; [1]Boise State University

4:00 PM
Measurement of Strain Rate Sensitivity of Selective Laser Melted Aluminum Alloy and Stainless Steel Samples: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

Additive Manufacturing of Functional and Energy Materials — Novel Applications

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Sneha Prabha Narra, Worcester Polytechnic Institute; Markus Chmielus, University of Pittsburgh; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University

Thursday PM | February 27, 2020
7B | San Diego Convention Ctr

Session Chair: Amir Mostafaei, Illinois Institute of Technology

2:00 PM
Polycrystal-inspired Hierarchical Lattice Materials: *Jedsada Lertthanasarn*[1]; Chen Liu[1]; Everth Hernández-Nava[2]; Iain Todd[2]; Minh-Son Pham[1]; [1]Imperial College London; [2]The University of Sheffield

2:20 PM
Development of an Austenitic/Martensitic Gradient Steel by Additive Manufacturing: *Flore Villaret*[1]; Xavier Boulnat[2]; Pascal Aubry[1]; Damien Fabrègue[2]; Yann de Carlan[1]; [1]CEA; [2]Université de Lyon, INSA de Lyon

2:40 PM
3D Printed Nanocomposites of Silicon Elastomer and Multiferroic Nanoparticles: *Felicia Horne*[1]; Naga Srinivas Korivi[1]; Vijay Rangari[1]; [1]Tuskegee University

3:00 PM
Energy Absorbing Functional Composites with Negative Stiffness: Al-ZrO2 Fabricated by Additive Friction Stir Deposition: *Hunter Rauch*[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute and State University

3:20 PM
3D Printed Polymer Multiferroic Composites: *Emery Utterback*[1]; Naga Srinivas Korivi[1]; Vijay Rangari[1]; [1]Tuskegee University

3:40 PM Break

4:00 PM
Additive Manufacturing of Multifunctional Continuous Carbon Fiber Composites via Coextrusion: Aditya Thakur[1]; *Xiangyang Dong*[1]; [1]Missouri University of Science and Technology

4:20 PM
Characterization of as Selected Laser Melting Built and Vacuum Heat Treated NiTa Alloy for Hard Disc Applications: *Cheng-Tse Wu*[1]; Michael Wu[2]; Gary Chung[2]; C.Y. Ma[2]; Feng Xu[3]; Kinnor Chattopadhyay[1]; [1]University of Toronto; [2]Solar Applied Materials Technology Corp; [3]Farsoon Technologies Corporation

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — In Situ Monitoring and Diagnostics: Powder Bed

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Thursday PM | February 27, 2020
8 | San Diego Convention Ctr

Session Chair: Joy Gockel, Wright State University

2:00 PM Invited
A Machine-Agnostic Approach to Layer-wise Process Monitoring and Control of Powder Bed Additive Manufacturing Technologies: *Luke Scime*[1]; Derek Siddel[1]; Vincent Paquit[1]; [1]Oak Ridge National Laboratory

2:30 PM
Rapid Characterization of AM Components for Alloy Design and Process Optimization: *Ryan Dehoff*[1]; Alex Plotkowski[1]; Kevin Sisco[2]; Paul Brackman[3]; Pradeep Bhattad[3]; Curtis Frederick[3]; Andres Rossy[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]Zeiss AG

2:50 PM
Simultaneous High-speed Measurements of Laser Absorptance and Melt Pool Geometry in Metal Powder Bed Systems: *Brian Simonds*[1]; Jack Tanner[1]; Paul Williams[1]; Niranjan Parab[2]; Cang Zhao[2]; Tao Sun[2]; [1]National Institute of Standards and Technology; [2]Argonne National Laboratory

3:10 PM
High Speed Video of the Influence of Preheating on Tungsten Microcracking During Laser Scanning: *Bey Vrancken*[1]; Rishi Ganeriwala[1]; Aiden Martin[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

3:30 PM
In-situ Measurement of the Kinetics of Homogenization and Aging Treatments in A205 Alloy Produced Through Additive Manufacturing: Guilherme Faria[1]; *Antonio Ramirez*[1]; [1]Ohio State University

3:50 PM Break

4:10 PM Invited
Quantifying Defect Signatures in Metal Additive Manufacturing Using In-situ Diagnostics: *Manyalibo Matthews*[1]; Bradley Jared[2]; John Carpenter[3]; Elena Garlea[4]; Benjamin Brown[5]; [1]Lawrence Livermore National Laboratory; [2]Sandia National Laboratories; [3]Los Alamos National Laboratory; [4]Y-12 National Security Complex; [5]Kansas City National Security Campus

4:40 PM
Unsupervised Learning Applied to Powder Metals for Additive Manufacturing: *Ryan Cohn*[1]; Andrew Kitahara[1]; Srujana Rao Yarasi[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

5:00 PM
Coherent Scanning Interferometry for Characterization of Recycled Metal Powder and Reusability Assessment in Additive Manufacturing: Susana Castillo[1]; *Anna Hayes*[1]; Rongguang Liang[1]; Gregory Colvin[1]; Krishna Muralidharan[1]; Douglas Loy[1]; Barrett Potter[1]; [1]University of Arizona

5:20 PM
In-line Powder Packing Density Analysis During Selective Laser Melting: *Tan-Phuc Le*[1]; Karl Davidson[1]; Bernard Gaskey[1]; Po-Ju Chang[1]; Matteo Seita[1]; [1]Nanyang Technological University

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Alloy Design-Functional Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Thursday PM | February 27, 2020
6F | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
The Synthesis of Ti based Bulk Metallic Glass Alloys for Additive Manufacturing: *Hwi-Jun Kim*[1]; Yeon-Joo Lee[1]; Young-Sin Choi[1]; [1]KITECH

2:30 PM
Additive Manufacturing of Bulk Metallic Glass Composites with Improved Mechanical Properties: Shunyu Liu[1]; Abhijeet Dhiman[1]; *Yung Shin*[1]; Vikas Tomar[1]; Samuel Zhang[1]; [1]Purdue University

2:50 PM
Additive Manufacturing of Crack-free W-base Refractory Materials: *Ian McCue*[1]; Michael Presley[1]; Michael Brupbacher[1]; Morgan Trexler[1]; [1]Johns Hopkins University Applied Physics Lab

3:10 PM
A Novel Titanium Alloy for Additively Manufactured Orthopaedic Implants: *Enrique Alabort*[1]; Alvaro De Diego[2]; Maria Vega Aguirre-Cebrián[2]; Daniel Barba[2]; Roger Reed[3]; [1]OxMet Technologies; [2]Universidad Politecnica de Madrid; [3]University of Oxford

3:30 PM
Additive Manufacturing of Wear Resistant Metallic Glass Components for Space Exploration: *Punnathat Bordeenithikasem*[1]; Samad Firdosy[1]; Andre Pate[1]; John Paul Borgonia[1]; Douglas Hofmann[1]; [1]NASA Jet Propulsion Laboratory

3:50 PM Break

4:05 PM Invited
A Parameter Optimization Framework for Defect-free Metal Additive Manufacturing Using Laser Powder Bed Fusion: *Ibrahim Karaman*[1]; Raiyan Seede[1]; Bing Zhang[1]; David Shoukr[1]; Alaa Elwany[1]; Raymundo Arroyave[1]; [1]Texas A&M University

4:35 PM
Material Design for Additive Manufacturing of Soft Magnetic Materials for Permanent Magnet Synchronous Machine Rotors: *Lennart Tasche*[1]; Florian Hengsbach[1]; Kai-Peter Hoyer[1]; Sebastian Magerkohl[2]; Stefan Urbanek[3]; Bernd Ponick[4]; Detmar Zimmer[5]; Mirko Schaper[1]; [1]Paderborn University Department of Material Science; [2]Paderborn University Chair of Design and Drive Technology; [3]University of Hannover Institute for Drive Systems and Power Electronics; [4]University of Hannover Institute for Drive Systems and Power Electronics ; [5]Paderborn University

4:55 PM
Novel Alloy Development Using Laser Directed Energy Deposition: *Eric Heikkenen*[1]; Sudarsanam Babu[1]; [1]The University of Tennessee

5:15 PM
Development of Prediction Tools for Incorporation of Cooling Rate Dependent Solute Drag Based Thermo-physical Properties in Additive Manufacturing: A Sensitivity Study: *Deepankar Pal*[1]; Kaisheng Wu[2]; Dave Conover[1]; [1]ANSYS; [2]Thermocalc

5:35 PM
Towards an ICME Framework of Designing Post-process for Additively Manufactured Ti-6Al-4V: *Shengyen Li*[1]; Kirby Matthew[1]; James Sobotka[1]; [1]Southwest Research Institute

---

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Microstructure and Mechanical Properties

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Thursday PM | February 27, 2020
6E | San Diego Convention Ctr

Session Chairs: Eric Lass, The University of Tennessee, Knoxville; Monnamme Tlotleng, University of Johannesburg

---

2:00 PM
Origin of Dislocation Structures in Additively Manufactured Austenitic Stainless Steel: *Kaila Bertsch*[1]; Gabriel Meric de Bellefon[1]; Bailey Kuehl[1]; Dan Thoma[1]; [1]University of Wisconsin-Madison

2:20 PM
Metastable Cellular Microstructure in Selective Laser Melted Maraging Steel: *Yingjie Yao*[1]; Zhigang Yang[1]; Chi Zhang[1]; Hao Chen[1]; [1]Key Laboratory for Advanced Materials of Ministry of Education, School of Materials Science and Engineering, Tsinghua University

2:40 PM
Micro-mechanical Characterization of Directed Energy Deposited 316L Stainless Steel with Hierarchical Microstructure: *Baolong Zheng*[1]; Xin Wang[1]; Sen Jiang[1]; Bingqing Chen[2]; Jiayu Liang[2]; Shuai Huang[2]; Yizhang Zhou[1]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Beijing Institute of Aeronautical Materials

3:00 PM
Micromechanical Modeling of Length-scale Effects and Performance of SLM Stainless Steel Microstructures: *Matti Lindroos*[1]; Samuel Forest[2]; Tatu Pinomaa[1]; Anssi Laukkanen[1]; [1]VTT Research Centre of Finland; [2]MINES ParisTech

3:20 PM
Influence of Microstructure, Texture and Heat Treatments on the Mechanical Properties of Additively Manufactured Hastelloy X: *Benedikt Diepold*[1]; Steffen Neumeier[1]; Mathias Göken[1]; [1]FAU Erlangen-Nuremberg

3:40 PM Break

4:00 PM
Effect of Build Size to the Final Microstructures in Ti6Al4V After Selective Laser Melting: *Sinting Cynthia Chang*[1]; Samy Hocine[1]; Steven Van Petegem[1]; Tuerdi Maimaityili[1]; Dario Ferreira Sanchez[1]; Daniel Grolimund[1]; Helena Van Swygenhoven[1]; [1]Paul Scherrer Institute

4:20 PM
Role of Thermal Gradients in the Microstructure Evolution in EBM Ti-6Al-4V Builds: *Sabina Kumar*[1]; Benjamin Stump[2]; Sudarsanam Babu[1]; [1]University of Tennessee; [2]Manufacturing Demonstration Facility

4:40 PM
High Temperature Anisotropic Mechanical Behavior of E-beam Ti6Al4V Material: *Jamal Mian*[1]; Jafar Razmi[1]; Leila Ladani[1]; [1]Arizona State University

5:00 PM
A Biomedical Titanium Alloy Manufactured by Selective Laser Melting (SLM): *Xuan Luo*[1]; Chao Yang[1]; Yuanyuan Li[1]; [1]South China University of Technology

5:20 PM
Simulating Microstructure in Metallic Materials Applied for Additive Manufacturing Processes: *Javed Akram*[1]; Thaddeus Low[1]; [1]ANSYS

2:20 PM
Effects of M(M=Ce,Zr,Ce-Zr) Compound Treatment on Characteristics of Inclusions and Microstructure FH40 Ship-building Steel Ingots: *Xianghai Meng*[1]; Zhe Wang[1]; Mengxing Li[2]; Meng Wang[3]; Yungang Li[1]; [1]North China University of Science and Technology; [2]HBIS Group Tangsteel Company Techology Center; [3]Tangshan Polytechnic College

2:40 PM
Electrochemical Study of the Effect of Benzotriazole and KI Ions on the Co2 Corrosion Characteristics of API X52 Pipeline Steel: Masoud Sabzi[1]; *Seyyed Hashem Mousavi Anijdan*[1]; [1]Islamic Azad University

3:00 PM
Impact of Cr and Mn on the Hydrogen-carbide Interaction in High-strength Steels: *Lekshmi Sreekala*[1]; Poulumi Dey[2]; Tilmann Hickel[1]; Jörg Neugebauer[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Technische Universiteit Delft

3:20 PM
Interstitial-free Bake Hardening Realized by Epsilon-martensite Reverse Transformation: *Shaolou Wei*[1]; Menglei Jiang[1]; Cemal Tasan[1]; [1]Massachusetts Institute of Technology

3:40 PM Break

4:00 PM
Mechanisms of Embrittlement and Recovery in Cast HY-80 High-strength Low-alloy Steel: *Matthew Draper*[1]; Sreeramamurthy Ankem[2]; [1]US Navy; [2]University of Maryland

4:20 PM
Martensite Transforamtion Induced Unprecedented Strength in Pure Iron: *Hongwang Zhang*[1]; [1]Yanshan University

4:40 PM
Strength and Toughness of Nano-structured Pearlite
: Kushal Mishra[1]; Vaibhav Khiratkar[1]; *Aparna Singh*[1]; [1]Metallurgical Engineering and Materials Science, IIT Bombay, Mumbai-400076, India

ADVANCED MATERIALS

Advanced High Strength Steels IV — Session VI

Sponsored by: TMS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Thursday PM | February 27, 2020
Balboa | Marriott Marquis Hotel

Session Chairs: Mary O'Brien, Colorado School of Mines; Kester Clarke, Colorado School of Mines

2:00 PM
Cryogenic Tensile and Microstructural Behaviors of High Manganese Steel Welds: *Myeonghwan Choi*[1]; Junghoon Lee[1]; Hyunbin Nam[1]; Namhyun Kang[1]; Myung-Hyun Kim[1]; Dae-Won Cho[2]; Dae-Geun Nam[3]; Seunghwan Lee[4]; [1]Pusan National University; [2]Busan Machinery Research Center; [3]Korea Institute of Industrial Technology; [4]Korea Aerospace University

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Additive Manufacturing of Magnetic Materials

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Thursday PM | February 27, 2020
Del Mar | Marriott Marquis Hotel

Session Chairs: Orlando Rios, Oak Ridge National Laboratory; Kevin Byerly, National Energy Technology Laboratory

2:00 PM Invited
Additive Manufacturing of NdFeB and MnAl Permanent Magnets: *Konstantin Skokov*[1]; Gutfleisch Oliver[1]; [1]Technische Universitat Darmstadt

2:30 PM Invited
Nd-Fe-B Magnets Produced by Powder Bed Additive Manufacturing: *Vladimir Popov*[1]; Oksana Golovnya[2]; Evgeny Strokin[1]; Menachem Bamberger[1]; Alexander Popov[2]; [1]Technion - Israel Institute of Technology; [2]M.N. Mikheev Institute of Metal Physics of the Ural Branch of the Russian Academy of Sciences

2:55 PM
Have it Your Way: Manufacturing of Permanent Magnets by Laser Powder-bed Fusion, Cold Spray, Extrusion: *Alexander Baker*[1]; Matt Worthington[1]; Sarah Baker[1]; Christine Orme[1]; Scott McCall[1]; [1]Lawrence Livermore National Laboratory

3:15 PM
Understanding the Role of Particle Size in the Development of Flexible Permanent Magnet-polymer Filaments: *Ester Palmero*[1]; Daniel Casaleiz[1]; Javier Rial[1]; Javier de Vicente[1]; Alberto Bollero[1]; [1]IMDEA Nanoscience

3:35 PM Break

3:55 PM Invited
Magnetically Active Composites for All-printed Electronics Applications: Ana Catarina Lima[1]; Nikola Perinka[2]; Nelson Pereira[1]; Vitor Correia[1]; Pedro Martins[1]; *Senentxu Lanceros-Mendez*[2]; [1]University of Minho; [2]BCMaterials

4:25 PM Invited
Composite Magnetic Filaments for Additive Manufacturing: A Novel Procedure for Laboratory Scale Production: *Victorino Franco*[1]; Álvaro Díaz-García[1]; Ana Bellido-Correa[1]; Agustín Cota[1]; Joaquín Ramírez-Rico[1]; Jia Yan Law[1]; [1]Universidad de Sevilla

4:50 PM
Additive Manufacturing Method to Fabricate Crack-free Highly Dense Fe-6 wt.% Si Soft Magnets: *Mariappan Paranthaman*[1]; Corson Cramer[1]; Peeyush Nandwana[1]; Jiaqiang Yan[1]; Samuel Evans[1]; Amy Elliott[1]; Chins Chinnasamy[2]; [1]Oak Ridge National Laboratory; [2]Carpenter Technology Corporation

5:10 PM
Advances in Directed Energy Deposition (DED) of Fe-Co Based Alloys and Functional Gradients: *Samad Firdosy*[1]; Peter Dillon[1]; John Paul Borgonia[1]; Ryan Conversano[1]; Bryan McEnerney[1]; Andrew Shapiro[1]; [1]Jet Propulsion Laboratory

---

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Energy Conversion and Storage IV

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Thursday PM | February 27, 2020
16B | San Diego Convention Ctr

Session Chairs: Aashutosh Mistry, Argon National Laboratory; Megan Butala, University of Florida

---

2:00 PM Invited
Operando Observation and Detailed Chemical Modeling of the Bilayer Solid Electrolyte Interphase: *Steven DeCaluwe*[1]; [1]Colorado School of Mines

2:20 PM
Engineering Routes Towards Synthesis of Layered Oxide Materials for High-performance Sodium-ion Batteries: *Mengya Li*[1]; Yaocai Bai[1]; David Wood III[1]; Ilias Belharouak[1]; Jianlin Li[1]; [1]Oak Ridge National Laboratory

2:40 PM
Cathode Modification by Dielectric Materials and their Performance in Li-ion Battery: *Shintaro Yasui*[1]; Sou Yasuhara[1]; Takashi Teranishi[2]; Yumi Yoshikawa[2]; Tomoyasu Taniyama[3]; Mitsuru Itoh[1]; [1]Tokyo Institute of Technology; [2]Okayama University; [3]Nagoya University

3:00 PM
Understanding the Catalytic Activity to Enhance the Reaction Kinetics of Metal-sulfur Batteries
: *Sagar Mitra*[1]; Arnab Ghosh[1]; Ajit Kumar[1]; [1]Indian Institute of Technology Bombay

3:20 PM
Life Cycle Analysis on Battery Energy Storage Systems: A Case Study on Flow Batteries and Lithium-ion Batteries: *Haoyang He*[1]; Shan Tian[1]; Brian Tarroja[1]; Oladele Ogunseitan[1]; Scott Samuelsen[1]; Julie Schoenung[1]; [1]University of California,Irvine

3:40 PM Break

4:00 PM
A Study on Charge-discharge Characteristics of Dipping Ga-Sn Electrode: *Hsien-Ching Liao*[1]; Fei-Yi Hung[1]; [1]National Cheng Kung University

4:20 PM
Charge-discharge Performance of Metal Hydride/Air Secondary Battery Using Modified Air Electrode by PDL Method: *Tatsuya Fukumoto*[1]; Kenji Kawaguchi[1]; Masatsugu Morimitsu[1]; [1]Doshisha University

4:40 PM
Improvement in Rechargeability of Zinc Electrode for Aqueous Secondary Batteries: *Takuya Okumura*[1]; Kenji Kawaguchi[1]; Masatsugu Morimitsu[1]; [1]Doshisha University

5:00 PM
Metal Enhancements to Porous Carbon Materials for Hydrogen Storage: Hillary Smith[1]; *Cullen Quine*[2]; Channing Ahn[2]; David Boyd[2]; Brent Fultz[2]; [1]Swarthmore College; [2]Caltech

---

LIGHT METALS

Aluminum Reduction Technology — Reduction Cell Technology and Development

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Jayson Tessier, Alcoa

Thursday PM | February 27, 2020
6D | San Diego Convention Ctr

Session Chair: Espen Tjonneland Wefring, Hydro Aluminium

2:00 PM Introductory Comments

2:05 PM
The Australian Energy Crisis, Its Impact on Domestic Aluminium Smelting and Potential Solutions: *David Wong*[1]; Alton Tabereaux[2]; Mark Dorreen[1]; [1]University of Auckland; [2]Consultant

2:25 PM
Recycling of the Flue Gas from Aluminium Electrolysis Cells: *Asbjorn Solheim*[1]; Samuel Senanu[1]; [1]SINTEF Industry

2:45 PM
Utilization of Waste Heat for Pre-heating of Anodes: Martin Grimstad[1]; Kim Ronny Elstad[2]; Asbjørn Solheim[3]; *Kristian Etienne Einarsrud*[1]; [1]Norwegian University of Science and Technology; [2]Alcoa Mosjøen; [3]SINTEF Industry

3:05 PM
Toward Minimizing the of Co-evolution of PFC Emission in EGA Smelter: Najeeba Al Jabri[1]; *Ali Jassim*[1]; Daniel Whitfield[1]; Sergey Akhmetov[1]; Barry Welch[2]; [1]EGA; [2]Welbank Consulting Ltd

3:25 PM Break

3:40 PM
Development and Application of GP500+ Energy Saving Aluminum Reduction Cell: *Zhuojun Xie*[1]; Song He[1]; Hongmin Ao[1]; [1]GAMI

4:00 PM
Research and Application of Direct Welding Technology on Super Large Section Conductor: *Xudong Wang*[1]; Xiaoqiang Feng[1]; Yingwu Li[1]; [1]Zhengzhou Jingwei Technology

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Mechanical and Other Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | February 27, 2020
Cardiff | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
Effects of Testing Temperature and Sample-size on Tensile Deformation of Metallic Glass: Chandra Meduri[1]; *Golden Kumar*[2]; [1]Texas Tech University; [2]The University of Texas at Dallas

2:20 PM
Effect of Thermal History on Crystallization Kinetics of a Bulk Glass-forming Liquid: *Güven Kurtuldu*[1]; Jörg Löffler[1]; [1]Laboratory of Metal Physics and Technology, Department of Materials, ETH Zürich

2:40 PM
Corrosion Behavior of SAM2×5 Amorphous Steel / Crystalline In Situ Composite: *Nada F. Qari*[1]; Arash Yazdani[1]; Darren Dewitt[1]; Javier E. Garay[1]; Olivia Graeve[1]; [1]University of California, San Diego

3:00 PM
Crystallization during Welding of Bulk Metallic Glasses: Martin Dickey[1]; Cody Bowman[1]; Timothy Pickle[2]; Kayode Oyedemi[3]; Anthony Slater[4]; Nicholas Hutchinson[5]; *Richard Baumer*[6]; [1]Newport News Shipbuilding; [2]Colorado School of Mines; [3]ARCOTEQ; [4]Cambridge Vacuum Engineering; [5]Eutectix; [6]LeTourneau University

3:20 PM Break

3:40 PM
Microstructural Optimization and Tensile Properties of Ti-based Bulk Metallic Glass Composites Containing Metastable ß-Ti: *Long Zhang*[1]; Haifeng Zhang[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

4:00 PM
Shear Band Nucleation Kinetics in Metallic Glasses: *Meng Gao*[1]; John Perepezko[1]; Junqiang Wang[2]; [1]University Of Wisconsin-Madison; [2]Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences

4:20 PM
Characterization of Failure Mechanisms in a Metallic/Bulk Metallic Glass Composite: *Ashraf Bastawros*[1]; [1]Iowas State University

4:40 PM
The Effect of Thermal and Mechanical Cycling on Atomic Structure and Fracture Toughness of Metallic Glasses: *Jittisa Ketkaew*[1]; Sebastian Kube[1]; Derek Kuldinow[1]; Rui Yamada[2]; Hui Wang[3]; Wojciech Dmowski[3]; Takeshi Egami[4]; Jan Schroers[1]; [1]Yale University; [2]Frontier Research Institute of Interdisciplinary Science (FRIS), Tohoku University; [3]University of Tennessee; [4]University of Tennessee, Oak Ridge National Laboratory

5:00 PM
Nanoscale Heterogeneity on Mechanical Performance of Cu-Zr-Al Thin Film Metallic Glasses: *Xiao Han*[1]; Yucong Gu[1]; Feng Yan[1]; Lin Li[1]; [1]University of Alabama

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Structures and Characterization

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | February 27, 2020
Marina Ballroom G | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
High Pressure Quenched Metallic Glasses: *Wojciech Dmowski*[1]; Stanislaw Gierlotka[2]; Geunhee Yoo[3]; Hui Wang[1]; Yoshihiko Yokoyama[4]; Eun Soo Park[3]; Takeshi Egami[5]; [1]University of Tennessee; [2]Polish Academy of Science; [3]Seoul National University; [4]Tohoku University; [5]Oak Ridge National Laboratiry

2:20 PM
Microstructural, Mechanical and Thermal Characterization of Mg65Ni25Y5M5 (M= Si, B, La) Amorphous Alloy by Melt Spinning: *Celal Kursun*[1]; Dan Thoma[1]; John Perepezko[1]; [1]University of Wisconsin, Madison

2:40 PM Invited
Role of Heterogeneous Microstructure Modifications in Affecting Fracture Toughness of Zr-based Bulk Metallic Glasses: *Jamie Kruzic*[1]; Bosong Li[1]; Bernd Gludovatz[1]; Anna Ceguerra[2]; Keita Nomoto[1]; Simon Ringer[2]; Shenghui Xie[3]; Sergio Scudino[4]; [1]University of New South Wales; [2]University of Sydney; [3]Shenzhen University; [4]IFW Dresden

3:00 PM
X-ray Diffraction Study of the Local Topological Rearrangement and Plasticity of Bulk Metallic Glasses: *Hui Wang*[1]; Wojciech Dmowski[1]; Zengquan Wang[1]; Yoshihiko Yokoyama[2]; Hongbin Bei[3]; Takeshi Egami[1]; [1]University of Tennessee; [2]Tohoku University; [3]Oak Ridge National Laboratory

3:20 PM
Quantification of Oxidation in Metallic Glass Powder using In-situ Synchrotron X-ray Scattering Technique: *Tanaji Paul*[1]; Linqi Zhang[2]; Sourabh Biswas[2]; Archana Loganathan[1]; Matthew Frith[3]; Jan Ilavsky[3]; Ivan Kuzmenko[3]; Jim Puckette[2]; A. Kaan Kalkan[2]; Arvind Agarwal[1]; Sandip Harimkar[2]; [1]Florida International University; [2]Oklahoma State University; [3]Argonne National Laboratory

3:40 PM Break

4:00 PM
Local Dynamics in Metallic Liquids Studied by Inelastic Neutron Scattering: *Zengquan Wang*[1]; Wojciech Dmowski[1]; Hui Wang[1]; Takeshi Egami[1]; [1]University of Tennessee

4:20 PM
Mechanical Deformation of Iron-based In Situ Metallic Glass Matrix Composites: *Arash Yazdani*[1]; Darren Dewitt[1]; Wei Huang[2]; Günther W.H. Höhne[3]; Scott T. Misture[4]; Javier E. Garay[1]; David Kisailus[2]; Olivia Graeve[1]; [1]University of California, San Diego; [2]University of California, Riverside; [3]Ulm University; [4]Alfred University

4:40 PM
Atomic Structural Features Hidden in Structure Factor of Metallic Alloy Liquids: *Chae Woo Ryu*[1]; Wojciech Dmowski[1]; Takeshi Egami[1]; [1]University of Tennessee

5:00 PM
Glass-forming Ability and Atomic Packing Structure of Al-TM-RE Amorphous Alloys: *Jinfu Li*[1]; [1]Shanghai Jiao Tong University

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Mechanical Properties II

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Thursday PM | February 27, 2020
Theater A-5 | San Diego Convention Ctr

Session Chairs: Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory

2:00 PM
Deformation Behavior of Mg-Al-Mn Sheets: *Patrik Dobron*[1]; Daria Drozdenko[1]; Michal Knapek[1]; Jan Bohlen[2]; Frantisek Chmelik[1]; [1]Charles University; [2]Helmholtz-Zentrum Geesthacht

2:20 PM
Formation of the Carbon-enriched Zone and its Evolution During the Long-term Aging Process for 9%Cr-CrMoV Dissimilar Welded Joint: *Kai Ding*[1]; Bingge Zhao[1]; Yuanheng Zhang[1]; Tao Wei[1]; Guanzhi Wu[1]; Yuanfang Wang[1]; Yulai Gao[1]; [1]Shanghai University

2:40 PM
Investigation of Impact Toughness of Electron Beam Welded AISI 321 SS at Cryogenic Temperatures: *Sandeep Singh Sandhu*[1]; Ajay Sharma[1]; Vineet Prabhakar[2]; [1]Quest Engineering College; [2]SUS Engineering College, Tangori

3:00 PM
The Influence Irradiation Conditions on the Microstructural Evolution of Irradiated U-Mo Fuels: *Charlyne Smith*[1]; Dennis Keiser[2]; Brandon Miller[2]; Assel Aitkaliyeva[1]; [1]University of Florida; [2]Idaho National Laboratory

3:20 PM
Microstructural Evolution of '-Ni_3Al Precipitates Affecting Mechanical Properties of Nickel-based Superalloys: *Rasim Eris*[1]; M. Vedat Akdeniz[1]; Amdulla O. Mekhrabov[1]; [1]Middle East Technical University

3:40 PM Break

3:55 PM
The Evolution of Precipitates in a Novel Heat-resistant Martensitic Steel During Creep: *Pengyu Wen*[1]; Haiwen Luo[1]; Zhengdong Liu[2]; Zhengzong Chen[2]; [1]University of Science and Technology Beijing; [2]China Irons & Steel Research Institute Group

4:15 PM
Influence of PWHT on Impact Toughness of Electron Beam Welded AISI 409 Stainless Steel: Akash Doomra[1]; *Sandeep Singh Sandhu*[1]; Beant Singh[2]; [1]Quest Engineering College; [2]PCET lalru

4:35 PM
Calibrating Yield Criteria in 6 Dimensions: A Collection of Analytic and Experimental Case Studies: *Zachary Brunson*[1]; Aaron Stebner[1]; [1]Colorado School of Mines

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Polymers and Composites II

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Thursday PM | February 27, 2020
Theater A-4 | San Diego Convention Ctr

Session Chairs: Jeongguk Kim, Korea Railroad Research Institute; Zhiwei Peng, Central South University

2:00 PM
Mechanical Behavior of Thermoplastic Filaments Fabricated with the Fused Modeling Deposition Technique: *Edisson Ordoñez*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

2:20 PM
Preparation and Characterization of Modified Polymer Fibers Membrane with ß-cyclodextrin and its Adsorption Properties: *Aiying Zhang*[1]; Xiang Wang[1]; Jiale Yang[1]; Ning Gao[1]; Zengguo Feng[1]; [1]School of Materials Science and Engineering, Beijing Institute of Technology

2:40 PM
Characterization of a Brazilian Kaolin and its Sorption Ability to Mineral Oils: *Gilmar Pinheiro*[1]; Thamyres Carvalho[1]; Bianca Michel[1]; Jessica Arjona[1]; Francisco Valenzuela-Diaz[1]; Maria Silva-Valenzuela[1]; Margarita Bobadilla[1]; Camila Matos[1]; Tatiana Costa[1]; [1]USP

3:00 PM
Particle Size Effects on Mechanical Properties of Polymer Bonded Composites for Non-hazardous High Explosive Surrogates: *Matthew Herman*[1]; Amanda Duque[1]; John Yeager[1]; [1]Los Alamos National Laboratory

3:20 PM Break

3:55 PM
Modeling and Characterization of Reflection, Absorption, and Scattering in Polycrystalline Materials: *Meir Shachar*[1]; Gottlieb Uahengo[1]; Elias Penilla[1]; Matthew Duarte[1]; Yasuhiro Kodera[1]; Javier Garay[1]; [1]University of California, San Diego

3:35 PM
Fabrication of Ultra-high Molecular Weight Polyethylene Membrane and Evaluation of Physical Characteristics for Wastewater Treatment: *Shanshan Xie*[1]; Zhangfu Yuan[1]; Yuantao Shi[1]; [1]University of Science and Technology Beijing

4:15 PM
Characterization of Brazilian Peat, Clay and Diatomite Blends for Use as Organic Compounds Adsorbents: *Tatiana Costa*; Francisco Valenzuela-Diaz[1]; Maria das Graças Da Silva-Valenzuela[1]; Jéssica Arjona[1]; [1]USP

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Session VI

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Thursday PM | February 27, 2020
32B | San Diego Convention Ctr

Session Chair: Houlong Zhuang, Arizona State University

2:00 PM Invited
Electronic Excitations and Ultrafast Dynamics: Pushing Towards Materials Engineering and Design: *Andre Schleife*[1]; [1]University of Illinois at Urbana-Champaign

2:30 PM
Analysis of Chemical Activity of Bismuthene in the Presence of Environment Gas Molecules by Means of Ab-initio Calculations: *Elena Korznikova*[1]; Andrey Kistanov[1]; Salavat Khadiullin[2]; [1]Russian Academy of Sciences; [2]Ufa State Aviation Technical University

2:50 PM
Accelerating the Genetic Algorithm for Structure Prediction in 2D Materials using Machine Learning: *Stephen Xie*[1]; Shreyas Honrao[2]; Anne Marie Tan[1]; Richard Hennig[1]; [1]University of Florida Department of Materials Science and Engineering; [2]NASA Ames Research Center

3:10 PM
Tunability of Martensitic Transformation in Mg-Sc Shape Memory Alloys: a DFT Study: *Shivam Tripathi*[1]; Karthik Guda Vishnu[1]; Michael Titus[1]; Alejandro Strachan[1]; [1]Purdue Univeristy

3:30 PM Break

3:50 PM Invited
Computational Discovery of Strongly Correlated Quantum Matter through Downfolding: *Hitesh Changlani*[1]; [1]Florida State University

4:20 PM
Influence of Strain on Mesoscopic 2D Film Growth from Phase Field Methods: *Tara Boland*[1]; Arunima Singh[1]; [1]Arizona State University

4:40 PM
Predicting Polymer Crystallinity Using Multi-fidelity Information Fusion with Machine Learning: *Shruti Venkatram*[1]; Lihua Chen[1]; Rampi Ramprasad[1]; [1]Georgia Institute of Technology

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Multiscale Modeling II

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Thursday PM | February 27, 2020
Theater A-9 | San Diego Convention Ctr

Session Chairs: Eva Zarkadoula, Oak Ridge National Laboratory; Dilpuneet Aidhy, University of Wyoming

2:00 PM
Molecular Dynamics Studies of Thermal Conductivity Degradation of UO_2 due to Dispersed Xe Atoms and Xe Bubbles: *Weiming Chen*[1]; Michael Cooper[2]; Ziqi Xiao[1]; David Andersson[2]; Xian-Ming Bai[1]; [1]Virginia Polytechnic Institute and State University; [2]Los Alamos National Laboratory

2:20 PM
A Micromechanics-based Modeling Approach to Predict the Mechanical Properties of Zircaloy with Hydride Precipitates: *Varun Gupta*[1]; Yulan Li[1]; Shenyang Hu[1]; Arun Devaraj[1]; David Senor[1]; [1]Pacific Northwest National Laboratory

2:40 PM
Microstructure-based Finite Element Model to Investigate the Effect of Grain Size and Homogenization on Hot-rolled U-10Mo: *Ayoub Soulami*[1]; Aaron Fortier[2]; Curt Lavender[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory; [2]RWTH Aachen

3:00 PM
Polycrystalline, Grand Potential Phase-field Model and Quantitative Phase-field Crystal Model for Microstructure Evolution: *Nana Ofori-Opoku*[1]; [1]Canadian Nuclear Laboratories

3:20 PM
Physics-based Full-field Fast Fourier Transform Modeling of Creep Behavior: Application to Stainless Steels: *M Arul Kumar*[1]; Ricardo Lebensohn[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

3:40 PM Break

4:00 PM
Reduced Order Modeling of Thermal Creep in 316H Stainless Steel: *Aaron Tallman*[1]; M Arul Kumar[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

4:20 PM
Sensitivity Analysis of Time-dependent Output for BISON Fuel Rod Analysis with Coated Cladding during Large-Break LOCA: *Yifeng Che*[1]; Koroush Shirvan[1]; [1]Massachusetts Institute of Technology

4:40 PM
Zirconium Alloy Cladding Burst Mechanisms under LOCA with Burnup Extension: Jianguo Yu[1]; Cole Blakely[1]; *Hongbin Zhang*[1]; [1]Idaho National Laboratory

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Data and High Throughput Methods II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Thursday PM | February 27, 2020
33C | San Diego Convention Ctr

Session Chairs: Praytush Tiwary, University of Maryland; Maryam Ghazisaeidi, Ohio State University

2:00 PM Invited
Autonomous Efficient Experiment Design for Materials Discovery: A Case Study on MAX Phases: *Anjana Talapatra*[1]; Raymundo Arroyave[2]; Shahin Boluki[2]; Xiaoning Qian[2]; Edward Dougherty[2]; [1]Los Alamos National Laboratory; [2]Texas A&M University

2:30 PM
Artificial Intelligence for Predicting Phase Stability on High Entropy Alloys: Anus Manzoor[1]; *Dilpuneet Aidhy*[1]; [1]University of Wyoming

2:50 PM
Bond-order Bond Energy Model for Alloys: *Wolfgang Windl*[1]; Christian Oberdorfer[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

3:10 PM Invited
Autonomous Scanning Droplet Cell for On-demand Alloy Electrodeposition and Characterization: *Brian DeCost*[1]; Howie Joress[1]; Stephen Ambrozik[1]; Trevor Braun[1]; Zachary Trautt[1]; Aaron Kusne[1]; Jason Hattrick-Simpers[1]; [1]National Institute of Standards and Technology

3:40 PM Break

4:00 PM Invited
Efficient Navigation of the Search Space for Accelerated Materials Discovery: *Prasanna Balachandran*[1]; [1]University of Virginia

4:30 PM Invited
From Molecular Dissociation to Crystal Nucleation: Next Generation Methods for Sampling Rare Events in All-atom Resolution: *Pratyush Tiwary*[1]; [1]University of Maryland

5:00 PM
Using Machine-learning Potentials for Free Energy Calculations of Multicomponent Alloys: *Prashanth Srinivasan*[1]; Yuji Ikeda[2]; Blazej Grabowski[3]; Jan Janssen[2]; Alexander Shapeev[4]; Jörg Neugebauer[2]; Fritz Körmann[2]; [1]Delft University of Technology; [2]Max-Planck-Institut für Eisenforschung; [3]University of Stuttgart; [4]Skolkovo Institute of Science and Technology

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Aqueous Corrosion

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Luke Brewer, University of Alabama; Sebastien Dryepondt, Oak Ridge National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Xiaoyuan Lou, Auburn University

Thursday PM | February 27, 2020
7A | San Diego Convention Ctr

Session Chairs: Jennifer Locke, OSU; Luke Brewer, University of Alabama

2:00 PM
The Effects of Ammonium Chloride and Thiosulfate Concentration on the Corrosion Behavior of Additively Manufactured 316L Stainless Steel: *Nahid Sultan Al-Mamun*[1]; Waseem Haider[1]; Ishraq Shabib[1]; [1]Central Michigan University

2:20 PM
Understanding the Anomalous Corrosion Behavior of Additively Manufactured Stainless Steels through Multi-modal Synchrotron Techniques: *Jason Trelewicz*[1]; David Sprouster[1]; Gary Halada[1]; Hanfei Yan[2]; Yong Chu[2]; Eric Dooryhee[2]; Guhaprasanna Manogharan[3]; [1]Stony Brook University; [2]Brookhaven National Laboratory; [3]The Pennsylvania State University

2:40 PM
Effect of Surface Contouring on Corrosion of 6061-RAM2 Produced by Laser-based Powder Bed Fusion Additive Manufacturing: Hamidreza Torbati-Sarraf[1]; *Seyed Alireza Torbati Sarraf*[2]; Amir Poursaee[1]; [1]Clemson University; [2]University of Southern California

3:00 PM
Issues in Localized Corrosion of Selective Laser Melted 316L : *Duane Armell Macatangay*[1]; Jonathan Skelton[1]; Wenhao Lin[1]; Robert Kelly[1]; Ji Ma[1]; [1]University of Virginia

3:20 PM
Corrosion Properties of Additively Manufactured Duplex Stainless Steel: *Greg Nigon*[1]; O. Burkan Isgor[1]; Somayeh Pasebani[1]; [1]Oregon State University

3:40 PM Break

3:55 PM Invited
Role of Microstructure and Surface Finish on the Corrosion of Selective Laser Melted 304 and 316 Stainless Steel: *Eric Schindelholz*; Michael Melia[1]; Rebecca Schaller[1]; Jesse Duran[1]; Jeffrey Rodelas[1]; [1]Sandia National Laboratories

4:20 PM
Interaction between Additive Manufacturing Defects, Powder Contamination, and Two Corrosive Environments: *Holly Martin*[1]; Daniel Bogen[1]; Jeremy McKnight[1]; Brett Conner[1]; [1]Youngstown State University

4:40 PM
Corrosion and Protection (Conversion Coating and Plasma Electrolytic Oxidation) of Ti6Al4V Processed by Powder Bed Fusion – Additive Manufacturing Electrochemical and EIS Study: *Joseph Hazan*[1]; Menachem Bamberger[1]; [1]Technion, Israel Institute of Technology

5:00 PM
Corrosion Behavior of 304L Stainless Steel Produced by Laser Powder Bed Fusion: Christopher Faraj[1]; Jacob Benoun[1]; *Ho Lun Chan*[1]; Vilupanur Ravi[1]; Zachary Hilton [2]; Joseph Newkirk[2]; [1]Cal Poly Pomona; [2]Missouri University of Science and Technology

5:20 PM
Corrosion Behavior of Newly Developed High Toughness Mixed-phase Steels: *Neetu Verma*[1]; S. Sangal[1]; K. Mondal[1]; [1]IIT Kanpur

5:40 PM
The Effects of Solution Chemistry on the Corrosion Behavior of Cold Sprayed AA7075: *Ozymandias Agar*[1]; Nicholas D'Attilio[1]; Luke Brewer[1]; [1]University of Alabama

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Corrosion and Fracture in Harsh Environments

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Thursday PM | February 27, 2020
Theater A-10 | San Diego Convention Ctr

Session Chairs: Wenjun Cai, Virginia Tech; Srujan Rokkam, Advanced Cooling Technologies

2:00 PM
Modeling of Corrosion Damage, Crack Dynamics and Fracture using a Physics-based Meshless Peridynamics Approach: *Srujan Rokkam*[1]; Masoud Behzadinasab[1]; Max Gunzburger[2]; Nam Phan[3]; Sachin Shanbhag[2]; Kishan Goel[3]; [1]Def-Aero, Advanced Cooling Technologies Inc; [2]Florida State University; [3]Naval Air Systems Command

2:20 PM
Comparative Assessment of the Fracture Behaviour of API-5L X65 and Micro-alloyed Steels in E80 Simulated Fuel Ethanol Environment: *Olufunmilayo Joseph*[1]; Seetharaman Sivaprasad[2]; Soumitro Tarafder[2]; John Ade Ajayi[3]; [1]Covenant University; [2]CSIR-National Metallurgical Laboratory; [3]Federal University of Technology, Akure

2:40 PM
Effects of Chromium and Molybdenum on Hydrogen Absorption Behavior in Iron: *Vanadia Yussalla*[1]; Kenichi Takai[1]; Tomohiko Omura[2]; [1]Sophia University; [2]Nippon Steel Corporation

3:00 PM
Evidence of Vacancy Generation During Grain Boundary Corrosion of Steel: Denizhan Yavas[1]; Thanh Phan[1]; Liming Xiong[1]; Kurt Hebert[1]; *Ashraf Bastawros*[1]; [1]Iowa State University

3:20 PM Break

3:40 PM
Predicting the Tribocorrosion Behavior of Aluminum Alloys using Finite Element Based Multiphysics Modeling: *Kaiwen Wang*[1]; Wenjun Cai[1]; [1]Virginia Polytechnic Institute and State University

4:00 PM
Investigation of Laboratory versus In-Service Sensitization Effects on Corrosion Fatigue Performance of AA5456-H116: *Allison Akman*[1]; David Schrock[1]; Jenifer (Warner) Locke[1]; [1]The Ohio State University

4:20 PM
Phase Field Modeling of Galvanic Corrosion in Magnesium-aluminum Joints: *Kübra Karayagiz*[1]; Adam Powell[1]; Qingli Ding[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

4:40 PM
Microstructural Aspects of Hydrogen Induced Stress Cracking in Various Carbon Steel Welds: *Hanji Park*[1]; Cheolho Park[2]; Myeonghyun Kim[1]; Yangdo Kim[1]; Namhyun Kang[1]; [1]Pusan National University; [2]Korea Atomic Energy Research Institute

5:00 PM Concluding Comments

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Machine Learning and Autonomous Researchers for Materials Discovery and Design — Session II

Program Organizer: Keith Brown, Boston University

Thursday PM | February 27, 2020
4 | San Diego Convention Ctr

Session Chair: Keith Brown, Boston University

2:00 PM Invited
Benji Maruyama talk: *Benji Maruyama*[1]; [1]US Air Force

2:40 PM Invited
Application of Machine Learning and Federated Big Data Storage & Analytics for Accelerated Additive Process and Parameter Development: *Vipul Gupta*[1]; [1]GE Research

3:10 PM Invited
Design of Halide Perovskites via Physics-informed Machine-learning: *Shijing Sun*[1]; [1]MIT Photovoltaics Research Laboratory

3:40 PM Break

4:00 PM Invited
Autonomous Systems for Allow Design: Towards Robust Closed-loop Alloy Deposition and Characterization: *Brian DeCost*[1]; [1]National Institute of Standards and Technology

4:40 PM Invited
Turning Statistical Mechanics Models into Materials Design Engines: *Marc Miskin*[1]; [1]University of Pennsylvania

ADVANCED MATERIALS

High Entropy Alloys VIII — Structures and Characterization

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | February 27, 2020
Marina Ballroom F | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
Roles of Martensitic Phase Fractions in Mechanical Behavior of TRIP-HEA: Sichao Fu[1]; Dunji Yu[1]; Yan Chen[1]; *Ke An*[1]; [1]Oak Ridge National Laboratory

2:20 PM Invited
On the Exceptional Mechanical Properties and Effect of Local Order in CrCoN-based High-entropy Alloys: *Robert Ritchie*[1]; Andrew Minor[1]; Mark Asta[1]; Jun Ding[2]; Ruopeng Zhang[1]; Shiteng Zhou[2]; Qin Yu[2]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

2:40 PM Invited
In-situ Neutron Diffraction Study of the Mechanical Properties of Al0.7CoCrFeNi High Entropy Alloy: Daeho Yun[1]; Hobyung Chae[1]; Taegyu Lee[2]; Ho Jin Ryu[2]; Bharat Gwalani[3]; Rajarshi Banerjee[3]; *Soo Yeol Lee*[1]; [1]Chungnam National University; [2]KAIST; [3]University of North Texas

3:00 PM Invited
In Situ Atom Probe Tomography of Oxidation Mechanism in High Entropy Alloys: *Bharat Gwalani*[1]; Elizabeth Kautz[1]; Sten Lambeets[1]; Libor Kovarik[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

3:20 PM Invited
Interpreting APT Data Containing He-bubbles in Irradiated Single-phase Concentrated Solid-solution Alloys (SP-CSAs): *Jonathan Poplawsky*[1]; Xing Wang[1]; Constantinos Hatzouglou[2]; Ke Jin[3]; Hongbin Bei[3]; Yongqiang Wang[4]; William Weber[5]; Yanwen Zhang[3]; Francois Vurpillot[2]; Karren More[1]; [1]The Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; [2]Normandie Université, UNIROUEN, INSA Rouen, CNRS, Groupe de Physique des Matériaux; [3]Materials Science and Technology Division, Oak Ridge National Laboratory; [4]Materials Science and Technology Division, Los Alamos National Laboratory; [5]Department of Materials Science and Engineering, University of Tennessee-Knoxville

3:40 PM Break

4:00 PM Invited
Metastability Engineering of HIgh Entropy Alloys: *Hyoung Seop Kim*[1]; [1]Pohang University of Science and Technology

4:20 PM Invited
In Situ TEM Characterizations on the Dual Phase High Entropy Alloy: *Sijing Chen*[1]; Qian Yu[1]; [1]Zhejiang University

4:40 PM Invited
Impact of Heat Treatment on Light Weight Multicomponent AlFeCuCrMg x (x =0, 0.5, 1, 1.7) Alloys: *Vinod Kumar*[1]; Ornov Maulik[2]; Devesh Mittal[3]; Priyanka Sahu[1]; Sheetal Dewangan[1]; [1]Indian Institute of Technology Indore; [2]Anton Paar India Pvt. Ltd.,; [3]MNIT JAIPUR

5:00 PM Invited
Welding Metallurgy and Weld Properties of High Entropy Alloys: Alexander Martin[1]; *Carolin Fink*[1]; [1]Ohio State University

ADVANCED MATERIALS

High Entropy Alloys VIII — Structures and Modeling II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | February 27, 2020
Mission Hills | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
Effect of Solute-solute Interactions on Yield Strength in HEAs: *William Curtin*[1]; Shankha Nag[1]; [1]Epfl Sti Igm Lammm

2:20 PM Invited
Simulation Studies of Grain Boundary Diffusion in a Model HEA Alloy: *Axel Seoane*[1]; Diana Farkas[1]; [1]Virginia Polytechnic Institute

2:40 PM Invited
ICME for Ultra-high Temperature Refractory High Entropy Materials: *William Yi Wang*[1]; Haoxuan Wang[1]; Deye Lin[2]; Jun Wang[1]; Shun-Li Shang[3]; Jiangwei Wang[4]; Chengxiong Zou[1]; Bin Tang[1]; Hongchao Kou[1]; Haifeng Song[2]; Chuang Dong[5]; Xi-Dong Hui[6]; Yiguang Wang[1]; Peter K Liaw[7]; Jinshan Li[1]; Zi-Kui Liu[3]; [1]Northwestern Polytechnical University; [2]Institute of Applied Physics and Computational Mathematics, Beijing; [3]Pennsylvania State University; [4]Zhejiang University; [5]Dalian University of Technology; [6]University of Science and Technology Beijing; [7]University of Tennessee

3:00 PM
Monte Carlo Study on Atomic Arrangement Around Crystal Defect in Multi-principal Element Alloys: *Shuhei Shinzato*[1]; Rodrigo Campos[1]; Shigenobu Ogata[1]; [1]Osaka University

3:20 PM
Density Functional Theory Calculations of Generalized Stacking Fault Energies in Equal-molar MoNbTi Multi-principal Element Alloys: *Yanqing Su*[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara

3:40 PM Break

4:00 PM Invited
Atomic and Electronic Basis for the Serration Behavior of High Entropy Alloys and Metallic Glasses: *Jinshan Li*[1]; William Yi Wang[1]; Jun Wang[1]; Shun-Li Shang[2]; Yi Wang[2]; Xi-Dong Hui[3]; Peter K Liaw[4]; Zi-Kui Liu[2]; [1]Northwestern Polytechnical University; [2]Pennsylvania State University; [3]University of Science and Technology Beijing; [4]University of Tennessee

4:20 PM
Simulations and Modeling of the High Temperature Yield Behavior of Chemically Complex Concentrated BCC Alloys: *Satish Rao*[1]; Brahim Akdim[1]; Edwin Antillon[1]; Christopher Woodward[2]; Oleg Senkov[1]; [1]Ues Inc.; [2]Air Force Research Laboratory

4:40 PM Invited
Unraveling Atomic-scale Lattice-distortion Strengthening of Precipitate-hardening High-entropy Alloys: *Jia Li*[1]; Haotian Chen[1]; Yang Chen[1]; Chao Jiang[1]; Qihong Fang[1]; Bin Liu[2]; Yong Liu[2]; [1]Hunan University; [2]Central South University

5:00 PM Invited
Atomistic Modeling of the Structures of High Entropy Alloy Nanoparticles from Carbothermal Shock Synthesis: *Guofeng Wang*[1]; Zhenyu Liu[1]; [1]University of Pittsburgh

ADVANCED MATERIALS

High Entropy Alloys VIII — Thermal and Other Properties

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | February 27, 2020
Marina Ballroom E | Marriott Marquis Hotel

Session Chair: To Be Announced

2:00 PM Invited
Development and Application of Phase-based Data Repository via CALPHAD Method in the HEA Discovery: *Chuan Zhang*[1]; Rui Feng[2]; Song-Mao Liang[3]; Michael Gao[4]; Fan Zhang[1]; Peter Liaw[2]; [1]CompuTherm LLC; [2]University of Tennessee; [3]University of Wisconsin-Madison; [4]National Energy Technology Laboratory

2:20 PM Invited
Development of CuFeMnNi-based High Entropy Alloys Using CALPHAD Approach and Thermomechanical Processing: Xuejun Huang[1]; Jiashi Miao[1]; *Alan Luo*[1]; [1]Ohio State University

2:40 PM Invited
Comparison of High-throughput Experimental Results with Thermodynamic Calculations for more than 2000 HEAs: *Chuangye Wang*[1]; Sebastian Kube[2]; Jan Schroers[2]; Ji-Cheng Zhao[1]; [1]University of Maryland; [2]Yale University

3:00 PM Invited
Corrosion, Wear, and Surface Degradation Behavior of High Entropy Alloys: Mayur Pole[1]; Chaitanya Mahajan[1]; Maryam Sadeghilaridjani[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

3:20 PM Invited
Speromagnetism and Asperomagnetism as the Ground States of the Tb-Dy-Ho-Er-Tm "Ideal" High-entropy Alloy: *Janez Dolinsek*[1]; [1]Jožef Stefan Institute & University of Ljubljana

3:40 PM Break

4:00 PM Invited
Phase Stability in Refractory High Entropy Alloys: German Samolyuk[1]; Yuri Osetsky[1]; G. Malcolm Stocks[1]; *James Morris*[2]; [1]Oak Ridge National Lab; [2]Ames Laboratory

4:20 PM
Design of HEAs Strengthened by $L1_2$ Precipitates using High Throughput Thermodynamic Calculations: Thomas Rieger[1]; Jean-Marc Joubert[1]; Mathilde Laurent-Brocq[1]; *Jean-Philippe Couzinié*[1]; [1]ICMPE, UMR 7182, CNRS - UPEC, F-94320, Thiais, France

4:40 PM
Quantifying the Effect of Randomness on Vacancy Diffusivity in High Entropy Alloys: *Spencer Thomas*[1]; Srikanth Patala[1]; [1]North Carolina State University

5:00 PM Invited
High Temperature Phase Stability and Mechanical Behavior of Face-centered Cubic High Entropy Alloys: Min-Gu Jo[1]; *Jin-Yoo Suh*[1]; Jae-Hyeok Shim[1]; Heung Nam Han[2]; Woo-Sang Jung[1]; [1]Korea Institute of Science and Technology; [2]Seoul National University

MATERIALS DESIGN

ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design — Session IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology; Raymundo Arroyave, Texas A&M University

Thursday PM | February 27, 2020
30D | San Diego Convention Ctr

Session Chair: James Saal, Citrine Informatics

2:00 PM
Improved Performance of Automatic Characterization of Steel Microstructure by Machine Learning Architecture: *JongHyuk Lee*[1]; Seonghwan Kim[1]; Nam Hoon Goo[1]; [1]Hyundai Steel

2:20 PM
Training Data-driven Machine Learning Models Using Physics Simulations: Predicting Local Thermal Histories in Additive Manufactured Components: *Michael Groeber*[1]; Karthik Giriprasad[1]; [1]The Ohio State University

2:40 PM
Relating Microstructure Features to Response Using Convolutional Neural Networks: *Sean Donegan*[1]; Navneet Kumar[2]; Michael Groeber[2]; [1]Air Force Research Laboratory; [2]The Ohio State University

3:00 PM
Prediction of Steel Micro-structure by Deep Learning Using Database of Thermo-dynamics and Phase Field Model: *Seonghwan Kim*[1]; Hyeok Jae Jeong[1]; Jong Hyuk Lee[1]; Nam Hoon Goo[1]; [1]Hyundai Steel Company

3:20 PM
Reduction of Uncertainty in a First-principles-based CALPHAD-type Phase Diagram via Sequential Learning of Phase Equilibrium Data: *Theresa Davey*[1]; Brandon Bocklund[2]; Zi-Kui Liu[2]; Ying Chen[1]; [1]Tohoku University; [2]Pennsylvania State University

3:40 PM Break

4:00 PM
Artificial Materials Intelligence (AMI) to Accelerate Discovery of Novel Superalloys: *Irina Roslyakova*[1]; Setareh Zomorodpoosh[1]; Mansur Ahmed[1]; Abdulmonem Obaied[1]; Ingo Steinbach[1]; [1]ICAMS, Ruhr-University Bochum

4:20 PM
Steel Development and Optimization Using Response Surface Models: *Jun Hu*[1]; Rachael Stewart[1]; Erik Pavlina[1]; Grant Thomas[1]; Alexander Duggan[2]; Roel Van De Velde[2]; [1]AK Steel; [2]ESTECO

4:40 PM
Utilizing the Statistical Machine Learning Approaches to Design New NiTiHf High Temperature Shape Memory Alloys: *Tejas Umale*[1]; Shahin Boluki[1]; Xiaoning Qian[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University

5:00 PM
Machine Learning-directed Navigation of Synthetic Design Space: A Statistical Learning Approach to Controlling the Synthesis of Perovskite Halide Nanoplatelets in the Quantum-confined Regime: *Erick Braham*[1]; Junsang Cho[1]; Kristel Forlano[1]; Raymundo Arroyave[1]; Sarbajit Banerjee[1]; [1]Texas A&M University

---

LIGHT METALS

Magnesium Technology 2020 — Fundamentals, Mechanical Behavior, Twinning, Plasticity, and Texture II

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Thursday PM | February 27, 2020
6C | San Diego Convention Ctr

Session Chairs: Tracy Berman, University of Michigan; Keerti Kappagantula, Pacific Northwest National Laboratory

---

2:00 PM
Mapping Anisotropy and Triaxiality Effects in Magnesium Alloys: Padmeya Indurkar[1]; Shahmeer Baweja[2]; Robert Perez[2]; Amol Vuppuluri[2]; *Shailendra Joshi*[2]; [1]National University of Singapore; [2]University of Houston

2:20 PM
Cold Formability of Extruded Magnesium Bands: Maria Nienaber[1]; Jan Bohlen[1]; Jose Victoria-Hernández[1]; Sangbong Yi[1]; Karl Ulrich Kainer[1]; *Dietmar Letzig*[1]; [1]Helmholtz-Zentrum Geesthacht

2:40 PM
The Effect of Plastic Deformation on the Precipitation Hardening Behavior of Biodegradable Mg-Sr-Ca-Zn Based Alloys: Matteo Nicolasi[1]; Baoqi Guo[2]; Mihriban Pekguleryuz[2]; *Mert Celikin*[1]; [1]University College Dublin; [2]McGill University

3:00 PM
Experimental Investigation of Raster Tool Path Strategy for Friction Stir Processing of Magnesium Alloy: *Abhishek Kumar*[1]; Nikhil Gotawala[1]; Aarush Sood[1]; Sushil Mishra[1]; Amber Shrivastava[1]; [1]Indian Institute of Technology Bombay

3:20 PM
Quantitative Relationship Analysis of Mechanical Properties with Microstructure and Texture Evolution in AZ Series Alloys: *Joung Sik Suh*[1]; Byeong-Chan Suh[1]; Jun Ho Bae[1]; Sang Eun Lee[1]; Byoung-Gi Moon[1]; Young Min Kim[1]; [1]Korea Institute of Materials Science

3:40 PM Break

4:00 PM
On the Influence of Twinning and Detwinning on the Deformation of Mg at the Micron Scale: *Mohammadhadi Maghsoudi*[1]; Gyuseok Kim[2]; Markus Ziehmer[1]; Erica T. Lilleodden[1]; [1]Helmholtz-Zentrum Geesthacht; [2]Quattrone Nanofabrication Facility, University of Pennsylvania

4:20 PM
An Investigation on the Microstructure and Mechanical Properties of Hot-dip-aluminized-Q235/AZ91D Bimetallic Material Produced by Solid-liquid Compound Casting: *Jun Cheng*[1]; Jian-hua Zhao[1]; Yao Tang[1]; Jingjing Shangguan[1]; [1]Chongqing University,

---

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Electrochemistry

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Stephen Raiman, Oak Ridge National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory

Thursday PM | February 27, 2020
Theater A-6 | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Invited
Application of Molten Salts in Nuclear Energy: *Mark Williamson*[1]; [1]Argonne National Laboratory

2:30 PM
Application of Voltammetry for Investigation of Materials Corrosion in LiF-NaF-KF (FLiNaK): *William Doniger*[1]; Cody Falconer[1]; Evan Buxton[1]; Mohamed Elbakshwan[1]; Adrien Couet[1]; Kumar Sridharan[1]; [1]University of Wisconsin,Madison

2:50 PM
Redox Potential Measurement of Ni2+/Ni in MgCl2-KCl-NaCl Molten Salt using Chronopotentiometry Method: *Mingyang Zhang*[1]; Jianbang Ge[1]; Jinsuo Zhang[1]; [1]Virginia Polytechnic Institute and State University

3:10 PM
Multifunctional Voltammetry Sensors for Long-duration Process Monitoring and Control of Molten Salt Equipment: *Nathaniel Hoyt*[1]; Jicheng Guo[1]; Elizabeth Stricker[1]; Mark Williamson[1]; [1]Argonne National Laboratory

3:30 PM
High-throughput Electrochemical Methods Development to Accelerate Molten Salt Corrosion Resistant Alloy Design: *Bonita Goh*[1]; William Doniger[1]; Phalgun Nelaturu[1]; Michael Moorehead[1]; Dimitris Papailiopoulos[1]; Dan Thoma[1]; Kumar Sridharan[1]; Adrien Couet[1]; [1]University of Wisconsin, Madison

3:50 PM Break

4:10 PM Invited
Determining Redox Potentials of Liquid Metal Electrodes for Recovery of Fission Products from Molten Salts: *Hojong Kim*[1]; [1]Pennsylvania State University

4:30 PM
Understanding the Effects of Operating Conditions on UO2 Electroreduction: *Krista Hawthorne*[1]; Augustus Merwin[1]; James Willit[1]; Mark Williamson[1]; [1]Argonne National Laboratory

4:50 PM
Cathodic Behavior of Moisture in LiCl-KCl Eutectic Melt: Applications to Pyroprocessing: *Litun Swain*[1]; Gurudas Pakhui[1]; Suddhasattwa Ghosh[1]; Bandi Prabhakara Reddy[1]; [1]Indira Gandhi Centre for Atomic Research, Kalpakkam

5:10 PM
Electrochemical Corrosion of Zircaloy-2 in Molten LiCl: *William Ebert*[1]; Evan Wu[1]; Vineeth Kumar Gattu[1]; James Willit[1]; [1]Argonne National Laboratory

MATERIALS DESIGN

Materials Design Approaches and Experiences V — Ferrous Alloys II

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Akane Suzuki, GE Research; Ji-Cheng Zhao, University of Maryland; Michael Fahrmann, Haynes International; Qiang Feng, University of Science and Technology Beijing; Michael Titus, Purdue University

Thursday PM | February 27, 2020
33A | San Diego Convention Ctr

Session Chairs: Bryan Webler, Carnegie Mellon University; Michael Fahrmann, Haynes International

2:00 PM Invited
Microstructure and Cracking Susceptibility of Continuously Cast Slabs of 3rd Generation Advanced High Strength Steels: Rafael Coura Giacomin[1]; *Bryan Webler*[1]; [1]Carnegie Mellon University

2:30 PM
Development of Nuclear Grade Wrought FeCrAl Alloys for Accident Tolerant Fuel Cladding: *Yukinori Yamamoto*[1]; Kevin Field[1]; Bruce Pint[1]; Kurt Terrani[1]; Raul Rebak[2]; Russ Fawcett[3]; [1]Oak Ridge National Laboratory; [2]GE Global Research; [3]Global Nuclear Fuel

2:50 PM
The FaMUS Methodology for Quantify Materials Understanding and its Application to the NSUF Research Portfolio: *Simon Pimblott*[1]; Rory Kennedy[1]; [1]Idaho National Laboratory

3:10 PM Break

3:30 PM Invited
Discovery of Maraging Steel: Machine Learning vs. Physical Metallurgical Models: Chunguang Shen[1]; Chenchong Wang[1]; Xiaolu Wei[1]; *Wei Xu*[1]; [1]Northeastern University

4:00 PM
Domain-guided ML Tool for Designing New Fe-9Cr Steels: *Vyacheslav Romanov*[1]; [1]National Energy Technology Laboratory

4:20 PM
Effect of Vibration on Residual Stress of a Stiffened Steel Plate During Welding: A Numerical Study: *Rururaja Pradhan*[1]; Mohammed Sunny[2]; Arunjyoti Sarkar[1]; [1]Department of Ocean Engineering and Naval Architecture; [2]Department of Aerospace Engineering,Indian Institute of Technology, Kharagpur

MATERIALS PROCESSING

Materials Processing Fundamentals — Molten Metal Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Metal; Sam Wagstaff, Novelis Inc.; Antoine Allanore, Massachusetts Institute of Technology; Fiseha Tesfaye, Abo Akademi University

Thursday PM | February 27, 2020
13 | San Diego Convention Ctr

Session Chairs: Samuel Wagstaff, Novelis Inc.; Allie Anderson, Gopher Resource

2:00 PM
Simulation and Optimization of Magnetically-assisted Welding of Stainless Steel 316L: *Kevin Carpenter*[1]; Ali Tabei[1]; Saereh Mirzababaei[1]; Somayeh Pasebani[1]; [1]Oregon State University

2:20 PM
Determining the Effect of Manufacturing Process Parameters of Selective Laser Melting on the Dynamic Mechanical Behavior of 316L Stainless Steel: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

2:40 PM
Heterogeneous Microstructure Induced Mechanical Responses in the Welded Joint of EH420 Shipbuilding Steel under High Heat Input Electro-gas Welding: *Xie Xu*[1]; Wang Cong[1]; [1]Northeastern University

3:00 PM
Numerical Modelling of Additive Manufactured Ti-Al-Si-Cu/Ti-6Al-4V Composite by Direct Laser Metal Deposition (DLMD) Technique: *Olawale Fatoba*[1]; Stephen Akinlabi[2]; Esther Akinlabi[2] Lester Naidoo[2]; [1]Kent State University; [2]University of Johannesburg

3:20 PM
Influence of Laser Intensity and Speed of Scanning on the Ultimate Tensile Strength and Metallurgical Properties of Laser Cladded Ti-6Al-4V+Ni/Ti-6Al-4V Composite Coating: Olawale Fatoba[1]; *Esther Akinlabi*[2]; Stephen Akinlabi[2]; [1]Kent State University; [2]University of Johannesburg

3:40 PM Break

4:00 PM
A Quantitative Study of Microsegregation Mechanisms in Aluminum Binary Alloys: *Zhenjie Yao*[1]; Yang Huo[2]; Mei Li[2]; John Allison[1]; [1]University of Michigan; [2]Ford Motor Company

4:20 PM
Expanded Perlite Microspheres; Linkage Between Material Processing Conditions and Microspheres Properties: *Panagiotis Angelopoulos*[1]; Maria Taxiarchou[1]; [1]School of Minign and Metallurgical Engineering, NTUA

4:40 PM
Contactless Ultrasound in Copper and Nickel Melts: *Catherine Tonry*[1]; Christopher Beckwith[1]; Valdis Bojarevics[1]; Georgi Djambazov[1]; Koulis Pericleous[1]; [1]University of Greenwich

5:00 PM
The Effect of Side Arcs on Current Distribution in Submerged Arc Furnaces for Silicon Production: *Yonatan Tesfahunegn*[1]; Thordur Magnusson[2]; Merete Tangstad[3]; Gudrun Saevarsdottir[1]; [1]Reykjavik University; [2]Stakksberg; [3]Norwegian University of Science and Technology

5:20 PM
Empirical Study of Laser Cleaning of Rust, Paint and Mill Scale from a Steel Surface: *Jean-Michaël Deschênes*[1]; Alex Fraser[1]; [1]Laserax Inc

MATERIALS PROCESSING

Materials Research in Reduced Gravity — Solidification II

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Robert Hyers, University of Massachusetts; Douglas Matson, Tufts University; Michael Sansoucie, NASA MSFC; Shaun McFadden, Ulster University; Jonghyun Lee, Iowa State University; Wilhelmus Sillekens, European Space Agency; Takehiko Ishikawa, JAXA

Thursday PM | February 27, 2020
18 | San Diego Convention Ctr

Session Chairs: Sonja Steinbach, DLR; Peter Galenko, Uni. Jena

2:00 PM
Dendrite Orientation Transition of fcc-Al in Bulk Al-Ge Alloys: *Sonja Steinbach*[1]; Matthias Kolbe[1]; Sebastian Wirth[2]; Laszlo Sturz[3]; Gerhard Zimmermann[3]; Florian Kargl[1]; Maike Becker[4]; [1]DLR; [2]RWTH Aachen; [3]ACCESS e.V.; [4]IM2NP

2:20 PM
Effects of Bi on the Interface Layer Between Sn-based Alloy and Cu Substrate Under Microgravity Conditions: *Rongyue Wang*[1]; Zhangfu Yuan[1]; Yuhui Hao[1]; [1]University of Science and Technology Beijing

2:40 PM
Comparison of Three-dimensional In Situ Observations and Phase-field Simulations of Microstructure Formation During Directional Solidification of Transparent Alloys Aboard the ISS: *Kaihua Ji*[1]; Fatima Mota[2]; Younggil Song[1]; Jorge Pereda[2]; Trevor Lyons[3]; Louise Strutzenberg[4]; Rohit Trivedi[3]; Nathalie Bergeon[2]; Alain Karma[1]; [1]Northeastern University; [2]Aix-Marseille Université and CNRS; [3]Iowa State University; [4]Marshall Space Flight Center

3:00 PM
Crystallizations Kinetics of Glass-forming ZrCu-based Alloys: *Peter Galenko*[1]; Stefanie Koch[1]; Markus Rettenmayr[1]; Vladimir Ankudinov[2]; Josef Slowik[1]; [1]University of Jena; [2]Udmurt State University

3:20 PM Break

3:50 PM Panel Discussion

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Deformation and Failure

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Thursday PM | February 27, 2020
Santa Rosa | Marriott Marquis Hotel

Session Chairs: Jiangwei Wang, Zhejiang University; Wendy Gu, Stanford University

2:00 PM Invited
Interface-dominated Plasticity in Metallic Nanostructured Materials: *Jiangwei Wang*[1]; Qi Zhu[1]; Siyuan Wei[1]; Chuang Deng[2]; Scott X. Mao[3]; Frederic Sansoz[4]; [1]Zhejiang University; [2]The University of Manitoba; [3]University of Pittsburgh; [4]The University of Vermont

2:40 PM
The Influence of 3D Interfaces on the Mechanical Behavior of Nanoscale Metallic Multilayers: *Justin Cheng*[1]; Kevin Baldwin[2]; Youxing Chen[3]; Nan Li[2]; Irene Beyerlein[4]; Nathan Mara[1]; [1]University of Minnesota Twin Cities; [2]Los Alamos National Laboratory; [3]University of North Carolina Charlotte; [4]University of California Santa Barbara

3:00 PM
Nanomechanical Studies of Dual-phase Titanium Alloys Made by Additive Manufacturing: *Zhiying Liu*[1]; Yu Zou[1]; [1]University of Toronto

3:20 PM
Cu-graphene Multilayer Composite for Robust Electronic Interconnect Material: *Wonsik Kim*[1]; Sang-Min Kim[2]; Byungil Hwang[3]; Seung Min Han[1]; [1]Korea Advanced Institute of Science and Technology; [2]Korea Institute of Machinery and Materials; [3]Chung-Ang University

3:40 PM Break

4:00 PM
Investigation of Crack Nucleation and Propagation During Nanoindentation of Silicate Glasses: *Yvonne Dieudonné*[1]; George Pharr[1]; [1]Texas A&M University

4:20 PM
Comparison of Intergranular Fracture Behavior Between Sulfur Doped Nickel Grain Boundaries: *Doruk Aksoy*[1]; Rémi Dingreville[2]; Douglas E. Spearot[1]; [1]University of Florida; [2]Sandia National Laboratories

4:40 PM
Mechanical Behavior of Metallic Glass-HCP Crystalline Nanolayers: Mohammad Abboud[1]; Amir Motallebzadeh[2]; *Sezer Ozerinc*[1]; [1]Middle East Technical University; [2]Koç University

MATERIALS DESIGN

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session VI

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, MicroTesting Solutions; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Thursday PM | February 27, 2020
32A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Keynote
Examination of Local Microscale-microsecond Temperature Rise in HMX-HTPB Energetic Material under Impact Loading: Ayotomi Olokun[1]; *Bing Li*[1]; Chandra Prakash[2]; Zhiwei Men[3]; Dana Dlott[3]; Vikas Tomar[1]; [1]Purdue University; [2]Johns Hopkins University; [3]University of Illinois Urbana-Champaign

2:40 PM Keynote
Impact of the Architecture / Texture on the Mechanical Behavior of Ni-microwires: How to Drive the Strength and Ductility: Ravi Raj Purohit Purushottam Raj Purohit[1]; Alla Ndiaye Dieng[1]; *Celine Gerard*[2]; Loic Signor[3]; Abhinav Arya[4]; Girish Bojjawar[4]; Satyam Suwas[4]; Atul H. Chokshi[4]; Ludovic Thilly[1]; [1]Pprime Institute - Poitiers University; [2]Pprime Institute - CNRS; [3]Pprime Institute - ENSMA; [4]Indian Institute of Science

3:20 PM
Investigation of Dynamic Increase Factor of Selective Laser Melted AlSi10Mg, Aluminum Alloy: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

3:40 PM Break

4:00 PM
In Situ TEM Investigation of the Electroplasticity Phenomenon in Metals: *Xiaoqing Li*[1]; John Turner[2]; Karen Bustillo[2]; Rohan Dhall[2]; Andrew Minor[1]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

4:20 PM
In-situ Mechano-electrochemical Coupling of Structural Supercapacitor Electrodes: *Dimitrios Loufakis*[1]; James Boyd[1]; Zachary Powell[1]; Alejandro Martinez[1]; Jodie Lutkenhaus[1]; Dimitris Lagoudas[1]; [1]Texas A&M University

4:40 PM
A Novel Approach to Join Large Coefficient of Thermal Expansion (CTE) Mismatched Thermoelectric (TE) Materials for High Temperature Applications: *Michell Aranda*[1]; Ike Chi[1]; Ravi Vilupanur[1]; Obed Villapando[1]; Brooke Singleton[1]; Fivos Drymiotis[1]; Billy Li[1]; Jean-Pierre Fleurial[1]; [1]JPL

5:00 PM
Synthesis and Mechanical Behavior of Freestanding NiTi Films with Varying Grain Sizes: *Paul Rasmussen*[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

5:20 PM Concluding Comments

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Nanocomposites VI: Nanoscience and Nanotechnology in Advanced Composites — Polymer and Other Nanocomposites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Srivatsan Tirumalai, The University of Akron; Manoj Gupta, National University of Singapore

Thursday PM | February 27, 2020
Solana | Marriott Marquis Hotel

Session Chair: Efosa Obazee, Rubber Research Institute of Nigeria

2:00 PM Invited
Facile, Large Scale Synthesis of Water Soluble Aginse2/Zns Quantum Dots and Its Cell Viability Assessment on Different Cell Lines: *Samuel Oluwafemi*[1]; [1]University of Johannesburg

2:30 PM Invited
Surface Modification of Bio Derived Carbon with Low Temperature Plasma Treatment for Polymer Composite Filler Applications: *Vijaya Rangari*[1]; Zaheeruddin Mohammed[1]; Shaik Jeelani[1]; [1]Tuskegee University

3:00 PM
Multifunctional Nanocomposites for Radiation Enhancement in Radiotherapy: Gabrielle Seymore[1]; Maria Molina Higgins[1]; *Jessika Rojas*[1]; [1]Virginia Commonwealth University

3:25 PM
Effect of Graphene Nanosheets Reinforcement on the Mechanical Properties of Rubber Seed Oil Based Polyurethane Nanocomposites: *Efosa Obazee*[1]; Felix Okieimen[2]; Prem Felix[3]; Subrata Ghosh[3]; [1]Rubber Research Institute of Nigeria; [2]University of Benin, Benin City; [3]Indian Institute of Technology Mandi

3:50 PM Break

4:10 PM
Continuous Flow Process for Removal and Recovery of Water Contaminants with Magnetic Nanocomposites: *Teagan Leitzke*[1]; Jerome Downey[1]; David Hutchins[1]; Brian St. Clair[1]; [1]Montana Technological University

4:35 PM
An Electrochemical Sensing Platform based on Bimetal-telluride Nanorods Decorated Reduced Graphene Oxide Nanocomposite for Highly Sensitive Voltammetric Detection of Food Toxic Roxarsone in Meat Samples: Govindasamy Mani[1]; *Sea-Fue Mani*[1]; [1]National Taipei University of Technology

5:00 PM
Chronoamperometric Approach for Detection of H_2O_2 Adulteration in Milk using Ag/TiO_2 Nanoparticles: *Bharti Sharma*[1]; [1]Guru Jambheshwar University Science and Technology

5:25 PM
Comparative Cytotoxicity and Photothermal Study of Graphene Oxide (Go), Graphene Quantum Dots (Gqds) And Gqds/Go-Gold Nanorod Conjugates Against Different Cancer Cell Lines: *Samuel Oluwafemi*[1]; Thabang Lebepe[1]; Tetsuya Kodama[2]; [1]University of Johannesburg; [2]Tohoku University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — General Topics II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Thursday PM | February 27, 2020
33B | San Diego Convention Ctr

Session Chairs: Bharat Gwalani, Pacific Northwest National Laboratory; Zhi Liang, National Institute of Standards and Technology

2:00 PM
Molecular Dynamic Study the Role of the Kinetic Factor during Nucleation of Stoichiometric Compounds from Liquid: *Huajing Song*[1]; Y Sun[2]; F Zhang[2]; C.Z. Wang[2]; K.M. Ho[3]; M.I. Mendelev[2]; [1]Los Alamos National Laboratory; [2]Ames Laboratory; [3]Iowa State University

2:20 PM
Predictably Tuning Transformation Temperatures in Thin Epitaxial Films: *Ashley Bucsek*[1]; Ananya Renuka Balakrishna[2]; Abhinav Prakash[2]; Bharat Jalan[2]; Richard James[2]; [1]University of Michigan; [2]University of Minnesota

2:40 PM
XRD and Synchrotron-based XRD Study of Chalcopyrite Leaching Catalyzed by Silver Ions: *Rui Liao*[1]; Jun Wang[1]; Shitong Liu[1]; Hao Lin[1]; Mo Lin[1]; Shichao Yu[1]; [1]Central South University

3:00 PM
(S)TEM Investigation of a Passivating Alumina Layer Formed During Air Annealing of CVD-Grown $Hf_{(1-x)}Al_xB_2$ Coatings: *Carly Romnes*[1]; Kinsey Canova[1]; Zoë Tucker[1]; Zhejun Zhang[1]; John Abelson[1]; Jessica Krogstad[1]; [1]University of Illinois at Urbana-Champaign

3:20 PM
Study of the C Partitioning Kinetics in Q&P Process: Experiment and Simulation: *Sachin Kumar*[1]; Shiv Singh[1]; [1]IIT Kharagpur

3:40 PM Break

4:00 PM
Analysis of the Grain Growth Rate on the Voxel-based Microstructural Representation: *Hyeonho Kim*[1]; Kunok Chang[1]; [1]Kyung Hee University

4:20 PM
Mechanically Driven Phase Transformation in CNT Reinforced Al-Cu-Fe Quasicrystalline Matrix Nanocomposite: Influence of Mechanical Milling and Cryomilling: *Yagnesh Shadangi*[1]; S. Varalakshmi[1]; Joysurya Basu[1]; Kausik Chattopadhyay[1]; Bhaskar Majumdar[2]; Nilay Mukhopadhyay[1]; [1]Indian Institute of Technology (BHU) Varanasi; [2]DMRL

4:40 PM
Comparison of Phase Transformations in Binary Ti-Mo and Zr-Nb Alloys: *Anna Veverková*[1]; Petr Harcuba[1]; Jana Šmilauerová[1]; Josef Stráský[1]; [1]Charles University

5:00 PM
The Validity of Additivity Rule for Pearlite Transformation in Eutectoid Steels: *Jeong Min Kim*[1]; Kyung Jong Lee[1]; [1]Hanyang University

ENERGY & ENVIRONMENT

Powder Materials for Energy Applications — Novel Materials and Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University

Thursday PM | February 27, 2020
17A | San Diego Convention Ctr

Session Chairs: Eugene Olevsky, San Diego State University; Hang Yu, Virginia Tech

2:00 PM Invited
Powder Metal Technology for High-performance Materials with Harmonic-structure: *Dmytro Orlov*[1]; Kei Ameyama[2]; [1]Lund University; [2]Ritsumeikan University

2:30 PM
Peltier Effect during Spark Plasma Sintering of Boron Carbide: *Joseph Sambasene Diatta*[1]; Andrey Maximenko[2]; Ifeanyichukwu Donald Olumor[3]; Geuntak Lee[3]; Eugene A. Olevsky[3]; [1]Assane Seck University, SENEGAL; [2]National Academy of Sciences; [3]San Diego State University

2:50 PM
Next Stage Development of Iron-based GARS Alloy Powders for Cold Spray Deposition of ODS Structural Materials for Extreme Environments: *Rebecca Whitesell*[1]; Timothy Prost[2]; Emma White[2]; Stuart Maloy[3]; Osman El Atwani[3]; Glenn Grant[4]; Iver Anderson[2]; [1]Iowa State University; [2]Ames Laboratory; [3]Los Alamos National Laboratory; [4]Pacific Northwest National Laboratory

3:10 PM
Miscibility Gap Alloy Thermal Storage Materials: *Mark Copus*[1]; [1]The University of Newcastle, Australia

3:30 PM
Preparation of Zinc Carbonate Hydroxide Microparticles via Deamination Precipitation by Heating: *Yan Zeng*[1]; Yongbin Yang[1]; Wei Gao[1]; Qianqian Duan[1]; Jiaming Qin[1]; [1]Central South University

MATERIALS PROCESSING

Process Metallurgy and Electrochemistry of Molten Salts, Liquid Metal Batteries, and Extra-terrestrial Materials Processing: An EPD Symposium in Honor of Don Sadoway — Prof. Sadoway Honorary Session IV

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Yasuhiro Fukunaka, JAXA/Waseda University

Thursday PM | February 27, 2020
14A | San Diego Convention Ctr

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM Invited
Are the Metallic Iron Inclusions Exist on the Surface of the Moon?: *Ramana Reddy*[1]; [1]University of Alabama

2:25 PM Invited
Getting the Most from Models in High-Temperature Materials Processing: *Robert Hyers*[1]; [1]University of Massachusetts

2:45 PM Break

3:00 PM
Molten Oxide Electrolysis for the Production of Ferroalloys and Steel: *Guillaume Lambotte*[1]; Richard Bradshaw[1]; Tadeu Carneiro[1]; [1]Boston Metal

3:20 PM
Thermodynamic and Kinetic Modelling of Molten Oxide Electrolysis Cells: *William Judge*[1]; Gisele Azimi[1]; [1]University of Toronto

3:40 PM Invited
Insights into the Oxidation Behavior of Cr1-xFex Anodes for Molten Oxide Electrolysis: *Antoine Allanore*[1]; Mohsen Esmaily[2]; [1]Massachusetts Institute of Technology; [2]Massachusetts Institute of Technology; Monash University

4:00 PM Invited
Hybrid Processes in Refining of Silicon: *Mansoor Barati*[1]; [1]University of Toronto

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Light-weight Alloys

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Thursday PM | February 27, 2020
31B | San Diego Convention Ctr

Session Chairs: Dalong Zhang, Pacific Northwestern National Laboratory; Yaojun Lin, Wuhan University of Technology

2:00 PM Invited
Annual Progress Report on Magnesium and Magnesium Alloys (2019): *Fusheng Pan*[1]; Jiangfeng Song[1]; [1]Chongqing University

2:30 PM Invited
Characterization of Twin-twin Interactions in Mg: *Yanqing Su*[1]; M. Kumar[2]; Xin Wang[3]; Yang Hu[3]; Kehang Yu[3]; Jiaxiang Wang[1]; Subhash Mahajan[4]; Enrique Lavernia[3]; Tim Rupert[3]; Julie Schoenung[3]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory; [3]University of California, Irvine; [4]University of California, Davis

3:00 PM
From Far-from-Equilibrium Fabrication to Far-from-Equilibrium Investigation – a Case Study for Mg/Mg Alloys at EJL Lab and Beyond: *Dalong Zhang*[1]; Lin Jiang[2]; Xin Wang[3]; Irene Beyerlein[4]; Andrew Minor[5]; Julie Schoenung[3]; Subhash Mahajan[6]; Enrique Lavernia[3]; [1]Pacific Northwest National Laboratory; [2]Thermo Fisher Scientific; [3]University of California, Irvine; [4]University of California, Santa Barbara; [5]University of California, Berkeley; Lawrence Berkeley National Laboratory; [6]University of California, Davis

3:20 PM
Research on Microstructure and Mechanical Properties of High Strength Duplex Mg-Li-Al-X Alloys: *Yan Yang*[1]; Xiaodong Peng[1]; [1]Chongqing University

3:40 PM Break

4:00 PM
Overview of Advancement and Development Trend on Magnesium Alloys based on Bibliometric Analysis: *Xiaodong Peng*[1]; Yan Yang[1]; Tiancai Xu[2]; [1]Chongqing University; [2]Chongqing University Library

4:20 PM
Role of Laser Surface Modification on Microstructure and Response of a Magnesium Alloy: Bupesh Raja V.K.[1]; Shaik. Abdul Adil[1]; Shaik.Mohammed Afridi[1]; Gururaj Parande[2]; Sravya Tekumalla[2]; *T. S. Srivatsan*[3]; Manoj Gupta[2]; [1]Sathyabama Institute of Science and Technology; [2]National University of Singapore; [3]The University of Akron

4:40 PM
Disintegrable Mg/Al Metal Matrix Composites for Oilfield Applications: *Zhihui Zhang*[1]; Zhiyue Xu[1]; [1]Baker Hughes, a GE Company

5:00 PM
Microstructure and Texture in Cryomilled and Spark Plasma Sintered Ti Grade 2: *Jiri Kozlik*[1]; Petr Harcuba[1]; Josef Strasky[1]; Hanka Becker[2]; Tomas Chraska[3]; Milos Janecek[1]; [1]Charles University; [2]TU Bergakademie Freiberg; [3]Czech Academy of Sciences

5:20 PM
Cryogenic Milling and Spark Plasma Sintering of Commercially Pure Ti and Metastable Beta Ti15Mo Alloy: *Josef Strasky*[1]; Jiri Kozlik[1]; Anna Veverková[1]; Petr Harcuba[1]; Hanka Becker[2]; Tomas Chraska[3]; [1]Charles University; [2]TU Freiberg; [3]Institute of Plasma Physics

5:40 PM
Tracer Impregnated nc-materials and Dissolvable Solids for Controlled & Bulk Release Machinable into Downhole Tools for Sensing and Characterization: *Indranil Roy*[1]; Ting Roy[2]; Jing Zhou[3]; [1]DAMORPHE; [2]SET Laboratory; [3]Rice University

---

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Irradiation of Zircinium, Tungsten and Copper Systems

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Thursday PM | February 27, 2020
Theater A-7 | San Diego Convention Ctr

Session Chairs: Khalid Hattar, Sandia National Laboratory; Chad Parish, Oak Ridge National Laboratory

---

2:00 PM
Microstructural Investigation of the Synergistic Effects that Can Cause Hydride Reorientation in Zirconium based Spent Nuclear Fuel Cladding: *Tyler Smith*[1]; Steven Zinkle[1]; [1]University of Tennessee

2:20 PM
Atom Probe Examinations of Zircaloy Irradiated at Nominally 410C: *Brian Cockeram*[1]; Phil Edmondson[2]; [1]Nnl Bettis Laboratory; [2]Oak Ridge National Laboratory

2:40 PM
Study of Niobium Clustering in Zr-1.0%Nb Alloy Irradiated with Kr2+ Ions or Neutrons to ~9 dpa at 310 °C: *Saheed Adisa*[1]; Matthew Swenson[1]; Jing Hu[2]; [1]University of Idaho; [2]Argonne National Laboratory

3:00 PM
Analysis of Neutron Irradiation Induced Element Redistribution in Ceramic and Metallic Alloy TPBAR Components: *Arun Devaraj*[1]; Bethany Mathews[1]; Bruce Arey[1]; Elizabeth Kautz[1]; Danny Edwards[1]; Gary Sevigny[1]; David Senor[1]; [1]Pacific Northwest National Laboratory

3:20 PM
Dual Beam Irradiation of Tungsten Materials: Synergistic Effects and Comparison with Sequential and Single Beam Irradiation: *Osman El-Atwani*[1]; William Cunningham[2]; Jason Trelewicz[2]; Wei-Ying Chen[3]; Meimei Li[3]; Stuart Maloy[1]; [1]Los Alamos National Laboratory; [2]Stony Brook University; [3]Argonne National Laboratory

3:40 PM Break

4:00 PM
Microstructure and Mechanical Properties of Neutron Irradiated Tungsten Fibers for Fusion Applications: *Lauren Garrison*[1]; Chad Parish[1]; Maxim Gussev[1]; John Echols[1]; Johann Riesch[2]; [1]Oak Ridge National Laboratory; [2]Max-Planck-Institut für Plasmaphysik

4:20 PM
Coupled Irradiation Induced Grain Growth and Damage Evolution in Solute Stabilized Nanocrystalline Tungsten: *Streit Cunningham*[1]; Khalid Hattar[2]; Jason Trelewicz[1]; [1]Stony Brook University; [2]Sandia National Laboratories

4:40 PM
Atomistic Modeling of Radiation Resistance in Concentrated Alloys: *Craig Daniels*[1]; Pascal Bellon[1]; Robert Averback[1]; [1]University of Illinois

5:00 PM
Defect-Interface Interactions in Irradiated Cu/Ag Nanocomposites:Interface Vacancy Pump Effect: *Weizhong Han*[1]; Min Wang[1]; [1]Xi'an Jiaotong University

5:20 PM
Elucidating Atomistic Mechanisms for Interface- and Grain Boundary-mediated Radiation Defects Annihilation: *Penghui Cao*[1]; Miaomiao Jin[2]; Kangpyo So[2]; Ju Li[2]; Michael Short[2]; [1]University of California, Irvine; [2]Massachusetts Institute of Technology

---

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Materials in Extremes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Thursday PM | February 27, 2020
5A | San Diego Convention Ctr

Session Chair: Nitin Daphalapurker, Los Alamos National Laboratory

---

2:00 PM Invited
Dynamics of Necking and Fracture in Ductile Porous Materials: *Ankit Srivastava*[1]; [1]Texas A&M University

2:40 PM
What Happens to a Microstructurally Stable Nanocrystalline Alloy after Undergoing Shock Loading?: *Billy Hornbuckle*[1]; Xuyang Zhou[2]; Cyril Williams[1]; Steven Dean[1]; Anit Giri[1]; Anthony Roberts[1]; Greg Thompson[2]; Kiran Solanki[3]; Kris Darling[1]; [1]US Army Research Laboratory; [2]The University of Alabama; [3]Arizona State University

3:00 PM
Investigating the Mesoscale Evolution of Microstructure during Cold Spray Single Particle Impact of BCC Metallic Powders: *Sumit Suresh*[1]; Seok-Woo Lee[1]; Mark Aindow[1]; Harold Brody[1]; Aaron Nardi[2]; Victor Champagne[2]; Avinash Dongare[1]; [1]University of Connecticut; [2]U.S. Army Research Laboratory

THE WORLD COMES HERE

TMS 2020

149th Annual Meeting & Exhibition

POSTER SESSION WITH PRESENTERS

The poster sessions is divided into 2 separate presentation times and grouped by topic area.

Poster presenters should stand by their poster during their designated presentation time.

POSTER SESSION I
Monday, February 24
5:30 to 7:00 p.m.

- Additive Technologies
- Biomaterials
- Corrosion
- Electronic Materials
- Energy & Environment
- Light Metals
- Mechanics and Structural Reliability
- Nuclear Materials

POSTER SESSION II
Tuesday, February 25
5:30 to 7:00 p.m.

- Advanced Materials
- Characterization
- Materials Design
- Materials Processing
- Nanostructured & Heterostructured Materials
- Physical Metallurgy

NUCLEAR MATERIALS

Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Assel Aitkaliyeva, University of Florida; Peter Hosemann, University of California - Berkeley; Samuel Briggs, Oregon State University; David Frazer, Los Alamos National Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Assel Aitkaliyeva, University of Florida

Characterization of Helium Implanted Single Crystal Titanium: *Sarah Stevenson*[1]; Mehdi Balooch[1]; Andrew Scott[1]; Peter Hosemann[1]; Frances Allen[1]; Saryu Fensin[2]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory

Damage Mitigation Strategies for Femtosecond Laser Machining of Micro-tensile Bars: *Sebastian Lam*[1]; Peter Hosemann[1]; Jonathan Gregory Gigax[2]; Quinn Mcculloch[2]; [1]University of California, Berkeley; [2]Los Alamos National Lab

Direct Compaction of Dispersion Fuels Using a Matrix Deposition on the Fuel Particles: *Sunghwan Kim*[1]; Kyu Hong Lee[1]; Won Jae So[1]; Yong Jin Jeong[1]; Kinam Kim[1]; Jong Man Park[1]; [1]Korea Atomic Energy Research Institute

Effects of Helium Ion Irradiation on Single Crystal Vanadium: *Andrew Scott*[1]; Peter Hosemann[1]; Mehdi Balooch[1]; Marco Sebastiani[2]; Muhammad Mughal[2]; Sarah Stevenson[1]; [1]University of California, Berkeley; [2]Università degli studi Roma Tre

Fabrication of Low-enriched Uranium Dispersion Targets with a High Uranium Density for Mo-99 Production: Kinam Kim[1]; *Jong Hwan Kim*[1]; Tae Won Cho[1]; Sunghwan Kim[1]; Kyuhong Lee[1]; Yong Jin Jeong[1]; Jong Man Park[1]; [1]Korea Atomic Energy Research Institute

In-situ Heavy Ion Irradiation of FCC and BCC High-entropy Alloys at Cryogenic and High Temperatures: *Calvin Parkin*[1]; Michael Moorehead[1]; Mohamed Elbakhshwan[1]; Jing Hu[2]; Wei-Ying Chen[2]; Kumar Sridharan[1]; Adrien Couet[1]; [1]University of Wisconsin, Madison; [2]Argonne National Laboratory

Mechanical Properties of Ion Irradiated and Helium Implanted HT9 Micropillars: *Ryan Schoell*[1]; Ce Zheng[1]; Khalid Hattar[2]; Djamel Kaoumi[1]; [1]North Carolina State University; [2]Sandia National Laboratory

Microstructure and Mechanical Behavior of Directed Energy Deposition Laser Additively Manufactured T-91: *Jack Peterson*[1]; Adi Benartzy[1]; Stuart Maloy[2]; Thomas Lienert[2]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory

Radiation Response of HT9 Ferritic/Martensitic Alloys as a Function of Interstitial Content: *Eda Aydogan*[1]; Jonathan Gigax[2]; Scott Parker[2]; Benjamin Eftink[2]; Yongqiang Wang[2]; Stuart Maloy[2]; [1]Sabanci University; [2]Los Alamos National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture IV: Toward Confident Use in Critical Applications — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nik Hrabe, National Institute of Standards and Technology; Steve Daniewicz, University of Alabama; Nima Shamsaei, Auburn University; John Lewandowski, Case Western Reserve University; Mohsen Seifi, ASTM International/Case Western Reserve University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Nik Hrabe, National Institute of Standards and Technology

As the Delamination Fracture Behavior in the AlSi10Mg DMLS Parts Built in Different Orientations: Roberto Seno[1]; *Eder Najar Lopes*[2]; [1]CBA; [2]Unicamp

Determining the Behavior of Stress Wave Through Selective Laser Melted AlSi10Mg Samples Produced in Bar Impact: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

Effect of Build Orientation and Post Machining on AM 316L Part Failure: *Michael Heiden*[1]; Dan Tung[1]; David Saiz[1]; Bradley Jared[1]; [1]Sandia National Laboratories

Effect of Post Heat-treatment on the Microstructure, Tensile and Fatigue Properties of AlSi10Mg Alloy Manufactured by Selective Laser Melting: *Tae-Hyun Park*[1]; Min-Seok Baek[1]; Yongho Sohn[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]University of Central Florida

Fatigue Behavior and Failure Mechanisms of Laser Beam Directed Energy Deposited Inconel 718: *Rakish Shrestha*[1]; Alexander Johnson[2]; Pooriya Nezhadfar[1]; Nima Shamsaei[1]; [1]Auburn University; [2]Trivector Services Inc

Heat Treatment Effects on High Cycle and Very High Cycle Fatigue Behavior of Additively Manufactured 17-4 PH Stainless Steel: Pooriya D. Nezhadfar[1]; Palmer Frye[2]; *Jutima Simsiriwong*[2]; Nima Shamsaei[1]; [1]Auburn University; [2]University of North Florida

Micro-mechanisms of Cyclic Plasticity in IN718 Fabricated by Laser Powder Bed Fusion: *Alessandro Piglione*[1]; Bonnie Attard[2]; Moataz Attallah[2]; Minh-Son Pham[1]; [1]Imperial College London; [2]University of Birmingham

Microscale Analysis of the Synergistic Effects of Notch and Post-processed Microstructures in AM Ti-6Al-4V: *Lara Draelos*[1]; Peeyush Nandwana[2]; Ankit Srivastava[1]; [1]Texas A&M University; [2]Oak Ridge National Laboratory

Microstructural Influence on the Fatigue Behaviour of Additively Manufactured 316L Stainless Steel Subjected to Different Heat Treatments: *Chola Elangeswaran*[1]; Antonio Cutolo[1]; Charlotte de Formanoir[1]; Gokula Krishna Muralidharan[2]; Brecht Van Hooreweder[1]; [1]KU Leuven; [2]3D Systems Leuven

Microstructure, High-temperature Tensile and Fatigue Properties of IN625 Manufactured by Selective Laser Melting: *Tae-Hoon Kang*[1]; Kyu-Sik Kim[1]; Michael Kassner[2]; Kwang-Tae Son[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]University of Southern California

Microstructure, Mechanical Properties, and Fatigue Damage Mechanisms in Laser Powder Bed Al-10Si-0.4Mg Alloys: *Timothy Piette*[1]; Robert Warren[1]; Edward Hummelt[2]; Diana Lados[1]; [1]Worcester Polytechnic Institute; [2]Eaton Corporation

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications II — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Subhashish Meher, Idaho National Laboratory; Indrajit Charit, University of Idaho; Michael Kirka, Oak Ridge National Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Michael Kirka, Oakridge National Laboratory

Characterization of Cold-spray Based Additively Manufactured Thick Copper Deposits: Danish Verma[1]; *Surinder Singh*[2]; Harpreet Singh[2]; [1]Punjab Engineering College Chandigarh; [2]Indian Institute of Technology Ropar (IIT Ropar)

Evaluation of Cold-sprayed 14YWT: *Jeffrey Graham*[1]; Mia Lenling[2]; Hwasung Yeom[2]; Peter Hosemann[1]; Kumar Sridharan[2]; [1]University of California, Berkeley; [2]University of Wisconsin

Microstructure and Mechanical Properties of ODS Eurofer Steel Produced by Selective Laser Melting: *J. Fu*[1]; I.M. Richardson[1]; M.J.M. Hermans[1]; [1]Delft University of Technology

Preliminary Concepts of an Automated Additive Manufacturing System for Accident Tolerant Uranium Silicide Fuel Pellets: *Rachael McIntyre*[1]; Isabella Van Rooyen[1]; [1]Idaho National Laboratory

The Cost Structure, Qualification and Robotic Process Automation of Additive Manufacturing: *Kevin Scholtes*[1]; Isabella Van Rooyen[2]; [1]The Univeristy of Texas at Tyler; [2]Idaho National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Functional and Energy Materials — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Sneha Prabha Narra, Worcester Polytechnic Institute; Markus Chmielus, University of Pittsburgh; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Layered Binder Jet Printing of Functional Ni-Mn-Ga Alloys: *Katerina Kimes*[1]; Erica Stevens[1]; Jeffrey Martin[1]; Pierangeli Rodriguez De Vecchis[1]; Danielle Brunetta[1]; Markus Chmielus[1]; [1]University of Pittsburgh

Quantitative Microstructure Study of Binder-jet Printed and Sintered Ni-Mn-Ga Alloy: *Chuyuan Zheng*[1]; Amir Mostafaei[2]; Pierangeli Rodriguez[1]; Erica Stevens[1]; Ian Nettleship[1]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Carnegie Mellon University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Tom Stockman, Los Alamos National Laboratory; Tao Sun, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Yan Gao, Ge Global Research; Amit Pandey, MicroTesting Solutions; Joy Gockel, Wright State University; Tim Horn, North Carolina State University; Sneha Prabha Narra, Worcester Polytechnic Institute; Judy Schneider, University of Alabama at Huntsville

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Accessing Nano-scale Structure and Dynamics During 3D-Printing by Operando X-Ray Photon Correlation Spectroscopy: *Maria Torres Arango*[1]; Yugang Zhang[1]; Gregory Doerk[2]; Ruipeng Li[1]; Chonghang Zhao[3]; Yu-chen Karen Chen-Wiegart[4]; Andrei Fluerasu[1]; Lutz Wiegart[1]; [1]National Synchrotron Light Source II, Brookhaven National Laboratory; [2]Center for Functional Nanomaterials, Brookhaven National Laboratory; [3]Stony Brook University; [4]National Synchrotron Light Source II, Brookhaven National Laboratory. Stony Brook University.

Advanced Techniques for Characterization of SLM Manufactured Alumina: *Malgorzata Makowska*[1]; Kevin Florio[2]; Stefan Pfeiffer[3]; Thomas Graule[3]; Konrad Wegener[2]; Federica Marone[1]; Dario Ferreira Sanchez[1]; Nicola Casati[1]; Helena Van Swygenhoven[1]; [1]PSI; [2]ETH Zurich; [3]Empa - Swiss Federal Laboratories for Materials Science and Technology

Building a Novel Heat Exchanger with Haynes 230 Alloy and Using Data Science to Characterize Rheological and Microstructural Properties in Additive Manufacturing: *Srujana Rao Yarasi*[1]; Andrew Kitahara[1]; Ziheng Wu[1]; Anthony Rollett[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

Characterizing the Deformation in Single Cell Ti-5553 Lattice Structures: *Maria Strantza*[1]; Nathan Johnson[2]; Donald Brown[2]; Jenny Wang[1]; Jefferson Cuadra[1]; David Macknelly[1]; John Carpenter[2]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory; [2]Los Alamos National Laboratory

Creep Behavior of a AlSiMg Alloy Produced by Additive Manufacturing: *Chiara Paoletti*[1]; Stefano Spigarelli[1]; Marcello Cabibbo[1]; Emanuela Cerri[2]; [1]Università Politecnica delle Marche; [2]Università di Parma

Effect of Laser-matter Interaction on Molten Pool Flow and Keyhole Dynamics: *Nadia Kouraytem*[1]; Xuxiao Li[1]; Ross Cunningham[2]; Cang Zhao[3]; Niranjan Parab[3]; Tao Sun[3]; Anthony Rollett[2]; Ashley Spear[1]; Wenda Tan[1]; [1]University of Utah; [2]Carnegie Mellon University; [3]Argonne National Laboratory

High Speed X-ray Diffraction: Niranjan Parab[1]; *Seunghee Oh*[2]; Joseph Aroh[2]; Joseph Pauza[2]; Sidi Feng[2]; Rachel Lim[2]; Christopher Kantzos[2]; Robert Suter[2]; Chihpin Chuang[1]; Cang Zhao[1]; Tao Sun[1]; Anthony Rollett[2]; [1]Argonne Natl. Lab.; [2]Carnegie Mellon University

Identifying the Formation of Laser Powder Bed Fusion Defects In-situ by Coupling High Speed X-ray and Infra-red Imaging: *Benjamin Gould*[1]; Sarah Wolff[2]; Niranjan Parab[1]; Cang Zhao[1]; Aaron Greco[1]; Tao Sun[1]; [1]Argonne National Laboratory; [2]Texas A&M

In-situ Characterization and Quantification of Melt Pool Variation Under Constant Input Energy Density in Laser Powder-bed Fusion Additive Manufacturing Process: *Qilin Guo*[1]; Cang Zhao[2]; Minglei Qu[1]; Lianghua Xiong[1]; Luis I. Escano[1]; S. Mohammad H. Hojjatzadeh[1]; Niranjan D. Parab[2]; Kamel Fezzaa[2]; Wes Everhart[3]; Tao Sun[2]; Lianyi Chen[1]; [1]Missouri University of Science and Technology; [2]Argonne National Laboratory; [3]Honeywell FM&T

In-situ Full-field Mapping of Melt Flow Dynamics in Laser Metal Additive Manufacturing: *Qilin Guo*[1]; Cang Zhao[2]; Minglei Qu[1]; Lianghua Xiong[1]; Luis I. Escano[1]; S. Mohammad H. Hojjatzadeh[1]; Niranjan D. Parab[2]; Kamel Fezzaa[2]; Tao Sun[2]; Lianyi Chen[1]; [1]Missouri University of Science and Technology; [2]Argonne National Laboratory

In-situ X-ray Characterization of Keyhole Dynamics in Laser-based Additive Manufacturing of Aluminium Alloys: Hongze Wang[1]; *Yu Zou*[1]; [1]University of Toronto

In-situ XCT Monitoring of the Pyrolysis of Additively Manufactured Ceramic Matrix Composites: *Mark O'Masta*[1]; Phuong Bui[1]; Natalie Larson[2]; Kayleigh Porter[1]; Justin Mayer[1]; Zak Eckel[1]; Tobias Schaedler[1]; [1]HRL Laboratories LLC; [2]Harvard University

Influence of Alloy Composition on Cell Formation in Additively Manufactured Stainless Steels: *Joseph Aroh*[1]; Seunghee Oh[1]; Rachel Lim[1]; Chihpin Chuang[1]; Niranjan Parab[1]; Cang Zhao[1]; Tao Sun[1]; P. Pistorius[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

Influence of Powder Recyclability on the Defect Density of Components Fabricated with Nickel-based Alloys Characterized with Micro X-ray CT: *Curtis Frederick*[1]; Edson Santos[1]; Michael Kirka[2]; Pradeep Bhattad[1]; Paul Brackman[1]; [1]Carl Zeiss; [2]Oak Ridge National Laboratory

Investigating the Behavior of Ti-5553 Octet Lattice Wedges Under Compression: *Jenny Wang*[1]; David Macknelly[2]; Stephen Knaus[1]; Kyle Klein[1]; Mary LeBlanc[1]; Jeffrey Florando[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory; [2]Atomic Weapons Establishment

Laser Additive Manufacturing of Dissimilar Metals: *Xuan Zhang*[1]; Wei-Ying Chen[1]; Cang Zhao[1]; Chihpin Chuang[1]; Tao Sun[1]; Meimei Li[1]; [1]Argonne National Laboratory

Measurements and Predictions of Residual Stresses in AM Ti-6Al-4V NIST Challenge Specimens: *James Sobotka*[1]; Matthew Kirby[1]; Sheng-yen Li[1]; [1]Southwest Research Institute

Microstructural Development and Mechanical Properties of Selective Laser Melted Co-Cr-W Dental Alloy: Leonhard Hitzler[1]; *Jonas Von Kobylinski*[1]; Robert Lawitzki[2]; Christian Krempaszky[1]; Ewald Werner[1]; [1]Technical University Munich; [2]University of Stuttgart

Real Time Observation of Binder Jetting Printing Process Using High-speed X-ray Imaging: *Niranjan Parab*[1]; John Barnes[2]; Cang Zhao[1]; Ross Cunningham[3]; Kamel Fezzaa[1]; Anthony Rollett[3]; Tao Sun[1]; [1]Argonne National Laboratory; [2]The Barnes Group Advisors; [3]Carnegie Mellon University

Residual Strain Gradients in Thin Walled Additively Manufactured Stainless Steel Pressure Vessels: *Bjorn Clausen*[1]; Rishi Ganeriwala[2]; Donald Brown[1]; Robert Ferencz[2]; John Carpenter[1]; [1]Los Alamos National Laboratory; [2]Lawrence Livermore National Laboratory

Residual Stress Measurement Techniques for Additive Manufacturing Parts: *Adi Benartzy*[1]; Kahraman Demir[2]; Jack Peterson[1]; Grace Gu[2]; Peter Hosemann[1]; [1]University of California, Berkeley NE Department; [2]University of California, Berkeley ME department

Strengthening Effect and Thermal Stability of Sub-grain Solidification Structures in L-PBF Stainless Steel 316L: *Thomas Voisin*[1]; Jean-Baptiste Forien[1]; Y. Morris Wang[1]; [1]Lawrence Livermore National Laboratory

Stress Evolution in Metal Additive Manufacturing: *Vu Nguyen*[1]; Yuqing Feng[1]; Sri Lathabai[1]; David Ritchie[1]; Geoffrey de Looze[1]; Robert Wilson[1]; [1]CSIRO

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Alternative Processes (Beyond the Beam) — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Powder Materials Committee

Program Organizers: Paul Prichard, Kennametal Inc.; Matthew Dunstan, U.S. Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal; James Paramore, U.S. Army Research Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Fabrication of Sub-microscale Metallic Glass Particles and Wires via High Pressure Atomization: *Wan Kim*[1]; Chae Woo Ryu[1]; Eun Soo Park[1]; Koji Nakayama[2]; [1]Seoul National University; [2]Tohoku University

Process Optimization of Cold Spray Deposited Steel and Iron Blended Powders onto Steel Substrates Using Nitrogen Carrier Gas: *Rose Roy*[1]; Christian Widener[1]; [1]VRC Metal Systems

Production of Teaching Materials Through 3D Printing as Support for Educational Processes Related to the Sciences, Heritage and Culture: *Henry Colorado*[1]; David Mendoza[1]; Fernando León Valencia[1]; Juan Manuel Perdomo[1]; [1]Universidad de Antioquia

Surface Characterization of IN718 Powder Stock and Influence on Net-shape HIP Microstructure: *Benjamin Georgin*[1]; Victor Samarov[2]; Hamish Fraser[1]; [1]The Ohio State University; [2]LNT

Temperature Dependent Thermal Conductivity of Metallic Powder Alloys for Additive Manufacturing: *Faiyaz Ahsan*[1]; Leila Ladani[1]; [1]Arizona State University

Thermal Analysis of Wire Arc Additive Manufacturing (WAAM): *Lauriane Guilmois*[1]; Philippe Le Masson[2]; Pascal Paillard[3]; [1]Institut de Recherche Technologique (IRT) Jules Verne; [2]Institut de Recherche Dupuy de Lôme (IRDL); [3]Institut des Matériaux Jean Rouxel (IMN)

Understanding Mechanisms Behind Morphological Changes in Gas Atomized Powders After Laser Irradiation: *Jonathan Skelton*[1]; Jerry Floro[1]; James Fitz-Gerald[1]; [1]University of Virginia

Wire+arc Additive Manufacturing for Fabrication of Bimetallic Additively Manufactured Structures: *Rumman Ul Ahsan*[1]; A. N. M. Tanvir[1]; Gi-Jeong Seo[1]; Changwook Ji[2]; P. K. Liaw[3]; Duck Bong Kim[1]; [1]Tennessee Technological University; [2]Korea Institute of Industrial Technology; [3]The University of Tennessee, Knoxville

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development II — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Behrang Poorganji, GE Additive; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Hunter Martin, HRL Laboratories; Atieh Moridi, Cornell University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Additive Manufacturing of Atomized Ti-1Al-8V-5Fe by Laser Powder Bed Fusion: *Eugene Ivanov*[1]; Eduardo del Rio[1]; Aaron Marshall[2]; Vivian Hogan[2]; Daniel Satco[3]; Ayman Salem[3]; [1]Tosoh SMD Inc; [2]Materials Resources, LLC; [3]Material Resources LLC

Advancing Printability of Materials through Laser Metal Additive Manufacturing: *Sofia Sheikh*[1]; Raymundo Arroyave[1]; [1]Texas A&M University

Automatically Quantifying Phase Information from HRTEM for Additively Manufactured Inconel 718: *Sen Liu*[1]; Behnam Aminahmadi[1]; Branden Kappes[1]; Aaron Stebner[1]; Xiaoli Zhang[1]; [1]Colorado School of Mines

Ball-milled CoCr + X (X=WC or SiC) Composite Powders for Additive Applications: *Madelyn Madrigal Camacho*[1]; Suveen Mathaudhu[1]; Guillermo Aguilar[1]; [1]University of California, Riverside

Cold Spray Deposition of Aluminum onto Polymer and Composite Substrates: *Reza Rokni*[1]; Po-Lun Feng[1]; Steve Nutt[1]; [1]University of Southern California

Compression Behavior of Additively Manufactured High Entropy Alloy with Transformation Induced Plasticity: *Saket Thapliyal*[1]; Saurabh Nene[1]; Priyanshi Agrawal[1]; Rajiv Mishra[1]; [1]University of North Texas

Design of Easy-to-use Structural Alloy Feedstocks for Additive Manufacturing Using Machine Learning Methods: *Akansha Singh*[1]; Ben Rafferty[2]; Jeremy Iten[2]; Jacob Nuechterlein[2]; Branden Kappes[1]; Sridhar Seetharaman[1]; Aaron Stebner[1]; [1]Colorado School of Mines; [2]Elementum 3D

Development of Laser Parameters for Pure Copper with Parts Fabricated from Laser Powder Bed Fusion (PBF): *Michael Brand*[1]; Colt Montgomery[1]; Robin Pacheco[1]; Amber Black[1]; Ryan Mier[1]; [1]Los Alamos National Laboratory

Development of Metallic Glass Micro-wires for the Direct Laser Melting Deposition Process: Song-Yi Kim[1]; A-Young Lee[1]; Hanuel Jang[1]; Hwi-Jun Kim[1]; Chang-Woo Lee[1]; *Min-Ha Lee*[1]; [1]KITECH

Effect of Laser Glazing on Quasicrystals in Powder-processed Icosahedral-phase-strengthened Aluminum Alloys: *Mingxuan Li*[1]; Hannah Leonard[1]; Sarshad Rommel[1]; Thomas Watson[2]; Tod Policandriotes[3]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

Exploring Rapid Solidification in Additive Manufacturing through Splat Quenching: *Zachary Hasenbusch*[1]; Sydney Morales[1]; Luke Brewer[1]; Laurentiu Nastac[1]; Andy Deal[2]; Ben Brown[2]; [1]University of Alabama; [2]Kansas City National Security Campus

High-temperature Compressive and Creep Properties of Equiatomic CoCrFeMnNi High-entropy Alloy Manufactured by Selective Laser Melting: *Kee-Ahn Lee*[1]; Young-Kyun Kim[1]; Sangsun Yang[2]; [1]Inha University; [2]Korea Institute of Materials Science

Hybrid Additive Manufacturing of MS1-H13 Steels via Direct Metal Laser Sintering: Sajad Shakerin[1]; *Mohsen Mohammadi*[1]; [1]Marine Additive Manufacturing Centre of Excellence (MAMCE)

Investigating Solidification and Liquation Cracking in AA7075 Electron Beam Freeform Fabrication Deposits: *Cecilia Mulvaney*[1]; James Fitz-Gerald[1]; Marcia Domack[2]; Karen Taminger[2]; [1]University of Virginia; [2]National Aeronautics and Space Administration

Investigating the Precipitation of Gamma Prime and Gamma Double Prime in IN718 Alloy at Non-equilibrium Thermal Conditions During Additive Manufacturing: *Caleb Yenusah*[1]; Yanzhou Ji[2]; Mark Horstemeyer[3]; Yucheng Liu[1]; Lei Chen[1]; [1]Mississippi State University; [2]The Pennsylvania State University; [3]Liberty University

Isotropic Microstructure and Mechanical Properties of Additively Manufactured Ti-based Alloy: *Gwanghyo Choi*[1]; Won Seok Choi[1]; Pyuck-Pa Choi[1]; [1]Korea Advanced Institute of Science and Engineering (KAIST)

Laser Powder Bed Fusion of a High Entropy Alloy Enabled with Transformation Induced Plasticity: *Priyanshi Agrawal*[1]; Saket Thapliyal[1]; Rajiv Mishra[1]; [1]University of North Texas

Nickel Free Stainless Steels Powders Designed for Laser Based Powder Bed Fusion Intended for Implantable Devices: Bernice Gatrell[1]; *Colton Steiner*[1]; Ron Aman[2]; Nader Dariavach[1]; Jason Lehrer[3]; [1]Johnson & Johnson; [2]Carpenter Technology Corp.; [3]Carpenter Technologies Corp.

On The Effect of Building Direction on the Microstructure and Grain Morphology of a Selective Laser Melted Maraging Stainless Steel: *Mehdi Sanjari*[1]; Amir Hadadzadeh[1]; Ayda Shahriairi[2]; Saeed Tamimi[3]; Hadi Pirgazi[4]; Babak Shalchi Amirkhiz[5]; Leo Kestens[4]; Mohsen Mohammadi[2]; [1]University of New Brunswick; CanmetMATERIALS; [2]University of New Brunswick; [3]AFRC-University of Strathclyde; [4]Ghent University; [5]CanmetMATERIALS; University of New Brunswick

Origin and How to Reduce Splatter in Powder Bed Fusion: Hans-Wilfried Mindt[1]; *Mustafa Megahed*[1]; [1]Esi Group

Performance of Wire-arc Additive Manufactured Ti-6Al-4V and Ti-5Al-5Mo-5V-3Cr Dissimilar Alloy-alloy Composite Interfaces: *Jacob Kennedy*[1]; Alec Davis[1]; Armando Caballero[2]; Ed Pickering[1]; Stewart Williams[2]; Phil Prangnell[1]; [1]University of Manchester; [2]Cranfield University

Powder Bed Additive Manufacturing of Cu / 17-4 PH Layered Structures: *Alexis Ernst*[1]; Rainer Hebert[1]; Mark Aindow[1]; [1]University of Connecticut

Predicting Phase Morphologies in AM Titanium: *Ian Bakst*[1]; [1]Honeywell FM&T

Selective Laser Melting of a High Strength Al-Zn-Mg-Cu Alloy: Microstructure and Mechanical Properties: *Zhiguang Zhu*[1]; Wenjun Lu[2]; Fernlan Ng[1]; Hangli Seet[1]; Zhiming Li[2]; Muiling Nai[1]; [1]Simtech; [2]Max-Planck-Institut für Eisenforschung

Simulation of Part-scale Grain Structure Development During Additive Manufacturing Solidification: *Matthew Rolchigo*[1]; Jim Belak[1]; Benjamin Stump[2]; Alex Plotkowski[2]; Robert Carson[1]; Neil Carlson[3]; Matt Bement[3]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory; [3]Los Alamos National Laboratory

Synchrotron Imaging of the Influence of TiB2 on Cracking Phenomena During Laser Powder Bed Fusion of Al2139: *David Rees*[1]; Chu Lun Alex Leung[1]; Joe Elambasseril[2]; Sebastian Marussi[1]; Saurabh Shah[1]; Shashidhara Marathe[3]; Milan Brandt[2]; Mark Easton[2]; Peter Lee[1]; [1]UCL Mechanical Engineering; [2]RMIT University; [3]Diamond Light Source Ltd

Tailoring Grain Structures for Metallic Additive Manufacturing: *Yijia Gu*[1]; Arezoo Emdadi[1]; [1]Missouri University of Science and Technology

Towards Grain Refinement of Titanium Alloys for Laser Powder-bed Fusion: *Marco Simonelli*[1]; Nesma Aboulkhair[1]; Yau Yau Tse[2]; Adam Clare[1]; Richard Hague[1]; [1]University of Nottingham; [2]Loughborough University

Understanding Cellular Structures in Additively Manufactured 316L: *Richard Fonda*[1]; Joseph Aroh[2]; Jerry Feng[1]; David Rowenhorst[1]; [1]Naval Research Laboratory; [2]Carnegie Mellon University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Processing Effects on Microstructure and Material Performance — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Joy Gockel, Wright State University; Emma White, Ames Laboratory; Richard Fonda, Naval Research Laboratory; Monnamme Tlotleng, University of Johannesburg; Jayme Keist, Pennsylvania State University; Hang Yu, Virginia Polytechnic Institute and State University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

3D Printing Ceramics Using Stereolithography: Peter Evans[1]; Digvijay Yadav[1]; Brady Butler[1]; *Kelvin Xie*[1]; [1]Texas A&M University

3D X-ray Tomography Analysis of the Effect of Process Parameters on Porosity Formation in Selective Laser Melting of Ti-6Al-4V Parts
: Mohamed Goune[1]; Stephane Gorsse[1]; *Guillaume Aubert*[1]; Sylvie Bordère[1]; [1]Icmcb

ß Phase Evolution Process in Selective Laser Melting Titanium-tantalum Continuous Gradient Alloy: *Baicheng Zhang*[1]; Xuanhui Qu[1]; [1]USTB

Additive Friction Stir-deposition of Copper: *Jonathan Priedeman*[1]; Brandon Phillips[1]; Billy Hornbuckle[2]; Kristopher Darling[2]; Paul Allison[1]; Gregory Thompson[1]; [1]University of Alabama; [2]Army Research Lab

Additive Manufacturing Simulation Comparison Using Commercial Tools: *Charles Fisher*[1]; Adam Gershen[1]; John Michopoulos[2]; Athanasios Iliopoulos[2]; John Steuben[2]; Andrew Birnbaum[2]; [1]Naval Surface Warfare Center - Carderock; [2]Naval Research Laboratory

Alpha Variant Selection in Additively Manufactured Ti-6Al-4V: Philip Stephenson[1]; *Ryan Demott*[1]; Nima Haghdadi[1]; Xiaozhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; [1]UNSW Sydney; [2]The University of Sydney

An Investigation into the Recyclability of AlSi10Mg Powder in LENS®: *Al Medrano*[1]; Parnian Kiani[1]; Kaka Ma[2]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Colorado State University

Analysis of the Effects of Strain Rates on Selective Laser Melted Ti-6Al-4V Samples Under Dynamic Loading Conditions: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

Annealing of Additively Manufactured Inconel 625: *Nakul Ghate*[1]; Amit Pandey[2]; Amber Shrivastava[1]; [1]Indian Institute of Technology Bombay; [2]Ansys Inc.

Argon Nitrogen Shielding Gas Effects on the Performance of Martensitic Stainless Steel in Metal Big Area Additive Manufacturing (MBAAM): *Bishal Silwal*[1]; Andrzej Nycz[2]; Chris Masuo[2]; Mark Noakes[2]; Amelia Mcnamee[2]; [1]Georgia Southern University; [2]Oak Ridge National Laboratory

Banded Heat Affected Zone (HAZ) and Post Build Ageing Microstructure Interactions in LBP-DED IN718: *Ioannis Bellos*[1]; Ed Pickering[1]; Chris Heason[2]; Philip Prangnell[1]; [1]The University of Manchester; [2]Rolls-Royce, plc

Characterization and Integration of the Anisotropy of Additively Manufactured Titanium in the Topology Optimization of Light-weight Structures: *Matthew Vaughn*[1]; Justin Unger[1]; Alberto Torres[1]; Andrew Gaynor[2]; Brandon Mcwilliams[2]; James Guest[1]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]US Army Research Laboratory

Controlling Microstructural Evolution in Metal Additive Manufacturing Using Bessel Beams: *Thejaswi Tumkur*[1]; Sheldon Wu[1]; Tien Roehling[1]; John Roehling[1]; Saad Khairallah[1]; Sullivan Figurskey[1]; Devon Courtwright[1]; Michael Crumb[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Lab

Creep Deformation Study of Heat-treated Nickel Alloy 718: *Alejandro Hinojos*[1]; Hyeyun Song[2]; Alber Sadek[2]; Wei Zhang[1]; Michael Mills[1]; [1]The Ohio State University; [2]The Edison Welding Institute

Critical Quenching Rates After Solution Annealing: Peculiarities of Aluminum-silicon Alloys Fabricated by Laser Powder-bed Fusion: Stephan Hafenstein[1]; Leonhard Hitzler[1]; Enes Sert[2]; Andreas Öchsner[2]; Markus Merkel[3]; Ewald Werner[1]; *Jonas Von Kobylinski*[1]; [1]Technical University Munich; [2]Esslingen University of Applied Sciences; [3]Aalen University of Applied Sciences

Dendrite Orientation Transition in Laser Remelted Titanium Alloys: Phase Field Simulation and Experiment Validation: Yujian Wang[1]; *Yu Zou*[1]; [1]University of Toronto

Determination of Optimal Design Parameters for Printing Process Simulation of New High-speed RS-320 Aluminum Alloy: *Maria Grol*[1]; Alexey Siverski[2]; Vladimir Korolev[1]; Daria Daubarayte[1]; Alexander Seferyan[1]; [1]LMTI UC RUSAL; [2]IGA Technologies

Direct Laser Metal Deposition of René 108 Single Crystal: *Praveen Sreeramagiri*[1]; Ajay Bhagavatam[1]; Husam Alrehaili[1]; Guru Dinda[1]; [1]Wayne State University

Effect of Partitioning Treatment on the Mechanical Behavior of an Additively Manufactured Ti-6Al-4V Alloy: *Kenta Yamanaka*[1]; Manami Mori[2]; Yusuke Onuki[3]; Shigeo Sato[3]; Akihiko Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College; [3]Ibaraki University

Effect of Scanning Strategy on Additively Manufactured Ti6Al4V: *Nakul Ghate*[1]; Bhanupratap Gaur[1]; Amber Shrivastava[1]; [1]Indian Institute of Technology Bombay

Effect of Semi-solid Treatment on Microstructure and Mechanical Properties Additive Manufactured Inconel 625: *Lukasz Rogal*[1]; Jan Dutkiewicz[1]; Karol Janusz[1]; Damian Kalita[1]; Marek Weglowski[1]; [1]Institute of Metallurgy and Materials Science

Effect of Temperature Dependent Properties on the Accuracy of Physics-based Surrogate Models for Powder Bed Fusion Additive Manufacturing: *Alexander Wolfer*[1]; Richard Otis[2]; Brian Weston[3]; Saad Khairallah[3]; Andy Anderson[3]; Andrew Shapiro[2]; Jean-Pierre Delplanque[1]; [1]University of California, Davis; [2]Jet Propulsion Laboratory, California Institute of Technology; [3]Lawrence Livermore National Laboratory

Effect of Thermal History on Elastic Strain and Microstructural Evolution in Additive Manufacturing: *Kathryn Small*[1]; Michael Groeber[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]Ohio State University

Effects of Laser-energy Density and Build Orientation on the Defect Structure, Microstructure and Tensile Properties of Laser Powder Bed Fused Inconel 718: *Dillon Watring*[1]; Jake Benzing[2]; Nik Hrabe[2]; Ashley Spear[1]; [1]University of Utah; [2]National Institute of Standards and Technology (NIST)

Effects of Nano-scale TiC on Defects and Mechanical Properties of IN738LC Manufactured by Selective Laser Melting: *Zhengrong Yu*[1]; Xiaogang Hu[1]; Qiang Zhu[1]; Hui Ding[2]; [1]Southern University of Science and Technology; [2]Southeast University

Effects of Overhangs and Support Structures on Local Heat Transfer During the Laser-Powder Bed Fusion of Stainless Steel 316L, Inconel 625 and Ti-6Al-4V: *Basil Paudel*[1]; Scott Thompson[2]; [1]Auburn University; [2]Kansas State University

Effects of Process Parameters on Microstructure and Mechanical Properties of Wire Arc Additive Manufactured Al-Mg-Si Alloy: *Gautier Doumenc*[1]; David Gloaguen[1]; Bruno Courant[2]; Pascal Paillard[3]; Laurent Couturier[3]; Alexandre Benoit[4]; [1]IRT-GeM-IMN; [2]GeM - Research Institute in civil and Mechanical Engineering; [3]IMN - Nantes Materials Institute; [4]IRT Jules Verne - French Institute in Research and Technology in Advanced Manufacturing

Effects of the Energy Density and Building Angle on the Tensile Properties of SLM Ti-6Al-4V Alloys: *Jungsub Lee*[1]; Woojin An[1]; Imdoo Jung[2]; Jusik Kim[3]; Sangshik Kim[1]; Hyokyung Sung[1]; [1]Gyeongsang National University; [2]3D Printing Center, Korea Institute of Materials Science; [3]ANH structure

Evolution of Dislocation Cell Substructure and its Effect on Precipitation Behavior in AM-IN718: *Thomas Gallmeyer*[1]; Jack Dale[1]; Behnam Aminahmadi[1]; Aaron Stebner[1]; [1]Colorado School Of Mines

Experimental Study on the Laser Cladding of T15 Coating for 42CrMo Steel: *Yingtao Zhang*[1]; Meng Jiang[1]; Gang Wang[1]; Xiulin Ji[1]; [1]College of Mechanical & Electrical Engineering, Hohai University

Fabrication of γ/γ'-strengthened Co-Al-W Alloys by Direct Laser Deposition: *Pyuck-Pa Choi*[1]; Boryung Yoo[1]; [1]KAIST

Gamma-titanium Intermetallic Alloy Produced by Selective Laser Melting Using Mechanically Alloyed and Plasma Spheroidized Powders: Igor Polozov[1]; *V. A. Popovich*[2]; Nikolay Razumov[1]; Tagir Makhmutov[1]; Anatoliy Popovich[1]; [1]Peter the Great St. Petersburg Polytechnic University; [2]Delft University of Technology

Heat Treatment of Wire+Arc Additively Manufactured Bimetallic Structures: *Rumman Ul Ahsan*[1]; Jae-Deuk Kim[2]; Gi-Jeong Seo[1]; Changwook Ji[2]; P. K. Liaw[3]; Duck Bong Kim[1]; A. N. M. Tanvir[1]; [1]Tennessee Technological University; [2]Korea Institute of Industrial Technology; [3]The University of Tennessee, Knoxville

High-resolution Holistic Characterization in Additive Manufacturing: Edward Cyr[1]; *Mackenzie Purdy*[1]; Peyman Setoodeh[1]; Kevin Lafleur[1]; Mohsen Mohammadi[1]; [1]Marine Additive Manufacturing Centre of Excellence

Influence of Print Orientation on Microstructure and Mechanical Performance of Selective Laser Sintered Polyamide-12: *Anil Krishna Battu*[1]; Tamas Varga[1]; Josef Christ[1]; Zachary Kennedy[1]; Wenbin Kuang[1]; Christopher Barrett[1]; [1]Pacific Northwest National Laboratory

Influence of the Partial Pressure on the 316L Stainless Steel Fusion with the Selective Laser Melting Process: *Alicia Annovazzi*[1]; Nouredine Fenineche[2]; Benjamin Vayre[3]; [1]LERMPS-UTBM-AddUp; [2]LERMPS-UTBM; [3]AddUp

Influence of the Process Parameters on the Densification and Microstructure of Ni-based Superalloys with Different Amount of ' Former Alloying Elements Processed by Laser Powder Bed Fusion: *Giulio Marchese*[1]; Simone Parizia[1]; Antonio Sivo[1]; Emilio Bassini[1]; Flaviana Calignano[2]; Sara Biamino[1]; Daniele Ugues[1]; [1]Department of Applied Science and Technology, Politecnico di Torino; [2]Department of Management and Production Engineering, Politecnico di Torino

Investigation of Martensite a' Phase Transformation Through Heat Treatments of a High Speed Laser Melted Ti6Al4V Components: *Paul Lekoadi*[1]; Nthabiseng Maledi[2]; Monnamme Tlotleng[1]; Bathusile Masina[1]; [1]CSIR; [2]University of Witwatersrand

Investigation of the Effect of Beam Scan Strategies on the Microstructure of EBM Additively Manufactured Inconel 738 Builds: *Chris Blackwell*[1]; Meiyue Shao[1]; Sriram Vijayan[1]; Sabina Kumar[2]; Sudarsanam Babu[3]; Joerg Jinschek[1]; [1]Ohio State University; [2]University of Tennessee; [3]Oak Ridge National Laboratory

Investigation of the Effect of Process Parameters on the Microstructural Evolution and Mechanical Properties of Inconel 718 Additively Manufactured in Direct Metal Laser Melting (DMLM) Process: *Navin Sakthivel*[1]; Satya Ganti[1]; Conrad Kao[1]; Thomas Dobrowolski[1]; Jim Overstreet[1]; Anjani Achanta[1]; Chad Yates[1]; Joshua Snitkoff[1]; [1]Baker Hughes, a GE Company

Joint Characteristics of Additively Manufactured 316L Stainless Steel Using Vacuum Brazing: *Gidong Kim*[1]; Dong-jin Oh[1]; Yongjoon Kang[1]; So-young Park[1]; Sang-woo Song[1]; [1]Korea Institute of Materials Science

Laser Powder Bed Fusion Parametric Investigation of Binary Al-Si Alloys: *Holden Hyer*[1]; Le Zhou[1]; Joshua Haupt[1]; Sharon Park[1]; Brandon McWilliams[2]; Kyu Cho[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]US Army Research Laboratory

Lattice Manufacturability Using Electron Beam Powder Bed Fusion: *Paul Korinko*[1]; Dale Hitchcock[1]; John Bobbitt[1]; Spencer Scott[1]; [1]Savannah River National Laboratory

Localized Plastic Deformation in Thin-walled Selective Laser Melted IN718 Specimens: *Sara Messina*[1]; Chris Torbet[1]; Chase Joslin[2]; Michael Kirka[2]; Matthew Begley[1]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory

Machine Learning Approach for Process Optimization of Pure Cu in a Powder Bed Fusion Additive Manufacturing with Electron Beam: *Kenta Aoyagi*[1]; Tadashi Kii[2]; Nobuyuki Sasaki[2]; Hirofumi Watanabe[3]; Yoshitaka Shibuya[3]; Kenji Sato[3]; Akihiko Chiba[1]; [1]Institute for Materials Research, Tohoku University; [2]Japan Additive Manufacturing & Processing Technology (JAMPT) Corporation; [3]JX Nippon Mining & Metals Corporation

Mechanical Properties of AlSi10Mg Processed by Laser Powder Bed Fusion at Elevated Temperature: *Even Hovig*[1]; Amin Azar[2]; Mohammed Mhamdi[2]; Knut Sørby[1]; [1]Norwegian University of Science and Technology; [2]SINTEF Industry

Mechanical, Thermal and Corrosion Properties of Cu-10Sn Alloy Prepared by Selective Laser Melting: *Congyuan Zeng*[1]; Bin Zhang[1]; Ali Hemmasian Ettefagh[1]; Hao Wen[1]; Hong Yao[1]; Wenjin Meng[1]; Jonathan Raush[2]; Shengmin Guo[1]; [1]Louisiana State University; [2]University of Louisiana at Lafayette

Microstructural Characteristics of Stainless Steel 316L Processed by Selective Laser Melting Technology: *Ismat Ara*[1]; X. W. Tangpong[1]; Fardad Azarmi[1]; [1]North Dakota State University (NDSU)

Microstructural Characterization of Ni-based Multilayer Coating After Laser Cladding on Cast Iron Substrate: *Fazati Bourahima*[1]; Michel Rege[1]; Christophe Lafarge[1]; Abderazak Khenafi[1]; [1]CHPOLANSKY

Microstructure and Mechanical Properties of AISI420 Stainless Steel Produced by Wire Arc Additive Manufacturing: *Jonas Lunde*[1]; Mostafa Kazemipour[1]; Salar Salahi[1]; Ali Nasiri[1]; [1]Memorial University of Newfoundland

Microstructure and Mechanical Properties of Direct Laser Metal Deposited GRCop-84 Alloy: *Ajay Bhagavatam*[1]; Praveen Sreeramagiri[1]; Asit Biswas[2]; Dean Baker[2]; Guru Dinda[1]; [1]Wayne State University; [2]Advanced Powder Solutions

Microstructure and Mechanical Properties of In 718 Alloy Manufactured by Several Different Process: *Seungmun Jung*[1]; Suk hoon Kang[1]; Chang-Kyu Rhee[1]; [1]KAERI

Microstructure and Mechanical Properties of Ti/TiC Composite Coatings Fabricated by Laser Engineered Net Shaping: *Madhavan Radhakrishnan*[1]; Zeynel Guler[1]; Md Mehadi Hassan[1]; Thomas Lienert[2]; Osman Anderoglu[1]; [1]University of New Mexico; [2]Optomec Inc

Microstructure Control in Microscale Additive Manufacturing of Copper by Localized Electrodeposition: *Soheil Daryadel*[1]; Majid Minary[2]; [1]University of Illinois at Urbana-Champaign; [2]University of Texas at Dallas

Nonlinear Coupling Effect Analysis of Material Properties, Processing Parameters and Part Geometry in Metal Additive Manufacturing by Full-scale Layerwise Additive Manufacturing Simulation Tool: *Jinquan Cheng*[1]; [1]CS3DM

Numerical Prediction of Microstructures by a Coupled Model (CA-FE) for Laser Beam Melting of Single-track 316L Stainless Steel : *Anaïs Baumard*[1]; Danièle Ayrault[1]; Olivier Fandeur[1]; Anne-Laure Vételé[1]; Cyril Bordreuil[2]; Frédéric Deschaux-Beaume[2]; [1]Den-Service d'études mécaniques et thermiques (SEMT), CEA; [2]LMGC, Univ. Montpellier, CNRS

On the Heat Treatment of AlSi10Mg Alloy Fabricated by Selective Laser Melting Process: Catherine Dolly Clement[1]; Julie Masson[2]; *Abu Syed Kabir*[1]; [1]Carleton University; [2]Institut Supérieur de l'Aéronautique et de l'Espace

On the Influence of Nitrogen on the Performance of Austenitic Stainless Steel 316L Processed by SLM: *Julia Richter*[1]; Thomas Niendorf[1]; [1]University of Kassel, Institute of Materials Engineering - Metallic Materials

On the Microstructure and Corrosion Behavior of Wire Arc Additively Manufactured AISI 420 Stainless Steel: Mostafa Kazemipour[1]; *Jonas Lunde*[1]; Salar Salahi[1]; Ali Nasiri[1]; [1]Memorial University of Newfoundland

On the Role of Defects in the Dynamic Response of AM SLM 316L: *Liam Smith*[1]; David Chapman[1]; Paul Hooper[2]; Daniel Eakins[1]; [1]University of Oxford; [2]Imperial College London

On the Size Effects in Additively Manufactured Titanium and the Implications in AM Components: *Daniel Barba*[1]; Carles Alabort[2]; Roger Reed[1]; Enrique Alabort[3]; [1]University of Oxford; [2]Universidad Politecnica de Valencia; [3]OxMet Technologies

Phase Field Modelling of Solidification in Additive Manufacturing Process: *Ramanarayan Hariharaputran*[1]; [1]Institute of High Performance Computing

Phase Transformation Kinetic Pathway in Heat Treatment of Ti-6Al-4V Manufactured by Selective Laser Melting: *Dang Khoa Do*[1]; Peifeng Li[1]; [1]University of Glasgow

Phase-field Method for Grain Evolution During Additive Manufacturing: *Alexander Chadwick*[1]; Peter Voorhees[1]; [1]Northwestern University

Powder Flowability Measurements: Statistical Correlations Between Powder Characteristics and Flowability Behavior: *Parnian Kiani*[1]; Umberto Scipioni Bertoli[1]; Alexander Dupuy[1]; Kaka Ma[2]; Julie Schoenung[1]; [1]University Of California, Irvine; [2]Colorado State University

Precipitation Behavior and Its Strengthening Effect of Maraging Steel in Laser Cladding Remanufacturing: Ke Ren[1]; Yiming Rong[1]; Shaopeng Wei[2]; Wei Xing[1]; *Gang Wang*[2]; [1]1.Harbin Institute of Technology 2.Southern University of Science and Technology; [2]Tsinghua University

Prediction of Large Regions of Microstructure and Phase Distributions for Additive Manufactured Alloys: Neil Bailey[1]; *Yung Shin*[1]; [1]Purdue University

Process Plateaus, Not Peaks, in Laser-powder Bed Fusion: *Bradley Jared*[1]; Josh Koepke[1]; Jarrett Tigges[1]; Michael Heiden[1]; David Saiz[1]; [1]Sandia National Laboratories

Processing Parameters Optimization on Additively Manufacturing Pure Magnesium for Quality Improvement: Experiments and Simulations: *Jinquan Cheng*[1]; Bandar AlMangour[2]; [1]CS3DM; [2]Saudi Arabia Basic Industries Corporation

Residual Stress Mitigation in Selective Laser Melting through Laser Scan Strategy Optimization Using Machine Learning: *Kahraman Demir*[1]; Charles Yang[1]; Adi Ben-Artzy[1]; Jack Peterson[1]; Grace Gu[1]; Peter Hosemann[1]; [1]University of California, Berkeley

Scaling Up Build Rates in Laser Powder Bed Fusion of Metals Using Dimensionless Parameters: *Jyi Sheuan Ten*[1]; Hang Li Seet[1]; Sharon Mui Ling Nai[1]; [1]Singapore Institute of Manufacturing Technology

Simultaneously Improved Thermophysical and Mechanical Properties of Additively Manufactured Cu-Ni-Sn-P Alloy Through Aging Heat Treatment: *Young-Kyun Kim*[1]; Dong-Hoon Yang[1]; Sun-Hong Park[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]Research Institute of Industrial Science and Technology

Small-scale Characterization of Wire-Arc Additive Manufactured Nickel Aluminum Bronze Alloy: *Meysam Haghshenas*[1]; Xinyu Song[2]; Devendra Verma[3]; Dharmendra Chalasani[4]; Mohsen Mohammadi[4]; [1]University of Toledo; [2]Weifang University; [3]Nanoscience Instruments; [4]University of New Brunswick

Strain-age Cracking of Nickel-base Superalloys Processed by Laser Beam Melting: *David Grange*[1]; Bruno Macquaire[1]; Jean-Dominique Bartout[1]; Christophe Colin[1]; [1]Safran SA

Tailoring Hierarchical Material Performance Through Process Manipulation: *Bradley Jared*[1]; David Saiz[1]; Michael Heiden[1]; Matthew Roach[1]; Anthony Garland[1]; Brad Boyce[1]; Ben White[1]; David Moore[1]; [1]Sandia National Laboratories

The Effect of Support Structures on Microstructure in LPBF and EBM: *Sandra Megahed*[1]; Vadim Aniko[1]; Maximilian Voshage[1]; Johannes Henrich Schleifenbaum[1]; [1]RWTH Aachen University

The Effects of Alloy Composition on Microstructure and Mechanical Properties of Duplex Stainless Steel Produced by Additive Manufacturing: *Andrew Iams*[1]; Todd Palmer[1]; [1]Pennsylvania State University

The Effects of LENS Process Parameters on the Behavior of 17-4 PH Stainless steel: *Ipfi Mathoho*[1]; Esther Akinlabi[2]; Nana Arthur[1]; Monnamme Tlotleng[1]; [1]CSIR Pretoria; [2]University of Johannesburg

The Process Parameters Extended Criterion for Laser Engineered Net Shaping of Inconel 738: *Yang Zhou*[1]; Zhaoyang Liu[1]; Chuan Guo[1]; Guowei Ye[1]; Xin Li[1]; Qiang Zhu[1]; [1]Southern University of Science and Technology

The Significance of Length Scales and Segregation in Strengthening Selective Laser Melted Stainless Steel Microstructures: *Tatu Pinomaa*[1]; Matti Lindroos[1]; Martin Walbrühl[2]; Nikolas Provatas[3]; Anssi Laukkanen[1]; [1]VTT Technical Research Centre of Finland; [2]Royal Institute of Technology (KTH); [3]McGill University

Thermodynamic Calculation and Characterization of Carbide Precipitation in Laser-deposited Material for High Speed Steel Alloy: Ali Jammal[1]; *Gang Wang*[1]; Songge Yang[2]; Yu Zhong[2]; Yiming Rong[3]; [1]Tsinghua University; [2]WPI; [3]Southern University of Science and Technology

Thermoelectric Magnetohydrodynamic Effects in Laser Additive Manufacturing: Coupled Macro-microscale Numerical Modelling: *Andrew Kao*[1]; Teddy Gan[1]; Catherine Tonry[1]; Ivars Krastins[1]; Koulis Pericleous[1]; [1]University of Greenwich

Understanding the Influence of Porosity and Defects on Fatigue Behavior in Additive Manufactured 316L Stainless Steel Using In-Situ X-Ray Computed Tomography: *Aeriel Murphy-Leonard*[1]; David Rowenhorst[1]; [1]Naval Research Laboratory

Unveiling the Microstructure-properties Relationship of LPBF-processed 316L: *Bij-Na Kim*[1]; David San Martin[2]; Pedro Rivera-Diaz-del-Castillo[3]; [1]Carpenter Additive; Lancaster University; [2]CENIM-CSIC; [3]Lancaster University

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Energy and Power Conversion Applications — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, Nasa Glenn Research Center; Markus Chmielus, University of Pittsburgh; Ryan Ott, Ames Laboratory/Cmi; Arcady Zhukov, UPV/EHU, and Ikerbasque, Basque Foundation for Science

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Arkady Zhukov, UPV/EHU and Ikerbasque

Core Losses in Co-rich Inductors with Tunable Permeability: *Alex Leary*[1]; Vladimir Keylin[1]; Ron Noebe[1]; Randy Bowman[1]; Grant Feichter[1]; Kevin Byerly[2]; Paul Ohodnicki[2]; Michael McHenry[3]; [1]Nasa Glenn Research Center; [2]NETL; [3]Carnegie Mellon University

Low Temperature Additive Manufacturing of Metamagnetic Shape Memory Alloys for Magnetocaloric Applications: Bosco Rodriguez[1]; *Daniel Salazar*[1]; Volodymyr Chernenko[1]; [1]BCMaterials

Magnetic Flux Density Dispersion on the Gaps of the FeSiNbCuB Nanocrystalline Block Core: *Aleksandra Kolano-Burian*[1]; Roman Kolano[1]; Przemyslaw Zackiewicz[1]; Marek Hreczka[1]; [1]Lukasiewicz Research Network – Institute of Non-Ferrous Metals

Processing and Properties of Low Porosity Cast SMC Cores: *Piotr Blyskun*[1]; Grzegorz Lukaszewicz[1]; Grzegorz Cieslak[1]; Aleksandra Kolano-Burian[2]; Maciej Kowalczyk[1]; [1]Faculty of Materials Science and Engineering, Warsaw University of Technology; [2]Institute of Non-ferrous Metals

Structure and Properties Evolution in Rapidly Annealed $Fe_{67}Co_{20}B_{13}$ Amorphous Material: *Maciej Kowalczyk*[1]; Jaroslaw Ferenc[1]; Anna Wójcik[2]; Aleksandra Kolano-Burian[3]; Tadeusz Kulik[1]; Piotr Blyskun[1]; [1]Warsaw University of Technology; [2]Polish Academy of Sciences; [3]Lukasiewicz Research Network

Transition Metal Based Nanostructured Hard Magnet: *Kinjal Gandha*[1]; Ikenna C. Nlebedim[1]; [1]Ames Laboratory

Tuning of Second Order Phase Transition of NiMnGa Heusler-type Glass-coated Microwires: Carlos Garcia[1]; Valentina Zhukova[2]; Sergei Shevyrtalov[3]; Mihail Ipatov[2]; Paula Corte-Leon[2]; *Arcady Zhukov*[4]; [1]Universidad Técnica Federico Santa María, Valparaiso, Chile; [2]University Basque Country, UPV/EHU; [3]Immanuel Kant Baltic Federal University; [4]UPV/EHU, and Ikerbasque, Basque Foundation for Science

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage VI — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Amit Pandey, MicroTesting Solutions; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Kyle Brinkman, Clemson University; Soumendra Basu, Boston University; Paul Ohodnicki, National Energy Technology Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University

A BiVO4-RGO Bilayer Electrode based Photoelectrochemical Supercapacitor: Anirban Roy[1]; *Pavel Majumdar*[2]; Krishnendu Pramanik[3]; Hiranmay Saha[4]; [1]University of Tennessee, Knoxville; [2]University of Utah; [3]University of Calcutta; [4]Indian Institute of Engineering Science and Technology

A Critical Evaluation of Internal Temperature Sensors Implanted in the Lithium-ion Batteries: Mihit Parekh[1]; *Bing Li*[1]; Vikas Tomar[1]; Vilas Pol[1]; [1]Purdue University

A Method for Efficient Lithium Desorption in Ni-rich Layered Structure Cathode Materials for Lithium Resource Regeneration: Seon-jin Lee[1]; Ji-woong Shin[1]; Sang-yong Oh[1]; Yun-chae Nam[1]; Bonkeup Koo[2]; *Jong-tae Son*[1]; [1]Korea National University of Transportation; [2]Hanbat National University

A Novel Class of High-ionic Conductivity, Stable Electrolyte for Li-ion All-Solid-State Batteries: Chunhu Tan[1]; Shuyi Chen[1]; Daniel Lin[1]; Tianyu Meng[1]; Jessica Lin[1]; Kevin Zanjani[1]; *Tim Lin*[1]; [1]Bioenno Tech

Al-Bi-O based Ternary Oxide as Anode Material for Rechargeable Alkali Metal-ion Batteries: *Saptarshi Das*[1]; Debasish Das[2]; Arijit Mitra[3]; Sambedan Jena[2]; Anandaroop Bhattacharya[4]; Subhasish Basu Majumder[1]; [1]Materials Science Centre, Indian Institute of Technology Kharagpur; [2]School of Nano Science and Technology, Indian Institute of Technology Kharagpur; [3]Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur; [4]Department of Mechanical Engineering, Indian Institute of Technology Kharagpur

Development of Platinum Electrocatalysts with Preferential Crystal Orientation for Energy Conversion Systems: *Silvina Gabriela Ramos*[1]; Gustavo Andreasen[2]; Alicia Ares[1]; Walter E. Triaca[2]; [1]Instituto de Materiales de Misiones (IMAM)-CONICET, UNaM; [2]Instituto de Investigaciones Fisicoquímicas Teóricas y Aplicadas (INIFTA), UNLP

Electrodeposited 3D Current Collectors for use in Negative Electrodes for Sodium-ion Batteries: A Structural Study: *Sambedan Jena*[1]; Bangmaya Satpathy[1]; Arijit Mitra[1]; Karabi Das[1]; Subhasish Basu Majumder[1]; Siddhartha Das[1]; [1]IIT Kharagpur

Electrodeposition of CoSe2 Film and its Application to Photoelectrochemical Solar Cells: *Kwang Soon Ahn*[1]; [1]Yeungnam University

Enhanced Stability of B-site W Doped Pr0.6Sr0.4Fe1-xWxO3-d Ceramic Membranes for Water Splitting: *Yanbo Liu*[1]; Hongwei Cheng[1]; Xiaofang Xu[1]; Qiangchao Sun[1]; Chaoyun Liu[1]; Qian Xu[1]; Xionggang Lu[1]; [1]Shanghai University

Enhancement of Metal Surface Mechanical Property by High Energy Beam Injection: *Sangwoo Kim*[1]; DongEung Kim[1]; Changhyun Jin[2]; [1]Korea Institute of Industrial Tech; [2]Yonsei University

Fabrication of Nickel Antimony Oxide-carbon Black Composite Anode for Sodium-ion Batteries by Electrophoretic Deposition Technique: *Unmesha Ray*[1]; Debasish Das[1]; Arijit Mitra[2]; Sambedan Jena[1]; S.B. Majumder[3]; Siddhartha Das[2]; [1]School of Nanoscience and Technology, Indian Institute of Technology Kharagpur, West Bengal; [2]Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, West Bengal; [3]Material Science Centre, Indian Institute of Technology Kharagpur, West Bengal

Fe2O3 Nano-particles Grown on Carbon Fabric as a Freestanding Anode for High-performance Lithium-ion Batteries: *Yang Jun*[1]; [1]University of Science and Technology Beijing

Finding Efficient Growth Parameters for Carbon Nanotube Growth: *Tyler Knapp*[1]; Jud Ready[1]; [1]Georgia Tech Research Institute

High-Rate and Long Cycle-Life of Bulk Na2/3[Ni1/3Mn2/3] O2 Sodium-ion Battery Cathode Enabled through Structural Inclusions: *Jintao Fu*[1]; Eric Detsi[1]; [1]University of Pennsylvania

Improving Wetting of Silver (Ag) on Oxide Surface with Patterned Nickel (Ni)-particles: *Jiyun Park*[1]; Jason Nicholas[1]; Yue Qi[1]; [1]Michigan State University

Investigation on the Superior Electrochemical Performance of Activated Carbon Modified with Garlic Derived Carbon Dots for Aqueous Supercapacitors: *Anurag Pandey*[1]; Santanu Dhara[2]; Tapan Nath[3]; [1]School of Nano Science and Technology, Indian Institute of Technology Kharagpur; [2]School of Medical Science and Technology, Indian Institute of Technology Kharagpur; [3]Department of Physics, Indian Institute of Technology Kharagpur

Lab Scale Implementation of In-situ Characterization Techniques for Alkali Metal-ion Batteries: *Arijit Mitra*[1]; Debasish Das[2]; Sambedan Jena[2]; Saptarshi Das[3]; Subhasish Majumder[3]; Siddhartha Das[1]; [1]Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, [2]School of Nanoscience and Technology, Indian Institute of Technology Kharagpur; [3]Material Science Centre, Indian Institute of Technology Kharagpur

Linking Nanoscale Grain Boundary Composition and Energetic Properties in Ceramic Oxides: *Tara Boland*[1]; Arunima Singh[1]; Peter Rez[1]; Peter Crozier[1]; [1]Arizona State University

Mechanistic Elucidation of Electrodeposition Stability at Metal-Solid Electrolyte Interfaces: *Ankit Verma*[1]; Partha Mukherjee[1]; [1]Purdue University

Microwave Dielectric Properties of Isovalent and Aliovalent Ions Doped Ca4(La4Pr2)(SiO4)4(PO4)2O2 Ceramics: *Sea Fue Wang*[1]; Yung Jen Lin[2]; Bo Cheng Lai[1]; Hong Bo Yang[2]; Jia Min Chen[2]; [1]National Taipei University of Technology; [2]Tatung University

Nanotwinned Copper Films Retaining High Strength and Moderate Elongation after Low Temperature Annealing: *Hsiang-Yuan Cheng*[1]; Chih Chen[1]; [1]National Chiao Tung University

Novel Three-dimensional Tricontinuous Bulk Conductor/Insulator/Conductor Nanocapacitor for Ultra-high-power Electrical Energy Storage: In Situ and Operando X-ray Scattering Studies of Processing and Performance: *Samuel Welborn*[1]; John Corsi[1]; Eric Detsi[1]; [1]University of Pennsylvania

Preparation of Porous Carbon Materials and its Application in Supercapacitors: XiaoMeng Yang[1]; PengFei Tang[1]; WeiJun Peng[1]; Ibrar Zahid[1]; GuiHong Han[1]; *Zhang YongSheng*[1]; [1]Zhengzhou University

Solid State Phase Change Materials for Energy Storage: Developing a Database: Xiaochuan Tang[1]; *Christopher Weinberger*[1]; [1]Colorado State University

Strategies for the Viability of Li-S Rechargeable Batteries by using Nanotechnology: Eunho Cha[1]; *Sanket Bhoyate*[1]; Wonbong Choi[1]; [1]University of North Texas

Study on the Influence of Different Preheating Conditions on Carbon Structure of 1/3 Coking Coal: *Linyang Zhang*[1]; Jingsong Wang[1]; Qingguo Xue[1]; Haibin Zuo[1]; Xuefeng She[1]; Guang Wang[1]; [1]University of Science and Technology Beijing

Synthesis of Nanoencapsulated Phase Change Materials with Ag Shell for Thermal Energy Storage: Huanmei Yuan[1]; *Hao Bai*[1]; Jian Zhang[1]; Zefei Zhang[1]; [1]University of Science and Technology Beijing

Theoretical Prediction of Intercalation Compounds Formed by Co-Intercalation of Mg Ions with Diamine into Graphite Anodes for Mg-Ion Batteries: *Pegah Mirabedini*[1]; P. Alex Greaney[1]; [1]University of California, Riverside

Thermal Cycling of Room Temperature Ionic Liquid-based Supercapacitors for Aerospace Applications: *Julia Allen*[1]; Jud Ready[1]; [1]Georgia Tech Research Institute

Transmission Electron Microscopy and X-ray Scattering Studies of the Degradation Mechanism of Nanoporous Alloy-type Anodes during Lithiation and Delithiation: *John Corsi*[1]; Eric Detsi[1]; [1]University of Pennslyvannia

Understanding Dendritic Growth in Mg-based Batteries and Design of Metallic Anodes: *Rachel Davidson*[1]; Sarbajit Banerjee[1]; [1]Texas A&M University

Raman Spectroscopy Study of Amorphous MnO2 and a-MnO2 Cathodes in Rechargeable Zn-metal Batteries: *Michael Kindle*[1]; Samantha Robillard[1]; John McCloy[1]; Min-Kyu Song[1]; [1]Washington State University

X-ray Computed Tomography Study in High-energy Lithium Batteries: *Younghwan Cha*[1]; Panpan Dong[1]; Xiahui Zhang[1]; Michael Kindle[1]; Min-Kyu Song[1]; [1]Washington State Univerisy

ELECTRONIC MATERIALS

Advanced Microelectronic Packaging, Emerging Interconnection Technology and Pb-free Solder — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Christopher Gourlay, Imperial College London; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University; Mike Wolverton, Raytheon; Babak Arfaei, Ford Motor Company; Andre Delhaise, Celestica; Mehran Maalekian, Mat-Tech; Mohd Arif Salleh, Universiti Malaysia Perlis

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Chris Gourlay, Imperial College London

A Novel Class of Multiscale Nanomaterials-based Thermal Interface Materials for High Temperatures, High Power Density Electronics: Chunhu Tan[1]; Shuyi Chen[1]; *Tim Lin*[1]; [1]Aegistech Technology Inc

Study of Pore Structure of Nano-silver Paste Sintered Interconnect under Current-stressing: *Ingann Chen*[1]; Chiaming Yang[1]; Pocheng Su[1]; Potsung Hsieh[1]; Steve Lienchung Hsu[1]; [1]National Cheng Kung University

BIOMATERIALS

Advances in Biomaterials for 3D Printing — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Biomaterials Committee

Program Organizers: Changxue Xu, Texas Tech University; Jun Yin, Zhejiang University; Zhengyi Zhang, Huazhong University of Science and Engineering; Yifei Jin, University of Florida

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

An Aluminum Alloy Powder for 3D Printing: Jingxia Wang[1]; [1]Shenyang Create-unite Industrial Technology Co.

MECHANICS & STRUCTURAL RELIABILITY

Advancing Current and State-of-the-Art Application of Ni- and Co-based Superalloys — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Chantal Sudbrack; Mario Bochiechio, Pratt & Whitney; Kevin Bockenstedt, ATI Specialty Materials; Katerina Christofidou, University of Sheffield; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Laura Dial, GE Global Research; Bij-Na Kim, Carpenter Additive; Victoria Miller, University of Florida; Kinga Unocic, Oak Ridge National Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Application of Computed Tomography as Non-destructive Test in Development Process of Aircraft Ni Superalloys Castings: *Dorota Wyrobek*[1]; Rafal Cygan[1]; Grzegorz Labaj[1]; [1]Consolidated Precision Products Poland

Evaluating the Hydrogen Environment-assisted Cracking Susceptibility of a Next-generation Co-Ni Alloy for Marine Fastener Applications: *Zachary Harris*[1]; Charles Demarest[1]; Brendy Rincon Troconis[2]; John Scully[1]; James Burns[1]; [1]University of Virginia; [2]University of Texas at San Antonio

Evolution of Microstructure in Net-shape HIP IN718 with Improved Fatigue Performance: *Benjamin Georgin*[1]; Victor Samarov[2]; Hamish Fraser[1]; [1]The Ohio State University; [2]LNT

Microstructure Evolution of the 410 Stainless Steel and Co-based Alloy Dissimilar Welded Joint Manufactured by Electron Beam Welding: *Guanzhi Wu*[1]; Yuanheng Zhang[1]; Kai Ding[1]; Bingge Zhao[1]; Yuanfang Wang[1]; Tao Wei[1]; Yulai Gao[1]; [1]Shanghai University

Phase-field Informed DDD Study: Dependence of Microstructural Evolution on the Crystallographic Orientations in Ni-based Single Crystal Superalloys: *Harikrishnan Rajendran*[1]; Jean- Briac le Graverend[1]; Amine Benzerga[1]; [1]Texas A&M University

Probing Effects of Alloying Additions and Local Phase Transformation Strengthening on Creep Deformation in Nickel Based Superalloys: *Ashton Egan*[1]; Lola Lilensten[2]; Paraskevas Kontis[2]; Sammy Tin[3]; Michael Mills[1]; [1]Ohio State University; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Illinois Institute of Technology

The Role of Microstructural Homogenization on Tensile and Stress-rupture Behavior of Selective Laser Melted Nickel Based 718 Alloy: *Shahzad Salam*[1]; Ichiro Mitama[1]; Takuma Sakata[1]; [1]Sumitomo Heavy Industries Ltd.

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications VIII — Student Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Hsin-jay Wu, National Chiao-tung University; Tiejun Zhu, Zhejiang University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Sinn-wen Chen, National Tsing Hua University

Assessment of Co-P Diffusion Barrier for Bismuth Telluride-based Thermoelectric Materials: *Zhen-Wei Sun*[1]; Chun-Hsien Wang[1]; Albert T. Wu[1]; [1]National Central University

Mass Production of Highly Performing BiSbTe Thermoelectric Materials Through Powder Metallurgy: *Pathan Sharief*[1]; Suk-Min Yoon[1]; May Likha Lwin[1]; Chul-Hee Lee[1]; Peyala Dharmaiah[1]; Babu Madavali[1]; Soon-Jik Hong[1]; [1]Kongju National University

Phase Diagram of Bi-Cu-Te and Thermoelectric Properties of Cu Doped Bi_2Te_3 Alloys: *Wan-Ting Yen*[1]; Hsin-Jay Wu[1]; [1]National Chiao Tung University

Phase Diagrams of Ag-Pb-Sn-Te System: Sinn-wen Chen[1]; Jia-yu Du[1]; *Yohanes Hutabalian*[1]; Aleš Kroupa[2]; [1]National Tsing Hua University; [2]Czech Academy of Sciences

Realizing the Microstructure in GeTe-based Thermoelectric Materials and Phase Transition Behavior: *Yi-Fen Tsai*[1]; Pai-Chun Wei[2]; Hsin-Jay Wu[1]; [1]National Chiao-Tung University; [2]Computer, Electrical, and Mathematical Sciences and Engineering Division King Abdullah University of Science and Technology (KAUST)

Thermoelectric Properties of Multiply Doped Mg3(Sb, Bi)2: *Yasuo Shibata*[1]; Yuji Ohishi[1]; Hiroaki Muta[1]; [1]Osaka University

LIGHT METALS

Alumina and Bauxite — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: James Vaughan, University of Queensland

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

A Review of Research on Alumina Extraction from High-alumina Fly Ash and a New Method for Preparing Alumina by Electrotransformation: *Xiuxiu Han*[1]; Zhang Tingan[1]; Guozhi Lv[1]; Xijuan Pan[1]; Daxue Fu[1]; [1]Northeastern University

Effect of Sodium Alkali Concentration on Calcification-carbonization Process: *Yang Chen*[1]; Zhang Tingan[1]; Guozhi Lv[1]; Xi Chao[1]; [1]Northeastern University

Flow Field Characteristics in Self-stirring Reactor Based on PIV Technology: *Zimu Zhang*[1]; Qiuyue Zhao[1]; Shuai Zhu[1]; Zhang Tingan[1]; [1]Northeastern University

Investigation on Heat Resisting Cast Iron Produced Through Carbothermic Reduction of Alumina Residue (Bayer Red Mud): *Jianmin Zeng*[1]; Ke Zhu[1]; Zimeng Tan[1]; Aoping He[1]; [1]Guangxi University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Dmitry Eskin, Brunel University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

A Heat-resisting Aluminum Alloy Wire: *Jingxia Wang*[1]; Zhisheng Yang[1]; Degang Shi[1]; Quan Hong[1]; Nansong Liu[1]; Xuan Dong[1]; [1]Shenyang Create-unite Industrial Technology Co.

Aluminum Nanocomposites Made via In-situ Metal-based Pyrolysis: Processing and Microstructure: *Aaron Gladstein*[1]; Alan Taub[1]; [1]University of Michigan

Analysis of Microhardness of Al-Si Alloys Directionally Solidified: Roberto Rozicki[1]; *Alicia Ares*[2]; [1]Programa de Materiales y Fisicoquímica (ProMyF). Facultad de Ciencias Exactas, Químicas y Naturales (FCEQyN). Universidad Nacional de Misiones (UNaM); [2]Universidad de Misiones

Corrosion Inhibition Effect of Aloe Saponaria Gel on the Corrosion Process of Aluminum: Malena Friedrich[1]; Mariana Schreiner[1]; *Alicia Ares*[2]; Claudia Méndez[2]; [1]Programa de Materiales y Fisicoquímica (ProMyF). Facultad de Ciencias Exactas, Químicas y Naturales (FCEQyN). Universidad Nacional de Misiones (UNaM); [2]IMAM (CONICET-UNaM)

Development of Two Cavities' Large Wheel Forming Process using Semi-solid Forging Technology: *Min Seok Moon*[1]; Myeong Han Yoo[1]; Kee Won Kim[2]; Jong Dae Yoon[2]; Joon Hyuk Song[1]; Sang Youp Oh[1]; [1]Korea Institute of Carbon Convergence Technology; [2]RheoForge Co., Ltd.

Effect of Nano a-Al(Fe,Mn)Si Particles on the Microstructure and Mechanical Properties of Extruded Al-Si-Mg-based Alloy with ZnO Addition: *Sangjun Lee*[1]; Donghyun Bae[1]; [1]Yonsei University

Effect of Si Modification on the Mechanical and Tribological Properties of an Al-Si Hyper-eutectic Alloy: *Jeheon Jeon*[1]; Donghyun Bae[1]; [1]Yonsei University

Effect of Transition Metals Micro-additions on Microstructure and Mechanical Properties Al-Si-Mg Alloys with Various Silicon Concentration: *Lukasz Rogal*[1]; Wojciech Maziarz[1]; Karol Janus[1]; [1]Institute of Metallurgy and Materials Science

Effects of Advanced Surface Treatments on Microstructure, Fatigue and Corrosion Properties of Aluminum Alloy 7075-T6: *Anurag Sharma*[1]; Jie Song[1]; Domenico Furfari[2]; Vijay Vasudevan[1]; Seetha Mannava[1]; [1]University of Cincinnati; [2]Airbus Operations

Effects of Cu Contents on Electric and Mechanical Properties of Al-Zn-Mg based Alloys: *Yong-Ho Kim*[1]; Sang-Su Na[1]; Hyeon-Taek Son[1]; [1]Korea Institute of Industrial Technology

Effects of Filtration Paper and Bleaching Earth on Rolling Mill Oil Performance: *Ali Ulus*[1]; Serpil Fidan[1]; Çisem Dogan[1]; Eda Özkaya[1]; Canan Inel[1]; [1]Asas Aluminium

Effects of Grain Refinement Induced by Nanoparticles on Mechanical Properties and Formability: *Jonggyu Jeon*[1]; J.H. Shin[2]; S.E. Shin[3]; Donghyun Bae[1]; [1]Yonsei Univ; [2]Korea Automotive Technology Institute; [3]Sunchon National University

Effects of Trace Elements on Thermal Conductivity and Formability of the Extruded Al-RE Alloy Systems: *Hyeon-Taek Son*[1]; Yong-Ho Kim[1]; Sang-Soo Na[1]; [1]Korea Institute of Industrial Technology

Experimental Investigation of $MgAl_2O_4$ Spinel Formation in Oxidation of Al-Mg Alloys: *Young-Ok Yoon*[1]; Seong-Ho Ha[1]; Bong-Hwan Kim[1]; Hyun-Kyu Lim[1]; Shae K. Kim[1]; [1]Korea Institute of Industrial Technology

Heat Treatment Effect and Mechanical Properties of Modified A7075 Alloy for Improved Extrudability: *Jaehyuck Shin*[1]; Sehoon Kim[1]; Jinpyeong Kim[1]; Siyoung Sung[1]; Beomsuck Han[1]; [1]Korea Automotive Technology Institute

Hybrid Aluminum Sheets with Improved Mechanical Properties by Repeated Roll-bonding Process: *ChaYong Lim*[1]; Seunghee Lee[2]; [1]Korea Institute of Materials Science; [2]Mokpo National University

Impact of Dispersion Hardening by Alumina Nano Particles on Mechanical Properties of Al 1100: Ilya Zhukov[1]; Alexander Kozuluin[1]; *Anton Khrustalev*[1]; Evgeny Moskvichev[2]; Alexander Vorozhtsov[1]; Dmitry Lychagin[1]; [1]Tomsk State University; [2]Institute of Strength Physics and Materials Science of the Siberian Branch of the Russian Academy of Sciences

Influence of Microstructures and Microhardness on Baking Parameters of an AA6016 Alloy Sheet: *Xiyu Wen*[1]; Ming Tang[2]; Jiahui Li[2]; Jingwu Zhang[2]; Shridas Ningileri[3]; [1]University of Kentucky; [2]Yanshan University; [3]Secat Inc.

Investigation of Temperature Variation during Friction Drilling of 6082 and 7075 Al-alloys: Nadia Hamzawy[1]; *Mahmoud Khedr*[1]; Tamer Mahmoud[1]; Iman El-Mahallawi[2]; Tarek Khalifa[1]; [1]Benha University; [2]Cairo University

Laser Joining of Aluminium and Steel Thin Sheets: *Besabakhe Skhosane*[1]; Sisa Pityana[1]; Monnamme Tlotleng[1]; [1]Council for Scientific and Industrial Research

Microstructure Analysis of Graded Interface Layers in a Model Multilayer Al/Al-Zn/Al by Scanning Microbeam Small-angle X-ray Scattering Measurements: *Shan Lin*[1]; Hiroshi Okuda[1]; Higashino Yukihiro[1]; Katsushi Matsumoto[2]; Kazufumi Sato[3]; [1]Kyoto University; [2]Kobe Steel, Ltd.; [3]Kobelco Research Institute, Inc.

Self-healing Aluminium Alloys: *Irena Paulin*[1]; Crtomir Donik[1]; Matjaž Godec[1]; [1]Institut for Metals and Technology

Study on the anti-EMF of Al-Er Master Alloy Prepared by Er2O3 as Erbium Source: Hongguang Kang[1]; *Jidong Li*[1]; Chaogang Zhang[1]; Qian Wang[1]; Yiyong Wang[1]; Zhe Ning[1]; Jinlin Lu[1]; Jing Li[1]; [1]Liaoning University of Science and Technology

Synergistic Effects of Cu and Zr V on Microstructure and Mechanical Properties of Al-Si-Mg Cast Alloy: *Mingshan Zhang*[1]; Junsheng Wang[1]; [1]Beijing Institute of Technology

The Effect of Initial Precipitates on Shear Deformation in 6061 Aluminium Alloy: *Wonkee Chae*[1]; JunHyun Han[1]; [1]Chungnam National University

The Effect of Profile Shape on Crystallographic Texture of Extruded 6xxx High Strength Aluminium Alloy: *Chrysoula Tzileroglou*[1]; Isaac Chang[1]; [1]Brunel University London

The Effect of Zinc Addition on Corrosion Resistance and Mechanical Properties of Recycled Aluminium Cans: *Ademola Agbeleye*[1]; Atinuke Oladoye[1]; Babatunde Bolasodun[1]; [1]University of Lagos

The Evaluaion of Forged Aluminum Heat Sink for LED Headlight of Automobile: *Young-Sek Yang*[1]; Geun Woo Lee[1]; Chang Ho Yoon[1]; [1]Foosung Precision Ind. Co., Ltd.

The Role of In-situ Stacking Faults and Twins in the Deformation Behavior of New Al Alloys: *Miran Joo*[1]; Jeheon Jeon[1]; Donghyun Bae[1]; [1]Yonsei University

BIOMATERIALS

Bio-Nano Interfaces and Engineering Applications — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Fabrication of Nanogenerator and its Potential Application in Implantable Biomedical Devices: *Siddharth Sharma*[1]; Indranil Lahiri[1]; Partha Roy[1]; Debrupa Lahiri[1]; [1]IIT Roorkee

BIOMATERIALS

Biodegradable Materials for Medical Applications II — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Biomaterials Committee

Program Organizers: Jaroslaw Drelich, Michigan Technological University; Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University; Jan-Marten Seitz, Syntellix AG; Petra Maier, Stralsund University of Applied Sciences; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California, Riverside

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Jaroslaw Drelich, Michigan Technological University; Ehsan Mostaed, Michigan Technological University; Malgorzata Sikora-Jasinska, Michigan Technological University; Jan-Marten Seitz, Syntellix AG; Petra Maier, University of Applied Sciences Stralsund; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California at Riverside

Bilayer Coated Magnesium Weaves as Degradable Bio-scaffolds: *Ju Xue*[1]; Cristina Romany[1]; Bowen Chen[1]; Lawrence Langan[1]; James Guest[1]; Timothy Weihs[1]; [1]Johns Hopkins University

Corrosion Products of Zinc Implant Degradation Suppress Neointimal Hyperplasia: *Roger Guillory*[1]; Timothy Kolesar[1]; Jaroslaw Drelich[1]; Jeremy Goldman[1]; [1]Michigan Technological University

Deformation Localization of Zn-Cu-Mn-Mg Alloys Designed for Bioresorbable Medical Implants: *Morteza Shaker Ardakani*[1]; Ehsan Mostaed[1]; Stephen Kampe[1]; Jaroslaw Drelich[1]; [1]Michigan Technological University

Discovery of Alloying Elements and Processing Parameters that Impart Improved Biocompatibility of Zinc-based Medical Implants: *Lea Morath*[1]; Alexander Oliver[1]; Katie Flom[1]; Roger Guillory[1]; Jeremy Goldman[1]; Eshan Mostaed[1]; Jaroslaw Drelich[1]; [1]Michigan Technological University

Effect of Compressive Strain on Biodegradability in Pure Magnesium: *Shun Yorifuji*[1]; Naoko Ikeo[1]; Toshiji Mukai[1]; [1]Kobe University

Evaluation of Electrospinning Parameters for Fabrication of Biodegradable Drug Carrier Silk Fibers: *Babak Jahani*[1]; Sahar Tabatabaei[2]; Salimeh Yasaei Sekeh[3]; Long Jiang[1]; [1]North Dakota State University; [2]Pharmascience ; [3]University of Maine

In-vitro Evaluation of AZ31 Magnesium Alloy Coated with Amorphous and Crystalline Magnesium Phosphate Coating: Rita João[1]; Catia Piedade[1]; Maria João Carmezim[2]; *Catarina Santos*[2]; [1]Instituto Politecnico de Setubal, Portugal; [2]CQE Instituto Superior Técnico, Universidade de Lisboa

Long Term Inflammatory Response to Zinc Materials in Murine Arteries: *Alexander Oliver*[1]; Roger Guillory[1]; Timothy Kolesar[1]; Lea Morath[1]; Katie Flom[1]; Ehsan Mostaed[1]; Jaroslaw Drelich[1]; Jeremy Goldman[1]; [1]Michigan Technological University

Mechanical and Wear behaviour of Mg-Ca Alloys for Orthopaedic Implant Applications: *Asmaa Elmaghraby*[1]; Ahmed Aziz[1]; [1]German University (GUC) in Cairo

New Approach in Development of Biodegradable FeMn Alloys: *Crtomir Donik*[1]; Irena Paulin[1]; Aleksandra Kocijan[1]; Matjaž Godec[1]; [1]Institute of Metals and technology

Novel Method for Increasing Mechanical Properties of Biodegradable Zinc: *Anna Jarzebska*[1]; Magdalena Bieda-Niemiec[1]; Lukasz Maj[1]; Martyna Strag[1]; Daniel Wojtas[2]; Robert Chulist[1]; Jan Guspiel[1]; Waclaw Pachla[3]; Krzysztof Sztwiertnia[1]; [1]Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Krako; [2]AGH University of Science and Technology Faculty of Physics and Applied Computer Science; [3]Institute of High Pressure Physics, Polish Academy of Sciences, Warszawa, Poland

Novel Surface Functionalization to Tailor Biomedical Applications of Metallic Zinc: *Marta Alves*[1]; Nuno Mira[1]; Catarina Santos[2]; M. Fátima Montemor[1]; [1]Instituto Superior Técnico; [2]Escola Superior de Tecnologia de Setúbal

Research on Zn-Ag-Mg alloy as a Potential Biodegradable Implant Material: *Maria Watroba*[1]; Wiktor Bednarczyk[1]; Jakub Kawalko[1]; Krzysztof Mech[1]; Gabriela Boelter[2]; Manuel Banzhaf[2]; Piotr Bala[1]; [1]AGH University of Science ans Technology; [2]University of Birmingham

BIOMATERIALS

Biological Materials Science — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Fabrication and Shape Memory Characteristics of Non-toxic Ti-Zr-Nb-Sn Biomaterials: *Yeon-wook Kim*[1]; Tae-hyun Nam[2]; Myunghwan Byun[1]; [1]Keimyung University; [2]Gyeongsang National University

Mechanical, Physical, and Morphological Characterization of a Composite Made from Luffa Cylindrica and EVA Copolymer: *Alejandro Restrepo Carmona*[1]; Henry Colorado[1]; [1]University Of Antioquia

Quantitative Study of Banana Green Peel Tannins for Preparing a Bioma Terial: Elisângela Ferreira[1]; *Veronica Candido*[1]; Rafaela Pinheiro[1]; Alisson Silva[1]; Sergio Monteiro[2]; Samara Marques[1]; [1]Universidade Federal do Pará; [2]Federal University of Rio de Janeiro

Radiopacifying Bismuth Oxide-based Composite Powder Prepared by High Energy Ball Milling: *Pee-Yew Lee*[1]; [1]National Taiwan Ocean University

BIOMATERIALS

Biological Materials Science — Student Poster Competition

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Steven Naleway, University of Utah; Jing Du, Penn State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Rajendra Kasinath, DePuy Synthes (Johnson and Johnson); David Restrepo, University of Texas at San Antonio

3D Printed Models of the Arrangement of Components in Two-phase Composites: Frances Su[1]; Fereshteh Sabet[2]; *Katherine Tang*[1]; Sean Garner[1]; Michael Tolley[1]; Iwona Jasiuk[2]; Joanna McKittrick[1]; [1]University of California, San Diego; [2]University of Illinois at Urbana-Champaign

Biodegradable 3D Fibrous Scaffold with Co-axially Aligned Carbon Nanotubes for Directional Regeneration of Peripheral Nerves: *Souvik Ghosh*[1]; Swati Haldar[1]; Sumeet Gupta[2]; Ankita Bisth[1]; Samrat Chauhan[3]; Partha Roy[1]; Debrupa Lahiri[1]; [1]Indian Institute of Technology, Roorkee; [2]Maharshi Markandeshwar University ; [3]Maharshi Markandeshwar University

Electrochemical Evaluation of Novel Titanium Alloys: *Thu Nguyen*[1]; Jacob Giacomi[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

Fracture Mechanisms of Epoxy-alumina Composites: Jiacheng Gao[1]; Ruyi Man[1]; Yuyang Wang[1]; *Yichun Tang*[1]; Kangning Su[1]; Michael Hillman[1]; Jing Du[1]; [1]Penn State University

Microsphere Calcium Phosphate Cements to Improve Injectability and 3D-printability of Dental Biomaterials: *Tony Yin*[1]; Krista Carlson[1]; Steven Naleway[1]; [1]University of Utah

Modulation of Neurogenic Differentiation by Reinforcement of Polymeric Scaffolds with Different Carbon Nanofillers: *Souvik Ghosh*[1]; Swati Haldar[1]; Viney Kumar[1]; Partha Roy[1]; Debrupa Lahiri[1]; [1]Indian Institute of Technology, Roorkee

Structural and Mechanical Characterization of Quasi-indestructible Armillaria Astoyae Rhizomorphs: *Debora Lyn Porter*[1]; Alexander Bradshaw[2]; Bryn Dentinger[2]; Steven Naleway[1]; [1]The University of Utah Department of Mechanical Engineering; [2]The University of Utah Department of Biology

The Effect of the Addition of Cobalt Powder on Compressive Properties of Porous Titanium as Bone Substitute Materials: *Feng Zhang*[1]; Guibao Qiu[1]; Hanghang Zhou[1]; Tengfei Lu[1]; [1]Chongqing University

Using Microspheres to Understand the Effect of Particle Geometry in Freeze Casting: *Sierra Freitas*[1]; Lauren Kochaver[2]; Krista Carlson[3]; Steven Naleway[2]; [1]Department of Biomedical Engineering; [2]Department of Mechanical Engineering; [3]Department of Material Science and Engineering

LIGHT METALS

Cast Shop Technology — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Johannes Morscheiser, Aleris Rolled Products Germany GmbH

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Effect of Electromagnetic Stirring on Morphology of a-Al Phase in Near Eutectic Al-Si Alloy: *Yuichiro Murakami*[1]; Kazutaka Suzuki[1]; Isao Matsui[1]; Naoki Omura[1]; [1]National Institute of Advanced Industrial Science and Technology

Furnace Lining Degradation by 5xxx Aluminum Alloys: *Athanasia Flampouri*[1]; Theofani Tzevelekou[1]; Sofia Papadopoulou[1]; Spyros Pinis[2]; Nikolaos Sgourdakis[2]; [1]ELKEME S.A.; [2]ElvalHalcor S.A.

Microsegregation Mechanisms in Aluminum Binary Alloys of Different Casting Techniques: a Quantitative study: *Zhenjie Yao*[1]; Yang Huo[2]; Mei Li[2]; John Allison[1]; [1]University of Michigan; [2]Ford Motor Company

Numerical Simulation of Temperature Field in 6061 Aluminum Alloy Vertical Twin-roll Casting Process: *Chaopan Xie*[1]; Xiaoping Liang[1]; Yu Wang[1]; [1]ChongQing University

CORROSION

Coatings and Surface Engineering for Environmental Protection II — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Arif Mubarok, PPG; Raul Rebak, GE Global Research; Rajeev Gupta, University of Akron; Tushar Borkar, Cleveland State University; Brian Okerberg, PPG Industries; Michael Mayo, PPG Industries

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Advanced Coating and Surface Modification Technologies for SiC-SiCf Composites for Hydrothermal Corrosion Protection in LWRs: *Kyle Quillin*[1]; Hwasung Yeom[1]; Tyler Dabney[1]; John Lacy[1]; Peng Xu[2]; Kumar Sridharan[1]; [1]University of Wisconsin, Madison; [2]Westinghouse Electric Company

Anti-Corrosive Properties and Theoretical Studies of Some Thiosemicarbazide Compounds on Mild Steel Corrosion in Hydrochloric Acid: *Esra Sezer*[1]; Emel Bayol[1]; A. Ali Gürten[2]; Fatma Kandemirli[3]; Yusuf Akkaya[1]; [1]Nigde Ömer Halisdemir University; [2]Osmaniye Korkut Ata University; [3]Kastamonu University

Cold Sprayed Coating for Corrosive Conditions: *Harminder Singh Chouhan*[1]; [1]Guru Nanak Dev University

Corrosion Control by Using Zinc as Sacrificial Anode Cathodic Protection in Geopolymer Concrete: Farah Farhana Binti Zainal[1]; Noratikah Binti Md Zin[1]; *Siti Aisyah Binti Abd Razak*[1]; Azmi Rahmat[1]; Kamarudin Hussin[1]; Mohd Mustafa Al Bakri Abdullah[1]; [1]Universiti Malaysia Perlis

Corrosion Resistance and Electrochemical Corrosion Characteristics of Stainless Steel for Seawater Desalination Evaporator: *Yangang Zhang*[1]; Liang Liao[1]; Zhangfu Yuan[1]; Chunhong Shi[1]; [1]University of Science and Technology Beijing

Development of Corrosion Barrier Coatings for U3Si2 Nuclear Fuel Pellets for Light Water Reactors: *John Lacy*[1]; Hwasung Yeom[1]; Lu Cai[2]; Kathryn Metzger[2]; Edward Lahoda[2]; Kumar Sridharan[1]; [1]University of Wisconsin - Madison; [2]Westinghouse Electric Company

Establishment of a Lead Loop Facility to Support Lead Cooled Fast Reactor Design: *Osman Anderoglu*[1]; Cemal Cakez[1]; Shuprio Ghosh[1]; Khaled Talaat[1]; Sang Lee[1]; Youho Lee[2]; Keith Woloshun[3]; Seung Kim[3]; Stuart Maloy[3]; Cetin Unal[3]; Michael Ickes[4]; Paolo Ferroni[4]; [1]University of New Mexico; [2]Seoul National University; [3]Los Alamos National Laboratory; [4]Westinghouse Electric Company

Microstructure Characteristics After Combustion and Fireproof Mechanism of TiAl-based Alloys: *Peixuan Ouyang*[1]; Guangbao Mi[2]; Peijie Li[3]; Shuting Zhang[4]; [1]North China University of Technology;Tsinghua Univiversity; [2]AECC Beijing Institute of Aeronautical Materials; [3]Tsinghua University; [4]North China University of Technology

Nanoceramic Coatings for Heavy Liquid Metal Applications: *Boris Paladino*[1]; Matteo Vanazzi[1]; Daniele Iadicicco[1]; Serena Bassini[2]; Marco Utili[2]; Fabio Di Fonzo[1]; [1]Istituto Italiano di Tecnologia (IIT); [2]ENEA

Pitting Corrosion in Ferritic Stainless Steels: Orlando Ledezma Villa[1]; *Emmanuel Sanchez Aguilar*[1]; [1]Universidad Autonoma de Nuevo Leon

ENERGY & ENVIRONMENT

Computational Materials Science and Engineering of Materials in Nuclear Reactors — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Dilpuneet Aidhy, University of Wyoming; Michael Tonks, University of Florida; Mahmood Mamivand, Boise State University; Giovanni Bonny, Belgian Nuclear Research Center

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Ab-initio Modelling of Iodine Defects in Strained Zirconium and Ordered Zirconium-oxygen Suboxides: *Vlad Podgurschi*[1]; Daniel King[1]; Jana Smutna[1]; Mark Wenman[1]; [1]Imperial College London

Ab-Initio Molecular Dynamics Study of Tritium Transport and Chemical Structures in Molten FLiBe and FLiNaK: *Stephen Lam*[1]; Ronald Ballinger[1]; Ju Li[1]; Charles Forsberg[1]; [1]Massachusetts Institute of Technology

Development of a New Thermochemistry Solver for Multiphysics Simulations of Nuclear Materials: *Parikshit Bajpai*[1]; Max Poschmann[1]; David Andrs[2]; Chaitanya Bhave[3]; Michael Tonks[3]; Markus Piro[1]; [1]Ontario Tech University; [2]Idaho National Laboratory; [3]University of Florida

ICME Modeling of U-10%wt Mo Alloys: A Linkage between Microstructure Evolution and Process Modeling: *Chao Wang*[1]; Zhijie Xu[1]; William Frazier[1]; Ayoub Soulami[1]; Saumyadeep Jana[1]; Kyoo Sil Choi[1]; Curt Lavender[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

Joining of Zircaloy-4 of Dissimilar Thickness Using Electron Beam Welding: *Lord Nayak*[1]; Gour Roy[1]; [1]Indian Institute of Technology Kharagpur

Machine Learning-assisted Risk-informed Sensitivity Analysis for ATF Under SBO: *Jianguo Yu*[1]; Cole Blakely[1]; Hongbin Zhang[1]; [1]Idaho National Laboratory

Mesoscale Modeling of High Burn-up Structure (HBS) Formation and Evolution in U-Mo Alloys: *Karim Ahmed*[1]; Daniel Schwen[2]; Yongfeng Zhang[2]; [1]Texas A&M University; [2]Idaho National Laboratory

Molecular Dynamics and Phase-field Study of Anisotropic Grain Growth Behavior in UO_2: *Jarin French*[1]; Yipeng Gao[2]; Xian-Ming Bai[1]; [1]Virginia Tech; [2]Idaho National Laboratory

Origin of Hardening in Spinodally-decomposed Fe-Cr Binary Alloys: *Tomoaki Suzudo*[1]; Takeshi Toyama[2]; Yoshiyasu Nagai[2]; [1]Japan Atomic Energy Agency; [2]Tohoku University

Recrystallization and Grain Growth Simulations for Multiple-pass Rolling and Annealing of U-10Mo: *William Frazier*[1]; Chao Wang[1]; Shenyang Hu[1]; Zhijie Xu[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

Research on the Macrosegregation of 30Cr2Ni4MoV Steel Ingots Under Different Solidification Thermal Boundary Conditions Simulated by Procast Software: *Zheng Chen*[1]; Yu Yao[2]; Lei Shi[2]; Jieyu Zhang[2]; [1]Tongling University; [2]Shanghai University

Shape and Stability of Voids and Fission Gas Bubbles in UO2: Conor Galvin[1]; Michael Rushton[2]; Michael Cooper[3]; David Andersson[3]; Robin Grimes[4]; *Patrick Burr*[5]; [1]UNSW + Imperial; [2]Bangor University; [3]Los Alamos National Laboratory; [4]Imperial College London; [5]UNSW Sydney

The Contribution of Li Vacancies to the Evolution of Thermal Conductivity in Irradiate LiAlO2: Seyed Aria Hosseini[1]; Tina Mirzae[1]; Eric Peraza[2]; *Alex Greaney*[1]; [1]University of California, Riverside; [2]Pacific Northwest National Laboratory

Thermodynamics of Hydrogen Pickup in Zr Alloys: *Vidur Tuli*[1]; Christopher Jones[2]; Katie Moore[2]; Michael Preuss[2]; Magnus Limback[3]; Antoine Claisse[3]; Patrick Burr[1]; [1]The University of New South Wales; [2]University of Manchester; [3]Westinghouse Electric Sweden AB

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Transitions at Grain Boundaries VII — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Douglas Spearot, University of Florida; Jian Luo, University of California, San Diego; Jennifer Carter, Case Western Reserve University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Deformation Nanomechanics and Dislocation Quantification at Atomic Scale in Nanocrystalline Pure-metal Magnesium: *Md Shahrier Hasan*[1]; Wenwu Xu[2]; [1]San Diego State University and University of California, San Diego; [2]San Diego State University

Investigation of Grain Boundary and Dislocation Interactions Through In-situ TEM MEMS-based Tensile Nanomechanical Testing of Ultrafine Grained Gold Thin Films: *Sandra Stangebye*[1]; Saurabh Gupta[1]; Yin Zhang[1]; Joshua Kacher[1]; Olivier Pierron[1]; Ting Zhu[1]; [1]Georgia Institute of Technology

The Chemical Effect on the Potential Energy Landscape of Grain Boundary: *Sam Garretson*[1]; Liang Tian[1]; Lin Li[1]; [1]The University of Alabama

ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management Symposium — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Energy Committee

Program Organizers: Xiaobo Chen, RMIT University; Yulin Zhong, Griffith University; Lei Zhang, University of Alaska Fairbanks; John Howarter, Purdue University; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Advanced Skutterudite-based Unicouples for a Proposed Enhanced Multi-mission Radioisotope Thermoelectric Generator: *Brian Phan*[1]; [1]Jet Propulsion Laboratory

CaO Poisoning on Mn-Ce/AC Catalyst for Selective Catalytic Reduction of NO with NH_3 at Low Temperature: *Zenghui Su*[1]; Shan Ren[1]; Jie Yang[1]; Tianshi Zhang[1]; Zelong Cai[1]; Lin Chen[1]; Ming Kong[1]; Qingcai Liu[1]; Jian Yang[1]; Jiangling Li[1]; [1]ChongQing University

Enabling Corrosion-resistant Magnesium Through Cross-linking Polymerized Inorganic Sol Coatings: *Wei Wang*[1]; Xiaona Yang[1]; Yong Fan[1]; Xiaobo Chen[2]; [1]Jilin University; [2]RMIT University

MnO_x-decorated Fe-Zr based Nano-catalysts for Low Temperature NH_3-SCR: Improvement of Catalytic Activity: *Chen Yang*[1]; Jian Yang[1]; Qingrui Jiao[1]; Yuanmeng Tian[1]; Qingcai Liu[1]; Shan Ren[1]; Jiangling Li[1]; [1]ChongQing University

Modeling the Rate of Heat Loss from the Stack of a Natural Gas Pressure Reducing Station Heater: *Amin Kazemi*; Ali Kianifar[1]; [1]Ferdowsi University of Mashhad

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Luke Brewer, University of Alabama; Sebastien Dryepondt, Oak Ridge National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Xiaoyuan Lou, Auburn University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Contrasting Corrosion and Cracking Behavior of Additively Manufactured and Wrought 17-4PH Stainless Steel: *Trevor Shoemaker*[1]; James Burns[1]; [1]University of Virginia

Localized Corrosion of Selective Laser Melted Stainless Steel 316L: *Duane Armell Macatangay*[1]; Jonathan Skelton[1]; Wenhao Lin[1]; Robert Kelly[1]; Ji Ma[1]; [1]University of Virginia

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Def-Aero, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Bai Cui, University of Nebraska-Lincoln

Fracture Failure Analysis on 20MnTiB Steel High-strength Bolt used in Bridge: *Lan Liu*[1]; Juan Wen[2]; QingCai Liu[1]; Lin Chen[1]; [1]Chongqing University; [2]Chongqing Cheng Tou Road and Bridge Administration Co.Ltd

Fracture Failure Analysis on 35VB Steel High-strength Bolt used in Bridge: *Lin Chen*[1]; Juan Wen[2]; Qingcai Liu[1]; Lan Liu[1]; [1]Chongqing University; [2]Chongqing Cheng Tou Road and Bridge Administration Co.Ltd

MECHANICS & STRUCTURAL RELIABILITY

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Garrett Pataky, Clemson University

A Microstructural Mechanism for Low-cycle Fatigue in NiTi Shape Memory Alloy: *Harshad Paranjape*[1]; Thomas Duerig[1]; [1]Confluent Medical Technologies

Analysis of Fatigue Crack Evolution using In-situ Testing: Susheel Dharmadhikari[1]; *Amrita Basak*[1]; [1]Pennsylvania State University

Assessing the Influence of Different Forging Process Parameters on the Local Fatigue Properties of a Precipitation Hardening Ferritic-pearlitic Steel: Matthias Hell[1]; *Rainer Wagener*[1]; Tobias Melz[1]; [1]Fraunhofer Institute for Structural Durability and System Reliability LBF

Bauschinger Effect and Strain Hardening of Polygonal Ferrite and Granular Bainite Occurring During Pipe-forming of Linepipe Steels: *Dae Woong Kim*[1]; Wan-Keun Kim[2]; Jin-ho Bae[2]; Hyoung Seop Kim[1]; Sunghak Lee[1]; [1]Postech; [2]POSCO

Deformation Mechanism of Nickel-titanium-hafnium Alloys Subjected to Rolling Contact Fatigue Experiments: *Behnam Aminahmadi*[1]; Sean Mills[1]; Christopher Dellacorte[2]; Ronald Noebe[2]; Aaron Stebner[1]; [1]Colorado School of Mines; [2]NASA Glenn Research Center

Determination of Critical Stress Intensity Factor from the Experimental Data Showing Indentation Size Effect for Modeling Crack Propagation: *Anand Kumar*[1]; Indrani Sen[1]; [1]Indian Institute of Technology, Kharagpur

Development and Validation of an Accelerated Fatigue Test Method using Model Dental-composite Restoration: *Wondwosen Aregawi*[1]; Anqi Zhang[1]; José Antonio Olivares Treviño[2]; Ruoqiong Chen[3]; Conrado Aparicio[1]; Joel Rudney[3]; Alex Fok[1]; [1]Minnesota Dental Research Center for Biomaterials and Biomechanics, School of Dentistry, University of Minnesota, United States; [2]Facultad de Ingenieria Mecanica Y Electrica, Universidad Autónoma de Nuevo León, Mexico; [3]Department of Diagnostic and Biological Sciences, School of Dentistry, University of Minnesota

Effect of Contact Pressure and Stress Ratio on the Fretting Fatigue Behavior of Ti-900 Fretted Against Ti-685: *Yokesh Kumar*[1]; Murthy Haradanahalli[1]; S.Ganesh Sundara Raman[1]; Anuradha Nayak Majila[2]; D. Chandru Fernando[2]; [1]Indian Institute of Technology Madras; [2]GTRE

Effect of Machining and Surface Microstructure in Fatigue Life for Aerospace Titanium Alloys: *Daniel Suarez Fernandez*[1]; Bradley Wynne[1]; Pete Crawforth[2]; Katharine Fox[3]; Martin Jackson[1]; [1]The University of Sheffield; [2]Advanced Manufacturing Research Centre; [3]Rolls-Royce plc.

Elucidating the Effect of High Altitude Environments on the Fatigue Life of 7075-T651 Aluminum Alloy Determined by using AFGROW Modeling: *Luke Brown*[1]; [1]University of Virginia

Fatigue Behavior and Analysis of Heavy Duty Riveted Steel Grating: *Warda Abdulla*[1]; Craig Menzemer[1]; [1]The University of Akron

Fatigue Crack Growth Behavior in Al-7075 Under In-plane Biaxial Loading with Mixed-mode Overloads: *Abhay Singh*[1]; Siddhant Datta[1]; Aditi Chattopadhyay[1]; Nam Phan[2]; [1]Arizona State University; [2]US Naval Air Systems Command

Influence of the Loading Frequency on the Fatigue Behavior of Steels: *Karl-Heinz Lang*[1]; Steffen Becker[1]; [1]Karlsruhe Institute of Technology (KIT)

Low-cycle Fatigue Modeling of Aluminum Landing Mat Connection System: *Nolan Hoffman*[1]; [1]U.S. Army ERDC

Monotonic and Cyclic Behavior of Alloy Mar-M-509 Fabricated by Direct Metal Laser Melting: *Saeede Ghorbanpour*[1]; Nicholas Ferreri[1]; Marko Knezevic[1]; [1]University of New Hampshire

Quantitative Characterization and Multi-scale Modeling of the Effects of Porosity on Fatigue Life in Ni-based Single Crystal Superalloys: *Keli Liu*[1]; Junsheng Wang[1]; [1]Beijing Institute of Technology

Quasi-in-situ Analysis of the Microstructure Evolution of AZ31B Alloy During Cyclic Deformation: *Rong Shi*[1]; [1]Chongqing university

Review of Surface Deformation Strengthening on the Fatigue Behavior of Metal Material: Hongyun Zhang; Shuangwu Xia; Shoudong Chen; *Jinbiao Zhang*; [1]

Understanding High Cycle Fatigue Behavior in a Bimodal Two-phase Ti-alloy Through Detailed Strain Mapping: *Conghui Liu*[1]; João Fonseca[1]; Michael Preuss[1]; [1]The University of Manchester

General Poster Session — Additive Technologies

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Effect of Process Parameters on Plasma Transferred Arc Additive Manufactured 17-4PH Using the Taguchi Method: *Sandy El Moghazi*[1]; Jose Mercado Rojas[1]; Tonya Wolfe[2]; Hani Henein[1]; Ahmed Qureshi[1]; [1]University of Alberta; [2]Innotech Alberta

Effect of Scanning Strategy and Energy Density on Mechanical and Microstructural Properties of 316L Stainless Steel Processed via Selective Laser Melting: *Taban Larimian*; Manigandan Kannan[1]; Dariusz Grzesiak[2]; Bandar Almangour[3]; Tushar Borkar[4]; [1]the University of Akron; [2]West Pomeranian University of Technology; [3]Saudi Arabia Basic Industries Corporation; [4]Cleveland State University

Effects of Bi in Rapid Solidification of a Hypoeutectic Al-Si Alloy: *José Marcelino Dias*[1]; Abdoul-Aziz Bogno[2]; Jose Spinelli[3]; Amauri Garcia4; Hani Henein[2]; 1University of Campinas and University of Alberta; [2]University of Alberta; [3]Federal University of São Carlos; [4]University of Campinas

Effects of Photoinitiators on Biomechanical Properties of Gelatin Methacrylate Hydrogels and Cell Viability in 3D Bioprinting: Heqi Xu[1]; *Jazzmin Casillas*[1]; Changxue Xu[1]; [1]Texas Tech University

Microstructure and Mechanical Properties of 410 Stainless Steel via Metal Big Area Additive Manufacturing: *Sougata Roy*[1]; Benjamin Shassere[2]; Jake Yoder[3]; Andrzej Nycz[1]; Mark Noakes[1]; Niyanth Sridharan[1]; [1]Oak Ridge National Laboratory; [2]MS Technology, Inc.; [3]Virginia Tech

Microstructure and Mechanical Properties of Ti-6Al-4V Additively Manufactured with Electron Beam Freeform Fabrication: *Samuel Present*[1]; Karen Taminger[2]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]NASA Langley Research Center

Properties and Microstructure of Additive Manufactured Carbon Steel: *Shifeng Liu*[1]; [1]Xi'an University of Architecture and Technology

General Poster Session — Biomaterials

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Zn-0.8Li Alloy with Superior Mechanical Properties and Ideal Degradation Rate for Biomedical Stents: *Lu-Ning Wang*[1]; [1]University of Science And Technology Beijing

General Poster Session — Corrosion

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Enhanced Passivation Layer by Cr Diffusion of 301 Stainless Steel Facilitated by SMAT: *Temitope Olugbade*[1]; Chang Liu[1]; Jian Lu[1]; [1]City University of Hong Kong

Mechanical Testing and Tomography of Crack Development in 5XXX Aluminum Service Material: *Benjamin Palmer*[1]; Visweswara Gudla[2]; John Lewandoski[1]; [1]Case Western Reserve University; [2]University of Manchester

The Role of Composition and Microstructure on the Cyclic Oxidation Kinetics of IN738LC, N5 and Rene 80: *Mallikarjuna Heggadadevanapura Thammaiah*[1]; Norman Richards[1]; William Caley[1]; [1]University of Manitoba

Development of Ni-based Amorphous Coating for the Prevention of Hydrogen Embrittlement in Line Pipe Grade Steels: *Santigopal Samanta*[1]; Charu Singh[1]; Kallol Mondal[2]; Amar Bhagat[1]; Monojit Dutta[1]; Shiv Brat Singh[3]; [1]Tata Steel Limited; [2]Indian Institute of Technology Kanpur; [3]Indian Institute of Technology Kharagpur

Replicating Corrosion in Gas Turbine Engines: *Abigail Ackerman*[1]; Ben Wood[1]; Stella Pedrazzini[1]; [1]Imperial College, London

General Poster Session — Electronic Materials

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Engineering Surface Ligands of Silver Nanocrystals to Design High Performance Electromagnetic Interference Shielding Properties: *Ji-Hyuk Choi*[1]; [1]Korea Institute of Geoscience and Mineral Resources

Fabrication of Highly Reliable Joint based on Cu@Ni@Sn Double-layer Powder for High Temperature Application: *Ju Xu*[1]; Hongyan Xu[1]; [1]Institute of Electrical Engineering,Chinese Academy of Sciences

Facile Microwave Synthesis of Size-tunable CdSe Quantum Dots for Industry and Solar Cell Applications: *Jacob Strimaitis*[1]; Taliya Gunawansa[1]; Sangram Pradhan[1]; Messaoud Bahoura[1]; [1]Norfolk State University

General Poster Session — Energy & Environment

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Effect of Additives on the Electrochemical Performance of the Cathodes based on Pure Oxygen Redox Reaction: *Yong Joon Park*[1]; Si Yeol Lee[1]; [1]Kyonggi University

Model to Predict Five-day Biochemical Oxygen Demand (BOD5) from Chemical Oxygen Demand and Permanganate Value in Surface Water: *Ita Uwidia*[1]; Christopher Ademoroti[1]; [1]University of Benin

Numerical Modeling of an Active Magnetic Regenerator Device for the Assessment of Promising Magnetic Refrigerants: *Huseyin Ucar*[1]; Durga Paudyal[2]; [1]California State Polytechnic University, Pomona; [2]Ames Laboratory

Sound Wave Induced Agglomeration of Ultra-fine Particles for Efficient Filtering: *Hyo-Soo Lee*[1]; Hai-Joong Lee[1]; [1]Korea Institute of Industrial Technology

Synthesis of Ni-Zn-B MAB Phases and an Investigation on their Electrochemical Properties: *Amir Ardalan Rezaie*[1]; Boniface Fokwa[1]; Juchen Guo[1]; [1]University of California, Riverside

Simulation of Heating Profiles of Various Magnetic Fluids in Alternating Magnetic Fields: *Brittany Williams*[1]; Huseyin Ucar[1]; Durga Paudyal[2]; [1]Cal Poly Pomona; [2]Iowa State University

General Poster Session — Light Metals

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Effect of Heat Treatment on Bending Performance of Extruded 6082 Aluminum Alloy T Profiles: *Mehmet Güner*[1]; Osman Halil Çelik[1]; Mert Altay[1]; Cem Mehmetalioglu[1]; [1]ASAS Aluminium

Improvement in Bending Formability of Rolled Magnesium Alloy through Precompression and Subsequent Annealing: Jong Un Lee[1]; Sang-Hoon Kim[1]; Ye Jin Kim[1]; *Sung Hyuk Park*[1]; [1]Kyungpook National University

Optimization of Aluminum Die Casting Processes Trough Improved Die Performances: *Mario Rosso*[1]; [1]INSTM

Pyramidal \60c+a\62 Cross-slip Mediated Ductility in Mg Alloys: *Rasool Ahmad*[1]; Zhaoxuan Wu[2]; William Curtin[1]; [1]EPFL; [2]City University of Hong Kong

Understanding Room Temperature Softening Behavior in AA5182: Atish Ray[1]; *John Carsley*[1]; DaeHoon Kang[1]; [1]Novelis Inc.

General Poster Session — Mechanics & Structural Relilability

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Grain Boundaries Energy Measurements in Bicrystals and Polycrystals of Uranium Dioxide: *Amani Ksibi*[1]; [1]Cea Cadarache

On the Computational Solution of Continuum Dislocation Dynamics: A Comparison of Two Stress Update Algorithms: *Peng Lin*[1]; Ben Anglin[2]; Clint Geller[2]; Anter El-Azab[1]; [1]Purdue University; [2]Naval Nuclear Laboratory

General Poster Session — Nuclear Materials

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Deformation Studies on Highly Irradiated RPV Steels using Advanced Instrumented Technique: *Mikhail Sokolov*[1]; Maxim Gussev[1]; Robert Odette[1]; [1]Oak Ridge National Laboratory

Influence of Grain Size and Precipitates on Tellurium Corrosion Behaviors of GH3535 Alloy: *Li Jiang*[1]; Zhi Jun Li[1]; [1]Shanghai Institute of Applied Physics

Systematic Analysis on the Primary Radiation Damage in Th1-xUxO2 Fluorite Systems: *Miaoimao Jin*[1]; Chao Jiang[1]; [1]Idaho National Lab

Progress of TMSR Structural Materials Research: *Hefei Huang*[1]; [1]Shanghai Institute of Applied Physics, Chinese Academy of Sciences

LIGHT METALS

Magnesium Technology 2020 — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: J. Brian Jordon, University of Alabama; Victoria Miller, University of Florida; Vineet Joshi, Pacific Northwest National Laboratory; Neale Neelameggham, IND LLC

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Wim Sillekens, European Space Agency; Neale Neelameggham, IND LLC

Analysis of Deposition Path of Solid State Additive Manufacturing of AZ31 Mg Alloy: *Malcolm Williams*[1]; Thomas Robinson[1]; Paul Allison[1]; J. Brian Jordon[1]; [1]University of Alabama

Application of Three-phase Miscibility Gap Formation Mechanisms in Mg Alloys: *Shuanglin Chen*[1]; John Morral[2]; [1]CompuTherm LLC; [2]The Ohio State University

Compression of High Purity Magnesium Single Crystals Along C-axis at Room Temperature and Elevated Temperatures: *Yan Huang*[1]; [1]Brunel University London

Dependence of Ductility in High Pressure Die Casting AM60 Mg-alloy on Porosity: *Zhang Yongfa*[1]; [1]Chongqing University

Effect of Annealing on Microstructure and Mechanical Properties of Mg-6Al Alloy Plates Processed by Differential Speed Rolling: *Honglin Zhang*[1]; Zhigang Xu[1]; Sergey Yarmolenko[1]; Laszlo Kecskes[2]; Qiuming Wei[3]; Jag Sankar[1]; [1]North Carolina A&T State University; [2]Johns Hopkins University; [3]UNCC

Effect of Gradient Nanostructure on Microstructure and Mechanical Properties of AZ31 Magnesium Alloy Under High Strain Fate: *Yong Liu*[1]; Meng Duan[1]; [1]Key Laboratory of Lightweight and High Strength Structural Materials of Jiangxi Province, School of Mechatronics Engineering, Nanchang University

Effect of Tension on Edge Crack of AZ31 Magnesium Alloys Sheets Prepared by On-line Heating Rolling: *Jiangfeng Song*[1]; [1]Chongqing University

Effect of UNSM on Low Cycle Fatigue Properties of LZ91 Mg-Li Dual-phase Alloy: *Zhengtong Lu*[1]; Qilong Wang[1]; Shuhao Liu[1]; Yun Zou[1]; [1]Zhengzhou University

Effect of Zn on Solidification and Aging Behavior of Magnesium Alloys Containing Rare Earths: *Amjad Javaid*[1]; Frank Czerwinski[1]; [1]Natural Resources Canada

Effect of ZnO Nano-particle Addition and High Shear Process on Grain Refinement in the As-cast Magnesium: *Kwangmin Choi*[1]; Donghyun Bae[1]; [1]Yonsei University

Fracture Toughness and Microstructural Evolution of Bulk Nanostructured ZV62 Magnesium Alloy and its Numerical Validation: *Raviraj Verma*[1]; R. Jayaganthan[2]; Sumeer K. Nath[1]; A. Srinivasan[3]; [1]Indian Institute of Technology Roorkee; [2]Indian Institute of Technology Madras; [3]National Institute for Interdisciplinary Science and Technology, CSIR

Grain Refinement Technology of Mg Alloy for Road Wheel Application: *Jun Ho Bae*[1]; Young Hoon Moon[1]; Bong Sun You[1]; Ha Sik Kim[1]; [1]Korea Institute Of Materials Science

Improvement of Mechanical Properties of Mg Alloys Through Confined Rolling: *Pavitra Krishnan*[1]; Zhigang Xu[2]; Sergey Yarmolenko[2]; Jagannanthan Sankar[2]; Laszlo Kecskes[3]; Qiuming Wei[1]; [1]University of North Carolina at Charlotte; [2]N.C. A&T State University; [3]HEMI, Johns Hopkins University

Influence of Ag Additions on Formability and Strength of a Mg-Zn-Zr Alloy Subjected to Severe Plastic Deformation via Equal Channel Angular Pressing: *Matthew Vaughan*[1]; Bilal Mansoor[2]; Robert Barber[1]; Ibrahim Karaman[1]; Rainer Eifler[3]; H.J. Maier[3]; [1]Texas A&M University; [2]Texas A&M University at Qatar; [3]Leibniz Universität Hannover

Influence of Manganese on Deformation Behavior of Magnesium Under Dynamic Loading: *Ryutaro Goeda*[1]; Masatake Yamaguchi[2]; Tatsuya Nakatsuji[1]; Naoko Ikeo[1]; Toshiji Mukai[1]; [1]Kobe University; [2]Japan Atomic Energy Agency

Investigation on the Microstructure and Castability of As-cast Mg-3Y-2Gd-1Nd-0.4Zr Alloy: *Lixiang Yang*[1]; Lu Xiao[2]; Yuling Xu[2]; Fei Li[1]; Yuanding Huang[3]; Norbert Hort[3]; Baode Sun[1]; Zhongquan Li[1]; [1]Shanghai Jiao Tong University; [2]Shanghai Spaceflight Precision Machinery Research Institute; [3]GKSS Research Centre,Institute of Materials Research

In-vivo Performance of Bioabsorbable BioMg 250 Mg Alloy Implants: *Raymond Decker*[1]; Jake Edick[1]; Steve LeBeau[1]; [1]nanoMag LLC

Microstructure and Hardness of Porous Magnesium Processed by Powder Metallurgy Using Polystyrene as the Space Holder: Ning Zou[1]; *Qizhen Li*[1]; [1]Washington State University

Microstructure and Mechanical Properties of Mg-6Sn Alloy Processed by Differential Speed Rolling: *Kamil Majchrowicz*[1]; Zbigniew Pakiela[1]; Pawel Józwik[2]; Zbigniew Bojar[2]; [1]Warsaw University of Technology; [2]Military University of Technology

Novel Low-cost Magnesium Alloys with High Yield Strength and Plasticity: *Peng Peng*[1]; [1]Chongqing University

Precipitation Hardening Effects on Extension Twinning in Magnesium Alloys: *Haidong Fan*[1]; [1]Sichuan University

Preparing Magnesium Alloys for Electron Backscatter Diffraction: *Tracy Berman*[1]; [1]University of Michigan

Quantifying Dislocation Behavior in Mg Using a Phase Field Dislocation Dynamics Model Multiple Active Slip Planes: *Claire Weaver*[1]; Abigail Hunter[2]; Shuozhi Xu[1]; Anil Kumar[2]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

Sol-gel Based Lanthanum Phosphate Coating on Magnesium Alloys for Corrosion Resistance: *Jithu Jayaraj*[1]; Ashitha P. P[2]; Suja P[1]; Srinivasan A[1]; U. T. S Pillai[1]; [1]CSIR-NIIST; [2]Indian Institute of Science Education and Research

Study on Creep Behavior and Microstructure Evolution of T6 State Mg-15Gd Metal Mold Casting Alloy: *Shuxia Ouyang*[1]; [1]Northwestern Polytechnical University

The Application of Hydrogen-containing Phase Diagram Calculations on the Design of Mg-RE Hydrogen Storage Alloy: *Qun Luo*[1]; Qian Li[1]; Kuo-Chih Chou[1]; [1]State Key Laboratory of Advanced Special Steel & Shanghai Key Laboratory of Advanced Ferrometallurgy & School of Materials Science and Engineering, Shanghai University & Materials Genome Institute, Shanghai University & Shanghai Institute of Materials Genome

The Study of Galvanic Corrosion of Magnesium Alloy from the Perspective of Work Functions: *Chen Tao*[1]; Yuan Yuan[1]; Pan Sheng[1]; [1]Chongqing University

Thermomechanical Processing of Dilute Mg-Zn-Ca Alloys: *Jenna Krynicki*[1]; Laszlo Kecskes[2]; Suhas Eswarappa Prameela[1]; Zhigang Xu[3]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]MATSYS, Inc.; [3]North Carolina A&T State University

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Stephen Raiman, Oak Ridge National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Ab-initio Thermodynamics of Molten Salts: *Nicholas Winner*[1]; Mark Asta[1]; [1]University of California, Berkeley

Characterization of LiCl-KCl Eutectic and LiCl-KCl+H_2O Mixtures Using Electrochemical Impedance Spectroscopy: *Litun Swain*[1]; Gurudas Pakhui[1]; Suddhasattwa Ghosh[1]; Bandi Prabhakara Reddy[1]; [1]Indira Gandhi Centre for Atomic Research, Kalpakkam

Effect of Mn and Zn Inhibitors on the Corrosion of Incoloy 800H in the MgCl2-KCl Molten Salt: *Yuxiang Peng*[1]; Ramana Reddy[1]; [1]University of Alabama

Electrochemical Impedance Spectroscopic Study of Oxide Scales on 316L Stainless Steel in Molten FLiNaK Salt: *Jie Qiu*[1]; Peter Hosemann[1]; Digby Macdonald[1]; John Scully[1]; [1]University of California at Berkeley

Hot Corrosion Behavior of Ni Based Inconel 939 Superalloy in Molten Salt: *Ali Hemmasian Ettefagh*[1]; Congyuan Zeng[1]; Shengmin Guo[1]; [1]Louisiana State University

LIBS Investigation of Molten Salt Corrosion: *William Ponder*[1]; Kristian Myhre[2]; Stephen Raiman[3]; [1]University of Tennessee Department of Nuclear Engineering; [2]Oak Ridge National Laboratory ; [3]Oak Ridge National Laboratory

Maximization of Reduction Cell Efficiency for Spent Uranium Oxide Fuel: *Jarom Chamberlain*[1]; Michael Simpson[1]; [1]University of Utah

Molten Salt Electrolysis of Alkaline-earth Elements Using Liquid Metal and Alloy Electrodes: *Thomas Nigl*[1]; Timothy Lichtenstein[1]; Yuran Kong[1]; Hojong Kim[1]; [1]Pennsylvania State University

Multimodal Characterization of the Morphological and Chemical Evolution of Ni and Ni-20Cr Microwires in Purified Molten KCl:$MgCl_2$: *Arthur Ronne*[1]; Yi Xie[2]; Phillip Halstenberg[3]; Mingyuan Ge[4]; Xianghui Xiao[4]; Yachun Wang[2]; Wah-Keat Lee[4]; Lingfeng He[2]; Shannon Mahurin[3]; Yu-Chen Karen Chen-Wiegart[5]; [1]Department of Materials Science and Chemical Engineering, Stony Brook University; [2]Advanced Characterization Department, Idaho National Laboratory; [3]Chemical Sciences Division, Oak Ridge National Laboratory; [4]National Synchrotron Light Source - II, Brookhaven National Laboratory; [5]National Synchrotron Light Source - II, Brookhaven National Laboratory; Department of Materials Science and Chemical Engineering, Stony Brook University

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIX — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hiroshi Nishikawa, Osaka University; Shi-Kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology, CAS; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; Song-Mao Liang, Clausthal University of Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Hiroshi Nishikawa, Osaka University; Shih-Kang Lin, National Cheng Kung University

A Switching Model of Phase-change Memory by Combining Electrothermal and Phase-field Models: Hwanwook Lee[1]; Minkyu Shin[1]; *Yongwoo Kwon*[1]; [1]Hongik University

CALPHAD-assisted Analyses of BOF Slag Recovery: *Han-Yu Wang*[1]; Wan-Yu Huang[1]; Yung-Chang Liu[2]; Kuan-Ju Lin[2]; Shih-kang Lin[1]; [1]National Cheng Kung University; [2]China Steel Corporation

Comparison of Oxide Reduction Temperature between Highly <111>-Oriented Nanotwinned Cu and Regular Cu Films: *Wei-You Hsu*[1]; Cheng-Syuan Wu[1]; Chi-Shen Lee[1]; Chih Chen[1]; [1]National Chiao Tung University

Effects of Current Stressing on Mechanical Property and Microstructure of an Fe-Ni Alloy at Ambient Temperature: *Jun-Jia Huang*[1]; Kwang-Lung Lin[1]; [1]National Cheng Kung University

Effects of Plating Current Density on the Microstructure of Cu Pillars and Its Solderability: *Pei-Tzu Lee*[1]; Ying-Syuan Wu[2]; Cheng-Yu Lee[2]; Wei-Ling Chou[2]; Hung-Cheng Liu[3]; Cheng-En Ho[2]; [1]National Taiwan University; [2]Yuan Ze University; [3]Kinsus Interconnect Technology Corp.

Effects of Surface Finish on the Interfacial Cu6Sn5 Morphology and Mechanical Characteristics in Solder Joints: *Wei-Ling Chou*[1]; Shu-Ping Yang[1]; Cheng-Yu Lee[1]; Tsai-Tung Kuo[2]; Cheng-En Ho[1]; [1]Yuan Ze University; [2]Taiwan Uyemura Limited Company

Interfacial Reactions in the Au/Sn-xZn/Cu Sandwich Couples: *Yi-Show Lin*[1]; Yi-Pin Wu[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science and Technology

From Electric Current-induced Lattice Strain to Electromigration Occurrence: an In-situ Study: *Kuan-Hsueh Lin*[1]; Yu-chen Liu[1]; Shih-kang Lin[1]; Ching-Shun Ku[2]; Shang-Jui Chiu[2]; [1]National Cheng Kung University; [2]National Synchrotron Radiation Research Center

Interfacial Reactions in the Cu/Sn/Ni Sandwich Couples: *Cheng-Han Lee*[1]; Shih-Jung Chai[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science and Technology

Mechanisms of Abnormal Grain Growth of Al Bonding Wires Under Annealing Process: *Jen-Hsuan Tsai*[1]; Fan-Yi Ouyang[1]; [1]National Tsing Hua University

Interfacial Reactions of Ag-Au-xPd Alloys Wire Bonding with Al: *Chiao-Yi Yang*[1]; Kuo-Jung Chen[1]; Wallace Chuang[2]; Eckart Schellkes[2]; Yee-Wen Yen[1]; [1]National Taiwan University of Science and Technology; [2]Robert Bosch Taiwan Co., Ltd. Automotive Electronics Division

Interfacial Reaction of Au-xAg/Al Couples: *Chiao-Yi Yang*[1]; Kuo-Jung Chen[1]; Hsien-Ming Hsiao[2]; Yee-Wen Yen[3]; [1]Department of Materials Science and Engineering, National Taiwan University of Science and Technology; [2]Institute of Nuclear Energy Research, Taoyuan.; [3]National Taiwan University of Science and Technology

Structure-property Relation of Glass Fiber-PZT Composites: *Fernando Londono*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

Interfacial Reactions in the Sn/Au-xCu Couples: *Po-Cheng Kuo*[1]; Chia-Yi Yeh[1]; Hsien-Ming Hsiao[2]; Yee-Wen Yen[3]; [1]Department of Materials Science and Engineering, National Taiwan University of Science and Technology.; [2]Institute of Nuclear Energy Research, Taoyuan.; [3]National Taiwan University of Science and Technology

ENERGY & ENVIRONMENT

Powder Materials for Energy Applications — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Oxygen Resistant Ceramic MGA for High Temperature Applications: *Samuel Reed*[1]; [1]The University of Newcastle

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Poster Session I

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: To Be Announced

Atomistic Simulation of Neutron Radiation Damage in High-temperature Superconducting REBCO Materials: *Rebecca Gray*[1]; Michael Rushton[2]; Samuel Murphy[1]; [1]Lancaster University; [2]Bangor University

Coupled Electronic and Nuclear Stopping Effects on Damage Accumulation in SiC: *Lauren Nuckols*[1]; Miguel Crespillo[1]; Chen Xu[1]; Yanwen Zhang[2]; William Weber[1]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory

Damage Evolution in Apatite Irradiated with Alpha Emitters: Dee Jay Cerico[1]; Frederico Garrido[1]; Cécile Gautheron[2]; Lech Nowicki[3]; Cyril Bachelet[1]; Jérôme Bourçois[1]; Sandrine Picard[1]; *Aurelie Gentils*[1]; [1]CSNSM, Université Paris-Sud-CNRS; [2]Géoscieces Paris-Sud, Université Paris-Sud-CNRS; [3]National Centre for Nuclear Research

Deep Ion Implantation at the 88-Inch Cyclotron: *Sarah Stevenson*[1]; Peter Hosemann[1]; Lee Bernstein[1]; Andrew Voyles[2]; Saryu Fensin[3]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory; [3]Los Alamos National Laboratory

Defect Clustering in Irradiated Alpha Uranium: Cluster Dynamics Modeling and Ion Irradiation Experiments: Fabia Farlin Athena[1]; *Sanjoy Majumder*[1]; Tiankai Yao[2]; Lingfeng He[2]; Anter El-Azab[1]; [1]Purdue University; [2]Idaho National Laboratory

Defect Ordering in yttria Stabilized Zirconia under 45 MeV Ion Irradiation: Nathan Madden[1]; Eric Lang[1]; Shannon Murray[1]; Jean Paul Allain[1]; Daniel Shoemaker[1]; Khalid Hattar[2]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign; [2]Sandia National Laboratories

Effect of Ion Beam Irradiation on Microstructure Evolution of a Multi-metallic Layer Composite Material for Accident Tolerant Fuel Cladding Development: *Taeyong Kim*[1]; Jeonghyun Lee[1]; Ji Hyun Kim[1]; [1]Ulsan National Institute of Science and Technology

Electronic Effects in Molecular Dynamics Simulations of Ion Irradiation of SiC: *Eva Zarkadoula*[1]; German Samolyuk[1]; Yanwen Zhang[1]; William Weber[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

Equilibrium and Irradiation-induced Point-defect Disorder in ThO_2 and U-doped ThO_2: Modeling and Ion Irradiation Experiments: *Maniesha Singh*[1]; Tiankai Yao[2]; Lingfeng He[2]; Anter El-Azab[1]; [1]Purdue University; [2]Idaho National Laboratory

Evidence of Radiation Enhanced Diffusion via In-situ Ion Irradiation of Yttria Stabilized Zirconia Nanoparticles: *Nathan Madden*[1]; Khalid Hattar[2]; Jessica Krogstad[1]; [1]University of Illinois at Urbana-Champaign; [2]Sandia National Laboratories

Formation of High-pressure Reidite Enhanced by Alpha-decay Damage from Uranium and Thorium: *Weixing Li*[1]; Shuai Nan[1]; Sisi Wang[1]; Rodney Ewing[2]; [1]ITPCAS, Chinese Academy of Scienes; [2]Stanford University

Gamma-radiation Induced Corrosion of Copper: *Inna Soroka*[1]; Mats Jonsson[1]; [1]KTH

Ion Irradiation Effects on the Impedance Behavior of Oxide Scales on Fe-based Materials in Liquid Lead-bismuth Eutectic: *Jie Qiu*[1]; Peter Hosemann[1]; Digby Macdonald[1]; [1]University of California at Berkeley

Ionization Induced Changes in Carbon Bonding of Graphite: *John Demaree*[1]; Lenore Miller[2]; Zhiping Luo[2]; Daryush Ila[2]; [1]CCDC Army Research Laboratory; [2]Fayetteville State University

Irradiation Behavior of Piezoelectric Materials for Nuclear Reactor Sensors Applications: *Maha Yazbeck*[1]; Gaofeng Sha[1]; Joel Hatch[1]; Cole Harlow[1]; Aleksandr Chernatynskiy[2]; Joshua Daw[3]; Marat Khafizov[1]; [1]The Ohio State University; [2]Missouri University of Science &Technology; [3]Idaho National Laboratory

Meso-, Micro-, and Nano-scale Characterization of Neutron Irradiated U-10Zr Metallic Fuels via Synchrotron μ-CT and Electron Microscopy: *Jonova Thomas*[1]; Alejandro Figueroa[1]; Lingfeng He[2]; Xiang Liu[2]; Daniel Murray[2]; Peter Kenesei[3]; Jonathan Almer[3]; Jason Harp[2]; Maria Okuniewski[1]; [1]Purdue University; [2]Idaho National Laboratory; [3]Argonne National Laboratory

XCT Characterization of Neutron Irradiated SiC-SiC Composites: *Jose Arregui-Mena*[1]; Takaaki Koyanagi[1]; Gyanender Singh[1]; Christian Deck[1]; Yutai Katoh[1]; [1]Oak Ridge National Laboratory

NUCLEAR MATERIALS

Radiation Effects in Metals and Ceramics — Poster Session II

Sponsored by: TMS Structural Materials Division, TMS Nuclear Materials Committee

Program Organizers: Djamel Kaoumi, North Carolina State University; Thak Sang Byun, Oak Ridge National Laboratory; Dane Morgan, University of Wisconsin-Madison; Maria Okuniewski, Purdue University; Mahmood Mamivand, Boise State University; Geoffrey Beausoleil, Idaho National Laboratory; Philip Edmondson, Oak Ridge National Laboratory; Khalid Hattar, Sandia National Laboratories; Aurelie Gentils, Université Paris-Saclay; Joel Ribis, Commissariat a l'Energie Atomic CEA

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Combined use of In-situ Ion Irradiation and In-situ Nanomechanical Testing for Characterizing Helium Pre-implanted 304 Stainless Steel: *Ce Zheng*[1]; David Frazer[2]; Peter Hosemann[2]; Djamel Kaoumi[1]; [1]North Carolina State University; [2]University of California, Berkeley

Coupled Bulk and Grain Boundary Compositional Patterning in Binary Immiscible Alloy Under Irradiation: A Phase Field Modeling Study: *Qun Li*[1]; Pascal Bellon[1]; Robert Averback[1]; [1]University of Illinois at Urbana–Champaign

Coupled Effects of Nuclear and Electronic Energy Loss on Ion Irradiation Damage in Lithium Tantalate: *Chen Xu*[1]; Miguel Crespillo[1]; Lauren Nuckols[1]; William Weber[1]; Yanwen Zhang[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

Doppler Broadening Positron Annihilation Spectroscopy for Understanding Void Formation in Neutron Irradiated Fe-Cr Alloys: *Carly Romnes*[1]; Ming Liu[2]; James Stubbins[1]; [1]University of Illinois at Urbana-Champaign; [2]North Carolina State University

Effect of Ordered Helium Bubbles on the Deformation and Fracture Behavior in Zr: *Liu Simian*[1]; Han Weizhong[1]; [1]Xi'an Jiaotong University

Elucidating the Role of Dispersoids on the Bulk and Nano-mechanical Properties of Dispersion-strengthened W Alloys Following Ion Irradiation with In-situ Characterization
: *Eric Lang*[1]; Quentin Rizzardi[1]; Robert Maass[2]; Jean Paul Allain[3]; [1]University of Illinois; [2]University of Illinois at Urbana Champaign; [3]The Pennsylvania State University

Evaluation of Bubble Layers in Single- and Poly-crystal Tungsten after Helium Exposure: *Daniel Morrall*[1]; Cierra DellaRova[2]; Russell Doerner[3]; Matthew Baldwin[3]; Chad Parish[4]; [1]Oak Ridge National Lab; [2]Colorado School of Mines; [3]University of California, San Diego; [4]Oak Ridge National Laboratory

Exceptional Radiation Performance of Crystalline-amorphous Nanocrystalline Metal: *Miaomiao Jin*[1]; Michael Short[2]; Penghui Cao[3]; [1]Idaho National Laboratory; [2]Massachusetts Institute of Technology; [3]University of California, Irvine

Generalized Dislocation Mobility Law for BCC FeCrAl Alloys: *Sanjoy Mazumder*[1]; Raven Maccione[1]; Yash Pachaury[1]; Janelle Wharry[1]; Anter El-Azab[1]; [1]Purdue University

Exploring Stability of Nanocrystalline Metals with Competing Solute Effects Under High Temperature Irradiation: *Christopher Barr*[1]; Patrick Price[1]; Nathan Heckman[1]; Brad Boyce[1]; Khalid Hattar[1]; [1]Sandia National Laboratories

Heavy Irradiation in Nanolayered CuNb Composites: *Zhexian Zhang*[1]; Osman Anderoglu[1]; Nathan Mara[2]; Yongqiang Wang[3]; [1]University of New Mexico; [2]University of Minnesota; [3]Los Alamos National Laboratory

Helium Irradiation Induced Ultra-high Strength Nanotwinned Cu with Nanovoids: *Cuncai Fan*[1]; Qiang Li[1]; Jie Ding[1]; Yanxiang Liang[2]; Zhongxia Shang[1]; Jin Li[1]; Ruizhe Su[1]; Jaehun Cho[1]; Di Chen[3]; Yongqiang Wang[4]; Jian Wang[2]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]University of Nebraska, Lincoln; [3] University of Houston; [4]Los Alamos National Laboratory

Hydrogen/Deuterium Precipitation and Blisters/Bubbles Formation in Tungsten: *Tieshan Wang*[1]; Zhehao Chen[1]; Xuan Meng[1]; Jiangtao Zhao[1]; Jiandong Zhang[1]; [1]Lanzhou University

How to Improve an Irradation-simulation Testbed: Younggak Shin[1]; Sanghyuk Yoo[2]; Keonwook Kang[2]; *Byeongchan Lee*[1]; [1]Kyung Hee University; [2]Yonsei University

Influence of Grain Size and the Presence of Nano Oxides on the Radiation Resistance of a FeCrW Alloy: *Bertrand Radiguet*[1]; Auriane Etienne[1]; Cristelle Pareige[1]; Nariman Enikeev[2]; Constantinos Hatzoglou[1]; Maria Vrellou[1]; Julia Ivanisenko[3]; [1]University Of Rouen; [2]Ufa State Aviation Technical University; [3]Karlsruhe Institute of Technology

Investigating Radiation Damage in Metallic and Ceramic Materials for Advanced Nuclear Systems using JANNuS Multiple Ion Beams: *Aurelie Gentils*[1]; Celine Cabet[2]; [1]CSNSM, Univ Paris-Sud and CNRS/IN2P3, Université Paris-Saclay; [2]DEN, Service de Recherches de Metallurgie Physique, CEA, Université Paris-Saclay

Ion-irradiation-induced Structural Disorder and Thermal Conductivity Changes of Intermetallic Compounds: *Shradha Agarwal*[1]; Andy Nelson[2]; Steven Zinkle[3]; [1]University of Tennessee and Oak Ridge National Laboratory; [2]Oak Ridge National Laboratory; [3]University of Tennessee

Ion Irradiation Effects on the Microstructure of PM-HIP Inconel 625: *Caleb Clement*[1]; Janelle Wharry[1]; Xiang Liu[2]; Megha Dubey[3]; David Gandy[4]; [1]Purdue University; [2]Idaho National Laboratory; [3]Boise State University, Center for Advanced Energy Studies; [4]Electric Power Research Institute

Irradiation Induced Damage Evolution in Tungsten: *Trevor Clark*[1]; Suveen Mathaudhu[2]; Samuel Briggs[3]; Robert Dowding[4]; Jason Trelewicz[5]; Khalid Hattar[1]; [1]Sandia National Laboratories; [2]University of California, Riverside; [3]Oregon State University; [4]United States Army Research Laboratory; [5]Stony Brook University

Material Irradiation and Investigation Capabilities at TRIUMF: *Ferran Boix Pamies*[1]; Alexander Gottberg[1]; [1]TRIUMF

Mechanical Response of FeCr Alloys under Thermal Aging and Irradiation: *Pengcheng Zhu*[1]; Yajie Zhao[1]; Shradha Agarwal[1]; Steven Zinkle[2]; [1]The University of Tennessee, Knoxville; [2]The University of Tennessee

Microstructural Response of FeCr/Y_2O_3 Bilayer System to He/H implantation: *Olga Emelianova*[1]; Aurelie Gentils[2]; Maria Ganchenkova[3]; Amir Gumarov[4]; Igor Yanilkin[4]; Iskander Vakhitov[4]; Igor Golovchanskiy[5]; Igor Shchetinin[5]; Lenar Tagirov[6]; Vladimir Borodin[7]; [1]CSNSM, Univ Paris-Sud, CNRS/IN2P3, Université Paris-Saclay and National Research Nuclear University MEPhI; [2]CSNSM, Univ Paris-Sud, CNRS/IN2P3, Université Paris-Saclay; [3]National Research Nuclear University MEPhI; [4]Kazan Federal University; [5]National University of Science and Technology MISIS; [6]Zavoisky Physical-Technical Institute, FRC Kazan Scientific Center of RAS; [7]NRC Kurchatov Institute and National Research Nuclear University MEPhI

Microtensile Testing to Examine Irradiation Response of Iron-Chromium Foils: *Shahnaz Hoque*[1]; [1]University of Oxford

Modeling Slip-induced Crack Initiation in Nickel Containing Nano-scale Helium Bubbles: *Tung Yan Liu*[1]; Michael Demkowicz[1]; [1]Texas A&M University

Molecular Dynamics Simulation of Irradiation Damage in Disordered Alloys with Ordered Precipitation: *Shijun Zhao*[1]; [1]City University of Hong Kong

Neutron Radiation Induced Patterning of Fe-Cr System: A Phase-field Approach: *Bohyun Yoon*[1]; Jeongwhan Lee[1]; Kunok Chang[1]; [1]Kyung Hee University

Quantitative Phase Field Model for Void Nucleation and Growth under Ion Irradiation in Pure Metals: *Rayaprolu Sreekar Annadanam*[1]; Anter El-Azab[1]; [1]Purdue University

Radiation Damage Mechanisms in the Oxides Formed on Zr Alloys: *Junliang Liu*[1]; Guanze He[1]; Anamul Mir[2]; Jing Hu[3]; Stephen Donnelly[2]; Meimei Li[3]; Sergio Lozano-Perez[1]; Chris Grovenor[1]; [1]University of Oxford; [2]University of Huddersfield; [3]Argonne National Laboratory

Radiation Tolerance in Stabilized Alumina Coatings: an In-situ Irradiation Study: *Matteo Vanazzi*[1]; Davide Loiacono[2]; Wei-Ying Chen[3]; Meimei Li[3]; Marco G. Beghi[2]; Fabio Di Fonzo[1]; [1]Center for Nano Science and Technology (CNST) - IIT; [2]Politecnico di Milano; [3]Argonne National Laboratoy

Radiation Tolerance of Gradient Grain-structured Copper: *Heather Salvador*[1]; Yiwei Sun[1]; Trevor Clark[2]; Khalid Hattar[2]; Sina Shahrezaei[3]; Suveen Mathaudhu[1]; [1]University of California, Riverside; [2]Sandia National Laboratories; [3]Pacific Northwest National Laboratory

Small Scale Tensile Testing of Grain Boundary Strength of Pristine and Neutron Irradiated Ni Based X-750 Alloy: *Yachun Wang*[1]; Xiang Liu[1]; Daniel Murray[1]; Fei Teng[1]; Mukesh Bachhav[1]; Wen Jiang[1]; Lingfeng He[1]; Cheng Sun[1]; Ziqi Xiao[2]; Xian-Ming Bai[2]; John Jackson[1]; Robert Carter[3]; [1]Idaho National Laboratory; [2]Virginia Polytechnic Institute and State University; [3]Electric Power Research Institute, Inc

Thin-film Thermal Neutron Detectors Based on $CsPbBr_3$: *Martin Reyes Banda*[1]; Leunam Fernandez Izquierdo[1]; Xavier Mathew[1]; Iker Chavez[1]; Lidia El Bouanani[1]; Joseph Chang[1]; Carlos Avila Avendano[1]; Nini R. Mathews[1]; Isabel Pintor Monroy[1]; Manuel Quevedo - Lopez[1]; [1]University of Texas at Dallas

Tungsten Transmutation Products from Mixed Spectrum Neutron Irradiation: *Nathan Reid*[1]; Lauren Garrison[2]; Yutai Katoh[2]; Jean Paul Allain[1]; [1]University of Illinois at Urbana-Champaign; [2]Oak Ridge National Laboratory

Westinghouse Electric Company Accident Tolerant Fuels Irradiations: *Luke Olson*[1]; [1]Westinghouse Electric Corporation

ELECTRONIC MATERIALS

Recent Advances in Functional Materials and 2D/3D Processing for Sensors and Electronic Applications — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Ravindra Nuggehalli, New Jersey Institute of Technology; Anming Hu, University of Tennessee; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Yong Lin Kong, University of Utah; Mariappan Paranthaman, Oak Ridge National Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Pooran Joshi, Oak Ridge National Laboratory

A Novel Electrochemical Sensor for Determination of DNA Damage Biomarkers in Biological Fluids using Two-dimensional (2D) Layered Nanomaterial (Mxene) Covered Binary Metal Sulfide Nanocomposite: *Sea-Fue Wang*[1]; Govindasamy Mani[1]; [1]National Taipei University Of Technology

Hierarchical Porous Graphene Microsphere Ink for Printed Microsupercapacitors: Quanhong Chang[1]; *Lei Huang*[1]; [1]Shanghai Normal University

Printed Flexible Sensors Functionalized with TiO2 Nanowires for Room Temperature CO2 Gas Sensing: *Lingyue Zhang*[1]; Anming Hu[1]; Yongchao Yu[1]; [1]University of Tennessee, Knoxville

Wave Propagation in Optical Waveguides: *Jonathan Martinez*[1]; Samiha Hossain[1]; Jessy Nemati[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

Processing of Bistable Composites with Embedded Mechano-electrical Transduction for Filtered Mechanosensing: *Hortense Le Ferrand*[1]; [1]Nanyang Technological University

Relation between Temperature Dependence of Gate Insulator and Magnetic Energy effect of Thin Film Transistor without Channel Layer: Teresa Oh[1]; [1]Cheongju University

BIOMATERIALS

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carrado, IPCMS - CNRS; Heinz Palkowski, Clausthal University of Technology; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Ramana Chintalapalle, University of Texas at El Paso; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington; Vikas Tomar, Purdue University

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Characterization of Rubber Seed Oil Modified for Biolubricant Feedstock Application: *Farouk Mohammed*[1]; Isiaka Bakare[1]; Felix Okieimen[2]; [1]Rubber Research Institute of Nigeria; [2] University of Benin

Development Status and Suggestions of Refractories for Carbon Calcination Equipment: *Yan Zhao*[1]; Quan Hong[1]; Degang Shi[1]; Nansong Liu[1]; Xuan Dong[1]; [1]Shenyang Create-unite Industrial Technology Co., Ltd.

Effect of Post-Deposition Annealing on the Structural and Optical Properties of Sputter-Deposited Ga2O3 Thin Films: *Nanthakishore Makeswaran*[1]; Anil Krishna Battu[1]; C.V. Ramana[1]; [1]University Of Texas, El Paso

Fabrication and Characterization of BiCuSeO Epitaxial Films as the Bottom Electrode of All-oxide Spin Valve: *Che Ming Lin*[1]; Kin Hou Lao[1]; [1]Department of MSE, NCKU

Nanotubular Oxide Layers Enhancing Biological Potential of ß Titanium Alloys for Biomedical Application: *Anna Majchrowicz*[1]; Agata Roguska[2]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology; [2]Institute of Physical Chemistry of the Polish Academy of Sciences

Preparation and Uniformity Analysis of Sol-Gel TiO2 Thin Films: *Jihui Luo*[1]; Lijuan Xiang[1]; Ruyi Yang[1]; Yang Li[1]; [1]Yangtze Normal University

ENERGY & ENVIRONMENT

Recycling of Secondary, Byproduct Materials and Energy — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Mingming Zhang, ArcelorMittal Global R&D; John Howarter, Purdue University; Elsa Olivetti, Massachusetts Institute of Technology; Alan Luo, Ohio State University; Adam Powell, Worcester Polytechnic Institute; Ziqi Sun, Queensland University of Technology

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Mingming Zhang, ArcelorMittal

Characterization of Wasted LEDs from Tubular Lamps Focused on Recycling Process by Hydrometallurgy: Rafael Oliveira[1]; *Amilton Botelho Júnior*[1]; Denise Espinosa[1]; [1]University of São Paulo

Comprehensive Utilization of Vanadium Extraction Tailings: a Brief Review: *Xin Wang*[1]; Junyi Xiang[1]; Jiawei Ling[1]; Qingyun Huang[2]; Xuewei Lv[1]; [1]College of Materials Science and Engineering, Chongqing University; [2]College of Metallurgical and Materials Engineering, Chongqing University of Science and Technology

Crystallization and Carbonization of TiO2-CaO-SiO2 Ternary Slag: *Gangqiang Fan*[1]; Jundan Tan[1]; Run Zhang[1]; Jie Dang[1]; Chenguang Bai[1]; Chaowen Tan; Huxu Lei[1]; [1]Chongqing University

Gravity Separation of Zinc Mine Tailing using Wilfley Shaking Table to Concentrate Hematite.
: Jonathan Tenório Vinhal[1]; Raquel Hungaro Costa[2]; *Amilton Botelho Junior*[2]; Jorge Tenório[1]; Denise Espinosa[1]; [1]University of Sao Paulo; [2]USP

Hydrothermal Regeneration of Cycled LiFePO4 Cathode Material from Spent Lithium Ion Batteries: *Qiankun Jing*[1]; Yubo Liu[1]; Bao Liu[1]; Jialiang Zhang[1]; Chengyan Wang[1]; [1]University of Science and Technology, Beijing

Minimization of Copper Contamination in Steel Scrap: *Hyunsoo Jin*[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

Recycling Corrugated Cardboard: Boon-Chai Ng[1]; *Joshua Lim*[1]; [1]Andrews University

Recycling of Blast Furnace Flue Dust with In-flight Reduction Technology: Reduction Behavior and Kinetic Analysis: *Jin Xu*[1]; Nan Wang[1]; Min Chen[1]; Haiyang Yu[1]; [1]Northeastern University

Recycling of Used Quartz Crucible and Parts using Acid Leaching and Hot Chlorination Process: *Kim Jong Ho*[1]; [1]Rist

Residual Quarry Sludge Stabilization to Prefabricate Sustainable Building Elements.: *Andres Felipe Restrepo Ramirez*[1]; Nicolas Zapata Perez[1]; Juan Carlos Ochoa Botero[1]; Yhan Paul Arias Jaramillo[1]; [1]Universidad Nacional de Colombia

Selective Recovery of Lithium from Ternary Spent Lithium-ion Batteries using Sulfate Roasting-water Leaching Process: *Di Chang*[1]; [1]Central South University

Separation and Recovery of Zinc and Cobalt from Zinc Plant Residue by Alkali Leaching: Guihong Han[1]; Yangbo Geng[1]; *Yukun Huang*[1]; Zuoqi Ma[1]; Yanfang Huang[1]; Weijun Peng[1]; [1]Zhengzhou University

Study on Mineral Phase Pomposition and Viscosity of Hot Metal Pretreatment Desulfurization Slag Based on Factsage: *Tengfei Ma*[1]; Wufeng Jiang[1]; Suju Hao[1]; Yuzhu Zhang[1]; [1]North China University of Science and Technology

Study on Oxidation Roasting Process of Cathode Sheets from Spent Lithium Ion Batteries: *Yan Xi*[1]; [1]Central South University

MECHANICS & STRUCTURAL RELIABILITY

Understanding and Predicting Dynamic Behavior of Materials — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory

Monday PM | February 24, 2020
Sails Pavilion | San Diego Convention Ctr

Laser Induced Shock Compression of Covalently Bonded Planetary Materials: *Boya Li*[1]; [1]Uuniversity of California, San Diego

Probing the Strength of Iron at Ultra-high Pressures and Strain Rates: *Gaia Righi*[1]; [1]University of California San Diego

MATERIALS PROCESSING

11th International Symposium on High Temperature Metallurgical Processing — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, University of Queensland; Onuralp Yucel, Istanbul Technical University; Ender Keskinkilic, Atilim University; Tao Jiang, Central South University; Jesse White, Elkem Carbon AS; Morsi Mahmoud, King Fahd University of Petroleum and Mineral

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Ender Keskinkilic, Atilim University; Jesse White, Elkem Carbon AS

A Multi-zone Equilibrium Model for using Secondary Raw Materials in the Silicon Furnace: *Kai Erik Ekstroem*[1]; Gabriella Tranell[1]; [1]Norwegian University of Science and Technology

A Novel Method to Determine the Bubble Dynamics of the Bath in a Pilot-scale Top Submerged Lance Furnace: *Avinash Kandalam*[1]; Jörg Kleeberg[1]; Michael Stelter[1]; Markus Reuter[2]; [1]TU Bergakademie Freiberg; [2]Helmholtz Institute Freiberg for Resource Technology

An Integrated Optimal Control Model for the Drying and Preheating Process in Iron Ore Pellet Manufacturing: *Xiaoxian Huang*[1]; Xiaohui Fan[1]; Xuling Chen[1]; Min Gan[1]; Zhiyun Ji[1]; [1]Central South University

Analysis of Post-combustion Behavior on O_2 Gas Injection in Converter Process: *Ji-A Lee*[1]; Jae-Hong Kwon[1]; Kyeong-Uk Lee[1]; Chang-Su Ha[2]; Jeong-Whan Han[1]; [1]Inha University; [2]POSCO

Characterization and Treatment of Electric Arc Furnace Dusts Generated During Steel Production in Peruvian Industries: *Mery Gomez-Marroquin*[1]; José Carlos D´Abreu[2]; Roberto de Avillez[2]; Sonia Letichevsky[2]; [1]Universidad Nacional de Ingenieria; [2]Puc-rio

Comprehensive Mathematical Model of Adding Scrap Steel to Blast Furnace: Yingchao Liu[1]; Jingbin Wang[2]; Yanjun Liu[2]; Cong Li[1]; *Xuefeng She*[1]; Jingsong Wang[1]; Qingguo Xue[1]; [1]University of Science and Technology Beijing; [2]Delong Steel Limited

Effect of Mechanical Carbon Coating on Reduction of Magnetic Ore Powder: *Suju Hao*[1]; Tianhao Sun[1]; Wufeng Jiang[1]; Yuzhu Zhang[1]; [1]North China University of Science and Technology

Drying Characteristic of Artificial Magnetite Pellet: *Hanquan Zhang*[1]; Chengxin Liu[1]; Hong Yu[1]; [1]Wuhan Institute of Technology

Effect of Plastic-coal Mixed Carbonization Reducing Agent on Direct Reduction Behavior of Carbon-bearing Pellets: *Jianhao Dong*[1]; Guang Wang[1]; Hao Zhang[1]; Jingsong Wang[1]; Qingguo Xue[1]; [1]University of Science and Technology Beijing

Effect of Slag-conglomerating Agent on Melting Properties of Desulfurized Slag in Hot Metal Pretreatment: *Wufeng Jiang*[1]; Tengfei Ma[1]; Suju Hao[1]; Yuzhu Zhang[1]; [1]North China University of Science & Technology

Effect of Steel–slag Reaction on Physicochemical Properties of Low-reactivity Mold Fluxes: *Xiaobo Yan*[1]; Yuanbing Wu[1]; Qiangqiang Wang[1]; Shengping He[1]; Qian Wang[1]; [1]Chongqing University

Experimental Research on Gasification Dephosphorization with Coke Powder Reducing Converter Molten Slag: *Chenxiao Li*[1]; Shuhuan Wang[1]; Ding Guo Zhao[1]; Yuekai Xue[1]; [1]North China University of Science and Technology

Experimental Study of CO_2 for Vanadium Extraction by Segmented Combined Blowing in Converter: *Pan Li*[1]; Yu Wang[1]; Zheng lei Guo[1]; [1]Chongqing University

Extraction of Metallic Tin and Regeneration of Calcium Oxide from Waste Calcium Stannate by Reducing Roasting: *Dixiu Wu*[1]; Junwei Han[1]; Wei Liu[1]; Wenqing Qin[1]; Fen Jiao[1]; [1]Central South University

Feasibility Research of Steel Scrap Melting in Multifunctional Hot Metal Ladle: *Shuai Deng*[1]; Anjun Xu[1]; Fei Yuan[1]; [1]University of science and Technology Beijing

Fundamental Research on Preparation of High-speed Railway Grounding Line by Continuous Pouring Process for Clad: *Chenglin Li*[1]; Zhang Tingan[1]; Yan Liu[1]; Peilin Chen[1]; [1]Northeastern University

Gasification Behaviors of Biomass with Vanadium Titanomagnetite as Oxygen Carrier: *Wei Cai*[1]; Zhucheng Huang[1]; Lingyun Yi[1]; Ronghai Zhong[1]; Xiong Jiang[1]; Baizhou Tian[1]; Chengfei Hu[1]; Yunyun Jin[1]; [1]Central South University

High-melting-point Phase Precipitates in Hot Metal and Simulation of the Frozen Process of the Hot Metal: *Yan Li*[1]; Pengjie Liu[1]; Tingfang Jian[1]; Leizhang Gao[1]; Meilong Hu[1]; [1]Chongqing University

Influence of Mg-Ca Separation Degree in MgO-bearing Fluxes on Fluidity of Liquid Phase During Sintering: *Shaoguo Chen*[1]; Wen Pan[1]; Zhixing Zhao[1]; [1]Shougang Research Institute of Technology

Influence of Process Parameters on the Metal Quality at Electron Beam Melting of Molybdenum: Katia Vutova[1]; Vania Vassileva[1]; *Vladislava Stefanova*[2]; Maria Naplatanova[1]; [1]Institute Of Electronics, Bas; [2]University of Chemical Technology and Metallurgy

Influence of Rotation Speed and Temperature on Dissolution Rate of Cr2O3 in Ti-bearing Blast Furnace Slag: *Feng Zhang*[1]; Guibao Qiu[1]; Ding Yang[1]; Jiang Wang[1]; [1]Chongqing University

In-situ Electrical Conductivity Measurements During Slag Cooling: *Ling Zhang*[1]; Annelies Malfliet[1]; Bart Blanpain[1]; Muxing Guo[1]; [1]KU Leuven

In-situ Investigation of Iron Ore Stock Pile During its Stacking and Reclaiming Process: *Wen Pan*[1]; Zhi-peng Kang[2]; Xia Zhao[3]; Yao-sheng Luo[2]; Shao-guo Chen[1]; [1]Beijing Key Lab of Green Recyclable Process for Iron & Steel Production Tech; [2]Shougang Jingtang United Iron & Steel Co.,Ltd.; [3]Shougang Institute of Technology, Beijing

Numerical Simulation on the Sedimentation and Interaction Behavior of Liquid Iron Droplets during Smelting Reduction of Converter Slag: Meile He[1]; *Min Chen*[1]; Nan Wang[1]; [1]Northeastern University

Optimization Application of Electromagnetic Stirring in Slab Continuous Casting Mold for Interstitial-free Steel: Hong Xiao[1]; *Haiyan Tang*[1]; [1]University of Science and Technology Beijing

Population Balance Modelling of the Poly-dispersed Bubble Flow Behavior in a Plasma Fuming Process: *Zhongfu Cheng*[1]; Yannan Wang[1]; Bart Blanpain[1]; Muxing Guo[1]; [1]KU Leuven

Preparing Cuspidine Glass-ceramics from Iron-removed Stainless Steel Pickling Sludge: Guanghui Li[1]; *Jian Wang*[1]; Jing Chen[1]; Jing Xiang You[1]; Tao Zhang[1]; Jiao Yang Duan[1]; Qing Ye[1]; Zhiwei Peng[1]; Mingjun Rao[1]; Tao Jiang[1]; [1]Central South University

Pyrolysis of Waste Steel Tailings and Iron Recovery: *Na Wang*[1]; Wei Liu[1]; Junwei Han[1]; Xun Wang[1]; Zihan Li[1]; Wenqing Qin[1]; [1]Central South University

Reduction Kinetics of Oxidized Magnetite Briquettes in Co-atmosphere: *Bayaraa Saraatanbazar*[1]; Guanghui Li[1]; [1]Central South University

Research and Application on Particle Size Matching Between Blending Ore and Fuel in Sintering Process of Shougang Jingtang Plant: *Shaoguo Chen*[1]; Jiangshan Shi[2]; Zhixing Zhao[1]; Zhengming Cheng[2]; Wen Pan[1]; Tongbin Wang[2]; Zhe Wang[2]; [1]Shougang Research Istitute of Technology; [2]Shougang Jingtang United Iron and Steel Co., Ltd.

Research of Gas-liquid Multiphase Flow in Oxygen-enriched Bottom Blowing Copper Melting Furnace: Dongbo Li[1]; *Zeshang Dong*[1]; Xin Yao[1]; Cheng Liu[1]; Tianyu Guo[1]; Bing Li[1]; Peng Li[1]; [1]China ENFI Engineering Corporation

Selective Carbothermic Reduction and Smelting (SCRS) Process for Beneficiation of Low-grade Iron-manganese Mineral Deposits: *Basak Anameric*[1]; [1]NRRI Coleraine Labs

Selective Recycling of Cu Alloys from Metal-rich Particles of Crushed Waste Printed Circuit Boards by High Temperature Centrifugation: *Long Meng*[1]; Zhe Wang[1]; Yiwei Zhong[1]; Zhancheng Guo[1]; [1]University of Science and Technology Beijing

Sinter Iron Ores and Titanium Ores used in Pelletizing: *Yan Zhang*[1]; Xiaojiang Wu[1]; Gele Qing[1]; Yunqing Tian[1]; Haoyu Cai[1]; [1]Shougang Group

Study on Coal Injection Evaluation Method in Blast Furnace: *Dongqing Wang*[1]; [1]Shougang Group

Study on Distribution of Sulfur Element in Blast Furnace Process with Different Pellet Ratios: *Wenxiang Deng*[1]; Lingling Zhang[1]; Daqiang Cang[1]; [1]University of Science and Technology Beijing

Study on the Flow Behavior of an Asymmetric Tundish in Unsteady Service Situation: *Zhan-peng Tie*[1]; Xiao-meng Zhang[1]; Shao-xiang LI[1]; Hai-yan Tang[1]; Pu Wang[1]; Jia-quan Zhang[1]; [1]University of Science & Technology Beijing

Study on Tuyere Coke Deterioration in the Super Large Blast Furnaces: *Weichun Zhu*[1]; [1]Shougang Group

Super-Gravity Field Enrichment of Silver and Antimony Contained in Pb-Ag-Sb Melts: *Xiaochun Wen*[1]; Lei Guo[1]; Qipeng Bao[1]; Jintao Gao[1]; Zhancheng Guo[1]; [1]University of Science and Technology Beijing

Synthesis of Na2(Ni, Fe)(SO4)2 Cathode Materials from Nickel Sulfide Concentrate by Combined Pyro- and Hydro-metallurgical Processes: *Lizhen Wei*[1]; [1]Shanghai University

Synthesis of Ni-Mgo Composite Through Sulfates Reductive and Catalytic Decomposition: *Rodrigo Souza*[1]; Joao Vidal[1]; Nathalli Mello[1]; Eduardo Brocchi[1]; [1]Pontifical Catholic Univ of Rio De Janeiro

Synthesis of Porous Graphite by Dealloying of Silicon Carbide: *Gina Greenidge*[1]; Jonah Erlebacher[1]; [1]Johns Hopkins University

Technology Advances in Pyrometallurgy with Focus on Recent Development of Sustainable Processes – Experiences of Swerim Pilot Plant Activities: *Guozhu Ye*[1]; [1]Swerim AB

Thermochemical Processing of Exothermic Metallic Systems - Direct Production of Metal Alloy Powders: *Jawad Haidar*[1]; [1]Kinaltek Pty Ltd.

Thermodynamic Analysis of Preparation of Iron-based Cermet with Zinc Kiln Slag: Ning Wang[1]; *Hongyan Yan*[1]; Chao Luo[2]; Hui Li[1]; Jinglong Liang[1]; [1]College of Metallurgy and Energy, North China University of Science and Technology; [2]School of Materials and Metallurgy, Inner Mongolia University of Science and Technology

A Study of Double Layer Pre-sintering toward Super-high Bed Height: *Huibo Liu*[1]; Qiang Zhong[1]; Li Guanghui[1]; Tao Jiang[1]; [1]Central South University

Effect of CO_2 Mix Ratios on Materials and Heat Balances of Bottom-blowing O2-CaO Converter: *Weifeng Li*[1]; Rong Zhu[1]; Kai Dong[1]; Shaoyan Hu[2]; Guangsheng Wei[1]; Chao Feng[1]; [1]University of Science and Technology Beijing; [2]Shagang School of Iron and Steel, Soochow University

Evaluation of the Liquid Phase Fluidity during Iron Ore Sintering: *Huaiying Ma*[1]; Zhixing Zhao[1]; Yue Xin[2]; Shuhai Ou[2]; Wen Pan[1]; [1]Research Institute of Technology, Shougang Group Corporation; [2]Beijing Shougang Co.,Ltd

Modification of Inclusions by Adding Mg to 16MnCrS5 Gear Steel: *Hui Liu*[1]; Yikui Xie[2]; Qiankun Yang[2]; Qi Zhou[1]; Jie Ma[1]; [1]Anhui Jianzhu University; [2]Shanghai University

Optimization Dephosphorization Process of the Early Stage in 300t Steelmaking Converter with Top and Bottom Combined Blowing: *Chao Feng*[1]; Rong Zhu[1]; Baochen Han[1]; Kai Dong[1]; Weifeng Li[1]; Guangsheng Wei[1]; [1]University of Science and Technology Beijing;

Recovery of Copper from Copper Smelting Slag using a Green Reductant: Guorui Qu[1]; Yonggang Wei[1]; Bo Li[1]; Hua Wang[1]; Yindong Yang[2]; Alexander McLean[2]; [1]Kunming University of Science and Technology; [2]University of Toronto

Reducing Carbon and Nitrogen Oxides Emission in Iron Ore Sintering Process by Double Layer Pre-sintering Technology: *Mingshun Zhou*[1]; Yidong Wang[2]; Yan Gu[2]; Dongming Zhao[3]; Jianwei Zhu[1]; Qiang Zhong[4]; Tao Jiang[4]; [1]Ansteel Group Iron and Steel Research Institute; [2]Ansteel Group Corporation Ltd.; [3]Anshan Iron and Steel Co., Ltd.; [4]Central South University

Research on Mechanism of Ring Formation in Grate-kiln of Titanium-containing Pellets: *Haoyu Cai*[1]; Jianliang Zhang[2]; Zhengjian Liu[2]; Gele Qing[1]; Yan Zhang[1]; [1]Shougang Research Institute of Technology; [2]University of Science and Technology Beijing

Slag-metal Separation Behaviors of Vanadium Titanomagnetite Metallized Pellets: *Jianjiang Xin*[1]; Nan Wang[1]; Min Chen[1]; Chen Chen[1]; [1]Northeastern University in China

The Narrow Window Evaluation Model of Converter Operation Process Based on the Logistic Regression Algorithm: *Chao Chen*[1]; [1]Northeast University in China

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; M Arul Kumar, Los Alamos National Laboratory

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

3D Characterization of Nano-scale Precipitates in Shape-memory Alloys: *Dexin Zhao*[1]; Tejas Umale[1]; Jobin Joy[1]; Ibrahim Karaman[1]; Dimitris Lagoudas[1]; Kelvin Xie[1]; [1]Texas A&M University

Characterization of Defects in As-transformed and Hot-deformed t-MnAl-C Alloys Using TEM: *Panpan Zhao*[1]; Kornelius Nielsch[1]; Thomas Woodcock[2]; [1]IFW Dresden, Institute for Metallic Materials;TU Dresden, Institute of Materials Science;; [2]IFW Dresden

Characterization of Metal Powders for Spreadability and Flow Modeling: *Taher Abu-Lebdeh*[1]; Tobi Kalejaiye[1]; Sameer Hamoush[1]; Vincent Lamberti[1]; [1]North Carolina A&T State University

Characterizing the Influence of Microstructure on Twin Nucleation in Ferroelastic Ceramics: *Charles Smith*[1]; Jessica Krogstad[1]; [1]University of Illinois Urbana-Champaign

Comparative Analysis of Bulk and Local State of Thin Film Viscoelastic Material on a MEMS Device Using Dynamic Nanomechanical Characterization: *Hasan Faisal*[1]; Milosh Mededovic[1]; Patrick O'Hara[1]; [1]Anton Paar USA

Computational Polarized Light Microscopy for Large Area Orientation Determination of Uniaxial Materials: *Ke-Wei Jin*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

Determination of Strains in Clear Teeth Aligners for Orthodontics: *Ning Ye*[1]; Susan Mantell[1]; Alex Fok[1]; [1]University of Minnesota

Ex-situ and In-situ X-ray Studies of Crystal Structure and Microstructure Evolution in Metallic Alloys Under Extreme Environments: *Tamas Varga*[1]; Bharat Gwalani[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

Imaging Microplasticity Events by Combining High Energy Diffractive Microscopy and Bragg Coherent Diffractive Imaging: *Matthew Wilkin*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

In-situ Compression of InSb Micro-pillars: a Comparative Study Between Laue and Monochromatic X-ray Micro-diffraction Techniques: *Ludovic Thilly*[1]; Tarik Sadat[1]; Mariana Verezhak[2]; Pierre Godard[1]; Pierre-Olivier Renault[1]; Steven Van Petegem[2]; Ana Diaz[2]; [1]University of Poitiers; [2]Paul Scherrer Institute

Optimising Teeth Parameters for Support Structures in High Speed Laser Powder Bed Fusion: *Mfanufikile Shange*[1]; [1]CSIR

Precipitation of Tetragonal τ-MnAl in a Twinned Rhombohedral Al_8Mn_5 Matrix: an EBSD Study: *Thomas G. Woodcock*[1]; Florian Bittner[1]; [1]IFW Dresden

Predictions of Local and Global Fields Based on a New Single Crystal Model: *Nitin Chandola*[1]; Oana Cazacu[1]; Benoit Revil-Baudard[1]; [1]University Of Florida

Propagating Uncertainty Through ICME Modules and Machine Learning Towards Quicker and Accurate Distortion and Residual Stress Predictions: Brijesh Kumar[1]; Piyush Ranade[1]; Alonso Peralta[1]; *Mustafa Megahed*[2]; [1]Honeywell Aerospace; [2]Esi Group

Residual Stress Analysis with 2D X-ray Detector without Sample Tilting: *Seung-Yub Lee*[1]; [1]Pratt & Whitney

Role of Microstructure in Abrasive Wear: A Systematic In-situ SEM Study: *Gianluca Roscioli*[1]; Cemal Tasan[1]; [1]Massachusetts Institute of Technology

Slip and Twinning of Commercial Pure Titanium During In-situ Tensile Test: *Joo-Hee Kang*[1]; Hye In Jung[2]; Ji Hoon Kim[2]; Chang-Seok Oh[1]; [1]Korea Institute of Materials Science; [2]Pusan National University

Thermal Corrections for Gleeble Right Circular Cylinder Compression Tests: *Kevin Severs*[1]; Ravi Shah[1]; Vikas Saraf[1]; [1]Allegheny Technologies Incorporated (Ati)

Thermo-mechanical Simulation of Steam Turbine Blade with Spark Plasma Sintering Developed NiCrCoTiAlW-Ta Superalloy Properties: *Olugbenga Ogunbiyi*[1]; [1]Tshwane University of Technology

Transient Texture Evolution During Friction Stir Processing of a Mg Alloy Revealed by In-situ Neutron Diffraction: *Yuan Li*[1]; Ke An[2]; Zhili Feng[2]; Hahn Choo[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

Understanding Deformation Mechanisms in a Low Ni/Co Alloy: Bharat Gwalani[1]; Govindarajan Muralidharan[2]; Dean Pierce[2]; Jonathan Poplawsky[2]; Donovan Leonard[2]; Libor Kovarik[1]; *Arun Devaraj*[1]; [1]Pacific Northwest National Laboratory; [2]Oak Ridge National Laboratory

Understanding the Deformation Mechanisms and Phase Transformations in High Alloy Metastable Austenitic Steels: *Stefan Martin*[1]; Christiane Ullrich[1]; Mykhaylo Motylenko[1]; David Rafaja[1]; [1]TU Bergakademie Freiberg

ADVANCED MATERIALS

Advanced High Strength Steels IV — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Steels Comittee

Program Organizers: Ana Araujo, AK Steel Research and Innovation Center; Mary O'Brien, Colorado School of Mines; Tilmann Hickel, Max Planck Institut fur Eisenforschung; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; C. Tasan, Massachusetts Institute of Technology; MingXin Huang, University of Hong Kong

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Electrochemical Characterization of Advanced High Strength Steel DP 780 MPa: *Abraham Escalona Gómez*[1]; Marisol Delgado Espino[1]; Maria del Refugio Lara Banda[1]; Facundo Almeraya Calderón[1]; [1]Universidad Autonoma de Nuevo Leon

Excellent Strength-ductility Combination of Austenitic-hadfield/martensitic-hot-press-forming Clad Steel Sheet: *Min Cheol Jo*[1]; Jaeyeong Park[1]; Seok Su Sohn[2]; Taejin Song[3]; Hyoung Seop Kim[1]; Sunghak Lee[1]; [1]Pohang Institute of Science & Technology (POSTECH); [2]Korea University; [3]POSCO

Mechanical and Corrosion Resistant Properties of TWIP Steel Alloyed with Varied Chromium Additions: *Fusheng Han*[1]; [1]Institute of Solid State Physics

Producing a 1200 MPa Complex-phase Advanced High Strength Steel: *Renan Lima*[1]; Kester Clarke[2]; Amy Clarke[2]; F.T.F Tolomelli[3]; Fernando Rizzo[1]; [1]Pontifícia Universidade Católica do Rio de Janeiro (PUC-RIO); [2]Colorado School of Mines; [3]Companhia Siderúrgica Nacional, Rodovia

Solutions to Hydrogen Embrittlement of Ultra-high Strength Press-hardened Steel for Automotive Application: *Lawrence Cho*[1]; P.E. Bradley[1]; Matthew Connolly[1]; M.L. Martin[1]; D.S. Lauria[1]; Frank Delrio[1]; A.J. Slifka[1]; E.J. Seo[2]; K.R. Jo[3]; S.W. Kim[4]; [1]National Institute of Standards and Technology; [2]Colorado School of Mines; [3]Pohang University of Science and Technology; [4]POSCO

The Effect of Alloy Elements on the Peritectic Range of Low-carbon Steels: Thermodynamic Calculation and High Temperature DSC Measurement: *Qingqiang Ren*[1]; Sung Il Baik[1]; Bruce Krakauer[2]; David Seidman[1]; [1]Northwestern University; [2]AO Smith Coorporate

Transformation Kinetics in a Trip Steel During the Plastic Deformation by Tension and Compression: *Jose Pacheco*[1]; Pedro Garnica[2]; Yadira Solana[2]; Lesliee Espino[3]; Jorge Navarro[2]; [1]DICIM UASLP; [2]TecNM, Instituto Tecnológico de Morelia, División de Estudios de Posgrado e Investigación; [3]TecNM, Instituto Tecnológico de Morelia, Departamento de Ingeniería en Materiales

CHARACTERIZATION

Advanced Real Time Imaging — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Alloy Phases Committee

Program Organizers: Jinichiro Nakano, National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Candan Tamerler, University of Kansas; Noritaka Saito, Kyushu University; Neslihan Dogan, McMaster University; Zuotai Zhang, Southern University of Science and Technology; Bryan Webler, Carnegie Mellon University; Anna Nakano, US Department of Energy National Energy Technology Laboratory

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

In-situ Observation of Aluminum Intermetallics Melts: *Jonathan Paras*[1]; Antoine Allanore[1]; [1]MIT

ADVANCED MATERIALS

Advanced Solid Phase Processing Symposium — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, University of California, Riverside; Cynthia Powell, Pacific Northwest National Laboratory; Kester Clarke, Colorado School of Mines; Anthony Reynolds, University of South Carolina; Mostafa Hassani, Cornell University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: To Be Announced

Mechanical and Microstructural Properties of Lightweight Laminates Manufactured by Explosive Welding: *Marta Orlowska*[1]; Piotr Bazarnik[1]; Zygmunt Szulc[2]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology; [2]ZTW Explomet GALKA, SZULC S.J.

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Srinivasa Rao Singamaneni, University of Texas at El Paso; Amit Pandey, MicroTesting Solutions; Nuggehalli Ravindra, New Jersey Institute of Technology

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Ritesh Sachan, Oklahoma State University

In-situ Analysis of IR Laser Radiation Damage on Nano-structured MoS2: *Kory Burns*[1]; [1]University of Florida

Microstructures Studies on Ag-TiO2 Thin Films for Self-cleaning Solar Panel Application: *Dewi Suriyani Che Halin*[1]; Kamrosni Abdul Razak[1]; Azliza Azani[2]; Mohd Mustafa Al Bakri Abdullah[1]; Mohd Arif Anuar Mohd Salleh[1]; Norsuria Mahmed[1]; Muhammad Mahyiddin Ramli[1]; Ayu Wazira Azhari[1]; Varistha Chobpattana[3]; Nuaim Siddiqi Dainal[1]; [1]Universiti Malaysia Perlis; [2]Center of Excellence Geopolymer & Green Technology (CEGeoGTech); [3]Rajamangala University of Technology Thanyaburi (RMUTT)

Scalable Synthesis of Graphene Quantum Dots and its Application in Bioimaging: *Vijayesh Kumar*[1]; Abhay Sachdev[1]; [1]CSIO-CSIR Chandigarh India

Synthesis of Mesoporous Metal-Silicates via Silicate-Exfoliation on Metal Hydroxides: Hong-Ping Lin[1]; *Hsien-Ming Hsiao*[1]; Yun-Chung Shen[1]; [1]Department of Chemistry, National Cheng Kung University

CHARACTERIZATION

Advances in Powder and Ceramic Materials Science — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Sergio Monteiro, Military Institute of Engineering; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Bowen Li, Michigan Technological University; Jinhong Li, China University of Geosciences (Beijing)

Bioinspired Ceramic Monoliths from Freeze-Casting for Filtration Applications: *Sean Garner*[1]; Zhixiong Li[1]; Doheon Lee[1]; Dimitri Deheyn[1]; Joanna McKittrick[1]; [1]University of California, San Diego

Composite Material of Soil with Waste Tire Fibers and Sugar Cane Molasses: *Juan Jimenez-Hoyos*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

Enhanced Stability and Carrier Transport Quality of a-CsPbI3 Perovskite Nanocrystals with Reduced Graphene Oxide: *Hong Lin*[1]; Qi Zhang[1]; [1]Tsinghua University

Evaluation of the Incorporation of Marble and Granite Residue in Coating Mortars: *Euzebio Zanelato*[1]; Jonas Alexandre[1]; Afonso Azevedo[2]; Markssuel Marvila[3]; Gustavo Xavier[1]; Sergio Monteiro[4]; [1]UENF; [2]UFF; [3]UCAM; [4]IME

Influence of Construction and Demolition Waste Incorporation in Concrete: Antônio Macedo[1]; Euzebio Zanelato[2]; André Manhães[1]; Afonso Azevedo[3]; Markssuel Marvila[1]; Jonas Alexandre[2]; *Sergio Monteiro*[4]; Lucio Petrucci[1]; [1]UCAM; [2]UENF; [3]UFF; [4]IME

Manufacturing and Characterization of Ceramics Made of Kaolinite Clay and Sewage Sludge from the Anodizing Industry: *Andrés Ramírez*[1]; Mauricio Correa[1]; Henry Colorado[1]; [1]Universidad de Antioquia

Microstructure Characterization of Annealed Polycrystalline YIG Samples Prepared from the Sol-gel Method Using 2d EBSD: *Minji Kim*[1]; Minsun Jang[1]; Youngkyun Son[1]; Kisuk Lee[1]; Sukbin Lee[1]; [1]Ulsan National Institute of Science and Technology

Preparation of Lithium and Terbium Doped Yttrium Borate: *Xiaoling Tan*[1]; [1]Qinghai University

Preparation of Na4V2O7 Powder by Solid-state Reaction: *Guishang Pei*[1]; Junyi Xiang[1]; Zhongci Liu[1]; Dapeng Zhong[1]; Feifei Pan[1]; Xuewei Lv[1]; [1]Chongqing University

Preparation of YBO3:Ce3+ Film via Impregnation-lifting Method and Its Photoluminescence Property: *Hongen Nian*[1]; [1]Qinghai Institute of Salt Lakes, Chinese Academy of Sciences

Process Optimization of Foaming Ceramics Made from Blast Furnace Slag and Fly Ash: *Sheng Kai Tao*[1]; [1]Northeastern University

Synthesis of Silicate Zinc Bioceramic via Mechanochemical Technique: Sorour Sadeghzade[1]; Rahmatollah Emadi[2]; *Fariborz Tavangarian*[1]; [1]Pennsylvania State University, Harrisburg; [2]Isfahan University of Technology

The Hardystonite/PA66 Composite for Using as the Intervertebral Fusion Cage: *Fariborz Tavangarian*[1]; Sorour Sadeghzade[1]; Rahmatollah Emadi[2]; [1]Pennsylvania State University, Harrisburg; [2]Isfahan University of Technology

MATERIALS PROCESSING

Advances in Surface Engineering II — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Tushar Borkar, Cleveland State University; Arif Mubarok, PPG; Rajeev Gupta, University of Akron; Sandip Harimkar, Oklahoma State University; Tanaji Paul, Florida International University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Comparison of Reduced Graphene Oxide Membranes by Spray and Vacuum Filtration for Use in Water Desalination: *Wagner Pinheiro*[1]; Anthony Oliveira[1]; Andreza Lima[1]; [1]Military Institute of Engineering

The Synchronous Suppression - Reinforced Dispersion Behaviors of Regulators on Micro Fine Ilmenite and Titanaugite: *Gui-xia Fan*[1]; Taojin Wang[1]; Shi-Xiong Zhang[1]; Yi-Jun Cao[1]; Peng Li[1]; [1]Zhengzhou University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryan Wong, University of California, Riverside; Mikhail Mendelev, Ames Laboratory; Bryce Meredig, Citrine Informatics; Ebrahim Asadi, University of Memphis; Francesca Tavazza, National Institute of Standards and Technology

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Mohsen Asle Zaeem, Colorado School of Mines

An Improved Collocation Method to Treat Traction-free Surfaces in Dislocation Dynamics Simulations: *Abu Bakar Siddique*[1]; Tariq Khraishi[1]; [1]University of New Mexico

Classifying Atomic Environments by the Gromov-Wasserstein Distance: *Sakura Kawano*[1]; Jeremy Mason[1]; [1]University of California, Davis

Coupled Light Capture and Lattice Boltzmann Model of TiO2 Micropillars Array for Water Purification: *Pegah Mirabedini*[1]; Agnieszka Truskowska[2]; Duncan Ashby[1]; Masaru P. Rao[1]; P. Alex Greaney[1]; [1]University of California, Riverside; [2]Rensselaer Polytechnic Institute

Investigation of Fe-O and Fe-N and H-O Bond Formation Process by the Molecular Dynamics Simulations: Jianxin Zhu[1]; *Guannan Guo*[1]; Jian-Ping Wang[1]; [1]University of Minnesota

Machine Learning and Computer Vision on Classification of Carbon Nanotube and Nanofiber Structures for TEM Dataset: *Qixiang Luo*[1]; Elizabeth Holm[1]; Chen Wang[2]; [1]Carnegie Mellon University; [2]National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention

Machine Learning Driven Functionally Graded Material Designs for Mitigation of Thermally Induced Stress: *Zhizhou Zhang*[1]; Zeqing Jin[1]; Kahraman Demir[1]; Grace Gu[1]; [1]Department of Mechanical Engineering, University of California, Berkeley

Methods to Simulate Grain Boundary Diffusion in Bicrystals and Polycrystals: *David Page*[1]; Katie Varela[1]; Oliver Johnson[1]; David Fullwood[1]; Eric Homer[1]; [1]Brigham Young University

Numerical Simulation for Microstructural Evolution in Solidification Process using CFD-CA (Cellular Automata) Coupled Method: *Wonjoo Lee*[1]; Yuhyeong Jeong[1]; Chanhee Won[1]; Jae-Wook Lee[2]; Howon Lee[2]; Seong-hoon Kang[2]; Johnhun Yoon[1]; [1]Hanyang University; [2]Korea Institute of Materials Science

PyMob: Software for Automated Assessment of Atomic Mobilities: *Katrin Abrahams*[1]; Irina Roslyakova[1]; Ingo Steinbach[1]; [1]Ruhr University Bochum

Randomness at Scale: Properties of Bulk Nanostructured Materials from Stochastic Representative Volume Elements: *Skylar Mays*[1]; Katherine Moody[1]; Mujan Seif[1]; John Balk[1]; Matthew Beck[1]; [1]University of Kentucky

Simulation of Compressive Stress-strain Curve for Additive Manufactured Ti6Al4V Cuboctahedron Cellular Structure: *Dhinakar Annadurai*[1]; Chen Jhewn-Kuang[1]; [1]AMPL, Material Science and Engineering, NTUT

Three-dimensional Modeling of Growth and Motion of Dendrites under Thermosolutal Convection: *Seyed Amin Nabavizadeh*[1]; Mohsen Eshraghi[2]; Sergio Felicelli[1]; [1]University of Akron; [2]Department of Mechanical Engineering, California State University

Uncertainty Propagation in CalPhaD Calculations: *Nicholas Ury*[1]; Richard Otis[2]; Vilupanur Ravi[1]; [1]California State Polytechnic University, Pomona; [2]Jet Propulsion Laboratory

ADVANCED MATERIALS

Bulk Metallic Glasses XVII — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee - Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Atomic Structure and Properties of Co-Ta-B Bulk Metallic Glasses: *Ivan Kaban*[1]; Pál Jóvári[2]; Ju Wang[1]; Mark Adam Webb[3]; Ning Chen[3]; Jacques Darpentigny[4]; [1]IFW Dresden, Germany; [2]Wigner Research Centre for Physics, Budapest, Hungary; [3]Canadian Light Source, Saskatoon, Canada; [4]Laboratoire Léon Brillouin, CEA-Saclay, France

Competitive Formation of Metallic Glasses in Ternary Eutectic Systems: *Dong Ma*[1]; [1]Oak Ridge National Laboratory

Effect of Ce Additive on Magnetic Properties and Glass Forming Ability of Fe-Si-B-P Amorphous Alloys: *Youngsin Choi*[1]; Sun-Yeoung Ki[1]; Joo Hyun Park[2]; Hwi-Jun Kim[1]; [1]Korea Institute of Industrial Technology / Liquid processing & Casting R&D Group; [2]Department of Materials Science and Chemical Engineering, Hanyang University

High Saturation Magnetic Flux Density of New Nanocomposite Materials Annealed in Various Temperatures: Seoyeon Kwon[1]; *Haein Yim*[1]; [1]Sookmyung Women's University

The Effect of Severe Plastic Deformation on the Relaxation Dynamics of a Bulk Metallic Glass Studied by X-ray Photon Correlation Spectroscopy: *Hongbo Zhou*[1]; Gerhard Wilde[1]; [1]University of Muenster

Shear Transformation Zone Properties from Nonlinear Anelastic Deformation: *Tianjiao Lei*[1]; Michael Atzmon[1]; [1]University of Michigan

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jian Li, Canmetmaterials; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Shadia Ikhmayies, Al Isra University; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Yunus Kalay, Middle East Technical University; Rajiv Soman, Eurofins EAG Materials Science LLC

A Comparison Between GO and RGO as Reinforcing in Polypropylene Nanocomposite Using Irradiated PP as a Compatibilizer: *Carlos Soares*[1]; Julyana Santana[1]; Olgun Guven[2]; Esperidiana Moura[1]; [1]Nuclear and Energy Research Institute; [2]Hacettepe University

A New Method to Obtain Cellulose Nanofiber from Wood: Miguel Sanchez Junior[1]; *Leila Miranda*[1]; [1]Universidade Presbiteriana Mackenzie

Aluminum Foam as Promising Materials for Ballistic Protection Application: *Fabio Garcia Filho*[1]; Fernanda Luz[1]; Artur Pereira[1]; Luana Demosthenes[1]; Michelle Oliveira[1]; Ulisses Costa[1]; Wendell Bezerra[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

Analysis of Nanoscale Iron Oxide Morphology: *Tianhao Sun*[1]; Suju Hao[1]; Wufeng Jiang[1]; Yuzhu Zhang[1]; [1]North China University of Science and Technology

Analysis of ß´ (Cu4Ti) Precipitation during Isothermal Aging of a Cu-4wt.%Ti Alloy: *Victor Lopez-Hirata*[1]; Felipe Hernandez-Santiago[1]; Maribel Saucedo-Muñoz[1]; Jose Villegas-Cardenas[2]; Erika Avila-Davila[3]; [1]Instituto Politecnico Nacional-ESIQIE; [2]Universidad Politécnica del Valle de México; [3]Tecnológico Nacional de México/ Instituto Tecnológico de Pachuca

Analysis of The Effect of Marine Salinity in Durability of Red Ceramics Calcinated In Different Temperatures: Markssuel Marvila[1]; Afonso Azevedo[1]; Mairyanne Souza[1]; Euzébio Zanelato[1]; Jonas Alexandre[1]; Gustavo Xavier[1]; *Sergio Monteiro*[2]; Carlos Maurício Vieira[1]; Geovana Delaqua[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia

Analysis of The Elasto-Plastic Behavior of Structural Steels Subjected to Cyclic Loads: Victor Barbosa De Souza[1]; Amanda Camerini[1]; *Afonso Garcez*[1]; [1]Uni Redentor

Analysis of the Performance of Applied Tire Residues in Concrete Pavements: *Luana Demosthenes*[1]; Michelle Oliveira[1]; Fabio Garcia[1]; Fernanda Luz[1]; Fábio Braga[1]; Leandro Demosthenes[2]; Lucio Nascimento[1]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia; [2]UFAM

Application of Nanoparticles of ZnO and ZnO-doped-Ag in Polymeric Blend of HMSPP/SEBS for Biocide Activity: *Luiz Komatsu*[1]; Washington Oliani[1]; Camila Oliveira[1]; Vijaya Rangari[2]; Duclerc Parra[1]; [1]Nuclear and Energy Research Institute; [2]Tuskegee University

Ballistic Behavior of Walnut Shell Composite: Larissa Nunes[1]; Raphael Henrique Reis[1]; *Michelle Oliveira*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

Ballistic Evaluation of Reinforced Composites with Mauve / Jute Hybrid Fabric for Ballistic Armor: *Luana Demosthenes*[1]; Michelle Oliveira[1]; Fabio Garcia[1]; Artur Pereira[1]; Fernanda Luz[1]; Wendell Bezerra[1]; Ulisses Costa[1]; Sergio Monteiro[1]; Lucio Nascimento[1]; [1]Instituto Militar de Engenharia

Ballistic Test of Multilayered Armor with Intermediate Polyester Composite Reinforced with High Concentration of Fique Fabric: *Artur Camposo Pereira*[1]; Fernanda da Luz[1]; Fabio Garcia Filho[1]; Ulisses Costa[1]; Michelle Oliveira[1]; Luana Demosthenes[1]; Wendell Bezerra[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

Characterization and Metallurgical Performance of Titangarnet: *Gang Li*[1]; Xuewei Lv[1]; Xuangeng Zhou[1]; Guibao Qiu[1]; [1]Chongqing University

Characterization by FTIR of Oxidized Pyrargyrite with Sodium Sulfide: *Yessica Paulina Gómez Espinosa*[1]; M Reyes Perez[1]; Elia Guadalue Palacios Beas[2]; J. C. Juarez Tapia[1]; M Pérez Labra[1]; Ivan A. Reyes Domínguez[3]; Mizraim Uriel Flores Guerrero[4]; Victor Esteban Reyes Cruz[1]; [1]Universidad Autonoma del Estado de Hidalgo; [2]Instituto Politécnico Nacional; [3]Universidad Autónoma de San Luis Potosí; [4]Universidad Tecnológica de Tulancingo.

Characterization by FTIR of Sphalerite Obtained in the Flotation without Collector in the Presence of Ferric Iron: *José Antonio Granados Oliver*[1]; M Reyes Perez[1]; Aislinn Michelle Teja Ruiz[1]; Francisco Raúl Barrientos Hernández[1]; M. Pérez-Labra[1]; J. C. Juárez Tapia[1]; José Angel Cobos-Murcia[1]; Elia Guadalue Palacios Beas[2]; [1]Universidad Autonoma del Estado de Hidalgo; [2]Instituto Politécnico Nacional

Characterization of a Brazilian Kaolin for its Use in the Controlled Release of Isoniazid: *Maria Valenzuela*[1]; Jessica Arjona[1]; Bianca Michel[1]; Tatiana Costa[1]; Thamyres Cardoso[1]; Gilmar Pinheiro[1]; Margarita Bobadilla[1]; Roberto Neves[2]; Francisco Valenzuela[1]; [1]Escola Politecnica Da U De Sao Paulo; [2]Universidade Federal do Para

Characterization of Bentonite Beneficiation Residue for Use in Structural Ceramics: *Larissa Maia dos Santos*[1]; Vinícius Macedo Brito Medeiros[1]; Maria das Graças Silva Valenzuela[2]; Francisco Rolando Valenzuela Diaz[2]; Orley Magalhães de Oliveira[1]; [1]IFBA - Instituto Federal da Bahia; [2]Politécnica da Universidade de São Paulo

Characterization of Clay Mix with Incorporation of Granite Waste to Produce Ceramic Tiles: *Afonso Azevedo*[1]; Daiane Cecchin[1]; Náiade Luiz[1]; Vasco Cruz[2]; Markssuel Marvila[3]; Euzébio Zanelato[3]; Sergio Monteiro[4]; Gabriela Morais[3]; Jonas Alexandre[3]; [1]Fluminense Federal University; [2]Universidade de Évora; [3]UENF; [4]IME

Characterization of Composites Formed by Low Density Polyethylene (LDPE) and Natural Bamboo Fibers, by Differential Exploration Calorimetry (DSC), Tensile Strength, and Hardness: *Nilson Pereira*[1]; Miriam Lucia Machado[2]; Suzan Casarin[3]; Leonardo Silva[1]; Mauro Alves[2]; [1]Instituto de Pesquisas Energeticas E Nucleares - Ipen; [2]Universidade de Presbiteriana Mackenzie; [3]Asser Porto Ferreira

Characterization of Hydrogels for Release of Cosmetic Assets Containing Nanoemulsions Of Mandellic Acid in Different Concentrations of Pseudoboehmite: *Leila Miranda*[1]; Isabella Tereza Barbosa[1]; Terezinha Masson[1]; Antonio Munhoz Junior[1]; Leonardo Andrade e Silva[2]; Aleksandra Aparecida Gonçalves[1]; [1]Universidade Presbiteriana Mackenzie; [2]Instituto de Pesquisas Energéticas e Nucleares - IPEN/CNEN

Characterization of STP Effects on Encapsulation Process and How to Attenuate It to Produce PLA, PLA/MMT.K and PLA/O-MMT.K Microcapsules: *Bianca Bottega Michel*[1]; Francisco Valenzuela-Diáz[1]; Maria das Graças Silva-Valenzuela[1]; Wang Hui[1]; Jessica Arjona[1]; [1]Polytechnic School - Usp

Charpy Impact Test Os Epoxy Composites Reinforced with Arapaima Scales: *Wendell Bruno Almeida Bezerra*[1]; Ulisses Oliveira Costa[1]; Fernanda Santos da Luz[1]; Michelle Souza Oliveira[1]; Luana Cristyne Da Cruz Demosthenes[1]; Fabio Da Costa Garcia Filho[1]; Sergio Neves Monteiro[1]; [1]Instituto Militar de Engenharia

Chemical and Mineralogical Characterization of a Cuprite-myargyrite Ore and Proposal of Elimination of Semimetals by Alkaline Bath: *Aislinn Teja Ruiz*[1]; Kinardo Flores Castro[2]; M. Perez Labra[2]; Martin Reyes Perez[2]; Elia G. Palacios Beas[1]; Victor Esteban Reyes Cruz[2]; Julio Cesar Juárez Tapia[2]; [1]Instituto Politécnico Nacional; [2]Universidad Autonoma del Estado de Hidalgo

Chemical Characterization and Mineralogical Analysis of Mining-metallurgical Tailing from the State of Morelos: Iván Martínez Soto[1]; Aislinn Michelle Teja R.[1]; Martín Reyes Pérez[1]; M. Pérez-Labra[1]; Víctor Reyes Cruz[1]; José Angel Cobos-Murcia[1]; Gustavo Urbano Reyes[1]; *Julio Cesar Juárez T.*[1]; [1]Universidad Autónoma del Estado de Hidalgo

Composition Determination of Atomic Columns in Misfit-layered Cobalt Oxide by Bloch-wave-based HAADF-STEM Image Simulation: *Takao Morimura*[1]; Tomoya Hiwatashi[1]; Shin-ichiro Kondo[1]; [1]Nagasaki University

Crystallization Kinetics and Mechanical Porperties of Zr-Cu-Al-Sm Metallic Glasses and Their Nanocomposites: Huseyin Cerci[1]; *Ilkay Kalay*[1]; [1]Cankaya University

Determinations of Trace and Ultra-Trace Level Contaminants in Advanced Materials Using Electrothermal Vaporization ICP–OES: *Abbas Fahami*[1]; Karol Putyera[1]; [1]Eurofins EAG Materials Science LLC

Development and Characterization of a Luminescent Coating for Asphalt Pavements: *Elkin Gutierrez*[1]; Henry Colorado[2]; [1]Universidad Antonio Nariño; [2]Universidad de Antioquia

Development and Characterization of CoCrCuFeNi(TiAl) High Entropy Alloys: *Ilkay Kalay*[1]; Huseyin Cerci[1]; [1]Cankaya University

Development of Non-equiatomic High Entropy Alloys for High Temperature Applications: *Ilkay Kalay*[1]; Ayberk Ayrenk[1]; [1]Cankaya University

Effect of Alloying Elements on Age Hardening and Coarsening of Beta Precipitates in Isothermally Aged Fe-Ni-Al Based Alloys: *Victor Lopez-Hirata*[1]; Hector Dorantes-Rosales[1]; Maribel Saucedo-Muñoz[1]; Nicolas Cayetano-Castro[1]; Erika Avila-Davila[2]; [1]Instituto Politecnico Nacional-ESIQIE; [2]Tecnológico Nacional de México/Instituto Tecnológico de Pachuca

Effect of Antioxidant on Resistance to Ammonia Erosion of Carbon Sleeve in Continuous Annealing Furnace for Low Temperature Grain-oriented Silicon Steel Production: *He Mingsheng*[1]; Jing Zhang[2]; Xuecheng Gong[2]; Yong Lei[2]; Shengjin Li[2]; [1]R&D Center of Wuhan Iron & Steel Co., Ltd; [2]Silicon Steel Division of Wuhan Iron & Steel Co., Ltd.

Effect of Different Ti-Sn Intermetallic Compounds Addition on Synthesis of Ti2SnC by Self-propagating High-temperature Combustion Technique: *Hongyan Sun*[1]; Xin Kong[1]; Guiyang Liu[1]; [1]Honghe University

Effect of Martensite Reorientation Deformation on the Evolutions of Crystallographic Textures and Lattice Strains of NiTi Wire: *Xiangguang Kong*[1]; Shijie Hao[1]; Hong Yang[2]; Zhen Sun[1]; Yinong Liu[2]; Yang Ren[3]; Changfeng Chen[1]; Lishan Cui[1]; [1]China University of Petroleum - Beijing; [2]The University of Western Australia, Perth; [3]X-ray Science Division, Argonne National Laboratory

Effect of Plastic Deformation on the Dynamic Behavior of Lean Duplex Stainless Steel 2101: Eng Yeo[1]; Ali Ameri[1]; *Juan Escobedo-Diaz*[1]; [1]University of New South Wales

Evaluation of Energy Absorption of the Epoxy Matrix Composite Reinforced with Tucum Fiber Through Izod Impact Test and Ballistic Impact of Ammunition .22: *Fernanda da Luz*[1]; Fabio Garcia Filho[1]; Luana Demosthenes[1]; Michelle Oliveira[1]; Ulisses Costa[1]; Wendell Bezerra[1]; Artur Pereira[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering, IME

Evaluation of Shock Impedance of Multilayered Armor Systems with Epoxy Composite Reinforced with Fique Fabric: *Michelle Oliveira*[1]; Luana Demosthenes[1]; Fabio Garcia Filho[1]; Fernanda da Luz[1]; Ulisses Costa[1]; Wendell Bezerra[1]; Artur Pereira[1]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia

Evaluation of Structural Differences Among Modified Brazilian Clay by Ammonium Quaternary Salts: *Jessica Arjona*[1]; Maria das Graças Silva-Valenzuela[1]; Bianca Michel[1]; Tatiana Costa[1]; Gilmar Pinheiro[1]; Thamyres Cardoso[1]; Francisco Valenzuela-Diaz[1]; [1]Universidade De Sao Paulo

Evaluation of the Absorption by Capillarity of Different Mortars Applied in Civil Construction: Afonso Azevedo[1]; *Markssuel Marvila*[2]; Juliana Pessanha[3]; Euzébio Zanelato[2]; André Manhães[2]; Sergio Monteiro[4]; Leonardo Pedroti[5]; Beatryz Mendes[5]; Niander Cerqueira[2]; Victor Souza[1]; [1]Fluminense Federal University; [2]UENF; [3]UCAM; [4]IME; [5]UFV

Evaluation of The Impedance of Shock of Multilayer Armoring with Epoxy Matrix Composite Reinforced with Fibers of Mallow and Hybrid Fabric of Jute and Mallow: *Lucio Nascimento*[1]; Sergio Monteiro[1]; Ulisses Costa[1]; Fernanda Luz[1]; Michelle Oliveira[1]; Fabio Garcia Filho[1]; Luana Demosthenes[1]; [1]Military Institute of Engineering

Evaluation of The Mechanical Behavior of Polymeric Composites Reinforced with Oil Palm Fibers: Edwillson Oliveira FIlho[1]; *Veronica Candido*[1]; Roberto Fujiyama[1]; Jean Rodrigues[2]; Sérgio Monteiro[3]; Alisson da Silva[1]; [1]UFPA; [2]IFPA; [3]IME-RJ

Evaluation of the Morphological, Thermal and Mechanical Properties of the Epoxy Composite Reinforced with Brazil Nut Shell: *Michelle Oliveira*[1]; Larissa Nunes[1]; Luana Demosthenes[1]; Wendell Bezerra[1]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia

Evaluation on the Design of Guaruman Fiber Reinforcement Polyester Matrix Composite for Ballistic Application: *Raphael Reis*[1]; Larissa Nunes[1]; Lucio Nascimento[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

Experimental Validation of Molecular Dynamics Simulation Results of Copper Single Crystal in Oriented Torsion: *Sergio Monteiro*[1]; Fabio Garcia Filho[1]; Fernanda da Luz[1]; [1]Military Institute of Engineering

Fique Fabric with Surface Reinforcements Produced from Natural Graphite: *Michelle Oliveira*[1]; Fabio Garcia Filho; Fernanda da Luz[1]; Artur Pereira[1]; Wagner Pinheiro[1]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia

Functionalization of Curauá Fibers with Graphene Oxide: *Ulisses Costa*[1]; Lucio Fabio Nascimento[1]; Julianna Magalhães Garcia[1]; Fabio Garcia Filho[1]; Fernanda Santos da Luz[1]; Sergio Neves Monteiro[1]; Wagner Anacleto Pinheiro[1]; Wendell Bruno Almeida Bezerra[1]; [1]Military Institute of Engineering

Functionalization of Piassava Fibers with Graphene Oxide: *Fernanda da Luz*[1]; Fabio Garcia Filho[1]; Ulisses Costa[1]; Michelle Oliveira[1]; Luana Demosthenes[1]; Artur Pereira[1]; Wendell Bezerra[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering, IME

Fundamental Study on Wettability of Pure Metal by Liquid Sodium: *Jun-Ichi Saito*[1]; Hideo Shibutani[2]; Yohei Kobayashi[3]; [1]Japan Atomic Energy Agency; [2]Kurume Institute of Technology; [3]National Institute of Technology, Maizuru College

Graphene Oxide Functionalization in Curaua Fiber/Epoxy Composites: Toward Tensile Properties: *Ulisses Costa*[1]; Lucio Fabio Nascimento[1]; Julianna Magalhães Garcia[1]; Fernanda Santos da Luz[1]; Fabio Garcia Filho[1]; Wendell Bruno Almeida Bezerra[1]; Wagner Anacleto Pinheiro[1]; Sergio Neves Monteiro[1]; [1]Military Institute of Engineering

High Strain Rate Nanoindentation of Single Crystalline Metals: *Wesley Higgins*[1]; George Pharr[1]; [1]Texas A&M University

How Small Molecules Can Trigger the One-way Effect in Shape Memory Polymers: *Axel Marquardt*[1]; Klaus Neuking[1]; Gunther Eggeler[1]; [1]Ruhr University Bochum

How to Measure High-temperature Heat Capacity Reliably by Drop Calorimetry: *Guishang Pei*[1]; Junyi Xiang[1]; Xuewei Lv[1]; Lilian Yang[1]; Gang Li[1]; Dapeng Zhong[1]; Feifei Pan[1]; [1]Chongqing University

Improvement Properties of Polypropylene by Graphene Oxide Incorporation: Tatiane Tatei[1]; Eric Fontes[1]; Renan Moreira[1]; Rene Oliveira[1]; Francisco Valenzuela-Diaz[2]; Vijaya Rangari[3]; *Esperidiana Moura*[1]; [1]Nuclear and Energy Research Institute; [2]University of Sao Paulo; [3]Tuskegee University

Incorporation of Coke Dust Gas (FGD) in Reds Ceramics: Victor Barbosa De Souza[1]; *Daniel Gallo*[1]; Niander Cerqueira[1]; [1]Uni Redentor

Incorporation of the Light Green Clay into Textile Polyamide Residues Properties: *Mariana Sartori*[1]; Dione Castro[1]; Francisco Valenzuela-Diaz[2]; Leonardo Silva[1]; [1]Nuclear and Energy Research Institute; [2]Escola Politécnica

Influence of Adiabatic Shear Bands on the Ballistic Resistance of High Hardness Armor Steel: *Suzane Oliveira*[1]; Ricardo Weber[1]; Andersan de Paula[1]; Sérgio Monteiro[1]; Elson Souza[1]; Pedro Passaline[1]; João Miguez Suarez[1]; [1]IME

Influence of Pmma Chemical Degradation in Ethanol: *Karollyne Monsores*[1]; Géssica Nicolau[1]; Anderson Oliveira[1]; Suzane Oliveira[1]; Ricardo Weber[1]; [1]Instituto Militar de Engenharia

Influence of Sealing Mortar in the Strength of Compression of the Structural Masonry Ceramic: Markssuel Marvila[1]; Afonso Azevedo[1]; Jonas Alexandre[1]; Rafael Oliveira[2]; Michel Oliveira[3]; Euzébio Zanelato[1]; *Sergio Monteiro*[4]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]IFF; [3]UFES; [4]IME

Influence of the Reduced Graphene Oxide Incorporation on Properties of Acrylonitrile Butadiene Styrene (ABS): Bianca Santos[1]; Andre Inácio[1]; Suellen Bartolomei[1]; Karina Carmo[1]; Taise Silva[1]; Rene Oliveira[1]; *Esperidiana Moura*[1]; [1]Nuclear and Energy Research Institute

Influence of UV Radiation in a Composite of Epoxidic Matrix Reinforced with Hybrid Fabric of Mallow/jute: *Ulisses Costa*[1]; Lucio Fabio[1]; Julianna Magalhães Garcia[1]; Michelle Souza Oliveira[1]; Fabio Garcia Filho[1]; Fernanda Santos da Luz[1]; Sergio Neves Monteiro[1]; Luana Demosthenes[1]; Wendell Bruno Almeida Bezerra[1]; [1]Military Institute of Engineering

Influence of UV Radiation in The Ballistic Behavior of a Composite of Epoxydic Matrix Reinforced with Hybrid Mallow/Jute Fabric: *Ulisses Costa*[1]; Lucio Fabio Nascimento[1]; Fabio Garcia Filho[1]; Fernanda Santos da Luz[1]; Julianna Magalhães Garcia[1]; Anderson Oliveira da silva[1]; André Ben-Hur Figueiredo[1]; Michelle Souza Oliveira[1]; Sergio Neves Monteiro[1]; [1]Military Institute of Engineering

Inhibition of Flame Propagation in Nanocomposites with Expanded Polystyrene Recycled, Clay, Gypsum and Titanium Dioxide: *Suellen Bartolomei*[1]; Esperidiana Moura[2]; Helio Wiebeck[1]; [1]University of Sao Paulo; [2]Ipen

In-situ Annealing and Orientation Mapping Studies of Deformed Multiphase Materials: *Magdalena Bieda-Niemiec*[1]; Anna Jarzebska[1]; Marek Faryna[1]; Krzysztof Sztwiertnia[1]; [1]Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Krakow

Investigating the Effect of Sintering Temperature on Structural and Tribological Properties of a Nanostructured Ti–20Nb–13Zr Alloy for Biomedical Applications: *Fellah Mamoun*[1]; Naouel Hezil[1]; Karima Abderrahim[2]; Mohamed Abdul Samad[3]; Alex Montagne[4]; Alberto Mejias[4]; Alain Iost[5]; Stephania Kosman[4]; Timofey Chekalkin[6]; Sabine Weiss[7]; Aleskei Obrosov[8]; [1]Abbes Laghrour University; [2]Surface Engineering Laboratory (L.I.S), Badji Mokhtar University, [3]KFUPM; [4]Arts et Metiers ParisTech, MSMP, 8; [5]Arts et Metiers ParisTech, MSMP; [6]Research Institute of Medical Materials, Tomsk State University ; [7]Department of Physical Metallurgy and Materials Technology, Brandenburg Technical University; [8]Department of Physical Metallurgy and Materials Technology, Brandenburg Technical University

Investigation on Mechanical and Thermal Behaviors of PBAT/PLA Blend Reinforced with Reduced Graphene Oxide Nanosheets: *Marcio Bartolomei*[1]; Karina Carmo[1]; Bianca Santos[1]; Suellen Bartolomei[1]; Rene Oliveira[1]; Esperidiana Moura[1]; [1]Nuclear and Energy Research Institute

Investigations on Flotation Separation of Scheelite from Calcite and Fluorite using ZT as Depressant: Tiantian Wang[1]; Hongxin Zhang[2]; *Yanfang Huang*[1]; Guihong Han[1]; Jiongtian Liu[1]; [1]Zhengzhou University; [2]Zhengzhou Institute of Multipurpose Utilization of Mineral Resources

Iron Ore Fines Granulation in a New High-speed Mixing Granulator: *Shanshan Wu*[1]; Xuewei Lv[1]; Zhongci Liu[1]; [1]Chongqing University

Leaching of Pre-oxidized Pyrargyrite With Na2s2o5: Vicente González Martínez[1]; *Isabel Hernández Martínez*[1]; M Reyes Perez[1]; M. Pérez Labra[1]; J. C. Juarez Tapia[1]; Ivan A. Reyes Dominguez[2]; Mizraim Uriel Flores Guerrero[3]; Gustavo Urbano Reyes[1]; [1]Universidad Autonoma del Estado de Hidalgo; [2]Universidad Autónoma de San Luis Potosí, Instituto de Metalurgia; [3]Universidad Tecnológica de Tulancingo. Área de Electromecánica Industrial

Magnetic and Microstructure Properties of Co-doped Rapidly Solidified Ni50Mn25-xCoxGa25 Heusler Alloys: *Imaddin Al-Omari*[1]; K. Meghana[2]; D. K. Satapathy[2]; T. Adhikary[2]; S. Aich[2]; [1]Sultan Qaboos University; [2]Indian Institute of Technology

Mechanical and Morphological Properties of Hybrid Composites Based on Recycled LDPE/EVA Blend Reinforced with Clay and Babassu Fiber Residues: Caroline Tamura[1]; Mariana Arantes[1]; Karina Carmo[1]; Bianca Santos[1]; Rene Oliveira[1]; *Esperidiana Moura*[1]; [1]Nuclear and Energy Research Institute

Mechanical Behavior of the Multidirectional Natural Hybrid Fabric with Surface Treatment Application Incorporated into the Epoxy Matrix: *Michelle Oliveira*[1]; Ulisses Costa[1]; Clara Caminha[1]; Fábio Braga[1]; Lucio Nascimento[1]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia

Microstructural Characterization of a Metallic Armor: *Suzane Oliveira*[1]; Karollyne Monsores[1]; Anderson da Silva[1]; Géssica Nicolau[1]; Pedro Passaline[1]; Débora Alves[1]; Ricardo Weber[1]; [1]IME

Microstructural Transformations in a High Hardness Armor Steel, After Ballistic Test with a 7.62 AP: *Suzane Oliveira*[1]; Karollyne Monsores[1]; Anderson da Silva[1]; Géssica Nicolau[1]; Ricardo Weber[1]; [1]IME

Observation of Topological Defects in Synthetic Antiferromagnets with Inverted Dzyaloshinskii-moriya Interaction: *Nisrit Pandey*[1]; Maxwell Li[1]; Marc De Graef[1]; Vincent Sokalski[1]; [1]Carnegie Mellon University

Orientation-induced Variability Range in Indentation-measured Elastic Modulus of Molecular Crystals: *Alexandra Burch*[1]; John Yeager[2]; David Bahr[1]; [1]Purdue University; [2]Los Alamos National Laboratory

PALF Reinforced Epoxy Composite Applied in a Rigid Armor System: *Fernanda da Luz*[1]; Fabio Garcia Filho[1]; Michelle Oliveira[1]; Ulisses Costa[1]; Luana Demosthenes[1]; Artur Pereira[1]; Wendell Bezerra[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering, IME

Preparation of Lithium Ion Battery Anode Materials from Precipitation Flotation Product: Huanhuan Miao[1]; Wenjuan Wang[1]; Yanfang Huang[1]; *Guihong Han*[1]; [1]Zhengzhou University

Preparation of Vanadium Powder by Thermal Reduction: A Review: *Dapeng Zhong*[1]; Xuewei Lv[1]; Junyi Xiang[1]; Zhongci Liu[1]; Guishang Pei[1]; Wuan Gu[2]; [1]Chongqing University; [2]Sichuan University

Processing and Characterization of Polyethylene-AgNPs Films – Biocide Effect: *Washington Oliani*[1]; Luiz Komatsu[1]; Ademar Lugao[1]; Vijaya Rangari[2]; Duclerc Parra[1]; [1]Nuclear Energy Research Inst – IPEN/USP; [2]Department of Materials Science and Engineering Tuskegee University, USA

Production and Characterization of PBAT Reinforced with Clay and Graphene Oxide Nanosheets - A Comparative Study: *Marcio Andrade*[1]; Robson Costa[1]; Danielle Araujo[1]; Rene Oliveira[1]; Vijaya Rangari[1]; Francisco Valenzuela-Diaz[2]; Esperidiana Moura[1]; [1]Nuclear and Energy Research Institute; [2]University of São Paulo

Reducing and Restoring the Strength of Rocks with Periodic Mechanical Effects: *Maksim Krasilov*[1]; Anastasia Tyutcheva[1]; [1]National University of Science and Technology "MISIS"

Resistance and Durability of Pressed and Burned Blocks of Red Ceramics with Humidity Variation: *Niander Cerqueira*[1]; Afonso Azevedo[2]; Victor Souza[3]; Daniel Gallo[3]; [1]Universidade Estadual do Norte Fluminense; [2]UFF; [3]UniRedentor

Self-compacting Concrete with Addition of Polymeric Residues of High Density Polyethylene, a Study of the Mechanical Behavior with Different Dosages: Niander Cerqueira[1]; *Victor Souza*[2]; [1]Universidade Estadual do Norte Fluminense; [2]UniRedentor

Simulation and Additive-manufacturing of the Smallest Flute: Design and Fabrication of an Acoustic Sensor to Measure Flow Parameters: *Zeqing Jin*[1]; Xi-Cheng Zhang[1]; [1]University of Rochester

Solder Cup Wire Insertion Study: *Shelley Williams*[1]; Lisa Deibler[1]; Rebecca Wheeling[1]; [1]Sandia National Laboratories

Statistical Analysis Applied to Ceramic Pellets Produced with (Al2O3 + Nb2O5 + LiF) at Different Temperatures with Different Watermills: *Luana Demosthenes*[1]; Fabio Garcia[1]; Michelle Oliveira[1]; Fernanda Luz[1]; Leandro Demosthenes[2]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia; [2]UFAM

Study of Fe-doped- KNN Ceramic as Multifunctional Material: *Fernando Badillo*[1]; Henry Colorado[1]; Alvaro Herrera[1]; Sebastian Amaya[1]; Adriana Echavarria[1]; [1]Universidad de Antioquia

Study of Styrene Effect on Non-radiation Grafting of Vinyl Benzyl Chloride on to Polyethylene-based Anion Exchange Membrane: *Di Huang*[1]; Jiann-Yang Hwang[1]; Zhichao Chen[2]; [1]Michigan Technological University; [2]Fitianbao Environmental Protection Company

Study of Thermal and Mechanical Properties of Geopolymers: *Alisson Silva*[1]; Verônica Candido[1]; Sérgio Monteiro[2]; [1]Universidade Federal do Pará; [2]Military Engineering Institute

Study on the Effect of Ultraviolet Radiation on Interfacial Resistance Between Polyaramide Thermoset Resin: *Anderson Oliveira da Silva*[1]; Karollyne Monsores[1]; Suzane Oliveira[1]; Géssica Nicolau[1]; Pedro Passalini[1]; Ricardo Weber[1]; Sérgio Monteiro[1]; [1]Military Institute Engineering

Study on the Separation of Zinc and Iron in Electric Arc Furnace Baghouse Dusts and Its Kinetics: Zhaoran Wang[1]; Chengcheng Huo[1]; Yuhong Zha[1]; *Canhua Li*[1]; [1]Anhui University of Technology

Synthesis and Characterization of Batio3 Doped with Eu3+ by the Reaction Solid State Method: *Juan Pablo Hernandez Lara*[1]; Miguel Pérez Labra[1]; Francisco Rául Barrientos Hernández[1]; José Antonio Romero Serrano[2]; Aurelio Hernández Ramírez[2]; Martín Reyes Pérez[1]; Julio Cesar Juárez Tapia[1]; Aislin Michelle Teja Ruiz[1]; Víctor Esteban Reyes Cruz[1]; Jaret del Carmen Ramírez Castellanos[1]; [1]Aactym-Uaeh; [2]ESIQIE-IPN.

Synthesis and Characterization on Copper Oxide Anode of Lithium-Ion Battery: Xuechun Han[1]; Shuzhen Yang[1]; Huina Sun[1]; Yanfang Huang[1]; *Guihong Han*[1]; [1]Zhengzhou University

Synthesis of a Synthetic Clay for the Use of Controlled Isoniazid Release Systems: *Thamyres de Carvalho*[1]; Pinheiro Gilmar[1]; Arjona Jessica[1]; Valenzuela Maria das Graças[1]; Hildebrando Edemariino[1]; Neves Roberto[1]; Valenzuela-Diaz Francisco[1]; [1]Polytechnic School of the University of São Paulo

The Experimental Study on Combustibility of Semi-coke and Pulverized Coals Injected in Blast Furnace: Guangsheng Suo[1]; Yang Li[1]; Xiong Xiao[1]; Guishang Pei[1]; [1]Chongqing University

Thermal and Mechanical Properties of Iron-actinides Intermetallic Compounds Existed in Metallic Phase of Fuel Debris: *Daisuke Okada*[1]; Yuji Ohishi[1]; Hiroaki Muta[1]; Ken Kurosaki[2]; [1]Osaka University; [2]Kyoto University

Thermal Behavior of Epoxydic Matrix Composites Reinforced with Graphene Oxide Functionalized Curauá Fibers: *Ulisses Costa*[1]; Lucio Fabio Nascimento[1]; Julianna Magalhães Garcia[1]; Wagner Anacleto Pinheiro[1]; Fernanda Santos da Luz[1]; Fabio Garcia Filho[1]; Sergio Neves Monteiro[1]; Wendell Bruno Almeida Bezerra[1]; [1]Military Institute of Engineering

Thermal Characterization of Human Hair: *Débora Alves*[1]; Ricardo Weber[1]; [1]Military Institute of Engineering

Thermal Characterization of Polymer Composites Reinforced with Sugarcane Bagasse Fiber: *Verônica Scarpini Candido*[1]; Alisson Rios da Silva[1]; Sergio Neves Monteiro[2]; [1]Universidade Federal do Pará; [2]Military Engineering Institute

Viscosity Determination of Liquid Soaps Based on MMT: *Maria das Graças da Silva-Valenzuela*[1]; Jéssica Arjona[1]; Bianca Michel[1]; Gilmar Pinheiro[1]; Tatiana Costa[1]; Francisco Valenzuela-Díaz[1]; [1]Polytechnique School of University of Sao Paulo Metallurgy and Materials Engineering Department

Weibull Analysis of Tensile Strength of High-performance Epoxy Matrix Composites Reinforced with Curaua Natural Fibers: Noan Simonassi[1]; *Fabio Garcia Filho*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

Wettability of Liquid Phase Caesium Compounds Against Metal Oxides Including UO_2 and ThO_2: *Hiroto Ishii*[1]; Yuji Ohishi[1]; Hiroaki Muta[1]; Masayoshi Uno[2]; Ken Kurosaki[3]; [1]Osaka University; [2]University of Fukui; [3]Kyoto University

MATERIALS DESIGN

Computational Discovery and Design of Emerging Materials — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Arunima Singh, Arizona State University; Houlong Zhuang, Arizona State University; Sugata Chowdhury, National Institute of Standards and Technology; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Discovery of Rare-earth-free Magnetic Materials using Adaptive Genetic Algorithm and First-principles Calculations: Zejin Yang[1]; Kai-Ming Ho[2]; *Cai-Zhuang Wang*[2]; [1]Zhejiang University of Technology and Iowa State University; [2]Iowa State University

Machine Learning Models for the Lattice Thermal Conductivity Prediction of Inorganic Materials: *Lihua Chen*[1]; [1]Georgia Institute of Technology

Searching for Electrical Conductivity Tunable Organic Molecules for Single-molecule Electronics: *Weiyi Zhang*[1]; Peter Greaney[1]; [1]University of California, Riverside

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Jorge Munoz, The University of Texas at El Paso; Sara Kadkhodaei, University of Illinois at Chicago; Vahid Attari, Texas A&M University; James Morris, Ames Laboratory

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Yongmei Jin, Michigan Tech. University; Mohsen Asle Zaeem, Colorado School of Mines; Pascal Bellon, University of Illinois; Fadi Abdeljawad, Clemson University; Anton Van der Ven, University of California, Santa Barbara; Zi-Kui Liu, Penn State University

A Model Fusion Approach to Modeling Microstructure Development during Heat Treatment: *Richard Couperthwaite*[1]; Raymundo Arróyave[1]; Ankit Srivastava[1]; Douglas Allaire[1]; Ibrahim Karaman[1]; [1]Texas A&M University

Atomistic Modeling of Austenite-ferrite Transformation Interface: *Olha Nakonechna*[1]; Helena Zapolsky[1]; Frederic Danoix[1]; Mohamed Gouné[2]; Didier Huin[3]; Nicolas Charbonnier[3]; [1]University of Rouen Normandy; [2]ICMCB, UPR CNRS 9048, University of Bordeaux; [3]ArcelorMittal research SA, voie romaine, 57 280 Maizières Les Metz

Atomistic Simulation Study of the Solid-liquid Interfacial Premelting at the Solid-liquid Interfaces of Pb Inclusions Embedded in Al Matrix: *Yang Yang*[1]; Hongtao Liang[1]; Umar Muhammad[1]; Xiangming Ma[1]; Mark Asta[2]; Brian Laird[3]; [1]East China Normal University; [2]University of California, Berkeley; [3]University of Kansas

Atomistically Informed Phase Field Simulations of Solute Drag: *Ayush Suhane*[1]; Matthias Militzer[1]; [1]University of British Columbia

Computational and Experimental Thermodynamics of Fe-Cr-Al-O Quaternary System: *Can Agca*[1]; Jake McMurray[2]; Joerg Neuefeind[2]; Alexandra Navrotsky[1]; [1]University of California, Davis; [2]Oak Ridge National Laboratory

Computational Simulation of Precipitation during Continuous Cooling of 6xxx Al-alloys: *Bernhard Miesenberger*[1]; Ernst Kozeschnik[2]; Benjamin Milkereit[3]; Erwin Povoden-Karadeniz[1]; [1]Christian Doppler Laboratory for Interfaces and Precipitation Engineering CDL-IPE, TU Wien; [2]Institute of Materials Science and Technology, TU Wien; [3]University of Rostock

Computational Study of the Structure and Thermodynamics of GP Zones in Mg Alloys: Kang Wang[1]; Du Cheng[1]; *Bi-Cheng Zhou*[1]; [1]University of Virginia

Determination of Diffusivity and its Correlation with Densification Mechanism during Spark Plasma Sintering: *Chao Yang*[1]; [1]South China University of Technology

Diffusion Along Coherent and Semi-coherent Metal/Oxide Interfaces from Reactive Molecular Dynamics: *Aakash Kumar*[1]; David Srolovitz[1]; [1]University Of Pennsylvania

Effect of Free Surface on Grain Growth by Monte Carlo Potts Model: *Sokyun Hong*[1]; Kyung Jong Lee[1]; [1]Hanyang University

Engineering Improved Electron-emitting Materials: Examining the Desorption and Diffusion Behavior of Scandate Cathodes at Operating Temperature: *Mujan Seif*[1]; Sydney Kolnsberg[1]; Kerry Baker[1]; Thomas Balk[1]; Matthew Beck[1]; [1]University of Kentucky

First-principles Study of Substitutional Solute Diffusion along a Screw Dislocation in fcc Ni: *Luke Wirth*[1]; Amir Farajian[1]; Christopher Woodward[2]; [1]Wright State University; [2]Air Force Research Laboratory

Gasification Characteristics and Kinetics of Coke with Fe2O3 Addition: *Ziming Wang*[1]; Kejiang Li[1]; Jianliang Zhang[1]; Minmin Sun[1]; Chunhe Jiang[1]; Hongtao Li[1]; [1]University of Science and Technology Beijing

Ginzburg-Landau Theory of the Crystal-Melt Interface Kinetic Coefficients: Beyond Body-centered-cubic Crystal Systems: *Xianqi Xu*[1]; Jeff J. Hoyt[2]; Brian B. Laird[3]; Asta Mark[4]; Yang Yang[1]; [1]School of Physics and Material Science, East China Normal University; [2]Department of Materials Science and Engineering, McMaster University; [3]Department of Chemistry, University of Kansas, USA; [4]Department of Materials Science and Engineering, University of California, Berkeley

Kinetic Monte Carlo Simulations of Effect of Grain Boundary Variability on Forming Times of RRAM Conductive Filaments: *Yang Hao Lau*[1]; Zhun Yong Ong[1]; Hiroyo Kawai[1]; Liling Zhang[1]; Gang Wu[1]; Bharathi Madurai Srinivasan[1]; David Wu[1]; [1]Institute of High Performance Computing

Kinetics of Scrap Melting in Iron-carbon Bath: *Mengke Liu*[1]; Guojun Ma[1]; Xiang Zhang[1]; [1]Key Laboratory for Ferrous Metallurgy and Resources Utilization of Ministry of Education, Wuhan University of Science and Technology; Hubei Provincial Key Laboratory of New Processes of Ironmaking and Steelmaking, Wuhan University of Science and Technology; State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology, Hubei Wuhan, China

Mesoscopic Model of Free Surface Behavior in the Continuous Casting Mold: *Peng Zhao*[1]; Bin Yang[2]; Liang Li[2]; Yinhe Lin[3]; [1]Kunming University of Science and Technology; Panzhihua University; [2]Kunming University of Science and Technology; [3]Yangtze Normal University

Monte Carlo Simulation on Clustering of Solute Atoms in a-Fe based on Interatomic Interaction Energies: *Masanori Enoki*[1]; Hiroshi Ohtani[1]; [1]IMRAM, Tohoku University

Multi-phase-field Modeling and Simulations of Polycrystalline Microstructure with Grain Boundary Phase: *Aoshi Nakai*[1]; Eisuke Miyoshi[1]; Tomohiro Takaki[1]; [1]Kyoto Institute of Technology

Multi-phase-field Modeling for Interaction of Moving Dendritic Particles: *Namito Yamanaka*[1]; Tomohiro Takaki[1]; Shinji Sakane[1]; Yasushi Shibuta[2]; Munekazu Ohno[3]; [1]Kyoto Institute of Technology; [2]The University of Tokyo; [3]Hokkaido University

Numerical Investigation of Heat Transfer and Fluid Flow Dynamics for the Molten Pool during Selective Laser Melting of Ti-6Al-4V Alloy: *Meng Qingbo*[1]; Zhou Xianglin[1]; [1]University of Science and Technology Beijing

Numerical Study of Raceway Shape and Size in a Model Blast Furnace: *Xing Peng*[1]; Jingsong Wang[1]; Cong Li[1]; Haibin Zuo[1]; Xuefeng She[1]; Guang Wang[1]; Qingguo Xue[1]; [1]University of Science and Technology Beijing

Phase-field Simulation Study of Crystallization of Polymer Droplets on Surfaces: *Yang Xia*[1]; Jason Liu[1]; Rodney Priestley[1]; Craig Arnold[1]; Mikko Haataja[1]; [1]Princeton University

Phase-field Study on the Transformation of Lath Martensite in Steel: *Mingyu Cho*[1]; Pilryung Cha[1]; [1]Kookmin University

Phase Field Modeling of Grain Boundary Grooving and Migration due to Electric Field and Thermal Gradient: *Supriyo Chakraborty*[1]; Praveen Kumar[2]; Abhik Choudhury[2]; [1]Ohio State University; [2]Indian Institute of Science

Predicting Aggregation and Adsorption Energies for Bimetallic Catalysts Using Machine Learning: *Shwetank Yadav*[1]; [1]University of Toronto

Predicting the Enthalpy of Hydrogen Dissolution in Niobium Using First Principles: *Arvind Ramachandran*[1]; Houlong Zhuang[1]; Klaus Lackner[1]; [1]Arizona State University

Prediction of Permeability Tensor for Columnar Dendritic Structures: Phase-field and Lattice Boltzmann Simulations: *Yasumasa Mitsuyama*[1]; Tomohiro Takaki[1]; Shinji Sakane[1]; Yasushi Shibuta[2]; Munekazu Ohno[3]; [1]Kyoto Institute of Technology; [2]The University of Tokyo; [3]Hokkaido University

Probing the Interactions Between Interstitial Hydrogen Atoms in Niobium Through Density Functional Theory Calculations: *Arvind Ramachandran*[1]; Houlong Zhuang[1]; Klaus Lackner[1]; [1]Arizona State University

Reduction Kinetics Analysis of Fe2O3 in the Case of Carbon Precipitation: Yangxin Chen[1]; Liangying Wen[1]; Shengfu Zhang[1]; *Jiao Cao*[1]; [1]Chongqing University

Role of Defects, Interfaces in FCC-BCC Massive Transformation in Iron Using Molecular Dynamics Simulation: *Pawan Tripathi*[1]; Somnath Bhowmick[1]; [1]Indian Institute of Technology, Kanpur, India

Solute Partition at Solid-liquid Interface of Binary Alloy by Molecular Dynamics Simulation: *Kensho Ueno*[1]; Yasushi Shibuta[1]; [1]The University of Tokyo

Study of Drying during Straight Grate Process and its Factors - Analysis with CFD: *Feng Cao*; [1]Central South University

Studying the Nb-H System Using Density Functional Theory Calculations: *Arvind Ramachandran*[1]; Houlong Zhuang[1]; Klaus Lackner[1]; [1]Arizona State University

Surface Diffusion in Metallic Glasses Using Atomistic Simulations: *Ajay Annamareddy*[1]; Paul Voyles[1]; John Perepezko[1]; Dane Morgan[1]; [1]University of Wisconsin

Thermodynamic Stability and Kinetics of Nb3Ge, Nb3Al, and Nb3Ga A15 Phases: *Ajinkya Hire*[1]; Hannah Bayard[1]; Chris Orozco[1]; Biswas Rijal[1]; Lilong Zhu[1]; Ryan Porter[2]; Zeming Sun[2]; Matthias Liepe[2]; Michele Manuel[1]; Richard Hennig[1]; [1]University of Florida; [2]Cornell Univerity

MATERIALS PROCESSING

Defects and Properties of Cast Metals — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Lang Yuan, University of South Carolina; Brian Thomas, Colorado School of Mines; Peter Lee, University College London; Mark Jolly, Cranfield University; Alex Plotkowski, Oak Ridge National Laboratory; Charles Monroe, University of Alabama at Birmingham

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Component Analysis of Defects in Secondary Special Brass Alloy: *Liu Wei*; Xing Peng[1]; Zhao Hongliang[1]; Wang Chengyan[1]; Chen Yongqiang[1]; Guo Shumei[2]; Liu Fengqin[1]; Huang Teng[2]; [1]University of Science and Technology Beijing; [2]Ningbo Wave Vibration Copper Co., Ltd.

Microstructure and Chemical Composition in Continuous Directional Solidification Cu–P–Sn Alloy: *Jihui Luo*[1]; Xinxin Deng[1]; Li Zhang[1]; Suliang Wang[1]; Zhongfang Xie[1]; Xianyue Ren[1]; [1]Yangtze Normal University

Ni/Mn Replacement in High-Ni Austenitic Stainless Cast Steels used for Turbo-charger: *Jisung Yoo*[1]; Won-Mi Choi[1]; Byeong-Joo Lee[1]; Yong-Jun Oh[2]; Gi-Yong Kim[3]; Sunghak Lee[1]; [1]Pohang Institute of Sci & Tech POSTECH; [2]Hanbat National University; [3]Key Yang Precision

Synchrotron Validated Modelling of Pore Formation During High Pressure Die Casting: *Zhixuan Gong*[1]; Shishira Bhagavath[2]; Tim Wigger[1]; Saurabh Shah[1]; Sebastian Marussi[1]; Shashidar Marathe[3]; Shyamprasad Karagadde[2]; Peter Lee[1]; [1]University College London; [2]Indian Institute of Technology Bombay; [3]Diamond Light Source Ltd

The Optical and Electronic Features of HgSiX2 (X=P, As) Chalcopyrite Materials: A First Principle Calculations: *Khalid Shah*[1]; Guiwu Lu*[1]; [1]China University of petroleum-Beijing

MATERIALS PROCESSING

Electrometallurgy 2020 — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Georges Houlachi, Hydro-Quebec; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: To Be Announced

Effects of Precursor Concentration on the Surface Morphology and Electrocatalytic Performance of Ti/IrO2-RuO2-SiO2 Anode for Oxygen Evolution Reaction: *Bao Liu*[1]; Shuo Wang[1]; Qiankun Jing[1]; Chengyan Wang[1]; [1]University of Science and Technology Beijing

Electrochemical Behavior of Fe2O3 in Electrodeoxygenation in NaCl-CaCl2 Molten Salt System: Lei Jia[1]; *Hui Li*[1]; Zongying Cai[1]; Jinglong Liang[1]; [1]North China University of Science and Technology

Electron Beam Refinery and Purification in Newly Constructed Production Units with Gas Discharged Electron Beam Guns: *Alexander Manulyk*[1]; Nikolayi Grechanyuk[1]; Pavel Kucherenko[1]; Alexey Melnik[1]; [1]Synergy Antech Services INC

Reduction Mechanism of Metal Cobalt from Cathode Material of Waste Lithium Cobalt Oxide Battery: Jing Wang[1]; *Jinglong Liang*[1]; Hui Li[1]; Jie Xu[1]; [1]North China University of Science And Technology

Review on the Bio-oxidation of Pyrite: Implications for Mining Industry: *Xin Lv*[1]; [1]Central South University

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Leveraging Materials in Topology Optimization — Poster Session

Program Organizer: Natasha Vermaak, Lehigh University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Posters to be announced

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Poster Session I

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Simona Hunyadi Murph, SRNL and UGA

3D Printing of Conductive Epoxy-carbon Nanotube Composite: *Masoud Kasraie*[1]; Parisa Pour Shahid Saeed Abadi[1]; [1]Michigan Tech University

Effect of Lithium Concentration-dependent Material Properties on Diffusion Induced Stresses of Sn Anode: *Chung Su Hong*[1]; Nadeem Qaiser[1]; Hyeon Gyun Nam[1]; Seung Min Han[1]; [1]KAIST

Flexible Honeycombed Nanoporous/glassy Hybrid for Efficient Electrocatalytic Hydrogen Generation: *Rui Li*[1]; K.C. Chan[1]; Xiongjun Liu[2]; Z.P. Lu[2]; [1]Hong Kong Polytechnic University; [2]University of Science & Technology Beijing

Nano-engineered Hybrid flywheels for High Energy Density and High Power Density: *Jamshid Kavosi*[1]; Mohammad Naraghi[1]; Terry Creasy[1]; Alan Palazzolo[1]; [1]Texas A&M University

Novel VS4 Nanorods Synthesized by a Facile Solvothermal Method for High Performance Electrochemical Capacitor Electrode: *Jun-Kai Feng*[1]; Jie Huang[1]; Hong-Yi Li[1]; Bing Xie[1]; [1]Chongqing University

Solid-state Electrolytes for Lithium–selenium Disulfide Batteries with Enhanced Safety: *Panpan Dong*[1]; Xiahui Zhang[1]; Younghwan Cha[1]; Min-Kyu Song[1]; [1]School of Mechanical and Materials Engineering, Washington State University

Strain Induced Cyclic Phase Transitions in Fatigue-tolerant 2D Elastocaloric/thermoelastic Materials for Future Cooling and Refrigeration Technologies: *Zhewen Yin*[1]; Sankha Mukherjee[2]; Yunjo Jeong[1]; MdRubayat-E Tanjil[1]; Chandra Veer Singh[2]; Michael Cai Wang[1]; [1]University of South Florida; [2]University of Toronto

Surface Composition of Cu@Ag Bimetallic Nanoparticles Tuned for Enhanced Oxygen Reduction Reaction: *Youngtae Park*[1]; Changsoo Lee[1]; Hyuck Mo Lee[1]; [1]KAIST

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Functional Nanomaterials 2020: Translating Innovation into Pioneering Technologies — Poster Session II

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee

Program Organizers: Simona Hunyadi Murph, Savannah River National Lab, ARC/HRTL; Huanyu Cheng, Pennsylvania State University; Yong Lin Kong, University of Utah; Min Kyu Song, Washington State University; Ning Zhang, University of Alabama

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Simona Hunyadi Murph, Savannah River National Lab and UGA

Fabrication of Bilayer Nanoporous Copper from Rapidly Solidified Al70Cu30 Ribbons by Chemical Dealloying Technique: *Hailan Ma*[1]; Bingge Zhao[1]; Kai Ding[1]; Yulai Gao[1]; [1]Shanghai University

High-performance Piezoelectric Nanogenerator Based on Electrospun Polymer for Powering Smart Wearables: *Siddharth Sharma*[1]; Indranil Lahiri[1]; Partha Roy[1]; Debrupa Lahiri[1]; [1]IIT Roorkee

Interfacial Surface Chemistry Effect on Thermal and Electrical Conductivity of Carbon Nanotube-copper Composites: *Farhad Daneshvar*[1]; Atif Aziz[2]; Tan Zhang[1]; Hung-Jue Sue[1]; Mark Welland[2]; [1]Texas A&M University; [2]University of Cambridge

Optimized Optical Properties and Mechanical Assessment of AlN/SiO2 Nanomultilayers: *Chelsea Appleget*[1]; Andrea Hodge[1]; [1]University of Southern California

Study of pH Influence in The Synthesis of Copper Nanoparticles Using Ascorbic Acid as Reducing and Stabilizing Agent: Thamiris Martins[1]; *Botelho Junior*[1]; Viviane de Moraes[2]; Denise Espinosa[1]; [1]USP; [2]Mauá Institute of Technology

The Effect of a Ripening Step in the Early Stages of WSe_2 Synthesis by Molecular Beam Epitaxy: *Peter Litwin*[1]; Costel Constantin[2]; Stephen McDonnell[1]; [1]University of Virginia; [2]James Madison University

Thermal Stability of Hafnium Zirconium Oxide on Transition Metal Dichalcogenides: *Maria Gabriela Sales*[1]; Shelby Fields[1]; Samantha Jaszewski[1]; Sean Smith[2]; Jon Ihlefeld[1]; Stephen McDonnell[1]; [1]Department of Materials Science and Engineering, University of Virginia; [2]Sandia National Laboratories

General Poster Session — Advanced Materials

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Advanced Manufacturing of High Density Reactive Materials: *Chris Haines*[1]; Matthew Beyard[2]; [1]US Army CCDC - Army Research Laboratory; [2]Office of Naval Research - Code 35

Developing Continuous and Multi-step Strain-annealing Processes for Fe-based Amorphous Magnetically-soft Inductor Cores: *Nickolaus Bruno*[1]; Ronald Noebe[2]; Alex Leary[2]; Vladimir Keylin[2]; Grant Feichter[2]; [1]South Dakota School of Mines and Technology; [2]NASA Glenn Research Center

Influence of Solution Heat Treatment on the Microstructures and Mechanical Properties of TC4 Alloy Prepared by SLM: *Shifeng Liu*[1]; Zhichang Zhang[1]; [1]Xi'an University of Architecture and Technology

Modelling and Neutron Diffraction Characterization of the Interface Bond Integrity of Spray Formed Dissimilar Steel Clad Systems: *Tung Lik Lee*[1]; J. Mi[2]; S. Ren[3]; S. Zhao[3]; J. Fan[3]; S. Kabra[1]; P. Grant[4]; [1]UK Research and Innovation (STFC); [2]University of Hull; [3]Baosteel; [4]University of Oxford

Effect of Mechanical Alloying parameters on Fienemet Alloys Processed by Spark Plasma Sintering: *Taban Larimian*; Rajeev Kumar Gupta[1]; Varun Chaudhary[2]; Raju Ramanujan[3]; [1]The University of Akron; [2]School of Materials Science & Engineering Nanyang Technological University; [3]Nanyang Technological University

General Poster Session — Characterization

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Automated Reconstruction of Spherical Kikuchi Maps: *Chaoyi Zhu*[1]; Kevin Kaufmann[1]; Kenneth Vecchio[1]; [1]University of California, San Diego

Bio-physicochemical Evaluation and Treatment of Kitchen Grey water: *Ita Uwidia*[1]; Esogbue Chukwuemeka[1]; [1]University of Benin

In-situ Measurement of Thin Film Moduli and Yield Stress via Confined Compression: *Owen Brazil*[1]; [1]Texas A&M

Investigation of Strain Rate Sensitivity with Novel High Strain Rate Nanoindentation: *Christopher Walker*[1]; George Pharr[1]; [1]Texas A&M University

Rapid Evaluation of Five-day Biochemical Oxygen Demand from Permanganate Value in Raw and Biologically Treated Domestic Sewage: *Ita Uwidia*[1]; Christopher Ademoroti[1]; [1]University of Benin

Wear Characteristics of Aluminum-quartz-barite Composites: Emmanuel Akpan[1]; Torti Uwaike[2]; Oluwashina Gbenebor[2]; Oluwaseyi Taiwo[2]; *Samson Adeosun*[2]; Samuel Olaleye[2]; [1]Institut fur Verbundwerkstoffe ; [2]University of Lagos

General Poster Session — Materials Design

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Density Functional Theory Calculations based on Investigation of Interaction Between Multiple Hydroxyamide Ligands and La3+ Ion: *Anindita Pati*[1]; Tarun Kundu[1]; Snehanshu Pal[2]; [1]Indian Institute of Technology Kharagpur; [2]NIT Rourkela

High-throughput Screening of Hydrogen Evolution Reaction for MXenes by Single Metal Atom Doping: *Jun Jiang*[1]; Xiaoxu Wang[1]; Caiqun Wang[1]; Liutao Zhao[1]; [1]Beijing Computing Center

Integrated Study of First-principles Calculations and Experimental Measurements for Hydrogen Effect on FCC to HCP Martensitic Transformation: *Satoshi Iikubo*[1]; Kenji Hirata[2]; Yui Kuroki[1]; Shoya Kawano[1]; Hiroshi Ohtani[3]; Motomichi Koyama[3]; Kaneaki Tsuzaki[4]; [1]Kyushu Institute of Technology; [2]National Institute of Advanced Industrial Science and Technology; [3]Tohoku University; [4]Kyushu University

Prediction of Aluminum Alloy Mechanical Properties with Bayesian Neural Network: *Shimpei Takemoto*[1]; Yoshishige Okuno[1]; Kenji Nagata[2]; Junya Inoue[3]; Manabu Enoki[3]; [1]Showa Denko; [2]NIMS; [3]The University of Tokyo

Text Data Mining Analysis on Changes in the Number of Doctoral Degree Holders in Computational Materials Science in Japan During the Last 50 Years: *Yayoi Terada*[1]; Tetsuo Mohri[1]; [1]IMR, Tohoku University

General Poster Session — Materials Processing

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Control of Precipitation Behavior of TiN in High Titanium Steel: *Lidong Xing*[1]; Jianlong Guo[2]; Zefeng Zhang[1]; Min Wang[1]; Yanping Bao[1]; Fanzheng Zeng[3]; Botao Chen[3]; [1]State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; [2]China Petroleum Materials Procurement Center; [3]Xiangtan Iron & Steel Co., Ltd. of Hu Nan Valin

Material Surface Metallurgy By Double-glow-discharge Plasma Technology --- Xu-Tec Process: Zhong Xu[1]; *Frank Xiong*[2]; [1]Taiyuan University of Technology; [2]Heaptech

Microstructural and Mechanical Properties of Pinch Rolls Fabricated by Horizontal Centrifugal Casting: *Kyeongsoon Park*[1]; G.W. Jung[1]; H.Y. Hong[1]; D.H. Kim[1]; N.K. Yi[2]; C.K. Kim[2]; [1]Sejong University; [2]S.M Metal

Microstructures and Superelasticity of Ti-Zr-Nb-Sn Alloy Fibers Prepared by Melt Spinning: *Taehyun Nam*[1]; Shuanglei Li[1]; [1]Gyeongsang National University

Simulation of Microstructure Evolution During Magnetic Field Assisted Manufacturing: *Omar Betancourt*[1]; Mahmood Mamivand[1]; [1]Boise State University

Influence of Al_2O_3 on the Liquid Phase Fluidity and the Consolidation Strength of Sintered Body Formed by Iron Ore Fines: Heping Li[1]; Zhibin Hong[1]; Shengli Wu[1]; Heng Zhou[1]; Mingyin Kou[1]; [1]University of Science and Technology Beijing

General Poster Session — Nanostructured and Heterostructured Materials

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Confined Laser Shock Detonation to Form Nanodiamonds with Nitrogen-vacancy Center: *Qiong Nian*[1]; Rui Dai[1]; [1]Arizona State University

Monodisperse Polystyrene Spheres: Studies on the Effects of Reaction Parameters on Particle Diameter and Colloidal Stability: Ikhazuagbe Ifijen[1]; *Esther Ikhuoria*[2]; Aireguamen Aigbodion[1]; Stanley Omorogbe[1]; [1]Rubber Research Institute of Nigeria; [2]University of Benin

Polymer-based Nanocomposites for Energy Storage and Their Applications as Active Sensors: *Yao Wang*

The Unusual Effect of Alloying Elements on Microstructure and Texture Development During HPT in Single Phase Zn-alloys: *Wiktor Bednarczyk*[1]; Maria Watroba[1]; Jakub Kawalko[1]; Nong Gao[2]; Marco Starink[2]; Piotr Bala[1]; Terence Langdon[2]; [1]AGH University of Science and Technology; [2]University of Southampton

Nanolaminated Al2O3/HfO2 insulator for high-performance flexible TFT: *Qiuwei Shi*[1]; Muhammad Izzat Bin Abdul Aziz[1]; Pooi See Lee[1]; [1]Nanyang Technological University

Wallpapering-inspired Approach to Create Wrinkles in a Single-layer Graphene: *Won Il Park*; Sang Il Lee[1]; Jae Hyung Lee[1]; Dong Won Yang[1]; Jae Hyeok Shin[1]; Won Jun Chang[1]; [1]Hanyang university

General Poster Session — Physical Metallurgy

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Explaining the Martensitic Transformation by Optimizing the Strain: *Félix Therrien*[1]; Vladan Stevanovic[1]; [1]Colorado School of Mines

Interaction Between Cu and Cr Coadsorption on MnS Inclusions in Low Alloy Steel and Study of the Interfaces Between a-Fe and MnS: *Wenting Lv*[1]; Luchun Yan[1]; Xiaolu Pang[1]; Huisheng Yang[1]; Lijie Qiao[1]; Yanjing Su[1]; Kewei Gao[1]; [1]University of Science and Technology Beijing

Optimization of Oxidation Resistance and Mechanical Properties of Refractory High-entropy Alloys-futuristic Strategy: *saad Sheikh*[1]; Hideyuki Murakami[1]; [1]National Institute for Materials Science, Japan

ADVANCED MATERIALS

High Entropy Alloys VIII — Poster Session I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

A Rapid Simulation Method of Single Phase High-entropy Alloys via CALPHAD-based High-throughput Calculation: *Peiyong Chen*[1]; Chanho Lee[1]; Xuesong Fan[1]; Chuan Zhang[2]; Jim Hu[3]; Peter Liaw[1]; [1]University of Tennessee; [2]CompuTherm LLC; [3]Honda R&D

Ab Initio Modeling of Peierls Potential of Screw Dislocations in bcc High-entropy Alloys: *Sheng Yin*[1]; Jun Ding[2]; Mark Asta[2]; Robert Ritchie[2]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

An Investigation into the Link Between Microstructure and Pitting Corrosion of Novel Alloy FBB8+Ti: *Mark Wischhusen*[1]; Carol Glover[1]; John Scully[1]; Peter Liaw[2]; Sean Agnew[1]; [1]University of Virginia - Department of Materials Science and Engineering; [2]University of Tennessee, Knoxville

Anisotropic Lattice Distortion Induced by Hydrogen in CoCrFeMnNi High-entropy Alloy: *Hung-Wei Yen*[1]; Shi-Wei Chen[2]; Yu-Ting Mai[1]; Yi-Ting Lin[1]; [1]National Taiwan University; [2]National Synchrotron Radiation Research Center

Antiphase Boundaries in the B2 Matrix of the Al-Co-Cr-Fe-Ni High Entropy Alloy: Louisa Meshi[1]; Lior Natovitz[1]; *Guy Hillel*[1]; Yatir Linden[1]; Shai Salhov[2]; Malki Pinkas[2]; [1]Ben Gurion Univ of the Negev; [2]Nuclear Research Center Negev

Atomic Scale Modeling of Hydrogen Accommodation and Transport in BCC Refractory High Entropy Alloys: *Simon Middleburgh*[1]; Daniel King[2]; [1]Nuclear Futures Institute; [2]Imperial College London

Atomistic Modeling of Dislocations in a Random High-entropy Alloy: *Diana Farkas*[1]; Roberto Pasianot[2]; [1]Virginia Polytechnic Institute; [2]Atomic Energy Comission, Argentina

Combinatorial Exploration of High Entropy Alloys: *Sebastian Alexander Kube*[1]; Sungwoo Sohn[1]; David Uhl[2]; Amit Datye[1]; Apurva Mehta[3]; Jan Schroers[1]; [1]Yale University; [2]Southern Connecticut State University; [3]SLAC National Accelerator Laboratory

Comparison of Short and Long Term Static Oxidation in Nb-Cr-W-Ta-V High Entropy Alloy: *Shailendra Varma*[1]; Francelia Sanchez[1]; Sabastian Moncayo[1]; Ramana Chintalapalle[1]; [1]University of Texas

Concurrent TWIP-TRIP, Short-range Order and Strain Localization in Single-crystal NiCrCo Medium Entropy Alloy Drives Exceptional Mechanical Behavior: *Sezer Picak*[1]; Prashant Singh[2]; Aayush Sharma[2]; Yuri I. Chumlyakov[3]; Duane D. Johnson[2]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University; [2]Lowa State University; [3]Siberian Physical Technical Institute

Correlation Effects in Diffusion in High Entropy Alloys Correlation Effects in Diffusion in High Entropy Alloys: *Irina Belova*[1]; Mohammad Afikuzzaman[1]; Graeme Murch[1]; [1]University of Newcastle

Corrosion Behavior of Selected High Entropy Alloys: *Elzbieta Godlewska*[1]; Marzena Mitoraj-Krolikowska[1]; Jakub Czerski[1]; Monika Jawanska[1]; Sergej Gein[2]; Ulrike Hecht[2]; [1]AGH UST; [2]Access e.V.

Corrosion Performance of a Non-equimolar High Entropy Alloy After Annealing: *Anup Panindre*[1]; Gopal Viswanathan[1]; Sirui Li[1]; Christopher Taylor[1]; Gerald Frankel[1]; [1]The Ohio State University

Corrosion Properties of Refractory TiNbTaZrMo High Entropy Alloy: *Kwangsuk Park*[1]; Bosung Seo[1]; Hyung-Ki Park[1]; Hyunsoo Kang[1]; Jang-Won Kang[1]; [1]Korea Institute of Industrial Technology

Deformation Mechanisms of Two Stable Face Centered Cubic High Entropy Alloys at Cryogenic Temperature: *Feng He*[1]; Shaolou Wei[2]; Zhijun Wang[3]; C. Cem Tasan[2]; [1]City University of Hong Kong; [2]Massachusetts Institute of Technology; [3] Northwestern Polytechnical University

Design of Non-equiatomic Refractory High Entropy Alloys through Combination of Various Strengthening Mechanisms Towards Strength-ductility Synergy: *Cheng Zhang*[1]; Benjamin MacDonald[1]; Fengwei Guo[2]; Yongwang Kang[2]; Xiaochang Xie[2]; Zhiqiang Fu[1]; Yizhang Zhou[1]; Enrique Lavernia[1]; [1]Department of Materials Science and Engineering, University of California Irvine; [2]AECC Beijing Institute of Aeronautical Materials

Designing New Corrosion Resistant High Entropy Alloys with Exceptional Strength-ductility Synergy and Good Weldability: *Saurabh Nene*[1]; Sanya Gupta[1]; Rajiv Mishra[1]; [1]University of North Texas

Direct Production of High Entropy Alloy Powders: *Jawad Haidar*[1]; [1]Kinaltek Pty Ltd.

Dislocation Dynamics in a BCC Refractory Multi-Principal Element Alloy MoNbTi: *Fulin Wang*[1]; Glenn Balbus[1]; Jungho Shin[1]; Paul Rottmann[1]; Jean-Charles Stinville[1]; Leah Mills[1]; Oleg Senkov[2]; Tresa Pollock[1]; Daniel Gianola[1]; [1]Materials Department, University of California, Santa Barbara; [2]Air Force Research Laboratory, Materials and Manufacturing Directorate

Dislocation Nucleation in FeCoCrNiMn High Entropy Alloy: *Jianwei Xiao*[1]; Chuang Deng[1]; [1]University of Manitoba

Effect of Al on Microstructure, Hardness, and Corrosion Performance of Al-Cr-Fe-Mn Alloys: *Jarrod Gesualdi*[1]; Cameron Blanchard[1]; Hojong Kim[1]; [1]The Pennsylvania State University

Effect of Heat Treatment on the Microstructure and Mechanical Properties of AlCrFeNiCu High Entropy Alloy: *Nicholus Malatji*[1]; Rudolf Kanyane[1]; Thabo Lengopeng[1]; Patricia Popoola[1]; Sisa Pityana[1]; [1]Tshwane University of Technology

Effect of Mn in CrCoFeNiMn High Entropy Alloy on Creep Performance: *Kyle Rozman*[1]; Martin Detrois[1]; Paul Jablonski[1]; Michael Gao[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

Electronic Properties and Characterization of Passive Films Formed on CrMnFeCoNi and CrFeCoNi Multiple Principal Element Alloys in a 0.1M NaOH Solution: *Hamidreza Torbati-Sarraf*[1]; Mitra Shabani[1]; Garrett Pataky[1]; Paul Jablonski[1]; Amir Poursaee[1]; [1]Clemson University

Engineering Atomic-level Complexity in Complex Concentrated Alloys: *Hyunseok Oh*[1]; Khorgolkhuu Odbadrakh[2]; Sang Jun Kim[3]; Wook Ha Ryu[3]; Kook Noh Yoon[3]; Sai Mu[4]; Fritz Körmann[5]; Yuji Ikeda[5]; Cemal Cem Tasan[1]; Dierk Raabe[5]; Takeshi Egami[4]; Eun Soo Park[3]; [1]Massachusetts Institute of Technology; [2]University of Tennessee and Oak Ridge National Laboratory; [3]Seoul National University; [4]Oak Ridge National Laboratory; [5]Max-Planck-Institut für Eisenforschung

Enhanced Irradiation Resistance Through Phase Transformation in NiFeCoCrCu HEA Film: *Li Jiang*[1]; Yuan Xiu[1]; Wen Zhang[1]; Min Wang[1]; [1]University of Michigan

Evaluation of Microstructural and Mechanical Properties of AlxCrFeMnNi High Entropy Alloys: Nicholus Malatji[1]; *Khumo Masemola*[1]; Patricia Popoola[1]; [1]Tshwane University of Technology

Evolution of Texture During Thermo-mechanical Processing of High Entropy Alloy (HEA): *Shi Hoon Choi*[1]; Min-seong Kim[1]; Lalit Kaushik[1]; Jaiveer Singh[1]; [1]Sunchon National University

First-principles Prediction of the Phase Stability and Mechanical Property of NbMoTaW High-entropy Alloy: *Kaisheng Huang*[1]; Wen-Dung Hsu[1]; [1]NCKU

Friction Stir Processing: A Microstructural Modification Technique for Complex Concentrated Alloys: *Anumat Sittiho*[1]; Jadzia Graves[1]; Madhumanti Bhattacharyya[1]; Indrajit Charit[1]; Rajiv Mishra[2]; [1]University of Idaho; [2]University of North Texas

Grain Size Dependent Entropy-driven Phase Transformation in High Entropy Oxides: *Alexander Dupuy*[1]; Xin Wang[1]; Julie Schoenung[1]; [1]University of California, Irvine

High Entropy Alloy Effect on Stability of Potential Permanent Magnets: *Ying Chen*[1]; Arkapol Saengdeejing[1]; [1]Tohoku University

High Strain Rate Deformation of Dual Phase High Entropy Alloy: Samrat Tamuly[1]; Saurabh Dixit[2]; *Prasenjit Khanikar*[1]; [1]Indian Institute of Technology Guwahati; [2]Mishra Dhatu Nigam Limited

Hydrogen Diffusion and Hydrogen-induced Stress Cracking (HISC) of Cold Rolled High Entropy Alloy (HEA, Co0.2Cr0.2Fe0.2Mn0.2Ni0.2): *Namhyun Kang*[1]; Junghoon Lee[1]; Hanji Park[1]; Cheolho Park[2]; [1]Pusan National University; [2]Korea Atomic Energy Research Institute

Impact of Interstitial Alloying on Stacking-fault Energies in High-entropy Alloys from First Principles: *Yuji Ikeda*[1]; Jörg Neugebauer[1]; Fritz Körmann[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

Interdiffusion, Solubility Limit and Role of Enthalpy and Entropy in Senary FCC Al-Co-Cr-Fe-Ni-Mn High Entropy Alloy: *Abhishek Mehta*[1]; Yongho Sohn[1]; [1]University of Central Florida

Internal Oxidation of Refractory MoWTaTiZr HEA using Periodic DFT and Atomistic Thermodynamic Modeling: *Eric Osei-Agyemang*[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

Low Cycle Fatigue Behavior and Cyclic Plastic Response of Equiatomic CrCoNi Medium-entropy Alloy with Partially and Fully Recrystallized Microstructures: *Milan Heczko*[1]; Connor Slone[2]; Veronika Mazanova[1]; Ivo Kubena[1]; Easo George[3]; Tomas Kruml[1]; Jaroslav Polak[1]; Michael Mills[2]; [1]Institute of Physics of Materials CAS; [2]The Ohio State University; [3]Oak Ridge National Laboratory

Mechanical Properties and Tribocorrosion Behaviors of TiNbTaZr-based High-entropy Alloys for Biomedical Applications: *Shih-Chieh Chao*[1]; Kuan-Cheng Lai[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

Mechanical Properties of CoCrFeMnNiMox High Entropy Alloy Films: *Tzu-Hsuan Huang*[1]; Chia-Lin Li[1]; Chun-Hway Hsueh[1]; [1]National Taiwan University

Micro- and Mesoscale Mechanical Properties of a FeCrMnNi High Entropy Alloy Subject to Large Strain Extrusion Machining: *Jonathan Gigax*[1]; Osman El-Atwani[1]; Quinn McCulloch[1]; Berk Aytuna[2]; Mert Efe[2]; Saryu Fensin[1]; Stuart Maloy[1]; Nan Li[1]; [1]Los Alamos National Lab; [2]Middle East Technical University

Microstructural Evolution and Mechanical Properties of Non-equiatomic Fe40Cr25Ni15 Al15Co5 High-entropy Alloy: *Vikas Shivam*[1]; Joysurya Basu[1]; Rampada Manna[1]; N. Mukhopadhyay[1]; [1]Indian Institute of Technology (BHU) Varanasi

Microstructure Evolution and Mechanical Behavior of Nitrogen Interstitial CoCrFeMnNi High-entropy Alloys: *Jing Zhang*[1]; Min Seok Kim[2]; Kook Noh Yoon[2]; Heh Sang Ahn[2]; Eun Soo Park[2]; [1]Jiangsu University of Science and Technology; [2]Seoul National University

Multi-component Intermetallic Precipitation in FCC based Complex Concentrated Alloys: *Sriswaroop Dasari*[1]; Vishal Soni[1]; Abhinav Jagetia[1]; Rajarshi Banerjee[1]; [1]University of North Texas

Origin of High Cr Cation Fractions in Passive Oxide of Ni38Fe20CrxMn21-0.5xCo21-0.5x High Entropy Alloys: *Junsoo Han*[1]; Angela Gerard[1]; Xuejie Li[2]; James Saal[3]; Pin Lu[3]; Wolfgang Windl[4]; Kevin Ogle[2]; Gerald Frankel[4]; John Scully[1]; [1]University of Virginia; [2]Chimie ParisTech; [3]Questek; [4]The Ohio State University

Origins of Excellent Passivation in Multiple Principle Element Alloys: *John Scully*[1]; Angela Gerard[1]; Carol Glover[1]; Kang Wang[1]; Bi-Cheng Zhou[1]; Prasanna Balachandran[1]; Gerald Frankel[2]; Pin Lu[3]; James Saal[3]; Daniel Schreiber[4]; Joseph Poon[1]; Sean Agnew[1]; [1]University of Virginia; [2]Ohio State University; [3]QuesTek Innovations LLC; [4]Pacific Northwest National Laboratory

Passivation Phenomena in Highly Corrosion Resistant High Entropy Alloys: An Evaluation of the Role of Chromium Content: *Angela Gerard*[1]; Junsoo Han[1]; Stephen McDonnell[1]; Dan Schreiber[2]; Pin Lu[3]; James Saal[3]; Wolfgang Windl[4]; Gerald Frankel[4]; John Scully[1]; [1]University of Virginia; [2]Pacific Northwest National Laboratory; [3]Questek Innovations; [4]Ohio State University

Phase Inversion in Refractory High Entropy Alloys: *Vishal Soni*[1]; Sriswaroop Dasari[1]; Bharat Gwalani[1]; Talukder Alam[1]; Oleg Senkov[2]; Daniel Miracle[3]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]UES Inc.; [3]Air Force Research Laboratory

Phase Stability of B2-ordered High Entropy Alloy: Yonghua Meng[1]; Fenghui Duan[1]; Jie Pan[1]; *Yi Li*[1]; [1]Shenyang National Laboratory for Materials Science, Institute of Metal Research

Pitting Corrosion Behavior of Ni38Fe20Crx(MnCo)42-x High Entropy Alloys: *Sarita Sahu*[1]; Orion Swanson[1]; Tianshu Li[1]; Angela Gerard[2]; John Scully[2]; Pin Lu[3]; James Saal[3]; Gerald Frankel[1]; [1]The Ohio State University; [2]University of Virginia; [3]Questek

Second-phase of 29Fe15Al18Cr27Ni High Entropy Alloy: *Jintao Wang*[1]; Shouping Liu[1]; Xiong Xiao[1]; Xiaoyu Han[1]; [1]Chongqing University

Size Effects and the Hall-Petch Relationship in the Mn17Fe22Co24Ni24Cu13 System: Artashes Ter-Isahakyan[1]; *John Balk*[1]; [1]University of Kentucky

Static and Dynamic Mechanical Performance of Non-equiatomic CoCrFeMnNi HEA: *Kyle Rozman*[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; Michael Gao[1]; [1]National Energy Technology Laboratory

Strengthening of Transformation-induced Plasticity-assisted High Entropy Alloy via Interstitial Nitrogen: *Kenta Yamanaka*[1]; Manami Mori[2]; Yusuke Onuki[3]; Shigeo Sato[3]; Akihiko Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College; [3]Ibaraki University

Synthesis of High Entropy Metal Carbides by a Solvothermal Process: *Ved Vakharia*[1]; Olivia Graeve[1]; [1]University of California, San Diego

Tailoring Multi-principal Element (MPE) Alloy Compositions based on Competing Deformation Mechanisms: *K V Vamsi*[1]; Marie-Agathe Charpagne[1]; Anton Van der Ven[1]; Tresa Pollock[1]; [1]University of California

The Controlled Large-area Synthesis of Two Dimensional Metals: *Tianyu Wang*[1]; Quanfeng He[1]; Jingyang Zhang[1]; Zhaoyi Ding[1]; Fucheng Li[1]; Yong Yang[1]; [1]City University of Hong Kong

The Prediction of Enthalpy and Elastic Properties of Fe-Cr-Co-Ni High Entropy Alloys by Using First Principles Methods: *Songge Yang*[1]; Mohammad Asadikiya[1]; Vadym Drozd[2]; Yu Zhong[1]; [1]Worcester Polytechnic Institute; [2]Florida International University

Thermal Expansion of Refractory MoWTaTiZr High Entropy Alloy: *Eric Osei-Agyemang*[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

Ultrahigh Strength and Thermal Stability of Nanocrystalline High-entropy Alloys Made by Electrodeposition: *Michel Hache*[1]; Uwe Erb[1]; Yu Zou[1]; [1]University of Toronto

Ultrastrong VCoNi Medium-entropy Alloy Enabled by Severe Lattice Distortion: *Seok Su Sohn*[1]; Alisson Kwiatkowski da Silva[2]; Yuji Ikeda[2]; Fritz Körmann[2]; Wenjun Lu[2]; Won Seok Choi[3]; Baptiste Gault[2]; Dirk Ponge[2]; Jörg Neugebauer[2]; Dierk Raabe[2]; [1]Korea University; [2]Max-Planck-Institut für Eisenforschung; [3]Korea Advanced Institute of Science and Technology

---

ADVANCED MATERIALS

High Entropy Alloys VIII — Poster Session II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

A Cuboidal B2-enhanced Dual-phase CrMnFeCoNiAl$_{0.75}$ High-entropy Alloy with Excellent High-temperature Strength: *Lijing Lin*[1]; Zhihong Zhong[2]; Peter Liaw[3]; [1]Hefei University of Technology and University of Tennessee, Knoxville; [2]Hefei University of Technology; [3]University of Tennessee, Knoxville

A Machine Learning Model for Alloy Design: *Zhaohan Zhang*[1]; Mu Li[1]; Katharine Flores[1]; Rohan Mishra[1]; [1]Washington University in St. Louis

Ab Initio Modeling of Large Defects in γ, γ', and γ" Superalloys: *Saro San*[1]; Wai-Yim Ching[1]; [1]University of Missouri Kansas City

Analysis of Irradiation Resistance of Tungsten-based Reduced Activation Alloy for Fusion Plasma Applications: Owais Waseem[1]; *Ho Jin Ryu*[1]; [1]KAIST, Korea

Analysis of Strengthening due to Grain Boundaries and Annealing Twin Boundaries in the CrCoNi Medium-entropy Alloy: *Mike Schneider*[1]; Easo George[2]; Tomáš Záležák[3]; Antonín Dlouhý[3]; Gunther Eggeler[1]; Guillaume Laplanche[1]; [1]Ruhr-Universitaet Bochum; [2]Oak Ridge National Laboratory; [3]Institute of Physics of Materials

Atom Probe Tomography Study of a Fe25Ni25Co25Ti15Al10 High-entropy Alloy: *Zhiqiang Fu*[1]; Andrew Hoffman[2]; Benjamin MacDonald[1]; Maalavan Arivu[2]; Haiming Wen[2]; Enrique Lavernia[1]; [1]University of California, Irvine; [2]Missouri University of Science and Technology

Atomic Diffusion in Melts of Refractory HEAs: *Ankit Roy*[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

CALPHAD Aided Design of MoNbTiZr-based High Entropy Alloys: *Benjamin MacDonald*[1]; Cheng Zhang[1]; Zhiqiang Fu[1]; Fengwei Guo[2]; Yongwang Kang[2]; Xiaochang Xie[2]; Yizhang Zhou[1]; Enrique Lavernia[1]; [1]University of California, Irvine; [2]AECC Beijing Institute of Aeronautical Materials

Composition Design of Coherent Precipitate-strengthening AlCuFeNiTi Multi-principal Element Alloys by High-throughput CALPHAD-type Calculation: *Shao-Yu Yen*[1]; Hao-che Wang[1]; Shih-kang Lin[1]; [1]National Cheng-Kung University

Compositional Effects of Stacking Fault Energies in Ni-based FCC Concentrated Alloys: *Liubin Xu*[1]; Luis Casillas-Trujillo[2]; Yanfei Gao[1]; Haixuan Xu[1]; [1]The University of Tennessee, Knoxville; [2]The University of Tennessee, Knoxville (now at Linköping University, Sweden)

Deformation Behavior of the Al0.3CoCrFeNi High-entropy Alloy during Low-cycle Fatigue by In-situ Neutron Diffraction: *Zongyang Lyu*[1]; Rui Feng[1]; Di Xie[1]; Yan Chen[2]; Ke An[2]; Yanfei Gao[1]; Peter Liaw[1]; [1]The University of Tennessee; [2]Spallation Neutron Source, Oak Ridge National Laboratory

Determination of Young's Modulus and Phase Prediction using Classical Molecular Dynamics in Refractory HEAs: *Ankit Roy*[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

Developing Non-equiatomic Refractory BCC HEAs with Improved Mechanical Properties using Combinatorial Screening: *Taohid Bin Nur Tuhser*[1]; Ian Winter[2]; Daryl Chrzan[2]; Andrew Minor[2]; Mark Asta[2]; Thomas Balk[1]; [1]University of Kentucky; [2]Lawrence Berkeley National Laboratory

Development of Metastable Nanolaminate High Entropy Alloy Overcoming Strength-ductility trade-off: *Min Seok Kim*[1]; Kook Noh Yoon[1]; Hyun Seok Oh[2]; Eun Soo Park[1]; [1]Seoul National University; [2]Massachusetts Institute of Technology

Development of TiVNbTaW High Entropy Alloy with TRIPLEX Nanostructure: *Sangjun Kim*[1]; Jinyeon Kim[1]; Da Hye Song[2]; Jin Kyu Lee[2]; Eun Soo Park[1]; [1]Seoul Nation University; [2]Kongju National University

Ductility of Quaternary Refractory Medium Entropy Alloys with Body-centered Cubic Structure: *Qian He*[1]; Shuhei Yoshida[1]; Tilak Bhattacharjee[1]; Nobuhiro Tsuji[1]; [1]Kyoto University

Effect of Sputtering Parameters on Structure and Mechanical Properties of TiZrHfNiCuCo High Entropy Alloy Films: *Ki Buem Kim*[1]; Young Seok Kim[1]; Taekjip Choi[1]; Jin Kyu Lee[2]; Hyo Soo Lee[3]; [1]Sejong University; [2]Kongju National University; [3]Korea Institute of Industrial Technology (KITECH)

Effects of Initial Grain Size on Friction Stir Weldability and Cryogenic Tensile Properties for Rolled and Cast CoCrFeMnNi High-entropy Alloys: *Sangwon Park*[1]; Youngsang Na[2]; Hyoung-Seop Kim[3]; Namhyun Kang[1]; [1]Pusan National University; [2]Korea Institute of Materials Science; [3]Pohang University of Science and Technology

Enhanced Mechanical Properties by Nitrogen Addition in N-CoCrNi and N-CoCrFeMnNi Compositionally Complex Alloy: Dennis Jodi[1]; Choi Nuri[2]; Joohyun Park[2]; Nokeun Park[1]; *Timothy Alexander Listyawan*[1]; [1]Yeungnam University; [2]Hanyang University

Fabriacte and Mechanical Properties of Non-equiatomic High Entropally Reinforced 6082 al Matrix Nanocomposite: *Anoushka Pal*[1]; [1]Indian Institute of Technology

Fabrication and Hardness Behavior of High Entropy Alloys: *Modupeola Dada*[1]; Patricia Popoola[1]; Ntombi Mathe[2]; Sisa Pityana[2]; Samson Adeosun[3]; Thabo lengopeng[2]; [1]Tshwane University of Technology.; [2]Council for Scientific and Industrial Research; [3]University of Lagos, Akoka

Formation and Mechanical Properties of TaNbVTiW High Entropy Alloys Prepared by Powder Metallurgy: Da Hye Song[1]; Sangjun Kim[2]; Eun Soo Park[2]; *Jin Kyu Lee*[1]; [1]Kongju National University; [2]Seoul National University

Formation Zone Prediction of the Al-Co-Fe-Ni-Ti t High Entropy Alloys by High-throughput Calculation (HTC) Technique: *Yu-Chun Li*[1]; Chu-Hsuan Wang[1]; Hsien-Ming Hsiao[2]; Satoshi Ikubo[3]; Chuan Zhang[4]; Yee-Wen Yen[5]; [1]Department of Materials Science and Engineering, National Taiwan University of Science and Technology; [2]Institute of Nuclear Energy Research, Taoyuan.; [3]Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology,; [4]CompuTherm LLC; [5]National Taiwan University of Science and Technology

Generalized Planar Fault Energies and Twinning in NbMoTaW BCC High Entropy Alloy: A First-principles Study: *Abu Anand*[1]; Chandra Singh[1]; [1]University of Toronto

High Entropy Alloys for Tribological Application Elaborated by Laser Direct Metal Deposition: *Gautier Huser*[1]; Pascal Aubry[1]; Ivan Guillot[2]; Loïc Perrière[2]; Ibrahim Demirci[3]; Emmanuel Rigal[4]; Hicham Maskrot[1]; [1]CEA/DEN-Service d'Etudes Analytiques et de Réactivité des Surfaces (SEARS), CEA, Université Paris-Saclay, F-91191, Gif sur Yvette, France; [2]Université Paris Est, ICMPE (UMR 7182), CNRS, UPEC, Thiais, France; [3]MSMP, Arts et Métiers ParisTech; [4]CEA Grenoble, DRT/Liten/DTBH

High Temperature Creep Behavior of AlZrCrMoNbTi High Entropy Alloy Using the Spark Plasma Sintering (SPS) System: Faris Sweidan[1]; *Ho Jin Ryu*[1]; [1]KAIST, Korea

Homogenous Structure Formation in FeCoNiCrMo High Entropy Alloy: *Ismael Hidalgo*[1]; Lin Li[2]; Feng Yan[2]; Xiao Han[2]; [1]University of Puerto Rico at Mayagüez.; [2]University of Alabama

Imaging Short Range Order in The CrCoNi Medium Entropy Alloy: *Ruopeng Zhang*[1]; Shiteng Zhao[1]; Jun Ding[2]; Yan Chong[1]; Qin Yu[2]; Colin Ophus[2]; Mark Asta[2]; Robert Ritchie[2]; Andrew Minor[2]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

Influence of Aluminum Additions to the Hall-Petch Relation in Single Phase FCC CoCrFeNi based High Entropy Alloys: *Abhinav Jagetia*[1]; Sriswaroop Dasari[1]; Vishal Soni[1]; Rajarshi Banerjee[1]; [1]University of North Texas Denton

Influence of Compositional Complexity on Helium Accumulation and Bubble Formation in Concentrated Solid Solution Alloys: *Shaofei Liu*[1]; Da Chen[1]; Ji-jung Kai[1]; [1]City University of Hong Kong

In-situ Neutron Diffraction Study on Stress-induced Phase Transformation in TiZrHfNbx Refractory High-entropy Alloys: *Xuesong Fan*[1]; Yan Chen[2]; Ke An[2]; Peter Liaw[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

Investigating BCC Refractory Multi-principal Element Alloys by Heaviside Digital Image Correlation: *Leah Mills*[1]; Jean-Charles Stinville[1]; Marie-Agathe Charpagne[1]; Valery Valle[2]; Noah Philips[3]; Oleg Senkov[4]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Institut PPrime; [3]ATI Specialty Materials and Components; [4]Air Force Research Laboratory

Mechanical and Biocompatibility Evaluation of MoxNbTaxTiZr High and Medium Entropy Alloys for Biomedical Implants: Muhammad Akmal[1]; *Ho Jin Ryu*[1]; [1]KAIST, Korea

Mechanical Properties and Deformation Behavior of NiTi-Based Low-, Medium- and High-Entropy Intermetallic Compounds at Different Temperatures: *Cheng-Yuan Tsai*[1]; Chi-Huan Tung[1]; Shou-Yi Chang[1]; [1]National Tsing Hua University

Mechanical Properties and Discrete Slip Events in Conventional Alloys and High-entropy Alloys at Different Temperatures: *Chun-Yi Chen*[1]; Chi-Huan Tung[1]; Shou-Yi Chang[1]; [1]National Tsing Hua University

Mechanical Properties and Thermal Stability of Single-Target Deposited Ta-Ti-Zr-Based Quinary High-Entropy Alloy and Nitride Coatings: *Chin-Chun Chang*[1]; Chia-Ying Yeh[1]; Hsiang-Ming Lai[1]; Yu-Ting Hsiao[1]; Shou-Yi Chang[1]; [1]National Tsing Hua University

Microalloying Technology: an Attractive Strategy for the Design of High-entropy Alloys: *Wenyi Huo*[1]; Feng Fang[1]; Jianku Shang[2]; Jianqing Jiang[1]; [1]Southeast University; [2]University of Illinois at Urbana-Champaign

Microstructure and Diffusion Properties of Ordered Multicomponent B2 Aluminides: *G. Mohan Muralikrishna*[1]; Mayur Vaidya[2]; Christian Liebscher[3]; Gerhard Wilde[2]; B.S. Murty[1]; Sergiy V. Divinski[2]; [1]Indian Institute of Technology Madras; [2]University of Muenster; [3]Max Planck Institute für Eisenforschung GmbH

Microstructure and Magnetic Behavior of FeCoNi(Mn–Si) x (x=0.5,0.75,1.0) High-entropy Alloys: *Priyanka Sahu*[1]; Suresh Solanki[2]; Sheetal Dewangan[1]; Vinod Kumar[1]; [1]Indian Institute of Technology Indore; [2]Global Institute of Technology, Jaipur, India

Microstructure and Mechanical Properties of an Equiatomic CoCrFeMnNi High Entropy Alloys Fabricated by Gas Atomization: *Cheenepalli Nagarjuna*[1]; Kwang Yong Jeong[1]; Hyeon Jeong You[1]; Gian Song[1]; Jin Kyu Lee[1]; Soon Jik Hong[1]; [1]Kongju National University

Microstructure and Mechanical Properties of Non-equiatomic Fe-Mn-Ni-Cr-Co-Al-Ti Septenary High Entropy Alloy: *S. Varalakshmi*[1]; Yagnesh Shadangi[1]; R. Manna[1]; N. K. Mukhopadhyay[1]; [1]Indian Institute of Technology (BHU) Varanasi

Microstructure and Tribological Behavior of Non-equiatomic Ti-Zr-Cr-Al-Si-V and Ti-Zr-Cr-Al-Si-V-Nb Refractory High Entropy Alloys: *Harsh Jain*[1]; Yagnesh Shadangi[1]; Vikas Shivam[1]; Nilay Mukhopadhyay[1]; Devendra Kumar[1]; [1]IIT BHU

Microstructure Characterization of Oxide Dispersion Strengthened CoCrFeMnNi High Entropy Alloy Synthesized by Cryo-milling and Spark Plasma Sintering: *SeungHyeok Chung*[1]; Bin Lee[2]; Soo Yeol Lee[3]; Ho Jin Ryu[1]; [1]KAIST; [2]KITECH; [3]CNU

Microstructure Evolution and Enhanced Strength in CoCrFeMnNi Alloy through High Speed Shear Loading: *Toru Murata*[1]; Nobuhiro Imakura[1]; Alok Singh[2]; Ivan Gutierrez-Urrutia[2]; Koichi Tsuchiya[2]; Naoko Ikeo[1]; Toshiji Mukai[1]; [1]Department of Mechanical Engineering, Graduate School of Engineering, Kobe University, Japan; [2]National Institute for Materials Science (NIMS),Japan

New Approaches for Exploration of Refractory Multi-principal Element Alloys: *Carolina Frey*[1]; Chris Borg[2]; James Saal[3]; Bryce Meredig[3]; Daniel Miracle[4]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Citrine Informatics ; [3]Citrine Informatics; [4]Air Force Research Laboratory

Oxidation Behavior of Al4Co3Cr25Cu10Fe25Ni33 at High Temperature: *Ching-Nien Tsai*[1]; Feng-Yi Cho[1]; Fan-Yi Ouyang[1]; [1]National Tsing Hua University

Partitioning Behavior based Design of BCC / B2 Dual-phase Refractory Multi-principal Element Alloys: *Hosun Jun*[1]; Pyuck-Pa Choi[1]; Zhiming Li[2]; Dierk Raabe[2]; [1]Korea Advanced Institute of Science and Engineering (KAIST); [2]Max-Planck-Institut für Eisenforschung GmbH

Phase Field Dislocation Dynamics Modeling of Refractory High Entropy Alloys: *Lauren Smith*[1]; Shuozhi Xu[1]; Yanqing Su[1]; Abigail Hunter[2]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

Phase Stability and Defect Properties of fcc FeCrMnNi HEAs: *Mark Fedorov*[1]; Jan Wróbel[1]; Antonio Fernández-Caballero[2]; Krzysztof Kurzydlowski[3]; Duc Nguyen-Manh[4]; [1]Faculty of Materials Engineering, Warsaw University of Technology; [2]EPSRC Centre for Doctoral Training in Materials for Demanding Environments, Faculty of Science and Engineering, University of Manchester; [3]Faculty of Mechanical Engineering, Bialystok University of Technology; [4]Culham Centre for Fusion Energy, United Kingdom Atomic Energy Authority

Phase Stability and Microstructural Evolution in Refractory High Entropy Superalloy: *Sangjun Kim*[1]; Hyunseok Oh[1]; Kook Noh Yoon[1]; Eun Soo Park[1]; [1]Seoul Nation University

Phase Stability of a Group of fcc-structured Medium-entropy Alloys Under High Pressure and High Temperature: *Fei Zhang*[1]; Hongbo Lou[1]; Yuan Wu[2]; Zhaoping Lu[2]; Qiaoshi Zeng[1]; [1]Center for High Pressure Science & Technology Advanced Research; [2]University of Science and Technology Beijing (USTB)

Physical Origin of Mechanical Behavior of NbTaTiV(Zr) High Entropy Alloy from First-principles Simulations: *Qi An*[1]; Jing Zhang[1]; Hongwei Wang[1]; Chan-Ho Lee[2]; Peter Liaw[2]; [1]University of Nevada, Reno; [2]The University of Tennessee

Preparation of CoCrFeNi High-entropy Alloy via Electro-deoxidation of Metal Oxides: *Yu Yang*[1]; Tongxiang Ma[1]; Mengjun Hu[1]; Pengjie Liu[1]; Liangying Wen[1]; Liwen Hu[1]; Meilong[1]; [1]Chongqing University

Significance of Grain Refinement in HfNbTiZr and CoCrFeNi High-entropy Alloys: *Wenrui Zhao*[1]; Jae-Kyung Han[1]; Megumi Kawasaki[1]; [1]Oregon state Univesity

Solute and Self-diffusion in HCP High Entropy Alloys: *Sandipan Sen*[1]; Mayur Vaidya[1]; Xi Zhang[2]; Lukasz Rogal[3]; Blazej Grabowski[4]; Gerhard Wilde[1]; Sergiy Divinski[1]; [1]University of Münster; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Institute of Metallurgy and Materials Science of the Polish Academy of Sciences; [4]University of Stuttgart

Stress Corrosion Cracking Mechanism of FCC Type High-entropy Alloys Structural Materials under High Temperature Pressurized Water Environment by Molecular Dynamics Simulation: *Chang Liu*[1]; Qian Chen[1]; Yang Wang[1]; Narumasa Miyazaki[1]; Yusuke Ootani[1]; Nobuki Ozawa[1]; Momoji Kubo[1]; [1]Tohoku University

Structural Evolution and Thermal Stability of Nanocrystalline High Entropy Alloy through Cryomilling: *Harshavardhan Saragadam*[1]; Yagnesh Shadangi[1]; Bhaskar Majumdar[2]; Nilay Krishna Mukhopadhyay[1]; [1]IIT(BHU)-VARANASI; [2]Defence Metallurgical Research Laboratory, Hyderabad

Synthesis and Phase Stability of High-entropy Nitrides and Carbonitrides: *Olivia Dippo*[1]; Tyler Harrington[1]; Neda Mesgarzadeh[1]; Kenneth Vecchio[1]; [1]University of California , San Diego

Temperature Dependence of Structural and Magnetic Properties of Single-crystal CoCrFeNiMn-based Alloys: *Guo-Yu Hung*[1]; Yao-Jen Chang[2]; Chi-Hung Lee[3]; Yi-Jia Chen[4]; Uwe Glatzel[5]; An-Chou Yeh[2]; Wen-Hsien Li[3]; Ssu-Yen Huang[4]; Nadya Mesti[1]; Bo-Hong Lai[1]; Tu-Ngoc Lam[1]; E-Wen Huang[1]; [1]National Chiao Tung University; [2]National Tsing Hua University; [3]National Central University; [4]National Taiwan University; [5]University Bayreuth, Bayreuth

The Development of High Performance Hybrid High Entropy Alloys(HEAs): *Weicheng Heng*[1]; Daixiu Wei[1]; Hidemi Kato[1]; Akihiko Chiba[1]; [1]Institute of Materials Research, Tohoku University

Theoretical and Experimental Investigation of Phase Structure and Mechanical Property Dependence on Composition in Nb-Ti-V-Zr Multi-principal Element Alloys: *Mu Li*[1]; Zhaohan Zhang[1]; Arashdeep Thind[1]; Rohan Mishra[1]; Katharine Flores[1]; [1]Washington University in St. Louis

Tuning Microstructure of Refractory High-entropy Alloys via Controlling Cooling Rates: *Hailong Huang*[1]; Zhaoping Lu[1]; [1]University of Science and Technology Beijing

Wire +Arc Additive Manufacturing of AlCoCrFeNi High Entropy Alloy: *Rumman Ul Ahsan*[1]; Gi-Jeong Seo[1]; A. N. M. Tanvir[1]; Yousub Lee[2]; P. K. Liaw[3]; Duck Bong Kim[1]; [1]Tennessee Technological University; [2]Oak Ridge National Laboratory; [3]The University of Tennessee, Knoxville

MATERIALS DESIGN

ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology; Raymundo Arroyave, Texas A&M University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Data Driven Prediction of Crystallographic Attributes of Small Molecules Using Various Molecular Fingerprints: *Piyush Karande*[1]; Peggy Li[1]; Soo Kim[1]; Joanne Kim[1]; Hyojin Kim[1]; Donald Loveland[1]; T. Yong-Jin Han[1]; [1]Lawrence Livermore National Laboratory

Data-driven Hard-magnetic Materials Selection for AC Applications by Multiple Attribute Decision Making: Sunny Pinnam[1]; *Tanjore Jayaraman*[1]; [1]University of Michigan-Dearborn

Deep learning Image Analysis for Lattice Material Qualification: *Anthony Garland*[1]; Ben White[1]; Brad Boyce[1]; Bradley Jared[1]; David Saiz[1]; Michael Heiden[1]; Matthew Roach[1]; David Moore[1]; [1]Sandia National Laboratories

Effect of Microtextured Regions on the Deformation Behavior of Titanium Alloys Submitted to Monotonic and Cyclic Loadings Investigated using FFT-EVP Simulations: *Azdine Nait-Ali*[1]; Samuel Hemery[1]; [1]Ensma

Identification of Fatigue Crack Nucleation Mechanics using Bayesian Inference: *Maxwell Pinz*[1]; George Weber[1]; Somnath Ghosh[1]; [1]Johns Hopkins University

Mapping Depletion Zone of High Nitrogen Stainless Steel Cr2N using STEM-EDS: An Application of Multi-variate Statistical Analysis: *Juyoung Kim*[1]; Jee-Hwan Bae[2]; Hong Kyu Kim[2]; Jaeyoung Hong[2]; Gyeung Ho Kim[2]; Kyu Hyoung Lee[1]; Dong Won Chun[2]; [1]Yonsei University; [2]Korea Institute of Science and Technology

Multi-class Inclusion Identification via Machine Learning of Multilevel Image Features: *Nan Gao*[1]; Mohammad Abdulsalam[1]; Bryan Webler[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

Multi-fidelity Surrogate Assisted Framework for Prediction and Control of Meltpool Geometry in Additive Manufacturing Processes: Sudeepta Modal[1]; Daniel Gwynn[1]; Asok Ray[1]; *Amrita Basak*[1]; [1]Pennsylvania State University

Prediction of Temperature After Cooling in Coils Using Machine Learning and Finite Element Method: *Hyeok Jae Jeong*[1]; Seonghwan Kim[1]; Nam Hoon Goo[1]; [1]Hyandai Steel

Teach AI to Learn Physics - Predicting 3D Molecular Structure of Aromatic Hydrocarbon Using Reinforcement Learning: *Soo Kim*[1]; Peggy Li[1]; Youngwoo Cho[1]; Joanne Kim[1]; Donald Loveland[1]; T. Yong-Jin Han[1]; [1]Lawrence Livermore National Laboratory

Uncertainty Quantification in Metallic Additive Manufacturing Through Physics-informed Data-driven Modeling with Experimental Validation: *Lei Chen*[1]; Zhuo Wang[2]; Zhen Hu[1]; Sankaran Mahadevan[3]; [1]University of Michigan-Dearborn; [2]Mississippi State University; [3]Vanderbilt University

MATERIALS PROCESSING

Low-cost Titanium: 'Affordable Ti' — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee, TMS: Powder Materials Committee

Program Organizers: Ramana Reddy, University of Alabama; M. Ashraf Imam, George Washington University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Ashraf Imam, George Washington University; Ramana Reddy, The University of Alabama

Deoxidation of TiAl Alloy Scrap with Metallic Yttrium and Calcium Fluoride Slag: *Jiao Lina*[1]; Wang Shihua[2]; Xiong Fuhao[3]; Chen Guangyao[3]; Dou Zhihe[4]; Lu Xionggang[3]; Li Chonghe[5]; [1] State Key Laboratory of Advanced Special Steel, Shanghai Key Laboratory of Advanced Ferrometallurgy, School of Materials Science and Engineering, Shanghai University; School of Metallurgy and Materials Engineering, Jiangsu University of Science and Technology; [2]Shanghai University Library, Shanghai University; [3]State Key Laboratory of Advanced Special Steel, Shanghai Key Laboratory of Advanced Ferrometallurgy, School of Materials Science and Engineering, Shanghai University; [4]Key Laboratory for Ecological Metallurgy of Multimetallic Mineral, Ministry of Education, Northeastern University; [5]State Key Laboratory of Advanced Special Steel, Shanghai Key Laboratory of Advanced Ferrometallurgy, School of Materials Science and Engineering, Shanghai University; Shanghai Special Casting Engineering Technology Research Center

Direct Fabrication of Strong and Ductile Ti-6Al-4V Alloy by Hot Pressing of the Machining Swarf: *Fei Yang*[1]; [1]Waikato University

Effect of Sintering Temperature on Tribological Behavior of Ti-Ni Alloy for Biomedical Applications: *Fellah Mamoun*[1]; Hezil Naouel[1]; Touhami Mohammed Zine[2]; Mohamed Abdrabou Hussein[3]; Alex Montagne[4]; Alberto Mejias[4]; Alain Iost; Stephania Kosman[4]; Timofey Chekalkin[5]; Aleskei Obrosov[6]; Sabine Wiess[6]; [1]Abbes Laghrour University; [2]Tribology and Materials group, Laboratory of Foundry, Badji Mokhtar University; [3]KFUPM; [4]LABO MSMP ECOLE NATIONALE SUPERIEUR ARTS ET MeTIERS PARIS TECH LILLE; [5]Research Institute of Medical Materials, Tomsk State University; [6]Department of Physical Metallurgy and Materials Technology, Brandenburg Technical University

Powder Metallurgy Fabrication, Microstructures and Tensile Mechanical Properties of Low Cost and High Performance Ti and Ti-6Al-4V Alloy Parts and Structural Members: *Deliang Zhang*[1]; Yifeng Zheng[2]; Rui Wang[1]; Junkun Yue[1]; Yifei Luo[2]; Hongzhi Niu[1]; Jiamiao Liang[2]; [1]Northeastern University; [2]Shanghai Jiao Tong University

Refinement of PEG/PMMA Binder Systems for Metal Injection Molding of Titanium: *Peng Cao*[1]; Muhammed Hayat[1]; [1]University of Auckland

MATERIALS PROCESSING

Materials Processing Fundamentals — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Metal; Sam Wagstaff, Novelis Inc.; Antoine Allanore, Massachusetts Institute of Technology; Fiseha Tesfaye, Abo Akademi University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Jonghyun Lee, Iowa State University

Control Center Segregation in Continuously Cast GCr15 Bloom by Optimization of Solidification Structure: *Hanghang An*[1]; Yan Ping Bao[1]; Quan Yang[1]; [1]University of Science and Technology Beijing

Effects of Welding Conditions and Post Weld Heat Treatment on Precipitation of Widmanstätten-austenite of Duplex Stainless Steels: *Yunxing Xia*[1]; Xiaofu Zhang[1]; Fumikazu Miyasaka[1]; Hiroaki Mori[1]; [1]Osaka University

Evaluation of Mechanical Properties of Welded Zn-Coated Steel using Tandem MAG Welding Process: *Jaesoo Lee*[1]; Jong-Deok Seo[1]; Dong-Yoon Kim[2]; Munjin Kang[2]; [1]Shin Young Co., Ltd.; [2]Korea Institute of Industrial Technology

Experimental and Numerical Investigation on Surface Damage of Cold Rolled Sheet caused by Inclusion Movement: *Xin Li*[1]; [1]University of Science and Technology Bejing

Heterogeneous Grain Microstructure Reducing/Eliminating Edge Breaks in Low Carbon Steels: *Tihe Zhou*[1]; Hatem Zurob[2]; Peng Zhang[3]; Sang Hyun Cho[3]; [1]Stelco Inc.; [2]McMaster University; [3]Algoma Inc.

Investigation on the Flow Field of Molten Steel in Ultra High-speed Billet Continuous Casting Mold: Pei Xu[1]; *Dengfu Chen*[1]; Peng Liu[1]; Qinzheng Wang[1]; Mujun Long[1]; Huamei Duan[1]; Jie Yang[1]; Qimin Wang[1]; [1]Chongqing Universuty

Machine Learning Approaches for Prediction Mechanical Properties of Austenitic Stainless Steels: *Liping Yang*[1]; Sen Liu[2]; [1]Sichuan University of Arts and Science; [2]Colorado School of Mines

Morphological and Thermal Analysis of Peruvian Residues from a Sludge Site of an Integrated Steel Plant: *Mery Gomez-Marroquin*[1]; Kim Phatti - Satto[2]; Abraham Terrones - Ramírez[2]; [1]APMMM/UNI; [2]UNI

Numerical Study of Inclusion Removal in Gas Stirred and Electromagnetically Stirred Ladles: Xipeng Guo[1]; Joshua Vandenoever[1]; Nicholas Walla[1]; Armin Silaen[1]; *Chenn Zhou*[1]; [1]Purdue University Northwest

Ordered Arrangements of $BaTiO_3$ Powders of Cubic Morphologies: *Maritza Sanchez*[1]; Olivia Graeve[1]; [1]University of California, San Diego

Preliminary Investigations of Room temperature and Elevated Temperature Properties of Reactively Processed Ni 3 Al-CNT Composites: *Raj Kumar Rachapudi*[1]; Crystal Gama[1]; Mohammed Shahid Islam[1]; Alberto Ricciulli[1]; Saman Sharifi[1]; Greg Essayan[1]; Kaitlin Kehl[1]; Khaled Morsi[1]; [1]SDSU

Roll Forming of Aluminum 7075-T6 Alloy for an Automotive Bumper Beam: *Taekyung Kim*[1]; Geun-Ho Kim[1]; Sang-Kyo Lee[2]; Seogou Choi[2]; Jongsup Lee[2]; [1]Asan Co., Ltd.; [2]Korea Institute of Industrial Technology

Thermodynamic Properties of Layered Tetradymite-like Compounds of the Ag–Ge–Sb–Te System: Mykola Moroz[1]; *Fiseha Tesfaye*[2]; Pavlo Demchenko[3]; Myroslava Prokhorenko[4]; Daniel Lindberg[5]; Oleksandr Reshetnyak[3]; Leena Hupa[2]; [1]National University of Water and Environmental Engineering; [2]Åbo Akademi University; [3]Ivan Franko National University of Lviv; [4]Lviv Polytechnic National University; [5]Aalto University

Weld Quality Prediction by a Pattern Recognition Neural Network of the External Appearance Image in the 3rd Generation AHSS Steel Sheets: *Munjin Kang*[1]; In-sung Hwang[1]; Young-Min Kim[1]; Dongcheol Kim[1]; [1]Korea Institute of Industrial Technology

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale V — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Christopher Weinberger, Colorado State University; Megan Cordill, Erich Schmid Institute; Garritt Tucker, Colorado School of Mines; Wendy Gu, Stanford University; Scott Mao, University of Pittsburgh; Yu Zou, University of Toronto

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chair: Christopher Weinberger, Colorado State University

A Novel Bimodal Microstructure for Improved Fatigue Resistance: *Wenwu Xu*[1]; Ken Ramirez[1]; Rachell Lee[1]; Sharier Hasan[1]; [1]San Diego State University

Atomistic Modeling of Fundamental Deformation Mechanisms in MAX Phases: *Gabriel Plummer*[1]; Garritt Tucker[1]; [1]Colorado School of Mines

Effect of Additional Elements on Deformation Mechanism of -TiAl: *Ji Young Kim*[1]; Jong-hun Kim[2]; Jae-Kwon Kim[2]; Taegu Lee[3]; Seung-Hwa Ryu[3]; Dong-chan Jang[3]; Eun Soo Park[4]; Seong-Woong Kim[2]; Seung-Eon Kim[2]; [1] Korea Institute of Materials Science; Seoul National University; [2]Korea Institute of Materials Science; [3]Korea Advanced Institute of Science and Technology; [4]Seoul National University

Effect of Lattice Defects on the Plastic Poisson's Ratio of Nanoporous Gold: *Feifei Fan*[1]; Luoxia Cao[1]; [1]University of Nevada, Reno

Enhanced Damage Tolerance of Pre-deformed Tungsten Microwires with High Dislocation Density: *Chaoqun Dang*[1]; Yang Lu[1]; [1]City University of Hong Kong

Grain Boundary Engineering Leading to Enhanced Mechanical Properties of Superhard Boron Carbide: *Qi An*[1]; Dezhou Guo[1]; Kolan Reddy[2]; [1]University of Nevada, Reno; [2]Shanghai Jiao Tong University

Highly-impermeable and Stretchable Encapsulation with Wavy Structure: *Hangeul Kim*[1]; Na-Hyang Kim[1]; Hansol Jeon[1]; Han Gi Chae[1]; Ju-Young Kim[1]; [1]UNIST

In-situ Tensile Test in TEM for High Precision Measurement of Mechanical Behavior and Quantitative Dislocation Motion Correlation with Single Crystal Ni: *Xiaoqing Li*[1]; John Turner[2]; Karen Bustillo[2]; Rohan Dhall[2]; Andrew Minor[1]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

Interfacial Mechanics and Reconstruction on Graphene-metal Surfaces: *Kaihao Zhang*[1]; Mitisha Surana[1]; Ganesh Ananthakrishnan[1]; Matthew Poss[1]; Pascal Pochet[2]; Harley Johnson[1]; Sameh Tawfick[1]; [1]University of Illinois Urbana Champaign; [2]Institute for Nanoscience and Cryogenics

Mechanical Properties of Electrochemically Lithiated Tin: *Chung Su Hong*; Seung Min Han; [1]KAIST

Microstructural Analysis and Mechanical Behavior of Ultrafine-grained Ni-Y-Zr Alloys: *Shruti Sharma*[1]; Samuel Moehring[1]; Pedro Peralta[1]; [1]Arizona State University

Phase Transformation Induced Plasticity in High-strength Hexagonal Close Packed Co with Stacking Faults: *Ruizhe Su*[1]; Dajla Neffati[2]; Jaehun Cho[1]; Qiang Li[1]; Jie Ding[1]; Haiyan Wang[1]; Yashashree Kulkarni[2]; Xinghang Zhang[1]; [1]Purdue University; [2]University of Houston

Pseudoelastic Response and Shape Memory Behavior in Ceramic Materials: *Hamed Hosseini-Toudeshki*[1]; Steven Herrera[2]; David Kisailus[2]; Olivia Graeve[1]; [1]University of California, San Diego; [2]University of California, Riverside

Role of Tantalum Concentration and Processing Temperature on Tensile Behavior of Nanocrystalline Copper-tantalum Alloys: *Soundarya Srinivasan*[1]; Chaitanya Kale[1]; Scott Turnage[1]; Billy Hornbuckle[2]; Kris Darling[2]; Kiran Solanki[1]; [1]Arizona State University; [2]US Army Research Laboratory

Strength Recovery in Self-healed Nanoporous Gold: Eun-Ji Gwak[1]; *Hansol Jeon*[1]; Ju-Young Kim[1]; [1]UNIST

Stress-strain Responses from Small Scale Testing (Nanoindentation, In-situ Micro-compression, Micro-tension) in Pure Magnesium: *Skye Supakul*[1]; Tolin Skov-Black[1]; Keenan O'Neill[1]; Scout Garrison[1]; Job Rodriguez[1]; Josiah Dowell[1]; [1]University of Nevada, Reno

Thickness-dependent Elastic Deformation Limit of Thermally-grown SiO_2 Thin Films: *Na-Hyang Kim*[1]; Hangeul Kim[1]; Ju-Young Kim[1]; [1]Ulsan National Institute of Science and Technology

Ultra-strong and Ductile Nb-nanowire/NiTi-based-matrix Nanocomposite via Strain Induced Transformation: *Yuxuan Chen*[1]; Kaiyuan Yu[1]; Lishan Cui[1]; [1]China University of Petroleum Beijing

MATERIALS DESIGN

Metastable Phases and Phase Equilibria: Towards Designing the Next Generation of Alloys — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Bij-Na Kim, Carpenter Additive; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama; Eric Lass, University of Tennessee, Knoxville; Mohsen Asle Zaeem, Colorado School of Mines; Mark Aindow, University of Connecticut; Peeyush Nandwana, Oak Ridge National Laboratory; Dinc Erdeniz, Marquette University; Andrew Bobel, General Motors

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

A New Metastable Ti Alloys with High Elastic Admissible Strain and Enhanced Ductility for Orthopaedic Application: *Yidong Xu*[1]; Junheng Gao[1]; Yuhe Huang[1]; Mark Rainforth[1]; [1]University of Sheffield

MATERIALS PROCESSING

PbZn 2020: The 9th International Symposium on Lead and Zinc Processing — Poster Session

Sponsored by: The Mining and Materails Processing Institute of Japan, Nonferrous Metals Society of China, GDMB: The Society for Mining, Metallurgy Resourcce and Environmental Technology, Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy & Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Pyrometallurgy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Andreas Siegmund, LanMetCon; Shafiq Alam, University of Saskatchewan; Joseph Grogan, Gopher Resource; Ulrich Kerney, Recylex; Cheng Liu, China Enfi Engineering Corporation; Etsuro Shibata, IMRAM, Tohoku University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Reaction Mechanism on A Novel Enhanced Smelting Technique for Lead-acid Battery Paste Recycling: *Wei Jin*[1]; [1]Central South University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Yufeng Zheng, University of Nevada, Reno; Rongpei Shi, Lawrence Livermore National Laboratory; Stoichko Antonov, University of Science and Technology Beijing; Yipeng Gao, Idaho National Laboratory; Rajarshi Banerjee, University of North Texas; Yongmei Jin, Michigan Technological University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Abnormal Temperature Dependence of Critical Transition Stress in Nanocrystalline NiTi Shape Memory Alloys: *Taotao Wang*[1]; Kaiyuan Yu[1]; Lishan Cui[1]; [1]China University of Petroleum, Beijing

Bainite Formation during Zinc Galvanizing on Steel: *Bong-Kyu Kim*[1]; Jun Hyun Han[1]; [1]Chungnam National University

Carbon and Microstructure Effects on the Magnetic Properties of Fe-CN Soft Magnetic Materials (Minnealloy): *Guannan Guo*[1]; Jinming Liu[1]; Jian-Ping Wang[1]; [1]University of Minnesota

Carbonation Behavior of Calcium Aluminate Cements with Additions of Silica: *John Zapata*[1]; Henry Colorado[1]; [1]University de Antioquia

Dealloyed High-strength Metallic Coatings: *Bernard Gaskey*[1]; Ian McCue[2]; Michael Brupbacher[2]; Jonah Erlebacher[3]; [1]Nanyang Technological University; [2]Johns Hopkins University Applied Physics Laboratory; [3]Johns Hopkins University

Dilatometric Analysis of the Martensite Decomposition by Stages during Continuous Heating: *Perla Díaz-Villaseñor*[1]; Octavio Vázquez-Gómez[1]; Eliuth Barrera-Villatoro[1]; Héctor Vergara-Hernández[1]; Edgar López-Martínez[2]; Bernardo Campillo-Illanes[3]; [1]Tecnológico Nacional de México / I.T. Morelia; [2]Universidad del Istmo; [3]Universidad Nacional Autónoma de México

Effect of Cooling Rate on Divorced Eutectoid Transformation in High-speed Steels: *Xuefeng Zhou*[1]; [1]Southeast University

Enhanced Chalcopyrite Bioleaching by Combined Catalysis of Activated Carbon and Visible Light: *Mo Lin*[1]; Shitong Liu[1]; Hao Lin[1]; Baojun Yang[1]; Jun Wang[1]; Guanzhou Qiu[1]; [1]Central South University

Enhanced Toughness of Nanograined Metallic Thin Films on Flexible NiTi Shape Memory Alloy Substrates: *Gan Zhang*[1]; Kaiyuan Yu[1]; Taotao Wang[1]; [1]China University of Petroleum-Beijing

Hierarchical Microstructure Enhanced Comprehensive Mechanical Properties in Ti-Alloys: *Mengyuan Hao*[1]; Dong Wang[1]; Qiaoyan Sun[1]; Pei Li[1]; Tianlong Zhang[1]; Yunzhi Wang[1]; [1]Xi'an Jiaotong University

High-pressure Synthesis of HCP Nickel from a Metallic Glass: *Abhinav Parakh*[1]; Mehrdad Kiani[1]; David Doan[1]; X. Wendy Gu[1]; [1]Stanford University

Highly Enhanced Cross Tensile Strength of the Resistance Spot Welded Medium Manganese Steel by Optimized Post-heating Pulse: *Yuanfang Wang*[1]; Kai Ding[1]; Bingge Zhao[1]; Yuanheng Zhang[1]; Tao Wei[1]; Guanzhi Wu[1]; Hua Pan[2]; Yulai Gao[1]; [1]Shanghai University; [2]Baoshan Iron & Steel Co., Ltd.

JMA Model Application to Elucidate the Kinetic Parameters in a Silicon Steel during Continuous Heating: *Alexis Gallegos-Pérez*[1]; Octavio Vázquez-Gómez[1]; José López-Soria[1]; Héctor Vergara-Hernández[1]; Pedro Garnica-González[1]; [1]Tecnológico Nacional de México / I.T. Morelia

Microstructural Evolution during Solidification of Ternary Eutectic Al-Cu-Mg: *Dominic Ezemenaka*[1]; Amber Genau[1]; Christian Patino[1]; [1]University of Alabama, Birmingham

Quasi-linear Superelasticity with Ultralow Modulus Induced by Nanoscaled Martensitic Phase Transition: *Shuangshuang Zhao*[1]; Qianglong Liang[1]; Chuanxin Liang[1]; Dong Wang[1]; Yuanchao Ji[1]; Yu Wang[1]; Xiaobing Ren[1]; Yunzhi Wang[1]; [1]Xi'an Jiaotong University

The Interaction of Point Defects with Stress Fields Generated by Persistent Slip Bands in f.c.c. Nickel: *Leslie Mushongera*[1]; Pankaj Kumar[1]; Michael Sangid[2]; [1]University of Nevada, Reno; [2]Purdue University

Thermal Treatment of Nickel Chromium Welded Super Alloy for Petroleum Application: *Bola Ibrahim*[1]; Ahmed Abdel-Aziz[1]; [1]German University in Cairo

ADVANCED MATERIALS

Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A SMD Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Composite Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Suveen Mathaudhu, University of California, Riverside; Yuntian Zhu, North Carolina State University; Manoj Gupta, National University of Singapore; Kaka Ma, Colorado State University; Troy Topping, California State University, Sacramento; Yizhang Zhou, University of California, Irvine; Joshua Yee, Sandia National Laboratories; Dalong Zhang, Pacific Northwest National Laboratory; Yaojun Lin, Wuhan University of Technology; Fei Chen, Wuhan University of Technology

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Microstructure and Mechanical Properties of 6082 Al based Hybrid Nanocomposites Reinforced with CNTs and Al-Cu-Fe Quasicrystals: *Sakshi Sharma*[1]; Ketan Ganne[2]; Yagnesh Shadangi[1]; Bhaskar Majumdar[3]; Nilay Mukhopadhyay[4]; [1]Department of Metallurgical Engineering Indian Institute of Technology (Banaras Hindu University), India; [2]Department of Metallurgical Engineering Indian Institute of Technology (Banaras Hindu University), India; Applied Materials India, Pvt Ltd, Bangalore, India; [3]Defence Metallurgical Research Laboratory, Hyderabad, India; [4]Department of Metallurgical Engineering Indian Institute of Technology (Banaras Hindu University), India,

MATERIALS PROCESSING

Rare Metal Extraction & Processing — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Kerstin Forsberg, KTH Royal Institute of Technology; Alafara Baba, University of Ilorin

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

A Novel Depressant of Sodium Polyacrylate for Magnesite Flotation: *Hongwei Cheng*[1]; Changmiao Liu[1]; Dong Dong[1]; Zihu Lv[1]; Fei Yang[1]; [1]Zhengzhou Institute of Multipurpose Utilization of Mineral Resources CAGS

Dissolution Behavior of Calcium Vanadates and Magnesium Vanadates in Sulfuric Acid: *Xin Wang*[1]; Junyi Xiang[1]; Qingyun Huang[2]; Xuewei Lv[1]; [1]College of Materials Science and Engineering, Chongqing Univesity; [2]College of Metallurgical and Materials Engineering, Chongqing University of Science and Technology

PRICE - PRocess Industries in the Circular Economy: *Dag Eriksen*[1]; [1]University of Oslo, Norway

PHYSICAL METALLURGY

Solid State Diffusion Bonding of Metals and Alloys — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Mohamed Elbakhshwan, University of Wisconsin Madison; Mark Anderson, University of Wisconsin Madison; Todd Allen, University of Michigan ; Tasnim Hassan, North Carolina State University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Session Chairs: Mohamed Elbakhshwan, University of Wisconsin-Madison; Heramb Mahajan, North Carolina State University

Friction Stir Diffusion Bonding of Magnesium Alloy ZK 60 to Steel: *Fadi Al-Badour*[1]; Abdulrahman N. Al-Ghamdia[1]; Akeem Y. Adesina[2]; Rami Suleiman[2]; Nesar Merah[2]; [1]King Fahd University of Petroleum and Minerals; [2]King Fahd University of Petroleum & Minerals

Joining of 14YWT Ferritic ODS Alloys by Spark Plasma Technique: *Madhavan Radhakrishnan*[1]; Elisa Torresani[2]; Eugene Olevsky[2]; Stuart Maloy[3]; Osman Anderoglu[1]; [1]University of New Mexico; [2]San Diego State University; [3]Los Alamos National Laboratory

Optimization and Prediction of Bond Characteristics of Ti6Al4V Diffusion Bonded Joints through RSM: *Pragatheswaran T*[1]; Rajakumar S[1]; Balasubramanian V[1]; Vijay Petley[2]; Shweta Verma[2]; [1]Annamalai University; [2]Gas Turbine Research Establishment

Solid State Diffusion Bonding of ODS Eurofer Steel by Spark Plasma Sintering: *J. Fu*[1]; J.C. Brouwer[1]; I.M. Richardson[1]; M.J.M. Hermans[1]; [1]Delft University of Technology

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Poster Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

A Comparative Study of Cu/Ta and Ti/Ta Multilayer Composites Processed by Accumulative Roll Bonding: *Liya Semenchenko*[1]; Ryan Mier[2]; Michael Demkowicz[1]; [1]Texas A&M University; [2]Los Alamos National Laboratory

Bulk High Strength Ultrafine Grained Silver Alloys via Powder Metallurgical Approaches: *Erik Sease*[1]; Evander Ramos[1]; Vladilen Gaisina[2]; Suveen Mathaudhu[1]; [1]University of California Riverside; [2]QuesTek

Deformation Induced Grain Boundary Segregation in Nanolaminated Al-Cu Alloy: *Wei Xu*[1]; XiaoChun Liu[1]; XiuYan Li[1]; Ke Lu[1]; [1]Institute of Metal Research Chinese Academy of Sciences

Deformation Mechanism and Mechanical Properties of Nano/Ultrafine Grained and Heterogeneous Fe-17Cr-6Ni Austenitic Steel.: *Xiangtao Deng*[1]; Chengshuai Lei[1]; Zhaodong Wang[1]; [1]Northeastern University

Dislocation Configurations in Nano-lamellae Ferrite in Heavily Cold Drawn Pearlitic Steel Wire: *Lichu Zhou*[1]; Feng Fang[1]; Jianqing Jiang[1]; [1]Southeast University

Effect of Severe Plastic Deformation on Mechanical Properties of Al6061: *Vagish Mishra*[1]; Karthik Palaniappan[2]; Balkrishna Rao[2]; Murthy H.[1]; [1]Dept. of Aerospace Engineering; [2]Indian Institute of Technology Madras

Effects of Bimetal Interfaces on Local Deformation: *Brandon Leu*[1]; Irene Beyerlein[1]; M Arul Kumar[2]; [1]University of California Santa Barbara; [2]Los Alamos National Laboratory

Evolution in Mechanical Response, Phase Transformation and Texture of Titanium Aluminide Processed by High-Pressure Torsion: *Jae-Kyung Han*[1]; Xi Li[2]; Rian Dippenaar[2]; Klaus-Dieter Liss[3]; Megumi Kawasaki[1]; [1]Oregon State University; [2]University of Wollongong; [3]Guangdong Technion - Israel Institute of Technology

Enhanced Mechanical Properties of Nano/Ultrafine-grained Structure Formed by Martensite Reversion in 18Cr-8Ni Austenitic Stainless Steel: *Jia Liu*[1]; Xiangtao Deng[1]; Zhaodong Wang[1]; [1]Northeastern University

In-situ Study of Strain Distribution and Crystal Rotation of Aluminum with Tailored Grain Size Distribution: *Wenqiang Gao*[1]; Godfrey Andrew William[1]; [1]Tsinghua University

Investigations on the Microstructure and Properties of Ultrafine-grained Cu-Al Materials Jointed with Friction Stir Welding: Yue Zhang; *Hongyang Yu*[1]; Dongbo Liu; Xiaoguang Yuan[1]; [1]Shenyang University of Technology

Joining of Ultrafine Grained Aluminium by Friction Stir Welding – Processing, Microstructure and Properties of Similar and Dissimilar Welds: *Marta Orlowska*[1]; Lech Olejnik[1]; Andreas Huetter[2]; Norbert Enzinger[2]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology; [2]Graz University of Technology

NANOSTRUCTURED AND HETEROSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XI) — Poster Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Caizhi Zhou, Missouri University of Science and Technology; Megumi Kawasaki, Oregon State University; Enrique Lavernia, University of California, Irvine; Terry Lowe, Colorado School of Mines; Suveen Mathaudhu, University of California, Riverside; Ruslan Valiev, UFA State Aviation Technical University; Yuntian Zhu, North Carolina State University

Tuesday PM | February 25, 2020
Sails Pavilion | San Diego Convention Ctr

Magnesium Based Composites Produced through HPT: *Moara Castro*[1]; Megumi Kawasaki[2]; Roberto Figueiredo[1]; [1]Universidade Federal de Minas Gerais; [2]Oregon State University

Measurement of Strain Effects on Electrical Conductivity and Wear Properties in Materials Processed by High Pressure Torsion: *Evander Ramos*[1]; Takahiro Masuda[2]; Sina Shahrezaei[1]; Zenji Horita[2]; Suveen Mathaudhu[3]; [1]University of California Riverside; [2]Kyushu University; [3]University of California, Riverside

Mechanical and Electrical Properties of an Ultrafine Grained Al-0.7Fe-0.1Si-0.2Er Alloy Processed by ECAP: *xingchi he*[1]; Yue Zhang[1]; Xiaoguang Yuan[1]; Fuyu Dong[1]; Ruichun Wang[1]; Weiqi Wang[1]; [1]School of Material Science and Engineering, Shenyang University of Technology

Microstructure and Tensile Behavior of Nanostructured Gradient TWIP Steel: Jie Ding[1]; Zhongxia Shang[1]; Jin Li[1]; H. Wang[1]; *Xinghang Zhang*[1]; [1]Purdue University

Nucleation, Growth and Coarsening of Precipitates in Immiscible Alloys During Low-temperature Severe Plastic Deformation: Gibbs-Thomson Behavior: *Nirab Pant*[1]; Yinon Ashkenazy[2]; Nisha Verma[1]; Robert Averback[1]; [1]University of Illinois, Urbana-Champaign; [2]Hebrew University of Jerusalem

Optimization of Mechanical Properties and Corrosion Resistance of Ultra-Fine Grained Titanium By Low-temperature Annealing: *Agata Sotniczuk*[1]; Krzysztof Topolski[1]; Halina Garbacz[1]; [1]Warsaw University of Technology

Pressure Effects During High Pressure Torsion of Dilute Magnesium-Yttrium: *Christian Roach*[1]; Kiran Solanki[2]; Suveen Mathaudhu[1]; [1]University of California, Riverside; [2]Arizona State University

Size-dependent Strengthening and Conductivity of Highly-textured Cu/BN Multilayers: *Naiqi Chen*[1]; Houyu Ma[1]; Yue Liu[1]; Tongxiang Fan[1]; [1]Shanghai Jiao Tong University

Stress Transfer in Heterogeneous Nanostructured Single-phase High Manganese Steel Investigated by In Situ Synchrotron Radiation: *Xing Fang*[1]; Kaiyuan Yu[1]; [1]China University of Petroleum, Beijing

Studying on the Role of Heterogeneous Interface in Graphene/Metal Composites for Enhancing the Irradiation Tolerance: *Kunming Yang*[1]; Yue Liu[1]; Houyu Ma[1]; Di Chen[1]; Tongxiang Fan[1]; [1]Shanghai Jiao Tong University

Synchrotron-based High-resolution Reciprocal Space Mapping to Understand Elasto-plastic Transition in Harmonic Structured Materials: *Elis Sjögren*[1]; Wolfgang Pantleon[2]; Ulrich Lienert[3]; Zoltan Hegedüs[3]; Kei Ameyama[4]; Dmytro Orlov[1]; [1]Lund University; [2]Technical University of Denmark; [3]Deutsches Elektronen Synchrotron; [4]Ritsumeikan University

Synthesis and Mechanical Characterization of Metallic Films with Highly Controlled Heterogeneous Microstructures: *Rohit Berlia*[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

B

C

D

F

G

H

I

J

K

L

M

N

O

Q

R

S

T

U

V

W

X

Y

Z