



FEBRUARY 27-MARCH 3, 2022
ANAHEIM CONVENTION CENTER & ANAHEIM MARRIOTT
ANAHEIM, CALIFORNIA, USA

FINAL TECHNICAL PROGRAM

#TMSAnnualMeeting • www.tms.org/TMS2022

The content in this final technical program was generated on February 11, 2022.

Please refer to the online session sheets for the most up-to-date information.

All times listed in this final technical program are in Pacific Standard Time (UTC-8:00).



Images may not represent TMS2022 health and safety measures, such as masks and social distancing.

To find a specific symposium, session, presenter name, or keyword, use the Find function on your PDF reader.

Symposium Name		ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
Additive Manufacturing													
Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials	262C							•	•	•	•	•	•
Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities	258B				•	•	•	•	•	•	•	•	•
Additive Manufacturing for Energy Applications IV	261B	•			•		•	•					•
Additive Manufacturing Keynote Session	257		•										
Additive Manufacturing of Large-scale Metallic Components	263A				•	•	•		•				•
Additive Manufacturing of Refractory Metallic Materials	262C	•			•	•							•
Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II	258A	•			•	•		•	•	•			•
Additive Manufacturing: Beyond the Beam III	263B				•	•	•	•	•				•
Additive Manufacturing: Beyond the Beam III	263C	•											
Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development	261A	•			•	•	•	•	•	•			•
Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena	260A					•	•	•	•	•			•
Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena	204B											•	
Powder Materials Processing and Fundamental Understanding	263C		•		•	•	•	•	•				•
Materials Processing													
12th International Symposium on High Temperature Metallurgical Processing	213A		•	•						•			•
Advances in Powder and Ceramic Materials Science	213C	•	•	•	•	•							•
Advances in Surface Engineering IV	210C	•	•	•		•							•
Defects and Properties of Cast Metals IV	210B	•	•	•	•	•							•
Furnace Tapping 2022	213D	•	•			•							•
Furnace Tapping 2022	204B				•								
Materials Processing Fundamentals	213D			•					•	•			•
Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals	211B		•										•
Rare Metal Extraction and Processing	213B	•	•										•
Mechanics & Structural Reliability													
Deformation and Damage Mechanisms of High Temperature Alloys	263A										•		•
Deformation and Damage Mechanisms of High Temperature Alloys	304B	•	•	•	•	•			•	•			
Dynamic Behavior of Materials IX	263C										•	•	•
Dynamic Behavior of Materials IX	304D	•	•	•	•	•			•	•			
Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior	263B										•		•
Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior	304C	•	•	•	•	•			•	•			
Structural Metamaterials	304A	•	•	•	•	•							•
Nuclear Materials													
Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties	202B	•	•		•	•	•	•	•				•
Materials and Chemistry for Molten Salt Systems	203B	•	•		•	•	•	•	•				•
Materials Systems for the Future of Fusion Energy	203A				•	•	•	•	•	•	•	•	•
Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials	204A	•	•		•	•	•	•	•			•	•
Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials	202A				•	•	•	•	•	•			•

To find a specific symposium, session, presenter name, or keyword, use the Find function on your PDF reader.

Symposium Name		ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
Physical Metallurgy													
Computational Thermodynamics and Kinetics	255C		•	•		•	•	•	•	•	•	•	•
Phase Transformations and Microstructural Evolution	255B		•	•		•	•	•	•	•	•	•	•
Light Metals													
2022 Light Metals Keynote Session	204B		•										
Alumina & Bauxite	On-Demand Only												•
Aluminum Alloys, Processing and Characterization	208B			•	•	•	•			•			•
Aluminum Reduction Technology	209B					•					•		•
Aluminum Reduction Technology	211A			•									
Aluminum Reduction Technology Joint Session with REWAS: Decarbonizing the Metals Industry	210C					•							•
Cast Shop Technology	209A			•		•			•	•			•
Electrode Technology for Aluminum Production	208A			•		•	•						•
Failure, and a Career That is Anything But: An LMD Symposium Honoring J. Wayne Jones	209B			•		•							•
Magnesium Technology	210A		•		•	•			•		•	•	•
Primary Aluminum Industry - Energy and Emission Reductions: An LMD Symposium in Honor of Halvor Kvande	208A								•	•			•
Recycling and Sustainability in Cast Shop Technology: Joint Session with REWAS 2022	209A						•						•
Characterization													
Advanced Characterization Techniques for Quantifying and Modeling Deformation	207A		•	•		•	•		•	•	•	•	•
Advanced Real Time Imaging	206A		•			•	•	•	•				•
Characterization of Minerals, Metals and Materials 2022	207B		•	•		•	•	•	•		•		•
Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling	206B		•	•		•		•	•	•	•	•	•
Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson	207C		•	•		•	•		•	•	•		•
Nanostructured Materials													
30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond	259A		•	•	•	•	•						•
30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond	259B									•		•	
30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond	204B										•		
Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films	259B			•	•	•							•
Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022	260B		•	•	•	•	•		•	•	•	•	•
Mechanical Behavior at the Nanoscale VI	262B		•	•	•	•	•		•		•		•
Mechanical Behavior at the Nanoscale VI	204B									•			
Self-organizing Nano-architected Materials	260C		•	•	•	•	•		•				•
Ultrafine-grained and Heterostructured Materials (UFGH XII)	262A		•	•	•	•	•		•	•	•		•
Advanced Materials													
2D Materials – Preparation, Properties & Applications	252C		•	•	•								•
Advanced Functional and Structural Thin Films and Coatings	204B						•						
Advanced Functional and Structural Thin Films and Coatings	252B				•				•	•	•		•
Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties	251A		•	•			•		•	•	•	•	•

To find a specific symposium, session, presenter name, or keyword, use the Find function on your PDF reader.

Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
Advances in Multi-Principal Elements Alloys X: Structures and Modeling	251B	•	•	•	•	•		•	•	•	•	•
Bulk Metallic Glasses XIX	253C		•	•	•	•		•		•	•	•
High Performance Steels	252C					•		•	•	•	•	•
Materials in Sport	251C	•										
Refractory Metals	252B	•	•		•							•
Electronic Materials												
Alloys and Compounds for Thermoelectric and Solar Cell Applications X	303D	•		•	•			•				•
Electronic Packaging and Interconnections	303B	•			•							•
Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI	303A		•		•	•						•
Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications	303C	•	•	•	•	•						•
Energy & Environment (including REWAS 2022 Symposia)												
Advanced Magnetic Materials for Sensors, Power, and Multifunctional Applications	213B								•	•	•	•
Advanced Materials for Energy Conversion and Storage 2022	212B	•	•	•	•	•		•	•	•		•
Composite Materials for Sustainable Eco-Friendly Applications	211A			•					•	•		•
Composites for Energy Applications: Materials for Renewable Energy Applications 2022	210D			•		•			•			•
Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring Matthew J. Kramer	210D	•	•		•							•
REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian	204B		•									
REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian	211A				•	•						•
REWAS 2022: Energy Technologies and CO2 Management	212A	•			•							•
REWAS 2022: Plenary	204B		•									
REWAS 2022: Poster Session	Exhibit Hall C			•								
REWAS 2022: Recovering the Unrecoverable	211B					•						•
REWAS 2022: Sustainable Production and Development Perspectives	211B				•							•
REWAS 2022: Automation and Digitalization for Advanced Manufacturing	212A							•				•
REWAS 2022: Automation and Digitalization for Advanced Manufacturing	211B								•			
REWAS 2022: Decarbonizing the Materials Industry	212A					•			•			•
Biomaterials												
Advances in Biomaterials for 3D Printing of Scaffolds and Tissues	201A	•	•				•					
Biological Materials Science	201B	•	•		•	•	•		•			•
Biological Materials Science	204B							•				
BioNano Interfaces and Engineering Applications	201A				•	•	•	•	•			•
Materials Design												
Advances in Titanium Technology	252A		•		•	•	•	•	•	•		•
AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification	256A	•	•		•	•	•	•	•	•	•	•
Algorithm Development in Materials Science and Engineering	253A	•	•		•	•	•	•	•	•		•
Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling	254B	•	•		•	•		•				•

To find a specific symposium, session, presenter name, or keyword, use the Find function on your PDF reader.

Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment	255A	•	•		•	•						•
ICME Case Studies: Successes and Challenges for Generation, Distribution, and Use of Public/Pre-Existing Materials Datasets	254A	•	•									•
Materials Design and Processing Optimization for Advanced Manufacturing: from Fundamentals to Application	253B	•	•		•	•	•	•	•	•		•
Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis	256B	•	•		•	•		•				•
Microstructural Templates Consisting of Isostructural Ordered Precipitate / Disordered Matrix Combinations: Microstructural Evolution and Properties	254A				•	•			•			•
Recent Investigations and Developments of Titanium-containing High Entropy Alloys	251C							•				•
Corrosion												
Environmental Degradation of Additively Manufactured Alloys	201C	•	•		•							•
Environmental Degradation of Multiple Principal Component Materials	201C			•				•	•	•		•
Environmentally Assisted Cracking: Theory and Practice	201D	•	•	•	•	•		•	•	•		•
Special Topics												
2022 Technical Division Student Poster Contest	Exhibit Hall C			•								
Acta Materialia Symposium	Ballroom E					•						•
Diversity in the Minerals, Metals, and Materials Professions 4 (DMMM4)	Marriott Grand Ballroom F							•	•	•	•	•
Diversity in the Minerals, Metals, and Materials Professions 4 (DMMM4)	Marriott Grand Ballroom H, J, K								•	•		
Frontiers of Materials Award Symposium Session: Data-Driven, Machine-learning Augmented Design and Novel Characterization for Nano-architected Materials	260C								•			•
Frontiers of Materials Award Symposium: Microbiologically Influenced Corrosion - How Organisms Accelerate Materials Degradation	On-Demand Only											•
Frontiers of Materials Award Symposium: Nanocarbon-based Flexible Devices: Emerging Materials and Processes	260A	•	•		•							
Late News Poster Session	Exhibit Hall C			•			•					
Moving Forward from a Pandemic: How the Field of Materials Science Has Adapted (2022 Student-led Symposium)	202A	•	•									•
Nix Award and Lecture Symposium: Nanomechanics and Mechanomaterials	259A								•			
Nix Award and Lecture Symposium: Recent Advances in Nanoindentation and Small-Scale Mechanical Testing	259A							•				



TMS2022 All-Conference Plenary

Ballroom ABCD - 3rd Floor • Tuesday • 12:00 p.m. to 1:00 p.m.

LIGHT METALS

2022 Light Metals Keynote Session — 50 Years of Continuous Light Metals Proceedings - Highlights and Vision for the Century

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

Program Organizer: Linus Perander, Yara International

Monday AM | February 28, 2022
204B | Anaheim Convention Center

Session Chair: Linus Perander, Yara International

8:30 AM Introductory Comments: Linus Perander, Yara International

8:35 AM Keynote

An Overview of the Last 50 Years of the Bayer Process: Gyorgy Banvolgyi¹; ¹Bán-Völgy Limited Partnership

8:55 AM Keynote

The Evolution of Smelting Aluminas: James Metson¹; ¹University of Auckland

9:15 AM Keynote

Review of Different Types of Models Related to Aluminum Reduction Cell Design and Operation: Marc Dupuis¹; ¹GeniSim Inc.

9:35 AM Keynote

50 Years of Fundamental Research, Continuous Development, and Technology Innovation within the Aluminum Smelting Industry: Jayson Tessier¹; ¹Alcoa Corporation

9:55 AM Break

10:10 AM Keynote

50 Years of Aluminum Cast House Technology Development: Lessons from 5 Case Studies: John Grandfield¹; ¹Grandfield Technology

10:30 AM Keynote

From Grain Refining to Casting Defects: Simplicity in Complexity: Dmitry Eskin¹; ¹Brunel University London

10:50 AM Keynote

Challenges for the Carbon Transition – Revisiting 50 Years of Anode Technology Development: Alan Tomsett¹; ¹Rio Tinto Pacific Operations

11:10 AM Keynote

50 Years of Research and Developments on Cathode Designs in Aluminium Reduction: Arne Ratvik¹; ¹SINTEF

11:30 AM Panel Discussion

ADVANCED MATERIALS

2D Materials – Preparation, Properties & Applications — Session I

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University

Monday AM | February 28, 2022
252C | Anaheim Convention Center

Session Chairs: Ramana Chintalapalle, University of Texas ; David Bird, US Army

8:30 AM Introductory Comments

8:40 AM

Synthesis and Characterization of Laser-induced Graphene for Gas Sensing Applications: Cadre Francis¹; Zach Dike¹; Ariel Briggs¹; Paul Simmonds¹; Jennifer Forbey¹; David Estrada¹; ¹Boise State University

9:00 AM Invited

A Comprehensive Understanding of the Gas Sensing Properties of 2D Materials Using the Framework of Density Functional Theory: Mohsen Asle Zaeem¹; Siby Thomas¹; ¹Colorado School of Mines

9:30 AM

Corrosion Behaviour of Atomic Layers of Graphene on Nickel Surfaces Exposed to Aggressive Microbial Environments: Ramesh Devadig¹; Md Hasan-Ur Rahman¹; Pawan Sigdel¹; Suvarna Talluri¹; Manoj Tripathi²; Bharat Jasthi¹; Venkataramana Gadhamshetty¹; ¹South Dakota School of Mines and Technology; ²University of Sussex

9:50 AM

Effect of Temperature and Acoustic Pressure during Ultrasound Liquid Phase Processing of Graphite in Water: Justin Morton¹; Dmitry Eskin²; Nicole Grobert³; Jiawei Mi⁴; Kyriakos Porfyrakis⁵; Paul Prentice⁶; Iakovos Tzanakis¹; ¹Oxford Brookes University; ²Brunel University London; ³University of Oxford ; ⁴University of Hull; ⁵University of Greenwich; ⁶University of Glasgow

10:10 AM Break

10:30 AM

Ferromagnetism in Q-carbon Balls as a Function of Their Size: Nayna Khosla¹; Jagdish Narayan¹; Kaushik Sarkar²; Dhananjay Kumar²; ¹North Carolina State University; ²North Carolina Agricultural and Technical State University

10:50 AM

Well-defined 3D Printing of Titanium Carbide (Ti₃C₂T_x) MXene Nanosheets into Complex and Hierarchical Microarchitectures with High Aspect Ratio: Bin Yuan¹; Chunshan Hu¹; Md. Azahar Ali¹; Rahul Panat¹; ¹Carnegie Mellon University

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — Main Session - 30 years of Nanoindentation with the Oliver-Pharr Method

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

Program Organizers: Verena Maier-Kiener, Montanuniversitaet Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Monday AM | February 28, 2022
259A | Anaheim Convention Center

Session Chairs: Benoit Merle, University Erlangen-Nuremberg (Fau); Samantha Lawrence, Los Alamos National Laboratory

8:30 AM Introductory Comments

8:40 AM Invited

Measurement of Hardness and Elastic Modulus by Depth Sensing Indentation: Improvements to the Technique Based on Continuous Stiffness Measurement: *Warren Oliver*¹; Phani Sudharshan²; George Pharr³; ¹KLA; ²ARCI; ³Texas A&M University

9:05 AM Invited

Nanoindentation's Top Ten Unexpected and Unusual Applications: *George Pharr*¹; ¹Texas A&M University

9:30 AM Invited

On the Generality of the Contact Stiffness Relationship in Frictional Contact of Dissimilar Elastic Solids: *Yanfei Gao*¹; Allan Bower²; ¹University of Tennessee-Knoxville; ²Brown University

9:55 AM Break

10:15 AM Invited

From Instrumented Indentation to Nanoindentation and Beyond: *Jean-Luc Loubet*¹; ¹LTDS UMR CNRS 5513

10:40 AM Invited

Nanoindentation: From the 1-D Original to 2 Dimensions: *John Pethica*¹; ¹Trinity College Dublin

11:05 AM Invited

10% Rule of Thumb for Indentation Mechanical Behavior: Fact or Fiction: *Megan Cordill*¹; ¹Erich Schmid Institute of Materials Science

11:30 AM

Nucleation, Activation, and Looking for Perfection: Yield Points in Nanoindentation: *David Bahr*¹; Michael Maughan²; Alexandra Burch³; ¹Purdue University; ²University of Idaho; ³Los Alamos National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications IV — Mechanical Properties and Performance Testing

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

Program Organizers: Isabella Van Rooyen, Pacific Northwest National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University; Michael Kirka, Oak Ridge National Laboratory

Monday AM | February 28, 2022
261B | Anaheim Convention Center

Session Chair: Indrajit Charit, University of Idaho

8:30 AM Invited

Additive Manufacturing Topology Optimization and Materials Testing at Westinghouse: William Cleary¹; *Thomas Pomorski*²; ¹Westinghouse Electric; ²Penn United Technologies

9:00 AM

Topological Optimization of CoCrMo Lattice Structures Fabricated by Laser Powder Bed Fusion: *Bandar AlMangour*¹; So-Yeon Park²; Kyu-Sik Kim²; Dariusz Grzesiak³; Kee-Ahn Lee²; ¹King Fahd University of Petroleum and Minerals; ²Inha University; ³West Pomeranian University of Technology

9:20 AM

Mechanical and Corrosion Properties of Friction Surfaced 304L Stainless Steel for Crack Repair: *Hemant Agiwal*¹; Hwasung Yeom¹; Kenneth Ross²; Kumar Sridharan¹; Frank Pfefferkorn¹; ¹University of Wisconsin Madison; ²Pacific Northwest National Laboratory

9:40 AM

Evaluation of Tensile Strength and Microstructure of 304L Stainless Steel Repaired via Additive Friction Stir Deposition: *Harish Rao*¹; Malcom Williams¹; Christopher Williamson¹; Noah Zahm¹; Paul Allison¹; Brian Jordon¹; Luke Brewer¹; Vijay Vasudevan¹; ¹University of Alabama

10:00 AM Break

10:20 AM

Oxide Dispersion Strengthened Stainless Steel by Reactive Additive Manufacturing: *Houshang Yin*¹; Jingfan Yang¹; Bingqiang Wei²; Mukesh Bachhav³; Jian Wang²; Xiaoyuan Lou¹; ¹Auburn University; ²University of Nebraska-Lincoln; ³Idaho National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of Refractory Alloys and Pure Refractory Elements

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Isabella Van Rooyen, Pacific Northwest National Laboratory; Omar Mireles, NASA Marshall Space Flight Center; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Edward Herderick, Ohio State University; Matthew Osborne, Global Advanced Metals

Monday AM | February 28, 2022
262C | Anaheim Convention Center

Session Chairs: Antonio Ramirez, The Ohio State University; Jeffrey Sowards, Nasa - MSFC; Isabella Van Rooyen, Pacific Northwest National Laboratory

8:30 AM Introductory Comments**8:35 AM Invited**

Refractory Metals – Some Historical Observations: *Jeffrey Wadsworth*

9:10 AM

Additive Manufacture of Refractory Metals for Aerospace Applications: *Omar Mireles¹; Jeffrey Sowards¹; ¹NASA Marshall Space Flight Center*

9:30 AM

Refractory Development Framework Using Computational Modeling: *Nathan Daubenmier¹; Antonio Ramirez²; Fredrick Michael²; Jeffrey Sowards²; Omar Mireles²; ¹The Ohio State University; ²NASA*

9:50 AM Break**10:10 AM**

Laser Powder-bed-fusion of Pure Tungsten for Fusion Energy Applications: *Alberico Talignan¹; Shiqi Zheng¹; Philip DePond²; Maria Strantz²; Jianchao Ye²; Y. Morris Wang¹; ¹University of California, Los Angeles; ²Lawrence Livermore National Laboratory*

10:30 AM

LPBF Printing of Nb for the Production of 3D Resonance Cavities: *Antonio Ramirez¹; Ricardo Namur²; Graham Clark¹; David Doll³; Michael Sumption¹; ¹Ohio State University; ²Univ. Estadual de Ponta Grossa; ³Hypertechresearch*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — High-speed X-ray Diffraction

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Monday AM | February 28, 2022
258A | Anaheim Convention Center

Session Chair: Andrew Chuang, Argonne National Laboratory

8:30 AM Introductory Comments**8:40 AM Invited**

In Situ X-ray Diffraction and Visualization of Laser Melting and Subsequent Phase Evolution: *Anthony Rollett¹; ¹Carnegie Mellon University*

9:10 AM

Study of Solidification Behavior in Laser Additive Manufacturing Using Synchrotron X-ray Diffraction: *Adrita Dass¹; Atieh Moridi¹; ¹Cornell University*

9:30 AM Invited

Unveiling Phase Transformation Dynamics of Metals under Additive Manufacturing Conditions by In-situ High-speed X-ray Diffraction: *Lianyi Chen¹; ¹University of Wisconsin-Madison*

10:00 AM Break**10:15 AM Invited**

Application of High-speed X-ray Diffraction to Understand the Microstructure Evolution during Additive Manufacturing of Hot-work Tool Steels: *Greta Lindwall¹; Niklas Holländer Pettersson¹; Hans-Henrik König¹; A. Durga¹; Chrysoula Ioannidou¹; Fan Zhang²; Andrew Chihpin Chuang³; Qilin Guo⁴; Lianyi Chen⁴; Steven Van Petegem⁵; ¹KTH Royal Institute of Technology; ²NIST; ³Argonne National Laboratory; ⁴University of Wisconsin; ⁵Paul Scherrer Institut*

10:45 AM

In-situ Temperature Quantification during Laser Powder Bed Fusion Additive Manufacturing: *Rachel Lim¹; Tuhin Mukherjee¹; Tarasankar DebRoy¹; Thien Phan²; Darren Pagan¹; ¹Pennsylvania State University; ²National Institute of Standards and Technology*

11:05 AM

Investigating the Ferrite-to-Austenite Solidification Competition in Stainless Steel Laser Welds with Time-resolved X-ray Diffraction: *Joseph Aroh¹; Seunghee Oh¹; Rachel Lim²; Benjamin Gould³; Andrew Chuang³; P. Chris Pistorius¹; Anthony Rollett¹; ¹Carnegie Mellon University; ²Pennsylvania State University; ³Argonne National Laboratory*

11:25 AM

Time-resolved Structural Characterization of Ni Alloy 718 under Laser Processing with In-situ Synchrotron X-ray Diffraction: *Seunghee Oh¹; Rachel Lim²; Joseph Aroh¹; Benjamin Gould³; Andrew Chuang³; Robert Suter¹; Anthony Rollett¹; ¹Carnegie Mellon University; ²Penn State University; ³Argonne National Laboratory*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III — Binder Jetting

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Monday AM | February 28, 2022
263C | Anaheim Convention Center

Session Chair: Peeyush Nandwana, Oak Ridge National Laboratory

8:30 AM

3D Binder-jet Printed Metal Filters: Aaron Acierno¹; Teddi Sedlar¹; Eric Rhodes¹; Markus Chmielus¹; ¹University of Pittsburgh

8:50 AM

Binder Jet Additive Manufactured H13: Microstructure Evolution and Properties: Peeyush Nandwana¹; Rangasayee Kannan¹; Kinga Unocic¹; ¹Oak Ridge National Laboratory

9:10 AM

Impact of Grain Boundary Mobility on Decreasing Porosity in Metal Binder Jetting of Free-sintering Low-alloy Steel: Stephen House¹; Pedro De Souza-Ciacco¹; Javier Carreno¹; Jackeline Vicente-Vazquez¹; Calixto Garcia¹; ¹University of Pittsburgh

9:30 AM

Droplet-powder Interactions in Binder Jetting: From Droplet to Line to Layer to Part: Nathan Crane¹; Trenton Colton¹; Colton Inkley¹; ¹Brigham Young University

9:50 AM Break

10:10 AM

Print Parameter Effects on Porosity Distribution in Binder Jetting of WC-Co: Paul Prichard¹; Hadi Miyanaji¹; Zhuqing Wang¹; ¹Kennametal Inc.

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — Fundamentals of Rapid Alloy Development

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Monday AM | February 28, 2022
261A | Anaheim Convention Center

Session Chair: Behrang Poorganji, University of Toledo

8:30 AM Invited

Accelerating Materials Design for Additive Manufacturing through Graded Alloy Deposition Techniques: Wei Xiong¹; ¹University of Pittsburgh

9:00 AM Invited

Additive Manufacturing Based Combinatorial Approach for Assessing the Magnetic Properties of High Entropy Alloys: Sriswaroop Dasari¹; M.S.K.K.Y. Nartu¹; Varun Chaudhary²; Tushar Borkar³; Bharat Gwalani⁴; Raju Ramanujan²; Rajarshi Banerjee¹; ¹University of North Texas; ²Nanyang Technological University; ³Cleveland State University; ⁴Pacific Northwest National Laboratory

9:30 AM Invited

Design of Alloy Compositions Conducive to AM: Abhinav Saboo¹; Marie Thomas¹; Jacqueline Hardin¹; Greg Olson¹; Jiadong Gong¹; Dana Frankel¹; ¹QuesTek Innovations LLC

10:00 AM Break

10:15 AM Invited

Why Model When You Can Just Go Print? Valuable Lessons From "Quick and Clean" Experimentation in AM: Jacob Nuechterlein¹; ¹Elementum 3D, Inc.

10:45 AM

Design Cycle Reductions in Novel Material and Alloy Development: Michael Juhasz¹; Melanie Lang¹; Jeff Riemann¹; ¹FormAlloy Technologies, Inc.

11:05 AM

A Phase-field Study of Microstructure Development in a Melt Pool during Additive Manufacturing: Yijia Gu¹; Xiaoming He¹; ¹Missouri University of Science and Technology

11:25 AM

Rapid Alloy Design via Additively Manufacturing Compositionally Graded Materials: Siyuan Wei¹; Yakai Zhao¹; Pei Wang²; Upadrasta Ramamurthy¹; ¹Nanyang Technological University; ²Institute of Materials Research and Engineering, Agency for Science, Technology and Research

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Thermo-physical and Microstructure Properties of Nuclear Fuels Special Session - Early Career

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Monday AM | February 28, 2022
202B | Anaheim Convention Center

Session Chairs: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory

8:30 AM Invited

Investigation of Hot-cell Capable Thermal Conductivity Measurements for Ceramic Fuels: *Troy Munro*¹; Justin Loose¹; Brian Merritt¹; Peter Hartvigsen¹; Ryan Ruth¹; ¹Brigham Young University

8:50 AM Invited

Thermal Stability of Uranium Compounds and Advanced Nuclear Materials under Extreme Conditions: *Elizabeth Sooby*¹; ¹University of Texas at San Antonio

9:10 AM

An Atomistic Study of the Anisotropic Elastic Response of Defects in Alpha Uranium: *Yuhao Wang*¹; Benjamin Beeler²; Andrea Jokisaari³; ¹University of Michigan Ann Arbor; ²North Carolina State University; ³Idaho National Laboratory

9:30 AM

Micromechanical Behavior of Thermally Loaded Monoclinic U-6Nb: *Daniel Savage*¹; Bjorn Clausen¹; Travis Carter¹; Joshua White¹; Sven Vogel¹; Donald Brown¹; ¹Los Alamos National Laboratory

9:50 AM Invited

Thermal Energy Transport in Defect-bearing and Uranium-doped Single Crystal Thorium Dioxide: *Cody Dennett*¹; David Hurley¹; ¹Idaho National Laboratory

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session I

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Monday AM | February 28, 2022
207A | Anaheim Convention Center

Session Chairs: Balila Jaya, Indian Institute of Technology Bombay; Khalid Hattar, Sandia National Laboratories; Daniel Gianola, University of California-Santa Barbara

8:30 AM Invited

Imaging Defects and Their Dynamics Using Scanning Electron Microscopy Approaches: *Daniel Gianola*¹; ¹University of California-Santa Barbara

9:00 AM

High Temperature In Situ TEM Based Nanomechanical Testing: *Shen Dillon*¹; ¹University of California, Irvine

9:20 AM

Applications of Direct Detection for EBSD Analysis of Deformed Materials: *Matthew Nowell*¹; Stuart Wright¹; William Lenthe¹; Rene de Kloe¹; ¹EDAX LLC

9:40 AM

Role of Misorientation on Grain Boundary Sliding through High-resolution Digital Image Correlation: *Alberto Orozco-Caballero*¹; Eugenia Nieto-Valeiras²; Javier Llorca²; Fernando Carreño³; ¹Polytechnic University of Madrid; ²IMDEA Materials Institute; ³CENIM-CSIC

10:00 AM Break

10:15 AM Invited

Exploring Nanoscale Fatigue through Coupled In-situ Microscopy and Modeling: *Khalid Hattar*¹; Christopher Barr¹; Ta Duong²; Daniel Bufford¹; Abhilash Molkeri²; Nathan Heckman¹; David Adams¹; Ankit Srivastava²; Michael Demkowicz²; Brad Boyce¹; ¹Sandia National Laboratories; ²Texas A&M University

10:45 AM

Significant Disparity of Deformation Behavior in Hot-rolled Highly-textured Mg and Mg-3Al-1Zn Alloy under Tension: *Kelvin Xie*¹; Dexin Zhao¹; ¹Texas A&M University

11:05 AM

In Situ Study of Kink Banding in Cu/Nb Nanolaminates: *Yifan Zhang*¹; Nan Li¹; Matthew Schneider¹; Laurent Capolungo¹; Rodney McCabe¹; ¹Los Alamos National Laboratory

11:25 AM

Strain Rate Dependent Deformation and In-situ TEM Crystallization in Crystalline/Amorphous Ni-Zr Thin Films: *Bibhu Prasad Sahu*¹; Amlan Dutta²; Rahul Mitra²; ¹University of Michigan; ²Indian Institute of Technology Kharagpur

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Energy Conversion and Storage MIX I

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Monday AM | February 28, 2022
212B | Anaheim Convention Center

Session Chair: Jung Pyung Choi, Pacific Northwest National Laboratory

8:30 AM Introductory Comments

8:35 AM Keynote

Designing Electrode Architectures across Length Scales: Some Lessons Learned from Li-ion and "Beyond Li" Chemistries: *Sarbajit Banerjee*¹; ¹Texas A&M University

9:10 AM Keynote

Development of Solid Oxide Cell and Stack Technologies at Nexceris: From Fuel Cells to Electrolyzers and Reversible Operation: *Emir Dogdibegovic*¹; Gene Arkenberg¹; David Kopechek¹; Anila Wallace¹; Scott Swartz²; ¹Nexceris

9:45 AM

Effect of Transition Metal Doping on the Electrochemical Properties of B-site Doped Neodymium Nickelate for Reversible Solid Oxide Cells: *Ayesha Akter*¹; Srikanth Gopalan¹; ¹Boston University

10:05 AM Keynote

High Energy Density Batteries for Vehicle Electrification: *Gayatri Dadheech*¹; ¹GM

CHARACTERIZATION

Advanced Real Time Imaging — Emerging Imaging Techniques

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

Program Organizers: Jinichiro Nakano, US Department of Energy - National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, Kth Royal Institute of Technology; David Veyssat, Stanford University; Pranjal Nautiyal, University of Pennsylvania

Monday AM | February 28, 2022
206A | Anaheim Convention Center

Session Chair: Cody Dennett, Idaho National Laboratory

8:30 AM Invited

Observing Nanoscale Defect Populations in Nickel through Transient Elasticity: *Cody Dennett*¹; ¹Idaho National Laboratory

8:50 AM

Molten State Physical Properties of Divalent and Trivalent Alkaline Earth, Transition Metal, and Rare Earth Oxides: *Jonathan Paras*¹; Osamu Takeda¹; Mindy Wu¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

9:10 AM

Pseudo-4D Characterization of Lamella Orientations in Locked Al-Al₂Cu Eutectic Colonies: *Paul Chao*¹; George Lindemann¹; Ashwin Shahani¹; ¹University of Michigan

9:30 AM

Analysis of In-situ X-ray Tomography Datasets of Dendritic Solidification Using 2D and 3D Machine Learning Algorithms: *Tiberiu Stan*¹; Nathan Pruyne²; Jim James²; Marcus Schwarting²; Jiwon Yeom³; Ben Blaiszik²; Ian Foster²; Peter Voorhees¹; ¹Northwestern University; ²Argonne National Laboratory; ³Korea Advanced Institute of Science and Technology

9:50 AM Break

10:10 AM

Challenges for Quantitative High-temperature Confocal Scanning Laser Microscopy: Understanding the Temperature Profile: *S. Thomas Britt*¹; P. Chris Pistorius¹; ¹Carnegie Mellon University

10:30 AM

Investigation of Echo Source and Signal Deterioration in Ultrasound Measurement of Metal Melt: *Bitong Wang*¹; Andrew Caldwell²; Antoine Allanore²; Douglas Kelley¹; ¹University of Rochester; ²Massachusetts Institute of Technology

BIOMATERIALS

Advances in Biomaterials for 3D Printing of Scaffolds and Tissues — Advances in Biomaterials for 3D Printing of Scaffolds and Tissues I

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

Program Organizers: Changxue Xu, Texas Tech University; Jun Yin, Zhejiang University; Zhengyi Zhang, Huazhong University of Science and Technology; Yifei Jin, University of Nevada Reno

Monday AM | February 28, 2022
201A | Anaheim Convention Center

Session Chairs: Changxue Xu, Texas Tech University; Kaidong Song, University of Florida

8:30 AM

Multifunctional Artificial Artery from Direct 3D Printing with Built-in Ferroelectricity and Tissue-matching Modulus for Real-time Sensing and Occlusion Monitoring: *Jun Li*¹; ¹University of Wisconsin-Madison

8:50 AM

Prediction of Cell Viability in Dynamic Optical Projection Stereolithography-based Bioprinting Using Machine Learning: *Heqi Xu*¹; Qingyang Liu²; Changxue Xu¹; Dazhong Wu²; ¹Texas Tech University; ²University of Central Florida

9:10 AM

4D Printable Salicylic Acid Photopolymers for Sustained Drug-releasing, Shape Memory Soft Tissue Scaffolds: *Andrew Weems*¹; ¹Ohio University

9:30 AM

Additive Manufacturing of Natural Materials as a Multidisciplinary Approach in Engineering Education: *Henry Colorado*¹; Mery Gomez-Marroquin²; Elkin Gutierrez³; ¹Universidad de Antioquia; ²Universidad Nacional de Ingeniería; ³Universidad Antonio Nariño

9:50 AM

Effects of Cell Sedimentation on Droplet Formation Process and Cell Distribution during Inkjet Printing of Cell-laden Bioink: Heqi Xu¹; Md Shahriar²; *Jiachen Liu*¹; Changxue Xu¹; ¹Texas Tech University

10:10 AM Break

10:30 AM

Acemannan Loaded Mg-doped 3D Printed Multifunctional Scaffolds: In Vivo and In Vitro Biological Property Evaluation: *Ujjayan Majumdar*¹; Susmita Bose¹; ¹Washington State University

10:50 AM

Curcumin and Vitamin D3 Enhances Osteogenic and Chemopreventive Properties of 3D Printed CaP Bone Scaffolds: *Yongdeok Jo*¹; Susmita Bose¹; ¹Washington State University

11:10 AM

Influence of Strut-size and Cell-size Variations on Additively Manufactured Porous Ti6Al4V: *Sushant Ciliveri*¹; Amit Bandyopadhyay¹; ¹Washington State University

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — Alloy Development and Application 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday AM | February 28, 2022
251A | Anaheim Convention Center

Session Chairs: Peter Liaw, The University of Tennessee; Carl Koch, North Carolina State University

8:30 AM Keynote

Low Density Multi-principal Element Alloys: A Review: *Carl Koch*¹; ¹North Carolina State University

9:00 AM Keynote

Design of Multi-principal Element Alloys for Use in a Broad Range of Temperatures: Cheng Zhang¹; *Enrique Lavernia*²; ¹University of California Irvine; ²National Academy of Engineering

9:30 AM

Strengthening Mechanisms and Deformation Behaviors in Single BCC Phase Refractory High-entropy Alloys: Chanho Lee¹; George Kim²; Yi Chou³; Michael Gao⁴; Ke An⁵; Gian Song⁶; Yi-Chia Chou³; Wei Chen²; Nan Li¹; Saryu Fensin¹; *Peter Liaw*⁷; ¹Los Alamos National Laboratory; ²Illinois Institute of Technology; ³National Chiao Tung University; ⁴National Energy Technology Laboratory/Leidos Research Support Team; ⁵Oak Ridge National Laboratory; ⁶Kongju National University; ⁷The University of Tennessee

9:50 AM Invited

Exploring Passivity of Multiple Principal Element Alloys: *David Shifter*¹; ¹Office of Naval Research

10:10 AM Break

10:30 AM Invited

Toward High Throughput Design and Development of Multi-principal Element Alloys for Corrosion and Oxidation Resistance (MPEAs): *Mitra Taheri*¹; ¹Johns Hopkins University

10:50 AM Invited

Exploring Alloy Design Pathways for Beneficial Short-range Ordering: C. Tasa¹; Feng He¹; Hyun Oh¹; Shaolou Wei¹; James Lebeau¹; Michael Xu¹; ¹Massachusetts Institute of Technology

11:10 AM Invited

Additive Manufacturing of High-performance High-entropy Alloys: *Wen Chen*¹; ¹University of Massachusetts-Amherst

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday AM | February 28, 2022
251B | Anaheim Convention Center

Session Chairs: Jeffrey Rickman, Lehigh University; Liang Qi, University of Michigan

8:30 AM

Modeling the Effect of Stress and Composition on the Stability of Lomer/Lomer-Cottrell Dislocations: *Anas Abu-Odeh*¹; Tarun Allaparti¹; Mark Asta¹; ¹University of California Berkeley

8:50 AM

Jerky Dislocation Motion in Multi-principal Element Alloys: From Atomic Peierls Stress to Dislocation Mobility: *Daniel Utt*¹; Subin Lee²; Yaolong Xing³; Hyejin Jeong³; Alexander Stukowski⁴; Sang Ho Oh³; Gerhard Dehm⁵; Karsten Albe¹; ¹Technische Universität Darmstadt; ²Karlsruhe Institute of Technology; ³Sungkyunkwan University; ⁴OVITO GmbH; ⁵Max-Planck-Institut für Eisenforschung GmbH

9:10 AM Invited

Energy Landscape of Deformation Twinning in Multi-principal Elements bcc Alloys: *Liang Qi*¹; Shih-Kuang Lee¹; ¹University of Michigan

9:30 AM

Critical Shear Stress Distributions and Dislocation Mobility in FeNiCrCoCu High Entropy Alloys via Atomistic Simulations: *Yixi Shen*¹; Douglas Spearot¹; ¹University of Florida

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Ceramic Particles and Powder

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Monday AM | February 28, 2022
213C | Anaheim Convention Center

Session Chairs: Ruigang Wang, University of Alabama; Jinhong Li, China University of Geosciences (Beijing)

8:30 AM Introductory Comments

8:35 AM Invited

High Flowability Ultra-high Temperature Ceramic Nanocomposites Feedstock Powder Synthesis via Gel-casting: Amy Wat¹; Ashley Hall¹; Bruce Yang¹; Congwang Ye¹; Gabriella King¹; Elizabeth Sobalvarro¹; Joshua Kuntz¹; Marcus Worsley¹; Wyatt Du Frane¹; James Cahill¹; ¹Lawrence Livermore National Laboratory

8:55 AM

Surface-engineered CeO₂ Nanocrystals as Cathode Host for High-performance Li-S Battery: Zhen Wei¹; Ruigang Wang¹; ¹The University of Alabama

9:15 AM

Immobilization of Laccase on CuO Nanoparticles: Stability, Catalytic Activity, and Cu Ion Exchange: F. Javier Suarez¹; Rafael Vazquez-Duhalt²; Olivia Graeve¹; ¹University of California San Diego; ²Universidad Nacional Autónoma de México

9:35 AM

Atomistic Simulations of Tension and Compression of Hybrid Core-shell Ceramic Nanoparticles: Kevin Kayang¹; Alexey Volkov¹; ¹The University of Alabama

9:55 AM

Deformation and Energy Absorbing Mechanism of Expanded Vermiculite Particles: Bowen Li¹; Hong Zou²; Jason Seeterlin¹; ¹Michigan Technological University; ²Runway Safe Group

10:15 AM Break

10:30 AM Invited

On the Manufacturing of Ceramics Powders by Sustainable Manufacturing Matrix: Surojit Gupta¹; ¹University of North Dakota

10:50 AM

Crystal Structure of Alkaline-doped Calcium and Strontium Hexaborides: Alan Hiraes¹; Olivia Graeve¹; ¹University of California San Diego

11:10 AM

Cold Sintering of Iron Powdered Metal Compacts and Their Performance: Linsea Paradis¹; Ramakrishnan Rajagopalan¹; Austin Fairman¹; Kyle Robertson¹; Daudi Waryoba¹; Clive Randall¹; ¹Penn State University

MATERIALS PROCESSING

Advances in Surface Engineering IV — Session I

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

Program Organizers: Arif Mubarak, PPG; Bharat Jasthi, South Dakota School of Mines & Technology; Tushar Borkar, Cleveland State University; Mary Lyn Lim, PPG Industries; Rajeev Gupta, North Carolina State University

Monday AM | February 28, 2022
210C | Anaheim Convention Center

Session Chair: Rajeev Gupta, North Carolina State University

8:30 AM

Atomic Origin of Corrosion Passivation in NiCrAl Alloys: A Density Functional Theory Study: Sainyam Nagar¹; Yashaswini Karanth¹; Vikrant Beura¹; Kiran Solanki¹; ¹Arizona State University

8:50 AM

Fluorine from Bad to Good in the Oxidation Behavior of Metallic Materials: Alexander Donchev¹; Mathias Galetz¹; ¹DECHEMA-Forschungsinstitut

9:10 AM

Microstructural Design via Plasma Variations in Hollow and Planar Cathode Sputtering: Adie Alwen¹; Andrea Hodge¹; ¹University of Southern California

9:30 AM

Ultra-high Temperature Oxidation Protection Coatings: Alloying of Transition Metal Borides: Thomas Glechner¹; Rainer Hahn¹; Ahmed Bahr¹; Tomasz Wojcik¹; Maximilian Weiss²; Jürgen Ramm³; Oliver Hunold³; Szilard Kolozsvári⁴; Helmut Riedl¹; ¹Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria; ²Institute of Chemical Technologies and Analytics, TU Wien, Austria; ³Oerlikon Surface Solutions AG, Liechtenstein; ⁴Plansee Composite Materials GmbH, Germany

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — MGI/Uncertainty Quantification

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Monday AM | February 28, 2022
256A | Anaheim Convention Center

Session Chairs: Somnath Ghosh, Johns Hopkins University; Gary Whelan, QuesTek Innovations LLC

8:30 AM Invited

10 Years of the Materials Genome Initiative: James Warren¹; ¹National Institute of Standards and Technology

9:00 AM Invited

Uncertainty Quantified Parametrically Homogenized Constitutive Models for Multi-scale Predictions of Fatigue Crack Nucleation in Ti Alloys: *Somnath Ghosh*¹; Shravan Kotha¹; Deniz Ozturk¹; ¹Johns Hopkins University

9:30 AM

Inference, Uncertainty Quantification, and Uncertainty Propagation for Grain Boundary Structure-property Models: *Oliver Johnson*¹; Eric Homer¹; David Fullwood¹; David Page¹; Kathryn Varela¹; Sterling Baird¹; ¹Brigham Young University

9:50 AM Break

10:10 AM

Uncertainty Quantification Framework for Robust Design of Fatigue Critical Alloys: *Gary Whelan*¹; David McDowell²; Sam Sorkin¹; Jiadong Gong¹; ¹QuesTek Innovations LLC; ²Georgia Institute of Technology

10:30 AM

Using Polycrystals for Bayesian Inference and Uncertainty Quantification of Grain Boundary Structure-property Models: *Brandon Snow*¹; Sterling Baird¹; Christian Kurniawan¹; David Fullwood¹; Eric Homer¹; Oliver Johnson¹; ¹Brigham Young University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Electronic and Atomistic Scale Algorithms and Their Applications

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Monday AM | February 28, 2022
253A | Anaheim Convention Center

Session Chairs: Bryan Wong, University of California, Riverside; Ebrahim Asadi, University of Memphis

8:30 AM Invited

Massive Parallelism for Theoretical Spectroscopy and Femtosecond Electron Dynamics First-principles Simulations: *Andre Schleife*¹; ¹University of Illinois Urbana-Champaign

9:00 AM

Quantum Computation for Predicting Solids-state Material Properties: *Kamal Choudhary*¹; ¹National Institute of Standards and Technology

9:20 AM

Verification of the Self-consistent Potential Correction as Applied to Charged 2D Materials: *Preston Vargas*¹; Richard Hennig¹; ¹University of Florida

9:40 AM Invited

Accurate First-principles Predictions of Organic Molecular Crystal Polymorphism: *Gregory Beran*¹; ¹University of California Riverside

10:10 AM Break

10:30 AM

Development of Segregation Energy Predictions Utilizing Advanced Descriptors of Local Atomic Environments: *Jacob Tavenner*¹; Ankit Gupta¹; Garritt Tucker¹; ¹Colorado School of Mines

10:50 AM

Measuring Individual Grain Boundary Diffusivity Measurements in Polycrystal Molecular Dynamics Simulations: *David Page*¹; Christian Kurniawan¹; Oliver Johnson¹; David Fullwood¹; Eric Homer¹; ¹Brigham Young University

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications X — Session I and II

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

Program Organizers: Hsin-Jay Wu, National Chiao Tung University; Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Cnrs Crismat Unicaen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Takao Mori, National Institute For Materials Science; Alexandra Zevalkin, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology; Pai-chun Wei, National Taiwan University

Monday AM | February 28, 2022
303D | Anaheim Convention Center

Session Chairs: Takao Mori, National Institute for Materials Science (NIMS); Hsin-Jay Wu, National Yang Ming Chiao Tung University

8:30 AM Introductory Comments

8:35 AM Invited

Advancing the Thermoelectric Performance of Full Heusler Alloys: *Ernst Bauer*¹; Fabian Garmroudi¹; Matthias Knopf¹; Alexander Riss¹; Michael Parzer¹; Takao Mori²; ¹Technische Universität Wien; ²NIMS Tsukuba

8:55 AM

Rational Band Engineering Leads to Enhanced Thermoelectric Performance of Fe₂VAL-type Heusler Compounds: *Alexander Riss*¹; Fabian Garmroudi¹; Michael Parzer¹; Sergii Khmelevskyi¹; Raimund Podloucky²; Kazuki Tobita³; Yukari Katsura⁴; Kaoru Kimura³; Takao Mori⁵; Ernst Bauer¹; ¹TU Wien; ²Universität Wien; ³The University of Tokyo; ⁴The University of Tokyo, Kashiwa; ⁵NIMS

9:15 AM

Anderson Transition as a Novel Route for High-performance Thermoelectrics: *Fabian Garmroudi*¹; Michael Parzer¹; Alexander Riss¹; Andrei Ruban²; Sergii Khmelevskyi¹; Michele Reticioli³; Matthias Knopf¹; Herwig Michor¹; Andrej Pustogow¹; Takao Mori⁴; Ernst Bauer¹; ¹Technische Universität Wien; ²KTH Royal Institute of Technology; ³Universität Wien; ⁴National Institute for Materials Science

9:35 AM

Improvement of Thermoelectric Figure of Merit of p-type BiSbTe Alloys through the Microstructure Controlling by Optimization of Initial Powder Size: *Babu Madaval*¹; Pathan Sharief¹; Sungjae Jo¹; Gian Song¹; Soon-Jik Hong¹; ¹Kongju National University

BIOMATERIALS

Biological Materials Science — Biological Materials Science I

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Monday AM | February 28, 2022
201B | Anaheim Convention Center

Session Chairs: Steven Naleway, The University of Utah; Hannes Schniepp, William and Mary

8:30 AM Invited

Lessons from Nature: Plants, Fish, Birds, and Mammals: *Marc Meyers*¹; Haocheng Quan²; Audrey Velasco-Hogan¹; Benjamin Lazarus³; Iwona Jasiuk³; Robert Ritchie⁴; ¹University of California-San Diego; ²Institute for New Materials; ³University of Illinois; ⁴University of California, Berkeley

9:05 AM

Bioinspiration of the Equine Hoof: *Rachel Luu*¹; Benjamin Lazarus¹; Charul Chadha²; Teresa Gómez-del Río³; Iwona Jasiuk²; Marc Meyers¹; ¹University of California, San Diego; ²University of Illinois at Urbana-Champaign; ³Universidad Rey Juan Carlos

9:25 AM

Properties, Mechanics, and Material Applications of Fungi: *Debora Lyn Porter*¹; Alexander Bradshaw¹; Ryan Nielsen¹; Pania Newell¹; Bryn Dentinger¹; Steven Naleway¹; ¹University of Utah

9:45 AM

Damage Control and Impact Resistance of the Jackfruit: *Benjamin Lazarus*¹; Rachel Luu¹; Ryan Fancher¹; Charles Soulen¹; Nicholas Boechler¹; Marc Meyers¹; ¹UCSD

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Advanced Characterization Methods I

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Monday AM | February 28, 2022
207B | Anaheim Convention Center

Session Chairs: Rajiv Soman, Eurofins EAG Laboratories; Bowen Li, Michigan Technological University

8:30 AM Introductory Comments

8:35 AM

A Review of Atom Probe Tomography Technology: The Present and Future: *Robert Ulfig*¹; David Larson¹; David Reinhard¹; Peter Clifton¹; ¹Cameca Instruments Inc.

8:55 AM

Characterization of Platinum Nanoparticles on a Non-conductive Perovskite Catalyst through Tailored Imaging Conditions in Scanning Electron Microscopy: *Andy Holwell*¹; *Maadhav Kothari*²; John Irvine²; Yukwon John³; Andrea Pascui⁴; ¹Carl Zeiss Microscopy LLC; ²University of St Andrews; ³Yonsei University; ⁴Johnson Matthey

9:15 AM

The Needle in the Haystack: The Role of New Advances in Correlative Light, Electron, Ion Beam and X-ray Microscopy in Finding, Imaging and Understanding Ever Fewer and Smaller Inclusions and Features in Steel: *Andy Holwell*¹; ¹Carl Zeiss Microscopy LLC

9:35 AM

Characterization of Explosive Crystals with X-ray Micro and Nano-scale Tomography: *Brian Patterson*¹; Lindsey Kuettner¹; Steven Young¹; Larry Hill¹; Alexandra Burch¹; John Yeager¹; ¹Los Alamos National Laboratory

9:55 AM Break

10:15 AM

Simulating Electron Microscopy to Elucidate Connections between Structural Measurements and Properties of Glassy Materials: *Nicholas Julian*¹; Robert Rudd²; Jaime Marian¹; ¹University of California Los Angeles; ²Lawrence Livermore National Laboratory

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Phase Stability I and II

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoulas, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Monday AM | February 28, 2022
255C | Anaheim Convention Center

Session Chairs: Prashant Singh, Ames Laboratory; Mira Todorova, Max-Planck-Institute

8:30 AM

Stability of Immiscible Nanocrystalline Alloys in Compositional and Thermal Fields: *Joseph Monti*¹; Emily Hopkins²; Fadi Abdeljawad³; Khalid Hattar¹; Brad Boyce¹; Remi Dingreville¹; ¹Sandia National Laboratories; ²Johns Hopkins University; ³Clemson University

8:50 AM

Ab Initio Simulations on the Pure Cr Lattice Stability at OK: Verification with the Fe-Cr and Ni-Cr Binary Systems: *Songge Yang*¹; Yi Wang²; Zi-kui Liu²; Yu Zhong¹; ¹Worcester Polytechnic Institute; ²Pen State University

9:10 AM Invited

Role of Alloying on Tunability of Martensitic Phase Transformation in Multi-principal Element Alloys: *Prashant Singh*¹; Sezer Picak²; Aayush Sharma¹; A.V. Smirnov¹; Y.I. Chumlyakov³; Raymundo Arroyave⁴; Ibrahim Karaman⁴; Duane D. Johnson¹; ¹Ames Laboratory; ²Texas A&M University ; ³Tomsk State University; ⁴Texas A&M University

9:40 AM

Compositional Patterning in Irradiated Polycrystalline Alloys: Robert Averbach¹; Pascal Bellon¹; Qun Li¹; ¹University of Illinois at Urbana-Champaign

10:00 AM Break

10:20 AM

Semiclassical Monte Carlo Simulation of the Heisenberg Model With Near-quantum Accuracy: *Flynn Walsh*¹; *Lin-Wang Wang*¹; *Robert Ritchie*¹; *Mark Asta*¹; ¹Lawrence Berkeley National Laboratory

MATERIALS PROCESSING

Defects and Properties of Cast Metals IV — 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; Andrew Kao, University of Greenwich; Kyle Fezi, Fort Wayne Metals

Monday AM | February 28, 2022
210B | Anaheim Convention Center

Session Chairs: Brian Thomas, Colorado School of Mines; Mark Jolly, Cranfield University

8:30 AM Introductory Comments

8:35 AM Invited

Measurement and Simulation of Reoxidation Inclusions in Steel Casting: Robert Donahue¹; *Christoph Beckermann*¹; ¹University of Iowa

9:00 AM

Particle Capture Defects in Continuous Steel Casting: Seong-Mook Cho¹; *Brian Thomas*²; ¹Pukyong National University; ²Colorado School of Mines

9:20 AM

Understanding Effects of Oxide Bifilms on Solidification Microstructures by Multiscale Modeling: *Sepideh Kavousi*¹; Mohsen Asle Zaeem¹; ¹Colorado School of Mines

9:40 AM

Characterization of Second Phase Particles in Twin Roll Cast Aluminum Alloy AA 8011: *Sooraj Patel*¹; *Jyoti Mukhopadhyay*¹; ¹Indian Institute of Technology Gandhinagar

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — Microstructural Evolution during Material Processing

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Monday AM | February 28, 2022
304B | Anaheim Convention Center

Session Chairs: Mark Hardy, Rolls-Royce plc; Akane Suzuki, GE Research

8:30 AM Invited

Influence of Gamma' Precipitates on Recrystallization and Grain Growth Phenomena in Ni Based Superalloys : Smith-Zener Pinning and So Much More: *Nathalie Bozzolo*¹; ¹MINES-ParisTech

9:00 AM

Forging and Heat Treatment Conditions that Produce Visible Grains in a Nickel Alloy: *Mark Hardy*¹; Ross Buckingham¹; Kevin Severs²; Christos Argyrakis¹; Sammy Tin³; ¹Rolls-Royce Plc; ²ATI Forged Products Cudahy; ³University of Arizona

9:20 AM Invited

Precipitate Free Zone Formation in an Alumina-forming Austenitic Stainless Steel and the Effect on Mechanical Properties: Andrew Peterson¹; *Ian Baker*¹; ¹Dartmouth College

9:50 AM Break

10:10 AM

Precipitate Free Zones (PFZ) Formation at Grain Boundaries in γ/γ Ni-based Superalloys: *Guillaume Burlot*¹; Jonathan Cormier¹; Anne Joulain¹; Dominique Eyidi¹; Patrick Villechaise¹; ¹Institut Pprime

10:30 AM

Preferential Precipitation of γ on Annealing Twin Boundaries in Superalloys: *Semanti Mukhopadhyay*¹; Hariharan Sriram¹; Shakthipriya Baskar Kannan¹; Charles Xu¹; Ashton Egan¹; Fei Xue²; Longsheng Feng¹; Richard DiDomizio³; Andrew Detor³; Katelun Wertz⁴; Milan Heczko¹; Robert Hayes⁵; Gopal B. Viswanathan¹; Christopher Zenk⁶; Emmanuelle Marquis²; Maryam Ghazisaeidi¹; Stephen Niezgoda¹; Yunzhi Wang¹; Michael Mills¹; ¹The Ohio State University; ²University of Michigan; ³GE Global Research Center; ⁴Air Force Research Laboratory; ⁵Metals Technology Inc.; ⁶Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Dynamic Loading of Additive Manufactured Materials

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Monday AM | February 28, 2022
304D | Anaheim Convention Center

Session Chairs: Eric Brown, Los Alamos National Laboratory; Arezoo Zare, Johns Hopkins University; Mukul Kumar, Lawrence Livermore National Laboratory

8:30 AM

Triaxiality-dependence of Dynamic Failure in Additively Manufactured Steel: *Jack Borg*¹; Bernard Gaskey²; Parth Garud³; Peter Sable⁴; ¹Marquette University; ²University of Dayton Research Institute; ³Georgia Institute of Technology; ⁴Air Force Research Laboratory

8:50 AM

Additive Manufacturing and Intermediate-rate Mechanical Response of High Performance Steel: *Bernard Gaskey*¹; Nick Hopkins²; Richard Harris³; Philip Flater³; ¹University of Dayton Research Institute; ²Integrated Solutions for Systems; ³Air Force Research Lab Munitions Directorate

9:10 AM

Design of Damage Resistance Materials Using Additive Manufacturing: *Saryu Fensin*¹; David Jones¹; George Gray¹; Carl Trujillo¹; Daniel Martinez¹; Ankur Agrawal¹; Dan Thoma¹; ¹Los Alamos National Laboratory

9:30 AM

Tailorable Shock and Fragmentation Behaviors of Additively Manufactured Interpenetrating Composites: *Spencer Taylor*¹; Bernard Gaskey²; Zachary Cordero¹; ¹Massachusetts Institute of Technology; ²Air Force Research Lab

9:50 AM Break

10:05 AM

Evaluation of the Effectiveness of Additive Friction Stir Deposition for Ballistic Repair of Aluminum Alloy 7075: George Stubblefield¹; Malcolm Williams¹; Zack Tew¹; Russell Rowe¹; Craig Mason²; James Jordon¹; Paul Allison¹; Mark Barkey¹; ¹University of Alabama; ²Pacific Northwest National Laboratory

10:25 AM

Spall Failure of ECAE-processed Mg-6Al via Laser-driven Micro-flyer Impact Experiments: *Christopher DiMarco*¹; Debjoy Mallick²; Chengyun Miao¹; David Gibbins¹; Jenna Krynicki¹; Nathaniel Davenport¹; Laszlo Kecskes¹; Tim Weihs¹; K.T. Ramesh¹; ¹Johns Hopkins University; ²US Army CCDC Army Research Laboratory

10:45 AM

Deformation Mechanisms and Shock Loading Responses of a Tribology-grade NiTiHf Alloy: *Tyler Knapp*¹; Aaron Stebner¹; ¹Georgia Institute of Technology

11:05 AM

Delamination Propagation in Laminate Carbon Fiber-epoxy Composites: *Lilly Schroer*¹; Mohammad Hamza Kirmani¹; ¹Georgia Institute of Technology

11:25 AM

Mitigating Spall Fracture of Ductile Materials by Introducing Porosity: *Edwin Chiu*¹; Ankit Srivastava¹; ¹TAMU Material Science Department

ELECTRONIC MATERIALS

Electronic Packaging and Interconnections — Low Melting Temperature Solder

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

Program Organizers: Tae-Kyu Lee, Cisco Systems; Albert T. Wu, National Central University; Won Sik Hong, Korea Electronics Technology Institute; Kazuhiro Nogita, University of Queensland; Govindarajan Muralidharan, Oak Ridge National Laboratory; David Yan, San Jose State University; Luke Wentlent, Plug Power

Monday AM | February 28, 2022
303B | Anaheim Convention Center

Session Chair: Praveen Kumar, Indian Institute of Science

8:30 AM Invited

Comparing Intermetallic Compound Formation in Solder Interconnects under Different Current Load Conditions: *Yi Ram Kim*¹; Allison Osmanson¹; Mohsen Tajedini¹; Choong-Un Kim¹; Patrick Thompson²; Qiao Chen²; ¹University of Texas at Arlington; ²Texas Instruments, Inc.

8:55 AM

Length Scale Dependent Mechanical Behaviour of Elastically Constrained Sn Rich Solder Joints: Anwesha Kanjilal¹; *Praveen Kumar*¹; ¹Indian Institute of Science, Bangalore

9:15 AM

Microstructural Evolution of Bi Phase during Reflow and Thermal Aging in Sn-58Bi Solder: *Amey Luktuke*¹; Sridhar Niverty¹; Hamidreza Torbati-Sarraf¹; Fengjiang Wang²; Aniket Tekawade³; Viktor Nikitin³; Rajkumar Kettimuthu³; Nikhilesh Chawla¹; ¹Purdue University; ²Jiangsu University of Science and Technology; ³Argonne National Laboratory

9:35 AM

Stress Development in Solder Interconnects under Pulsed Electric Current: *Allison Osmanson*¹; Yi Ram Kim¹; Mohsen Tajedini¹; Choong-Un Kim¹; Patrick Thompson²; Qiao Chen²; Sylvester Ankamah-Kusi²; ¹University of Texas at Arlington; ²Texas Instruments

9:55 AM Break

10:15 AM

Surface Precipitation and Growth of Bismuth Particles in Sn-Ag-Cu-Bi Solder Joints: *John Wu*¹; Amey Luktuke¹; Nikhilesh Chawla¹; ¹Purdue University

10:35 AM

Enhancing Mechanical Properties via Adding Ni and Zn in Cu/Sn3.5Ag/Cu TLP Soldering by TCB Process: *Zih You Wu*¹; Junq Gong Duh¹; ¹National Tsing Hua University

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Part I: Low Temperature/Aqueous Corrosion, Stress Corrosion Cracking, Pitting, Metal Dissolution

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Additive Manufacturing Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Elizabeth Trillo, Southwest Research Institute; Andrew Hoffman, GE Research; Brendy Rincon Troconis, University of Texas at San Antonio

Monday AM | February 28, 2022
201C | Anaheim Convention Center

Session Chairs: Jennifer Locke, Ohio State University; Brendy Rincon, UTSA

8:30 AM Introductory Comments

8:35 AM Invited

Corrosion of Additively Manufacture Magnesium Alloys: *Nick Birbilis*¹; Zhuoran Zeng¹; ¹The Australian National University

9:05 AM

Effect of Post Processing Treatments on Corrosion Behavior of Laser Powder Bed Fusion (LPBF) 7050 Aluminum Alloy: *Rupesh Rajendran*¹; Crosby Owens²; Preet Singh¹; ¹Georgia Institute of Technology; ²Northrop Grumman Corporation

9:25 AM

Corrosion Properties of AM A20X: *Jamie Stull*¹; *Courtney Clark*¹; Timothy Gorey¹; Colt Montgomery¹; Robin Pacheco¹; Don Johnson¹; Daniel Hooks¹; ¹Los Alamos National Laboratory

9:45 AM Break

10:00 AM Invited

Impact of Chemistry and Microstructure on Corrosion Properties of Designed High-performance Stainless Steel Powder for Additive Manufacturing: *Dana Frankel*¹; *Abhinav Saboo*¹; *Marie Thomas*¹; *Jason Sebastian*¹; ¹QuesTek Innovations LLC

10:30 AM

Surface Finishing Effects on the Corrosion Properties of Additively Manufactured 316L Stainless Steel: *Courtney Clark*¹; Timothy Gorey¹; Jamie Stull¹; Don Johnson¹; Randy Edwards¹; Enkeleda Dervishi-Whetham¹; Daniel Hooks¹; ¹Los Alamos National Laboratory

10:50 AM

Exploring the Stress-corrosion Cracking Susceptibility of Additively Manufactured 316L in Boiling Magnesium Chloride: *Erin Karasz*¹; Jason Taylor¹; David Autenrieth¹; Philip Reu¹; Kyle Johnson¹; Michael Melia¹; Philip Noell¹; ¹Sandia

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Hydrogen Embrittlement

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Monday AM | February 28, 2022
201D | Anaheim Convention Center

Session Chairs: Reiner Kirchheim, Georg-August-Universität Göttingen; Ting Zhu, Georgia Tech

8:30 AM Invited

Contributions to the Understanding of Hydrogen Embrittlement by a Thermodynamic Approach: *Reiner Kirchheim*¹; ¹University of Goettingen

9:05 AM

Hydrogen-Induced Cracking of Pure Titanium in Hydrochloric Acid Solution Using Constant Load Method: *Osama Alyousfi*¹; ¹Kuwait University

9:25 AM

Atomistic Study on Diffusion and Trapping of Hydrogen in Nanocrystalline Steel: *Denver Seely*¹; *Bradley Huddleston*¹; *Nayoon Lee*¹; *Sungkwang Mun*¹; *Anh Vo*¹; *Doyl Dickel*¹; *Krista Limmer*²; ¹Mississippi State University; ²U.S. Army Combat Capabilities Development Command Army Research Laboratory

9:45 AM

A Surface Deformation Approach for Improved Hydrogen Embrittlement Resistance: *Haoxue Yan*¹; *Dylan Hall*²; *Jinwoo Kim*¹; *S. Raima Mahmud*¹; *David Dye*²; *C. Cem Tasan*¹; ¹Massachusetts Institute of Technology; ²Imperial College London

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — From Plastic Localization to Damage Nucleation and Propagation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Jean-Charles Stinville, University of Illinois Urbana-Champaign; Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Orion Kafka, NIST

Monday AM | February 28, 2022
254B | Anaheim Convention Center

Session Chair: Jean-Charles Stinville, University of Illinois Urbana-Champaign

8:30 AM Invited

On the Relevant Scale Related to Fatigue Crack Initiation in Different Metallic Alloys: *Patrick Villechaise*¹; *Jonathan Cormier*¹; *Samuel Hemery*¹; ¹Institut Pprime

9:00 AM Invited

Role of Cyclic Strain Localization in Fatigue Crack Initiation and Growth: Jaroslav Polak¹; Veronika Mazanova²; Tomáš Babinský¹; Milan Heczko²; ¹Institute of Physics of Materials ASCR; ²CEMAS, Ohio State University

9:30 AM

Influence of Compressive Hold Times in Dwell-fatigue of Alloy 718: Melanie Bordas-Czaplicki¹; Jonathan Cormier²; Patrick Villechaise²; Vincent Roue³; ¹Safran Aircraft Engines - ENSMA - Institut Pprime - UPR CNRS 3346; ²Institut Pprime; ³Safran Aircraft Engines

9:50 AM

Cyclic Plasticity and Fatigue Properties of Ultra-high Strength CrCoNi Medium-entropy Alloy with Heterogeneous Partially Recrystallized Microstructure: Milan Heczko¹; Veronika Mazánová¹; Connor Stone²; Ivo Kubena³; Jiri Tobiáš³; Tomáš Kruml³; Easo George⁴; Maryam Ghazisaeidi¹; Jaroslav Polák³; Michael Mills¹; ¹The Ohio State University; ²Exponent, Inc.; ³Institute of Physics of Materials CAS; ⁴Oak Ridge National Laboratory

10:10 AM Break

10:25 AM

Role of Twins on Localization of Cyclic Strain and Fatigue Crack Initiation in CrCoNi Medium-entropy Alloy: Veronika Mazanova¹; Mulaine Shih¹; Milan Heczko¹; Connor E. Stone²; Easo George³; Jaroslav Polak⁴; Maryam Ghazisaeidi¹; Michael J. Mills¹; ¹The Ohio State University; ²Exponent; ³Oak Ridge National Laboratory; ⁴Institute of Physics of Materials CAS

10:45 AM

Enhancing Fatigue Crack Growth Resistance of High Strength Aluminum Alloys Reinforced by Shape Memory Alloy: Nelson Netto¹; Lv Zhao²; Eric Charkaluk³; Aude Simar¹; ¹Institute of Mechanics, Materials and Civil Engineering, Université Catholique de Louvain, Louvain la Neuve, Belgium; ²Department of Mechanics, School of Aerospace Engineering, Huazhong University of Science and Technology, Wuhan, China; ³Laboratoire de Mécanique des Solides, CNRS, École Polytechnique, Palaiseau, France

11:05 AM

Crack Initiation and Growth Behavior of Additively Manufactured Contemporary Aluminum Alloys: Surface Roughness, Micro-/Defect-structure, and Build Orientation: P.D. Nezhadfar¹; Muztahid Muhammad²; Mikyle Paul¹; Spencer Thompson²; Ankit Saharan²; Nam Phan³; Nima Shamsaei¹; ¹Auburn University; ²EOS GmbH; ³Naval Air Systems Command

11:25 AM

Microstructures, Mechanical Properties, and Fatigue Damage Mechanisms in Laser Powder Bed and Conventionally Cast Al-10Si-0.4Mg Alloys: Timothy Piette¹; Robert Warren¹; Anthony Spangenberg¹; Diana Lados¹; ¹Worcester Polytechnic Institute

11:45 AM

Effect of Wire Size on the Fatigue Life of Superelastic Nitinol: Parisa Shabani Nezhad¹; Jacob Rusch¹; John Moore¹; Dinc Erdeniz²; ¹Marquette University; ²University of Cincinnati

12:05 PM

Understanding the Connections Between Microstructural Features and Fatigue Crack Initiation and Propagation Properties in Medical Formulations of Ultra-high-molecular-weight-polyethylene (UHMWPE): Bethany Smith¹; Qin Yu²; Lisa Pruitt¹; Robert Ritchie¹; Samantha Kwan¹; Alex Sangster³; Jon Ell¹; ¹University of California, Berkeley; ²Lawrence Berkeley National Laboratory; ³Marlboro Academy

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Nanocarbon-based Flexible Devices: Emerging Materials and Processes — Session I: Future of Nanoelectronics

Program Organizer: Mostafa Bedewy, University of Pittsburgh

Monday AM | February 28, 2022
260A | Anaheim Convention Center

8:30 AM Introductory Comments

8:35 AM Keynote

Nanoelectronics Grafted onto and within Colloids to Enable Colloidal Robotics: Michael Strano¹; ¹Massachusetts Institute of Technology

9:15 AM Keynote

Design and Applications of Printable and Flexible Nanoelectronic Material Inks: Mark Hersam¹; ¹Northwestern University

9:55 AM Break

10:10 AM Keynote

Going where Silicon Cannot Reach: Print-in-place and Recyclable Electronics from Nanomaterials: Aaron Franklin¹; ¹Duke University

10:50 AM Keynote

Direct-write of Laser Induced Graphene with Spatially Varying Properties on Polymers: Mostafa Bedewy¹; ¹University of Pittsburgh

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Low-Dimensional 0D Nanoparticles & Plasmonics

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woonchul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Monday AM | February 28, 2022
260B | Anaheim Convention Center

Session Chairs: Nasrin Hooshmand, Georgia Institute of Technology; Hagar Labouta, University of Manitoba

8:30 AM

Extinction Properties of Singular Plasmonic Nanoparticles: Nasim Mohammadi Estakhri¹; Nooshin M. Estakhri²; ¹Chapman University; ²University of Michigan

8:50 AM

Hydrogen Sensing Using Novel Core-shell Plasmonic Nanoparticles: Joshua Maurer¹; David Sconyers¹; Rosemary Calabro¹; Stephen Bartolucci¹; ¹US Army DEVCOM-AC

9:10 AM

Electron Transport in Plasmonic Nanocomposites: *Patrick Ward*¹; ¹Savannah River National Laboratory

9:30 AM

Plasmonic Nanoparticles for Sensing, Drug Delivery and Photothermal Therapy of Cancer: *Nasrin Hooshmand*¹; ¹Georgia Institute of Technology

9:50 AM Break

10:10 AM Keynote

Plasmonic Approaches to Biology and Medicine: *Paul Weiss*¹; ¹University of California Los Angeles

MATERIALS PROCESSING

Furnace Tapping 2022 – Session I

Sponsored by: The Southern African Institute of Mining and Metallurgy, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Materials Characterization Committee, Industrial Advisory Committee

Program Organizers: Joalet Steenkamp, MINTEK; Dean Gregurek, RHI Magnesita; Quinn Reynolds, Mintek; Gerardo Alvear Flores, Rio Tinto; Hugo Joubert, Tenova Pyromet; Phillip Mackey, P.J. Mackey Technology, Inc.

Monday AM | February 28, 2022
213D | Anaheim Convention Center

Session Chair: Joalet Steenkamp, Mintek / University of the Witwatersrand

8:30 AM Introductory Comments

8:40 AM Keynote

Controlled Tapping – The Research Project: *Merete Tangstad*¹; ¹Norwegian University of Science and Technology

9:25 AM

MIRS Robotic Tapping and Plugging of Non-ferrous Smelting Furnaces: *Rodrigo Madariaga*¹; Luis Arevalo¹; Tom Gabardi¹; Phillip Mackey²; ¹MIRS Robotics; ²P.J. Mackey Technology, Inc.

9:45 AM Invited

CFD Study on Continuous Tapping of Silicon: *Jan Erik Olsen*¹; Michal Ksiazek¹; Merete Tangstad²; ¹SINTEF; ²NTNU

10:05 AM Break

10:25 AM

Reduced-order Models of Furnace Tapping Systems – A Case Study from a Submerged Arc Furnace Producing Silicomanganese: *Quinn Reynolds*¹; Joalet Steenkamp¹; Jakobus Sutherland²; ¹MINTEK; ²Transalloys

10:45 AM

The Interaction of Slag and Carbon on the Electrical Properties: *Gerrit Surup*¹; Kseniia Koseniuk¹; Merete Tangstad¹; ¹NTNU

11:10 AM

Electrical Resistivity of Transformed Carbon Materials in the Silicon Furnace: *Haley Hoover*¹; Merete Tangstad¹; Gudrun Sævarsdóttir²; ¹NTNU; ²Reykjavik University

11:35 AM Concluding Comments

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior – Grain Boundary Migration and Deformation: Part I

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Monday AM | February 28, 2022
304C | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines

8:30 AM Introductory Comments

8:35 AM Invited

Grain Boundary Mobilities in Polycrystalline Materials: Jin Zhang¹; Phillip Staublin¹; Henning Poulsen²; James Warren³; *Peter Voorhees*¹; ¹Northwestern University; ²Technical University of Denmark; ³National Institute of Standards and Technology

9:05 AM

Reconciling the Variability of Grain Boundary Migration Behaviors Using a Classical Approach: *Eric Homer*¹; Darcey Britton¹; Oliver Johnson¹; Gregory Thompson²; ¹Brigham Young University; ²University of Alabama

9:25 AM

Emergent Disconnections in Phase Field Microstructure: Modeling Complex Boundary Migration at the Mesoscale: Mahi Gokuli¹; *Brandon Runnels*²; ¹California Institute of Technology; ²University of Colorado Colorado Springs

9:45 AM

Interactions between Interfacial Disconnections and Facet Junctions: Implications for Faceting and Boundary Evolution: *Douglas Medlin*¹; Chris Barr¹; James Nathaniel¹; Elton Chen¹; Ping Lu¹; David Adams¹; Rémi Dingreville¹; Brad Boyce¹; ¹Sandia National Laboratories

10:05 AM Break

10:20 AM Invited

Does Grain Boundary Character Matter? Intergranular Failure in Al Alloys under Bending: *Josh Kacher*¹; Sazol Das²; Yung Suk Jeremy Yoo³; ¹Georgia Institute of Technology; ²Novelis Inc.; ³University of Michigan

10:50 AM

Model for Grain Boundary Stress Field Evolution due to Dislocation-grain Boundary Interactions and Influence on Subsequent Slip Transmission: *Darshan Bamney*¹; Laurent Capolungo²; Douglas Spearot¹; ¹University of Florida; ²Los Alamos National Laboratory

11:10 AM

Effects of Segregated Solute Atoms and Clusters on Grain Boundary Properties in Magnesium Alloys: *Vaidehi Menon*¹; Liang Qi¹; ¹University of Michigan

11:30 AM

Investigating Factors that Influence Stress-induced Grain Boundary Migration in Ultrafine-grained Metal Thin Films: *Sandra Stangebye*¹; Yin Zhang¹; Ting Zhu¹; Olivier Pierron¹; Josh Kacher¹; ¹Georgia Institute of Technology

11:50 AM

High-throughput Atomistic Simulations of Dislocation-grain Boundary Interactions: *Sumit Suresh*¹; Michael Baskes¹; Nithin Mathew¹; Abigail Hunter¹; Saryu Fensin¹; ¹Los Alamos National Laboratory

MATERIALS DESIGN

Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment — Alloy Theory I: Cluster and Machine Learning Representations of Thermodynamics

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

Program Organizers: Raymundo Arroyave, Texas A&M University; Wei Chen, Illinois Institute of Technology; Yong-Jie Hu, Drexel University; Tresa Pollock, University of California, Santa Barbara

Monday AM | February 28, 2022
255A | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM Keynote

William Hume-Rothery Award Lecture: Study of Ferroelectricity and Phase Transitions in Hafnia: *Sesha Behara*¹; *Anton Van der Ven*¹; ¹University of California, Santa Barbara

9:15 AM Invited

ACE of Spades: *Drutz Ralf*¹; ¹Icans Ruhr-Universitaet Bochum

9:45 AM Invited

Construction and Application of First-principles Parameterized Cluster Expansion Effective Hamiltonians Using CASM: *Brian Puchala*¹; John Thomas²; Anirudh Natarajan²; Anton Van der Ven²; ¹University of Michigan; ²University of California, Santa Barbara

10:15 AM Break

10:30 AM Invited

Turning Ab Initio Simulations into Surprising Bulk Predictions: *Elizabeth Decolvenaere*¹; Emily Levin²; Ram Seshadri²; Alexander Donchev¹; John Klepeis¹; Anton Van der Ven²; David Shaw¹; ¹D. E. Shaw Research; ²University of California, Santa Barbara

11:00 AM Invited

Building Useful Machine-learned Interatomic Potentials: *Gus Hart*¹; ¹Brigham Young University

MATERIALS DESIGN

ICME Case Studies: Successes and Challenges for Generation, Distribution, and Use of Public/Pre-Existing Materials Datasets — Leveraging Open Datasets

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

Program Organizers: Stephen DeWitt, Oak Ridge National Laboratory; Vikas Tomar, Purdue University; James Saal, Citrine Informatics; James Warren, National Institute of Standards and Technology

Monday AM | February 28, 2022
254A | Anaheim Convention Center

Session Chair: Stephen DeWitt, Oak Ridge National Laboratory

8:30 AM

Filling Data Gaps in 3D Microstructure with Deep Learning: *Neal Brodnik*¹; Devendra Jangid¹; Michael Goebel¹; Amil Khan¹; Saisidharth Majeti¹; McLean Echlin¹; B. S. Manjunath¹; Samantha Daly¹; Tresa Pollock¹; ¹University of California Santa Barbara

8:50 AM

Holistic Merging of Experimental and Computational Datasets – A Case Study for Diffusion Coefficients: *Wei Zhong*¹; *Ji-Cheng Zhao*¹; ¹University of Maryland

9:10 AM Invited

Materials Innovation and Design Enabled by the Materials Project: *Kristin Persson*¹; ¹University of California, Berkeley

9:40 AM

Data-driven Model Based Comparison of Public Datasets for Online State of Charge Estimation in Lithium-ion Batteries: *Meghana Sudarshan*¹; Alexey Serov¹; Casey Jones¹; Vikas Tomar¹; ¹Purdue University

LIGHT METALS

Magnesium Technology — Keynote Session

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Monday AM | February 28, 2022
210A | Anaheim Convention Center

Session Chairs: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc.

8:30 AM Introductory Comments

8:40 AM Keynote

Magnesium Alloy Development for Structural and Biomedical Applications: *Alan Luo*¹; ¹Ohio State University

9:20 AM Keynote

Unlocking the Strengthening Potential of Magnesium Alloys Using Deformation-induced Clustering and Precipitation: *Suhas Eswarappa Prameela*¹; Taisuke Sasaki²; Peng Yi¹; Michael Falk¹; *Timothy Weihs*¹; ¹Johns Hopkins University; ²NIMS

10:00 AM Break

10:15 AM Keynote

An Update on Magnesium Based Powder Metallurgy and Additive Manufacturing Processes: *Rajiv Tandon*¹; ¹Luxfer Magtech

10:55 AM Keynote

Historical Developments and Status of Carbothermal Reduction Technology to Produce Magnesium Metal: *Aaron Palumbo*¹; Boris Chubukov¹; ¹Big Blue Technologies

ENERGY & ENVIRONMENT

Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring Matthew J. Kramer — Hard Magnets

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

Program Organizers: Scott McCall, Lawrence Livermore National Laboratory; Ryan Ott, Ames Laboratory

Monday AM | February 28, 2022

210D | Anaheim Convention Center

Session Chair: Ryan Ott, Ames Laboratory

8:30 AM Introductory Comments

8:35 AM Invited

Challenges in Affordable, Reliable Permanent Magnets: *Matthew Kramer*¹; ¹Iowa State University

9:05 AM Invited

Iron Nitride: a Non-rare-earth Containing Permanent Magnet: *Frank Johnson*¹; ¹Niron Magnetics, Inc.

9:35 AM Invited

Critical Materials Challenges in ThMn12-type Hard Magnetic Alloys for Permanent Magnets: *Daniel Salazar*¹; ¹BCMaterials

10:05 AM Break

10:25 AM Invited

Developing Substitutes for Magnetic Alloys: *Thomas Lograsso*¹; ¹Critical Materials Institute

10:55 AM Invited

Controlling First-order Magnetic Phase Transitions in Rare-earth Intermetallics: *Vitalij Pecharsky*¹; ¹Ames Laboratory, Iowa State University

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Corrosion I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Monday AM | February 28, 2022

203B | Anaheim Convention Center

Session Chair: Kumar Sridharan, University of Wisconsin

8:30 AM

Effects of Molten Salt Corrosion Associated with Proton Irradiation on the Micro-tensile Strength of Grain Boundaries in a Ni-20Cr Alloy: *Fei Teng*¹; Weiyue Zhou²; Yachun Wang¹; Daniel Murray¹; Michael Short²; Lingfeng He¹; ¹Idaho National Laboratory; ²Massachusetts Institute of Technology

8:50 AM

Inconel 617 Corrosion Study in Molten NaF-KF-UF₄-UF₃ Salts: *Qiufeng Yang*¹; Jinsuo Zhang¹; ¹Virginia Polytechnic Institute of Technology

9:10 AM

Corrosion Resistance of Steel and Nickel Alloys in Molten Nitrate Salt: *Andrew Dong*¹; Camilla Stitt²; Peter Hosemann¹; George Young²; ¹University of California Berkeley; ²Kairos Power

9:30 AM

Voids Observed during Molten Salt Corrosion: Kirkendall or Not?: *Weiyue Zhou*¹; Miaomiao Jin²; Yang Yang²; Michael Short¹; ¹Massachusetts Institute of Technology; ²Penn State University

9:50 AM Break

10:10 AM

The Corrosion of Severely Plastically Deformed SS316 in LiCl-Li₂O at 650 °C: *Jeremy Moon*¹; Andrew Hoffman²; Haiming Wen³; Dev Chidambaram¹; ¹University of Nevada, Reno; ²GE Research; ³Missouri S&T

10:30 AM

Understanding Molten Salt Corrosion in Ni-20Cr Model Alloy Using Multimodal Characterization: *Kaustubh Bawane*¹; Xiaoyang Liu²; Ruchi Gakhar¹; Michael Woods¹; Mingyuan Ge³; Xianghui Xiao³; Wah-Keat Lee³; Simon Pimblott¹; James Wishart³; Yu-chen Karen Chen-Wiegart²; Lingfeng He¹; ¹Idaho National Laboratory; ²Stony Brook University; ³Brookhaven National Laboratory

10:50 AM

ICME Development of a Cold Spray Enabled Corrosion Resistant Bimetallic Structure for Nuclear Reactors: *Pin Lu*¹; Joseph Heelan²; Vilupanur Ravi³; ¹Questek Innovations LLC; ²Solvus Global; ³Cal Poly Pomona

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Young Investigator Session I

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Monday AM | February 28, 2022
253B | Anaheim Convention Center

Session Chairs: Dana Frankel, QuesTek Innovations LLC; Wei Xiong, University of Pittsburgh

8:30 AM Keynote

Materials Design for Advanced Manufacturing: Gregory Olson¹; Jason Sebastian¹; ¹Massachusetts Institute of Technology

9:00 AM Invited

Development Framework Advancing State-of-the-art for Space Propulsion Components: Ida Berglund¹; Fuyao Yan¹; Martin Walbrühl¹; Jiayi Yan¹; ¹QuesTek Europe AB

9:25 AM Invited

Finding a Balance in FeCrAl, Optimizing Fabrication Routes and Chemistry Utilizing Experiments, Modeling, and Machine Learning: Andrew Hoffman¹; Vipul Gupta¹; Bojun Feng¹; Sayan Ghosh¹; Rajnikant Umretiya¹; Raul Rebak¹; ¹GE Research

9:50 AM Invited

Chemistry-processing-microstructure Relationships in Materials for Advanced Manufacturing: Eric Lass¹; ¹University of Tennessee-Knoxville

10:15 AM Break

10:35 AM Invited

Laser Powder Bed Fusion of High-strength, Crack-susceptible Superalloys: Considerations in Composition, Printing Process and Heat Treatment: Marcus Lam¹; ¹Monash University

11:00 AM Invited

Modeling Non-equilibrium Segregation and Microstructural Evolution during Rapid Solidification in Additive Manufacturing: Application to IN718 Alloy: Kang Wang¹; Bi-Cheng Zhou¹; ¹University of Virginia

11:25 AM Invited

Deformation Pathways in an Engineered Ti Alloy Duplex Microstructure Produced Using Selective Laser Melting: Jenniffer Bustillos¹; Atieh Moridi¹; ¹Cornell University

ADVANCED MATERIALS

Materials in Sport — Materials in Sport

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

Program Organizers: Brian Love, University of Michigan; W. Jud Ready, Georgia Institute of Technology; Nikhilesh Chawla, Purdue University

Monday AM | February 28, 2022
251C | Anaheim Convention Center

Session Chairs: Nikhilesh Chawla, Purdue University; W. Jud Ready, Georgia Institute of Technology; Brian Love, University of Michigan

8:30 AM Introductory Comments

8:35 AM

Material Characterization of Nordic Ski Waxes: Jeffrey Bates¹; ¹University of Utah

8:55 AM

"Stuck on You": Functional Friction Measurements of Doctored Baseballs Coated with "Sticky Substances": Brian Love¹; ¹University of Michigan

9:15 AM

Additive Manufacturing for Adjustable Putters: Brittan Pero¹; Caroline Means¹; Jaime Berez²; Elliott Jost¹; Jason Kuiper²; Justin Martin²; Stewart Cink³; Chris Saldana¹; ¹Georgia Institute of Technology; ²Bobby Jones Golf Course; ³PGA Tour

9:35 AM

Viscoelastic Self-sensing Nano-composite Materials and Their Use in Sports Applications: David Fullwood¹; Isaac Sorensen¹; Jacob Carter¹; Kurt Jensen¹; Ryan Hanson¹; Spencer Baker¹; Adam Bilodeau¹; Matthew Seeley¹; Ulrike Mitchell¹; Anton Bowden¹; ¹Brigham Young University

9:55 AM Break

10:15 AM

Materials Science and Engineering of Multiscale Foams for High Performance Footwear: Arun Sundar Singaravelu¹; Max Drexler²; Jasmine Rupert²; Chris Holmes²; Eshan Ganju³; Nikhilesh Chawla³; ¹Arizona State University; ²adidas; ³Purdue University

10:35 AM

Measuring Cool Touch of Key Sports Performance Apparel T-shirt Materials Using a Modified Transient Plane Source (MTPS) Sensor to Inform Future Technology Development: Susan Sokolowski¹; Emily Karolidis¹; Arya Hakimian²; ¹University of Oregon; ²CTherm

10:55 AM

A Mechanical Behavior Comparison between Cloth and Elastomeric Kinesiotapes Used in Athletic Training and Rehabilitation: Declan Shannon¹; Brian Love¹; ¹University of Michigan

11:15 AM

Adding a New Dimension to Activewear Fabrics: One-Way Transport Leveraging Biomimicry Science instead of Chemical Treatments for Perspiration Transport: Chad Lawrence¹; Jordan Lightstone¹; Jason Hu¹; ¹NexTex Innovations, Inc.

11:35 AM Concluding Comments

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Fuels & Claddings I

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Monday AM | February 28, 2022
204A | Anaheim Convention Center

Session Chairs: Peng Xu, Idaho National Laboratory; Erofil Kardoulaki, Los Alamos National Laboratory

8:30 AM Invited

Development of Advanced Nuclear Fuels for Current and Next Generation Reactors: *Joshua White¹; Tarik Saleh¹; Kenneth McClellan¹; ¹Los Alamos National Laboratory*

9:00 AM

Fabrication and Thermophysical Properties of (U,Zr)C; A High Uranium Density Fuel Candidate for Nuclear Thermal Propulsion Reactors: *Erofil Kardoulaki¹; Brian Taylor²; Jhonathan Rosales²; Tim Coons³; Darrin Byler¹; Ken McClellan¹; ¹Los Alamos National Laboratory; ²NASA*

9:20 AM

High Temperature Mechanical Testing of Uranium Fuel Pellets: *Tarik Saleh¹; James Valdez¹; Michael Torrez¹; Scarlett Widgeon Paisner¹; Kathryn Metzger²; Joshua White¹; ¹Los Alamos National Laboratory; ²Westinghouse Electric Corporation*

9:40 AM

Material Degradation Analysis through Machine Learning-based Information Extraction from Legacy SFR Metallic Fuel Performance Data: *Zhi-Gang Mei¹; Aaron Oaks¹; Kun Mo¹; Yinbin Miao¹; Logan Ward¹; Abdellatif Yacout¹; ¹Argonne National Laboratory*

10:00 AM Break

10:20 AM

Investigating the Thermophysical Properties and Key Contributions to the Thermal Conductivity of Different Nitride Systems: *Conor Galvin¹; Nicholas Barron²; Navaratnarajah Kuganathan¹; Michael Cooper³; Robin Grimes¹; ¹Imperial College London; ²National Nuclear Laboratory; ³Los Alamos National Laboratory*

10:50 AM

Effect of Microstructure and Rolling Treatment on Static Recrystallization Behavior in Monolithic U-10Mo Fuel Foils: *William Frazier¹; Kyoo Sil Choi¹; Lei Li¹; Yucheng Fu¹; Zhijie Xu¹; Ayoub Soulami¹; Vineet Joshi¹; ¹Pacific Northwest National Laboratory*

11:10 AM

Phase Field Fracture Study of the Effect of Gas Bubble on Fracture at U-Mo/Zr Interface: *Aashique Rezwan¹; Sean Masengale¹; Benjamin Beeler²; Yongfeng Zhang¹; ¹University of Wisconsin Madison; ²Idaho National Laboratory*

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Deformation Mechanisms I

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Monday AM | February 28, 2022
262B | Anaheim Convention Center

Session Chairs: Matthew Daly, University of Illinois at Chicago; Christopher Weinberger, Colorado State University

8:30 AM Introductory Comments

8:40 AM

Deciphering the Deformation Mechanisms of Nanocrystalline-nanotwinned Metals in Hall-Petch Breakdown Regime: *Yinmin (Morris) Wang¹; ¹University of California, Los Angeles*

9:00 AM Invited

Deformation Twins in BCC Metals - Atomic Level Origins: *Christopher Weinberger¹; Anik Faisal¹; ¹Colorado State University*

9:30 AM

The Complexity of Deformation Twinning: *Huseyin Sehitoglu¹; Sameer Mohammed¹; Gorkem Gengor¹; Orcun Celebi¹; ¹University of Illinois*

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Session I

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Monday AM | February 28, 2022
206B | Anaheim Convention Center

Session Chairs: Daniel Miracle, Air Force Research Laboratory; Alejandro Barrios, Sandia National Laboratories

8:30 AM Keynote

Emerging Capabilities for the High-throughput Characterization of Structural Materials: *Daniel Miracle¹; Mu Li²; Zhaohan Zhang²; Rohan Mishra²; Katharine Flores²; ¹Air Force Research Laboratory; ²Washington University in St. Louis*

9:10 AM Invited

Capturing the Mechanical Response of Three Phase Semi-solids at High Temperatures Using In Situ Synchrotron Imaging - From Superalloys to Magmas: *Peter Lee*¹; Mohammed Azeem¹; Nolwenn Le Gall¹; Robert Atwood²; ¹University College London; ²Diamond Light Source

9:40 AM Invited

Elucidating Deformation Pathways in Refractory Multi-principal Element Alloys via In Situ Experiments: *Daniel Gianola*¹; ¹University of California-Santa Barbara

10:10 AM Break

10:30 AM

High-throughput Fatigue Testing of Nanocrystalline Al Thin Films: *Alejandro Barrios*¹; Cody Kunka¹; John Nogan¹; Khalid Hattar¹; Brad Boyce¹; ¹Sandia National Laboratories

MATERIALS DESIGN

Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis — Aluminum Metal Matrix Composites

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

Program Organizers: Srivatsan Tirumalai, The University of Akron; Pradeep Rohatgi, University of Wisconsin; Simona Hunyadi Murph, Savannah River National Laboratory

Monday AM | February 28, 2022
256B | Anaheim Convention Center

Session Chair: Tirumalai S Srivatsan, The University of Akron

8:30 AM Invited

The Abrasive Wear Behavior of an In-situ Processed Aluminum Alloy Metal Matrix Composites: Srivatsan Tirumalai¹; *Jimmy Karloopia*²; Shaik Mozammil²; Pradeep Jha²; ¹The University of Akron; ²Indian Institute of Technology, Roorkee

8:55 AM

A Comparative Study of Carbon Nanotubes and Graphene Nanoplatelets on Structure-property Relationship of Aluminium Matrix Composites Synthesized by Spark Plasma Sintering: Mahmood Khan¹; Muhammad Shahzad²; Muhammad Basit³; Rafi Din²; *Shahid Akhtar*⁴; Syed Wilayat Husain³; Ragnhild Aune¹; ¹Norwegian University of Science and Technology; ²Pakistan Institute of Science and Technology; ³Institute of Space Technology (IST); ⁴Hydro Aluminium AS

9:15 AM Invited

Application of Triboinformatics Approach in Tribological Studies of Aluminum Alloys and Aluminum/Graphite Metal Matrix Composites: *Md Syam Hasan*¹; Amir Kordijazi²; Pradeep Rohatgi¹; Michael Nosonovsky¹; ¹University of Wisconsin- Milwaukee; ²SUNY Polytechnic Institute

9:40 AM Invited

Interfacial Structure and Mechanical Properties of 6082 Al Matrix Composites Reinforced with Al-Cu-Fe Quasicrystalline: *Yagnesh Shadangi*¹; Vikas Shivam²; Joysurya Basu¹; Kausik Chattopadhyay¹; Nilay Mukhopadhyay¹; ¹IIT BHU; ²IIT Ropar

10:05 AM Break

10:20 AM

Mechanical Alloying of Feedstock Powder for Selective Laser Melting: Aluminum Alloy Matrix Composites: *Ethan Parsons*¹; ¹Massachusetts Institute of Technology

10:40 AM Invited

Recent Advances in Aluminium-based Hybrid Metal Matrix Composites: A Review: *Sudhir Ranjan*¹; Jimmy Karloopia¹; Pradeep Jha¹; ¹Indian Institute of Technology Roorkee

11:05 AM

Role of Ultrasonic Cavitation on Microstructure, Bulk Mechanical and Tribological Behavior of 2D Tungsten Disulfide Reinforced Aluminum Matrix Composites: *Tanaji Paul*¹; Ana Exime¹; Riddhiben Joshi¹; Cheng Zhang¹; Benjamin Boest¹; Arvind Agarwal¹; ¹Florida International University

11:25 AM Invited

The Damping Capacity and Sliding Wear Behavior of an Aluminum Alloy Metal Matrix Composite: Role of Reinforcement : *Kedarnath Rane*¹; Narendra Dhokey²; Srivatsan Tirumalai³; ¹National Manufacturing Institute Scotland; ²College of Engineering; ³The University of Akron

SPECIAL TOPICS

Moving Forward from a Pandemic: How the Field of Materials Science Has Adapted (2022 Student-led Symposium) — Materials Research and Leadership in Uncertain Times

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Christine Smudde, University of California, Davis; Jared Stimac; Mingwei Zhang, University of California, Davis

Monday AM | February 28, 2022
202A | Anaheim Convention Center

Session Chairs: Gianmarco Sahragard-Monfared, University of California, Davis; Christine Smudde, University of California, Davis

8:30 AM Introductory Comments

8:35 AM

Materials Science during a Pandemic: A National Lab Perspective: *Ellen Cerreta*¹; ¹Los Alamos National Laboratory

8:55 AM

Conducting Materials Research during and after a Global Pandemic: *Timothy Smith*¹; Pete Bonacuse¹; ¹NASA Glenn Research Center

9:15 AM

When the World Went Remote: Adapting to Crisis and Creating Positive Change during the COVID-19 Pandemic: *Paul Mason*¹; ¹Thermo-Calc Software Inc.

9:35 AM

COVID-19 Impacts on Policy and Funding in Materials Engineering - A Perspective from the National Science Foundation: *Alexis Lewis*¹; ¹National Science Foundation

9:55 AM Break

10:15 AM

Lessons Learned during the COVID-19 Pandemic Regarding Antimicrobial Copper-based or Copper-containing Materials/ Surfaces: *Bryer Sousa*¹; Danielle Cote¹; ¹Worcester Polytechnic Institute

10:35 AM

Copper Ion Release in Copper-based Alloys: Implications on the Transmission of Coronaviruses Originating from Human Contact with Fomite Surfaces: *Victor Wallemacq*¹; Carol Glover¹; Tsuyoshi Miyake¹; Daniel Engel¹; John Scully¹; Stephen McDonnell¹; ¹University of Virginia

10:55 AM

Challenges and Solutions Associated with Publishing during a Global Pandemic: *Susan Sinnott*¹; ¹Pennsylvania State University

11:15 AM

Improvements to the Nanoindentation Technique and Its Use to Measure the Properties of Microfibers: *Warren Oliver*¹; Yujie Meng¹; ¹KLA

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Phase Transformation

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Monday AM | February 28, 2022
255B | Anaheim Convention Center

Session Chairs: Eric Payton, Air Force Research Laboratory; Mohsen Asle Zaeem, Colorado School of Mines

8:30 AM Invited

Tuning Nano-scale Phase Transitions to Expand Transformation-induced Plasticity: *C. Tasan*¹; Shaolou Wei¹; ¹Massachusetts Institute of Technology

9:00 AM

Deformation-induced Phase Transformation and Microstructure Evolution in CrCoNi Medium Entropy Alloy: *Hangman Chen*¹; Penghui Cao¹; ¹University of California, Irvine

9:20 AM

Effect of Boron Segregation on Bainite Nucleation during Isothermal Transformation: *Pierre Douquet*¹; Gregory Da Rosa²; Philippe Maugis¹; Josée Drillet²; Khalid Hoummada¹; ¹Aix Marseille Univ, CNRS, IM2NP, Marseille, France; ²ArcelorMittal Maizières Research SA, Voie Romaine, BP30320, 57283 Maizières les Metz, France

9:40 AM Invited

Localized Phase Transformation at Stacking Faults and Mechanism-based Alloy Design: Longsheng Feng¹; Timothy Smith²; Ashton Egan¹; Fan Zhang³; Michael Mills¹; *Yunzhi Wang*¹; ¹The Ohio State University; ²NASA Glenn Research Center; ³CompuTherm LLC

10:10 AM Break

10:25 AM

Shear Deformation-induced Modification of Defect Structures and Hierarchical Microstructures in Metallic systems: *Bharat Gwalani*¹; Matthew Olszta¹; Miao Song¹; Wenkai Fu¹; Yulan Li¹; Qin Pang¹; Anqi Yu¹; Mayur Pole¹; Jia Liu¹; Joshua Silverstein¹; Xiaolong Ma¹; Tanvi Anjantiwalay¹; Aashish Rohatgi¹; Mert Efe¹; Peter Sushko¹; Arun Devaraj¹; Ayoub Soulami¹; Suveen Mathaudhu¹; Cynthia Powell¹; Lei Li¹; ¹Pacific Northwest National Laboratory

10:45 AM

Tricky Transformations in an Ion Irradiated Nickel-titanium Alloy: *Alejandro Hinojos*¹; Daniel Hong¹; Nan Li²; Khalid Hattar³; Peter Anderson¹; Michael Mills¹; ¹The Ohio State University; ²Los Alamos National Laboratories; ³Sandia National Laboratories

11:05 AM

Unravelling the Mechanisms of Irradiation Induced Phase Transformation in Nanocrystalline Gold: *James Nathaniel*¹; Douglas Medlin¹; Khalid Hattar¹; Mitra Taheri²; ¹Sandia National Laboratories; ²Johns Hopkins University

MATERIALS PROCESSING

Rare Metal Extraction and Processing — Processes for Rare Earth Elements

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

Program Organizers: Takanari Ouchi, University of Tokyo; Gisele Azimi, University of Toronto; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Alafara Baba, University of Ilorin; Hong Peng, University of Queensland

Monday AM | February 28, 2022
213B | Anaheim Convention Center

Session Chairs: Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Takanari Ouchi, University of Tokyo

8:30 AM Introductory Comments

8:40 AM Invited

EPD Distinguished Lecture: Rare Earth and Critical Material Recovery from Peralkaline Volcanic Ores: Minerals Processing, Hydrometallurgy and Solvent Extraction Separation: *David Dreisinger*¹; ¹University of British Columbia

9:20 AM

Two-phase Rare-earth Alloys as Reference Electrodes in Molten Chlorides for Reliable Electrochemical Measurements: Nathan Smith¹; Stephanie Castro Baldivieso¹; Timothy Lichtenstein¹; Sanghyeok Im¹; *Hojong Kim*¹; ¹Pennsylvania State University

9:40 AM

Electrochemical Cell Design for Emf Measurements of Liquid Nd-Bi Alloys via Coulombic Titration in LiCl-KCl-NdCl₃ Electrolyte: *Sanghyeok Im*¹; Nathan Smith¹; Stephanie Castro Baldivieso¹; Hojong Kim¹; ¹The Pennsylvania State University

10:00 AM Break

10:20 AM

Low-cost Distillation Technology for Rare Earth Recycling: *Chinenye Chinwego*¹; Hunter Wagner¹; Emily Giancola¹; Jonathan Jironvil¹; Adam Powell¹; ¹Worcester Polytechnic Institute

10:40 AM Keynote

Extraction and Recovery of Rare-earth Elements and Critical Materials from Coal Waste Using Low Cost Processing Methods: Prasenjit Podder¹; *Michael Free*¹; Prashant Sarswat¹; ¹University of Utah

11:20 AM

Selective Sulfidation for Rare Earth Element Separation: *Caspar Stinn*¹; Antoine Allanoire¹; ¹Massachusetts Institute of Technology

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications – Functional Materials and 2D/3D Devices I

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | February 28, 2022
303C | Anaheim Convention Center

Session Chairs: Pooran Joshi, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Yong Kong, University of Utah

8:30 AM Invited

Bridging the Length-scale Gap: Synthesizing Three-dimensional Ceramic Microlattices by Aerosol Jet Nanoparticle Printing: Bin Yuan¹; *Chunshan Hu*¹; Rahul Panat¹; ¹Carnegie Mellon University

8:55 AM Invited

Direct 4D Printing of Stretchable Supercapacitors Using Hybrid Composite Materials: Yihao Zhou¹; Charles Parker²; Jeffrey Glass²; Pooran Joshi³; Amit Naskar³; *Changyong Cao*¹; ¹Michigan State University; ²Duke University; ³Oak Ridge National Laboratory

9:20 AM Invited

Flexible Electric Energy Storage for Low-power Devices: By Liya Napollion¹; *Kwang Kim*¹; ¹University of Nevada, Las Vegas

9:45 AM

3D Printing of Nanostructures Using Electrohydrodynamic Jet Printing for Surface Enhanced Raman Scattering (SERS) Based Optical Sensor: *Savan Suri*¹; Konstantinos Sierros¹; ¹West Virginia University

10:05 AM Break

10:20 AM

Computational Modeling of Transport Properties of Functional Conductive Inks Using Molecular Dynamic Simulation for Printed Electronics: *Patrick Dzisah*¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

ADVANCED MATERIALS

Refractory Metals — Tungsten, Molybdenum, and Niobium

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

Program Organizers: Eric Taleff, University of Texas at Austin; Lauren Garrison, Oak Ridge National Laboratory; Alexander Knowles, University of Birmingham

Monday AM | February 28, 2022
252B | Anaheim Convention Center

Session Chairs: Lauren Garrison, Oak Ridge National Laboratory; Gary Rozak, H.C. Starck Solutions

8:30 AM

Grain Boundary Doping as Effective Method to Improve Mechanical Properties in Ultra-fine Grained Tungsten: *Daniel Kiener*¹; Michael Wurmschuber¹; Simon Doppermann¹; Stefan Wurster²; Severin Jakob¹; Markus Alfreider¹; Klemens Schmuck¹; Rishi Bodlos³; Lorenz Romaner¹; Verena Maier-Kiener¹; Helmut Clemens¹; ¹University of Leoben; ²Erich Schmid Institute of Materials Science; ³Materials Center Leoben

8:50 AM

Realizing Sub-micron Tungsten and Tungsten Composite Microstructures via Deformable Punch Spark Plasma Sintering: *Nachiket Shah*¹; Nathan Madden¹; Sergei Zvenigorodsky²; Zachariah Koyn²; Jessica Krogstad¹; ¹University of Illinois at Urbana-Champaign; ²Energy Driven Technologies LLC

9:10 AM

NanoPhase Separation Sintering in Mo and Mo-W Based Systems: *Christian Oliver*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

9:30 AM

Nanostructured Tungsten Alloys for Nuclear Fusion: *Neal Parkes*¹; Alexander Knowles¹; Chris Hardie²; ¹University of Birmingham; ²UK Atomic Energy Authority

9:50 AM Break

10:05 AM

Tensile Properties of Molybdenum & ODS MoLa Sheet at Elevated Temperatures: *Alex Xie*¹; Jacqueline Foradora¹; Gary Rozak¹; Mike Stawovy¹; ¹H.C. Starck Solutions

10:25 AM

Bending Creep Deformation of ODS MoLa with 0.6 vs 1.1 wt.%La: *Brandon Kenny*¹; Gary Rozak²; Jacqueline Foradora²; Alex Xie³; ¹Miami University; ²H.C. Starck Solutions Euclid; ³H.C. Starck Solutions Taicang

10:45 AM

Flow Behavior and Associated Microstructures of Niobium at 1200 to 1500°C: *Emily Brady*¹; Eric Taleff²; ¹Exponent; ²University of Texas at Austin

ENERGY & ENVIRONMENT

REWAS 2022: Energy Technologies and CO₂ Management — Renewable Energy and Combustion Technologies

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

Program Organizers: Fiseha Tesfaye, Åbo Akademi University; Lei Zhang, University of Alaska Fairbanks; Donna Guillen, Idaho National Laboratory; Ziqi Sun, Queensland University of Technology; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Mingming Zhang, Wood Mackenzie; Dirk Verhulst, Consultant, Extractive Metallurgy and Energy Efficiency; Shafiq Alam, University of Saskatchewan; Mertol Göknelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway; Chukwunwike Illoeje, Argonne National Laboratory

Monday AM | February 28, 2022
212A | Anaheim Convention Center

Session Chair: Camille Fleuriault, Eramet Norway

8:30 AM Introductory Comments**8:35 AM**

Design of a Molten Salt Metal-air Battery with High-energy Density: *Mahya Shahabi*¹; Nicholas Masse¹; Hongyi Sun¹; Lucien Wallace¹; Adam Powell¹; Yu Zhong¹; ¹Worcester Polytechnic Institute

8:55 AM

Silicon-production from SiO₂-gas via Gas-phase Reactions: *Halvor Dalaker*¹; ¹Sintef

9:15 AM

Macroscopic Modeling and Phase Field Modeling of Solar Grade Silicon by Molten Salt Electrolysis: *Aditya Moudgal*¹; Mohammad Asadikiya¹; Douglas Moore¹; Gabriel Espinosa¹; Lucien Wallace¹; Alexander Wadsworth¹; Alexander Alonzo¹; Peter Catalino¹; Andrew Charlebois¹; Evan Costa¹; Tyler Melo¹; Adam Powell¹; Yu Zhong¹; Uday Pal²; ¹Worcester Polytechnic Institute; ²Boston University

9:35 AM

Design of Phase Change Material Composites for Efficient and Rapid Storage of Thermal Energy: *Patrick Shamberger*¹; Alison Hoe¹; Achutha Tamraparni¹; Chen Zhang¹; Alaa Elwany¹; Jonathan Felts¹; ¹Texas A&M University

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — Broader Impacts and Environmental Degradation I: Hydrogen Embrittlement

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Monday AM | February 28, 2022
207C | Anaheim Convention Center

Session Chairs: Kaila Bertsch, Lawrence Livermore National Laboratory; Kelly Nygren, Cornell University/CHESS; May Martin, National Institute of Standards and Technology; Shuai Wang, Southern University of Science and Technology; Bai Cui, University of Nebraska- Lincoln

8:30 AM Introductory Comments**8:40 AM Invited**

Hydrogen Embrittlement: From Experiments and Modeling to Prognosis: *Petros Sofronis*¹; Zahra Hosseini¹; Mohsen Dadfarnia²; Masanobu Kubota³; Akihide Nagao³; Brian Somerday⁴; Robert Ritchie⁴; ¹University of Illinois; ²Seattle University; ³Kyushu University; ⁴University of California, Berkeley

9:10 AM Invited

Multi-scale Characterization of the Effects of High Altitude Environments on Crack Tip Damage Evolution during Fatigue Loading of AA7075-T651: *James Burns*¹; Zach Harris¹; Adam Thompson¹; ¹University of Virginia

9:40 AM Invited

Factors Influencing Fatigue Crack Growth Properties of Steels in Hydrogen Gas Environment: *Hisao Matsunaga*¹; ¹Kyushu University

10:10 AM Break**10:25 AM Invited**

Effect of Hydrogen on Creep Properties: *Masanobu Kubota*¹; Daisuke Takazaki²; Ryosuke Komoda³; Kentrao Wada²; Toshihiro Tsuchiyama⁴; Mohsen Dadfarnia⁵; Brian Somerday⁶; Petros Sofronis⁷; ¹I2CNER, Kyushu University; ²Graduate School of Kyushu University; ³Fukuoka University & I2CNER, Kyushu University; ⁴Kyushu University; ⁵Seattle University & I2CNER, Kyushu University; ⁶University of Illinois at Urbana-Champaign, Somerday Consulting LLC & I2CNER, Kyushu University; ⁷University of Illinois at Urbana-Champaign & I2CNER, Kyushu University

10:55 AM Invited

Effects of Hydrogen on Deformation Evaluated with EBSD of Single Crystal Austenitic Stainless Steel: *Brian Kagay*¹; Coleman Allemen¹; Brandon Talamini¹; Chris San Marchi¹; ¹Sandia National Laboratories

11:25 AM Invited

The Central Role of the Chemical Potential of Hydrogen Regarding Hydrogen Ingress, Trapping, Defect Generation and Fracture: *Reiner Kirchheim*¹; ¹University of Goettingen

NANOSTRUCTURED MATERIALS

Self-organizing Nano-architected Materials — Pattern Formation and Synthesis

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Monday AM | February 28, 2022
260C | Anaheim Convention Center

Session Chairs: Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Jonah Erlebacher, Johns Hopkins University

8:30 AM Invited

Self-organizing Gradient Nanostructures via Chemical Heterogeneities: *Brad Boyce*¹; *Khalid Hattar*¹; *Remi Dingrevillie*¹; *Doug Medlin*¹; *Joseph Monti*¹; *Alejandro Barrios*¹; *James Nathaniel*¹; *Zachary Milne*¹; *David Adams*¹; ¹Sandia National Laboratories

9:00 AM Invited

Hierarchical Morphologies in Co-sputter Deposited Thin Films: *Amit Misra*¹; ¹University of Michigan

9:20 AM

Microporous Nanoparticle Emulsion Thermosets for Multi-material, Multifunctional Porous Nano-composites: *Yogin Patel*¹; *Michael Grzenda*¹; *Charm Nicholas*¹; *Molla Hasan*²; *Jonathan Singer*¹; ¹Rutgers-New Brunswick; ²Alfred University

9:40 AM Break

10:00 AM Invited

Nanoporous Nanoparticles: From Catalysis to 3D Printing: *Jonah Erlebacher*¹; *Alyssa Chuang*¹; *Pheobe Appel*¹; *Jodie Baris*¹; ¹Johns Hopkins University

10:30 AM Invited

Grain Boundary Formation through Particle Detachment during Coarsening of Nanoporous Metals: *Kate Elder*¹; *W. Beck Andrews*²; *Markus Ziehmer*³; *Alexander Chadwick*¹; *Erica Lilleodden*³; *Katsuyo Thornton*²; *Peter Voorhees*¹; ¹Northwestern University; ²University of Michigan; ³Helmholtz-Zentrum Geesthach

11:00 AM

Quasi-periodic Nanoarchitectures in Eutectic Thin Films: Lengthscales and Inherent Instabilities: *Eli Sullivan*¹; *Jonathan Skelton*¹; *James Fitz-Gerald*¹; *Jerrold Floro*¹; ¹University of Virginia

11:20 AM

Elucidating the Kinetics for Three-dimensional Bicontinuous Structures Formation in Molten Salt Dealloying via In Situ Synchrotron X-ray Nano-tomography: *Xiaoyang Liu*¹; *Arthur Ronne*¹; *Kaustubh Bawane*²; *Xiaoyin Zheng*¹; *Yang Liu*¹; *Lin-Chieh Yu*¹; *Mingyuan Ge*³; *Phillip Halstenberg*⁴; *Xianghui Xiao*³; *Shannon Mahurin*⁵; *Sheng Dai*⁶; *Wah-Keat Lee*³; *James Wishart*³; *Lingfeng He*²; *Yu-chen Chen-Wiegart*⁷; ¹Stony Brook University; ²Idaho National Laboratory; ³Brookhaven National Laboratory; ⁴University of Tennessee; ⁵Oak Ridge National Laboratory; ⁶University of Tennessee/ Oak Ridge National Laboratory; ⁷Stony Brook University/ Brookhaven National Laboratory

MECHANICS & STRUCTURAL RELIABILITY

Structural Metamaterials — Session I

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

Program Organizers: Amy Wat, Lawrence Livermore National Laboratory; Brad Boyce, Sandia National Laboratories; Xiaoyu Zheng, University of California, Los Angeles; Fabrizio Scarpa, University of Bristol; Robert Ritchie, University of California, Berkeley

Monday AM | February 28, 2022
304A | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM

Bioinspired Hierarchical Architected Structures Via Additive Manufacturing: *Ali Afrouzian*¹; *Amit Bandyopadhyay*¹; ¹Washington State University

8:50 AM

Phase Field Modeling of Crack Propagation, Deflection and Delamination in Engineered Interfaces: *Vinamra Agrawal*¹; *Brandon Runnels*²; ¹Auburn University; ²University of Colorado at Colorado Springs

9:10 AM

Seeing Beneath the Surface: Estimating Interior Material Properties with Visual Vibration Tomography: *Berthy Feng*¹; *Alexander Ogren*¹; *Chiara Daraio*¹; *Katherine Bouman*¹; ¹Caltech

9:30 AM Invited

Temperature and Stress-induced Recovery in Artificial Shape Memory Alloys: *Yunlan Zhang*¹; *Mirian Velay*¹; *David Restrepo*²; *Nilesh Mankame*³; *Pablo Zavattieri*¹; ¹Purdue University; ²University of Texas, San Antonio; ³General Motors Global Research & Development

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Fundamentals in Mechanical Behavior and Radiation Effects I

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Monday AM | February 28, 2022
262A | Anaheim Convention Center

Session Chairs: Ting Zhu, Georgia Institute of Technology.; Francesco Maresca, University of Groningen; Xialong Ma, Pacific Northwest National Laboratory

8:30 AM Invited

Non-equilibrium Evolution of Metastable Grain Boundaries in Nanocrystals at Extreme Conditions: *Zhitong Bai*¹; *Yue Fan*¹; ¹University of Michigan

9:00 AM Invited

Predicting the Transformation Strain that Controls Ductility and Toughness in Advanced Steels: *Francesco Maresca*¹; Efthymios Polatidis²; Miroslav Smid²; Helena Van Swygenhoven²; William Curtin³; ¹University of Groningen; ²PSI; ³EPFL

9:30 AM Invited

On the Role of Gradients on Strengthening, Ductility, and Size Effects: *Elias Aifantis*¹; ¹Emeritus, Aristotle University, Thessaloniki 54124, GR; Emeritus, Michigan Technological University, Houghton MI 49931, USA; Mercator Fellow, Friedrich – Alexander University, Erlangen – Nuremberg 90762, DE

10:00 AM Break

10:20 AM

Deformation Mechanism of Ultrafine-grained FeCrAl Alloy – An In Situ Micropillar Compression Strain Rate Jump Study: *Tianyi Sun*¹; Jaehun Cho¹; Zhongxia Shang¹; Tongjun Niu¹; Jie Ding¹; Dongyue Xie²; Jian Wang²; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University, School of Materials Engineering; ²University of Nebraska-Lincoln

MATERIALS PROCESSING

12th 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; Jesse White, Elkem Carbon Solutions; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, Jiangxi University of Science and Technology; Onuralp Yücel, Istanbul Technical University; Ender Keskinilic, Atılım University; Tao Jiang, Central South University; Morsi Mahmoud, King Fahd University of Petroleum & Minerals

Monday PM | February 28, 2022
213A | Anaheim Convention Center

Session Chair: Onuralp Yücel, Istanbul Technical University

2:00 PM Introductory Comments

2:05 PM

Recent Studies on Hot Metal Desulfurization: *Ender Keskinilic*¹; ¹Atılım University

2:25 PM

Evaporation of Antimony Trioxide from Antimony Slag by Nitrogen Injection in a Top Submerged Lance Smelting Set-up: *Hongbin Ling*¹; Annelies Malfliet¹; Bart Blanpain¹; Muxing Guo¹; ¹KU Leuven

2:45 PM

Large Eddy Simulation on Slag Entrainment in Slab Continuous Casting Mold under Different Casting Speeds: *Yanbin Yin*¹; Jiongming Zhang¹; ¹University of Science and Technology Beijing

ADVANCED MATERIALS

2D Materials – Preparation, Properties & Applications – Session II

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University

Monday PM | February 28, 2022
252C | Anaheim Convention Center

Session Chairs: Sufian Abedrabbo, Khalifa University; Gerald Ferblantier, Strasbourg University

2:00 PM Introductory Comments

2:10 PM

Chemisorption of Gadolinium Ions on 2D-g-C₃N₄ for an Efficient Piezo-photocatalytic Remediation of Kanamycin Sulfate: *Saikat Kuila*¹; Tarun Kundu¹; ¹Indian Institute of Technology Kharagpur

2:30 PM

Effect of Pore Alignment in the Mechanical Properties of 2D Material 3D Foam – Polymer Composites: *Kazuo Orihara*¹; Arvind Agarwal¹; ¹Florida International University

2:50 PM

Elastic Response and Strain Solitons Behavior of Molybdenum Ditelluride (MoTe₂) Based 2D Van der Waals Heterostructure: *Aditya Dey*¹; Shoaib Chowdhury¹; Hesam Askari¹; ¹University of Rochester

3:10 PM Invited

Dispersing Two-dimensional Ti₃C₂T_x MXene Nanosheets in Nonpolar Organic Solvents within Minutes: *Bin Yuan*¹; Chunshan Hu¹; Azahar Ali¹; Rahul Panat¹; ¹Carnegie Mellon University

3:40 PM Break

4:00 PM

High Fidelity Multi-physics Numerical Modelling of Ultrasonic Bubble Dynamics and Liquid Exfoliation of 2D Graphite: *Ling Qin*¹; Barbara Maciejewska²; Kyriakos Porfyrakis³; Iakovos Tzanakis⁴; Nicole Grobert²; Dmitry Eskin⁵; Jiawei Mi¹; ¹University of Hull; ²University of Oxford; ³University of Greenwich; ⁴Oxford Brookes University; ⁵Brunel University London

4:20 PM

Novel Approach to Produce Thick CNT Based Bucky Paper for Radar Absorption and EMI Shielding Applications: *Syed Sajid*¹; Rajakumar Devarapalli¹; Daniel Choi¹; Shaohong Luo¹; ¹Khalifa University

4:40 PM

Structural Phase Transition and Pseudoelastic Behavior in Strained Monolayer Molybdenum Ditelluride (MoTe₂): *Shoaib Ahmed Chowdhury*¹; Aditya Dey¹; Hesam Askari¹; ¹University of Rochester

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — High Strain Rates and Creep Testing

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

Program Organizers: Verena Maier-Kiener, Montanuniversität Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Monday PM | February 28, 2022
259A | Anaheim Convention Center

Session Chairs: Megan Cordill, Erich Schmid Institute of Materials Science; Yang-Tse Cheng, University of Kentucky

2:00 PM Invited

A Mathematical Framework for High Strain Rate Nanoindentation Testing: Sudharshan Phani Pardhasaradhi¹; Benjamin Hackett²; Christopher Walker²; Warren Oliver³; George Pharr²; ¹ARCI; ²Texas A&M University; ³KLA Corporation

2:25 PM

Nanoindentation at High Sustained Strain Rates: Recent Improvements and Challenges: Benoit Merle¹; ¹University Erlangen-Nuremberg (Fau)

2:45 PM Invited

New Instrumentation and Analysis Methodology for Nano-impact Testing: Mario Rueda¹; Ben Beake²; Jon Molina-Aldareguia¹; ¹Imdea Materials Institute; ²Micro Materials Ltd.

3:10 PM

Work-based Definition of the Strain Rate in indentation: Donald Stone¹; Z. Melgarejo¹; Abdelmageed Elmoustafa²; ¹University of Wisconsin; ²Old Dominion University

3:30 PM Break

3:45 PM Invited

Development of a New Method to Measure Surface Mechanical Properties Using In Situ SEM Microshear: Application at High Strain Rate: Gaylord Guillonnet¹; Guillaume Kermouche²; Sergio Sao Joao²; ¹Ecole Centrale de Lyon; ²Mines Saint-Etienne

4:10 PM

A New Long-term Indentation Relaxation Method to Measure Creep Properties at the Micro-scale with Application to Fused Silica, PMMA and Amorphous Selenium: Paul Baral¹; Gaylord Guillonnet²; Guillaume Kermouche³; Jean-Michel Bergheau²; Jean-Luc Loubet²; ¹Université Catholique de Louvain; ²Ecole Centrale de Lyon; ³Ecole Nationale des Mines de Saint Etienne

4:30 PM

Nanoindentation Creep Testing: Advantages and Limitations of the Constant Contact Pressure Method: Karsten Durst¹; Christian Minnert¹; ¹TU Darmstadt

4:50 PM

Simulations and Experiments of the Strain Rate Sensitivity Measurements Using Conical and Spherical Indentation Creep: Yousuf Mohammed¹; Donald Stone²; Abdelmageed Elmoustafa¹; ¹Old Dominion University; ²University of Wisconsin-Madison

ADDITIVE TECHNOLOGIES

Additive Manufacturing Keynote Session — Additive Manufacturing Keynote Session

Sponsored by:

Program Organizer: Allison Beese, Pennsylvania State University

Monday PM | February 28, 2022
257 | Anaheim Convention Center

2:00 PM Introductory Comments

2:05 PM Keynote

Metallic Alloy Microstructure Control under Additive Manufacturing Conditions: Amy Clarke¹; ¹Colorado School of Mines

2:35 PM Keynote

Designing High-temperature Aluminum Intermetallics for Additive Manufacturing: Michele Manuel¹; ¹University of Florida

3:05 PM Keynote

Advancing Process Control in Metal Additive Manufacturing: Manyalibo Matthews¹; ¹Lawrence Livermore National Laboratory

3:35 PM Break

3:55 PM Keynote

TMS Young Innovator in the Materials Science of Additive Manufacturing Award: The Critical Roles of Keyhole in Laser Powder Bed Fusion: Tao Sun¹; ¹University of Virginia

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Nuclear Fuels - Thermo-physical Property Modeling

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Monday PM | February 28, 2022
202B | Anaheim Convention Center

Session Chair: Peter Hosemann, University of California, Berkeley

2:00 PM Invited

Predicting Thermophysical Properties of Actinide Oxides Using Atomic Scale Simulation: Michael Rushton¹; Conor Galvin²; Michael Cooper³; ¹Bangor University; ²Imperial College London; ³Los Alamos National Laboratory

2:30 PM

An Integrated Approach for Coupling Experimental Data, Physics-based Models, and Machine Learning Algorithms for Predicting the Effective Thermal Conductivity of U-based Fuels: Fergany Badry¹; Monika Singh¹; Timothy Coffman¹; Mohammed Gomaa Abdoelatef¹; Sean McDevitt¹; Karim Ahmed¹; ¹Texas A&M University

2:50 PM

A Predictive Approach to Model Thermal Conductivity Degradation for In-pile UO₂: Joshua Ferrigno¹; Saqeeb Adnan¹; Marat Khafizov¹; ¹Ohio State University

3:10 PM

Thermal Conductivity Degradation by Solid Fission Products: Machine Learning Coupled with First Principles Model: *Elina Charatsidou¹; Kyle Johnson²; Marcus Hedberg³; Pär Olsson¹; Denise Adorno Lopes⁴; ¹KTH Royal Institute of Technology; ²Studsvik Nuclear AB; ³Chalmers University of Technology; ⁴Westinghouse Electric Sweden*

3:30 PM

A Monte-Carlo Solver for Coupled Electron-phonon Boltzmann Transport Equation in Metallic a-U: *Jie Peng¹; Anter El-Azab¹; W. Ryan Deskins¹; Linu Malakkal²; ¹Purdue University; ²Idaho National Laboratory*

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session II

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Monday PM | February 28, 2022
207A | Anaheim Convention Center

Session Chairs: Penghui Cao, University of California, Irvine; Aerial Murphy-Leonard, Ohio State University

2:00 PM Invited

Quantifying Damage Evolution during In-situ Loading of Additive Manufactured 316L Stainless Steel Using High Energy X-rays: *Aerial Murphy-Leonard¹; David Rowenhorst²; ¹Ohio State University; ²US Naval Research Laboratory*

2:30 PM

Line Profile Analysis from In Situ Synchrotron X-ray Diffraction to Study the Microstructural Evolution during Elasto-plastic Transition in Nickel with Bimodal Grain Structure: *Elis Sjogren¹; Wolfgang Pantleon²; Ulrich Lienert³; Zoltan Hegedüs³; Kei Ameyama⁴; Dmytro Orlov¹; ¹Lund University; ²Technical University of Denmark; ³Deutsches Elektronen-Synchrotron; ⁴Ritsumeikan University*

2:50 PM

Recent Advances and Applications of Lab-based Diffraction Contrast Tomography: *Jette Oddershede¹; Jun Sun¹; Florian Bachmann¹; Hrishikesh Bale²; Erik Lauridsen¹; ¹Xnovo Technology; ²Carl Zeiss X-ray Microscopy Inc.*

3:10 PM

Time Resolved Evolution of the 3D Nanoporous Structure of Sintered Ag by X-ray Nanotomography: Role of the Interface with a Copper Substrate: *Xavier Milhet¹; Kokouvi N'Tsouaglo¹; Jerome Colin¹; Loic Signor¹; Azdine Nait-Ali¹; Juan Creus²; Mikael Gueguen¹; Marc Legros³; ¹Prime Institute CNRS ENSMA; ²LaSIE Université La Rochelle; ³CEMES - CNRS - Toulouse*

3:30 PM Break

3:45 PM Invited

Fundamental Deformation Mechanisms in Metals with Gradient Structure and Multi-principal Element Alloys: *Penghui Cao¹; ¹University of California, Irvine*

4:15 PM

Cores of 1/2<110>-type Dislocations in the CrMnFeCoNi High-entropy Alloy Investigated by STEM, the Center of Symmetry and the Nye Tensor Mapping Techniques: *Milan Heczko¹; Veronika Mazánová¹; Roman Gröger²; Tomáš Zálezák²; Mohammad Hooshmand³; Easo George⁴; Michael Mills¹; Antonin Dlouhý²; ¹The Ohio State University; ²Institute of Physics of Materials CAS; ³University of California; ⁴Oak Ridge National Laboratory*

4:35 PM

Local Phase Transformation at Microtwins and Planar Defects in Creep Deformed Ni-Base Superalloys: *Ashton Egan¹; Fei Xue²; Longsheng Feng¹; Shakthipriya Baskar Kannan¹; Gregory Sparks³; Timothy Smith⁴; Emmanuelle Marquis²; Yunzhi Wang¹; Maryam Ghazisaeidi¹; Michael Mills¹; ¹Ohio State University; ²University of Michigan; ³Air Force Research Laboratory; ⁴NASA Glenn Research Center*

4:55 PM

Investigation of Dislocation Structures in an Al-Li Binary Alloy via High Resolution X-ray Characterization Techniques: *Sven Gustafson¹; Wolfgang Ludwig²; Katherine Shanks³; Carsten Detlefs⁴; Michael Sangid¹; ¹Purdue University; ²University Lyon I; ³Cornell High Energy Synchrotron Source; ⁴European Synchrotron Radiation Facility*

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Energy Conversion with SOCs

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Monday PM | February 28, 2022
212B | Anaheim Convention Center

Session Chairs: Soumendra Basu, Boston University; Xiao-Dong Zhou, University of Louisiana at Lafayette

2:00 PM Invited

High-performance Solid Oxide Cells for Cost Effective Hydrogen Production: *Xiao-Dong Zhou¹; Yudong Wang¹; Yanhua Sun¹; Nengneng Xu¹; Gordon Xia¹; ¹University of Louisiana at Lafayette*

2:25 PM Invited

Microstructural Stability of Reversible Solid Oxide Electrochemical Cells Subjected to Mode Switching: *Hector Grande¹; Jillian Rix¹; Michelle Sugimoto¹; John-In Lee¹; Ayesha Akter¹; Srikanth Gopalan¹; Uday Pal¹; Soumendra Basu¹; ¹Boston University*

2:50 PM

Quantifying Triple Phase Boundary Density in Nanocatalyst-infiltrated SOFC Anodes Using 3-D Reconstruction and Scanning Electron Microscopy: *Jillian Rix¹; Hector Grande¹; Uday Pal¹; Srikanth Gopalan¹; Soumendra Basu¹; ¹Boston University*

NANOSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — Advances in Thin Film Oxides I/Recent Advances in Nanoscale Materials

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Amit Pandey, Lockheed Martin Space; Saurabh Puri, Microstructure Engineering; Amber Srivastava, Indian Institute of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday PM | February 28, 2022
259B | Anaheim Convention Center

Session Chairs: Ritesh Sachan, Oklahoma State University; Saurabh Puri, Microstructure Engineering; David Bird, US Army

2:00 PM Invited

Hybrid Thin Film Interface for High Temperature Electronics Modules: *Ajit Roy*¹; Sergei Shenogin¹; John Ferguson¹; John Jones¹; Sabyasachi Ganguli¹; ¹Air Force Research Laboratory

2:30 PM Invited

Meta-stable Orthorhombic Phase of HfZrOx Thin Films for Ferroelectric Devices: *Jiyoung Kim*¹; ¹University of Texas at Dallas

3:00 PM Invited

Identification of NV Centers in Nanodiamond through STEM-EELS/EDS: *Bethany Hudak*¹; Rhonda Stroud¹; ¹Naval Research Laboratory

3:30 PM Break

3:50 PM

Correlating Properties of Irradiation Produced Nanoscale Superlattices with Irradiation Condition Parameters by Combining Rate Theory and Kinetic Monte Carlo Simulations: *Anton Schneider*¹; Yongfeng Zhang¹; Chao Jiang²; Jian Gan²; ¹University of Wisconsin Madison; ²Idaho National Laboratory

4:15 PM

Growth of Complex Oxide Thin Films with Nanoscale Porosity by Pulsed Laser Deposition: *Huiming Guo*¹; Xin Wang¹; Alexander Dupuy¹; Julie Schoenung¹; William Bowman¹; ¹Department of Materials Science and Engineering, University of California, Irvine

4:40 PM

Novel Bent-lattice Nanostructures in Crystallizing Amorphous Films Discovered by Transmission Electron Microscopy: *Vladimir Kolosov*¹; ¹Ural Federal University

BIOMATERIALS

Advances in Biomaterials for 3D Printing of Scaffolds and Tissues — Advances in Biomaterials for 3D Printing of Scaffolds and Tissues II

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

Program Organizers: Changxue Xu, Texas Tech University; Jun Yin, Zhejiang University; Zhengyi Zhang, Huazhong University of Science and Technology; Yifei Jin, University of Nevada Reno

Monday PM | February 28, 2022
201A | Anaheim Convention Center

Session Chairs: Heqi Xu, Texas Tech University; Jiachen Liu, Texas Tech University

2:00 PM

Development and 3D Printing of a Bioabsorbable Composite Material for Orthopaedic Applications: Cillian Thompson¹; Cristina Pascual-González²; Guillermo Domínguez¹; Monica Echeverry-Rendón¹; Carlos González²; *Javier Llorca*²; ¹IMDEA Materials Institute; ²IMDEA Materials Institute & Technical University of Madrid

2:20 PM

Femto-second Laser Lithography of Fluorescent 2D/3D Nanostructures: *Shobha Shukla*¹; ¹IIT Bombay

2:40 PM

Effects of Topographic Parameters on a Micropillar Surface on Cell Migration and Morphology: Srikumar Krishnamoorthy¹; *Jiachen Liu*¹; Heqi Xu¹; Zhengyi Zhang²; Changxue Xu¹; Md Shahriar¹; ¹Texas Tech University; ²Huazhong University of Science and Technology

3:00 PM

Synthesis and Characterization of Hydroxyapatite from Solid Mineral for Dental and Orthopedic Applications: Grace Oyatogun¹; Temitope Esan¹; *Victor Abere*¹; Chinenye Ibekwe¹; Kunle Oluwasegun¹; ¹Obafemi Awolowo University

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — Alloy Development and Application 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday PM | February 28, 2022
251A | Anaheim Convention Center

Session Chairs: Brian Cantor, University of Oxford; Joseph Poon, University of Virginia

2:00 PM Invited

CANCELLED: Do We Need a Refractory Alloy with Super-high Strength at Room Temperature?: Oleg Senkov¹; *Daniel Miracle*¹; ¹Air Force Research Laboratory

2:20 PM Invited

What Controls Corrosion and Passivation of Compositionally Complex Alloys?: *John Scully¹*; Samuel Inman¹; Junsoo Han²; Debashish Sur¹; Angela Gerard¹; ¹Department of Materials Science and Engineering- University of Virginia; ²Institut de Recherche Chimie Paris- Chimie ParisTech

2:40 PM Invited

A Periodic Table for HEA Design: *Scott Broderick¹*; Krishna Rajan¹; Debasis Sengupta²; Stephen Giles²; ¹University at Buffalo; ²CFD Research Corporation

3:00 PM Invited

Data-guided Exploration of High Entropy Alloys for Cryocooler Applications: *Indranil Roy¹*; Ankit Roy¹; Ganesh Balasubramanian¹; Louis Santodonato²; ¹Lehigh University; ²Santo Science

3:20 PM Break**3:40 PM**

Additive Manufacturing of High-entropy Alloys for High Strength and Lightweight Structures: *Jie Ren¹*; Wen Chen¹; ¹UMass Amherst

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday PM | February 28, 2022
251B | Anaheim Convention Center

Session Chairs: Diana Farkas, Virginia Polytechnic Institute; Francesco Maresca, University of Groningen

2:00 PM Invited

Simulations of Deformation and Fracture in Multi-principal Element Alloys: *Diana Farkas¹*; ¹Virginia Polytechnic Institute

2:20 PM Invited

Interactions between a Dislocation and a Twin Boundary/HCP Lamella and Their Temperature Dependence in Ni-based Equiatomic Alloys: *Haixuan Xu¹*; Sho¹; ¹University of Tennessee

2:40 PM Invited

Theory of Yield Strength in BCC High Entropy Alloys: *Francesco Maresca¹*; Chanhoo Lee²; Rui Feng²; Yi Chou³; Tamas Ungar⁴; Michael Widom⁵; Ke An⁶; Jonathan Poplawsky⁶; Yi-Chia Chou³; Peter Liaw²; William Curtin⁷; ¹University of Groningen; ²University of Tennessee; ³National Chiao Tung University; ⁴Eotvos University Budapest; ⁵Carnegie Mellon University; ⁶Oak Ridge National Laboratory; ⁷EPFL

3:00 PM

Atomistic Modeling of Diffusive High Temperature Plasticity in BCC Refractory-based MPEAs: *Joel Berry¹*; Kate Elder¹; Aurelien Perron¹; ¹Lawrence Livermore National Laboratory

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Advanced Ceramics and Processes and Ceramic-based Composites

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Monday PM | February 28, 2022
213C | Anaheim Convention Center

Session Chairs: Shefford Baker, Cornell University; Jinhong Li, China University of Geosciences (Beijing)

2:00 PM Introductory Comments**2:05 PM Invited**

Transformative Ceramic Science and Engineering Design to Address Societal Needs: *Julie Schoenung¹*; ¹University of California, Irvine

2:25 PM

Processing & Mechanical Properties of Additively Manufactured Ceramic Matrix Composites Using Preceramic Polymers: *Mark O'Masta¹*; Ekaterina Stonkevitch¹; Kayleigh Porter¹; Phuong Bui¹; Zak Eckel¹; Tobias Schaedler¹; ¹HRL Laboratories LLC

2:45 PM

Numerical Characteristics of Plasma Arc Welding in SiC-ZrB₂ Composite Ceramics: *Akash Meena¹*; Jecce Jarman¹; Arezoo Emdadi¹; Jeremy Watts¹; ¹Missouri Univ of Science and Tech

3:05 PM

The Effect of Particle Size on the Morphology of Polyester and Epoxy Based Auto-hybrid Composites: *Kator Jomboh¹*; Adele Garkida²; Vershima Alkali²; ¹University of Maiduguri, Borno State; ²Ahmadu Bello University, Zaria, Nigeria

3:25 PM Break**3:45 PM**

Catalytic Pyrolysis of Polyethylene and Polypropylene over Y Zeolite: *Xunrui Wang¹*; Jinhong Li¹; Chengdong Wang¹; Xiang Wang²; ¹China University of Geosciences, Beijing; ²Chinese Academy of Sciences, Beijing

4:05 PM

Effect of Boron Nitride on the Thermal Properties of Expanded Vermiculite-based Composite Phase Change Material: *Yong Deng¹*; Jinhong Li²; ¹Guizhou University; ²China University of Geosciences, Beijing

MATERIALS PROCESSING

Advances in Surface Engineering IV — Session II

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

Program Organizers: Arif Mubarak, PPG; Bharat Jasthi, South Dakota School of Mines & Technology; Tushar Borkar, Cleveland State University; Mary Lyn Lim, PPG Industries; Rajeev Gupta, North Carolina State University

Monday PM | February 28, 2022
210C | Anaheim Convention Center

Session Chair: Mohammad Umar Farooq Khan, Texas A&M University

2:00 PM

Effect of Test Temperature on Tribological Behavior of Laser Cladded Stellite 21 Coating on 350 Maraging Steel: *Sougata Roy¹; Niyanth Sridharan²; Ercan Cakmak²; Hamed Ghaednia³; Arup Gangopadhyay⁴; Jun Qu²; ¹University of North Dakota; ²Oak Ridge National Laboratory; ³Ghering Group; ⁴Ford Motor Company*

2:20 PM

Electrochemical Study of Stainless Steels in Diesel Exhaust Fluid (DEF) and Simulated Diesel Exhaust Acid Condensate Environments: *Anusha Chilukuri¹; Michael Warwick¹; Gaurav Argade¹; ¹Cummins Inc.*

2:40 PM

Evolution of Friction and Shear Deformation Induced Mixing of Graphene on Copper Substrate: *Mayur Pole¹; Shuang Li¹; Kate Whalen¹; Aditya Nittala¹; Jinhui Tao¹; Bharat Gwalani¹; Keerti Kappagantula¹; ¹Pacific Northwest National Laboratory*

3:00 PM

Corrosion-resistant Yet Sacrificial Metallic Coatings with an Ability to Release Inhibitor on Demand: *C.S. Witharamage¹; M. Alrizqi¹; A. Darwish¹; A. Nieto²; Rajeev Gupta¹; ¹North Carolina State University; ²Naval Postgraduate School*

3:20 PM Break

3:40 PM

Finite Element Simulation for the Electropolishing of Niobium: *Kaiwen Wang¹; Wenjun Cai¹; Hui Tian²; Charles Reece²; ¹Virginia Polytechnic Institute and State University; ²Thomas Jefferson National Accelerator Facility*

4:00 PM

Mapping the Nanomechanical Behavior of Refractory Alloy Nitride Coatings: *Andre Bohn¹; Yu-Hsuan Lin¹; Justin Cheng¹; David Poerschke¹; Nathan Mara¹; ¹University of Minnesota*

MATERIALS DESIGN

Advances in Titanium Technology — Invited Talks

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Monday PM | February 28, 2022
252A | Anaheim Convention Center

Session Chair: Yufeng Zheng, University of Nevada Reno

2:00 PM Invited

Developing New Metastable Beta-titanium Alloys and Optimizing Their Properties through Heat-treatments: *Brian Welk¹; Nevin Taylor¹; Mathew Cohen¹; Zachary Kloenne¹; Hamish Fraser¹; ¹Ohio State University*

2:20 PM Invited

Defect Engineering for Heterogeneous and Adaptive Microstructures: *Yunzhi Wang¹; ¹Ohio State University*

2:40 PM Invited

Tuning Elastic Properties of β -phase to Engineer High Strength-ductility β -Titanium Alloys: *Riyadh Salloom¹; Srinivas Aditya Mantri¹; Mohan Sai Kiran Nartu¹; Abhishek Sharma¹; Sriswaroop Dasari¹; Ravisankar Haridas¹; Srinivasan Srivilliputhur¹; Rajarshi Banerjee¹; ¹University of North Texas*

3:00 PM Invited

Enlarging the Palette of Mechanical Properties of Ti64 by a Quenching and Partitioning Approach: *Stephane Godet¹; Loic Malet¹; Frederic Prima²; Odeline Dumas¹; ¹Universite Libre De Bruxelles; ²Chimie ParisTech*

3:20 PM Invited

Microstructure Formation in Titanium Alloys: *Abigail Ackerman¹; Benjamin Savitzky²; Colin Ophus²; Mohsen Danaie³; Phani Karamched⁴; David Dye¹; ¹Imperial College, London; ²National Center for Electron Microscopy Lawrence Berkeley National Laboratory; ³Electron Physical Sciences Imaging Centre (ePSIC), Diamond Light Source; ⁴University of Oxford*

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Material Design I

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Monday PM | February 28, 2022
256A | Anaheim Convention Center

Session Chair: Anjana Talapatra, Los Alamos National Laboratory

2:00 PM Invited

Autonomous Research Systems: *Benji Maruyama¹; ¹US Air Force*

2:30 PM Invited

AI/ML/DL Approaches for Accelerating Materials Discovery and Design: *Ankit Agrawal*¹; ¹Northwestern University

3:00 PM

Ensemble of State-of-the-art Property Prediction Machine Learning Algorithms: *Sterling Baird*¹; Marianne Liu²; Kaai Kauwe¹; Taylor Sparks¹; ¹University of Utah; ²West High School

3:20 PM Break

3:40 PM

Band Gap Predictions of Novel Double Perovskite Oxides: *Anjana Talapatra*¹; Blas Uberuaga¹; Christopher Stanek¹; Ghanshyam Pilania¹; ¹Los Alamos National Laboratory

4:00 PM

Closed-loop Discovery of the Composition-structure-properties Relationships of Superconductors: *Christopher Stiles*¹; Nam Le¹; Ian McCue¹; Alexander New¹; Christine Piatko¹; Janna Domenico¹; Eddie Gienger¹; Kyle McElroy¹; Ivelisse Cabrera¹; Daniel Rose¹; Timothy Montalbano¹; Michael Pekala¹; Christine Chung¹; Tyrel McQueen²; Elizabeth Pogue²; Christopher Ratto¹; Andrew Lennon¹; ¹Johns Hopkins University Applied Physics Laboratory; ²Johns Hopkins University

4:20 PM

Topological Class Detection with Attention-based Neural Network: *Hasan Muhammad Sayeed*¹; Taylor D. Sparks¹; ¹University of Utah

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Nano and Micro Scale Algorithms and Their Applications

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendeleev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Monday PM | February 28, 2022
253A | Anaheim Convention Center

Session Chairs: Mohsen Asle Zaeem, Colorado School of Mines; Sam Reeve, Oak Ridge National Laboratory

2:00 PM

Combining Discrete and Continuous in Time Stochastic Simulations in a Solid-solid Phase Field Simulation: *Nicholas Julian*¹; Enrique Martinez Saez²; Jaime Marian¹; ¹University of California Los Angeles; ²Clemson University

2:20 PM

An Orientation-field Phase Field Model for Anisotropic Grain Growth: *Philip Staublin*¹; Peter Voorhees¹; James Warren²; Arnab Mukherjee¹; ¹Northwestern University; ²National Institute of Standards and Technology

2:40 PM

Digital Representation and Quantification of Discrete Dislocation Structures: *Andreas Robertson*¹; Surya Kalidindi¹; ¹Georgia Institute of Technology

3:00 PM

Line Free 3D Dislocation Dynamics in Finite Domains: *Aitor Cruzado*¹; Pilar Ariza²; Alan Needleman¹; Michael Ortiz³; Amine Benzerga¹; ¹Texas A&M University; ²University of Seville; ³California Institute of Technology

3:20 PM Break

3:40 PM

Statistics of the Lattice Distortion of Dislocated Crystals: *Joseph Anderson*¹; Anter El-Azab¹; ¹Purdue University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Alloy and MMC Development

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Monday PM | February 28, 2022
208B | Anaheim Convention Center

Session Chair: Dmitry Eskin, Brunel University

2:00 PM Introductory Comments

2:05 PM

Development of Advanced Aluminum Alloy for Structural Castings: *Randy Beals*¹; Xiaoping Niu¹; Zach Brown¹; ¹Magna International

2:30 PM

Interplay between Cooling Rate, Microstructure, and Mechanical Properties of an Al-Ce-Ni-Mn Alloy: *Jordan Kozakevich*¹; Joshua Stroh²; Victor Mallouhi¹; Dimitry Sediako¹; David Weiss²; ¹HPPM Laboratories, UBCO; ²Eck Industries

2:55 PM

Influence of Tungsten Nanoparticles on the Structure and Mechanical Behavior of AA5056 under Quasi-static Loading: *Nikolai Kakhidze*¹; Anastasia Akhmadieva¹; Anton Khrestalov¹; Ilya Zhukov¹; Alexander Vorozhtsov¹; ¹National Research Tomsk State University

3:20 PM Break

3:35 PM

On the Influence of Alloy Composition and Sn Micro-alloying on Mechanical Properties and Corrosion Resistance of EN-AW 6056: *Axel Marquardt*¹; Ines Zerbin¹; Peer Decker¹; Peter Baumgart²; Luisa Marzoli¹; Marcel Rosefort¹; ¹TRIMET Aluminium SE; ²IBPB Engineering Services

4:00 PM

Effect of Alloying Elements on Strength Properties and Casting Properties of Corrosion Resistant Quench-free Al-Ca Alloys: *Dmitry Fokin*¹; Sergey Matveev¹; Roman Vakhromov¹; Aleksandr Alabin²; ¹Light Materials and Technologies Institute UC RUSAL; ²JSC RUSAL Management

4:25 PM

Effect of Bi Alloying Element Addition on Microstructural Change in Al-Mg-Si Alloys: *Zeynep Tutku Özen*¹; Osman Halil Çelik¹; Mehmet Bugra Guner¹; Ilyas Artunç Sari¹; Abdullah Kinaci¹; ¹Asas Aluminium

4:50 PM

Effect of TiC Nanoparticles on Solidification Processing and Properties of Al-1.4Mg-0.8Si Alloy: *Shuaihang Pan*¹; Yitian Chi¹; Jie Yuan¹; *Tianqi Zheng*¹; Xiaochun Li¹; ¹University of California-Los Angeles

LIGHT METALS

Aluminum Reduction Technology — Cell Technology and Operations

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

Program Organizers: Kristian Etienne Einarsrud, Norwegian University of Science and Technology; Stephan Broek, Boston Metal; Mertol Göknelma, Izmir Institute of Technology; Dmitry Eskin, Brunel University

Monday PM | February 28, 2022
211A | Anaheim Convention Center

Session Chair: Andre Felipe Schneider, Hatch

2:00 PM Introductory Comments

2:05 PM

Restart of Copper-insert Pots in EGA's High Amperage Potlines: *Ali Jassim*¹; Pradeep Kalidindi²; Shaikha Al Shehhi³; Najeeba Al Jabri¹; Abdallah Rahbar¹; Nadia Ahli¹; ¹EGA

2:30 PM

Strategic Training and Development of Smelter Teams to Improve Business Outcomes: *David Emerson*¹; Leo Ruffo¹; Barry Sadler¹; Dave Umbaugh¹; ¹SCCR Training & Development

2:55 PM

Concentration Distribution of Carbon Particles in Aluminium Electrolysis Cells: *Matthias Dechent*¹; ¹Trimet Aluminium SE

3:20 PM Break

3:35 PM

Stabilizing a Low-dimensional Model of Magnetohydrodynamic Instabilities in Aluminum Electrolysis Cells: *Ibrahim Mohammad*¹; Douglas Kelley¹; ¹University of Rochester

4:00 PM

An Attempt to Estimate the Sulfuric Acid Dewpoint in the Flue Gas from Aluminium Electrolysis Cells: *Asbjorn Solheim*¹; ¹SINTEF Industry

BIOMATERIALS

Biological Materials Science — Biological Materials Science II

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Monday PM | February 28, 2022
201B | Anaheim Convention Center

Session Chairs: David Restrepo, The University of Texas at San Antonio; Alexander Ossa, Universidad EAFIT

2:00 PM Invited

Biological Blueprints Towards Next Generation Multifunctional Materials: *David Kisailus*¹; ¹University of California-Irvine

2:35 PM

Diatom Frustules: Universal Building Blocks for Novel Multifunctional Materials: *Hannes Schniepp*¹; Aaron Stapel¹; ¹William & Mary

2:55 PM

Deep Learning and Finite Element Method towards the Application of Microfracture Analysis for Prevention of Fatigue Fractures in Bones: *Gerardo Presbitero*¹; Marco Hernandez²; Inés Hernández-Ferruzca³; José Quiroga-Arias⁴; Bibiana González-Pérez³; Carlos Mora-Núñez³; Eduardo Macías-Ávila¹; Álvaro Gómez-Ovalle¹; Christian Mendoza-Buenrostro⁵; ¹Industrial Engineering and Development Center (CIDESI); ²Autonomous University of Nuevo León; ³Technological University of Querétaro; ⁴Aeronautical University in Querétaro; ⁵Tecnológico de Monterrey, ITESM, Centro de Innovación en Diseño y Tecnología (CIDyT)

3:15 PM Invited

On the Mechanics of the Tooth-stylus-radula Systems of Chitons: A Soft Conveying-belt for Efficient Force Transduction: John Connolly¹; Phani Saketh Dasika¹; Wen Yang²; Devis Montroni²; Robin James²; David Kisailus²; *Pablo Zavattieri*¹; ¹Purdue University; ²University of California, Irvine

3:50 PM Break

4:05 PM

Nature's Soft Robot: The Chiton Radula: Wen Yang¹; John Connelly²; Devis Montroni²; Robin James¹; Taifeng Wang¹; Li Xing¹; Pablo Zavattieri²; David Kisailus¹; *Jung-Eun Lee*¹; ¹University of California-Irvine; ²Purdue University

4:25 PM

Bioinspired Materials from Extrinsically-controlled Fabrication Techniques: *Steven Naleway*¹; Debora Lyn Porter¹; Josh Fernquist¹; Tony Yin¹; Josh Alexander¹; Max Mroz¹; ¹University of Utah

4:45 PM

Interwoven Lattices Inspired by the Venus Flower Basket: *Yash Mistry*¹; Swapnil Morankar²; Nikhilesh Chawla²; Clint Penick³; Dhruv Bhate¹; ¹Arizona State University; ²Purdue University; ³Kennesaw State University

ADVANCED MATERIALS

Bulk Metallic Glasses XIX — Homogeneous and Inhomogeneous Deformation & Mechanical and Physical Properties I

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Monday PM | February 28, 2022
253C | Anaheim Convention Center

Session Chair: Peter Derlet, Paul Scherrer Institute

2:00 PM Invited

Unveiling the Local Atomic Arrangements and Short-circuit Diffusion in Shear Bands: *Reda Chellali*¹; Sree Nandam¹; Horst Hahn¹; ¹Karlsruhe Institute of Technology (KIT)

2:25 PM

Small-scale Deformation Behavior of Metallic Glasses and Their Composites: *Nandita Ghodki*¹; Shristy Jha¹; Saideep Muskeri¹; Sundeeep Mukherjee¹; ¹University of North Texas

2:45 PM

Strength, Ductility and Elasticity of Metallic Glass Nanoparticles and Bulk Nano-glasses: *Wendy Gu*¹; Melody Wang¹; Mehrdad Kiani¹; Abhinav Parakh¹; Anabelle Colmenares¹; ¹Stanford University

3:05 PM

On the True Stress-strain Curve of Metallic Glasses: *Amlan Das*¹; Catherine Ott¹; Dinesh Pechimuthu²; Robabeh Moosavi²; Anja Waske²; Mihai Stoica³; Robert Maass²; ¹University Of Illinois Urbana Champaign; ²Federal Institute of Materials Research and Testing; ³ETH Zurich

3:25 PM Break

3:40 PM

A Cavity-based Micromechanical Model for the Shear Band Failure in Metallic Glasses under Arbitrary Stress State: *Yanfei Gao*¹; ¹University of Tennessee-Knoxville

4:00 PM

Measuring Metallic Glass Viscosities over Wide Composition Ranges: *Sebastian Kube*¹; Sungwoo Sohn¹; Theo Evers¹; Will Polsky¹; Rodrigo Ojeda-Mota¹; Kevin Ryan¹; Sean Rinehart¹; Yong Sun¹; Jan Schroers¹; ¹Yale University

4:20 PM

Shear Fracture in Bulk Metallic Glass Composites: Devashish Rajpoot¹; R.L. Narayan¹; Long Zhang²; Parag Tandaiya¹; Ramamurty Upadrasta³; *Punit Kumar*⁴; ¹IIT-Bombay; ²Institute for Metals Research, CAS; ³Nanyang Technological University; ⁴LBNL

4:40 PM Discussion on deformation of metallic glasses

LIGHT METALS

Cast Shop Technology — Analysis / Special Wagstaff

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

Program Organizers: Stephen Instone, Speira GmbH; Mertol Göknelma, Izmir Institute of Technology; Samuel Wagstaff, Oculatus; Dmitry Eskin, Brunel University

Monday PM | February 28, 2022
209A | Anaheim Convention Center

Session Chair: Sam Wagstaff, Oculatus Consulting

2:00 PM Introductory Comments

2:05 PM

Microalloying to Inhibit Oxidation of Al-Mg Alloys: *Nicholas Smith*¹; Martin Syvertsen¹; Anne Kvithyld¹; ¹SINTEF

2:30 PM

Heat Treatment of Mg-containing Aluminum Alloys 5182 and 6016 in an Oxidizing Atmosphere with 4 % CO₂: *Cathrine Solem*¹; Per Erik Vullum²; Gabriella Tranell¹; Ragnhild Aune¹; ¹Norwegian University of Science and Technology; ²SINTEF Industry

2:55 PM

Quality Defects Metallurgical Root Cause Analysis for Aluminium Thin Foil Production: *Feyza Denizli*¹; Yusuf Özçetin¹; Ali Ulus¹; Canan Inel¹; ¹Asas Alumuninum

3:20 PM Break

3:35 PM

The Origins of Wagstaff Inc. Part 1- Two Emerging Technologies Collide: Frank Wagstaff¹; *Robert Wagstaff*²; Samuel Wagstaff²; ¹Retired; ²Oculatus

4:00 PM

The Origins of Wagstaff Inc. Part 2- Aggressive R&D: Frank Wagstaff¹; *Robert Wagstaff*²; Samuel Wagstaff²; ¹Retired; ²Oculatus

4:25 PM Panel Discussion

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Advanced Microstructural Characterization Methods

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Monday PM | February 28, 2022
207B | Anaheim Convention Center

Session Chairs: John Carpenter, Los Alamos National Laboratory; Bowen Li, Michigan Technological University

2:00 PM Introductory Comments

2:05 PM

Challenges Concerning the Characterization of Cementite in Low Carbon Steel Using Electron Backscatter Diffraction: *Mary O'Brien*¹; Kip Findley²; Samantha Lawrence¹; ¹Los Alamos National Laboratory; ²Colorado School of Mines

2:25 PM

Characterizing Microstructures of Additively Manufactured Nickel and Cobalt Based Superalloys via TriBeam Tomography: *James Lamb*¹; McLean Echlin¹; Tresa Pollock¹; ¹University of California Santa Barbara

2:45 PM

Interpreting X-ray Absorption and Diffraction Contrast for Massive Non-destructive 3D Crystallographic Mapping of Metals in Laboratory CT: *Andy Holwell*¹; Maadhav Kothari¹; Hrishikesh Bale¹; Jun Sun²; Jette Oddershede²; ¹Carl Zeiss Microscopy LLC; ²Xnovo Technology ApS

3:05 PM

Single Crystal Cast Microstructures Characterized by the RVB-EBSD Method: *Pascal Thome*¹; Felicitas Scholz¹; Jan Frenzel¹; Gunther Eggeler¹; ¹Ruhr University Bochum

3:25 PM Break

3:45 PM

A Multiscale, Multimodal Approach to Studying Static Recrystallization in Mg-3Zn-0.1Ca with In-situ nf-HEDM, ff-HEDM, and DFXM: *Ashley Bucsek*¹; Sangwon Lee¹; Reza Roumina¹; Tracy Berman¹; Can Yildirim²; Carsten Detlefs²; John Allison¹; ¹University of Michigan; ²European Synchrotron Radiation Facility

4:05 PM

Three-dimensional Atomic Mapping of Ligands on Nanoparticles by Atom Probe Tomography: *Kyuseon Jang*¹; Seho Kim²; Hosun Jun¹; Chanwon Jung¹; Jiwon Yu³; Sangheon Lee³; Pyuck-pa Choi¹; ¹Korea Advanced Institute of Science and Technology (KAIST); ²Max-Planck-Institut für Eisenforschung GmbH; ³Ewha Womans University

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — High Entropy Alloys/Alloying

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoula, Oak Ridge National Laboratory; Damien Turret, IMDEA Materials Institute; James Morris, Ames Laboratory

Monday PM | February 28, 2022
255C | Anaheim Convention Center

Session Chairs: Maryam Ghazisaeidi, Ohio State University; James Morris, Ames Lab

2:00 PM Invited

Using Ab Initio Thermodynamic Modeling to Understand Phase Stability in High Entropy Alloys and How Order-disorder Transition Affects the Performance of Photovoltaic Materials: *Geoffroy Hautier*¹; ¹Dartmouth

2:30 PM

Refractory-HEAs: From CALPHAD to Alloy Optimization: *Aurelien Perron*¹; Joel Berry¹; Brandon Bocklund¹; Richard Otis²; Alexander Landa¹; Charles Tong¹; Amit Samanta¹; Hunter Henderson¹; Zachary Sims¹; Thomas Voisin¹; Vincenzo Lordi¹; Scott McCall¹; Joseph McKeown¹; ¹Lawrence Livermore National Laboratory; ²Jet Propulsion Laboratory, California Institute of Technology

2:50 PM Invited

Utilizing Nanoprecipitates to Modulate Phase Transformation, Strength, and Ductility of HEAs: *Ying Yang*¹; Eva Zarkadoula¹; Easo George¹; ¹Oak Ridge National Laboratory

3:20 PM

Predicting Phase Behavior in High Entropy and Chemically Complex Alloys: *James Morris*¹; Louis Santodonato²; Andreas Kulovits³; German Samolyuk⁴; ¹Ames Laboratory; ²Santo Science; ³Arconic Inc.; ⁴Oak Ridge National Laboratory

3:40 PM Break

4:00 PM

Strain and Chemical Interactions in the Early Stages of Precipitation of Multi-component Mg Alloys: *Du Cheng*¹; Kang Wang¹; Bi-Cheng Zhou¹; ¹University of Virginia

MATERIALS PROCESSING

Defects and Properties of Cast Metals IV — 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; Andrew Kao, University of Greenwich; Kyle Fezi, Fort Wayne Metals

Monday PM | February 28, 2022
210B | Anaheim Convention Center

Session Chairs: Kyle Fezi, Fort Wayne Metals ; Paul King, Ampere Scientific

2:00 PM Invited

Elucidating the Relationship between Arc Behavior and Solidification Defects during Vacuum Arc Remelting of Superalloys: *Daniel McCulley*¹; Joshua Motley¹; Matthew Cibula¹; Paul King¹; ¹Ampere Scientific

2:25 PM

Controlling Freckle Defect Formation Using Magnetic Fields: *Andrew Kao*¹; Natalia Shevchenko²; Xianqiang Fan³; Catherine Tonry¹; Peter Lee³; Sven Eckert²; Koulis Pericleous¹; ¹University Of Greenwich; ²Helmholtz-Zentrum Dresden-Rossendorf; ³UCL

2:45 PM

Improving Material Properties Using Contactless Ultrasonic Cavitation: *Catherine Tonry*¹; Agnieszka Dybalska²; Valdis Bojarevics¹; Georgi Djambazov¹; William Griffiths²; Koulis Pericleous¹; ¹University Of Greenwich; ²University of Birmingham

3:05 PM

Formation Mechanisms of Surface Blistering in AA6xxx Rolled Products: Microstructure Characterization, Ultrasonic Analysis, and Rolling Tests: *Pascal Gauthier*¹; Mousa Javidani²; Tao Wang¹; John Evans³; ¹Rio Tinto; ²Université du Québec à Chicoutimi; ³Constellium

3:25 PM Break

3:45 PM

3D Characterization of Competitive Dendrite Growth and On the Role of Low Angle Grain Boundaries during Solidification of Single Crystal Ni-based Superalloys: *Felicitas Scholz*¹; Pascal Thome¹; Jan Frenzel¹; Gunther Eggeler¹; ¹Ruhr-University Bochum

4:05 PM

Evolution of Microstructure and Mechanical Properties of the As-cast 1030B Al Sheet during Ultrasound-assisted Continuous Casting: *Ripeng Jiang*¹; Wenhao Zhao¹; *Li Zhang*²; Xiaoqian Li¹; Shaokang Guan²; ¹Central South University; ²Zhengzhou University

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — Effects of Component Manufacture on Microstructure & Properties

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Monday PM | February 28, 2022
304B | Anaheim Convention Center

Session Chairs: Andrew Wessman, University of Arizona; Jeremy Rame, Safran Aircraft Engines

2:00 PM Invited

Welding and Weldability of Ni- and Ni-Fe-based Superalloys: *Joel Andersson*¹; ¹University West

2:30 PM

Creep Behavior and Durability of Laser Metal Deposited Waspaloy: *Romain Bordas*¹; Roland Fortunier²; Patrick Villechaise¹; Jonathan Cormier¹; Azdine Nait-Ali²; Sébastien Rix³; Lucie Rat³; ¹ENSMA - Institut Pprime - UPR CNRS 3346; ²LTDS, école centrale Lyon, on secondment to ENSMA; ³Safran Aircraft Engines

2:50 PM

Defect Control and Mechanical Properties of Laser Powder Bed Fusion Built Haynes 230 for High Temperature Application
: *Ziheng Wu*¹; Junwon Seo¹; Nicholas Lamprinakos¹; Srujana Rao Yarasi¹; Anthony Rollett¹; ¹Carnegie Mellon University

3:10 PM

Rejuvenation Treatment for Ni-based Single Crystal Superalloys with Process Induced Pre-deformation: *Satoshi Utada*¹; Jeremy Rame²; Patrick Villechaise³; Jonathan Cormier³; ¹Department of Materials, University of Oxford; ²Safran Aircraft Engines; ³ENSMA - Institut Pprime - UPR CNRS 3346

3:30 PM Break**3:50 PM**

Improving the Creep Properties of High-strength Superalloys Produced by Laser Powder Bed Fusion: *Marcus Lam*¹; ¹Monash University

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Strength and Spall I

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Monday PM | February 28, 2022
304D | Anaheim Convention Center

Session Chairs: Neil Bourne, The University of Manchester; Bruce Remington, Lawrence Livermore National Laboratory

2:00 PM

In-Situ X-ray Diffraction Shock Experiments on Titanium Diboride: *Cyril Williams*¹; ¹US Army Research Laboratory

2:20 PM

Shock Response of Single-crystal Boron Carbide along Orientations with Extreme Elastic Moduli: MD Simulations and Experimental Comparison: *Ghatu Subhash*¹; Amith Cheenady¹; ¹University of Florida

2:40 PM

Dynamic Compressive Response of Highly-oriented MAX Phases under Planar Confinement: *Xingyuan Zhao*¹; Tarek Elmelegy²; Maxim Sokol³; Michel Barsoum²; Leslie Lamberson¹; ¹Colorado School of Mines; ²Drexel University; ³Tel Aviv University

3:00 PM

Structure / Property (Constitutive and Dynamic Strength / Damage) Characterization of Single-phase FeAl: *George Gray*¹; Saryu Fensin¹; David Jones¹; H Wang²; Kenneth Vecchio²; ¹Los Alamos National Laboratory; ²University of California, San Diego

3:20 PM Break**3:40 PM**

Dynamic Compression Behavior of Composite Media with Varying "Microstructural" Conditions: *Mukul Kumar*¹; ¹Lawrence Livermore National Laboratory

4:00 PM

Investigating Spall Failure in Shock Compressed Iron: *Gaia Righi*¹; Carlos Ruestes²; Camelia Stan³; Suzanne Ali³; Robert Rudd³; Hye-Sook Park³; Marc Meyers¹; ¹University Of California San Diego; ²Universidad Nacional de Cuyo; ³Lawrence Livermore National Lab

4:20 PM

Path Dependence in Spall Fracture: *David Jones*¹; Daniel Martinez¹; Ramon Martinez¹; Saryu Fensin¹; Neil Bourne²; George Gray¹; ¹Lanl; ²University of Manchester

LIGHT METALS

Electrode Technology for Aluminum Production — Session I

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

Program Organizers: Stephan Broek, Boston Metal; Dmitry Eskin, Brunel University

Monday PM | February 28, 2022
208A | Anaheim Convention Center

Session Chairs: Derek Santangelo, Hatch; Stephan Broek, Boston Metal

2:00 PM Introductory Comments

2:05 PM

Driving Continuous Improvement in a Modern GPC/CPC Testing Laboratory: Heather Riche¹; Leona Fletcher¹; Maia Hunt¹; Les Edwards¹; ¹Rain Carbon Inc.

2:30 PM

Machine Vision Sensor Based on Image Texture Analysis Applied to Industrial Anode Paste: Julien Lauzon-Gauthier¹; Carl Duchesne²; Jayson Tessier¹; ¹Alcoa Corporation; ²Laval University

2:55 PM

Optical and Electrochemical Characterisation of Carbon Anodes with Varying Porosity and Coke Quality: Goril Jahrsengene¹; Mahyar Farahani²; Hogne Linga³; Ann Mari Svensson²; ¹SINTEF Industry; ²NTNU Norwegian University of Science and Technology; ³Hydro Aluminium AS

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Part II: Low Temperature/Aqueous Corrosion, Stress Corrosion Cracking, Pitting, Metal Dissolution

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Additive Manufacturing Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Elizabeth Trillo, Southwest Research Institute; Andrew Hoffman, GE Research; Brendy Rincon Troconis, University of Texas at San Antonio

Monday PM | February 28, 2022
201C | Anaheim Convention Center

Session Chairs: Elizabeth Trillo, SWRI; Xiaoyuan Lou, Auburn University

2:00 PM Invited

AM Stainless Steel 316L in Corrosive Environment: Features Controlling Pitting and Metal Dissolution: Thomas Voisin¹; Rongpei Shi¹; Shohini Sen-Britain¹; Zhen Qi¹; Yuliang Zhang¹; Seongkoo Cho¹; Yakun Zhu¹; Josh Kacher²; Ibo Matthews¹; Y. Morris Wang³; Roger Qiu¹; Brandon Wood¹; ¹Lawrence Livermore National Laboratory; ²Georgia Institute of Technology; ³University of California Los Angeles

2:30 PM

Environmental Susceptibility of EBM Ti-6Al-4V as a Function of Print Direction in Seawater: Matthew McMahon¹; Nicholas Pizzolato¹; Fatou Cisse¹; Eric Dau¹; William Golumbskie¹; ¹Naval Surface Warfare Center, Carderock Division

2:50 PM

Tribo-corrosion Degradation of Additively Manufactured Multi-principal Element Alloy: Jibril Shittu¹; Maryam Sadeghilaridjani²; Mayur Pole³; Sundeep Mukherjee³; ¹LLNL; ²Arizona State University; ³University of North Texas

3:10 PM

Microstructure and Corrosion Behavior of 309L Stainless Steel Clad onto Carbon Steel Using Wire-fed Directed Energy Deposition: Scott Bozeman¹; O. Isgor¹; Julie Tucker¹; ¹Oregon State University

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Monday PM | February 28, 2022
201D | Anaheim Convention Center

Session Chairs: Peter Andresen, Andresen Consulting; Yong Yang, University of Florida

2:00 PM Invited

Stress Corrosion Cracking Guidelines Challenges: Peter Andresen¹; ¹Andresen Consulting

2:35 PM

Peening Technologies to Mitigate Initiation and Resurgence of Stress Corrosion Cracking in Dry Cask Storage Stainless Steel Canisters: John Lacy¹; Hwasung Yeom¹; Stan Bovid²; Micheal Kattoura²; Andrew Tieu³; Willie Bloom³; Jonathan Tatman⁴; Kenneth Ross⁵; Kumar Sridharan¹; ¹University of Wisconsin-Madison; ²LSP Technologies; ³VLN Advanced Technologies; ⁴Electric Power Research Institute; ⁵Pacific Northwest National Laboratory

2:55 PM

An Investigation of Stress Corrosion Cracking Performance for Naturally Aged 5xxx Alloys: William Golumbskie¹; Matthew McMahon¹; Emily Holcombe¹; Mitra Taheri²; ¹Naval Surface Warfare Center-Carderock Division; ²Johns Hopkins University

3:15 PM

Effect of Water on Localized Corrosion and Stress Corrosion Cracking of Stainless Steels in Chloride Environments: Narasi Sridhar¹; Liu Cao²; Angeire Huggins Gonzalez²; Ramgopal Thodla²; ¹MC Consult LLC; ²DNV

LIGHT METALS

Failure, and a Career That is Anything But: An LMD Symposium Honoring J. Wayne Jones — Keynote Session

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

Program Organizers: Victoria Miller, University of Florida; Michael Caton, US Air Force Research Laboratory; Nikhilesh Chawla, Purdue University; Trevor Harding, California Polytechnic State University; Paul Krajewski, General Motors Corporation; Tresa Pollock, University of California, Santa Barbara

Monday PM | February 28, 2022
209B | Anaheim Convention Center

Session Chair: Victoria Miller, University of Florida

2:00 PM Introductory Comments

2:10 PM Keynote

Reducing Uncertainty: Reflections on Establishing Life Limits: *James Larsen*¹; *Sushant Jha*²; *Reji John*¹; *Andrew Rosenberger*¹; *Dennis Buchanan*²; *John Porter, III*²; *Adam Pilchak*³; *Patrick Golden*¹; ¹Air Force Research Laboratory; ²University of Dayton Research Institute; ³Materials Resources, LLC

2:55 PM Keynote

Strain Localization and Very High Cycle Fatigue: *Jean-Charles Stinville*¹; *Alice Cervellon*¹; *Tresa Pollock*¹; ¹University of California, Santa Barbara

3:40 PM Break

4:00 PM Keynote

Accelerating Understanding of Fatigue of Metals: *John Allison*¹; ¹University of Michigan

4:45 PM Keynote

Automotive Unobtainium: Material Challenges for the Future of Transportation: *Paul Krajewski*¹; *Nancy Johnson*¹; *Xingyi Yang*¹; *Selina Zhao*¹; *Janet Robincheck*¹; *Whitney Poling*¹; *Kai-Han Chang*¹; *Andrea Corrión*²; ¹General Motors Corporation; ²HRL Laboratories, LLC.

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Advanced Experimental Characterization of Microstructurally Driven Fatigue Behavior

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Jean-Charles Stinville, University of Illinois Urbana-Champaign; Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Orion Kafka, NIST

Monday PM | February 28, 2022
254B | Anaheim Convention Center

Session Chair: Garrett Pataky, Clemson University

2:00 PM Invited

Coupled Characterization Approaches for Fatigue Assessment of High-strength Steel and Light Metal Alloy Structures: *Alexander Koch*¹; *Nikolas Baak*¹; *Jochen Tenkamp*¹; *Anke Schmiedt-Kalenborn*¹; *Frank Walther*¹; ¹TU Dortmund University

2:30 PM

Slip Localization, Fatigue Strength and Microstructural Effects in Polycrystalline Alloys: *Jean-Charles Stinville*¹; *T.M. Pollock*²; ¹University of Illinois Urbana-Champaign; ²University of California-Santa Barbara

2:50 PM Invited

Direct Observations and Characterization of Crack Closure during Microstructurally Small Fatigue Crack Growth via In Situ High-energy X-ray Characterization: *Michael Sangid*¹; *Priya Ravi*¹; *Diwakar Naragani*¹; *Peter Kenesei*²; *Jun-Sang Park*²; ¹Purdue University; ²Argonne National Laboratory

3:20 PM Break

3:40 PM Invited

Tracking Crystal-scale Cyclic Plasticity in Inconel 718 Using In Situ Loading and High Energy X-rays: *Dalton Shadle*¹; *Kelly Nygren*²; *Matthew Miller*¹; ¹Cornell University; ²Cornell High Energy Synchrotron Source

4:10 PM

Grain Reorientation and Stress-state Evolution during Cyclic Loading of an \945-Ti Alloy below the Elastic Limit: *Rachel Lim*¹; *Darren Pagan*¹; *Joel Bernier*²; *Paul Shade*³; *Anthony Rollett*⁴; ¹Pennsylvania State University; ²Lawrence Livermore National Laboratory; ³Air Force Research Laboratory; ⁴Carnegie Mellon University

4:30 PM

In-situ Diffraction Studies of the Fatigue-crack-growth Behavior in a TRIP-assisted Advanced High Strength Steel: *Di Xie*¹; *Yi Yang*¹; *Lu Huang*²; *Yang Ren*³; *Yanfei Gao*¹; ¹University of Tennessee Knoxville; ²United States Steel Corporation; ³Argonne National Laboratory

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Nanocarbon-based Flexible Devices: Emerging Materials and Processes — Session II: From 1D Nanostructures to Soft Materials

Program Organizer: Mostafa Bedewy, University of Pittsburgh

Monday PM | February 28, 2022
260A | Anaheim Convention Center

2:00 PM Introductory Comments

2:05 PM Keynote

Self-assembly and Synthesis of Semiconducting Carbon Nanotubes and Graphene Nanoribbons for Electronics: *Michael Arnold¹*; ¹University of Wisconsin-Madison

2:45 PM Keynote

Soft Materials Approaches to Carbon Nanotubes: Gels and Composites: *Mohammad Islam¹*; ¹Carnegie Mellon University

3:25 PM Break

3:40 PM Keynote

1D Nanomaterial Based Flexible and Stretchable Electronics: *Yong Zhu¹*; ¹North Carolina State University

4:20 PM Panel Discussion

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Low-Dimensional Materials Synthesis

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovsky, University of Calgary; Patrick Ward, Savannah River National Laboratory

Monday PM | February 28, 2022
260B | Anaheim Convention Center

Session Chairs: Woochul Lee, University of Hawaii at Manoa; Michael Cai Wang, University of South Florida

2:00 PM

Water-driven CH₃NH₃PbBr₃ Nanocrystals: *Fuqian Yang¹*; ¹University of Kentucky

2:20 PM

Tuning the Rapid Thermochemical Pretreatment of Alumina-supported Iron Catalyst to Improve Catalytic Lifetime in Chemical Vapor Deposition of Carbon Nanotubes: *Golnaz Tomaraei¹*; *Jaegun Lee¹*; *Moataz Abdulhafez¹*; *Mostafa Bedewy¹*; ¹University of Pittsburgh

2:40 PM

Salt Treatment to Purify Carbon Nanotube Sheets Produced via the Floating Catalyst CVD Method: *Anuptha Pujari¹*; *Arun Bhattacharjee²*; *Ashley Paz y Puente¹*; *Mark Schulz¹*; ¹University of Cincinnati; ²Pacific Northwest National Laboratory

3:00 PM

Thermal Conductivity Enhancement of PEO/PEDOT: PSS Composite Nanofiber: *Anh Tuan Nguyen¹*; *Woochul Lee¹*; ¹University of Hawaii at Manoa

3:20 PM Break

3:40 PM

The Scaling of Low-temperature Ferroelectric Hf_{0.5}Zr_{0.5}O₂ Thin Films Using Anhydrous H₂O₂: *Yong Chan Jung¹*; *Jin-Hyun Kim¹*; *Jaidah Mohan¹*; *Heber Hernandez-Arriaga¹*; *Su Min Hwang¹*; *Daniel Alvarez²*; *Jeffrey Spiegelman²*; *Si Joon Kim³*; *Jiyoung Kim¹*; ¹The University of Texas at Dallas; ²RASIRC; ³Kangwon National University

4:00 PM

Two-dimensional Metallic Mesoporous Materials (2D-MMM) via Mechanical Transformation from 0D/1D Precursors: *Md Rubayat-E Tanjil¹*; *Tanuj Gupta²*; *Matthew Gole³*; *Zhewen Yin¹*; *Keegan Suero¹*; *Donald McCleary¹*; *Ossie Douglas¹*; *Alissa Anderson¹*; *Catherine Murphy³*; *Huijuan Zhao²*; *Michael Cai Wang¹*; ¹University of South Florida; ²Clemson University; ³University of Illinois Urbana-Champaign

4:20 PM Keynote

Wafer-scale Epitaxial Growth of 2D Transition Metal Dichalcogenides: *Joan Redwing¹*; ¹Pennsylvania State University

MATERIALS PROCESSING

Furnace Tapping 2022 — Session II

Sponsored by: The Southern African Institute of Mining and Metallurgy, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Materials Characterization Committee, Industrial Advisory Committee

Program Organizers: Joalet Steenkamp, MINTEK; Dean Gregurek, RHI Magnesita; Quinn Reynolds, Mintek; Gerardo Alvear Flores, Rio Tinto; Hugo Joubert, Tenova Pyromet; Phillip Mackey, P.J. Mackey Technology, Inc.

Monday PM | February 28, 2022
213D | Anaheim Convention Center

Session Chair: Hugo Joubert, Tenova Pyromet

2:00 PM Introductory Comments

2:05 PM

Furnace Tapping 101: *Joalet Steenkamp¹*; *Jan Olsen²*; *Quinn Reynolds¹*; ¹MINTEK; ²SINTEF

2:25 PM

Tapped Alloy Mass Prediction Using Data-driven Models with an Application to Silicomanganese Production: *Alexey Cherkaev¹*; *Khutso Rampyapedi²*; *Quinn Reynolds¹*; *Joalet Steenkamp¹*; ¹Mintek; ²Transalloys

2:45 PM

Slag Reduction and Viscosities Interaction in Ferromanganese Process: *Tichaona Mukono¹*; *Maria Wallin¹*; *Merete Tangstad¹*; ¹Norwegian University of Science and Technology

3:10 PM Break

3:30 PM

Lab Scale Physical Model Experiments to Understand the Effect of Particle Bed on Tapping Flow Rates: Varun Loomba¹; Hesam Pourfallah¹; Jan Olsen²; *Kristian Einarsrud*¹; ¹Norwegian University of Science and Technology; ²SINTEF Industry

3:55 PM

Theoretical Framework and Practical Recommendations for Proper Thermal Lance Use and Selection: Roberto Pena¹; *Sebastian Nunez*²; Antonio Umana¹; Darwin Morales¹; ¹Trefimet S.A.

4:15 PM Concluding Comments

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Behaviors at Extreme Environments

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Monday PM | February 28, 2022

304C | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Pascal Bellon, UIUC

2:00 PM Invited

Radiation Effects on Interfacial Phenomena in Ceramics: *Izabela Szlufarska*¹; Hongliang Zhang¹; Jianqi Xi¹; Brian Sheldon²; Christos Athanasiou²; Xing Wang³; ¹University of Wisconsin-Madison; ²Brown University; ³Penn State University

2:30 PM Invited

Interpreting Discrete GND Footprints of Atomic-level Irradiation Defects Near Grain Boundaries: *Jaime Marian*¹; Mitra Taheri²; David Srolovitz³; ¹University of California, Los Angeles; ²Johns-Hopkins University; ³City University of Hong Kong

3:00 PM

Phase Field Modeling of the Coupling between Compositional Patterning and Radiation Induced Precipitation at Grain Boundaries and Dislocation Loops in Immiscible Binary Alloys during Irradiation: *Gabriel Franck Bouobda Moladje*¹; Robert S Averback¹; Pascal Bellon¹; ¹University of Illinois at Urbana-Champaign

3:20 PM

Plastic Deformation in Nickel Bicrystals Containing Helium Bubbles: *Tung Yan Liu*¹; Michael Demkowicz¹; ¹Texas A&M University

3:40 PM Break

3:55 PM Invited

Computational Insights into the Interactions of Defects with Grain Boundaries: *Blas Uberuaga*¹; ¹Los Alamos National Laboratory

4:25 PM

Integration of Microscopy and Deep Learning to Define Localized Grain Boundary Sink Efficiency: *Emily Hopkins*¹; Emma Liu¹; Ryan Jacobs²; Priyam Patki³; James Nathaniel¹; Kevin Field³; Dane Morgan²; Mitra Taheri¹; ¹Johns Hopkins University; ²University of Wisconsin - Madison; ³University of Michigan

4:45 PM

Dynamic Interaction between Grain Boundary and Structural Defects by Molecular Dynamics Simulation: *Liang Zhang*¹; Cheng Lu²; Yasushi Shibuta³; ¹Chongqing University; ²University of Wollongong; ³The University of Tokyo

MATERIALS DESIGN

Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment — Alloy Theory II: Quantum, Electronic and Atomistic Approaches to Materials Understanding

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

Program Organizers: Raymundo Arroyave, Texas A&M University; Wei Chen, Illinois Institute of Technology; Yong-Jie Hu, Drexel University; Tresa Pollock, University of California, Santa Barbara

Monday PM | February 28, 2022

255A | Anaheim Convention Center

Session Chair: To Be Announced

2:00 PM Invited

Leveraging First-principles Theory in the Pursuit of Novel Electrode Materials: *Kristin Persson*¹; ¹University of California, Berkeley

2:30 PM Invited

Prospects of Quantum Computing for Modeling Phase Transformations in Battery Materials: *Maxwell Radin*¹; Peter Johnson¹; ¹Zapata Computing

3:00 PM Invited

From Layered Oxides to Disordered Rocksalt Cathodes: The Future of Energy Storage by Understanding the Atomistics of Li Diffusion: *Gerbrand Ceder*¹; ¹University of California-Berkeley

3:30 PM Break

3:50 PM Invited

Molecular-scale Structure and Dynamics of Molten Salts: Simulations and Implications for Corrosive Processes: Nick Winner¹; Haley Williams¹; Raluca Scarlat¹; *Mark Asta*¹; ¹University of California, Berkeley

4:20 PM Invited

First-principles Materials Design for Mechanically-controlled Topological Magnetism: *Daniil Kitchaev*¹; Anton Van der Ven¹; ¹University of California Santa Barbara

MATERIALS DESIGN

ICME Case Studies: Successes and Challenges for Generation, Distribution, and Use of Public/Pre-Existing Materials Datasets — Public Dataset Construction and Metadata Tagging

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

Program Organizers: Stephen DeWitt, Oak Ridge National Laboratory; Vikas Tomar, Purdue University; James Saal, Citrine Informatics; James Warren, National Institute of Standards and Technology

Monday PM | February 28, 2022
254A | Anaheim Convention Center

Session Chair: James Saal, Citrine Informatics

2:00 PM Invited

Added Value and Increased Organization: Capturing Experimental Data Provenance in Materials Commons 2.0: *Tracy Berman*¹; Brian Puchala¹; Glenn Tarcea¹; John Allison¹; ¹University of Michigan

2:30 PM Invited

Generating, Sharing, and Using Halide Perovskite Exploratory Synthesis Data to Discover New Materials: *Joshua Schrier*¹; ¹Fordham University

3:00 PM Invited

Challenges in Producing, Curating, and Sharing Large Multimodal, Multi-institutional Data Sets for Additive Manufacturing: *Lyle Levine*¹; Brandon Lane²; Carelyn Campbell²; Gerard Lemson²; Edwin Schwalbach³; Megna Shah³; ¹The Ohio State University; ²National Institute of Standards and Technology; ³Air Force Research Laboratory

3:30 PM Break

3:50 PM

A Validation Framework for Microstructure-sensitive Fatigue Simulation Models: *Ali Riza Durmaz*¹; Nikolai Arnaudov²; Erik Natkowski²; Petra Sonnweber-Ribic²; Sebastian Münstermann³; Chris Eberl¹; Peter Gumbsch¹; ¹Fraunhofer Iwm; ²Robert Bosch GmbH; ³RWTH Aachen

4:10 PM Invited

Hard Fought Lessons on Open Data and Code Sharing and the Terra Infirma of Ground Truth: *Jason Hattrick-Simpers*; ¹

ENERGY & ENVIRONMENT

Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring Matthew J. Kramer — Microstructure and Processing

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

Program Organizers: Scott McCall, Lawrence Livermore National Laboratory; Ryan Ott, Ames Laboratory

Monday PM | February 28, 2022
210D | Anaheim Convention Center

Session Chair: Orlando Rios, University of Tennessee-Knoxville

2:00 PM Invited

Far-from-equilibrium Materials Processing: *Jeffrey Shield*¹; ¹University of Nebraska

2:30 PM Invited

From High-throughput Synchrotron Diffraction to Closed-loop Autonomous Materials Discovery: *Ichiro Takeuchi*¹; ¹University of Maryland

3:00 PM

Mechanically Strengthened Heterogeneous Sm-Co Sintered Magnets: *Baozhi Cui*¹; Xubo Liu¹; Cajetan Nlebedim¹; Jun Cui¹; ¹Ames Laboratory

3:20 PM Break

3:40 PM

Utilizing High Energy X-rays to Perform In Situ observations of Alnico Spinodal Evolution: *Emily Rinko*¹; Matthew Kramer¹; Iver Anderson¹; ¹Iowa State University

4:00 PM Invited

Exploring the Edge of Stability in Chemically Complex Alloys: *Pratik Ray*¹; ¹IIT Ropar

4:30 PM Invited

Synthesis and Characterization of Rare-earth-based Metallic Glasses: *Yunus Kalay*¹; ¹Middle East Technical University

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Corrosion II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Monday PM | February 28, 2022
203B | Anaheim Convention Center

Session Chair: Jinsuo Zhang, Virginia Tech

2:00 PM

Multi-modal Characterization of Interfacial Corrosion of Ni-based Alloys in Chloride-based Molten Salts: *Trishelle Copeland-Johnson*¹; Michael Woods¹; Ruchi Gakhar¹; Guoping Cao¹; Lingfeng He¹; ¹Idaho National Laboratory

2:20 PM

Static Corrosion of 316 Stainless Steel Upon Exposure to Metal Fluorides in Molten Salt: *Ryan Hayes*¹; Sean Mills¹; Haley Williams¹; Andrew Minor¹; Raluca Scarlat¹; ¹University of California Berkeley

2:40 PM

Study of the Influence of Metal Ions on the Kinetics of Molten Salt Corrosion with Transmission Electron Microscopy and In situ Synchrotron X-ray Nano-tomography: *Xiaoyang Liu*¹; Xiaoyin Zheng¹; Kaustubh Bawane²; Michael Woods²; Mingyuan Ge³; Phillip Halstenberg⁴; Sheng Dai⁵; Xianghui Xiao³; Wah-Keat Lee³; Shannon Mahurin⁶; Ruchi Gakhar²; Lingfeng He²; Yu-chen Chen-Wiegart⁷; ¹Stony Brook University; ²Idaho National Laboratory; ³Brookhaven National Laboratory; ⁴University of Tennessee; ⁵University of Tennessee/ Oak Ridge National Laboratory; ⁶Oak Ridge National Laboratory; ⁷Stony Brook University/ Brookhaven National Laboratory

3:00 PM

Effect of Impurities on Stability of Graphite in Molten FLiNaK: *Krishna Moorthi Sankar*¹; Preet Singh¹; ¹Georgia Institute of Technology

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Young Investigator Session II

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Monday PM | February 28, 2022
253B | Anaheim Convention Center

Session Chairs: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC

2:00 PM Invited

Composition and Thermo-mechanical Processing Optimization towards Superior Steels: Two Case Studies: *C. Tazan*¹; Gianluca Roscioli¹; Menglei Jiang¹; Hyun Oh¹; ¹Massachusetts Institute of Technology

2:25 PM Invited

Understanding Welding Metallurgy and Process-structure-property Relationships for Advanced Manufacturing: High-throughput Experimental Techniques Guided by Thermodynamic Modeling: *Carolyn Fink*¹; ¹Ohio State University

2:50 PM Invited

Development and Manufacturing of Solid-solution or Precipitation-strengthened Multi-principal Element Alloys with Superior Properties: *Haiming Wen*¹; Matthew Luebke²; Hans Pommerenke¹; ¹Missouri University of Science and Technology

3:15 PM Invited

Deformation and Failure of Cold Sprayed Metal Matrix Composites: A Synchrotron X-ray Approach: *Lewei He*¹; *Mostafa Hassani*¹; ¹Cornell University

3:40 PM Break

3:55 PM Invited

Short-range Order and Its Impacts on the BCC NbMoTaW Multi-principal Element Alloy by Machine-learning Potentials: *XiaoXiang Yu*¹; Qiang Zhu²; YunJiang Wang³; Lin Li⁴; ¹Northwestern University; ²University of Nevada, Las Vegas; ³Institute of Mechanics, Chinese Academy of Sciences; ⁴The University of Alabama

4:20 PM Invited

Local Electronic Descriptors for Defect Properties of bcc Refractory Alloys: *Yong-Jie Hu*¹; Liang Qi²; ¹Drexel University; ²University of Michigan

4:45 PM Invited

How Deep Learning Can Help with Materials Design: *Sara Kadkhodaei*¹; Ali Davariashiyani¹; ¹University of Illinois at Chicago

5:10 PM Invited

Materials Design of High-melting-point Materials from First Principles, Database, and Machine Learning: *Qijun Hong*¹; ¹Arizona State University

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Novel Nuclear Materials & Characterization I

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Monday PM | February 28, 2022
204A | Anaheim Convention Center

Session Chairs: Alex Leide, University of Bristol; Jie Lian, Rensselaer Polytechnic Institute

2:00 PM Invited

Characterizing and Testing High Dose Neutron Irradiated Materials for Cladding Applications: *Stuart Maloy*¹; Ben Eftink¹; Tarik Saleh¹; Mychailo Toloczko²; Dave Hoelzer³; T. S Byun³; ¹Los Alamos National Laboratory; ²Pacific Northwest National Laboratory; ³Oak Ridge National Laboratory

2:30 PM

Microstructure Characterization and Micro-mechanical Properties of 14YWT Tubing after Proton Irradiation: *Cayla Harvey*¹; Osman El-Atwani²; Stuart Maloy²; Siddhartha Pathak³; ¹University of Nevada, Reno; ²Los Alamos National Laboratory; ³Iowa State University

2:50 PM

Behavior of Ceramic Matrix Composite in Molten Salt Environments Under Biaxial Stresses: *Wylie Simpson*¹; Xinyi Wang¹; James Earthman¹; ¹University of California Irvine

3:10 PM

Ion Irradiation Effects on Microstructure Evolution and Mechanical Properties of Silicon Oxycarbide: *Kathy Lu*¹; Sanjay Kumar Singh¹; Kaustubh Bawane²; ¹Virginia Polytechnic Institute and State University; ²Idaho National Laboratory

3:30 PM Break

3:50 PM

Compositionally Graded Specimen: A High-throughput Approach for Nuclear Material Development

: *Jingfan Yang*¹; Laura Hawkins²; Miao Song³; Lingfeng He²; Zhijie Jiao³; Yongfeng Zhang⁴; Daniel Schwen²; Xiaoyuan Lou¹; ¹Auburn University; ²Idaho National Laboratory; ³University of Michigan; ⁴University of Wisconsin

4:10 PM

Chemical Redistribution of Alloying Elements through Oxide/Metal Interface of Irradiated ZrNbFe Alloys and Its Implication on Corrosion Behavior: Zefeng Yu¹; Elizabeth Kautz²; Hongliang Zhang¹; Anton Schneider¹; Yongfeng Zhang¹; Sten Lambeets²; Arun Devaraj²; *Adrien Couet*¹; ¹University of Wisconsin-Madison; ²Pacific Northwest National Laboratory

4:30 PM

Deformation Behavior of Helium Irradiated Nano-pillars Containing a Helium Gas Bubble Superlattice: Andrew Scott¹; Yujun Xie²; Peter Hosemann¹; ¹University of California Berkeley; ²Lawrence Berkeley National Laboratory

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Size Effects

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Monday PM | February 28, 2022
262B | Anaheim Convention Center

Session Chairs: Changhong Cao, McGill University; Kevin Turner, University of Pennsylvania

2:00 PM Invited

In Situ Atomic-scale Observation of Surface-diffusion-controlled Softening in Metallic Nanocrystals: Scott Mao¹; ¹University of Pittsburgh

2:30 PM

Dynamic Recrystallization-induced Strengthening in Amorphous-nanocrystalline Silver-nickel Nanolaminates: Ryan Pringle¹; Frederic Sanzoz²; ¹The University of Vermont

2:50 PM

Achieving Micron-scale Plasticity and Theoretical Strength in Silicon: Ming Chen¹; Laszlo Pethö²; Alla Sologubenko³; Johann Michler²; Ralph Spolenak⁴; *Jeffrey Wheeler*⁵; ¹Paul Scherrer Institute; ²Empa; ³ScopeM/ETH Zurich; ⁴ETH Zurich; ⁵FemtoTools AG, Furtbachstrasse 4, CH-8107 Buchs/ZH, Switzerland

3:10 PM

Grain Size Dependent Deformation Mechanisms in Complex Concentrated Oxides (Co,Cu,Mg,Ni,Zn)O: Xin Wang¹; Justin Cortez¹; Alexander Dupuy¹; Julie Schoenung¹; William Bowman¹; ¹University of California Irvine

3:30 PM Break

3:50 PM Invited

Tuning the Fracture Toughness of Polymer-infiltrated Nanoparticle Films via Nanoconfinement: Kevin Turner¹; Yiwei Qiang¹; Daeyeon Lee¹; ¹University of Pennsylvania

4:20 PM

Mechanical Behavior of Nanotwinned Al Alloys at Elevated Temperatures: Xinghang Zhang¹; Qiang Li²; Dongyue Xie³; Jian Wang³; ¹Purdue University; ²Ames Lab; ³University of Nebraska, Lincoln

4:40 PM

Precipitation Hardening in BCC Multilayer Thin Films: Yailuth Loaiza Lopera¹; David Bahr¹; ¹Purdue University

5:00 PM

The Effects of Grain Boundaries on the Micromechanical Properties of Transparent Nanocrystalline Spinel: Jessica Maita¹; Sarshad Rommel¹; Jacob Davis²; James Wollmershauser³; Edward Gorzkowski³; Boris Feigelson³; Mark Aindow¹; Seok-Woo Lee¹; ¹University of Connecticut; ²University of Massachusetts Amherst; ³U.S. Naval Research Laboratory

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Session II

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Monday PM | February 28, 2022
206B | Anaheim Convention Center

Session Chairs: Shailendra Joshi, University of Houston; C. Tasan, Massachusetts Institute of Technology

2:00 PM Invited

Linking Local and Global Strains: From Films to Lattices: Mitra Taheri¹; ¹Johns Hopkins University

2:30 PM

Investigation of Dislocation-grain Boundary Interactions through In-situ Micro-mechanical Testing with Strain Mapping: Dongyue Xie¹; Sumit Suresh¹; Jade Peng¹; Jonathan Gigax¹; Nithin Mathew¹; Darby Luscher¹; Abigail Hunter¹; Saryu Fensin¹; Nan Li¹; ¹Los Alamos National Laboratory

2:50 PM

Effect of Temperature and Composition on the Superelasticity of SrNi₂P₂ Single Crystal: Shuyang Xiao¹; Juan Schmidt²; Gorgen-Lesseux Guilhaume²; Paul Canfield²; Seok-Woo Lee¹; ¹University of Connecticut; ²Iowa State University

3:10 PM

Deformation Behavior Identification of a Friction Stir Welded 304L Austenitic Stainless-steel Using In-situ EBSD: Nitish Bibhanshu¹; Maxim Gussev¹; Wei Tang¹; ¹Oak Ridge National Laboratory

3:30 PM Break

3:50 PM

Transmission X-ray Microscopy Reveals Role of Voids in Hydrogen Embrittlement: Andrew Lee¹; Abhinav Parakh¹; Wendy Gu¹; ¹Stanford University

4:10 PM

Growing Voids and Migrating Twins: Shailendra Joshi¹; ¹University of Houston

4:30 PM

Examining Hot Corrosion Crack Tip Arrest through Advanced Microscopy Analysis of Ni-superalloy CMSX-4: *Maadhav Kothari*¹; Andy Holwell¹; Hrishikesh Bale¹; Simon Gray²; Jonathan Leggett³; ¹Carl Zeiss Microscopy LLC; ²Cranfield University; ³Rolls Royce

4:50 PM Invited

Similarity of Microscopic Strain Localization in Very Different Microstructures: *C. Tasan*¹; Krista Biggs¹; Onur Guvenc¹; Jiyun Kang¹; Hyun Oh¹; Shaolou Wei¹; ¹Massachusetts Institute of Technology

MATERIALS DESIGN

Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis — Additive Manufacturing and Processing of Composite Materials

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

Program Organizers: Srivatsan Tirumalai, The University of Akron; Pradeep Rohatgi, University of Wisconsin; Simona Hunyadi Murph, Savannah River National Laboratory

Monday PM | February 28, 2022
256B | Anaheim Convention Center

Session Chair: Tirumalai Srivatsan, The University of Akron

2:00 PM Keynote

Additive Manufacturing of Metal Matrix Composites for Structural and Biomedical Applications: *Amit Bandyopadhyay*¹; Susmita Bose¹; ¹Washington State University

2:30 PM Invited

Additive Manufacturing of Titanium – Boron Carbide In situ Composites: *Mohan Sai Kiran Nartu*¹; Srinivas Aditya Mantri¹; Thomas W. Scharf¹; Brandon Mc Williams²; Kyu Cho²; Narendra Dahotre¹; Rajarshi Banerjee¹; ¹University of North Texas; ²CCDC U.S. Army Research Laboratory

2:55 PM

Solid-state Additive Manufacturing of AA6061-graphene MMCs: *Jessica Lopez*¹; Malcom Williams¹; James Jordon¹; Timothy Rushing²; Gregory Thompson¹; Paul Allison¹; ¹The University of Alabama; ²U.S. Army ERDC

3:15 PM Invited

Development of Aluminum-based Metal Matrix Composites Using Friction Extrusion: *Rajib Kalsar*¹; Xiaolong Ma¹; Jens Darsell¹; Miao Song¹; Nicole Overman¹; Keerti Kappagantula¹; Vineet Joshi¹; ¹Pacific Northwest National Laboratory

3:40 PM Break

3:55 PM

An Investigation of Mechanical Properties of Additively Manufactured Regolith Reinforced Titanium Alloy [Ti6Al4V]: *Ali Afrouzian*¹; Kellen Traxel¹; Amit Bandyopadhyay¹; ¹Washington State University

4:15 PM Invited

In-situ Synthesis of (TiB+TiN)/Ti Composites with Ultrahigh Mechanical Strength via Laser Powder Bed Fusion: *Boyuan Li*¹; Changjun Han¹; *Kun Zhou*¹; ¹Nanyang Technological University

SPECIAL TOPICS

Moving Forward from a Pandemic: How the Field of Materials Science Has Adapted (2022 Student-led Symposium) — Education and User Facilities - Supporting Students and Users During the Pandemic

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Christine Smudde, University of California, Davis; Jared Stimac; Mingwei Zhang, University of California, Davis

Monday PM | February 28, 2022
202A | Anaheim Convention Center

Session Chairs: Mingwei Zhang, University of California, Davis; Jared Stimac, University of California, Davis

2:00 PM

Survey Results from the TMS Education Committee: Changes in Education due to Covid-19: *Alison Polasik*¹; Kester Clarke²; ¹Campbell University; ²Colorado School of Mines

2:20 PM

How CHESS Responded to the Corona Virus Pandemic: *Joel Brock*¹; *Matthew Miller*¹; ¹Cornell University

2:40 PM

Materials Science at the Molecular Foundry - Adaptation and Innovation during the COVID-19 Pandemic: *Shannon Ciston*¹; ¹Lawrence Berkeley National Laboratory

3:00 PM

Supporting Students in a Turbulent Time: Lessons Learned: *Susan Gentry*¹; ¹University of California, Davis

3:20 PM Break

3:35 PM

Maintaining a Productive Electron Microscopy Facility in the Face of COVID-19: *Nicholas Rudawski*¹; ¹University of Florida

3:55 PM

Engineering Education during and Post Pandemic: *Matthew Sherburne*¹; ¹University of California, Berkeley

4:15 PM

Navigating and Adapting User Facilities through Challenging Times: *Khalid Hattar*¹; ¹Sandia National Laboratories

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI — Machine Learning and Phase Stability/Advanced Electronic Interconnections

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chaohong Wang, National Chung Chung University; Chih Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; A.S.Md Abdul Haseeb, University of Malaya; Vesa Vuorinen, Aalto University; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Monday PM | February 28, 2022
303A | Anaheim Convention Center

Session Chairs: Shih-kang Lin, National Cheng Kung University; Yu-chen Liu, National Cheng Kung University

2:00 PM Invited

The Challenge of Machine Learning the Stability of Materials: *Christopher Bartel*¹; ¹University of California, Berkeley

2:30 PM

Role of Composition in the Phase Transition of Ge-Sb-Te Alloys: *Robert Appleton*¹; *Alejandro Strachan*¹; *Zachary McClure*¹; ¹Purdue University

2:50 PM

The Influence of Morphology in Ultrathin Ag Structure on ZnO/Ag/ZnO Transmittance Grown by Sputtering Compared with Simulation: *Bao-Jhen Li*¹; ¹National Central University

3:10 PM

Ab Initio Interfacial Stability and Cu-segregation Effect upon γ' and γ_2 Precipitates in Al-Zn-Mg-Cu Alloys
: *Yu-ning Chiu*¹; *Chung-yi Yu*²; *Shih-kang Lin*¹; ¹National Cheng Kung University; ²China Steel Corp

3:30 PM Break

3:50 PM

Study of Ferroelectricity and Phase Transitions in Hafnia: *Sesha Behara*¹; *Anton Van der Ven*¹; ¹University of California Santa Barbara

4:10 PM

Interfacial Reactions between Sn-0.7 Cu Alloys C194, Alloy25, and C1990 Substrates: *Yong-Chi Chang*¹; *Tzu-Yang Tsai*¹; *Tai-Hsuan Chung*¹; *Yee-Wen Yen*¹; ¹NTUST

4:30 PM

Mechanical Performance of Advanced Multicomponent Solder Alloy under Thermal Aging: *Ding Zhou*¹; *A.S.M.A. Haseeb*¹; *Andri Andriyana*¹; ¹University of Malaya

4:50 PM

Investigation of Thermal Properties and Thermal Reliability of Ga-based Low Melting Temperature Alloys as Thermal Interface Materials (TIMs): *Yifan Wu*¹; *Rajath Kantharaj*¹; *Albraa Alsaati*¹; *Amy Marconnet*¹; *Carol Handwerker*¹; ¹Purdue University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Microstructure Evolution

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Monday PM | February 28, 2022
255B | Anaheim Convention Center

Session Chair: Ramasis Goswami, Naval Research Laboratory

2:00 PM

Dynamic Microstructural Evolution of Al-Cu Alloy during Friction Stir Processing Studied Using Synchrotron Based In Situ High Energy X-ray Diffraction: *Arun Bhattacharjee*¹; *Julian Escobar Atehortua*¹; *Jorge dos Santos*²; *Jan Herrnring*²; *Luciano Bergmann*²; *Peter Staron*²; *Benjamin Klusemann*²; *Bharat Gwalani*¹; *Suveen Mathaudhu*³; *Cynthia Powell*⁴; *Arun Devaraj*¹; ¹Physical and Computational Sciences Directorate, Pacific Northwest National Laboratory; ²Institute of Materials Mechanics, Helmholtz-Zentrum Hereon; ³Metallurgical and Materials Engineering, Colorado School of Mines; ⁴Energy and Environment Directorate, Pacific Northwest National Laboratory

2:20 PM

Formation of Three-phase Eutectic Grains on Primary Phases: Observations from In Situ and Multi-modal Imaging: *George Lindemann*¹; *Paul Chao*¹; *Allen Hunter*¹; *Ashwin Shahani*¹; ¹University of Michigan

2:40 PM

Microstructural Evolution during Galling: *Samuel Rogers*¹; *David Dye*¹; ¹Imperial College London

3:00 PM Invited

Metallic Alloy Microstructure Evolution during Materials Processing: *Amy Clarke*¹; *Jonah Klemm-Toole*¹; *Kester Clarke*¹; *Alec Saville*¹; *Christopher Jasien*¹; *Gus Becker*¹; *Brian Rodgers*¹; *Jeremy Shin*¹; *Joseph McKeown*²; *John Roehling*²; *Damien Tournet*³; *Sven Vogel*⁴; *Jake Benzing*⁵; *Adam Creuziger*⁵; *Adam Pilchak*⁶; *Kamel Fezzaa*⁷; *Tao Sun*⁸; *Tresa Pollock*⁹; *Alain Karma*¹⁰; ¹Colorado School of Mines; ²Lawrence Livermore National Laboratory; ³IMDEA Materials; ⁴Los Alamos National Laboratory; ⁵National Institute of Standards and Technology; ⁶MRL Materials Resources LLC; ⁷Argonne National Laboratory; ⁸University of Virginia; ⁹University of California Santa Barbara; ¹⁰Northeastern University

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Additive Manufacturing I

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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Monday PM | February 28, 2022
263C | Anaheim Convention Center

Session Chairs: Eugene Olevsky, San Diego State University; Hang Yu, Virginia Polytechnic Institute and State University

2:00 PM Invited

Laser-based, Machine-learning Guided, Additive Manufacturing of Ceramics with Designed Microstructure and Hardness: Xiao Geng¹; Jianan Tang¹; Dongsheng Li²; Yunfeng Shi³; Jianhua Tong¹; Hai Xiao¹; Fei Peng¹; *Rajendra Bordia*¹; ¹Clemson University; ²Advanced Manufacturing LLC; ³Rensselaer Polytechnic Institute

2:30 PM

Influence of Powder Reuse in LPBF on the Attributes of SS316L Particles and Powder Beds: *Timothee Delacroix*¹; Fernando Lomello¹; Frédéric Schuster¹; Hicham Maskrot¹; Jean-Paul Garandet¹; ¹CEA

2:50 PM

Understanding Surface Roughness on Vertical Walls in Laser Powder Bed Fusion Additive Manufacturing: *Tianyu Zhang*¹; Lang Yuan¹; ¹University of South Carolina

3:10 PM

Optical Analysis of Powder Oxygen Content in Metal Powder Bed Fusion: *Tan-Phuc Le*¹; Xiaogang Wang¹; Nick Weeks²; Matteo Seita¹; ¹Nanyang Technological University; ²Carpenter Additive

3:30 PM Break**3:50 PM**

Synchrotron X-ray Imaging of Cracking during Laser Powder Bed Fusion (LPBF) of Aged CM247 Powder with Varying Oxygen Content: *David Rees*¹; Chu Lun Alex Leung¹; Thomas Kellock¹; Gowtham Soundarapandian²; Sebastian Marussi¹; Saurabh Shah¹; Robert Atwood³; Ben Saunders⁴; Gavin Baxter⁵; Peter Lee¹; ¹University College London; ²National Structural Integrity Research Centre; ³Diamond Light Source Ltd; ⁴Rolls-Royce plc.; ⁵MAPP EPSRC Future Manufacturing Hub

4:10 PM

Inconel 718 Contamination in Ti6Al4V during Powder Bed Fusion: *Cory Groden*¹; Kellen Traxel¹; Amit Bandyopadhyay¹; ¹Washington State University

4:30 PM

Electromigration Behavior of Additively Manufactured Copper Wirings: *Hugo Ramirez Grijalba*¹; Ping-Chuan Wang¹; Dan Freedman¹; ¹SUNY New Paltz

MATERIALS PROCESSING

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — Powder Metallurgy of Non-ferrous and Refractory Metals

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

Program Organizers: Ma Qian, Royal Melbourne Institute of Technology; James Paramore, US Army Research Laboratory; David Yan, San Jose State University; Gang Chen, University of Science and Technology Beijing

Monday PM | February 28, 2022
211B | Anaheim Convention Center

Session Chairs: James Paramore, United States Army Research Laboratory; David Yan, San Jose State University

2:00 PM

Investigations of Phase Transformations in a Blendend Elemental Ti-Nb-Zr-O Alloys Prepared by a Field-assisted Sintering Technique: *Dalibor Preisler*¹; Jiri Kozlik¹; Josef Strasky¹; Tomas Chraska²; Milos Janecek¹; Hanus Seiner³; ¹Charles University; ²Institute of Plasma Physics, Czech Academy of Sciences; ³Institute of Thermomechanics, Czech Academy of Sciences

2:20 PM

Microstructural/Mechanical Properties Relationship of Elongated Ti-15Mo Bars Produced by Unconventional Spark Plasma Sintering Technology: *Mariano Casas Luna*¹; Adrián Majoros¹; Anna Veverková¹; Dalibor Preisler¹; Josef Stráský¹; ¹Charles University

2:40 PM Invited

Titanium Near Net Shape PM Parts Produced by Direct Powder Forging: *Bernard Tougas*¹; Sébastien Germain-Careau¹; Elena Kolitsky¹; Gheorghe Marin¹; ¹Quebec Metallurgy Center

3:05 PM

Influence of Calcium Powder in Heavily Deformed Aluminum-calcium Metal-metal Composites: *Dustin Hickman*¹; Trevor Riedemann²; Jordan Tiarks²; Iver Anderson²; ¹Iowa State University; ²Ames Laboratory

3:25 PM Break**3:40 PM Keynote**

Microstructural Refinement and Uniformity of Refractory Metals: *Lin Zhang*¹; Xingyu Li¹; Xuanhui Qu¹; ¹University of Science and Technology Beijing

4:20 PM

Scaling Up Porous Copper Foams by Planetary Milling and Oxide Reduction: *Julian Tse Lop Kun*¹; Adam Rutherford¹; Mark Atwater¹; ¹Liberty University

4:40 PM

Accelerated Powder Consolidation in Nanocrystalline Materials Competes with Organic Burn-off: *Yannick Naunheim*¹; Christopher A. Schuh¹; ¹Massachusetts Institute of Technology

MATERIALS PROCESSING

Rare Metal Extraction and Processing — Solvent Extraction for Rare Metals

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

Program Organizers: Takanari Ouchi, University of Tokyo; Gisele Azimi, University of Toronto; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Alafara Baba, University of Ilorin; Hong Peng, University of Queensland

Monday PM | February 28, 2022
213B | Anaheim Convention Center

Session Chairs: Takanari Ouchi, University of Tokyo; Hojong Kim, Pennsylvania State University; Kerstin Forsberg, KTH Royal Institute of Technology

2:00 PM Introductory Comments

2:10 PM Keynote

Physicochemistry in Service of Process Design: Case of Uranium Recovery by Liquid-liquid Extraction: *Alexandre Chagnès*¹; ¹Universite De Lorraine-Georess

2:50 PM

Effect of Antisolvent Type and Concentration on Morphology and Crystal Size of (NH₄)₃ScF₆ Obtained by Antisolvent Crystallization: Edward Peters¹; Michael Svård¹; Kerstin Forsberg¹; ¹KTH Royal Institute of Technology

3:10 PM

Tellurium Recovery – Development of a Novel Hydrometallurgical Process: *Shijie Wang*¹; ¹Coeur Mining, Inc

3:30 PM Break

3:50 PM

Purification of a Low-grade Molybdenite Ore for Industrial Steel Production: *Alafara Baba*¹; Christianah Adeyemi²; Mamata Mohapatra³; Mustapha Raji¹; Fausat Akanji⁴; Abdul Alabi⁵; ¹University of Ilorin; ²University of Ilorin & The Federal Polytechnic, Offa; ³CSIR-Institute of Minerals and Materials Technology; ⁴University of Ilorin & Sheda, Kwali, Abuja; ⁵Kwara State University, Malete

4:10 PM

Comprehensive Processing of Mica Concentrate from Yaroslavlsky GRK for Lithium Carbonate, Potassium Sulfate, Aluminum Sulfate, Rubidium and Cesium: Andrey Panov¹; Aleksandr Suss¹; Nataliya Kuznetsova¹; Sergey Ostashin²; Evgeniy Isakov³; ¹RUSAL Engineering and Technology Center; ²JSC RUSAL Management; ³Yaroslavlsky GRK

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications — Functional Materials and 2D/3D Devices II

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday PM | February 28, 2022
303C | Anaheim Convention Center

Session Chairs: Rahul Panat, Carnegie Mellon University; Tolga Aytug, Oak Ridge National Laboratory; Changyong Cao, Michigan State University

2:00 PM Invited

3D Printed Energy Storage Devices: *Majid Beidaghi*¹; ¹Auburn University

2:25 PM

Controlled Embedding of Multidimensional Flexible Sensors Using Direct Ink Writing: *Akshay Kakar*¹; Derrick Banerjee¹; Edward Sablosky¹; Konstantinos Sierros¹; ¹West Virginia University

2:45 PM Invited

Copper-carbon Nanotube Composite Based Advanced Conductors: *Kai Li*¹; Michael McGuire¹; Andrew Lupini²; Fred List¹; Burak Ozpinedi¹; Soydan Ozcan¹; Tolga Aytug¹; ¹Oak Ridge National Laboratory

3:10 PM Invited

Screen Printing of Multifunctional Wearable E-Textile from Water-based Silver Conductive Inks: Bin Tian¹; Wei Wu¹; *Changyong Cao*²; ¹Wuhan University; ²Michigan State University

3:35 PM Break

3:50 PM Invited

Revealing the Messtructures of 3D Printed Battery with Synchrotron Coherent X-ray Scattering and Nano-tomography: Dean Yen¹; Karol Dyro¹; Cheng-Hung Lin¹; Mingyuan Ge²; Lutz Wiegart²; *Yu-chen Karen Chen-Wiegart*³; ¹Stony Brook University; ²Brookhaven National Laboratory; ³Stony Brook University / Brookhaven National Laboratory

4:15 PM Invited

Laser-induced Direct-write of Conductive Graphene Patterns with Tunable Porosity on Polymers: Moataz Abdulhafez¹; *Golnaz Tomaraei*¹; Ki-Ho Nam¹; Mostafa Bedewy¹; ¹University of Pittsburgh

4:40 PM

Coaxial Core-shell Direct Ink Writing of Conductive Elastomeric Fibers: *John Burke*¹; Derrick Banerjee¹; Domenic Cipollone¹; Chih-Hung Chang²; Han Mei²; Edward Sablosky¹; Konstantinos Sierros¹; ¹West Virginia University; ²Oregon State University

5:00 PM

Utilizing Direct Ink Writing to Create Applications-specific Flexible and Stretchable Solid-state Lithium Battery Arrays: *Nicholas Winch*¹; Harrison Loh¹; Domenic Cipollone¹; Savan Suri¹; Eda Aysal¹; Derrick Banerjee¹; Konstantinos Sierros¹; ¹West Virginia University

ADVANCED MATERIALS

Refractory Metals — Alloy Development and Compositionally Complex Alloys

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

Program Organizers: Eric Taleff, University of Texas at Austin; Lauren Garrison, Oak Ridge National Laboratory; Alexander Knowles, University of Birmingham

Monday PM | February 28, 2022
252B | Anaheim Convention Center

Session Chairs: Sandy Knowles, University of Birmingham; Lesley Cornish, University of the Witwatersrand

2:00 PM Invited

Platinum-based Superalloys: Combating High Temperatures and Aggressive Environments: *Lesley Cornish*¹; ¹University of the Witwatersrand

2:20 PM

Design of BCC High-entropy Alloys with Low Neutron Absorption Cross-section: *Pedro Ferreira*¹; Daniel King²; Alexander Knowles¹; ¹University of Birmingham; ²Imperial College London

2:40 PM

Design of MoW-TaTiZr Refractory Multi-principal Element Alloys: *Gaoyuan Ouyang*¹; Prashant Singh¹; Jun Cui¹; Matthew Kramer¹; Duane Johnson¹; ¹Ames Laboratory

3:00 PM Invited

Refractory High Entropy Alloys for Applications in Extreme Environments: *Osman El-Atwani*¹; Hi Vo¹; Matheus Tunes¹; Andrew Alvarado¹; Kevin Baldwin¹; Koray Iroc²; Eda Aydogan²; Stuart Maloy¹; Enrique Martinez³; ¹Los Alamos National Laboratory; ²Middle East Technical University; ³Clemson University

3:20 PM Break**3:40 PM**

High-throughput Engineering of Oxidation Behavior in Complex Refractory Alloys: *Daniel Saucedo*¹; Prashant Singh²; Raymundo Arroyave¹; ¹Texas A&M University; ²AMES Laboratory

4:00 PM

Sustainability-based Selection of Materials for Refractory High Entropy Alloys: *Xinyi Wang*¹; Annalise Kramer¹; Haoyang He¹; Julie Schoenung¹; ¹University of California, Irvine

4:20 PM

The Influence of Impurities on the Interfacial Chemistry of Niobium – Alumina High-temperature Refractories: *Michael Eusterholz*¹; Torben Boll¹; Alexander Kauffmann¹; Reshma Sonkusare¹; Tilo Zienert²; Dirk Endler²; Vincent Ott¹; Anja Weidner²; Julian Gebauer¹; Christos Aneziris²; Michael Stüber¹; Martin Heilmaier¹; Bastian Kraft¹; ¹Karlsruhe Institute of Technology; ²TU Bergakademie Freiberg

ENERGY & ENVIRONMENT

REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian — Sustainability Opportunities in Aluminum

Sponsored by: TMS: Recycling and Environmental Technologies Committee, TMS: Aluminum Committee

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Brajendra Mishra, Worcester Polytechnic Institute; Bart Blanpain, KU Leuven; Adam Powell, Worcester Polytechnic Institute; Mertol Göknelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway

Monday PM | February 28, 2022
204B | Anaheim Convention Center

4:15 PM Introductory Comments**4:20 PM Invited**

Aluminum Roadmap to a Sustainable Future: *John Weritz*¹; ¹The Aluminum Association

4:45 PM Invited

Increasing Secondary Alloy Usage in Aluminum Die Casting Industry: *Alan Luo*¹; ¹Ohio State University

5:10 PM Invited

The Future of the Aluminum Industry. It's Closer Than You Think: *Robert De Saro*¹; Sean Kelly²; Joe Craparo¹; Emily Molstad²; ¹Energy Research Company; ²Solvus Global

ENERGY & ENVIRONMENT

REWAS 2022: Plenary — REWAS 2022: Plenary Session: Developing Tomorrow's Technical Cycles

Program Organizer: Elsa Olivetti, Massachusetts Institute of Technology

Monday PM | February 28, 2022
204B | Anaheim Convention Center

Session Chairs: Elsa Olivetti, Massachusetts Institute of Technology; Camille Fleuriault, Eramet Norway

2:00 PM Introductory Comments**2:05 PM Invited**

Life Cycle of Materials – A Personal Journey: *Diran Apelian*¹; ¹University of California, Irvine

2:30 PM Invited

The Intersection Sustainable Manufacturing and Industrial Decarbonization: *Joe Cresko*¹; Chukwunwike Iloje²; ¹Advanced Manufacturing Office, U.S. Department of Energy; ²Energy Systems Division, Argonne National Laboratory

2:55 PM Invited

EU and NA Perspectives on the Potential of Carbon Utilization: Business, Technology and Policy Landscape: *Frederic Clerc*¹; Anastasios Perimenis²; ¹Urban Future Lab; ²CO2 Value Europe

3:35 PM Invited

Actions of the Copper Industry towards Future Carbon Neutral Society: *Takashi Nakamura*¹; ¹Tohoku University

4:00 PM Break

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — Advanced Characterization I: Transmission Electron Microscopy

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Monday PM | February 28, 2022
207C | Anaheim Convention Center

Session Chairs: Stephen House, University of Pittsburgh/ECC; Khalid Hattar, Sandia National Laboratory; Kelly Nygren, Cornell University/CHESS; Blythe Clark, Sandia National Laboratory

2:00 PM Invited

Experiments in an Environmental Transmission Electron Microscope: Challenges And Solutions: *Renu Sharma*¹; Wei-Chang Yang¹; ¹National Institute of Standards and Technology

2:30 PM Invited

Seeing is Believing: Contributions of Advanced Electron Microscopy Techniques to Understanding Materials Degradation in Energy Systems: *M Grace Burke*¹; ¹University of Manchester

NANOSTRUCTURED MATERIALS

Self-organizing Nano-architected Materials — Synthesis: Diffusion-Coupled Growth

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Monday PM | February 28, 2022
260C | Anaheim Convention Center

Session Chairs: Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum Hereon

2:00 PM Invited

Bicontinuous Structure Formation by Peritectic Melting: *Mingwang Zhong*¹; Longhai Lai¹; Alain Karma¹; ¹Northeastern University

2:30 PM

Oriented Nanoporous Metal via Reduction-induced Decomposition: *Congcheng Wang*¹; Qing Chen¹; ¹Hong Kong University of Science & Technology

2:50 PM

Coupled Coarsening and Dissolution Kinetics during Liquid Metal Dealloying: *Longhai Lai*¹; Bernard Gaskey²; Alyssa Chuang²; Jonah Erlebacher²; Alain Karma¹; ¹Northeastern University; ²Johns Hopkins University

3:10 PM

Nanoporous Refractory Multi-principal Element Alloy Thin Films for Higher Temperature Application Fabricated by Vacuum Thermal Dealloying: *Tibra Das Gupta*¹; Thomas Balk¹; ¹University of Kentucky

3:30 PM Break

3:50 PM

Powder-based Dealloying: Scalable Synthesis of Porous Refractory Alloys: *Alyssa Chuang*¹; Ian McCue²; Jonah Erlebacher¹; ¹Johns Hopkins University; ²Johns Hopkins Applied Physics Laboratory

4:10 PM

Grain Boundary Effects in Liquid Metal Dealloying: A Phase Field Study: *Nathan Bieberdorf*¹; Laurent Capolungo²; Mark Asta¹; ¹University of California Berkeley; ²Los Alamos National Laboratory

4:30 PM

Process-structure Relationships in Nanoporous Gold Dealloying and Sources of Its Synthesis Variability: *Stanislau Niazorau*¹; Aliaksandr Sharstniou¹; Natalya Kublik¹; Bruno Azeredo¹; ¹Arizona State University

MECHANICS & STRUCTURAL RELIABILITY

Structural Metamaterials — Session II

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

Program Organizers: Amy Wat, Lawrence Livermore National Laboratory; Brad Boyce, Sandia National Laboratories; Xiaoyu Zheng, University of California, Los Angeles; Fabrizio Scarpa, University of Bristol; Robert Ritchie, University of California, Berkeley

Monday PM | February 28, 2022
304A | Anaheim Convention Center

Session Chair: To Be Announced

2:00 PM

Flexibly Tunable Yet Strong Gear-based Mechanical Metamaterials: *Peter Gumbsch*¹; Xin Fang²; Jihong Wen²; Li Cheng³; Dianlong Yu²; Hongjia Zhang²; ¹Karlsruhe Institute of Technology KIT; ²NUDT; ³HongKong Polytechnic University

2:20 PM

A Comparison of Energy Absorption Behavior of Additively Manufactured AlSi10Mg Honeycomb, Lattice and TPMS Cellular Structures under Quasistatic Compression: *Mandar Shinde*¹; Irving Ramirez-Chavez²; Daniel Anderson¹; Jason Fait²; Mark Jarrett²; Dhruv Bhate¹; ¹Arizona State University; ²BAE Systems

2:40 PM

Architected Bioinspired Alumina with a Metallic Nickel Compliant-phase: *Amy Wat*¹; Claudio Ferraro²; Xu Deng³; Andrew Sweet⁴; Antoni Tomsia⁵; Eduardo Saiz²; Robert Ritchie⁴; ¹Lawrence Livermore National Laboratory; ²Imperial College London; ³University of Electronic Science and Technology of China; ⁴University of California, Berkeley; ⁵Lawrence Berkeley National Laboratory

3:00 PM

Interpenetrating Chain Lattices with Tailorable Energy Absorption in Tension: *Spencer Taylor*¹; Zachary Cordero¹; ¹Massachusetts Institute of Technology

3:20 PM Break

3:40 PM

Combined Effects of Heterogeneity and Length-scale on Mechanical Properties of Lattice Metamaterials: *Mujan Seif*¹; Matthew Beck¹; ¹University of Kentucky

4:00 PM

Machine Learning Design of Dynamic/Impact Behaviors: *Desheng Yao*¹; ¹University of California, Los Angeles

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Fundamentals in Mechanical Behavior and Radiation Effects II

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Monday PM | February 28, 2022

262A | Anaheim Convention Center

Session Chairs: Khalid Hattar, Sandia National Laboratories; Michael Demkowicz, Texas A&M University; Brad Boyce, Sandia National Laboratories

2:00 PM Invited

Helium in Metal Composites: *Michael Demkowicz*¹; ¹Texas A&M University

2:30 PM Invited

Comparing the Thermal, Mechanical, and Radiation Stability of Nanocrystalline Platinum-gold: *Khalid Hattar*¹; Alejandro Barrios Santos¹; Emily Hopkins¹; Christopher Barr¹; James Nathaniel¹; Elton Chen¹; Chongze Hu¹; Remi Dingreville¹; Daniel Bufford¹; David Adams¹; Doug Medlin¹; Fadi Abedljawad²; Brad Boyce¹; ¹Sandia National Laboratories; ²Clemson University

3:00 PM Invited

Synergistic Thermal and Radiation Stability in Grain Boundary Doped Nanocrystalline Tungsten: William Cunningham¹; Khalid Hattar²; Yuanyuan Zhu³; Danny Edwards⁴; *Jason Trelewicz*¹; ¹Stony Brook University; ²Sandia National Laboratories; ³University of Connecticut; ⁴Pacific Northwest National Laboratory

3:30 PM Break

3:50 PM Invited

Amorphous Ceramic and Metallic Composites: Microstructure and Mechanical Properties: *Jian Wang*¹; Binqiang Wei¹; Wenqian Wu¹; ¹University of Nebraska-Lincoln

4:20 PM Invited

Implications of Fatigue-crack Healing in Nanocrystalline Metals: *Brad Boyce*¹; Christopher Barr¹; Ta Duong¹; Daniel Bufford¹; Abhilash Molkeri¹; Nathan Heckman¹; David Adams¹; Ankit Srivastava¹; Khalid Hattar¹; Michael Demkowicz¹; ¹Sandia National Laboratories

4:50 PM Invited

A Perspective on Microstructural and Phase Evolution in Alloys during Extended Plastic Deformation: *Pascal Bellon*¹; Robert Averback¹; Fuzeng Ren²; Nirab Pant¹; Yinon Ashkenazy³; ¹University of Illinois at Urbana-Champaign; ²Southern University of Science and Technology; ³Hebrew University of Jerusalem

5:20 PM

Microstructure Control in Metal Composites Processed by Equal Channel Angular Extrusion: *Charles Borenstein*¹; Brady Butler²; James Paramore²; Robert Barber¹; Zachary Levin³; Karl Hartwig¹; Michael Demkowicz¹; ¹Texas A&M; ²US Army Research Laboratory; ³MS-16 Group, Los Alamos National Laboratory

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — High Temperature & Local Flow Curves

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

Program Organizers: Verena Maier-Kiener, Montanuniversitaet Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Tuesday AM | March 1, 2022

259A | Anaheim Convention Center

Session Chairs: Jeffrey Wheeler, ETH Zurich; Nathan Mara, University of Minnesota

8:00 AM

High-temperature Scanning Indentation: A New Technique to Assess Microstructural Changes Along Thermal Ramping: *Gabrielle Tiphène*¹; Paul Baral²; Solène Comby-Dassonneville³; Gaylord Guillonnet¹; Guillaume Kermouche⁴; Jean-Michel Bergheau¹; Warren Oliver⁵; Jean-Luc Loubet¹; ¹Ecole centrale de Lyon, LTDS UMR CNRS 5513, France; ²Institute of Mechanics, Materials and Civil Engineering, UCLouvain, B-1348, Louvain-la-Neuve, Belgium; ³INSA-Lyon, MATEIS UMR CNRS 5510, 7 Avenue Jean Capelle, 69621, Villeurbanne Cedex, France; ⁴Mines Saint-Etienne, UMR CNRS 5307 LGF, Centre SMS, F – 42023 Saint-Etienne, France; ⁵KLA Nanomechanics Inc, Oak Ridge, USA

8:20 AM

Nanoindentation to Determine High Temperature Rate Effects in Advanced Nuclear Reactor Steels: *Moujhuri Sau*¹; Zezhou Li¹; Eric Hintsala²; Douglas Stauffer²; Laurent Capolungo³; Nathan Mara¹; ¹University of Minnesota; ²Bruker Nano Inc.; ³Los Alamos National Laboratory

8:40 AM Invited

Variable Strain Rate Stress-strain Behavior Using Displacement-controlled Spherical Nanoindentation: *Jeffrey Wheeler*¹; ¹FemtoTools AG, Furtbachstrasse 4, CH-8107 Buchs/ZH, Switzerland

9:05 AM

Nanoindentation for Reliable Assessment of Mechanical Flow Curves Under Ambient and Non-ambient Conditions: Verena Maier-Kiener¹; Gerald Schaffar¹; Anna Ebner¹; *Daniel Kiener*¹; ¹Montanuniversitaet Leoben

9:25 AM Break

9:40 AM

Measuring Stress-strain Curves of Metals by Nanoindentation with a Frustum: *Jennifer Hay*¹; Marzyeh Moradi¹; ¹KLA

10:00 AM

Process-structure-property-performance Relations for High-pressure Cold-sprayed Metals via Nanoindentation Stress-strain Measurements: *Bryer Sousa*¹; Jennifer Hay²; Danielle Cote¹; ¹Worcester Polytechnic Institute; ²KLA Instruments

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — Reimagining Process, Material, and Component Optimization

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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Tuesday AM | March 1, 2022
258B | Anaheim Convention Center

Session Chair: Nima Shamsaei, Auburn University

8:00 AM Invited

Powder Oxygen Heterogeneities and Significant Intra-build Tensile Strength Variation from Common EB-PBF Ti-6Al-4V Powder Reuse Methods: Nicholas Derimow¹; Jake Benzing¹; Newell Moser¹; Orion Kafka¹; *Nik Hrabe*¹; Priya Pathare²; Frank DelRio²; ¹National Institute of Standards and Technology; ²Sandia National Laboratory

8:30 AM

Characterization of Additively Manufactured 17-4 PH Steel Structure with Ultrasonic Technique: *Justin Boswell*¹; Ping-Chuan Wang¹; Aaron Nelson¹; Terence Costigan²; Robert Van Pelt²; ¹SUNY New Paltz; ²Sono-Tek Corporation

8:50 AM

Fracture Behavior of Laser Powder Bed Fusion Fabricated Ti41Nb via In-situ Alloying: *Sheng Huang*¹; Punit Kumar¹; R. Lakshmi Narayan²; Wai Yee Yeong¹; Upadrasta Ramamurty¹; ¹Nanyang Technological University; ²Indian Institute of Technology Delhi

9:10 AM

Compression Testing and Characterization of L-PBF Ti-5Al-5V-5Mo-3C and E-PBF Ti-6Al-4V: Paul Korinko¹; *Mackenzie Smith*¹; ¹Savannah River National Laboratory

9:30 AM Break

9:50 AM Invited

Rotating Bending Fatigue Behavior of EB-PBF Ti-6Al-4V with Globular Alpha Surface Layer: Nicholas Derimow¹; *Keenan Hanson*²; Jake Benzing¹; Newell Moser¹; Orion Kafka¹; *Nik Hrabe*¹; ¹National Institute of Standards and Technology; ²Stryker Orthopaedics

10:20 AM Invited

High-strain Rate / Shock-loading Response of AM-processed Materials: *George Gray*¹; Saryu Fensin¹; David Jones¹; Dan Thoma²; ¹Los Alamos National Laboratory; ²University of Wisconsin-Madison

10:50 AM Invited

Mechanical Properties of AM Deposited Metallic Components: *Jan Dzugan*¹; Daniel Melzer¹; Sylwia Rzepa¹; Libor Kraus¹; Mohsen Seifi²; Nima Shamsaei³; John Lewandowski⁴; ¹COMTES FHT; ²ASTM International; ³Auburn University; ⁴Case Western Reserve University

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications IV — Characterization/Modeling

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

Program Organizers: Isabella Van Rooyen, Pacific Northwest National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University; Michael Kirka, Oak Ridge National Laboratory

Tuesday AM | March 1, 2022
261B | Anaheim Convention Center

Session Chairs: Indrajit Charit, University of Idaho; Amey Khanolkar, Idaho National Laboratory; Xiaoyuan Lou, Auburn University

8:00 AM Invited

Characterization and Testing of Additively Manufactured T-91 Ferritic/Martensitic Material: *Peter Hosemann*¹; Jeffrey Bickel¹; Calvin Lear²; Thomas Lienert³; Debroy Tarasankar⁴; Tuhin Mukherjee⁴; Osman El Atwani²; Stuart Maloy²; ¹University of California, Berkeley; ²Los Alamos National Laboratory; ³Optomec; ⁴Penn State University

8:30 AM

Optimization, Processing and Characterization of a Crack-resistant High-gamma Prime Superalloy for Additive Manufacturing in Power Generation Applications: Ning Zhou¹; *Stephane Forsik*²; Austin Dicus¹; Tao Wang¹; Gian Colombo¹; Andrew Holliday²; Michael Kirka³; Alexander Lunt⁴; Mario Epler¹; ¹Carpenter Technology Corporation; ²Carpenter Additive; ³Oak Ridge National Laboratory; ⁴University of Bath

8:50 AM

Effect of Microstructural Features on High Temperature Strength and Ductility of Selective Laser Melted Ni-base Superalloy: *Masaki Taneike*¹; ¹Mitsubishi Heavy Industries, Ltd.

9:10 AM

Relating Laser Scanning Effects to Cracking and Grain Structure of High-strength Superalloys: *Marcus Lam*¹; ¹Monash University

9:30 AM Break

9:45 AM

The Microstructure, Mechanical, and Physical Properties of Additively Manufactured 316H Stainless Steel Lattices: *Carly Romnes*¹; Mohamed Aboukhatwa²; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²Illinois Applied Research Institute

10:05 AM

High Substrate Heating (up to 500 degC) in Laser Powder Bed Fusion of High-strength Superalloys and Its Implications: *Marcus Lam*¹; ¹Monash University

10:25 AM

Light on: In Situ Investigation of Structural Transformation of Additive Manufactured Aluminum Alloys Using Synchrotron Methods: *Fan Zhang*¹; ¹National Institute of Standards and Technology

10:45 AM

Identification of Nanoparticles Dispersion Mechanism in 316L Metal Matrix Composite Additively Manufactured by Hybrid Process of Jetting and Laser Powder Bed Fusion: *Milad Ghayoor*¹; Omid Sadeghi¹; Bryce Cox¹; Ryan Doyle¹; Joshua Gess¹; Somayeh Pasebani¹; ¹Oregon State University

11:05 AM

Design of Graded Transition Joints between Grade 91 Ferritic/Martensitic Steel and 347 Austenitic Stainless Steels with Non-linear Composition Variation Using Integrated Computational Materials Engineering (ICME) Approach: *Rangasayee Kannan¹; Yousub Lee¹; Andres Rossy¹; Brian Jordan¹; Edgar Lara-Curzio¹; Peeyush Nandwana¹; ¹Oak Ridge National Laboratory*

11:25 AM

Recent Advancements in SPPARKS Metal Additive Manufacturing Simulation Capabilities: *Theron Rodgers¹; Robert Moore²; John Mitchell¹; Jeremy Trageser¹; Daniel Moser¹; Fadi Abdeljawad²; Jonathan Madison¹; ¹Sandia National Laboratories; ²Clemson University*

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Steels

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

Program Organizers: Sneha Prabha Narra, Carnegie Mellon University; Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh

Tuesday AM | March 1, 2022

263A | Anaheim Convention Center

Session Chair: Sougata Roy, University of North Dakota

8:00 AM

Correlating Microstructure with Thermal Models in Wire-arc Additive Manufacturing of Mild Steel: *Mark Anderson¹; Jeffrey Shield¹; Prahalada Rao¹; Janmejay Kulkarni²; Alex Riensche¹; Surya Kumar²; ¹University of Nebraska - Lincoln; ²Indian Institute of Technology Hyderabad*

8:20 AM

Characterization of a Large-scale 316L Body Produced with High Deposition Rate Wire Arc Directed Energy Deposition: *Luc Hagen¹; Zhenzhen Yu¹; Stephen Tate²; Andrzej Nycz³; Luke Meyer³; Jonah Klemm-Toole¹; ¹Colorado School of Mines; ²EPRI; ³Oak Ridge National Laboratory*

8:40 AM

Effects of Interlayer Dwell Time on Microstructure of Maraging Steel 250 Thin Walls Fabricated via Wire Arc Additive Manufacturing: *Yao Xu¹; Brajendra Mishra¹; Sneha Prabha Narra²; ¹Worcester Polytechnic Institute; ²Carnegie Mellon University*

9:00 AM

The Effect of Preheating Substrate on the Microstructure and Mechanical Properties in Laser Deposited Martensitic Steel: *Md Mehadi Hassan¹; Madhavan Radhakrishnan¹; Thomas Lienert²; Osman Anderoglu¹; ¹University of New Mexico; ²Optomec Inc.*

9:20 AM Break

9:40 AM

Wire Arc Additive Manufacturing of Stainless Steels: Kinetics Modeling of Phase Transformations Using Differential Scanning Calorimetry: *Md Moniruzzaman¹; Ali Nasiri²; Amir Hadadzadeh¹; ¹University of Memphis; ²Dalhousie University*

10:00 AM

A Comparative Study of Deformation Mechanisms in 316L Stainless Steel Fabricated by Additive and Additive + Subtractive (Hybrid) Manufacturing: *Rangasayee Kannan¹; Peeyush Nandwana¹; Christopher Fancher¹; Thomas Feldhausen¹; ¹Oak Ridge National Laboratory*

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of Refractory Alloys and High Entropy Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Isabella Van Rooyen, Pacific Northwest National Laboratory; Omar Mireles, NASA Marshall Space Flight Center; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Edward Herderick, Ohio State University; Matthew Osborne, Global Advanced Metals

Tuesday AM | March 1, 2022

262C | Anaheim Convention Center

Session Chairs: Eric Lass, University of Tennessee - Knoxville; Matt Osbourne, Global Advanced Metals; Jeffrey Sowards, Nasa - MSFC

8:00 AM

Additive Manufacturing of Refractory High Entropy Alloys: *Shahryar Mooraji¹; Xuesing Fan²; George Kim³; Wen Chen¹; Peter Liaw²; Wei Chen³; ¹UMass Amherst; ²University of Tennessee, Knoxville; ³Illinois Institute of Technology*

8:20 AM

Effect of Minor Titanium and Aluminum Addition on Ductility of Refractory High Entropy Alloy: *Surya Bijjala¹; Pankaj Kumar¹; ¹University of New Mexico*

8:40 AM

Mechanical Properties and Microstructural Characteristics of Additively Manufactured C103 Niobium Alloy: *Prithvi Awasthi¹; Priyanka Agrawal¹; Ravi Haridas¹; Rajiv Mishra¹; Michael Stawovy²; Scott Ohm²; Aidin Imandoust¹; ¹University of North Texas; ²H.C. Starck Solutions*

9:00 AM

Laser Beam Directed Energy Deposition Process Optimization for Refractory High Entropy Alloys: *Erin Barrick¹; Raymond Puckett¹; Shaun Whetten¹; Jonathan Pegues¹; Michael Melia¹; Remi Dingreville¹; Sal Rodriguez¹; Andrew Kustas¹; ¹Sandia National Laboratories*

9:20 AM Break

9:40 AM

Design and Development of 3D Printable Nb-based Alloys for High Temperature Applications: *Ishtiaq Ahmed Fazle Rabbi¹; Prithvi Awasthi¹; Aidin Imandoust¹; ¹University of North Texas*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — High-speed X-ray Imaging

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Tuesday AM | March 1, 2022
258A | Anaheim Convention Center

Session Chair: Tao Sun, University of Virginia

8:00 AM Invited

Utilising High-speed Synchrotron X-ray Imaging to Understand the Response of AM Alloys under Realistic Processing Conditions:

*Peter Lee*¹; Chu Lun Alex Leung¹; Yunhui Chen¹; Sebastian Marussi¹; Samy Hocine¹; Elena Ruckh¹; Yuze Huang¹; Maureen Fitzpatrick¹; Marta Majkut²; Alexander Rack²; Veijo Honkimaki²; Robert Atwood³; Sam Clark⁴; Ben Saunders⁵; Martyn Jones⁵; ¹University College London; ²European Synchrotron Radiation Facility; ³Diamond Light Source; ⁴Argonne National Laboratory; ⁵Rolls-Royce plc

8:30 AM

In-situ Dynamic Synchrotron X-ray Radiography Study on the Effect of Laser Power on Melt Pool Dynamics and Solidification Kinetics during Laser Spot Melting of Ti-6Al-4V Alloy: *Rakesh Kamath*¹; Ryan Heldt¹; Yuan Li¹; Meiyue Shao²; Sriram Vijayan²; Joerg Jinschek²; Tao Sun³; Hahn Choo¹; ¹University of Tennessee; ²Ohio State University; ³Argonne National Laboratory; University of Virginia

8:50 AM

Grain Morphology Prediction in AM Simulated Beta-Titanium: *Chris Jasien*¹; Alec Saville¹; Jonah Klemm-Toole¹; Kamel Fezzaa²; Tao Sun²; Amy Clarke¹; ¹Colorado School of Mines; ²Advanced Photon Source, Argonne National Laboratory

9:10 AM

Comparison of Benefits and Limitations of High Temporal Versus Low Temporal Resolution of In Situ In Operando AM Imaging of Superalloys: *Maureen Fitzpatrick*¹; Yunhui Chen¹; Marta Majkut²; Bratislav Lukic²; Kudakwashe Jakata²; Sebastian Marussi¹; Alexander Rack²; Peter Lee¹; ¹UCL; ²ESRF

9:30 AM Break

9:45 AM

Characterization of the Healability of Aluminium Alloys Produced by Laser Powder Bed Fusion (L-PBF) Using X-ray Nanoholotomography at Synchrotron (ESRF): *Julie Gheysen*¹; Mariia Arsenenko¹; Grzegorz Pyka¹; Florent Hannard¹; Julie Villanova²; Aude Simar¹; ¹UCLouvain; ²ESRF

10:05 AM

Building Links between Laser Melting Phenomena Observed with In Situ X-ray Imaging and Laboratory-based Process Monitor: *Nicholas Catta*¹; Aiden Martin²; Jenny Wang²; Jean Baptiste Forien²; Maria Strantz²; Manyalibo Matthews²; ¹Lawrence Livermore National Laboratory; ²Lawrence Livermore National Lab

10:25 AM Invited

Melt Pool Oscillations at Keyhole Transition as a Precursor to Pore-generating Turbulence: *Brian Simonds*¹; Tao Sun²; Saad Khairallah³; ¹National Institute of Standards and Technology; ²University of Virginia; ³Lawrence Livermore National Laboratory

10:55 AM

Pairing X-ray Synchrotron Imaging, In-situ Absorption Measurements, Thermal Modeling, and Post-mortem Metallography Towards the Understanding of the Solidification Microstructures in Ti-6Al-4V for Additive Manufacturing Applications: *Nicholas Derimow*¹; Edwin Schwalbach²; Jake Benzing¹; Alexandria Artusio-Glimpse¹; Nikolas Hrabec¹; Brian Simonds¹; ¹National Institute of Standards and Technology; ²Air Force Research Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III — Cold Spray

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Tuesday AM | March 1, 2022
263B | Anaheim Convention Center

Session Chairs: Zach Levin, Los Alamos National Laboratory; Brady Butler, DEVCOM ARL

8:00 AM Introductory Comments

8:10 AM

Effect of Laser Heating on Microstructure and Deposition Properties of Cold Sprayed SS304L: *Christopher Roper*¹; Anita Heczel¹; Venkata Satish Bhattiprolu²; Jeno Gubicza³; Tamas Kolonits³; Luke Brewer¹; ¹The University of Alabama; ²South Dakota School of Mines and Technology; ³Eötvös Loránd University

8:30 AM

Mesoscale Simulation of Cold Spray Microstructure Formation: *Theron Rodgers*¹; Jacob Mahaffey¹; ¹Sandia National Laboratories

8:50 AM

Influence of Hydrogen Content and Particle Size Distribution on the Microstructure of Tantalum Cold Spray Coatings: *Kliah Soto Leytan*¹; Mahsa Amir¹; Lorenzo Valdevit¹; *Daniel Mumm*¹; ¹University of California, Irvine

9:10 AM

Practical Considerations for Complex Path Planning for Cold Spray Additive Manufacturing: *Christopher Massar*¹; ¹Worcester Polytechnic Institute

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — High Temperature Alloys

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Tuesday AM | March 1, 2022
261A | Anaheim Convention Center

Session Chair: James Saal, Citrine Informatics

8:00 AM

Composition-dependence of the Microstructural and Mechanical Properties of Co-Cr-Fe-Ni Multicomponent Alloys Fabricated by Directed Energy Deposition: *Daniel Salas Mula*¹; Ryan Saucier¹; Tanner Kirk¹; Sezer Picak¹; Michael Elverud¹; Raymundo Arróyave¹; Ibrahim Karaman¹; ¹Texas A&M University

8:20 AM

Development of Metal-ceramic Hybrid Structure Using Additive Manufacturing Technology: *Hyun-Gil Kim*¹; Sung Chan Yoo¹; ¹KAERI

8:40 AM

3D Printing of Ni-based Superalloys: Influence of Composition on Processability and Performance: *Joseph Ghoussoub*¹; Yuanbo Tang¹; Roger Reed¹; ¹University of Oxford

9:00 AM

Additively Manufactured 718 Ni Alloys with Oxide Nanoparticles: *Benjamin Stegman*¹; Bo Yang¹; Zhongxia Shang¹; Jie Ding¹; Tianyi Sun¹; Jack Lopez²; William Jarosinski²; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University; ²Praxair Surface Technologies Inc.

9:20 AM Break

9:35 AM

Applications of a Subspace-inclusive Sampling Method for the Computational Design of Compositionally Graded Alloys: *Marshall Allen*¹; Raymundo Arroyave¹; Richard Malak¹; ¹Texas A&M University

9:55 AM

Behavior of Coated Particles in Directed Energy Deposition: *Sen Jiang*¹; *Baolong Zheng*¹; David Svetlizky²; Yizhang Zhou¹; Lorenzo Valdevit¹; Noam Eliaz²; Enrique Lavernia³; Julie Schoenung¹; ¹University of California Irvine; ²Tel-Aviv University; ³National Academy of Engineering

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Nuclear Fuels Microstructure-Experimental

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Tuesday AM | March 1, 2022
202B | Anaheim Convention Center

Session Chair: Fabiola Cappia, Idaho National Laboratory

8:00 AM Invited

Pulsed Neutron Characterization of Irradiated Fuels at LANSCE: *Sven Vogel*¹; Thilo Balke¹; Charles A. Bouman²; Luca Capriotti³; Jason M. Harp⁴; Alexander M. Long¹; Danielle C. Schaper¹; Anton S. Tremsin⁵; Brendt E. Wohlberg¹; Eric J. Larson¹; Aaron E. Craft³; Brian J. Gross³; D. Travis Carver¹; James R. Angell³; Vedant K. Mehta¹; ¹Los Alamos National Laboratory; ²Purdue University; ³Idaho National Laboratory; ⁴Oak Ridge National Laboratory; ⁵University of California Berkeley

8:30 AM

On the Phases Observed in Irradiated U-19Pu-14Zr Fuels: *Assel Aitkaliyeva*¹; Thaddeus Rahn¹; Karen Wright²; Luca Capriotti²; ¹University of Florida; ²Idaho National Laboratory

8:50 AM

Perspectives on Synchrotron Micro-computed Tomography and Serial Sectioning Applied to Metallic Nuclear Fuels: *Maria Okuniewski*¹; Alejandro Figueroa Bengoa¹; Jonova Thomas²; ¹Purdue University; ²Argonne National Laboratory

9:10 AM

Thermophysical Properties of Liquid Chlorides from 600-1600 K: *Stephen Parker*¹; ¹Los Alamos National Laboratory

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session III

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Taran, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Tuesday AM | March 1, 2022
207A | Anaheim Convention Center

Session Chairs: Michael Tonks, University Of Florida; Rodney McCabe, Los Alamos National Laboratory

8:00 AM Invited

A 3D Microstructure Evaluation Tool for Interface Statistics: An Application to Deformation Twins: *Rodney McCabe*¹; Patrick Pinney¹; Renuka Gogusetti¹; M Arul Kumar¹; Carlos Tomé¹; Laurent Capolungo¹; ¹Los Alamos National Laboratory

8:30 AM

Martensitic Transformation-mediated Twin Nucleation in Hexagonal Close Packed Metals: *Lei Cao*¹; Amir Hassan Zahiri¹; Jamie Ombogo¹; ¹University of Nevada

8:50 AM

Investigation of Grain Size Effects on Cyclic Deformation and Twinning in Magnesium Alloys by High Energy X-ray Diffraction: *Duncan Greeley*¹; Mohammadreza Yaghoobi¹; Katherine Shanks²; Darren Pagan²; Veera Sundararaghavan¹; John Allison¹; ¹University of Michigan; ²Cornell High Energy Synchrotron Source

9:10 AM

Statistical Analysis of Forward and Lateral Transmission of Twins Across Grain Boundaries in HCP Magnesium: *Mariyappan Arul Kumar*¹; Rodney McCabe¹; Laurent Capolungo¹; Carlos Tome¹; ¹Los Alamos National Laboratory

9:30 AM Break

9:45 AM Invited

Considering the Impact of Anisotropy on Microcracking in Brittle Materials Using the Phase Field Fracture Model: *Michael Tonks*¹; Shuaifang Zhang²; Aashique Rezwan³; Andrea Jokisaari⁴; Wen Jiang⁴; ¹University of Florida; ²Oak Ridge National Laboratory; ³University of Wisconsin-Madison; ⁴Idaho National Laboratory

10:15 AM

On the Correlation between Plastic Strain and Misorientation in Polycrystalline Body-centered-cubic Titanium Alloys: An Experimentally and Numerically Study: *Vahid Khademi*¹; Thomas Bieler¹; Masahiko Ikeda²; *Carl Boehlert*¹; ¹Michigan State University; ²Kansai University

10:35 AM

The Effects of Precipitates on Twinning in Mg Alloys: *Brandon Leu*¹; M Arul Kumar²; Kelvin Xie³; Irene Beyerlein¹; ¹University of California, Santa Barbara; ²Los Alamos National Laboratory; ³Texas A&M University

10:55 AM

Experimental Characterization and Explicit Slip Band Micromechanical Modeling of Slip Localization in FCC and HCP Metals: *Behnam Ahmadikia*¹; Jean Charles Stinville¹; Tresa Pollock¹; Irene Beyerlein¹; ¹University Of California Santa Barbara

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Energy Storage with Battery

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Tuesday AM | March 1, 2022
212B | Anaheim Convention Center

Session Chairs: Sarbajit Banerjee, Texas A&M University; Partha Mukherjee, Purdue University

8:00 AM Invited

Engineering Phase Transformations in Intercalation Materials: *Ananya Renuka Balakrishna*¹; ¹University of Southern California

8:25 AM

Chemo-mechanics of Alkali-ion Intercalation into Iron Phosphate Composite Cathodes: *Omer Ozgur Capraz*¹; *Bertan Ozdogru*¹; ¹Oklahoma State University

8:45 AM

Computational Investigations of the Structure and Interface Stability of the Solid Electrolyte Material Li4PS4I: *Ahmad Al-Qawasmeh*¹; El Mostafa Benchafia¹; Sufian Abedrabbo¹; ¹Khakifa University

9:05 AM

First Principles Studies on Doping Effect of Ni-rich Cathode Material: *Zhou Xiangyuan*¹; ¹Central South University

9:25 AM Break

9:45 AM

AI BMS Design with Sensor and ML Integration: *Alexey Serov*¹; ¹Purdue University

CHARACTERIZATION

Advanced Real Time Imaging — Alloys, Ceramics, and Additive Manufacturing

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

Program Organizers: Jinichiro Nakano, US Department of Energy - National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, Kth Royal Institute of Technology; David Veysset, Stanford University; Pranjal Nautiyal, University of Pennsylvania

Tuesday AM | March 1, 2022
206A | Anaheim Convention Center

Session Chair: Wangzhong Mu, Kth Royal Institute of Technology

8:00 AM

In-situ Observation of Phase Transformations in Co-based Dual Phase Entropic Alloys Using High Temperature Confocal Laser Scanning Microscopy: *Wangzhong Mu*¹; Wei Wang²; Ziyong Hou³; Sohei Sukenaga⁴; Hiroyuki Shibata⁴; Henrik Larsson¹; Huahai Mao¹; ¹KTH Royal Institute of Technology; ²Northeast Electric Power University; ³International Joint Laboratory for Light Alloys (MOE), College of Materials Science and Engineering & Shenyang National Laboratory for Materials Science, Chongqing University; ⁴Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

8:20 AM

Assessing the Evolution of Pit Growth Kinetics during Atmospheric Corrosion Using In-situ X-ray Tomography: *Philip Noell*¹; Eric Schindelholz²; Michael Melia¹; Ian Campbell¹; ¹Sandia National Laboratories; ²The Ohio State University

8:40 AM

In-situ X-ray Imaging of Melt Flow and Melt Pool Variation during Laser Metal Additive Manufacturing Process: *Qilin Guo*¹; Cang Zhao²; Minglei Qu¹; Lianghua Xiong³; Luis I. Escano¹; S. Mohammad H. Hojjatzadeh¹; Niranjana D. Parab²; Kamel Fezzaa²; Wes Evehart⁴; Tao Sun²; Lianyi Chen¹; ¹University Of Wisconsin Madison; ²Argonne National Laboratory; ³Missouri S&T; ⁴Department of Energy's Kansas City National Security Campus Managed by Honeywell FM&T

9:00 AM

Two-color Pyrometry as a Defect Predictor in the Additive Manufacturing of 316L Stainless Steel: *Mary Arnhart¹; Andrew Polonsky¹; Thomas Ivanoff¹; John Mitchell¹; Bradley Jared¹; Daryl Dagle²; Jonathan Madison¹; ¹Sandia National Laboratories; ²Ball Aerospace & Technologies Corporation*

9:20 AM Break

9:40 AM

Visualizing the Path of Corroding Mg Alloys Using High Phase Contrast X-ray Computed Tomography: *Chi Zhang¹; Junsheng Wang¹; Chen Liu²; Keli Liu¹; Guangyuan Tian¹; Xin Li¹; ¹Beijing Institute of Technology; ²Ningbo Branch of Chinese Academy of Ordnance Science*

NANOSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — Advances in Thin Film Oxides II

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Amit Pandey, Lockheed Martin Space; Saurabh Puri, Microstructure Engineering; Amber Srivastava, Indian Institute of Technology; Nugehalli Ravindra, New Jersey Institute of Technology

Tuesday AM | March 1, 2022

259B | Anaheim Convention Center

Session Chair: Amber Srivastava, IIT-B

8:00 AM Invited

ALD Deposited Functional Hetero-nano Structured Ceria Films: *Sudipta Seal¹; Udit Kumar¹; Corbin Feit¹; S. Novia Berriel¹; Ayush Arunachalam¹; Kanad Basu¹; Parag Banerjee¹; ¹University of Central Florida*

8:30 AM

Effect of Saturated Gas Species on the Binding Interaction between Nanobubbles and Nanoparticles: *Ao Li¹; James Earthman¹; ¹University of California-Irvine*

8:55 AM

3D Heterostructures via Mechanochemical Reshuffling of Layered and Non-layered Metal Chalcogenides: *Viktor Balema¹; ¹ProChem Inc. Rockford IL USA*

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — Structures and Modeling III

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday AM | March 1, 2022

251B | Anaheim Convention Center

Session Chairs: Chelsey Hargather, New Mexico Institute of Mining and Technology; Seungha Shin, University of Tennessee

8:00 AM

First-principles-based High-throughput Prediction of the Phase Stability of Refractory Complex Concentrated Alloys: *Zhaohan Zhang¹; Mu Li¹; John Cavin¹; Katharine Flores¹; Rohan Mishra¹; ¹Washington University in St. Louis*

8:20 AM Invited

First-principles Exploration of Diffusion Activation Energy in CoCrNi and CoCrFeNiMn High-entropy Alloys, with Comparison to Creep Activation Energy: *Christopher Lafferty¹; Chelsey Hargather¹; ¹New Mexico Institute of Mining and Technology*

8:40 AM Invited

Experimental, Theoretical, and Numerical Study for Dynamic Strain Aging in HfNbTaTiZr High-entropy Alloys: *Yooseob Song¹; Weidong Li²; Shuying Chen³; Ko-Kai Tseng⁴; Jien-Wei Yeh⁴; Peter K. Liaw²; ¹University of Texas Rio Grande Valley; ²The University of Tennessee, Knoxville; ³Yantai University; ⁴National Tsing Hua University*

9:00 AM Invited

Multiscale Dynamics of the Oxide Scale in High-entropy Alloys: *Indranil Roy¹; Jhalak²; Ganesh Balasubramanian¹; Pratik Ray²; ¹Lehigh University; ²Indian Institute of Technology Ropar*

9:20 AM Break

9:40 AM Invited

Developing Interatomic Potentials for High Entropy Alloys: *Diana Farkas¹; Alfredo Caro²; ¹Virginia Polytechnic Institute; ²George Washington University*

10:00 AM

Atomistic Modeling of Vacancy Concentration and Tracer Diffusion in Ni-CoCrFeMn Alloys: *Daniel Utt¹; Karsten Albe¹; ¹Technische Universität Darmstadt*

10:20 AM Invited

Computational Study of Thermodynamic and Thermoelectric Properties of Al-Co-Cr-Fe-Ni and Al-Cu-Fe-Mn-Ni High-entropy Alloys: *Md Abdullah Al Hasan¹; Seungha Shin¹; Xuesong Fan¹; Peter Liaw¹; Dustin Gilbert¹; ¹University of Tennessee*

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Advanced Ceramics and Processes

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Tuesday AM | March 1, 2022
213C | Anaheim Convention Center

Session Chairs: Eugene Olevsky, San Diego State University; Faqin Dong, Southwest University of Science and Technology

8:00 AM Invited

Tailored and Bioinspired Porous Ceramics from Externally-controlled Freeze Casting: *Steven Naleway¹; Debora Lyn Porter¹; Josh Fernquist¹; Tony Yin¹; Josh Alexander¹; Max Mroz¹; ¹University of Utah*

8:20 AM

Atomistic Modeling of the Effect of External Electric Field on Diffusivity and Flash Sintering of 8YSZ: *Wenwu Xu¹; Md. Shahrier Hasan¹; Eugene Olevsky¹; ¹San Diego State University*

8:40 AM

Consolidation of Cemented Tungsten Carbide with FeNiZr Binder via Tandem Field Assisted Sintering and Hot Isostatic Pressing: *Sean Fudger¹; Thomas Luckenbaugh¹; B. Chad Hornbuckle¹; Anit Giri¹; Kris Darling¹; ¹DEVCOM - Army Research Laboratory*

9:00 AM

Effect of Copper Doping on the Thermal Stability of Mayenite Electride: *Liam Fisher¹; Kaka Ma¹; ¹Colorado State University*

9:20 AM

Rapid Synthesis of Zirconia-ceria Mixed Oxides by Flash Sintering: *Rubens Ingraci¹; Darrin Byler¹; Kenneth McClellan¹; Erofil Kardoulaki¹; ¹Los Alamos National Laboratory*

9:40 AM Break

9:55 AM

Multiscale Phase Homogeneity in Bulk (CoCuMgNiZn)O High Entropy Oxides: *Alexander Dupuy¹; Mohammed Reda Chellali²; Xin Wang¹; Horst Hahn²; Julie Schoenung¹; ¹University of California, Irvine; ²Karlsruhe Institute of Technology*

10:15 AM

Kinetic Investigations of Phase Formation Processes in the Ba(Ca,Sr)O-Al₂O₃-ZrO₂ System: *Nikolai Iliukha¹; ¹Kyiv University*

10:35 AM

Containerless Processing and Characterization of Potential Host Crystals for Photorefractive Devices: *Elizabeth Hodges¹; Michael Sansoucie²; Robert Hyers¹; ¹University of Massachusetts-Amherst; ²NASA*

10:55 AM

Microstructures and Mechanical Properties of α -SiC Ceramics after High-temperature Laser Shock Peening: *Fei Wang¹; Xin Chen²; Daniel DeLellis³; Amanda Krause³; Yongfeng Lu⁴; Bai Cui⁴; ¹University of Nebraska Lincoln; ²University of Nebraska-Lincoln; ³University of Florida; ⁴University of Nebraska-Lincoln*

MATERIALS DESIGN

Advances in Titanium Technology — Phase Transformation in Ti Alloys

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Tuesday AM | March 1, 2022
252A | Anaheim Convention Center

Session Chair: Stoichko Antonov, Max-Planck-Institut für Eisenforschung GmbH

8:00 AM

Role of Defects in Alpha Precipitation in Metastable Beta Ti-5Al-5Mo-5V-3Cr Alloy: *Dian Li¹; Wenrui Zhao¹; Stoichko Antonov²; Yufeng Zheng¹; ¹University of Nevada-Reno; ²Max-Planck-Institut für Eisenforschung*

8:20 AM

β -titanium bcc-superalloys with Reinforcement by β' Ordered bcc TiFe Precipitates: *Paraic O'Kelly¹; Alexander Knowles¹; ¹University of Birmingham*

8:40 AM

Exploring Sub-stoichiometric Titanium Hydride Phase Space via Vacuum Hydrogen Annealing, X-ray Diffraction, and Combined Thermogravimetric Analysis/Mass Spectroscopy: *Chad Macziewski¹; Daniel Bufford¹; ¹Sandia National Laboratories*

9:00 AM

Local Distortion Effects on the Dynamic Lattice Stability in the BCC Phase of Titanium and Its Alloys: An Ab-initio Study: *Sri Ranga Jai Likhith¹; Benjamin Ellyson¹; Amy Clarke¹; ¹Colorado School of Mines*

9:20 AM

Monte Carlo Simulations for Texture-controlled Grain Growth during Beta-annealing of Ti-6Al-4V: *Denielle Ricciardi¹; Nate Levkulich¹; Lee Semiatin¹; Eric Payton¹; ¹Air Force Research Laboratory*

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Image Characterization

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Tuesday AM | March 1, 2022
256A | Anaheim Convention Center

Session Chair: Marat Latypov, University of Arizona

8:00 AM Invited

Physics-informed Data-driven Surrogate Modeling for Advancing Experiments and the Study of Novel Materials: *Anup Pandey¹; Reemu Pokharel¹; ¹Los Alamos National Laboratory*

8:30 AM

Learning from 2D: Data-driven Model Predicting Bulk Properties Based on 2D Microstructure Sections: *Marat Latypov*¹; ¹University of Arizona

8:50 AM

Investigation of Microstructure Image Segmentation via Deep Learning with Limited Data Annotations: *Bo Lei*¹; *Elizabeth Holm*¹; ¹Carnegie Mellon University

9:10 AM

Synthesizing Realistic Images of Material Microstructures Using Convolutional Neural Networks: *Stephen Baek*¹; *H.S. Udaykumar*²; *WaiChing Sun*³; *Phong Nguyen*¹; ¹University of Virginia; ²University of Iowa; ³Columbia University

9:30 AM Break

9:50 AM

Density-based Monte Carlo Consensus Clustering (DMC3) for Feature Extraction from Atom Probe Tomographs: *Evan Still*¹; *Daniel Schrieber*²; *Peter Hosemann*¹; ¹University of California Berkeley; ²Pacific Northwest National Laboratory

10:10 AM

Deep Learning-based Algorithms for X-ray Microtomography Analysis: Unravelling Challenges for 4D Experiments: *Hamidreza T-Sarraf*¹; *Hanyu Zhu*¹; *Swapnil Morankar*¹; *Amey Lukhtuke*¹; *Sridhar Niverty*¹; *Nikhilesh Chawla*¹; ¹Purdue University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Interatomic Potentials and Their Applications

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Tuesday AM | March 1, 2022

253A | Anaheim Convention Center

Session Chairs: Mikhail Mendelev, KBR, Inc./NASA Ames Research Center; Garritt Tucker, Colorado School of Mines

8:00 AM Invited

Addressing Variability in Atomistic Predictions: *Lucas Hale*¹; ¹National Institute of Standards and Technology

8:30 AM

A Generalization of the Universal Equation of States to Develop Magnetic Interatomic Potentials: *Isaac Toda-Caraballo*¹; *Jan Wróbel*²; *Duc Nguyen-Manh*³; ¹CENIM-CSIC; ²Warsaw University of Technology; ³Culham Centre for Fusion Energy, United Kingdom Atomic Energy Authority

8:50 AM Invited

An Entropy-maximization Approach for the Generation of Training Sets for Machine-learned Potentials: *Joshua Brown*¹; *Mariia Karabin*²; *Danny Perez*¹; ¹Los Alamos National Laboratory; ²Oak Ridge National Laboratory

9:20 AM Break

9:40 AM

Interatomic Potentials for Materials Science and Beyond; Advances in Machine Learned Spectral Neighborhood Analysis Potentials: *Mitchell Wood*¹; *Mary Alice Cusentino*¹; *Ivan Oleynik*²; *Aidan Thompson*¹; ¹Sandia National Laboratories; ²University of South Florida

10:00 AM

Refinements to the Production of Machine Learning Interatomic Potentials: *Jared Stimac*¹; *Jeremy Mason*¹; ¹University of California, Davis

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications X — Session III and IV

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

Program Organizers: Hsin-Jay Wu, National Chiao Tung University; Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Cnrs Crismat Unicaen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Takao Mori, National Institute For Materials Science; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology; Pai-chun Wei, National Taiwan University

Tuesday AM | March 1, 2022

303D | Anaheim Convention Center

Session Chairs: Yoshisato Kimura, Tokyo Institute of Technology; Philippe Jund, Montpellier University

8:00 AM Invited

Electronic and Phononic Features for High Thermoelectric Performance in Half-Heusler Materials: *David Singh*¹; *Zhenzhen Feng*²; ¹University of Missouri; ²Henan University

8:20 AM

Ultra-high Solubility of Al and Enhanced Thermopower in Fe₂VA_{1-x}: *Michael Parzer*¹; *Fabian Garmroudi*¹; *Alexander Riss*¹; *Takao Mori*²; *Ernst Bauer*¹; ¹TU Wien; ²National Institute of Materials Science

8:40 AM

High-throughput Transport Property Measurements of Additively Manufactured Thermoelectric Materials: *Dylan Kirsch*¹; *Vijayabarathi Ponnambalam*²; *Joshua Martin*¹; *Connor Headley*³; *Saniya LeBlanc*²; *Prasanna Balachandran*³; *Ji Ma*³; ¹National Institute of Standards and Technology; ²George Washington University; ³University of Virginia

9:00 AM Invited

The Role of Additive Manufacturing in Tailoring Thermoelectric Leg Shape and Transport Properties: *Saniya Leblanc*¹; *Bengisu Sisik*¹; *Ryan Welch*¹; *Yahya Oztan*¹; *Vijayabarathi Ponnambalam*¹; ¹George Washington University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Solidification Microstructure and Processing

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Tuesday AM | March 1, 2022
208B | Anaheim Convention Center

Session Chair: Jiawei Mi, University of Hull

8:00 AM

Understanding Pre-solidified Grains in Structural Castings of Nematolloy HE700 Experiments: *Talha Aziz*¹; Andre Phillion¹; Sumanth Shankar¹; Kumar Sadayappan²; ¹McMaster University; ²CanmetMaterials

8:25 AM

High Speed Observations of Ultrasonic Fragmentation and Deagglomeration Process of Free-floating Intermetallics and Oxide Particles: *Abhinav Priyadarshi*¹; Tungky Subroto²; Koulis Pericleous³; Dmitry Eskin²; John Durodola¹; Iakovos Tzanakis¹; ¹Oxford Brookes University; ²Brunel University London; ³University of Greenwich

8:50 AM Invited

Machine Learning Enhanced Synchrotron X-ray Tomography Analysis of the Convoluted 3D Fe-rich Intermetallic Phases in a Recycled Al Alloy: *Zhiguo Zhang*¹; Ling Qin¹; Jiawei Mi¹; ¹University of Hull

9:15 AM Break

9:30 AM

Al-Mg₂Si-Mg Alloys: Microstructure and Mechanical Properties from High Pressure Die Casting to Additive Manufacturing: Hailin Yang¹; Jianying Wang¹; Xixi Dong²; Shouxun Ji²; *Eric Nyberg*³; ¹Central South University; ²Brunel University London; ³Kaiser Aluminum Trentwood

9:55 AM

Phase Transformation and Microstructure Evolution of Al-Mn Alloy Made by Laser Additive Manufacturing: *Qingyu Pan*¹; Monica Kapoor²; Sean Mileski²; John Carsley²; Xiaoyuan Lou¹; ¹Auburn University; ²Novelis Global Research and Technology Center

10:20 AM

Growth Morphology of Nodular Primary Silicon in Hypereutectic Al-Si Alloy and Growth Mechanism: *Ruyao Wang*¹; Weihua Lu¹; ¹Institute of Materials Science and Engineering, Donghua University,

LIGHT METALS

Aluminum Reduction Technology Joint Session with REWAS: Decarbonizing the Metals Industry — Sustainability Joint Session with REWAS

Sponsored by: TMS: Recycling and Environmental Technologies Committee, TMS: Aluminum Committee

Program Organizers: Mertol Göknelma, Izmir Institute of Technology; Stephan Broek, Boston Metal

Tuesday AM | March 1, 2022
210C | Anaheim Convention Center

Session Chair: Stephan Broek, Hatch

8:00 AM Introductory Comments

8:05 AM

Cooling of Pot Gas Enabling Carbon Footprint Reductions: *Anders Sorhuus*¹; Håvard Olsen¹; Mikkel Sørum¹; Guillaume Girault²; ¹REEL Norway AS; ²REEL

8:25 AM

Bus Bars FSW Repair during Full Operation of Alumina Electrolysis: *Peter Brziak*¹; Gabriel Batista¹; Oliver Rovný¹; Vojtech Václav¹; Rastislav Dankovič¹; ¹Welding Research Institute

8:45 AM

Stabilizing Electrolysis Cells with Oscillating Currents: Amplitude, Frequency and Current Efficiency: *Ibrahim Mohammad*¹; Marc Dupuis²; Paul Funkenbusch¹; Douglas Kelley¹; ¹University of Rochester; ²GeniSim Inc.

BIOMATERIALS

Biological Materials Science — Biological Materials Science III

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Tuesday AM | March 1, 2022
201B | Anaheim Convention Center

Session Chairs: Jing Du, Penn State University; Ning Zhang, The University of Alabama

8:00 AM

Use of Freeze-casted Fluorohydroxyapatite as an Osteogenic Bone Substitute: *Anthony Yin*¹; Sujee Jeyapalina²; Steven Naleway¹; ¹Department of Mechanical Engineering, University of Utah; ²Department of Surgery, University of Utah Health

8:20 AM

Nanomechanical Mapping in Bone Using Atomic Force Microscopy: Yichun Tang¹; Yuxiao Zhou¹; *Jing Du*¹; ¹Penn State University

8:40 AM

Freeze-cast Ceramic Membranes for Pathogen Capture and Bioprocessing: *Katherine Faber*¹; Orland Bateman¹; Noriaki Arai¹; Laura Quinn¹; Julia Kornfield¹; Mamadou Diallo¹; ¹California Institute of Technology

9:00 AM

Curcumin Loaded Zinc – Fluorine Doped Hydroxyapatite for Osteoblast Growth, Osteosarcoma Inhibition, and Antibacterial Properties: *Arjak Bhattacharjee*¹; Amit Bandyopadhyay¹; Susmita Bose¹; ¹W. M. Keck Biomedical Materials Research Lab, Washington State University

BIOMATERIALS

BioNano Interfaces and Engineering Applications – Bionano Interfaces & Engineering Applications I

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

Program Organizers: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Tuesday AM | March 1, 2022

201A | Anaheim Convention Center

Session Chair: To Be Announced

8:00 AM Keynote

3D Printing for Bone Regeneration: Convergence of Knowledge: *Susmita Bose*¹; ¹Washington State University

8:40 AM Invited

Self-assembling Nanoclay Gels for Tissue Regeneration: *Jon Dawson*¹; ¹University of Southampton

9:10 AM

In vitro Pre-osteoblast Cell Differentiation by Luminescent Hydroxyapatite: *Fabian Martinez*²; Karla Juárez-Moreno²; Manuel Herrera²; Olivia Graeve¹; ¹University of California San Diego; ²Universidad Nacional Autónoma de México

9:30 AM Break

9:50 AM

Sensing of COVID-19 Antibodies and Antigens in Seconds via Aerosol Jet Nanoprinted Reduced Graphene Oxide Coated Three Dimensional Electrodes: *Md. Azahar Ali*¹; Chunshan Hu¹; Sanjida Jahan¹; Bin Yuan¹; Mohammad Sadeq Saleh¹; Fei Zhang²; Shou-Jiang Gao²; Rahul Panat¹; ¹Carnegie Mellon University; ²University of Pittsburgh Medical Center

ADVANCED MATERIALS

Bulk Metallic Glasses XIX — Mechanical and Physical Properties II

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Tuesday AM | March 1, 2022

253C | Anaheim Convention Center

Session Chairs: Lindsay Greer, University of Cambridge; Katherine Flores, Washington University

8:00 AM Invited

Elasticity and Configurational Thermodynamics of Metallic Glass Forming Liquids: *William Johnson*¹; Qi An²; ¹California Institute of Technology; ²Univ. of Nevada Reno

8:25 AM

Assessment of Excess Entropy in Extremely Fragile Glasses: *Hillary Smith*¹; Claire Saunders²; Camille Bernal²; Stefan Haegeli Lohaus²; Marios Demetriou³; Brent Fultz²; ¹Swarthmore College; ²Caltech; ³Glassimetal

8:45 AM

Cu-Nb Metallic Glasses with High Hardness: Mohammad Abboud¹; Amir Motallebzadeh²; Özgür Duygulu³; Robert Maaß⁴; *Sezer Ozerinc*¹; ¹Middle East Technical University; ²Koç University Surface Science and Technology Center; ³TÜBITAK Marmara Research Center Materials Institute; ⁴Federal Institute of Materials Research and Testing (BAM)

9:05 AM

Observation of the Invar Effect by In-situ X-ray Diffraction in Fe-based Bulk Metallic Glasses: *Alexander Firlus*¹; Mihai Stoica¹; Stefan Michalik²; Robin Schäublin¹; Jörg Löffler¹; ¹ETH Zurich; ²Diamond Light Source

9:25 AM Discussion on mechanical and physical properties of metallic glasses

LIGHT METALS

Cast Shop Technology — Melt Treatment

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

Program Organizers: Stephen Instone, Speira GmbH; Mertol Gökelma, Izmir Institute of Technology; Samuel Wagstaff, Oculatus; Dmitry Eskin, Brunel University

Tuesday AM | March 1, 2022

209A | Anaheim Convention Center

Session Chair: Gerd-Ulrich Gruen, Speira GmbH

8:00 AM

Performance of Regular and Modified Ceramic Foam Filters (CFFs) during Aluminium Melt Filtration in a Pilot Scale Setup: *Are Bergin*¹; Claudia Voigt²; Robert Fritzsche³; Shahid Akhtar⁴; Lars Arnberg³; Christos G. Aneziris²; Ragnhild E. Aune³; ¹Norwegian University of Science and Technology & Hydro Aluminium AS; ²Technische Universität Bergakademie Freiberg; ³Norwegian University of Science and Technology; ⁴Hydro Aluminium AS

8:25 AM

Effect of Flow Management on Ultrasonic Melt Processing in a Launder upon DC Casting: Tungky Subroto¹; Dmitry Eskin¹; Christopher Beckwith²; Dan Roberts³; Iakovos Tzanakis⁴; Georgi Djambazov²; Koulis Pericleous²; ¹Brunel Centre for Advanced Solidification Technology (BCAST), Brunel University London; ²University of Greenwich; ³Constellium UTC; ⁴Oxford Brookes University

8:50 AM

Chlorine Free Degas System for Aluminum Slab Casting and Its Effect on Sheet Products: Sandrella Samaha¹; Tao Wang¹; Patrice Robichaud¹; Pascal Gauthier¹; Josee Colbert¹; Ginny Hammersmith²; Peter Evans³; ¹Rio Tinto; ²Logan Aluminum; ³Novelis Corporation

9:15 AM

Aluminothemic Reduction of Sulfides via Reactive Vacuum Distillation: Caspar Stinn¹; Spencer Toll¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Characterization of Mechanical Properties

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Tuesday AM | March 1, 2022
207B | Anaheim Convention Center

Session Chairs: Kelvin Xie, Texas A&M University; Veeraraghavan Sundar, UES Inc.

8:00 AM Introductory Comments

8:05 AM

Harnessing Thermomechanical Treatment to Explore Processing-structure-property Relationships in ARB Cu/Nb: Justin Cheng¹; Madhavan Radhakrishnan²; Cody Miller³; Ryan Mier³; Carl Osborn³; Sven Vogel³; John Carpenter³; Osman Anderoglu²; Nathan Mara¹; ¹University of Minnesota Twin Cities; ²University of New Mexico; ³Los Alamos National Laboratory

8:25 AM

Review on Hybrid Severe Plastic Deformation of ZV44 Magnesium Alloy: Microstructure, Property, and Application: Raviraj Verma¹; Gaurav Singh¹; Rakesh Ch.¹; Jayaganthan R.¹; ¹Engineering Design Department, Indian Institute of Technology Madras, INDIA

8:45 AM

Development of a New Small Punch Test System for Shear and Bending Tests: Tal Yehuda¹; Matan Tubul¹; Ziv Ungarish¹; Shay Amar¹; ¹Negev Nuclear Research Center

9:05 AM

Automated Laue Pattern Analysis for Multi-peak Strain Imaging of Nanocrystals at 34-ID-C: Yueheng Zhang¹; Anthony Rollett¹; Robert Suter¹; ¹Carnegie Mellon University

9:25 AM Break

9:45 AM

Effect of Equal Channel Angular Pressing and Targeted Heat Treatment on Aluminum AA7075 Sheet Metal: Maximilian Gruber¹; Thomas Spoerer¹; Christian Illgen²; Philipp Frint²; Martin Wagner²; Philipp Lechner³; Wolfram Volk¹; ¹Technical University of Munich; ²Technical University of Chemnitz; ³Chair of Metal Forming and Casting, Technical University of Munich

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Machine Learning in CTK I and II

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicago; Eva Zarkadoulou, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Tuesday AM | March 1, 2022
255C | Anaheim Convention Center

Session Chairs: Kamal Choudhary, NIST; Jorge Munoz, University of Texas El Paso

8:00 AM

Modeling Anharmonicity with Many-body Perturbation Theory and Machine Learning Potentials in Cu₂O: Claire Saunders¹; Dennis Kim²; Olle Hellman³; Hillary Smith⁴; Camille Bernal¹; Vladimir Ladygin¹; Brent Fultz¹; ¹California Institute of Technology; ²Massachusetts Institute of Technology; ³Weizmann Institute of Science; ⁴Swarthmore College

8:20 AM

Finite-temperature Lattice Dynamics from Graph Kernel Machine Learning Interatomic Potentials: Jorge Munoz¹; Adrian De la Rocha¹; Valeria Arteaga¹; Vanessa Meraz¹; Sofia Gomez¹; Yu-Hang Tang²; Wibe de Jong²; ¹University of Texas at El Paso; ²Lawrence Berkeley National Laboratory

8:40 AM Invited

Machine Learning Assisted Simulations of Materials Thermodynamics: Ying Wai Li¹; ¹Los Alamos National Laboratory

9:10 AM Invited

ALIGNN: Atomistic Line Graph Neural Network for Improved Materials Property Predictions: Kamal Choudhary¹; ¹National Institute of Standards and Technology

9:40 AM Break

10:00 AM Invited

Integrating Model Interpretability Methods into Machine Learning with Implications in Materials Discovery: Prasanna V. Balachandran¹; ¹University Of Virginia

10:30 AM

Predicting the Energetics and Kinetics of Cr Atoms in Fe-Ni-Cr Alloys via Physics-based Machine Learning: Yuchu Wang¹; Yue Fan¹; ¹University of Michigan

MATERIALS PROCESSING**Defects and Properties of Cast Metals IV — 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; Andrew Kao, University of Greenwich; Kyle Fezi, Fort Wayne Metals

Tuesday AM | March 1, 2022
210B | Anaheim Convention Center

Session Chairs: Peter Lee, University College London; Andrew Kao, University of Greenwich

8:00 AM

Uncertainty Quantification of Model Predictions due to Fluid Flow in Laser Powder Bed Fusion of IN625: *Scott Wells¹; Matthew Krane¹*; ¹Purdue University

8:20 AM

Modelling Concurrent Structural Mechanical Mechanisms in Microstructure Solidification: *Peter Soar¹; Andrew Kao¹; Georgi Djambazov¹; Natalia Shevchenko²; Sven Eckert²; Koulis Pericleous¹*; ¹University Of Greenwich; ²Helmholtz-Zentrum Dresden-Rossendorf

8:40 AM

The Influence of Environmental and Material Properties Data on Defect Predictions in Computational Fluid Dynamics Simulations of Investment Casting: *Christopher Jones¹; Mark Jolly¹; Anders Jarfors²; Patrik Vrethed³; Pedro Silva³*; ¹Cranfield University; ²Jönköping University; ³TPC Components AB

MECHANICS & STRUCTURAL RELIABILITY**Deformation and Damage Mechanisms of High Temperature Alloys — Understanding Deformation Behavior & Damage Using Advanced Characterization**

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Tuesday AM | March 1, 2022
304B | Anaheim Convention Center

Session Chairs: Paraskevas Kontis, Max-Planck-Institut für Eisenforschung GmbH; Jean Charles Stinville, University of Illinois at Urbana-Champaign

8:00 AM

Effects of Alloying Elements on Mechanical Properties and Environmental Resistance of Silicide Strengthened Nb-based Alloys: *Akane Suzuki¹; Chen Shen¹; Patrick Brennan¹; Scott Oppenheimer¹; Bernard Bewlay¹*; ¹GE Research

8:20 AM

Slip Localization and the Prediction of Fatigue Strength of Polycrystalline Alloys: *Jean-Charles Stinville¹; M.A. Charpagne¹; A. Cervellon²; S. Hémery²; F. Wang³; P.G. Callahan⁴; V. Valle²; T.M. Pollock⁵*; ¹University of Illinois Urbana-Champaign; ²Institut Pprime; ³Shanghai Jiao Tong University; ⁴Naval Research Laboratory; ⁵University of California Santa Barbara

8:40 AM

Intra- and Intergranular Deformation Measurement in Polycrystalline Materials at High Temperature Using High-resolution Digital Image Correlation: *Damien Texier¹; Julien Milanese²; Eric Andrieu³; Marie-Agathe Charpagne⁴; Jean-Charles Stinville⁴*; ¹CNRS - Institut Clément Ader; ²MIDIVAL; ³CIRIMAT - UMR CNRS 5085; ⁴Materials Science and Engineering, UIUC

9:00 AM

Investigating the High-temperature High-cycle Fatigue Properties of a Novel Fe-Ni-Cr-Al-Ti-based Superalloy: *Shivakant Shukla¹; Jonathan Poplawsky¹; Donovan Leonard¹; Michael Lance¹; Govindarajan Muralidharan¹*; ¹Oak Ridge National Laboratory

9:20 AM

In Situ Characterisation of the Thermomechanical Deformation Behaviour of Powder Processed Ni-based Superalloys: *Frances Synnott¹; Lewis Owen¹; Howard Stone²; Nicholas Jones²; Paul Mignanello³; Mark Hardy³; Martin Jackson¹; Katerina Christofidou¹*; ¹University of Sheffield; ²The University of Cambridge; ³Rolls-Royce plc

9:40 AM Break

10:00 AM

Stacking Faults in Forged Polycrystalline Ni-based Superalloys in the Fully Heat-treated Condition Prior to Further Deformation: *Regina Schluetter¹; Mauro Callisti¹; Mark Hardy²; Cathie Rae¹*; ¹University Of Cambridge; ²Rolls-Royce plc

10:20 AM

Local Phase Transformation Strengthening in Ni-based Superalloys and Induction of Alternative Displacive-diffusional Shearing Pathways: *Ashton Egan¹; Fei Xue²; Gregory Sparks³; Timothy Smith⁴; Emmanuelle Marquis²; Sammy Tin⁵; Michael Mills¹*; ¹Ohio State University; ²University of Michigan; ³Air Force Research Laboratory; ⁴NASA Glenn Research Center; ⁵University of Arizona

10:40 AM

Investigating Deformation Mechanisms in Ni-based Superalloys with Compact γ - γ' Coprecipitates: *Semanti Mukhopadhyay¹; Hariharan Sriram¹; Richard DiDomizio²; Andrew Detor²; Robert Hayes³; Gopal B. Viswanathan¹; Christopher Zenk⁴; Yunzhi Wang¹; Michael Mills¹*; ¹The Ohio State University; ²GE Global Research Center; ³Metals Technology Inc.; ⁴Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

11:00 AM

Materials Selection and Structural Design Considerations for Regeneratively Cooled Rotating Detonation Rocket Engines: *Zachary Cordero¹; Eric Jorgensen¹*; ¹Massachusetts Institute of Technology

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Strength and Spall II / X-ray, Spectroscopy and Imaging I

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Tuesday AM | March 1, 2022
304D | Anaheim Convention Center

Session Chairs: George Gray, Los Alamos National Laboratory; Michael Demkowicz, Texas A&M University

8:30 AM

Dynamic Materials Experiments at High Pressures and High Strain Rates on the National Ignition Facility Laser*: *Bruce Remington*¹; ¹Lawrence Livermore Nat Lab

8:50 AM

Richtmyer-Meshkov Instability Plate Impact Experiments on Three Body-centred Cubic Metals: *Ben Adams*¹; Glenn Whiteman¹; Ben Thorington-Jones¹; James Turner¹; ¹Awe Plc

9:10 AM

On Phase Transformation in the Weak Shock Regime: *Neil Bourne*¹; George Gray²; Saryu Fensin²; ¹University of Manchester; ²Los Alamos National Laboratory

9:30 AM

Measurement and Simulation of Dynamic Friction via Kolsky Bar Technique: *Benjamin Morrow*¹; Virginia Euser¹; Clarissa Yablinsky¹; Nicholas Denissen¹; ¹Los Alamos National Laboratory

9:50 AM Break

10:05 AM

Exploring the Effect of Microstructure on the Dynamic Behavior of 1045 Steel: *Virginia Euser*¹; George Gray¹; David Jones¹; Daniel Martinez¹; Saryu Fensin¹; ¹Los Alamos National Laboratory

10:25 AM

Prospects and Challenges in Understanding the Strength of Materials in Extremes: *Marc Meyers*¹; Gaia Righi¹; Hye Sook Park²; Bruce Remington²; Chris Wehrenberg²; Carlos Ruestes³; Eduardo Bringa³; ¹University of California-San Diego; ²LLNL; ³U. Nacional de Cuyo

10:45 AM

Dynamic-tensile-extrusion for Investigating Large Strain and High Strain Rate Behavior: *Eric Brown*¹; George Gray¹; Nicola Bonora²; Carl Trujillo¹; ¹Los Alamos National Laboratory; ²University of Cassino

LIGHT METALS

Electrode Technology for Aluminum Production — Session II

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

Program Organizers: Stephan Broek, Boston Metal; Dmitry Eskin, Brunel University

Tuesday AM | March 1, 2022
208A | Anaheim Convention Center

Session Chair: Derek Santangelo, Hatch

8:00 AM

Dynamics of Anode Baking Furnace VOC Emissions through a Firing Cycle: *Ole Kjos*¹; Thor Aarhaug¹; Heiko Gaertner¹; Anders Brunsvik¹; ¹Sintef As

8:25 AM

Anode Rod Tracking: A New Marking Method for Optimized Implementation: *Pascal Cote*¹; Jean-Pierre Gagné¹; Rémi St-Pierre¹; ¹Stas Inc.

8:50 AM

Plate Yokes. Anode Assembly without Cast Iron: *Jørund Hop*¹; Vidar Hjelle¹; Per Johnny Teigen¹; Inge Arild Vee¹; Bjarte Øye²; Grzegorz Stefanski¹; ¹Hydro Aluminium AS; ²SINTEF

9:15 AM

Bio-binders and Its Carbonization and Interaction with Petroleum Coke during Baking: *Görl Jahrsengene*¹; Stein Rørvik¹; Anne Store¹; Liang Wang²; Øyvind Skreiberg²; ¹SINTEF Industry; ²SINTEF Energy Research

ELECTRONIC MATERIALS

Electronic Packaging and Interconnections — Advanced Bonding and Interface

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

Program Organizers: Tae-Kyu Lee, Cisco Systems; Albert T. Wu, National Central University; Won Sik Hong, Korea Electronics Technology Institute; Kazuhiro Nogita, University of Queensland; Govindarajan Muralidharan, Oak Ridge National Laboratory; David Yan, San Jose State University; Luke Wentlent, Plug Power

Tuesday AM | March 1, 2022
303B | Anaheim Convention Center

Session Chairs: Kazuhiro Nogita, University of Queensland; Xin-Fu Tan, University of Queensland; Govindarajan Muralidharan, Oak Ridge National Laboratory; Luke Wentlent, Plug Power

10:00 AM Invited

Tin Whisker Growth in Space: *Katsuaki Sukanuma*¹; Norio Nemoto²; Tsuyoshi Nakagawa²; Seiichiroh Kan²; Shinichiroh Ichimaru²; ¹Osaka University; ²Japan Aerospace Exploration Agency

10:25 AM

Die-bonding Performance and Mechanism of Ag Micron Paste with Pressure-less Sintering: *Tetsu Takemasa*¹; Chuantong Chen²; Katsuaki Sukanuma²; ¹Senju Metal Industry Co., Ltd.; ²Osaka University

10:45 AM

Study of Creep Properties of Sn-Ag-Cu Alloys Employing Different Strain Rates Using Nanoindentation: M.A. Mamun¹; Donald Stone²; Abdelmageed Elmustafa¹; ¹Old Dominion University; ²University of Wisconsin-Madison

CORROSION

Environmental Degradation of Additively Manufactured Alloys — High Temperature and Environmental Effects

Sponsored by: TMS Structural Materials Division, TMS; Corrosion and Environmental Effects Committee, TMS; Additive Manufacturing Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Elizabeth Trillo, Southwest Research Institute; Andrew Hoffman, GE Research; Brendy Rincon Troconis, University of Texas at San Antonio

Tuesday AM | March 1, 2022
201C | Anaheim Convention Center

Session Chairs: Kinga Unocic, ORNL; Sebastien Dryepondt, ORNL; Andrew Hoffman, GE Research, US

8:00 AM

Long-term High-temperature Oxidation Performance of Inconel 625 Processed by Laser-assisted Additive Manufacturing: Grace De Leon Nope¹; Juan Alvarado-Orozco²; Guofeng Wang¹; Brian Gleeson¹; ¹University of Pittsburgh; ²CIDESI

8:20 AM

Metal Dusting Resistance of Additively Manufactured Ni-based Alloys: Influence of Post-processing Surface and Heat Treatments: Emma White¹; Clara Schlereth¹; Benedikt Nowak²; Heike Hattendorf²; Mathias Galetz¹; ¹DEHEMA Forschungsinstitut; ²VDM Metals

8:40 AM Invited

Hydrogen Trapping at Grain Boundaries and Dislocation Structures in Additively-manufactured Stainless Steel 316L Evaluated via SIMS/EBSD: Kaila Bertsch¹; Peter Weber¹; Shohini Sen-Britain¹; Chris San Marchi¹; Thomas Voisin¹; Morris Wang²; Brandon Wood¹; ¹Lawrence Livermore National Laboratory; ²University of California-Los Angeles

9:10 AM

Sensitization of Austenitic Alloys Made by Laser Powder Bed Fusion: Jingfan Yang¹; Laura Hawkins²; John Snitzer¹; Xiang Liu²; Miao Song³; Lingfeng He²; Xiaoyuan Lou¹; ¹Auburn University; ²Idaho National Laboratory; ³University of Michigan

9:30 AM Break

9:45 AM

Pulsed Transient High Heat Flux Testing of Coated Alloys in Extreme Environments: Sanjay Sampath¹; John Saputo¹; Felipe Caliar¹; ¹State University of New York

10:05 AM

Transpiration Cooling of Additively Manufactured Porous Metallic Structures in High Heat Flux Environments: Kaitlyn Mullin¹; John Martin²; Christopher Roper²; Carlos Levi¹; Tresa Pollock¹; ¹University of California Santa Barbara; ²HRL Laboratories

10:25 AM

How Part Surfaces Influence Corrosion for a Laser Powder Bed Fusion 316L Stainless Steel: Michael Melia¹; Erin Karasz¹; Kasandra Escarcega Herrera¹; Jason Taylor¹; Samantha Rosenberg¹; Paul Kotula¹; Michael Heiden¹; Jeffrey Rodelas¹; ¹Sandia National Laboratories

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Tuesday AM | March 1, 2022
201D | Anaheim Convention Center

Session Chairs: Yongfeng Lu, University of Nebraska-Lincoln; Khalid Hattar, Sandia National Laboratories

8:00 AM Invited

A Portable Solution to Corrosion Remediation of Sea Ships to Desensitize Severely Sensitized Aluminum Alloys Using Lasers: Yongfeng Lu¹; Leimin Deng¹; Chenfei Zhang¹; Shiding Sun¹; Bai Cui¹; ¹University of Nebraska, Lincoln

8:35 AM

Effect of Grain Boundary Character on Chloride-induced Transgranular Stress Corrosion Cracking Propagation in an Austenitic Stainless Steel: Haozheng Qu¹; Eric Schindelholz²; Rebecca Schaller³; Jason Taylor³; Timothy Montoya³; Nianju Gu¹; Nathaniel Pettifor⁴; Janelle Wharry¹; ¹Purdue University; ²Ohio State University; ³Sandia National Laboratories; ⁴Ivy Tech Community College

8:55 AM Invited

Recent Developments in Coupled In-situ Transmission Electron Microscopy to Better Understand Materials Degradation: Khalid Hattar¹; Katherine Jungjohann¹; ¹Sandia National Laboratories

9:30 AM

Relating Localized Corrosion Rates to Microstructure in Pure Al Exposed to Salt Water Environments: Bruno Geoly¹; Frank Yu¹; Devon Phelps¹; Joseph Stover¹; Michael Melia²; Philip Noell²; Josh Kacher¹; ¹Georgia Institute of Technology; ²Sandia National Labs

9:50 AM Break

10:10 AM

In-situ SEM Investigation of Chemo-mechanical Effects on Cutting-induced Mixed-mode II-III fracture of Martensitic Stainless Steel: Gianluca Roscioli¹; Cemal Tasan¹; ¹Massachusetts Institute of Technology

LIGHT METALS

Failure, and a Career That is Anything But: An LMD Symposium Honoring J. Wayne Jones — Fatigue, Creep, and Other Types of Failure

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

Program Organizers: Victoria Miller, University of Florida; Michael Caton, US Air Force Research Laboratory; Nikhilesh Chawla, Purdue University; Trevor Harding, California Polytechnic State University; Paul Krajewski, General Motors Corporation; Tresa Pollock, University of California, Santa Barbara

Tuesday AM | March 1, 2022
209B | Anaheim Convention Center

Session Chairs: Benjamin Begley, University of Florida; Paul Krajewski, General Motors Company

8:00 AM Invited

Understanding Fatigue Damage of Metallic Materials in 4D: Probing Microstructural Evolution in Real-time: *Nikhilesh Chawla*¹; ¹Purdue University

8:30 AM

Contributions of R. F. Mehl (Carnegie-Mellon University; 1932-76) to Metal Fatigue: *K. S. Ravi Chandran*¹; ¹University of Utah

8:50 AM Invited

Very High Cycle Fatigue (VHCF) Phenomena – Influence of Microstructure on Crack Growth in the Near-threshold Regime Investigated by Means of Ultrasonic Fatigue Testing: *Martina Zimmermann*¹; Tina Kirsten¹; Fatih Bülbül²; Marcel Wicke³; Angelika Brückner-Foitz⁴; Hans-Jürgen Christ⁵; ¹Technical University of Dresden; ²Formerly: University of Siegen; ³Formerly: University of Kassel; ⁴University of Kassel; ⁵University of Siegen

9:20 AM Break

9:35 AM

Tear Resistance of AA7075-T6 Sheet at Room Temperature and 200 °C: *Daniel Nikolai*¹; Eric Taleff¹; ¹University of Texas Austin

9:55 AM

The Elevated Temperature High Cycle Fatigue Behavior of an Additively Manufactured Al-Ce-Ni-Mn Alloy: *Amit Shyam*¹; Sumit Bahl¹; Alex Plotkowski¹; Joseph Simpson¹; Richard Michi¹; Kevin Sisco²; Ryan Dehoff¹; Allen Haynes¹; Qigui Wang³; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³General Motors

10:15 AM Invited

Hold Time Low Cycle Fatigue of Ni-base Single-crystal Superalloys: *Akane Suzuki*¹; ¹GE Research

10:35 AM Invited

Capturing the Full Range: *Tracy Berman*¹; ¹University of Michigan

11:05 AM Concluding Comments

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multiscale Modeling Approaches to Improve Fatigue Predictions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Jean-Charles Stinville, University of Illinois Urbana-Champaign; Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kotsos, Drexel University; Brian Wisner, Ohio University; Orion Kafka, NIST

Tuesday AM | March 1, 2022
254B | Anaheim Convention Center

Session Chair: Antonios Kotsos, Drexel University

8:00 AM Invited

PRISMS-fatigue: A General Framework for Fatigue Analysis in Polycrystalline Metals and Alloys Using the Crystal Plasticity Finite Element Method: *Mohammadreza Yaghoobi*¹; Krzysztof S. Stopka²; Aaditya Lakshmanan¹; Veera Sundararaghavan¹; John E. Allison¹; David L. McDowell²; ¹University of Michigan; ²Georgia Institute of Technology

8:30 AM

Microstructure Effects on the Extreme Value Fatigue Response of FCC Metals and Alloys: Effects of Sample Size and Grain Neighborhood: *Krzysztof Stopka*¹; Mohammadreza Yaghoobi²; John Allison²; David McDowell³; ¹Purdue University; ²University of Michigan; ³Georgia Institute of Technology

8:50 AM

Mechanistic Short Crack Growth in Ni Single Crystals: A Study of the Crack Paths and Growth Rates in -' Microstructure: *Vassilios Karamitros*¹; Duncan MacLachlan²; Fionn Dunne¹; ¹Imperial College London; ²Rolls-Royce plc

9:10 AM

How Do Heterogeneous Dislocation Distributions Determine the Long-range Internal Stress: *Yejun Gu*¹; Jaafar El-Awady²; ¹IHPC/ Johns Hopkins University; ²Johns Hopkins University

9:30 AM Break

9:50 AM Invited

Discovery of a Reciprocal Relationship in Fatigue between Stress-life (S-N) Behavior and Fatigue Crack Growth Behavior: *K. S. Ravi Chandran*¹; ¹University of Utah

10:20 AM

Prediction of Critical Stress by Anisotropic Calculation of Dislocation Core-width: *Orcun Koray Celebi*¹; Ahmed Sameer Khan Mohammed¹; Jessica Anne Krogstad¹; Huseyin Sehitoglu¹; ¹University of Illinois at Urbana-Champaign

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Nanocarbon-based Flexible Devices: Emerging Materials and Processes — Session III: Emerging Nanocarbon Applications

Program Organizer: Mostafa Bedewy, University of Pittsburgh

Tuesday AM | March 1, 2022
260A | Anaheim Convention Center

8:00 AM Introductory Comments

8:05 AM Invited

Probing the Brain with Carbon Microelectrode Arrays: Promises and Challenges: *Elisa Castagnola*¹; ¹University of Pittsburgh

8:35 AM Invited

Wafer-scale Processing of Carbon Nanotube Forests for High-performance, Flexible Composites: *Eric Meshot*¹; ¹Lawrence Livermore National Laboratory

9:05 AM Invited

Electromechanically Stable Thin Metallic Films Reinforced by Synthesis of a Graphene Wrapper: *Sameh Tawfik*¹; Kaihao Zhang¹; Mitisha Surana¹; Jad Yaacoub¹; ¹University of Illinois at Urbana Champaign

9:35 AM Invited

Controlled Deformation of Graphene for Flexible Electronics: *SungWoo Nam*¹; ¹University of California, Irvine

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Low-Dimensional Mechanics, Interfaces, Surfaces

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Tuesday AM | March 1, 2022
260B | Anaheim Convention Center

Session Chairs: Michael Cai Wang, University of South Florida; Surojit Gupta, University of North Dakota

8:00 AM Invited

Nanoscale Effects on Intercalation-induced Phase Transitions in 2D Materials: *Mengjing Wang*¹; Joshua Pondick¹; Shiyu Xu¹; Judy Cha¹; ¹Yale University

8:20 AM Invited

Freeze Casting of Graphene Aerogel Structures with Unidirectional Pores: Yu-Kai Weng¹; *Seungha Shin*¹; Kenneth Kihm¹; Douglas Aaron¹; Mohammad Bahzad¹; Mian Umar Saeed¹; ¹University of Tennessee

8:40 AM Invited

Intrinsic Fatigue of Graphene and Molybdenum Disulfide: *Tobin Filleter*¹; ¹University of Toronto

9:00 AM Keynote

Mechanics Design in Cellulose-enabled High-performance Functional Materials: *Teng Li*¹; ¹University of Maryland, College Park

9:45 AM Break

10:05 AM

Effects of Graphene Surface Interaction on Water-ice Phase Change: *Yu-Kai Weng*¹; Seungha Shin¹; Kenneth Kihm¹; Douglas Aaron¹; ¹University of Tennessee

10:25 AM

Exciton Transport in Strained Two-dimensional Semiconductors: *Jin Myung Kim*¹; Kwang-Yong Jeong²; Jaepil So²; Mike Wang³; Peter Snapp¹; Hong-Gyu Park²; SungWoo Nam¹; ¹University of Illinois at Urbana-Champaign; ²Korea University; ³University of South Florida

10:45 AM Keynote

Nanoscale Frictional Behavior of Two-dimensional Materials: *Robert Carpick*¹; ¹University of Pennsylvania

MATERIALS PROCESSING

Furnace Tapping 2022 — Session III

Sponsored by: The Southern African Institute of Mining and Metallurgy, TMS Extraction and Processing Division, TMS; Pyrometallurgy Committee, TMS; Process Technology and Modeling Committee, TMS; Materials Characterization Committee, Industrial Advisory Committee

Program Organizers: Joalet Steenkamp, MINTEK; Dean Gregurek, RHI Magnesita; Quinn Reynolds, Mintek; Gerardo Alvear Flores, Rio Tinto; Hugo Joubert, Tenova Pyromet; Phillip Mackey, P.J. Mackey Technology, Inc.

Tuesday AM | March 1, 2022
204B | Anaheim Convention Center

Session Chair: Quinn Reynolds, Mintek

8:00 AM Introductory Comments

8:05 AM Keynote

PGM-Ni-Cu Tapping: An Updated Industry Survey: *Isabelle Nolet*¹; Lucy Rodd¹; Tyler Futterer¹; Spencer Straub¹; Jehane Du Toit¹; Wesley Taylor¹; ¹Hatch

8:50 AM Panel Discussion: "The Good, the Bad and the Ugly of Furnace Tapping" - Panelists include Stanko Nikolic, Glencore Technology; Ryan Walton, Rio Tinto Kennecott; Christine Wenzl, RHI Magnesita; Stefan Schmidt, Aurubis AG; and Harmen Oterdoom, Independent Consultant

10:25 AM Break

10:45 AM Invited

Data Analysis to Assess Carry-over Slag: *P. Chris Pistorius*¹; ¹Carnegie Mellon University

11:10 AM

Sensor Technologies for Optimized Tapping Procedures: Christine Wenzl¹; Magnus Persson¹; Ladislav Koncick¹; *Guenter Unterreiter*²; ¹RHI Magnesita; ²RHI Magnesita GmbH

11:30 AM

Successful Development and Optimisation of Lead ISASMELT™ Furnace Slag Tapping System at Kazzinc Ltd.: Benjamin Hogg¹; *Mark Prince*¹; Mark Letchford¹; Alistair Burrows²; Timur Tokzhigitov²; Turarbek Azekenov²; ¹Glencore Technology; ²Kazzinc Ltd

11:50 AM Concluding Comments

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Alloying, Solute Segregation, and Precipitation: Part I

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Tuesday AM | March 1, 2022
304C | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Liang Qi, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines

8:00 AM Invited

Spectrum-based Isotherms for Grain Boundary Segregation: *Christopher Schuh*¹; Malik Wagih¹; Nutth Tuchinda¹; Thomas Matson¹; ¹Massachusetts Institute of Technology

8:30 AM

Atomic-scale Analysis of Heterogeneous Nickel Solute Segregation into Random Grain Boundaries and Polycrystals: *Frederic Sansoz*¹; Eve-Audrey Picard¹; Tara Nenninger¹; ¹The University of Vermont

8:50 AM

Competition Between Shear Coupling and Sliding in Doped Nickel Grain Boundaries: *Spencer Thomas*¹; Jason Trelewicz¹; ¹Stony Brook University

9:10 AM

Contributions of Triple Junctions and Quadruple Nodes to Grain-size Dependent Intergranular Segregation: *Nutth Tuchinda*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

9:30 AM Break

9:45 AM

2nd Generation of Nanocrystalline Cu-3Ta with Improved Precipitate Coherency: *Billy Hornbuckle*¹; Josh Smeltzer²; Albert Ostlund¹; Blake Fullenwider¹; Chris Marvel²; Anit Giri¹; Martin Harmer²; Kiran Solanki²; Kris Darling¹; ¹US Army Research Laboratory; ²Lehigh University; ³Arizona State University

10:05 AM Invited

Influence of Contaminates on Nanocrystalline Thermomechanical Stability: Jonathan Priedeman¹; B. Chad Hornbuckle²; Kristopher Darling³; Sean Fudger³; *Gregory Thompson*¹; ¹University of Alabama; ²Army Research Laboratory; ³Army Research Laboratory

10:35 AM

Corrosion-induced Grain Boundary Migration: *Yang Yang*¹; Weiyue Zhou²; Sheng Yin³; Qin Yu³; Daniel Schreiber⁴; Jim Ciston³; Mark Asta³; Michael Short²; Andrew Minor³; ¹The Pennsylvania State University; ²Massachusetts Institute of Technology; ³Lawrence Berkeley National Laboratory; ⁴Pacific Northwest National Laboratory

10:55 AM

Origins of Weak Strengthening Effect in As-cast Al-Si Alloys: *Wenqian Wu*¹; Mingyu Gong¹; Bingqiang Wei¹; Amit Misra²; Jian Wang¹; ¹University of Nebraska-Lincoln; ²University of Michigan

MATERIALS DESIGN

Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment — Theory-Guided and Simulation-Assisted Materials Discovery and Design

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

Program Organizers: Raymundo Arroyave, Texas A&M University; Wei Chen, Illinois Institute of Technology; Yong-Jie Hu, Drexel University; Tresa Pollock, University of California, Santa Barbara

Tuesday AM | March 1, 2022
255A | Anaheim Convention Center

Session Chair: To Be Announced

8:00 AM Invited

To Mix or Not to Mix? Synthesizability Entropy-descriptors and the Controversial Role of Vibrations in the Stability of High-entropy Ceramics: *Stefano Curtarolo*¹; ¹Duke University

8:30 AM

Towards the Accelerated Exploration of the High Entropy Alloy Space: *Raymundo Arroyave*¹; ¹Texas A&M University

9:00 AM Invited

Integrating Theory, Simulation and Experiment to Accelerate Predictive Materials Science: *John Allison*¹; ¹University of Michigan

9:30 AM Break

9:45 AM Invited

Computational Tools for the Ab-initio Design of Advanced Structural Materials: *Anirudh Raju Natarajan*¹; Anton Van der Ven¹; ¹University of California, Santa Barbara

10:15 AM Invited

Integrated Computational Modeling of Solute Segregation to Defect, Segregation Transition, Localized Phase Transformation and Dislocation Transformation, All Starting from Ab Initio Calculations: Longsheng Feng¹; You Rao²; Ashton Egan¹; Maryam Ghazisaeidi¹; Michael Mills¹; *Yunzhi Wang*¹; ¹The Ohio State University; ²EPFL

10:45 AM Invited

High-throughput Discovery of Inorganic Compounds: Sean Griesemer¹; Cheol Woo Park¹; Logan Ward²; *Christopher Wolverton*¹; ¹Northwestern University; ²Argonne National Laboratory

LIGHT METALS

Magnesium Technology — Fundamentals of Plastic Deformation and Primary Production, Recycling and Ecological Issues

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Tuesday AM | March 1, 2022
210A | Anaheim Convention Center

Session Chairs: Tracy Berman, University of Michigan; Dmytro Orlov, Lund University; Joshua Caris, Terves, LLC; Aaron Palumbo, Big Blue Technologies

8:00 AM Invited

Strengthening Mechanisms and Thermal Stability of MgLiCa Alloys Processed by Severe Plastic Deformation: Heather Salvador¹; Suveen Mathaudhu¹; ¹University of California-Riverside

8:20 AM

A Magnesium Clean Energy Ecosystem Vision: Adam Powell¹; ¹Worcester Polytechnic Institute

8:40 AM

ILTEC Technology in Magnesium Industry – Elimination of Water as Cooling Medium: Andreas Filzwieser¹; Hans-Jörg Krassnig¹; Martina Hanel¹; ¹METTOP GmbH

9:00 AM

Design of Efficient Low-cost Recycling of Magnesium Using Gravity-driven Multiple Effect Thermal System (G-METS): Gabriel Espinosa¹; Armaghan Telgerafchi¹; Daniel McArthur¹; Madison Rutherford¹; Adam Powell¹; David Dussault²; ¹Worcester Polytechnic Institute; ²Elemental Beverage Company

9:20 AM

Mg-Ca-X Alloys – A Brief Fact Sheet of High Strength Mg Wrought Alloys: Nikolaus Papenberg¹; Clemens Simson¹; Stefan Gneiger¹; ¹Light Metals Technologies Ranshofen

ENERGY & ENVIRONMENT

Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring Matthew J. Kramer — The Softer Side of Magnetism

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

Program Organizers: Scott McCall, Lawrence Livermore National Laboratory; Ryan Ott, Ames Laboratory

Tuesday AM | March 1, 2022
210D | Anaheim Convention Center

Session Chair: Scott McCall, LLNL

8:00 AM Invited

Giant Saturation Magnetization of Fe-based Soft Magnetic Amorphous Alloy by Introducing Nitrogen: Song-Yi Kim¹; Hye-Ryeong Oh²; Hwi-Jun Kim¹; Min-Ha Lee³; ¹KITECH; ²Korea Electronics Technology Institute; ³KITECH North America

8:30 AM Invited

Nanocomposite Soft Magnetics: Applications, State-of-art, and Emerging Trends: Paul Ohodnicki¹; ¹University of Pittsburgh

9:00 AM Invited

Like Poles Attraction and Unlike Poles Repulsion - Science Behind the Mystery: Hui Meng¹; Guiping Tang²; Abby Shen³; Michelle Qian³; Qifeng Wei¹; George Mizzell⁴; Min Zou³; Christina Chen³; ¹Foresee Group; ²Quadrant at Hangzhou; ³Quadrant at San Jose; ⁴SuperMagnetMan

9:30 AM Break

9:50 AM Invited

Microstructural Evolutions, Phase Transformations and Hard Magnetic Properties in Polycrystalline Ce-Co-Fe-Cu Alloys: Kinjal Gandha¹; Rakesh Chaudhary¹; Matthew Kramer¹; Ryan Ott¹; Durga Paudyal¹; Ikenna Nlebedim¹; ¹Ames Laboratory

10:20 AM Invited

Structure and Magnetic Properties of Galfenol Nanocomposite Alloys: M. T. Islam¹; R. Nandwana¹; J. Healy¹; J. K. Jaklich¹; B. Dong¹; Matthew Willard¹; A. Yu²; Y. Ijiri²; E. E. Moore³; S. K. McCall³; ¹Case Western Reserve University; ²Oberlin College; ³Lawrence Livermore Laboratory

10:50 AM

A Solution to the Permalloy Problem: Ananya Renuka Balakrishna¹; ¹University of Southern California

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Electrochemistry

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Tuesday AM | March 1, 2022
203B | Anaheim Convention Center

Session Chair: Nathan Hoyt, Argonne National Laboratory

8:00 AM

Electrochemical Solutions for Corrosion in Molten Chloride Salt Systems: Kerry Rippey¹; Judith Vidal¹; Liam Witterman¹; ¹National Renewable Energy Laboratory

8:20 AM

Development of an Electrochemical Model for Corrosion of 316H Stainless Steel by Molten FLiNaK Using Meso-scale YellowJacket: Chaitanya Bhawe¹; Michael Tonks¹; Kumar Sridharan²; Guiqui Zheng³; ¹University of Florida; ²University of Wisconsin-Madison; ³Massachusetts Institute of Technology

8:40 AM

UF4/UF3 Redox Control in NaF-KF-UF4 Systems: Amanda Leong¹; Jinsuo Zhang¹; ¹Virginia Polytechnic Institute

9:00 AM

To Galvanically Corrode or Not Galvanically Corrode: Cody Falconer¹; Yafei Wang¹; William Doniger¹; Matthew Weinstein¹; Mohamed Elbakhshwan¹; Kumar Sridharan¹; Adrien Couet¹; ¹University of Wisconsin Madison

9:20 AM Break

9:40 AM

A Novel Cyclic Voltammetry-based Automated Mini-probe for In-situ Corrosion Product Quantification during High-throughput HEA Corrosion Testing in Molten Salts: *Bonita Goh*¹; Yafei Wang¹; Will Doniger¹; Phalgun Nelaturu¹; Dan Thoma¹; Kumar Sridharan¹; Adrien Couet¹; ¹University of Wisconsin Madison

10:00 AM

Electrochemical Measurement of Uranium Concentration in FLiNaK: *Matthew Newton*¹; Michael Simpson¹; ¹University of Utah

10:20 AM

Redox Control as Corrosion Control Method in Molten FLiNaK: *Krishna Moorthi Sankar*¹; Preet Singh¹; ¹Georgia Institute of Technology

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Young Investigator Session III

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Tuesday AM | March 1, 2022

253B | Anaheim Convention Center

Session Chairs: Xun Liu, The Ohio State University; Xiaoxiang Yu, Novelis Inc.

8:00 AM Keynote

Design of Cold-workable Refractory Complex Concentrated Alloys for Applications at Ambient-to-elevated Temperatures: Cheng Zhang¹; *Enrique Lavernia*²; ¹University of California Irvine; ²National Academy of Engineering

8:30 AM Invited

Laser Forming of Sheet Metal: Incorporating a Metallurgical Perspective: *Victoria Miller*¹; ¹University of Florida

8:55 AM Invited

Power Ultrasound in Advanced Manufacturing: *Xun Liu*¹; Jiarui Kang¹; Tianzhao Wang¹; ¹Ohio State University

9:20 AM Invited

Design and Manufacturing of Tailorable Polymer Derived Ceramic Composites: *Yan Li*¹; ¹Dartmouth College

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — Cross-cutting Experiments and Fusion Materials Perspectives

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Tuesday AM | March 1, 2022

203A | Anaheim Convention Center

Session Chairs: Yuanyuan Zhu, University of Connecticut; Jason Trelewicz, Stony Brook University

8:00 AM

In-situ Thermal Diffusivity Recovery and Defect Annealing Kinetics in Self-ion Implanted Tungsten Using Transient Grating Spectroscopy: *Mohamed Abdallah Reza*¹; Hongbing Yu²; Kenichiro Mizohata³; Felix Hofmann¹; ¹University of Oxford; ²Canadian Nuclear Laboratories; ³University of Helsinki

8:20 AM

Direct Visualization of Tungsten Oxidation by In-situ Environmental TEM: Maanas Togaru¹; Rajat Sainju¹; Lichun Zhang¹; Weilin Jiang²; *Yuanyuan Zhu*¹; ¹University of Connecticut; ²Pacific Northwest National Laboratory

8:40 AM Invited

Paving the Way for a Fusion Pilot Plant: *Kathryn McCarthy*¹; ¹Oak Ridge National Laboratory

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Accident Tolerant Fuels and Advanced Characterization

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Tuesday AM | March 1, 2022

204A | Anaheim Convention Center

Session Chairs: Alexander Leide, University of Bristol; Joshua Kane, Idaho National Laboratory; Takaaki Koyanagi, Oak Ridge National Laboratory; Kumar Sridharan, University of Wisconsin-Madison

8:00 AM

Advanced Characterization and Multiscale Testing for SiC Ceramic Matrix Composite Cladding as Accident Tolerant Fuel Candidate Materials for LWR Applications: *Peng Xu*¹; David Frazer¹; Tsvetoslav Pavlov¹; Nikolaus Cordes¹; Fabiola Cappia¹; David Kamerman¹; Sean Gonderman²; Christian Deck²; Jack Gazza²; ¹Idaho National Laboratory; ²General Atomics

8:20 AM

Fiber/Matrix Debonding of SiC/SiC Composites Evaluated Using the Micropillar Compression: Omer Karakoc¹; Takaaki Koyanagi¹; Takashi Nozawa²; Yutai Katoh¹; ¹Oak Ridge National Laboratory; ²National Institutes for Quantum and Radiological Science and Technology

8:40 AM

Strain Rate Sensitivity Studies of Commercial FeCrAl Alloy: Hamdy Abouelella¹; Chengying Xu¹; Korukonda Murty¹; ¹North Carolina State University

9:00 AM

Impact of Lithium Accommodation on Defect Chemistry in ZrO₂: Gareth Stephens¹; Yan Ren Than²; ¹Nuclear Futures Institute Bangor; ²National University of Singapore

9:20 AM

In Situ Study of High Temperature Mechanical Behavior of Irradiated FeCrAl Alloys: Tianyi Sun¹; Tongjun Niu¹; Dongyue Xie²; Adam Gabriel³; Lin Shao³; Jian Wang²; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University; ²University of Nebraska-Lincoln; ³Texas A&M University

9:40 AM Break

10:00 AM

Accelerating Advanced Fuel Development and Analysis by Combining Modelling and Experiment: Simon Middleburgh¹; Phylis Makurunge¹; Fabio Martini¹; Mustafa Bolukbasi¹; Lee Evitts¹; Dave Goddard²; Antoine Claisse³; William Lee¹; Nicholas Barron²; ¹Bangor University; ²National Nuclear Laboratory (NNL); ³Westinghouse Electric Sweden AB

10:20 AM

Assessment of Local Deformation Behavior in Mesoscale Tensile Specimens via Digital-image Correlation: Yachun Wang¹; David Frazer¹; Daniel Murray¹; Geoffrey Beausoleil¹; Mahmut Cinbiz¹; ¹Idaho National Laboratory

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Deformation Mechanisms II

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Tuesday AM | March 1, 2022

262B | Anaheim Convention Center

Session Chairs: Douglas Stauffer, Bruker Nano Inc.; Garritt Tucker, Colorado School of Mines

8:00 AM

Atomistic Simulation of Amorphous/Crystalline Metal Composite Interface Mechanical Behavior by Nanoindentation: Amir Abdelmawla¹; Thanh Phan¹; Liming Xiong¹; Ashraf Bastawros¹; ¹lowa State University

8:20 AM Invited

On the Nanoscale Mechanics of Basal Dislocations in MAX Phases: Atomistic Modeling of Structure and Mobility: Gabriel Plummer¹; Christopher Weinberger²; Michel Barsoum³; Garritt Tucker¹; ¹Colorado School of Mines; ²Colorado State University; ³Drexel University

8:50 AM

The Evolution of Deformation Twinning in a Heterogeneous Planar Fault Energy Landscape: Ritesh Jagatramka¹; Matthew Daly¹; ¹University of Illinois at Chicago

9:10 AM

Mechanical Behavior of Free-standing and Matrix-embedded Metallic Nanoparticles at Different Temperatures: Alla Dieng¹; Louise Grau¹; Celine Gerard¹; Jean-Claude Granddier¹; ¹Institut Pprime - CNRS ISAE-ENSMA

9:30 AM Break

9:50 AM

Mechanical Behavior and Microstructure Evolution in a Nanocrystalline Tri-immiscible Alloy: Yashaswini Karanth¹; Saurabh Sharma²; Billy Hornbuckle²; Kristopher Darling²; Kiran Solanki¹; ¹Arizona State University; ²U.S. Army Research Laboratory

10:10 AM Invited

Nano-mechanical Behavior Associated with Dislocation-boundary Interaction Characterized through Nanoindentation and TEM In-situ Straining: Takahito Ohmura¹; ¹National Institute for Materials Science

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Session III

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Tuesday AM | March 1, 2022

206B | Anaheim Convention Center

Session Chairs: Benjamin Eftink, Los Alamos National Laboratory; Sourav Das, University of Illinois at Urbana-Champaign

8:00 AM

Dwell Fatigue in Ti Alloys; TEM on Dislocations, HEDM, alpha2-Ti3Al and SAXS: David Dye¹; Sudha Joseph¹; Felicity Dear¹; Yilun Xu¹; Rachel Lim²; Thomas McAuliffe¹; Joel Bernier³; Darren Pagan²; Phani Karamched⁴; Kate Fox⁵; David Rugg⁶; Fionn Dunne¹; ¹Imperial College; ²Penn State University; ³Lawrence Livermore National Laboratory; ⁴Oxford University; ⁵Rolls-Royce plc; ⁶formerly Rolls-Royce plc

8:20 AM

Correlating the Microstructure of Friction-stir Processed Al 7085 to Mechanical Properties Using In-situ Micromechanical Testing: Tanvi Ajantiwalay¹; Christian Roach¹; Hrishikesh Das¹; Mert Efe¹; Piyush Upadhyay¹; Arun Devaraj¹; ¹Pacific Northwest National Laboratory

8:40 AM

High Strength Nanocrystalline CoAl Intermetallics with Room Temperature Deformability: Xinghang Zhang¹; Ruizhe Su¹; Dajla Neffati²; Yashashree Kulkarni²; ¹Purdue University; ²University of Houston

9:00 AM Invited

Three-dimensional Dislocation Characterization during In-situ Straining TEM: *Benjamin Eftink*¹; Stuart Maloy¹; ¹Los Alamos National Laboratory

9:30 AM Break

9:50 AM

In Situ TEM Measurements of Electron-induced Creep in Amorphous Materials: *Sourav Das*¹; Gowtham Jawaharram¹; Shen Dillon¹; Robert Averback¹; ¹University of Illinois at Urbana-Champaign

10:10 AM

Deformation and Mechanical Properties of Benzene Microcrystals at Cryogenic Temperatures: *Wenxin Zhang*¹; Bryce Edwards¹; Lucas Pabarcus¹; Lei Zhong²; Xuan Zhang³; Huajian Gao²; Robert Hodyss⁴; Julia Greer¹; ¹California Institute of Technology; ²Brown University; ³NM—Leibniz Institute for New Materials; ⁴Jet Propulsion Laboratory

10:30 AM

In-situ Mechanics of Superalloys and Bond Coating at 1000C: *Sanjit Bhowmick*¹; ¹Bruker

MATERIALS DESIGN

Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis — Design and Development of Metal-based Composite Materials

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

Program Organizers: Srivatsan Tirumalai, The University of Akron; Pradeep Rohatgi, University of Wisconsin; Simona Hunyadi Murph, Savannah River National Laboratory

Tuesday AM | March 1, 2022
256B | Anaheim Convention Center

Session Chair: Simona Murph, Savannah River National Laboratory

8:00 AM Keynote

Transforming the Approach to Designing Metal Matrix Composites: *Julie Schoenung*¹; ¹University of California, Irvine

8:30 AM Keynote

Superconducting Metal Matrix Composites: *Krishan Chawla*¹; ¹University of Alabama at Birmingham

9:00 AM Invited

Investigation of Fine Scale Microstructure and Mechanical Behavior of Al-Mg-B and Al-Mg-Cd Composites for Intergranular Corrosion Protection Applications: *Ramasis Goswami*¹; ¹Naval Research Laboratory

9:25 AM

Design and Synthesis of Carbon-inorganic Nanocomposites via Direct Utilization of Carbon Dioxide for Sustainable Energy: *Min Kyu Song*¹; ¹Washington State University

9:45 AM Break

10:00 AM

Sustainable and Climate-friendly Economic and Technological Development from Use of Metal Matrix Composites: *Akhil Charak*¹; Jimmy Karloopia¹; Srivatsan Tirumalai²; ¹Indian Institute of Technology Roorkee; ²The University of Akron

10:20 AM Invited

Development of Zirconia Toughened Nanocomposites Using the Technique of Spark Plasma Sintering: Role of Reinforcement: Srivatsan Tirumalai¹; *Kunjee Meena*²; Shaik Mozammil³; ¹The University of Akron; ²Mahatma Gandhi Engineering College; ³Indian Institute of Technology Roorkee

10:45 AM

Use of Three-dimensional Finite Elements to Simulate Morphology of Chip during Turning of an Aluminum Alloy Composite: *Shaik Mozammil*¹; Eklavya Koshta¹; Jimmy Karloopia²; Kunjee Meena²; Srivatsan Tirumalai³; P.K. Swain⁴; ¹Indian Institute of Technology Roorkee; ²Mahatma Gandhi Engineering College Jaipur; ³The University of Akron; ⁴Aryan Institute of Engineering and Technology

11:05 AM

Metal Matrix Composites Development Using Binder Jet Additive Manufacturing: *Hanlei Zhang*¹; Daozheng Li¹; Mitra Shabani¹; Wei Xiong¹; ¹University of Pittsburgh

MATERIALS DESIGN

Microstructural Templates Consisting of Isostructural Ordered Precipitate / Disordered Matrix Combinations: Microstructural Evolution and Properties — Session I

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; Bharat Gwalani, Pacific Northwest National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Jessica Krogstad, University of Illinois at Urbana-Champaign; Ashley Paz Y Puente, University of Cincinnati; Keith Knipling, Naval Research Laboratory; Matthew Steiner, University of Cincinnati

Tuesday AM | March 1, 2022
254A | Anaheim Convention Center

Session Chairs: Rajarshi Banerjee, University of North Texas, Denton; Bharat Gwalani, Pacific Northwest National Laboratory

8:00 AM Introductory Comments

8:05 AM Invited

Novel Nickel-based Alloys for High Temperature Structural Applications: Boateng Twum Donkor¹; Sonali Ravikumar¹; Anurag Sharma¹; Jie Song¹; *Vijay Vasudevan*²; ¹University of Cincinnati; ²University of North Texas

8:35 AM Invited

Tuning the Degree of Chemical Ordering in the Solid Solution of a Complex Concentrated Alloy and Its Impact on Mechanical Properties: *Sriswaroop Dasari*¹; Abhinav Jagetia¹; Abhishek Sharma¹; M.S.K.K.Y. Nartu¹; Vishal Soni¹; Bharat Gwalani¹; Stephane Gorsse¹; Rajarshi Banerjee¹; ¹University of North Texas

9:05 AM Invited

The Role of Precipitate Size Distribution and Morphology on Ni Superalloy Deformation Micromechanisms: *James Coakley*¹; Muhammad Awais²; Jonathan Cormier²; Ke An³; Neil D'Souza⁴; Howard Stone⁵; ¹University of Miami; ²École nationale supérieure de mécanique et d'aérotechnique; ³Oak Ridge National Laboratory; ⁴Rolls-Royce plc.; ⁵University of Cambridge

9:35 AM Break

9:55 AM

Investigation of Nucleation Mechanisms Associated with the Formation of Coprecipitates in Ni-based Superalloys: Hariharan Sriram¹; Semanti Mukhopadhyay¹; Michael Mills¹; Yunzhi Wang¹; ¹Ohio State University

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI — Adaptable, Reconfigurable, and Self-healing Hard Materials

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chaohong Wang, National Chung Cheng University; Chih Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; A.S.Md Abdul Haseeb, University of Malaya; Vesa Vuorinen, Aalto University; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Tuesday AM | March 1, 2022
303A | Anaheim Convention Center

Session Chair: James Pikul, University of Pennsylvania

8:00 AM Invited

Vat Polymerization of Adaptable and Reconfigurable Three-dimensional (3D) Micro-architected Materials: Julia Greer¹; Amylynn Chen¹; Zane Taylor¹; Xiaoxing Xia¹; ¹California Institute of Technology

8:25 AM Invited

Design of Multifunctional Architected Materials: James Guest¹; ¹Johns Hopkins University

8:50 AM Invited

Using Solid-liquid Phase Transformation in Fusible Metals as a Self-healing Mechanism for Next Generation Metal-ion Battery Anodes: Lin Wang¹; Eric Detsi¹; ¹University of Pennsylvania

9:15 AM Invited

Room-temperature Electrochemical Healing of Difficult-to-weld Metallic Materials: James Pikul¹; ¹University of Pennsylvania

9:40 AM Break

10:00 AM Invited

Self-healing of Fiber-composite Laminates via In Situ Thermal Remending: Jason Patrick¹; Alexander Snyder¹; Zachary Phillips¹; ¹North Carolina State University

10:25 AM Invited

Linked Metamaterials with Adaptable Stiffness: Chiara Daraio¹; ¹ETH Zurich

10:50 AM

Novel Zr-based Alloy with Low Young's Modulus and Magnetic Susceptibility for Biomedical Implants: Ligang Zhang¹; Renhao Xue¹; Dong Wang¹; Libin Liu¹; ¹Central South University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Ferrous Alloys

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Tuesday AM | March 1, 2022
255B | Anaheim Convention Center

Session Chair: Megumi Kawasaki, Oregon State University

8:00 AM

Kinetics of Phase Transformations in Boron-containing 304L Stainless Steel: Erin Barrick¹; James (Tony) Ohlhausen¹; Donald Susan¹; Khalid Hattar¹; Jack Herrmann¹; Peter Duran¹; Jeffrey Rodelas¹; Charles Robino¹; ¹Sandia National Laboratories

8:20 AM

Structural Evolution by Grain Refinement and Relaxation upon Heating of an Additive-manufactured 316L Stainless Steel: Jae-Kyung Han¹; Xiaojing Liu²; Yusuke Onuki³; Yulia Kuzminova⁴; Stanislav Evlashin⁴; Klaus-Dieter Liss²; Megumi Kawasaki¹; ¹Oregon State University; ²Guangdong Technion - Israel Institute of Technology; ³Ibaraki University; ⁴Skolkovo Institute of Science and Technology

8:40 AM

Cluster Evolution and Phase Transformation in Austenitic High-Cr Stainless Steel: A Comparison of Thin Film and Bulk Geometries: Po-Cheng Kung¹; Jian-Min Zuo¹; Jessica Krogstad¹; ¹University of Illinois Urbana Champaign

9:00 AM

Phase Separation under Irradiation in FeNi and Low-alloyed Steels: Quentin Tence¹; Maylise Nastar¹; Estelle Meslin¹; Isabelle Mouton²; Brigitte Décamps³; ¹CEA Saclay, Service de Recherche en Métallurgie Physique, Université Paris Saclay; ²CEA Saclay, Service de Recherche en Métallurgie Appliquée, Université Paris Saclay; ³CNRS, IJC-Lab, Université Paris Saclay

9:20 AM

Leveraging EBSD Data for Phase Transformation Product Quantification in a Low Carbon Steel by Deep Learning: Simon Breumier¹; Tomas Ostornujof²; Nathalie Gey³; Audrey Couturier⁴; Pierre-Emmanuel Aba-perea¹; Bianca Frincu⁴; Natalia Loukachenko⁴; Lionel Germain²; ¹Institut de Recherche Technologique Matériaux, Métallurgie et Procédés - 4, rue Augustin Fresnel F-57078 Metz France; ²Laboratory of Excellence on Design of Alloy Metals for Low-mAss Structures (DAMAS), Université de Lorraine, France; ³Université de Lorraine, CNRS, Arts et Métiers Paris Tech, LEM3, F-57000 Metz, France; ⁴INDUSTEEL (ArcelorMittal), Centre de Recherche des Matériaux du Creusot (CRM), Le Creusot, France

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Ferrous Alloys

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Tuesday AM | March 1, 2022
255B | Anaheim Convention Center

Session Chair: Megumi Kawasaki, Oregon State University

8:00 AM

Kinetics of Phase Transformations in Boron-containing 304L Stainless Steel: *Erin Barrick*¹; James (Tony) Ohlhausen¹; Donald Susan¹; Khalid Hattar¹; Jack Herrmann¹; Peter Duran¹; Jeffrey Rodelas¹; Charles Robino¹; ¹Sandia National Laboratories

8:20 AM

Structural Evolution by Grain Refinement and Relaxation upon Heating of an Additive-manufactured 316L Stainless Steel: *Jae-Kyung Han*¹; Xiaojing Liu²; Yusuke Onuki³; Yulia Kuzminova⁴; Stanislav Evlashin⁴; Klaus-Dieter Liss²; *Megumi Kawasaki*¹; ¹Oregon State University; ²Guangdong Technion - Israel Institute of Technology; ³Ibaraki University; ⁴Skolkovo Institute of Science and Technology

8:40 AM

Cluster Evolution and Phase Transformation in Austenitic High-Cr Stainless Steel: A Comparison of Thin Film and Bulk Geometries: *Po-Cheng Kung*¹; Jian-Min Zuo¹; Jessica Krogstad¹; ¹University of Illinois Urbana Champaign

9:00 AM

Phase Separation under Irradiation in FeNi and Low-alloyed Steels: *Quentin Tence*¹; Maylise Nastar¹; Estelle Meslin¹; Isabelle Mouton²; Brigitte Décamps³; ¹CEA Saclay, Service de Recherche en Métallurgie Physique, Université Paris Saclay; ²CEA Saclay, Service de Recherche en Métallurgie Appliquée, Université Paris Saclay; ³CNRS, IJC-Lab, Université Paris Saclay

9:20 AM

Leveraging EBSD Data for Phase Transformation Product Quantification in a Low Carbon Steel by Deep Learning: *Simon Breumier*¹; *Tomas Ostorjuf*²; Nathalie Gey³; Audrey Couturier⁴; Pierre-Emmanuel Aba-perea¹; Bianca Frincu⁴; Natalia Loukachenko⁴; Lionel Germain²; ¹Institut de Recherche Technologique Matériaux, Métallurgie et Procédés - 4, rue Augustin Fresnel F-57078 Metz France; ²Laboratory of Excellence on Design of Alloy Metals for Low-mAss Structures (DAMAS), Université de Lorraine, France; ³Université de Lorraine, CNRS, Arts et Métiers Paris Tech, LEM3, F-57000 Metz, France; ⁴INDUSTEEL (ArcelorMittal), Centre de Recherche des Matériaux du Creusot (CRMC), Le Creusot, France

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Additive Manufacturing II

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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Tuesday AM | March 1, 2022
263C | Anaheim Convention Center

Session Chairs: Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

8:00 AM

Additive Manufacturing of Ionic Liquids Harvested Metal for Martian Habitation: *Blake Stewart*¹; Haley Doude¹; Jennifer Edmunson²; Eric Fox²; Hongjoo Rhee¹; ¹Mississippi State University; ²National Aeronautics and Space Administration

8:20 AM

Challenges Associated with Micro-additive Manufactured 316 and 17-4PH Stainless Steel Components Produced by Binder Jet and Direct Metal Laser Sintering: *Michael Pires*¹; Chia-chun Chao¹; Gregory Pawlikowski²; Rodney Martens²; Bradley Schultz²; Martin Bayes²; Masashi Watanabe¹; Wojciech Misiolek¹; ¹Lehigh University; ²TE Connectivity Corporation

8:40 AM

Direct Powder Combination, Consolidation, and Forming of Metals and Composites via Solid-state Additive Manufacturing: *Robert Griffiths*¹; Hunter Rauch¹; Hang Yu¹; ¹Virginia Polytechnic Institute

9:00 AM

Effect of Powder Reuse on Mechanical Behavior of Additively Manufactured Ti-6Al-4V: *Shuai Shao*¹; *Arash Soltani-Tehrani*; Nima Shamsaei¹; ¹Auburn University

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications — Functional Materials and 2D/3D Devices III

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Tuesday AM | March 1, 2022
303C | Anaheim Convention Center

Session Chairs: David Estrada, Boise State University; Konstantinos Sierros, West Virginia University; David Bird, US Army

8:00 AM Invited

Enabling Sustainability and Circularity Through Big Area Additive Manufacturing: Katie Copenhaver¹; Meghan Lamm¹; Matthew Korey¹; Mitchell Rencheck¹; Xianhui Zhao¹; Halil Tekinalp¹; Soydan Ozcan¹; ¹Oak Ridge National Laboratory

8:25 AM

Electrohydrodynamic Printing as an Enabler for High Resolution Deposition: Direct and Hybrid Printing Strategies: Harrison Loh¹; Konstantinos Sierros¹; ¹West Virginia University

8:45 AM

Engineered Low Density Polymers Within Additively Manufactured Polyacrylates: Elbert Caravaca¹; David Bird¹; Katlyn Hanson²; Nuggehalli Ravindra³; ¹CCDC-Armament Center, FCDD-ACM-EP; ²LEIDOS; ³New Jersey Institute of Technology

9:05 AM Invited

Evaluation of Graphene Based Materials for Electromagnetic Shielding: Eugene Zakar¹; Theodore Anthony¹; Wayne Churaman¹; Madan Dubey¹; ¹Army Research Laboratory

9:30 AM Break

9:45 AM

Imbibition Control of Polymer Solutions via Molecular Weight and Surface Functionalization onto Nanoporous Metal Media: Amm Hasib¹; Bruno Azeredo¹; ¹Arizona State University

10:05 AM Invited

Self-limiting Electrospray Deposition Post-processing with Functional Materials: Jonathan Singer¹; ¹Rutgers University

10:30 AM

Isolation of Monolayer Black Phosphorus for Additive Manufacturing of Optoelectronic Devices: Florent Muramutsa¹; Ariel Briggs¹; Joshua Wood²; Chad Husko²; Jonathan Logan²; Samuel Pedersen³; Brian Jaques³; David Estrada⁴; ¹Boise State University; ²Iris Light Technologies, Inc.; ³Boise State University, Center for Advanced Energy Studies; ⁴Boise State University, Center for Advanced Energy Studies, Idaho National Laboratory

ADVANCED MATERIALS

Refractory Metals — Alloy Development, Silicides, and Hardmetals

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

Program Organizers: Eric Taleff, University of Texas at Austin; Lauren Garrison, Oak Ridge National Laboratory; Alexander Knowles, University of Birmingham

Tuesday AM | March 1, 2022
252B | Anaheim Convention Center

Session Chairs: Eric Taleff, The University of Texas at Austin; Anke Silvia Ulrich, DECHEMA Forschungsinstitut

8:00 AM Invited

Development of Heat-treatable Crss-Cr3Si-based Alloys: Microstructure, Oxidation, and Creep: Anke Ulrich¹; Petra Pfizenmaier²; Uwe Glatzel²; Mathias Galetz¹; ¹Dechema-Forschungsinstitut; ²University Bayreuth

8:20 AM

Effect of Heating Rate and Substrate on the Oxidation Behavior of Hafnium Aluminum Diboride Thin Films: Samyukta Shrivastav¹; Dana Yun¹; Carly Romnes¹; Kinsey Canova¹; John Abelson¹; Jessica Krogstad¹; ¹University of Illinois at Urbana Champaign

8:40 AM

Oxidation Behavior of Mo-Si-B-Al Alloys at Elevated Temperature: Longfei Liu¹; Ranran Su¹; John Perepezko¹; ¹University of Wisconsin-Madison

9:00 AM

Hydrogen Reduction of Cobalt(II,III) Oxide to Make Sub-micron and Micron Size Cobalt Metal Powder for WC-Co Synthesis: Raj Singh Gaur¹; Thomas Jewett²; Scott Braymiller²; ¹SH Chemicals; ²Global Tungsten and Powders

ENERGY & ENVIRONMENT

REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian — Building Sustainability in Metals through Partnerships

Sponsored by: TMS: Recycling and Environmental Technologies Committee, TMS: Aluminum Committee

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Brajendra Mishra, Worcester Polytechnic Institute; Bart Blanpain, KU Leuven; Adam Powell, Worcester Polytechnic Institute; Mertol Göknelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway

Tuesday AM | March 1, 2022
211A | Anaheim Convention Center

Session Chair: Brajendra Mishra, Worcester Polytechnic Institute

8:00 AM Introductory Comments

8:05 AM Invited

A Foundation for Learning and Collaboration to Solve Future Societal Challenges: Christina Meskers¹; Maurits Van Camp²; ¹Norwegian University of Science & Technology; ²University of Queensland

8:30 AM Invited

Electrochemical Pathways Towards Sustainable Energy: *Donald Sadoway*¹; ¹Massachusetts Institute of Technology

8:55 AM Invited

How the Implications of Force Majeure Resulted in the Adoption of More Sustainable Materials: Kevin Anderson¹; Jason Mallek¹; Miles Gathright²; *James Miller*³; Tina Glass³; Lee Berry⁴; ¹Brunswick-Mercury Marine; ²Brunswick - Boston Whaler; ³Celanese Corporation; ⁴Mafic Corporation

9:15 AM Invited

Industry-University Collaboration in Metals Processing and Recycling: Challenges and Lessons Learned from a Regional and Global Perspective: *Bart Blanpain*¹; ¹KU Leuven

9:40 AM Break

9:55 AM Invited

Materials-aware STEM Education as a Foundation for a Sustainable World: *Glenn Daehn*¹; ¹Ohio State University

10:20 AM Invited

New Approaches for Implementing and Teaching Sustainability: *Carol Handwerker*¹; ¹Purdue University

10:45 AM Invited

Sustainable Development of Materials: Combining Chemicals Management, Life Cycle Thinking and the Circular Economy: *Julie Schoenung*¹; ¹University of California, Irvine

11:10 AM Invited

The Legacy of Prof. Diran Apelian: In Retrospect: *Brajendra Mishra*¹; ¹Worcester Polytechnic Institute

ENERGY & ENVIRONMENT

REWAS 2022: Energy Technologies and CO₂ Management — Energy Efficiency, Decarbonization and CO₂ Management

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

Program Organizers: Fiseha Tesfaye, Åbo Akademi University; Lei Zhang, University of Alaska Fairbanks; Donna Guillen, Idaho National Laboratory; Ziqi Sun, Queensland University of Technology; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Mingming Zhang, Wood Mackenzie; Dirk Verhulst, Consultant, Extractive Metallurgy and Energy Efficiency; Shafiq Alam, University of Saskatchewan; Mertol Gökkelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway; Chukwunwike Iloeje, Argonne National Laboratory

Tuesday AM | March 1, 2022

212A | Anaheim Convention Center

Session Chair: Camille Fleuriault, Eramet Norway

8:00 AM Introductory Comments

8:05 AM Invited

Circored Fine Ore Direct Reduction Plus DRI Smelting - Proven Technologies for the Transition towards Green Steel: Sebastian Lang¹; Timo Haimi²; Max Koepf¹; *Roberto Valery*³; ¹Metso Outotec GmbH & Co KG; ²Metso Outotec Oy; ³Metso Outotec Germany GmbH - Oberursel (Taunus)

8:35 AM

Treatment of an Indigenous Lepidolite Ore for Sustainable Energy Considerations: *Alafara Baba*¹; Daud Olaoluwa¹; Kuranga Ayinla¹; Abdullah Ibrahim¹; Ayo Balogun¹; Sadiu Girigisu¹; Oluwagbemiga Adebola¹; Jumoke Fasiku¹; ¹University of Ilorin

8:55 AM Invited

To Decarbonize Industry, We Must Decarbonize Heat: *Addison Stark*¹; ¹Clark Street Associates

9:25 AM

Benefits of a Smart Electrical Energy Management Information System and Its Impact in Your CO₂ Footprint: *Hector Linares*¹; ¹Carmeuse

9:45 AM Break

10:00 AM Invited

Energy Efficiency, Electrification, and Low-carbon Fuels & Energy Sources for Decarbonizing Materials Industry: *Sachin Nimbalkar*¹; Chukwunwike Iloeje²; Joe Cresko³; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory; ³U.S. Department of Energy

10:25 AM

Geomimicry Inspired MicroNano Concrete as Subsurface Hydraulic Barrier Materials: Learning from Shale Rocks as Best Geological Seals: *Cody Massion*¹; Vamsi S.K. Vissa¹; Yunxing Lu²; Dustin Crandall³; Andrew Bunker²; Mileva Radonjic¹; ¹Oklahoma State University; ²University of Pittsburgh; ³National Energy Technology Laboratory

10:45 AM Invited

Radiative Cooling: Harnessing the Cold of Space as a Renewable Thermodynamic Resource: *Aaswath Raman*¹; ¹UCLA Samueli School of Engineering

11:10 AM

Solidification of Salt Hydrate Eutectics Using Multiple Nucleation Agents: *Sophia Ahmed*¹; Robert Mach¹; Haley Jones¹; Fabiola Alamo²; Patrick Shamberger¹; ¹Texas A&M University

11:30 AM

The Influence of H₂ and CO Atmospheres on SiO Formation: *Trygve Aarnæs*¹; Eli Ringdalen²; Merete Tangstad¹; ¹Norwegian University of Science and Technology; ²SINTEF Industry

ENERGY & ENVIRONMENT

REWAS 2022: Sustainable Production and Development Perspectives — Developing Responsible Production Practices and Supply Chains

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

Program Organizers: Mertol Gökkelma, Izmir Institute of Technology; Mingming Zhang, Wood Mackenzie; Elsa Olivetti, Massachusetts Institute of Technology; Gerardo Alvear, Glencore Technology; Camille Fleuriault, Eramet Norway

Tuesday AM | March 1, 2022

211B | Anaheim Convention Center

Session Chairs: Adamantia Lazou, Norwegian University of Science and Technology; Katrin Daehn, Massachusetts Institute of Technology

8:00 AM Introductory Comments

8:05 AM Invited

Process Simulation and Digitization for Integrated Circularity and Life Cycle Sustainability Assessment of Silicon, Perovskite and Tandem Photovoltaic Systems: Neill Bartie¹; Lucero Cobos-Becerra²; Magnus Fröhling³; Rutger Schlatmann²; *Markus Reuter*⁴; ¹Technische Universität Braunschweig, Technical University of Munich; ²Helmholtz-Zentrum Berlin für Materialien und Energie; ³Technical University of Munich; ⁴SMS Group GmbH

8:35 AM

Economics-informed Material System Modeling of the Copper Supply Chain: *John Ryter¹; Xinkai Fu¹; Karan Bhuwarka¹; Richard Roth¹; Elsa Olivetti¹; ¹Massachusetts Institute of Technology*

8:55 AM

Environmental Benefits of Closing the Solar Manufacturing and Recycling Loop: *Robert Flores¹; Haoyang He¹; Parikhit Sinha²; Garvin Heath³; Paul Leu⁴; Julie Schoenung¹; ¹University of California, Irvine; ²First Solar; ³National Renewable Energy Laboratory; ⁴University of Pittsburgh*

9:15 AM

Life Cycle Sustainability Assessment of Repair through Wire and Arc Additive Manufacturing: *Emanuele Pagone¹; Joachim Antonissen²; Filomeno Martina³; ¹Cranfield University; ²Guaranteed BV; ³WAAM3D*

9:35 AM Break

9:55 AM

Brass Jewelry: A Sustainability Assessment: *Christopher Glaubenskle¹; Annalise Kramer¹; Amir Saeidi¹; Haoyang He¹; Julie Schoenung¹; ¹University of California, Irvine*

10:15 AM

The UK Transforming the Foundation Industries Research and Innovation Hub (TransFIRE): *Mark Jolly¹; Anne Velenturf²; Konstantinos Salonitis¹; Sanjooram Paddea¹; ¹Cranfield University; ²University of Leeds*

10:35 AM

The REMADE Institute: R&D to Accelerate the Transition to a Circular Economy: *Edward Daniels¹; ¹REMADE Institute*

10:55 AM

Chemical Hazard Assessment of Electrolyte Compounds for Lithium-ion Batteries: *Branden Schwaabe¹; Haoyang He¹; Christopher Glaubenskle¹; Julie Schoenung¹; ¹University of California, Irvine*

11:15 AM

Lithium Ion and Flow Batteries for Energy Storage: A Chemical Hazard Assessment: *Haoyang He¹; Shan Tian¹; Chris Glaubenskle¹; Brian Tarroja¹; Scott Samuelsen¹; Oladele Ogunseitan¹; Julie Schoenung¹; ¹University of California Irvine*

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — Deformation and Plasticity

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

**Tuesday AM | March 1, 2022
207C | Anaheim Convention Center**

Session Chairs: Josh Kacher, Georgia Institute of Technology; Stephen House, University of Pittsburgh/ECC; Blythe Clark, Sandia National Laboratory

8:00 AM Invited

Elucidating Dislocation-interface Interactions via In Situ Straining in the Electron Microscope: *Nathan Mara¹; ¹University of Minnesota*

8:30 AM Invited

Interaction of Glide Dislocations with Interfaces in Mg Alloys: *M. T. Andani¹; Z. Huang¹; C. Yang¹; A. Lakshmanan¹; L. Qi¹; V. Sundararaghavan¹; J. Allison¹; Amit Misra¹; ¹University of Michigan*

9:00 AM Invited

Investigation of Slip Transmission through a Complete Grain-level Assessment of the Stress-strain Evolution in Polycrystalline Alloys: *Michael Sangid¹; John Rotella¹; Diwakar Naragani¹; Jun-Sang Park²; Peter Kenesei²; Paul Shade³; ¹Purdue University; ²Argonne National Laboratory; ³Air Force Research Laboratory*

9:30 AM Break

9:45 AM Invited

Deformation by Dislocations, Twinning, and Phase Transformations in Compositionally Complex FCC Solid Solutions: *Michael Mills¹; Connor Stone²; Jiashi Miao¹; Veronika Mazanova¹; Mulaine Shih¹; Milan Heczko¹; Maryam Ghazisaeidi¹; ¹Ohio State University; ²Exponent*

10:15 AM Invited

Multifaceted Research in Plasticity: *Huseyin Sehitoglu¹; Sameer Mohammed¹; ¹University of Illinois*

10:45 AM Invited

Modeling Grain Boundary Mediated Plasticity with Massively Parallel Atomistic Simulations: *Timofey Frolov¹; Nicolas Bertin¹; Tomas Oppelstrup¹; ¹Lawrence Livermore National Laboratory*

NANOSTRUCTURED MATERIALS

Self-organizing Nano-architected Materials — Synthesis: Novel Approaches

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Tuesday AM | March 1, 2022
260C | Anaheim Convention Center

Session Chairs: Ian McCue, Northwestern University; Andrea Hodge, University of Southern California

8:00 AM Invited

Composite Hierarchical Structures: *Andrea Hodge*¹; ¹University of Southern California

8:30 AM Invited

3D Printing of Biomimetic Hierarchical Architectures by Integration of Self-organized Nanoporous Materials: *Juergen Biener*¹; ¹Lawrence Livermore National Laboratory

9:00 AM Invited

Additive Manufacturing of Nanoporous Nanostructures: *Wendy Gu*¹; Qi Li²; John Kulikowski³; David Doan¹; ¹Stanford University

9:30 AM Break

9:50 AM

Hierarchically Porous Gold via 3D Printing and Dealloying for Selective Electrochemical Reduction of CO₂ to CO with Enhanced Mass Transport: *Jintao Fu*¹; Shahryar Mooraj²; Shuai Feng²; Wen Chen²; Eric Detsi¹; ¹University of Pennsylvania; ²University of Massachusetts

10:10 AM Invited

Programming Self-assembly of Designed Nano-architected Materials: *Oleg Gang*¹; ¹Columbia University

10:40 AM

Centimeter-scale Crack-free Self-assembly for Ultra-high Tensile Strength Metallic Nanolattices: *Zhimin Jiang*¹; James Pikul¹; ¹University of Pennsylvania

11:00 AM

Kinetic Monte-Carlo Simulations of Vapor Phase Dealloying: *Longhai Lai*¹; Alain Karma¹; ¹Northeastern University

MECHANICS & STRUCTURAL RELIABILITY

Structural Metamaterials — Session III

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

Program Organizers: Amy Wat, Lawrence Livermore National Laboratory; Brad Boyce, Sandia National Laboratories; Xiaoyu Zheng, University of California, Los Angeles; Fabrizio Scarpa, University of Bristol; Robert Ritchie, University of California, Berkeley

Tuesday AM | March 1, 2022
304A | Anaheim Convention Center

Session Chair: To Be Announced

8:00 AM

Single Test Evaluation and Design of Directional Elastic Properties in Anisotropic Materials: *Jagannadh Boddapati*¹; Moritz Flaschel²; Siddhant Kumar³; Laura De Lorenzis²; Chiara Daraio¹; ¹California Institute of Technology; ²ETH Zürich; ³Delft University of Technology

8:20 AM Invited

Topological States and Bandgaps in Dimerized Minimal Surfaces: Massimo Ruzzene¹; Matheus Rosa¹; *Yuning Guo*¹; ¹University of Colorado

9:00 AM

Machine Learning of Symbolic Expressions to Model Dispersion Curves in Metamaterials: *Hongsup Oh*¹; Sharat Paul¹; Alberdi Ryan²; Robbins Joshua²; Pai Wang¹; Jacob Hochhalter¹; ¹University of Utah; ²Sandia National Laboratories

9:20 AM Break

9:40 AM

Large-strain Compressive Response and Failure Mechanisms of Additively Manufactured Cubic Chiral Lattices: *Caterina Iantaffi*¹; Eral Bele¹; Chu Lun Alex Leung¹; Martina Meisnar²; Thomas Rohr²; Peter D. Lee¹; ¹University College London; ²ESA-ESTEC

10:00 AM Invited

Exceptional Mechanical Properties of Additively Manufactured Nano-architected Materials with Complex Topologies: *Lorenzo Valdevit*¹; ¹University of California, Irvine

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — Irradiation-Corrosion of Materials in Light Water Reactors I

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Tuesday AM | March 1, 2022
202A | Anaheim Convention Center

Session Chair: To Be Announced

8:00 AM Invited

Synergistic Processes in Irradiation-corrosion of Materials in High Temperature Water: Rigel Hanbury¹; Peng Wang²; Stephen Raiman¹; Gary Was¹; ¹University of Michigan

8:30 AM

Effect of Ion Irradiation on the Corrosion of 304SS in PWR Simulated Water Chemistry: Fu-Yun Tsai¹; Ryan Schoell¹; Khalid Hattar²; Djamel Kaoumi¹; ¹North Carolina State University; ²Sandia National Laboratories

8:50 AM

Investigation of Hydrogen Trapping by Irradiation-induced Defects in 316L Stainless Steel: Frantz Martin¹; Anne-Cécile Bach²; S. Perrin³; F. Jomard⁴; Cecile Duhamel⁴; Jerome Crepin⁵; ¹Université Paris-Saclay, CEA; ²Université Paris-Saclay, CEA, MINES ParisTech, PSL Research University; ³CEA, DES, ISEC, DE2D, SEAD, LCBC, University of Montpellier; ⁴Groupe d'Etude de la Matière Condensée, CNRS, UVSQ; ⁵MINES ParisTech, PSL Research University

9:10 AM

Effects of Water Radiolysis and Displacement Damage during Simultaneous Irradiation and Corrosion of 316L Stainless Steel: Rigel Hanbury¹; Jonas Heuer²; Gary Was¹; ¹University of Michigan; ²Naval Nuclear Laboratory

9:30 AM Break

9:50 AM

Effects of Pre-irradiation on the Corrosion Behavior of I600 in Hydrogenated Water: Ryan Schoell¹; Fu-Yun Tsai¹; Peter Baldo²; Yongqiang Wang³; Djamel Kaoumi¹; ¹North Carolina State University; ²Argonne National Laboratory; ³Los Alamos National Laboratory

10:10 AM

The Role of Surface and Interfacial Chemistry in Hydrogen Corrosion of Uranium: Shohini Sen-Britain¹; Yaakov Idell¹; Wigbert Siekhaus¹; Kerri Blobaum¹; Bill Mclean¹; ¹Lawrence Livermore National Laboratory

10:30 AM

Cooperative Role of Pressure- and Corrosion on Stress Buildup of the High Temperature LWR Pipes: Asghar Aryanfar¹; Jaime Marian²; ¹American University of Beirut; ²University of California Los Angeles

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Microstructure, Mechanisms & Property I

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Tuesday AM | March 1, 2022
262A | Anaheim Convention Center

Session Chairs: Yuntian Zhu, City University of Hong Kong; Xiaolei Wu, Institute of Mechanics, Chinese Academy; Hao Zhou, Nanjing University of Science and Technology

8:00 AM

Strain Hardening and Ductility by Grain Refinement-induced Plasticity in Multi-level Hetero-structured Brass: Xiaolei Wu¹; ¹Chinese Academy of Sciences

8:20 AM

Ultra-high Strength and Ductility of a Multiple Component Alloy with a Heterogeneous Microstructure of Grains and Precipitates: Weitong Wang¹; Shengyun Yuan¹; Yong Zhang²; ¹Nanjing University of Science and Technology

8:40 AM

Microstructural Evolution and Tensile Properties of Nano-crystalline Twinning Induced Plasticity Steel Produced by High-pressure Torsion: Gyeonghyeon Jang¹; Jae Nam Kim¹; Hakhyeon Lee¹; Taekyung Lee²; Nariman Enikeev³; Marina Abramova³; Ruslan Z Valiev³; Hyoung Seop Kim¹; Chong Soo Lee¹; ¹Pohang University of Science & Technology; ²Pusan National University; ³Ufa State Aviation Technical University

SPECIAL TOPICS

TMS2022 All-Conference Plenary

Tuesday PM | March 1, 2022
Ballroom A-D | Anaheim Convention Center

Session Chair: Ellen Cerreta, Los Alamos National Laboratory

12:00 PM Plenary

Alloy Design at Apple: James Yurko¹; ¹Apple Materials Engineering

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — Extreme Environments

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

Program Organizers: Verena Maier-Kiener, Montanuniversität Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Tuesday PM | March 1, 2022
259A | Anaheim Convention Center

Session Chairs: Matt Pharr, Texas A&M University; Samantha Lawrence, Los Alamos National Laboratory

2:30 PM Invited

Nanoindentations on Nuclear Reactor Relevant Materials: *Peter Hosemann*¹; Stuart Maloy²; Robert Odette³; X Huang¹; Jeffrey Bickel¹; ¹University of California, Berkeley; ²Los Alamos National Laboratory; ³University of California, Santa Barbara

2:55 PM Invited

Adapting Nanoindentation for In-situ Electron Microscopy Experiments in Coupled Environments: *Khalid Hattar*¹; Shen Dillon²; Brad Boyce¹; Katherine Jungjohann¹; ¹Sandia National Laboratories; ²University of California, Irvine

3:20 PM

Nanoindentation of Zoned Radiation-damaged Zircon: Micro-pillar Splitting and Mechanical Properties Mapping: *Tobias Beirau*¹; Edoardo Rossi²; Marco Sebastiani²; Warren Oliver³; Herbert Pöhlmann¹; Rodney Ewing⁴; ¹Martin Luther University Halle-Wittenberg; ²"Roma TRE" University; ³KLA-Tencor; ⁴Stanford University

3:40 PM Invited

Indentation Measurements of the Coupled Electrochemical-mechanical Behavior of Materials for Making Better Batteries: *Yang-Tse Cheng*¹; ¹University of Kentucky

4:05 PM Break

4:25 PM Invited

Nanomechanics of Materials for High-capacity Rechargeable Batteries: *Matt Pharr*¹; ¹Texas A&M University

SPECIAL TOPICS

Acta Materialia Symposium — Acta Materialia Award Session

Program Organizer: Carolyn Hansson, University of Waterloo

Tuesday PM | March 1, 2022
Ballroom E | Anaheim Convention Center

Session Chair: Carolyn Hansson, University of Waterloo

3:00 PM Introductory Comments

3:10 PM Presentation of Acta Student Awards

3:30 PM Invited

Acta Materialia Gold Medal Lecture: Sustainable Physical Metallurgy: Making Green Steel with Hydrogen: *Dierk Raabe*¹; ¹Max-Planck Institut für Eisenforschung

3:50 PM Invited

Acta Materialia Silver Medal Lecture: Dwell Fatigue and In-service Cracking in Jet Engine Titanium: *David Dye*¹; ¹Imperial College

4:10 PM Question and Answer Period

4:20 PM Invited

Acta Materialia Hollomon Award for Materials and Society: Advanced Ceramics for Energy Storage and Green Hydrogen Production: *Alexander Michaelis*¹; ¹Fraunhofer Institute of Ceramic Technologies and Systems, IKTS

4:40 PM Question and Answer Period

4:50 PM Invited

Acta Materialia Mary Fortune Global Diversity Lecture: Engaging a Diverse Student Body through Education, Outreach and Mentorship: *Amber Genau*¹; ¹University of Alabama at Birmingham

5:10 PM Question and Answer Period

5:20 PM Brief break for prepare for reception

5:30 PM Wine and Cheese Reception with Posters: Student Award Winners in Acta Materialia Symposium:

Cemile Basgul - Thermal Localization Improves the Interlayer Adhesion and Structural Integrity of 3D Printed PEEK Lumbar Spinal Cages; Alice Cervellon - Crack Initiation Mechanisms of Ni-based Single-crystal Superalloys in the Very High Cycle Fatigue Regime at High Temperature; Sebastian Kube - Metastability in High Entropy Alloys; William Meador - A Detailed Mechanical and Microstructural Analysis of the Ovine Tricuspid Valve Leaflets; Jonathan Priedeman - The Influence of Alloying in Stabilizing a Faceted Grain Boundary Structure; Shaolou Wei, Cemal Cem Tasan - Deformation Faulting in a Metastable CoCrNiW Complex Concentrated Alloy: A Case of Negative Intrinsic Stacking Fault Energy?

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — Surface Roughness and Porosity Effects

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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Tuesday PM | March 1, 2022
258B | Anaheim Convention Center

Session Chairs: Nik Hrabe, National Institute of Standards and Technology (NIST); Jake Benzing, National Institute of Standards and Technology (NIST)

2:30 PM Invited

Additive Manufacturing Surface Roughness Formation, Characterization, and Influence on Fatigue Performance: *Joy Gockel*¹; Rachel Evans²; Edwin Glaubitz¹; Anna Dunn²; Wesley Eidt²; ¹Colorado School of Mines; ²Wright State University

3:00 PM

The Role of As-built Surface Morphology in High Cycle Fatigue Failure of IN718: *Orion Kafka*¹; Jake Benzing¹; Nikolas Hrabe¹; Newell Moser¹; Donald Godfrey²; Philipp Schumacher²; Chad Beamer³; ¹National Institute of Standards and Technology; ²SLM Solutions; ³Quintus Technologies

3:20 PM

The Influence of Orientation and Processing Method on Fatigue Crack Growth Behavior of AM Stainless Steel: *Christine Smudde¹; Michael Hill¹; Christopher San Marchi²; Jeffery Gibeling¹; ¹Univeristy of California, Davis; ²Sandia National Laboratories*

3:40 PM

Mesoscale Modeling of the Additively Manufactured 316L: Effects of Microstructure and Microscale Residual Stresses: *Mohammadreza Yaghoobi¹; Yin Zhang²; Krzysztof S. Stopka²; David J Rowenhorst³; Ting Zhu²; John E. Allison¹; David L. McDowell²; ¹University of Michigan; ²Georgia Institute of Technology; ³US Naval Research Laboratory*

4:00 PM Break

4:20 PM Invited

Effect of Stress State and Pores on Multiaxial Fracture of Low- and High-ductility Additively Manufactured Metals: *Allison Beese¹; ¹Pennsylvania State University*

4:50 PM

Flaw Type Dependent Tensile Properties of 316L Stainless Steel Manufactured by Laser Powder Bed Fusion: *Nathalia Diaz Vallejo¹; Ke Huang²; Christopher Kain²; Le Zhou³; Jeongmin Woo¹; Nicolas Ayers¹; Asif Mahmud¹; Erin Honse⁴; Han Chan⁴; Alexander Hall⁴; František Zelenka⁴; Yongho Sohn¹; ¹University of Central Florida; ²Siemens Energy; ³Marquette University; ⁴Thermo Fisher Scientific*

5:10 PM

High Cycle Fatigue Behavior of Additively Manufactured Thin Wall Inconel 718 (Dependence on Thickness and HIP): *Paul Paradise¹; Anushree Saxena¹; Andrew Sarasin¹; Nikki Van Handel¹; Dhruv Bhat¹; ¹Arizona State University*

5:30 PM

Non-destructive Determination of Single Crystal Elastic Constants in Additively Manufactured Alloys by Bayesian Inference and Resonant Ultrasound Spectroscopy: *Jeffrey Rossin¹; Patrick Leser²; Kira Pusch¹; Carolina Frey¹; Chris Torbet¹; Stephen Smith²; Samantha Daly¹; Tresa Pollock¹; ¹University of California Santa Barbara; ²NASA Langley Research Center*

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Novel Applications and Alloys

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

Program Organizers: Sneha Prabha Narra, Carnegie Mellon University; Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh

Tuesday PM | March 1, 2022

263A | Anaheim Convention Center

Session Chair: Joel Andersson, University West

2:30 PM Invited

Large Metal Structures with Wire Arc Additive Manufacturing-Case Studies with Invar Tooling and AM718 Structural Parts: *Badri Narayanan¹; Ben Schaeffer¹; Brad Barnhart¹; Andrzej Nycz²; Sougata Roy³; Hannah Sims⁴; Thodla Ramgopal⁵; ¹Lincoln Electric Company; ²Oakridge National Labs; ³University of North Dakota; ⁴Case Western Reserve University; ⁵DNV*

3:10 PM

Rapid Low-temperature Bend-forming of Hierarchical Reticulated Structures: *Zachary Cordero¹; Harsh Bhundiya¹; Fabien Royer¹; ¹Massachusetts Institute of Technology*

3:30 PM

An Investigation on the Capabilities of Laser Directed Energy Deposition Additive Manufacturing Process in Building Challenging Materials and Geometries: *Meysam Akbari¹; Ji-Cheng Zhao¹; ¹University of Maryland*

3:50 PM Break

4:10 PM

Assessment of Hybrid Additive Manufacturing Concept for Production of Parts for Space Applications: *Simon Malej¹; Matjaž Godec¹; Matej Balazic²; Crtomir Donik¹; Alexander Walz³; Tom Lienert⁴; Laurent Pambaguian⁵; ¹Institute of Metals and Technology; ²Balmar d.o.o.; ³DISTECH – Disruptive Technologies GmbH; ⁴Optomec, Inc; ⁵European Space Research and Technology Centre*

4:30 PM

A Comparative Study between the Laser Metal Deposition and Selective Laser Melting of AlxCoCrFeNi MPEA: *Praveen Sreeramagiri¹; Husam Alrehaili²; Xin Wu²; Ganesh Balasubramanian¹; ¹Lehigh University; ²Wayne State University*

4:50 PM Invited

Wire Arc Additive Manufacturing of Nano-treated High Strength Aluminum Alloys: *Yitian Chi¹; Maximilian Liese¹; Xiaochun Li¹; ¹University of California Los Angeles*

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of Refractory Alloys and Hybrid Alloys and Components

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Isabella Van Rooyen, Pacific Northwest National Laboratory; Omar Mireles, NASA Marshall Space Flight Center; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Edward Herderick, Ohio State University; Matthew Osborne, Global Advanced Metals

Tuesday PM | March 1, 2022

262C | Anaheim Convention Center

Session Chairs: Omar Mireles, NASA MFSC; Edward Herderick, Ohio State University; Faramarz Zarandi, Raytheon Technologies

2:30 PM

Development of Titanium-steel Hybrid Material Using DED Additive Manufacturing Technology: *Sung Chan Yoo¹; Hyun-Gil Kim¹; ¹Korea Atomic Energy Research Institute*

2:50 PM

Union of Mo and Cr Alloys into a Single Multi-materials Part Using Laser-powder Directed Energy Deposition: *Vincent Jacquier¹; Julien Zollinger²; Frédéric Schuster³; Hicham Maskrot¹; Philippe Zeller¹; Wilfried Pacquentin¹; ¹Université Paris-Saclay, CEA, Service d'Etudes Analytiques et de Réactivité des Surfaces, 91191, Gif-sur-Yvette, France; ²IJL, Université de Lorraine, CNRS, 54000 Nancy, France; ³Cross-Cutting Program on Materials and Processes Skills, CEA, Université Paris-Saclay, 91191 Gif-sur-Yvette, France*

3:10 PM

Enhancement of the Thermal Conductivity of Inconel 718 with the Addition of Tungsten: *Cory Groden¹; Eric Nyberg¹; Amit Bandyopadhyay¹; ¹Washington State University*

3:30 PM

Laser Assisted Cold Spray Deposition for Niobium and Tantalum Materials: *Brett Tucker Roper¹; Luke Brewer¹; Paul Allison¹; Andy Deal²; Tim Eastman²; ¹The University of Alabama; ²Kansas City National Security Campus*

3:50 PM Break

4:10 PM

Study of Melt-pool Geometry and Microstructure in Pure W by Powder-feed Directed Energy Deposition: *Amaranth Karra¹; Maarten de Boer¹; Bryan Webler¹; ¹Carnegie Mellon University*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — In Situ Monitoring of Laser Powder-bed Fusion

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Tuesday PM | March 1, 2022
258A | Anaheim Convention Center

Session Chair: Joy Gockel, Colorado School of Mines

2:30 PM Invited

Digitally Twinned Additive Manufacturing: Real-time Detection of Flaws in Laser Powder Bed Fusion by Combining Thermal Simulations with In-Situ Meltpool Sensor Data: *Reza Yavari¹; Alex Riensche¹; Emine Tekerek²; Adriane Tenequer³; Lars Jacquemett⁴; Scott Halliday³; Marcie Vandever³; Ziyad Smoqi¹; Vignesh Perumal²; Kevin Cole¹; Antonios Kontsos²; *Prahalad Rao¹; ¹University of Nebraska; ²Drexel University; ³Navajo Technical University; ⁴Sigma Labs**

3:00 PM

Simultaneous 3D-location and Temperature Tracking of Hot Spatter during Laser Powder Bed Fusion Using a High-speed Spectral Plenoptic Camera: *Ralf Fischer¹; Dustin Kelly¹; Sarah Morris¹; Ari Goldman¹; Brian Thurow¹; Barton Prorok¹; ¹Auburn University*

3:20 PM Invited

Process Monitoring of Melt Pool Spatter at Melt Pool, Layer and Part Scales: *Jack Beuth¹; Christian Gobert¹; Brandon Abranovic¹; ¹Carnegie Mellon University*

3:50 PM Break

4:05 PM

Sensor Enabled Material Response Prediction in Powder Bed Fusion Additive Manufacturing: *Justin Gambone¹; ¹GE Research*

4:25 PM

In Situ Characterization of Laser-based Metal Additive Manufacturing by Detection of Thermal Electron Emission: *Philip Depond¹; John Fuller¹; Saad Khairallah¹; Justin Angus¹; Gabe Guss¹; Manyalibo Matthews¹; Aiden Martin¹; ¹Lawrence Livermore National Laboratory*

4:45 PM

In-situ Characterization of Melt Flow Instability in Laser Metal Additive Manufacturing: *Qilin Guo¹; Minglei Qu¹; S. Mohammad H. Hojjatzadeh¹; Luis I. Escano¹; Zachary Young¹; Kamel Fezzaa²; Lianyi Chen¹; ¹University of Wisconsin Madison; ²Argonne National Laboratory*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III — Friction Stir Processing

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Tuesday PM | March 1, 2022
263B | Anaheim Convention Center

Session Chair: Nihan Tuncer, Desktop Metal

2:30 PM Introductory Comments

2:35 PM

Overview of the Process Fundamentals Underlying Additive Friction Stir Deposition: *Hang Yu¹; Hunter Rauch¹; Robert Griffiths¹; ¹Virginia Polytechnic Institute and State University*

2:55 PM

Mechanical Properties and Characterization of Solid-state Additive Manufacturing of AA6061 and AA5083: *Sadie Beck¹; J. Jordon²; Paul Allison²; C. Williamson²; ¹The University of West Alabama; ²The University of Alabama*

3:15 PM

Micro- and Nanostructural Evolution in AA7075 Manufactured by Additive Friction Stir Deposition: *Rekha M Y¹; Dustin Avery¹; Paul G Allison¹; Brian Jordon¹; Luke N Brewer¹; ¹University of Alabama*

3:35 PM

Processing-structure-property Correlation in Additive Friction Stir Deposited Ti-6Al-4V Alloy from Recycled Metal Chips: *Priyanshi Agrawal¹; Rajiv Mishra¹; Ravi Verma²; ¹University of North Texas; ²Materials and Manufacturing Tech, Boeing Research and Technology*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — Aluminum Alloys

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Tuesday PM | March 1, 2022
261A | Anaheim Convention Center

Session Chair: Hunter Martin, HRL

2:30 PM Invited

Alloy Design for High Temperature Aluminum: *Darby LaPlant¹; John Martin¹; ¹HRL Laboratories, LLC*

3:00 PM Invited

Alloy Design and Rapid Development of New Ternary and Quaternary Al-Ce-based Alloys for Additive Manufacturing: *Hunter Henderson¹; Aurelien Perron¹; Emily Moore¹; Scott McCall¹; Ryan Ott²; Orlando Rios³; ¹Lawrence Livermore National Laboratory; ²Ames Laboratory; ³University of Tennessee-Knoxville*

3:30 PM

A Modified 7068 Aluminum Alloy Designed for Laser Powder Bed Fusion: *Brandon Fields¹; Benjamin MacDonald¹; Xiaochun Li²; Lorenzo Valdevit¹; Diran Apelian¹; ¹University of California, Irvine; ²University of California, Los Angeles*

3:50 PM

An Advanced High-performance Aluminum Alloy Designed for Wire-arc Additive Manufacturing: *Thomas Klein¹; Martin Schnall¹; Rudolf Gradinger¹; Stephan Ucsnik¹; ¹LKR Light Metals Technologies Ranshofen*

4:10 PM Break**4:25 PM**

Laser Powder Bed Fusion of Novel Aluminum Alloy: *Glenn Bean¹; ¹The Aerospace Corporation*

4:45 PM

Selective Laser Melting of Novel 7075 Aluminum Alloy with Internally Dispersed Nanoparticles: *Tianqi Zheng¹; Shuaihang Pan¹; Bingbing Li²; Xiaochun Li¹; ¹University of California, Los Angeles; ²California State University, Northridge*

5:05 PM

Towards New High-strength Al-alloys Specifically Designed for L-PBF: *Giuseppe Del Guercio¹; David McCartney¹; Nesma Aboulkhair¹; Christopher Tuck¹; Marco Simonelli¹; ¹University of Nottingham*

5:25 PM

Thermodynamic Modeling to Design New Al-Ce Alloys: *Emily Moore¹; Hunter Henderson¹; Orlando Rios²; Scott McCall¹; David Weiss³; Aurélien Perron¹; ¹Lawrence Livermore National Laboratory; ²University of Tennessee at Knoxville; ³Eck Industries*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — Small Scale Mechanical Testing/Microstructural Features I

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

Program Organizers: Meysam Haghshenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Tuesday PM | March 1, 2022
260A | Anaheim Convention Center

Session Chairs: Meysam Haghshenas, University of Toledo; Joy Gockel, Colorado School of Mines

2:30 PM Introductory Comments**2:35 PM**

High-throughput Synthesis and Testing of Novel Alloys for Additive Manufacturing: *Madelyn Madrigal-Camacho¹; Kendrick Mensink¹; Guillermo Aguilar¹; Suveen Mathaudhu¹; ¹University of California-Riverside*

2:55 PM

Bridging the Deformation Length-scales in Additively Manufactured Metals via In Situ Mechanical Testing: *Yinmin (Morris) Wang¹; ¹University of California, Los Angeles*

3:15 PM

What Can We Learn from Micromechanical Testing: A Case Study for EBM-produced Ti-6Al-4V: *Sezer Ozerinc¹; ¹Middle East Technical University*

3:35 PM

The Effect of Microstructural Features on the Mechanical Properties of Additively Manufactured Metals and Alloys: *Ajit Achuthan¹; ¹Clarkson University*

3:55 PM Break**4:15 PM**

Effect of Cr Addition on the Microstructure and Mechanical Properties of Additively Manufactured GRCop-84: *Ajay Bhagavatam¹; Husam Alrehaili¹; Guru Dinda²; Golam Newaz¹; ¹Wayne State University; ²Savannah River National Laboratory*

4:35 PM

In Situ Investigation on the Multi-scale Deformation Mechanisms in Additively Manufactured Hierarchical Boron Nitride Nanotube Based Composites: *Tyler Dolmetsch¹; Tanaji Paul¹; Cheng Zhang¹; Benjamin Boesl¹; Arvind Agarwal¹; ¹Florida International University*

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Nuclear Fuels Microstructure-Modeling

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Tuesday PM | March 1, 2022
202B | Anaheim Convention Center

Session Chair: David Frazer, Idaho National Laboratory

2:30 PM Invited

Mesoscale Hybrid Model for Fission Gas Behavior in UO₂: Coupling the Phase Field Method to Spatially Resolved Cluster Dynamics: *Sophie Blondel*¹; David Andersson²; David Bernholdt³; Dong-Uk Kim⁴; Fande Kong⁵; Md Ali Muntaha⁴; Philip Roth³; Michael Tonks⁴; Brian Wirth¹; ¹University of Tennessee; ²Los Alamos National Laboratory; ³Oak Ridge National Laboratory; ⁴University of Florida; ⁵Idaho National Laboratory

3:00 PM

Adding Irradiation-assisted Grain Growth to the MARMOT Tool for UO₂ Nuclear Fuel: *Md Ali Muntaha*¹; Larry Aagesen²; Michael Tonks¹; Zefeng Yu³; Arthur Motta³; ¹University of Florida; ²Idaho National Laboratory; ³Penn State University

3:20 PM

Multiphysics Modeling of Fracture in Sintered Uranium Dioxide Pellets: *Levi McClenny*¹; *Mohammad Abdoelatef*²; Moiz Butt¹; Hari Krishnan¹; Michal Pate¹; Kay Yee¹; Wen Jiang²; Karim Ahmed¹; Sean McDevitt¹; ¹Texas A&M University; ²Idaho National Laboratory

3:40 PM Invited

Modeling Irradiation-enhanced Diffusion in Advanced Ceramic Nuclear Fuels: *Michael Cooper*¹; Christopher Matthews¹; Vancho Kocovski¹; Christopher Stanek¹; David Andersson¹; ¹Los Alamos National Laboratory

4:10 PM Break

4:30 PM

Centipede: A New Tool for Calculating Irradiation Enhanced Transport of Defects in Nuclear Fuel: *Christopher Matthews*¹; Michael Cooper; Romain Perriot¹; Xiang-Yang Liu¹; Chris Stanek¹; David Andersson¹; ¹Los Alamos National Laboratory

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session IV

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Taran, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Tuesday PM | March 1, 2022
207A | Anaheim Convention Center

Session Chairs: Michael Glazoff, Idaho National Laboratory; Carlos Tome, LANL

2:30 PM Invited

Applications of an Efficient Elasto-visco-plastic Self-consistent Polycrystal Model Interfaced with a Finite Element Framework: *Youngung Jeong*¹; *Carlos Tome*²; Bohye Jeon¹; Mooyeong Joo¹; ¹Changwon National University; ²Los Alamos National Laboratory

3:00 PM

Prismatic Slip Induced Interface Sliding in Alpha/Beta Titanium Alloys: *Zachary Kloenne*¹; Stoichko Antonov²; Gopal Viswanathan¹; Michael Loretto³; Hamish Fraser¹; ¹Ohio State University; ²Max-Planck-Institut für Eisenforschung GmbH; ³University of Birmingham

3:20 PM

Analysis of RVE Size Based on Slip Activity Using Far-field HEDM Data: *Rachel Lim*¹; Anthony Rollett²; Darren Pagan¹; ¹Pennsylvania State University; ²Carnegie Mellon University

3:40 PM

Strain Accommodation Mechanisms in the Near Alpha Ti-6Al-2Sn-4Zr-2Mo Alloy Studied Using Experiments and Simulations: *Samuel Hemery*¹; Azdine Nait-Ali²; Mikael Gueguen²; Olga Smerdova²; Christophe Tromas²; ¹Institute Prime - Ensma; ²Institut Pprime

ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings — Young Talents in Research/ Multifunctional Biomaterials, Innovative Approaches to New Concepts and Applications

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Ramana Chintalapalle, University of Texas at El Paso; Adele Carrado, IPCMS - CNRS Université de Strasbourg; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougou, Cnrs - Is2m; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Tuesday PM | March 1, 2022
204B | Anaheim Convention Center

Session Chairs: Adele Carrado, IPCMS - CNRS, Université de Strasbourg, France; Heinz Palkowski, TU-Clausthal IMET

2:30 PM Introductory Comments

2:35 PM Invited

Challenges of TiN Thin Film Coating Development and Deposition onto Medical Grade Thermoplastic Polyurethane (TPU) Used in Biomedical Devices: *Maren Fossum*¹; Kari Kjørholt¹; Javier Sanchez²; Christoph Burgstaller³; Richard Olsson⁴; Ragnhild Aune¹; ¹Norwegian University of Science and Technology; ²Danderyd Hospital at Karolinska Institute (DS KI); ³TCKT - Transfercenter für Kunststofftechnik; ⁴KTH Royal Institute of Technology

3:05 PM Invited

Polymer Grafting on Metal Surfaces Using "Grafting from" Chemical Method: *Flavien Mouillard*¹; Oumaima Laghzali¹; Patrick Masson¹; Genevieve Pourroy¹; Adele Carrado¹; ¹CNRS UMR7504

3:35 PM Invited

Metal Mesh Reinforced Polymers: An Interesting Alternative for Biomedical Applications: *Gargi Nayak*¹; Heinz Palkowski²; ¹TU Clausthal; ²TU Clausthal

4:05 PM Break

4:25 PM Invited

Effect of Post-deposition Annealing on the Structure and Optical Properties of GeO₂ Thin Films: *Paul Nalam*¹; Debabrata Das¹; Ramana Chintalapalle¹; ¹The Center for Advanced Materials Research, The University of Texas at El Paso

4:55 PM

Effects of Femtosecond Laser Shock Peening on the Tribocorrosion Resistance of Biodegradable WE43 Magnesium Alloys: *Wenbo Wang*¹; Chang-Yu Hung¹; Leslie Howe²; Jia Chen¹; Kaiwen Wang¹; Vinh Ho¹; Shannon Lenahan¹; Mitsuhiro Murayama¹; Nguyen Vinh¹; Wenjun Cai¹; ¹Virginia Polytechnic Institute and State University

5:15 PM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Functional Materials for Energy

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Tuesday PM | March 1, 2022
212B | Anaheim Convention Center

Session Chairs: Paul Ohodnicki, University of Pittsburgh; Swetha Chandrasekaran, Lawrence Livermore National Laboratory

2:30 PM

Enhancing the Thermoelectric Performance of Si Using Energy Filtering: *Aria Hosseini*¹; Lorenzo Mangolini¹; *Peter Greaney*¹; ¹University of California, Riverside

2:50 PM

Adsorption and Surface Diffusion of Metals for Advanced Manufacturing Applications: *Austin Biagge*¹; Lan Li¹; ¹Boise State University

3:10 PM

Bioinspired Low-cost Photoelectrochemical Green Hydrogen Production Cell: *Laura Carmona Saldarriaga*¹; Edgar Ossa Henao¹; ¹Universidad Eafit

3:30 PM

Chemical Vapor Deposition Synthesis of Atomically Dispersed Single Metal Site Carbon Fibers for Highly Efficient Electrocatalysis: *Qiurong Shi*¹; *Sivasankara Rao Ede*²; David Kisailus¹; ¹University of California, Irvine; ²University of California, Irvine

3:50 PM Break

4:10 PM

Bismuth Ferrite: Comparing the Effect of Synthesis Route on Properties: *Lyndon Smith*¹; Rifat Mahbub²; Jeffrey Shield²; Vijaya Rangari¹; Shaik Jeelani¹; ¹Tuskegee University; ²University of Nebraska-Lincoln

4:30 PM

Film Strains Enhance the Reversible Cycling of Intercalation Electrodes: *Delin Zhang*¹; Ananya Renuka Balakrishna¹; ¹University of Southern California

4:50 PM

Synthesis of Bicontinuous 3-D Turbostratic Graphene: *Peter Santiago*¹; Sierra Gross¹; Derek Chang¹; Ali Mohraz¹; Regina Ragan¹; ¹University of California, Irvine

CHARACTERIZATION

Advanced Real Time Imaging — Joint session: Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling

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

Program Organizers: Jinichiro Nakano, US Department of Energy - National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, Kth Royal Institute of Technology; David Veyssset, Stanford University; Pranjal Nautiyal, University of Pennsylvania

Tuesday PM | March 1, 2022
206A | Anaheim Convention Center

Session Chair: Jiawei Mi, University of Hull

2:30 PM Invited

Ultrafast Real-time Imaging and Modelling of the Dynamics of Fatigue Liquid Exfoliation of 2D Graphite under Ultrasound: *Jiawei Mi¹; Ling Qin¹; ¹University of Hull*

2:50 PM Invited

Real-time Deformation Mechanisms of Hierarchically Structured Nanocomposites Using High-resolution In Situ Testing: *Tyler Dolmetsch¹; Kazue Orikasa¹; Tanaji Paul¹; Cheng Zhang¹; Benjamin Boesl¹; Arvind Agarwal¹; ¹Florida International University*

3:10 PM

In Situ Atomic Force Microscopy Evaluation of the Normal Pressure-dependent Lubrication Mechanism of Phosphonium Phosphate Ionic Liquid: *Filippo Mangolini¹; Zixuan Li¹; Andrei Dolocan¹; Oscar Morales-Collazo¹; Jerzy Sadowski²; Hugo Celio¹; Joan Brennecke¹; ¹University of Texas at Austin; ²Brookhaven National Laboratory*

3:30 PM

Tension Compression Asymmetry and Plastic Anisotropy in Mg Single Crystal Response Evaluated Using Micromechanical Tests: *Skye Supakul¹; Manish Jain²; Bin Li³; Siddhartha Pathak¹; ¹Iowa State University; ²EMPA - Materials Science and Technology; ³University of Nevada, Reno*

3:50 PM Break

4:10 PM Invited

Understanding Deformation at the Nanoscale via In Situ SEM Mechanical Testing: *Nathan Mara¹; ¹University of Minnesota*

4:30 PM

Determination of Strain Path Envelope in an Optimized Biaxial Cruciform Specimen of AISI 1008 Steel under Linear, Bilinear, and Nonlinear Strain Paths: *Jordan Hoffman¹; Dilip Banerjee¹; Mark Iadicola¹; ¹National Institute of Standards and Technology*

4:50 PM

In-situ Investigation of Deformation Behavior of 5Mn Steel at Different Strain Rates by Digital Image Correlation: *Yonggang Yang¹; Zhenli Mi¹; Wangzhong Mu²; Mian Li¹; Mai Wang¹; ¹University of Science and Technology Beijing; ²KTH-Royal Institute of Technology*

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — Alloy Development and Application III

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM | March 1, 2022
251A | Anaheim Convention Center

Session Chairs: Yanwen Zhang, Oak Ridge National Laboratory; William Weber, University of Tennessee

2:30 PM Invited

Discovery of New Refractory High-entropy Alloys with Improved High-temperature Properties: *Stephen Giles¹; Debasis Sengupta¹; Scott Broderick²; Krishna Rajan²; Peter Liaw³; ¹CFD Research Corp; ²University at Buffalo; ³University of Tennessee, Knoxville*

2:50 PM Invited

Multi-principal Elements Alloys as Filler Metals for Similar and Dissimilar Joining Applications: *Zhenzhen Yu¹; Benjamin Schneidman¹; Abdelrahman Abdelmotagaly¹; Andrew Chuang²; ¹Colorado School of Mines; ²Argonne National Laboratory*

3:10 PM

A Novel Approach to Designing Low-density CCAs Exploiting Multi-element Eutectics: *Clemens Simson¹; Stefan Gneiger¹; Alexander Großalber¹; Stefan Pogatscher²; ¹LKR Light Metals Technologies Ranshofen; ²Montanuniversität Leoben*

3:30 PM

Microalloying Technology: A Promising Strategy for Design of Nanocrystalline High-entropy Alloy Films: *Wenyi Huo¹; Feng Fang²; Zonghan Xie³; Hyoung Seop Kim⁴; Jianqing Jiang¹; ¹Nanjing Forestry University; ²Southeast University; ³University of Adelaide; ⁴Pohang University of Science & Technology (POSTECH)*

3:50 PM Break

4:10 PM

Synthesis and Characterization of Porous AlCoCrFeNi High-entropy-alloy: *Akib Javed¹; Golden Kumar¹; ¹The University of Texas at Dallas*

4:30 PM

Expanding the Design Space of Ti-V-Nb-Hf Refractory High-entropy Alloys through Al-alloying: *Shaolou Wei¹; Cem Tasan¹; ¹Massachusetts Institute of Technology*

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — Structures and Characterization 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM | March 1, 2022
251B | Anaheim Convention Center

Session Chairs: Takeshi Egami, The University of Tennessee, Knoxville; Jian-Min Zuo, University of Illinois Urbana-Champaign

2:30 PM Invited

Chemical Randomness and Lattice Distortions in Multi-principal Elements Alloys: Advances in Characterization: *Jian Min Zuo*¹; Haw-Wen Hsiao²; Yu-Tsun Shao³; Yang Hu⁴; Qun Yang²; ¹University of Illinois; ²ShanghaiTech University

2:50 PM

Metastability and Phase Selection in High Entropy Alloys: *Sebastian Kube*¹; Sungwoo Sohn¹; Pamela Banner¹; David Uhl²; Amit Datye³; Suchismita Sarker³; Apurva Mehta³; Jan Schroers¹; ¹Yale University; ²Southern Connecticut State University; ³SLAC National Accelerator Laboratory

3:10 PM Invited

TEM Study of a Refractory Complex Concentrated Alloy with BCC/B2 Microstructure: *Jean-Philippe Couzine*¹; Milan Heczko²; Veronika Mazanova²; Oleg Senkov³; Rajarshi Banerjee⁴; Maryam Ghazisaeidi²; Michael Mills²; ¹Université Paris Est and Department of Materials Science and Engineering, The Ohio State University; ²The Ohio State University; ³Air Force Research Laboratory; ⁴University of North Texas

3:30 PM Invited

Design of High Temperature RCCAs Using Ordered Thermally Stable Structures: *Jaimie Tiley*¹; Soumya Nag¹; Ke An¹; Ercan Cakmak¹; Jonathan Poplawsky¹; Raymond Unocic¹; Sriswaroop Dasari²; Rajarshi Banerjee²; ¹Oak Ridge National Laboratory; ²University of North Texas

3:50 PM Break

4:10 PM Invited

In-situ 4D-STEM Imaging of the Synergistic Deformation Mechanisms Responsible for the Fracture Resistance in CrCoNi: *Yang Yang*¹; Sheng Yin²; Qin Yu²; Ruopeng Zhang²; Mark Asta²; Robert Ritchie²; Andrew Minor²; ¹The Pennsylvania State University; ²LBNL

4:30 PM Invited

Effective Atomic Size in Multi-principal Element Alloys: *Takeshi Egami*¹; ¹University of Tennessee

MATERIALS PROCESSING

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

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Tuesday PM | March 1, 2022
213C | Anaheim Convention Center

Session Chairs: Dipankar Ghosh, Old Dominion University; Bowen Li, Michigan Tech

2:30 PM

Influence of Microstructure on Mechanical Properties in High Entropy Oxides: *Justin Cortez*¹; Alexander Dupuy¹; Hasti Vahidi¹; Olivia Donaldson¹; Tim Rupert¹; William Bowman¹; Julie Schoenung¹; ¹University of California Irvine

2:50 PM

A Novel Design Approach to Achieving High Strength and Ductility in Traditionally Brittle Nanoporous Silicon Nitride Membranes: *Ali K. Shargh*¹; Gregory Madejski¹; James McGrath¹; Niaz Abdolrahimi¹; ¹University of Rochester

3:10 PM Invited

Low-temperature Pathways to Porous SiC Solids: *Laura Quinn*¹; Taijung Kuo¹; *Katherine Faber*¹; ¹California Institute of Technology

3:30 PM

The Emergence of ZIA Phases: *Matheus Araujo Tunes*¹; Rubens Ingraci Neto¹; James Valdez¹; Jon Baldwin¹; Saryu Fensin¹; Osman El-Atwani¹; Stuart Maloy¹; ¹Los Alamos National Laboratory

3:50 PM Break

4:05 PM

The Influence of Composition, Processing, and Microstructure on the Electrical Behavior of High Entropy Oxides: *Arturo Meza*¹; Alexander Dupuy¹; Julie Schoenung¹; ¹University of California Irvine

4:25 PM

Phase Field Modeling of Silicon Carbide Microstructure Evolution: *Elias Munoz*¹; Vahid Attari¹; Marco Martinez²; Matthew Dickerson²; Miladin Radovic¹; Raymundo Arroyave¹; ¹Texas A&M University; ²Air Force Research Lab

MATERIALS PROCESSING

Advances in Surface Engineering IV — Session III

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

Program Organizers: Arif Mubarak, PPG; Bharat Jasthi, South Dakota School of Mines & Technology; Tushar Borkar, Cleveland State University; Mary Lyn Lim, PPG Industries; Rajeev Gupta, North Carolina State University

Tuesday PM | March 1, 2022
210C | Anaheim Convention Center

Session Chair: Rajeev Gupta, North Carolina State University

2:30 PM

Corrosion Behavior of Shear Extruded Mg-3Si Magnesium Alloy: Role of Mg₂Si Fragmentation and Grain Refinement: *Vikrant Beura*¹; Vineet Joshi²; Kiran Solanki¹; ¹Arizona State University; ²Pacific Northwest National Laboratory

2:50 PM

Microstructural, Mechanical, and Corrosion Properties of Pulsed Laser Deposited Hexagonal Boron Nitride Nanofilms: *Venkata Kandada*¹; Venkata Gadhamshetty¹; Bharat K. Jasthi¹; ¹South Dakota School of Mines & Technology

3:10 PM

HVOF 316L and C276 Metal Cladding for Corrosion Protection: *Juliane Ribeiro da Cruz*¹; *Sanjay Sampath*¹; ¹State University of New York at Stony Brook

3:30 PM

Simultaneous Effects of MC Carbide Formers on Hardness of Wear Resistant Overlays by Design of Experiments and Machine Learning: *Jing Li*¹; Bing Cao¹; Haohan Chen¹; Leijun Li¹; ¹University of Alberta

3:50 PM Break

4:10 PM

Strong Covalent Bonding between PMMA/Zn-Mg Alloys Using Grafting-from Technique for Biomedical Applications: *Oumaima Laghzali*¹; Alia Diaa²; Flavien Mouillard¹; Nahed El Mahalawy²; Genevieve Pourroy¹; Patrick Masson¹; Heinz Palkowski³; *Adele Carrado*¹; ¹IPCMS - CNRS, Université de Strasbourg, France; ²German University of Cairo, Cairo, Egypt; ³IMET, Clausthal University of Technology, Clausthal-Zellerfeld, Germany

4:30 PM

Towards the Tuning of the Degradation Behaviour of Pure Biodegradable Zn by Laser Texturing: *Carlo Biffi*¹; Jacopo Flocchi¹; Sofia Gambaro¹; Ausonio Tuisi¹; ¹CNR - National Research Council

4:50 PM

Unraveling the Roles of Thickness, Crystallinity and Composition of Powder Passivation Layers during Cold Spraying of Aluminum Powder: *Cameron Crook*¹; Seyed Saeidi¹; Diran Apelian¹; Daniel Mumm¹; Lorenzo Valdevit¹; ¹University of California Irvine

MATERIALS DESIGN

Advances in Titanium Technology — Deformation Behavior in Ti Alloys I

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Tuesday PM | March 1, 2022
252A | Anaheim Convention Center

Session Chair: Fan Sun, PSL Research University

2:30 PM

Transformations in TRIP/TWIP Ti Alloys Studied via In-situ Methods: *Fan Sun*¹; Bingnan Qian¹; Lola Liliensten¹; Philippe Vermaut²; Frédéric Prima³; ¹PSL Research University

2:50 PM

In-situ Synchrotron X-ray Diffraction of High Strain Rate Deformation of TRIP/TWIP Ti-Mo Alloys: *Benjamin Ellyson*¹; Kamel Fezzaa²; Tao Sun¹; Niranjana Parab¹; Christopher Finckel¹; Connor Rietema¹; Douglas Smith¹; John Copley¹; Chloe Johnson¹; Chandler Becker¹; Jonah Klemm-Toole¹; Cody Kirk¹; Nesredin Kedir¹; Jinling Gao¹; Weinong Wayne Chen¹; Rajarshi Banerjee¹; Kester Clarke¹; Amy Clarke¹; ¹Colorado School of Mines

3:10 PM

Characterization of Nanoscale Metastable Phases in a TRIP Titanium Alloy: *Wenrui Zhao*¹; Dian Li¹; *Yufeng Zheng*¹; ¹University of Nevada, Reno

3:30 PM

Assessing the Variability in Mechanical Properties of Biocompatible Ti-13Nb-13Zr Titanium Alloy with Respect to Thermomechanical Treatments and Associated Microstructures: *Stéphanie Delannoy*¹; Sarah Baiz²; Pascal Laheurte³; Laurence Jordan⁴; Frédéric Prima⁵; ¹PSL Research University, Chimie ParisTech - CNRS, Institut de Recherche de Chimie Paris UMR CNRS 8247 / Biotech Dental; ²Laboratoire Procédés et Ingénierie en Mécanique et Matériaux, PIMM, ENSAM, UMR 8006, CNRS, CNAM; ³Laboratoire d'Etude des Microstructures et de Mécanique des Matériaux, LEM3 UMR CNRS 7239, Université de Lorraine; ⁴PSL Research University, Chimie ParisTech—CNRS, Institut de Recherche de Chimie Paris UMR CNRS 8247 / Dental Faculty, Université de Paris / Hospital Rothschild, AP-HP; ⁵PSL Research University, Chimie ParisTech—CNRS, Institut de Recherche de Chimie Paris UMR CNRS 8247

3:50 PM Break

4:10 PM

Twins in Ti under Different Loading Conditions: *Nilanjan Mitra*¹; ¹Johns Hopkins University

4:30 PM

Formation of {11-22} Contraction Twins in Titanium through Reversible Martensitic Phase Transformation: *Amir Hassan Zahiri*¹; Jamie Ombogo¹; Lei Cao¹; ¹University of Nevada Reno

4:50 PM

Critical Comparison of Estimation of Critical Resolved Shear Stress from Slip Line Trace Analysis and Spherical Indentation Protocols and Bayesian Learning Techniques for Ti 6Al-2Sn-4Zr-2Mo and Ti 6Al-2Sn-4Zr-6Mo Alloys: *Soumya Mohan*¹; Arunima Banerjee²; Andrew Castillo¹; Natalia Millan Espitia¹; Biswaranjan Dash³; Zhuowen Zhao⁴; Shanoob Balachandran⁵; Dipankar Banerjee⁶; Surya Kalidindi¹; ¹Georgia Institute of Technology; ²John Hopkins University; ³Garrett Advancing Motion; ⁴Michigan State University; ⁵Alloyed; ⁶Indian Institute of Science

5:10 PM

Characterization and Slip of α Screw Dislocation in Pure hcp a Titanium from Atomistic Simulations: Ali Rida¹; Satish Rao²; Jaafar El-Awady¹; ¹Johns Hopkins University; ²UES, Inc.

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Material Design II

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Tuesday PM | March 1, 2022

256A | Anaheim Convention Center

Session Chairs: Taylor Sparks, University of Utah; Jason Gibson, University Of Florida

2:30 PM

DiSCoVeR Algorithm for Identifying Promising Unlikely Candidates for New Materials: *Taylor Sparks*¹; Tran Diep¹; ¹University of Utah

2:50 PM

Physics Based Analytical Models for the Design of New Metastable Rare-earth Compounds: *Prashant Singh*¹; T. Del Rose¹; Guillermo Vazquez²; Raymundo Arroyave²; Yaroslav Mudryk¹; Ames Laboratory; ²Texas A&M University

3:10 PM

Optimizing Thermoelectric Compositions to Achieve Extraordinary Properties: *Andrew Falkowski*¹; Taylor Sparks¹; ¹University of Utah

3:30 PM

Deep Neural Network Regressor for Phase Fraction Estimation on the High Entropy Alloy System Al-Co-Cr-Fe-Mn-Nb-Ni: *Guillermo Vazquez Tovar*¹; Sourav Chakravarty¹; Rebeca Gurrola¹; Raymundo Arroyave¹; ¹Texas A&M University

3:50 PM

A Novel Approach for Rapid Alloy Development Leveraging Machine Learning: *Nhon Vo*¹; Ha Bui²; ¹NanoAl LLC; ²Amatrium Inc.

4:10 PM Break

4:30 PM

Accelerated Genetic Algorithm via a Pre-trained Crystal Graph Convolutional Neural Network: *Jason Gibson*¹; Richard Hennig¹; ¹University of Florida

4:50 PM

Balancing Data for Generalizable Machine Learning to Predict Glass-forming Ability of Ternary Alloys: *Yi Yao*¹; Timothy Sullivan¹; Feng Yan¹; Jiaqi Gong¹; Lin Li¹; ¹University of Alabama Tuscaloosa

5:10 PM

Data Driven Approach to Design/Discover Intercalating Ions and Layered Materials for Metal-ion Batteries: *Shayani Parida*¹; Avnish Mishra¹; Arthur Doble²; C Barry Carter³; Avinash Dongare¹; ¹University of Connecticut; ²EaglePicher Technologies LLC; ³CINT, Sandia National Laboratories

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Microscale Algorithms and Their Applications - Solidification

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Tuesday PM | March 1, 2022

253A | Anaheim Convention Center

Session Chairs: Mohsen Asle Zaeem, Colorado School of Mines; Adrian Sabau, Oak Ridge National Laboratory

4:00 PM

Multiscale Modeling of Ni Alloys Selective Laser Melting Combining CalPhaD, Finite Elements, and Phase-field Methods: Seyed Mohammad Elahi¹; Rouhollah Tavakoli²; Ahmed Kaci Boukellal²; Thomas Isensee¹; Ignacio Romero¹; *Damien Tournet*²; ¹IMDEA Materials & Universidad Politecnica de Madrid (UPM); ²IMDEA Materials

4:20 PM

Microstructure and Porosity Predictions in Additively Manufactured Ti-6Al-4V Alloys Using a Hierarchical Modeling Approach: Bonnie Whitney¹; *Akshatha Chandrashekar Dixith*¹; Anthony Spangenberg¹; Diana Lados¹; ¹Worcester Polytechnic Institute

4:40 PM Invited

OpenMP GPU Offloading for Cellular Automaton Solidification Microstructural Model: *Lang Yuan*¹; Adrian Sabau²; Jean-Luc Fattebert²; ¹University of South Carolina; ²Oak Ridge National Laboratory

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Microstructure Evolution & Characterization

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Tuesday PM | March 1, 2022
208B | Anaheim Convention Center

Session Chair: Andre Phillion, McMaster University

2:30 PM

Computational and Microstructural Analysis to Understand the Correlation between Precipitate Distribution and Mechanical Properties in Al-Cu-Mg-Mn Wire Material: *Peer Decker*¹; Axel Marquardt¹; Dominique Cance²; Magali Guizard²; Luisa Marzoli¹; Marcel Rosefort¹; ¹Trimet Aluminium Se; ²Trimet France

2:55 PM

Influence of Heat Treatment on the Electrical Resistivity of Aluminum Alloyed with Zirconium and Scandium: Alexander Alabin¹; Dmitry Fokin¹; Sergey Valchuk¹; ¹UC RUSAL

3:20 PM

Micro and Mechanical Characteristic of Hotband Annealed of a Continuous Cast Al-1.5Cu Alloy with Potential Application in High Strength and Low-cost Auto Forming Parts & Sheets: *Xiyu Wen*¹; ¹University of Kentucky

3:45 PM

Effect of Homogenization on Anodic Film and Electrochemical Behavior of an A535 Alloy after Sealing with Stearic Sealant: *Suwaree Chankitmongkol*¹; Dmitry Eskin²; Chaowalit Limmaneevichitr³; Phromphong Pandee³; Nattarat Kengkla³; Jirakit Athchaisiri³; Tanawat Tanawansombat³; Napadol Parnlasarn³; Onnjira Diewwanit³; ¹King Mongkut's Institute of Technology Ladkrabang; ²Brunel University; ³King Mongkut's University of Technology Thonburi

LIGHT METALS

Aluminum Reduction Technology — Alumina Dissolution and Dispersion

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

Program Organizers: Kristian Etienne Einarsrud, Norwegian University of Science and Technology; Stephan Broek, Boston Metal; Mertol Göknelma, Izmir Institute of Technology; Dmitry Eskin, Brunel University

Tuesday PM | March 1, 2022
209B | Anaheim Convention Center

Session Chair: Andrey Yasinsky, Siberian Federal Institute

2:30 PM Introductory Comments

2:35 PM

Advanced Alumina Dissolution Modelling: *Valdis Bojarevics*¹; Marc Dupuis²; ¹University of Greenwich; ²GeniSim Inc

3:00 PM

Oxide Sensor Measurements and Simultaneous Optical Observations during Dissolution of Alumina in Cryolite Melt: Luis Bracamonte¹; Kristian Etienne Einarsrud¹; Christian Rosenkilde²; *Espen Sandnes*¹; ¹Norwegian University of Science and Technology; ²Hydro Aluminium

BIOMATERIALS

Biological Materials Science — Biological Materials Science IV

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Tuesday PM | March 1, 2022
201B | Anaheim Convention Center

Session Chairs: Steven Naleway, The University of Utah; Hannes Schniepp, William and Mary

2:30 PM Invited

Harnessing Biomolecules for Multifunctional Dental Biomaterials: *Candan Tamerler*¹; Paulette Spencer¹; ¹University of Kansas

3:05 PM

Preparation and Characterization of Alloys of the Ti-10Mo-Mn System for Biomedical Purposes: Mariana Lourenço¹; *Carlos Grandini*¹; ¹Unesp

3:25 PM Invited

Bioinspired Materials for Organic, Flexible, and Degradable Biosensors: Sayantan Pradhan¹; Meng Xu¹; Ramendra Pal¹; *Vamsi Yadavalli*¹; ¹Virginia Commonwealth University

4:00 PM Break

4:15 PM

Mechanical Characterization of Collagen Hydrogels by Quasi-static Uniaxial Tensile Experiments: JiEung Kim¹; Sangmin Lee¹; Taek-soo Kim¹; *Dongchan Jang*¹; ¹KAIST

BIOMATERIALS

BioNano Interfaces and Engineering Applications — Bionano Interfaces & Engineering Applications II

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

Program Organizers: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Tuesday PM | March 1, 2022
201A | Anaheim Convention Center

Session Chair: To Be Announced

2:30 PM

Calcium Phosphate-based Bone Grafts with Curcumin and Vitamin C Shows Osteogenic, Chemo-preventive and Anti-bacterial Potential for Orthopaedic and Dental Applications: *Ujjayan Majumdar*¹; Susmita Bose¹; ¹Washington State University

2:50 PM

Structural Development and Phase Transformation of Mesocrystalline Iron Oxides in the Ultrahard Teeth of Cryptochiton Stelleri: *Taifeng Wang*¹; *Wei Huang*¹; *Wen Yang*¹; *Satoshi Murata*²; *Atsushi Arakaki*²; *David Kisailus*¹; ¹University of California, Irvine; ²Tokyo University of Agriculture and Technology

3:10 PM

Gingerol and EGCG Enhance Osteogenic and Antibacterial Properties of Ag-doped CaP Bone Grafts: *Yongdeok Jo*¹; *Susmita Bose*¹; ¹Washington State University

3:30 PM

Zinc Functionalized Polydopamine-curcumin Coated 3D Printed Calcium Phosphate Scaffolds for Enhanced Osteogenesis, and in Vitro Chemoprevention: *Arjak Bhattacharjee*¹; *Susmita Bose*¹; ¹W. M. Keck Biomedical Materials Research Lab, Washington State University

3:50 PM Break

4:10 PM Invited

Grain Size Effects and Mechanisms for Increased Antimicrobial Efficiency in Ultrafine-grained Bulk Copper: *Evander Ramos*¹; *Isabella Bagdasarian*¹; *Yaqiong Li*¹; *Masuda Takahiro*²; *Yoichi Takizawa*³; *Justin Chartron*¹; *Alex Greaney*¹; *Zenji Horita*²; *Joshua Morgan*¹; *Suveen Mathaudhu*¹; ¹University of California-Riverside; ²Kyushu University; ³Nagano Forging Co., Ltd

ADVANCED MATERIALS

Bulk Metallic Glasses XIX — Atomistic Simulations, Modelling and Theory

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Tuesday PM | March 1, 2022

253C | Anaheim Convention Center

Session Chairs: Daniel Soper, Erich Schmid Institute of Materials Science; Jun Ding, Xi'an Jiaotong University

2:30 PM Invited

Atomic Cooperativity in Metallic Glass: *Takeshi Egami*¹; ¹University of Tennessee

2:55 PM

Chemical and Topological Frustration in Binary Metallic Glass Formation: *Yuanhao Hu*¹; *Jan Schroers*¹; *Mark Shattuck*²; *Corey O'Hern*¹; ¹Yale University; ²The City College of New York

3:15 PM

Evidence of Crystalline Phase Precursors within High-temperature Metallic Liquids and their Effect on Glass-forming Ability: *Porter Weeks*¹; *Katharine Flores*¹; ¹Washington University in St. Louis

3:35 PM

Hall-Petch-like Relationship in Metallic Glasses: *Yucong Gu*¹; *Lin Li*¹; *Xiao Han*¹; *Feng Yan*¹; ¹University of Alabama

3:55 PM Discussion on atomistic simulations, modelling, and theory of metallic glasses

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Characterization of Polymers, Composites, Coatings and Ceramics

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Tuesday PM | March 1, 2022

207B | Anaheim Convention Center

Session Chairs: Wendell Bruno Almeida Bezerra, University of California San Diego; Sheron Tavares, University of California San Diego

2:30 PM Introductory Comments

2:35 PM

Cobalt Ferrite Based Multiferroic Polymer Nanocomposites: *Alix Martin*¹; ¹Tuskegee

2:55 PM

Understanding 3D Volumetric Analysis of Active MOF Embedded in Thin Film Polymer: *Andy Holwell*¹; *Maadhav Kothari*¹; *Markus Boese*¹; *Simon Vo*²; *Russell Morris*²; *Alexander Forse*³; *Suzi Pugh*³; ¹Carl Zeiss Microscopy LLC; ²University of St Andrews; ³University of Cambridge

3:15 PM

Employing a Semi-quantitative System to Elucidate Particle Spacing in Particle-reinforced Composite: *Andrew O'Connor*¹; *Cheol Park*¹; *Michele Manuel*¹; ¹University of Florida

3:35 PM

Interfacial Investigation of High Loaded Plastic Bonded Explosive Interfaces Modified via Biologically Inspired Core-shell Coating Technique. LA-UR-21-26026: *Matthew Herman*¹; *Erik Watkins*¹; *John Yeager*¹; ¹Los Alamos National Laboratory

3:55 PM Break

4:10 PM

Evaluation of the Pozzolanic Effect of Microsilica on Physical and Mechanical Properties in Mortar Mixtures: *Elisa Alcalá de Villarreal*¹; *Inocente Villarreal*¹; ¹UNEG

4:30 PM

Ubim fiber: another possible reinforcement in composites: *Belayne Marchi*¹; *Wendell Bezerra*¹; *Michelle Oliveira*¹; *Talita de Sousa*¹; *Veronica Candido*²; *Alisson Silva*²; *Sergio Monteiro*¹; ¹Instituto Militar de Engenharia; ²Universidade Federal do Pará

ENERGY & ENVIRONMENT

Composites for Energy Applications: Materials for Renewable Energy Applications 2022 — Hydrogen and Thermal Energy Storage

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

Program Organizers: Patrick Ward, Savannah River National Laboratory; Joseph Teprovich, California State University Northridge; Anthony Thompson, Savannah River National Laboratory; Simona Hunyadi Murph, Savannah River National Laboratory

Tuesday PM | March 1, 2022
210D | Anaheim Convention Center

Session Chair: Patrick Ward, Savannah River National Laboratory

2:30 PM Invited

Sulfur-based High Temperature Thermal Energy Storage: *Kaiyuan Jin*¹; ¹University of California-Los Angeles

3:00 PM Invited

Design of Novel Composites by Using Bioplastics and Biomass: *Surojit Gupta*¹; ¹University of North Dakota

3:30 PM Invited

Energetics of the Reversible Dehydrogenation of Magnesium Borohydride and Mg(BH₄)₂-THF Composite to Magnesium Boranes: *Craig Jensen*¹; Sunil Shrestha¹; Kazuomi Fujioka¹; Rui Sun¹; Phuong Nguyen¹; Tom Autrey²; ¹University of Hawaii; ²Pacific Northwest National Laboratory

4:00 PM

Development and Characterization of High Capacity Hydrogen Energy Storage Materials: *Zachary Duca*¹; Patrick Ward¹; Hector Colon-Mercado¹; Henry Sessions¹; Dustin Olson¹; Joseph Teprovich²; ¹Savannah River National Laboratory; ²California State University Northridge

4:20 PM Concluding Comments

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Uncertainty Quantification in CTK/Grain Boundary Thermodynamics

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoul, Oak Ridge National Laboratory; Damien Turret, IMDEA Materials Institute; James Morris, Ames Laboratory

Tuesday PM | March 1, 2022
255C | Anaheim Convention Center

Session Chairs: Reza Darvishi Kamachali, Institute for Materials Research and Testing (BAM); Vahid Attari, Texas A&M University

2:30 PM

Bayesian Learning of Thermodynamic Integration and Numerical Convergence for Accurate Phase Diagrams: *Vladimir Ladygin*¹; Alexander Shapeev²; Iliya Beniya³; Edgar Makarov²; ¹California Institute of Technology; ²Skolkovo Institute of Science and Technology; ³Moscow Institute of Technology

2:50 PM Invited

Uncertainty Reduction for Calculated Phase Equilibria: *Richard Otis*¹; Brandon Bocklund²; Zi-Kui Liu²; ¹Jet Propulsion Laboratory; ²Pennsylvania State University

3:20 PM Invited

CALPHAD-guided Grain Boundary Phase Diagrams and Opening Possibilities for Grain Boundary Engineering: *Reza Darvishi Kamachali*¹; Lei Wang¹; Anna Manzon¹; Birgit Skrotzki¹; Gregory Thompson²; ¹Federal Institute for Materials Research and Testing (BAM); ²Department of Metallurgical Materials Engineering, The University of Alabama

3:50 PM Break

4:10 PM

Computing Grain Boundary Diagrams: *Chongze Hu*¹; Jian Luo²; ¹Sandia National Laboratories; ²University of California San Diego

4:30 PM

Nucleation of Grain Boundary Phases: Ian Winter¹; Rob Rudd¹; Tomas Oppelstrup¹; *Timofey Frolov*¹; ¹Lawrence Livermore National Laboratory

MATERIALS PROCESSING

Defects and Properties of Cast Metals IV — Defects III- 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; Andrew Kao, University of Greenwich; Kyle Fezi, Fort Wayne Metals

Tuesday PM | March 1, 2022
210B | Anaheim Convention Center

Session Chairs: Alex Plotkowski, Oak Ridge National Laboratory; Etienne Martin, Polytechnique Montreal

4:00 PM Invited

Quantifying Pore Evolution during Laser Powder Fusion Using High-speed X-ray Imaging and High Fidelity Multiphase Simulation: *Chu Lun Alex Leung*¹; Michael Mallon²; Dawid Luczyniec²; Yuze Huang¹; Samuel J. Clark³; Yunhui Chen¹; Sebastian Marussi¹; Lorna Sinclair²; Margie P. Olbinado⁴; Elodie Boller⁵; Alexander Rack⁵; Iain Todd⁶; Peter D. Lee¹; ¹University College London; ²European Space Agency; ³Argonne National Laboratory; ⁴Paul Scherrer Institute; ⁵European Synchrotron Radiation Facility; ⁶University of Sheffield

4:25 PM

Porosity Formation in High Pressure Die Casting: Experiments and Simulations: Nicole Trometer¹; Xuejun Huang¹; Michael Moodispaw¹; Jianyue Zhang¹; *Alan Luo*¹; ¹Ohio State University

4:45 PM

Nucleation in Undercooled Melt upon Changes in the Electromagnetic Stirring: *Gwendolyn Bracker*¹; Stephan Schneider²; Juergen Brillo²; Georg Lohoefer²; Robert Hyers¹; ¹University of Massachusetts; ²Deutsches Zentrum für Luft- und Raumfahrt (DLR)

5:05 PM Concluding Comments

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — Material Models

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Tuesday PM | March 1, 2022
304B | Anaheim Convention Center

Session Chairs: Paraskevas Kontis, Max-Planck-Institut für Eisenforschung GmbH; Jonathan Cormier, ISAE-ENSMA & Institut Pprime

2:30 PM

Systematic Study of the Effect of Alloying on APB and SISF Energies in $L1_2$ -(Co,Ni)₃(Al,W,Ta): *K V Vamsi¹; Tresa Pollock¹; ¹University of California-Santa Barbara*

2:50 PM

A Physics-based Vacancy Diffusion Model to Capture High Temperature Creep Responses: Application to 316H Stainless Steel: *Aritra Chakraborty¹; Mariyappan Arul Kumar¹; Ricardo Lebensohn¹; Laurent Capolungo¹; ¹Los Alamos National Laboratory*

3:10 PM

Damage-coupled Monotonic and Cyclic Softening Modeling in Inconel 718 Superalloys: *Jean-Briac le Graverend¹; ¹Texas A&M University*

3:30 PM

Phase Field Modeling of Void Growth under Creep: *Tianle Cheng¹; Fei Xue²; Jeffrey Hawk³; Youhai Wen³; ¹U.S. Department of Energy, National Energy Technology Laboratory / NETL Site Support Contractor; ²U.S. Department of Energy, National Energy Technology Laboratory / ORISE; ³U.S. Department of Energy, National Energy Technology Laboratory*

3:50 PM

Numerical Studies to Analyze the Deformation Behavior of Corroded Material under High Velocity Impact Using Continuum Damage Mechanics: *Yogeshwar Jasra¹; Pardeep Kumar²; Paras Mohan Jasra³; Ravindra Kumar Saxena¹; ¹Sant Longowal Institute of Engineering and Technology; ²R.V. Industries; ³DOTec Corp*

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — X-ray, Spectroscopy and Imaging II

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Tuesday PM | March 1, 2022
304D | Anaheim Convention Center

Session Chairs: Cyril Williams, Army Research Laboratory; Christopher DiMarco, Johns Hopkins University

2:30 PM

Observation of Shear Band Localization in Ti-64 through In-situ Imaging under Dynamic Compression Conditions: *Jonathan Lind¹; Matthew Nelms¹; Alison Kubota¹; Mukul Kumar¹; Nathan Barton¹; ¹Lawrence Livermore Laboratory*

2:50 PM

Modified Reflective Digital Gradient Sensing (R-DGS) for Impact Applications: *Pinkesh Malhotra¹; Chengyun Miao¹; Justin Moreno¹; Matt Shaeffer¹; Kalia Ramesh¹; ¹Johns Hopkins University*

3:10 PM

Using Full-field Strain and Temperature Measurements to Determine the Taylor-Quinney Coefficient in Tensile Split Hopkinson Bar Tests: *Amos Gilat¹; Jarrod Smith; Jermy Seidt¹; ¹Ohio State Univ*

3:30 PM

Amorphization of Covalently-bonded Materials: A Generalized Deformation Mechanism under Extreme Conditions: *Boya Li¹; Shiteng Zhao²; Bruce Remington³; Christopher Wehrenberg³; Hye-Sook Park³; Eric Hahn¹; Marc Meyers¹; ¹University of California San Diego; ²Beihang University; ³Lawrence Livermore National Laboratory*

3:50 PM Break

4:05 PM

Twinning-assisted Dynamic Recrystallization: A New Mechanism Revealed by Single Microparticle Supersonic Impact: *Ahmed Alade Tiamiyu¹; Edward Pang¹; Christopher Schuh¹; ¹MIT*

4:25 PM

Quasi-static to Dynamic Transition in Strengthening Effects of Helium Bubbles in Copper: *Calvin Lear¹; David Jones¹; Jonathan Gigax¹; Daniel Martinez¹; Rachel Flanagan¹; Minh Hoang¹; Jeremy Payton¹; Michael Prime¹; Saryu Fensin¹; ¹Los Alamos National Laboratory*

LIGHT METALS

Electrode Technology for Aluminum Production — Session III

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

Program Organizers: Stephan Broek, Boston Metal; Dmitry Eskin, Brunel University

Tuesday PM | March 1, 2022
208A | Anaheim Convention Center

Session Chair: Stephan Broek, Hatch

2:30 PM

Effects of Stub Preheating Temperature on the Anode Voltage Drop in the Aluminium Reduction Cell: *Tuofu Li*¹; Wenju Tao²; Zhaowen Wang²; ¹General Research Institute of Mining and Metallurgy Technology Group; ²Northeastern University

2:55 PM

EGA Journey with Different Ramming Pastes: *Ali Jassim*¹; Najeeba Al Jabri¹; Alexander Arkhipov¹; Mohamed Tawfik Boraie¹; ¹EGA

3:20 PM

Molecular Dynamic Insights into Carbon Electrode Behaviors of Aluminium Electrolysis: *Jiaqi Li*¹; Jie Li¹; Jingkun Wang¹; Hongliang Zhang¹; ¹Central South University

3:45 PM

Quality Evaluation of Nitride Bonded SiC Sideline Materials. Historical Trends 1997-2022 Including Results and Development of Test Methods: *Egil Skybakmoen*¹; ¹SINTEF Industry

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Tuesday PM | March 1, 2022
201D | Anaheim Convention Center

Session Chair: To Be Announced

2:30 PM

A New Test Specimen to Determine Environmentally-assisted Cracking Threshold: *James Sobotka*¹; Carl Popelar¹; Fassett Hickey¹; Julian Hallai²; Yifei Zeng³; ¹Southwest Research Institute; ²Exponent; ³ExxonMobil

2:50 PM

Predicting Electrochemical Conditions in a Stress Corrosion Crack Tip and the Influence of Exposure Environment: *Ryan Katona*¹; Erin Karasz¹; James Burns²; Charles Bryan¹; Rebecca Schaller¹; Robert Kelly²; ¹Sandia National Laboratories; ²University of Virginia

3:10 PM

Environmental Fracture of Alpha-brass in a Multi-scale QM/MM Approach: *Antoine Clement*¹; Thierry Auger¹; ¹CNRS

3:30 PM

Optimization of Stress Corrosion Mitigation in Al-Mg via Zn-Rich Primers: Matthew McMahon¹; Eric Dau¹; Allison Akman¹; ¹Naval Surface Warfare Center, Carderock Division

3:50 PM

The Effect of Loading Rate on the Environment-assisted Cracking Behavior of Sensitized AA5456-H116: *Zachary Harris*¹; James Burns¹; ¹University of Virginia

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Data-Driven Investigations of Fatigue

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Jean-Charles Stinville, University of Illinois Urbana-Champaign; Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Orion Kafka, NIST

Tuesday PM | March 1, 2022
254B | Anaheim Convention Center

Session Chairs: Ashley Spear, University of Utah; Orion L. Kafka, National Institute of Standards and Technology

2:30 PM

Combining Multimodal Data of Fatigue Fracture Surfaces for Analysis in a CNN: *Katelyn Jones*¹; Elizabeth Holm¹; Anthony Rollett¹; ¹Carnegie Mellon University

2:50 PM

Process-microstructure-behavior Relationships for Fatigue of Additively Manufactured Al Alloys: *Emine Tekerek*¹; Vignesh Perumal¹; Alex Riensche²; Prahalada Rao²; Lars Jacquemeton³; Darren Beckett³; Harold Halliday⁴; Joseph T. McKeown⁵; Antonios Kontsos¹; ¹Drexel University; ²University of Nebraska-Lincoln; ³Sigma Labs, Inc.; ⁴Navajo Technical University; ⁵Lawrence Livermore National Laboratory

3:10 PM

Revealing the Critical Role of Volumetric Defects in the Fatigue Behavior of LB-PBF Ti-6Al-4V: Muztahid Muhammad¹; Arun Poudel¹; Salman Yasin¹; Shuai Shao¹; Nima Shamsaei¹; ¹Auburn University

3:30 PM

Correlation of Microstructure and Damage Tolerant Properties of Additive Manufactured Ti-6Al-4V: *Ralph Bush*¹; Tessa Barbosa¹; Elijah Palm¹; Benjamin Smith¹; ¹US Air Force

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Low-Dimensional Electronics & Optoelectronics

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Tuesday PM | March 1, 2022
260B | Anaheim Convention Center

Session Chairs: Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

2:30 PM Invited

"Smart" Biodegradable Polymer at Nano and Micro Scales for Medical Applications: *Thanh Nguyen*¹; ¹University of Connecticut

2:55 PM

Harnessing Microstructures for Tunable Interference Color: *Lauren Zarzar*¹; ¹Penn State University

3:15 PM

Strain-tunable Optoelectronic Response of Crumpled Graphene/Organic Semiconductor Heterostructure: *Zhichao Zhang*¹; Jin Myung Kim¹; Sungwoo Nam¹; ¹University of Illinois

3:35 PM

Suspended Graphene/PEDOT:PSS Channel for H₂ Gas Sensing Fabricated Using Direct-write Functional Fibers: *Abiral Regmi*¹; Noori Na¹; Jiyoung Chang¹; ¹University of Utah

3:55 PM Break

4:15 PM

Controlled Synthesis of Gas Sensing Composite Metal/Metal Oxide Graphene-based Nanofibers: *Luz Cruz*¹; Qiurong Shi¹; Devis Montroni¹; *David Kisailus*¹; Roberto Rivera¹; ¹University of California, Irvine

4:35 PM Keynote

Structural Evolution and Electrical Conductivity of Polymer Derived Ceramics: *Kathy Lu*¹; Sanjay Kumar¹; ¹Virginia Polytechnic Institute and State University

MATERIALS PROCESSING

Furnace Tapping 2022 — Session IV

Sponsored by: The Southern African Institute of Mining and Metallurgy, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee, TMS: Materials Characterization Committee, Industrial Advisory Committee

Program Organizers: Joalet Steenkamp, MINTEK; Dean Gregurek, RHI Magnesita; Quinn Reynolds, Mintek; Gerardo Alvear Flores, Rio Tinto; Hugo Joubert, Tenova Pyromet; Phillip Mackey, P.J. Mackey Technology, Inc.

Tuesday PM | March 1, 2022
213D | Anaheim Convention Center

Session Chair: Rodrigo Madariaga, MIRS USA

2:30 PM Introductory Comments

2:35 PM

Health Friendly Plugging Repair Pastes: *Antonio De Pretto*¹; Lars Lindstad¹; ¹Elkem Carbon AS

2:55 PM

Tapblock Refractory Wear Monitoring and Hearth Refractory Design Optimization in Metallurgical Furnaces: *Cameron Soltys*¹; Jayant Borana¹; Hamid Ghorbani¹; Richard MacRosty¹; Tom Plikas¹; Chad Van der Woude¹; ¹Hatch

3:15 PM

The Evaluation of Chemical Wear of Carbon-based Tap-hole Refractories in Ferrochrome Production: *Martin Sitefane*¹; Joalet Steenkamp¹; ¹Mintek

3:35 PM

Metal and Slag Extraction from Different Zones of a Submerged Arc Furnace with Non-uniform Porous Bed Using CFD: *Varun Loomba*¹; Jan Olsen²; *Kristian Einarsrud*¹; ¹Norwegian University of Science and Technology; ²SINTEF Industry

3:55 PM Break

4:15 PM

Investigation of Melting Behavior and Viscosity of Slags from Secondary Ferromanganese Production: *David Scheiblehner*¹; Christoph Sagadin¹; Helmut Antrekowitsch¹; Stefan Luidold¹; Dieter Offenthaler²; ¹Montanuniversität; ²Batrec Industrie AG

4:35 PM

Tap-hole Refractory Issues and Remedies: *Dean Gregurek*¹; Christine Wenzl¹; Jürgen Schmidl¹; Alfred Spanring¹; ¹RHI Magnesita

4:55 PM

Slide Gate Technology for Slag Tapping: *Goran Vukovic*¹; ¹RHI Magnesita

5:15 PM

Tap-hole Clay Technologies for Ferroalloy Reduction Furnaces: *Tomas Oliveira*¹; Wagner Moulin-Silva¹; Aloisio Ribeiro¹; Modestino Brito²; ¹RHI Magnesita; ²Yamagata Consultoria

5:35 PM

Simulation-based Approaches for Optimized Tap Hole Design: *Guenter Unterreiter*¹; Anton Ishmurzin¹; Ulrich Marschall¹; Alfred Spanring¹; ¹RHI Magnesita

5:55 PM Concluding Comments

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Grain Boundary Migration and Deformation: Part II

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Tuesday PM | March 1, 2022
304C | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Jeremy Mason, UC-Davis

2:30 PM

Slip Transfer and Cracking at Grain Boundaries in FCC and HCP Metals: Eugenia Nieto-Valeiras¹; Maral Sarebanzadeh²; Meijuan Zhang³; Alberto Orozco-Caballero²; *Javier Llorca*¹; ¹IMDEA Materials Institute & Technical University of Madrid; ²Technical University of Madrid; ³IMDEA Materials Institute

2:50 PM Invited

Mechanisms for and Thermodynamics of Interfacial Strain Mediation: *Shen Dillon*¹; ¹University of California, Irvine

3:20 PM

Grain Boundary Pop-in during Nanoindentation of W: Recent Observation on Dislocation Grain Boundary Interaction: *Karsten Durst*¹; ¹TU Darmstadt

3:40 PM

A Crystal Plasticity Framework to Model Continuum Disconnections in Polycrystals: Junan He¹; Himanshu Joshi¹; *Nikhil Chandra Admal*¹; ¹University of Illinois at Urbana-Champaign

ADVANCED MATERIALS

High Performance Steels — Metastability in Steels

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung; Benjamin Adam, Oregon State University

Tuesday PM | March 1, 2022
252C | Anaheim Convention Center

Session Chairs: Ana Araujo, CBMM NA; Melissa Thrun, Colorado School of Mines

2:30 PM

A Novel Approach to Improve Strength-ductility Combinations in Medium Manganese Steels: *Dawn Van Iderstine*¹; Matthew Cagle¹; YubRaj Paudel¹; Shiraz Mujahid¹; Hongjoo Rhee¹; Haitham El Kadiri²; ¹Center for Advanced Vehicular Systems, Mississippi State University; ²Department of Mechanical Engineering, Mississippi State University

2:50 PM

Deformable Plastic Strain-induced Epsilon-martensite in FeMnCo Alloys: A Pathway Towards Overcoming the Limits of Metastability: *Shaolou Wei*¹; Cem Tasan¹; ¹Massachusetts Institute of Technology

3:10 PM

Effects of Austenite Stability on Sheet Forming of Advanced High Strength Steels: *Christopher Finfrack*¹; Benjamin Ellyson¹; John Copley¹; Brady McBride¹; C. Becker¹; Diptak Bhattacharya¹; Doug Smith¹; Chloe Johnson¹; Connor Rietema¹; Raj Banerjee²; Kamel Fezzaa³; Cody Kirk⁴; Nesredin Kadir⁴; Jinling Gao⁴; Weinong Chen⁴; Tao Sun⁵; Niranjana Parab³; Jonah Klemm-Toole¹; Amy Clarke¹; Kester Clarke¹; ¹Colorado School of Mines; ²University of North Texas; ³Argonne National Laboratory; ⁴Purdue University; ⁵University of Virginia

3:30 PM

Stacking Fault Energy Dependent Deformation Mechanisms in Medium-Mn Steels: *Krista Limmer*¹; Daniel Field¹; Daniel Magagnosc¹; Timothy Walter¹; Christopher Meredith¹; Jeffrey Lloyd¹; ¹DEVCOM Army Research Laboratory

3:50 PM

Reverted Austenite in Precipitation Hardened Stainless Steels: Design Considerations and Mechanical Effects: *Hyunseok Oh*¹; Jiyun Kang¹; Menglei Jiang¹; Cemal Cem Tasan¹; ¹Massachusetts Institute of Technology

4:10 PM Break

4:25 PM

Tailoring Transformation Plasticity to Resist Microvoid Shear Localization: *Brandon Snow*¹; G. Olson¹; D. Parks¹; ¹Massachusetts Institute of Technology

4:45 PM

Tempering & Austempering of Double Soaked Medium Manganese Steels: *Alexandra Glover*¹; Cheng Liu¹; Emmanuel DeMoor²; John Speer²; ¹Los Alamos National Laboratory; ²Colorado School of Mines

5:05 PM

The Influence of Temperature on the Strain-hardening Behavior of Fe-22/25/28Mn-3Al-3Si TRIP/TWIP Steels

: *Dean Pierce*¹; Jake Benzing²; Jose Jiménez³; Tilmann Hickel⁴; Ivan Bleskov⁴; Jong Keum¹; Dierk Raabe⁴; Jim Wittig⁵; ¹Oak Ridge National Laboratory; ²National Institute of Standards and Technology; ³Centro Nacional de Investigaciones Metalurgicas (CSIC); ⁴Max-Planck-Institut für Eisenforschung; ⁵Vanderbilt University

5:25 PM

Manganese-diffusion Controlled Kinetics of Austenite Growth and Cementite Dissolution during Intercritical Annealing of Medium-Mn Steels: *Josh Mueller*¹; John Speer²; David Matlock²; Emmanuel De Moor²; ¹Los Alamos National Laboratory; ²Colorado School of Mines

MATERIALS DESIGN

Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment — Phonons, Transport and Microstructure Evolution/CALPHAD and Alloy Design

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

Program Organizers: Raymundo Arroyave, Texas A&M University; Wei Chen, Illinois Institute of Technology; Yong-Jie Hu, Drexel University; Tresa Pollock, University of California, Santa Barbara

Tuesday PM | March 1, 2022
255A | Anaheim Convention Center

Session Chair: To Be Announced

2:30 PM Invited

Phonon Anharmonicity Beyond Perturbation Theory: *Brent Fultz*¹; Vladimir Ladygin¹; Michael Manley²; Yang Shen¹; Claire Saunders¹; Camille Bernal¹; ¹California Institute of Technology; ²Oak Ridge National Laboratory

3:00 PM Invited

Machine Learning in Diffusivity Calculations Using a Variational Principle: *Dallas Trinkle*¹; ¹University of Illinois at Urbana-Champaign

3:30 PM Invited

Building a Diffusion Mobility Database for γ/γ' Co-superalloys: *Carelyn Campbell*¹; Kil-won Moon¹; Greta Lindwall²; ¹National Institute of Standards and Technology; ²Royal Institute of Technology

4:00 PM Break

4:15 PM Invited

CALPHAD Modeling of Phase-based Properties: *Ursula Kattner*¹; *Carelyn Campbell*¹; ¹National Institute of Standards and Technology

4:45 PM Invited

Precipitate Shearing, Fault Energies and the Design of Superalloys: *K.V. Vamsi*¹; *Yolita Eggeler*²; *Tresa Pollock*¹; ¹University of California, Santa Barbara; ²Karlsruhe Institute of Technology

5:15 PM Invited

Challenges in Addressing the Silicate Attack Problem in Gas Turbine Coatings: *Carlos Levi*¹; ¹University of California, Santa Barbara

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Salt Properties and Chemistry

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Tuesday PM | March 1, 2022
203B | Anaheim Convention Center

Session Chair: Raluca Scarlat, University of California, Berkeley

2:30 PM

Determination of Fluoride Molten Salt Thermal Diffusivity and Sound Speed via Transient Grating Spectroscopy: *Sean Robertson*¹; Michael Short¹; ¹Massachusetts Institute of Technology

2:50 PM

Understanding the Structure of Complexes in Molten Salts Using Absorption Spectroscopy: *Jeremy Moon*¹; Dev Chidambaram¹; ¹University of Nevada, Reno

3:10 PM

Ab Initio Molecular Dynamics Study of Thermophysical and Transport Properties for High Temperature LiCl-KCl and NaCl-MgCl₂ System: *Kai Duemmler*¹; Yuxiao Lin²; Michael Woods²; Toni Karlsson²; Ruchi Gahkar²; Benjamin Beeler¹; ¹North Carolina State University; ²Idaho National Laboratory

3:30 PM

Chlorination of UO₂ to UCl₃ in a Molten LiCl-KCl Using ZrCl₄: *Jarom Chamberlain*¹; Michael Simpson¹; ¹University of Utah

3:50 PM Break

4:10 PM

Molten Uranium Chloride Salts Investigated by Ab Initio Molecular Dynamics Simulations: *David Andersson*¹; ¹Los Alamos National Laboratory

4:30 PM

First-principles Molecular Dynamics of CaF₂-MgF₂ Molten Salt System: *Yifan Zhang*¹; Abu Miraz²; Uday Pal³; Adam Powell¹; Michael Gao⁴; Yu Zhong¹; ¹Worcester Polytechnic Institute; ²Louisiana Tech University; ³Boston University; ⁴National Energy Technology Laboratory

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Session IV

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Tuesday PM | March 1, 2022
253B | Anaheim Convention Center

Session Chairs: Le Zhou, Marquette University; Xiaoxiang Yu, Novelis Inc.

4:00 PM

Variation in Density, Phase Constituents, Microstructure, Surface Roughness and Modulus/Hardness Observed from LPBF Parametric Study of Ti – 6 wt.% Al – 4 wt.% V Alloy: *Asif Mahmud*¹; Jeongmin Woo¹; Holden Hyer¹; Ji-Yoon Kim²; Tinh Huynh¹; Abhishek Mehta¹; Kee-Ahn Lee²; Yongho Sohn¹; ¹University of Central Florida; ²Inha University

4:20 PM

Towards Laser Powder Bed Process Optimization: An Approach for Fast Process-microstructure Predictions: *Mason Jones*¹; Jean-Pierre Delplanque¹; ¹University of California Davis

4:40 PM Invited

Additive Manufacturing of High-performance Compositionally Complex Metal Alloys: Wen Chen¹; *Shahryar Mooraj*¹; ¹University of Massachusetts-Amherst

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — Radiation Effects in High Heat Flux Materials I

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Tuesday PM | March 1, 2022
203A | Anaheim Convention Center

Session Chairs: Brian Wirth, University of Tennessee; Jason Trelewicz, Stony Brook University

2:30 PM

Grain Boundary Softening in Helium Implanted Fine-grained Tungsten: *William Cunningham*¹; Yang Zhang¹; Osman El-Atwani²; Jason Trelewicz¹; ¹Stony Brook University; ²Los Alamos National Laboratory

2:50 PM Invited

Multiscale Materials Modeling of Structural Materials and Plasma Facing Components in the Extreme Fusion Environment: *Brian Wirth*¹; ¹University of Tennessee

3:20 PM

Evaluating the Temperature Dependence of Bubble Bursting Rate for Low Energy Helium Plasma-exposed Tungsten: *Yogendra Panchal*¹; Sophie Blondel¹; Dwaipayan Dasgupta¹; Robert Kolasinski²; Brian Wirth¹; ¹University of Tennessee, Knoxville; ²Sandia National Laboratories

3:40 PM

Macroscopic Elastic Stress and Strain Produced by Irradiation: *Luca Real*¹; Max Boleininger¹; Mark Gilbert¹; Sergei Dudarev¹; ¹UKAEA

4:00 PM Break

4:20 PM Invited

Integrated Multi-physics Modeling of Impurity Migration, Surface Morphology, and Material Evolution in Present and Future Tokamaks: *Ane Lasa*¹; Sophie Blondel¹; Timothy Younkin²; David Bernholdt²; John Canik²; Mark Cianciosa²; Wael Elwasif²; David Green²; Phil Roth²; Jon Drobny³; Davide Curreli³; Brian Wirth¹; ¹University of Tennessee; ²Oak Ridge National Laboratory; ³University of Illinois Urbana-Champaign

4:50 PM Invited

Expanding Irradiation Damage Models to Fusion Conditions: Tackling the Multispecies Paradigm at High Temperatures: *Jaime Marian*¹; ¹University of California, Los Angeles

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Structural Materials Characterization & Modelling I

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Tuesday PM | March 1, 2022
204A | Anaheim Convention Center

Session Chairs: Erofil Kardoulaki, LANL; Joshua White, LANL

2:30 PM Invited

Degradation Modes of Core Materials under Multiple Components of the Reactor Environment: *Gary Was*¹; ¹University of Michigan

3:00 PM

Study of the Irradiation Induced Microstructure and Mechanical Properties in Low Alloyed Ferritic Steels: *Maria Vrellou*¹; Bertrand Radiguet¹; Akiyoshi Nomoto²; Philippe Pareige¹; ¹Groupe de Physique des Matériaux - Université de Rouen Normandie; ²Central Research Institute of Electric Power Industry

3:20 PM

Neutron Irradiation Effects on Mechanical Anisotropy in Alloy 625: *Caleb Clement*¹; Megha Dubey²; Yu Lu²; Sheng Cheng²; Donna Guillen³; David Gandy⁴; Janelle Wharry¹; ¹Purdue University; ²Boise State University/ Center for Advanced Energy Studies; ³Idaho National Laboratory; ⁴Electric Power Research Institute

3:40 PM Break

4:00 PM

Micromechanical Testing of Femtosecond Laser Machined Tensile Samples of Varied Geometries: *Jason Duckering*¹; Andrew Dong¹; Peter Hosemann¹; Stuart Maloy²; ¹University of California Berkeley; ²Los Alamos National Laboratory

4:20 PM

Through-thickness Microstructure Characterization in a Centrifugally Cast Austenitic Stainless Steel Nuclear Reactor Primary Loop Pipe Using Time-of-flight Neutron Diffraction: *Matthew Schmitt¹; Daniel Savage¹; James Wall²; John Yeager¹; Chanhoo Lee¹; Sven Vogel¹; ¹Los Alamos National Laboratory; ²Electric Power Research Institute*

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Contact and Fracture

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Tuesday PM | March 1, 2022
262B | Anaheim Convention Center

Session Chairs: Matthew Daly, University of Illinois-Chicago; Robert Carpick, University of Pennsylvania

2:30 PM Invited

Visualizing Nanoscale Contacts In Situ: History-dependent Adhesion of Si-Si and MoS₂-MoS₂ Interfaces: *Robert Carpick¹; ¹University of Pennsylvania*

3:00 PM

Measuring and Understanding Nanoscale Adhesion and Deformation Using In Situ Experiments in a Transmission Electron Microscope: *Tevis Jacobs¹; Soodabeh Azadehramjbar¹; Ruikang Ding¹; Andrew Baker¹; Sai Bharadwaj Vishnubhotla¹; Ingrid Padilla Espinosa²; Rimei Chen²; Ashlie Martini²; ¹University of Pittsburgh; ²University of California, Merced*

3:20 PM

Tribochemical Formation of Diamond-like Carbon Films on Catalytically-active Noble Alloys: *Frank DelRio¹; Morgan Jones¹; Thomas Beechem¹; Anthony McDonald¹; Tomas Babuska²; Michael Dugger¹; Michael Chandross¹; Nicolas Argibay¹; John Curry¹; ¹Sandia National Laboratories; ²Florida State University*

3:40 PM

Direct Measurement of Adhesion for Noble-metal Nanoparticles Using In Situ Transmission Electron Microscopy: *Andrew Baker¹; Sai Bharadwaj Vishnubhotla¹; Sanjana Karpe¹; Yahui Yang¹; Goetz Vesper¹; Tevis Jacobs¹; ¹University of Pittsburgh*

4:00 PM Break

4:20 PM Invited

Fracture of Two-dimensional Materials: *Jun Lou¹; ¹Rice University*

4:50 PM

Competing Behavior of Slip and Fracture on the Nanomechanical Response of Pharmaceutical Materials: *Sushmita Majumder¹; Chenguang Wang¹; Kevin Schmalbach¹; Javier Garcia-Barriocanal¹; Greg Haugstad¹; Changquan Calvin Sun¹; Nathan Mara¹; ¹University of Minnesota-Twin Cities*

MATERIALS DESIGN

Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis — Self-Healing Composite Materials and Other Composites

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

Program Organizers: Srivatsan Tirumalai, The University of Akron; Pradeep Rohatgi, University of Wisconsin; Simona Hunyadi Murph, Savannah River National Laboratory

Tuesday PM | March 1, 2022
256B | Anaheim Convention Center

Session Chair: Tirumalai S Srivatsan, The University of Akron

2:30 PM Keynote

Design and Fabrication of a Novel Al-based Self-healing Metal-matrix Composite: *David Svetlizky¹; Baolong Zheng²; Sen Jiang²; Yizhang Zhou²; Lorenzo Valdevit²; Enrique Lavernia³; Julie Schoenung²; Noam Eliaz¹; ¹Tel-Aviv University; ²University of California, Irvine; ³National Academy of Engineering*

3:00 PM Invited

Particle Injection and Phase Formation in Directed Energy Deposited Nickel-based Superalloy Composites: *Sen Jiang¹; Baolong Zheng¹; Xin Wang¹; Benjamin MacDonald¹; Yizhang Zhou¹; Julie Schoenung¹; ¹University of California Irvine*

3:20 PM Invited

Solidification Processing of Functionally Graded Metal Matrix Composites: *TPD Rajan¹; ¹CSIR-National Institute for Interdisciplinary Science and Technology*

3:45 PM

Recent Advances in Self-healing Metal Matrix Composites: *Masum Bellah¹; Michael Nosonovsky¹; Pradeep Rohatgi¹; ¹University of Wisconsin Milwaukee*

4:05 PM Break

4:20 PM Invited

Tribological Response of Magnesium/Glass Microballoon Syntactic Foams: *Vyasraj Manakari¹; Gururaj Parande¹; Mrityunjay Doddamani²; Srivatsan Tirumalai³; Manoj Gupta¹; ¹National University of Singapore; ²National Institute of Technology Karnataka; ³The University of Akron*

4:45 PM

Wettability of High Pressure Die Cast Aluminium Alloy on SiC and Al₂O₃ with the Influence of Surfactants: *Mahfuz Karim¹; Guangyu Liu¹; Brian McKay¹; Dmitry Eskin¹; ¹BCAST Brunel University*

MATERIALS DESIGN

Microstructural Templates Consisting of Isostructural Ordered Precipitate / Disordered Matrix Combinations: Microstructural Evolution and Properties — Session II

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; Bharat Gwalani, Pacific Northwest National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Jessica Krogstad, University of Illinois at Urbana-Champaign; Ashley Paz Y Puente, University of Cincinnati; Keith Knipling, Naval Research Laboratory; Matthew Steiner, University of Cincinnati

Tuesday PM | March 1, 2022
254A | Anaheim Convention Center

Session Chairs: Sriswaroop Dasari, University of North Texas; Eric Lass, The University of Tennessee, Knoxville

2:30 PM Introductory Comments

2:35 PM Invited

Deformable Intermetallic Nanorods Leads to an Excellent Strength-ductility Combination in a High Entropy Alloy: *Bharat Gwalani*¹; Sriswaroop Dasari²; Vishal Soni²; Shivakant Shukla¹; Abhinav Jagetia²; Priyanshi Agrawal²; Rajiv Mishra²; Rajarshi Banerjee²; ¹Pacific Northwest National Laboratory; ²University of North Texas

3:05 PM Invited

Free Energy Landscape, Transformation Pathway and Alloy Parameters Leading to Various Isostructural Ordered Precipitate Microstructures: Kamalnath Kadirvel¹; Shalini Roy Koneru¹; Rajarshi Banerjee²; Hamish Fraser¹; Yunzhi Wang¹; ¹The Ohio State University; ²University of North Texas

3:35 PM Invited

High Temperature Deformation Pathways in Ordered L12- and Imm-based Compounds: Thomas Mann¹; Dongsheng Wen¹; Sae Matsunaga¹; Marisol Koslowski¹; Michael Fahrman²; *Michael Titus*¹; ¹Purdue University; ²Haynes International

4:05 PM Break

4:25 PM Invited

Core/Triple Shell Precipitates in Al-Er-Sc-Zr-(V,Nb,Ta) Alloys: *Keith Knipling*¹; ¹Naval Research Laboratory

4:55 PM Concluding Comments

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI — Advanced Process and Materials for Electronics

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chaohong Wang, National Chung Cheng University; Chih Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; A.S.Md Abdul Haseeb, University of Malaya; Vesa Vuorinen, Aalto University; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Tuesday PM | March 1, 2022
303A | Anaheim Convention Center

Session Chairs: Chih Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University

2:30 PM Invited

A Critical Analysis of Joining Processes for NiTi Shape Memory Alloys: *Boyd Panton*¹; Amirali Shamsolhodaei²; Jianxiong Li¹; Anupam Vivek¹; Glenn Daehn¹; Peng Peng²; Y. N. Zhou²; ¹The Ohio State University; ²University of Waterloo

3:00 PM

Effect of Detwinning on Tensile Strength of Nanotwinned Cu Films: *Chiahung Lee*¹; ¹National Central University

3:20 PM

Effect of Vertical Interfaces on Phase Transformation Behavior of MoS₂: *Shayani Parida*¹; Arthur Doble²; Barry Carter³; Avinash Dongare¹; ¹University of Connecticut; ²EaglePicher Technologies LLC; ³CINT, Sandia National Laboratories

3:40 PM

Comparison of NiCo and NiP Electroplating for Wear Resistant Probe Tip: Na-Young Kang¹; *Jaeho Lee*¹; ¹Hongik University

4:00 PM

Morphological Effect of Patterned Sapphire Substrate on Efficiency of White-light Phosphor LED Package: *Chia-Yueh Chou*¹; Cheng-Yi Liu¹; ¹National Central University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Superalloys and Shape Memory Alloys

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Tuesday PM | March 1, 2022
255B | Anaheim Convention Center

Session Chair: Eric Lass, University of Tennessee-Knoxville

2:30 PM Invited

A Strategy to Optimize Local Phase Transformation Strengthening for Next Generation Superalloys: *Timothy Smith*¹; Nikolai Zarkevich²; Ashton Egan³; Timothy Gabb¹; John Lawson²; Michael Mills³; ¹NASA Glenn Research Center; ²NASA Ames; ³Ohio State University

3:00 PM

An Investigation into the Effect of Primary Gamma Prime Stimulated Metadynamic Recrystallization on Supersolvus Grain Sizes in Ni Superalloy LSHR: *Eric Payton*¹; Jared Shank²; Kayla Evans³; Denielle Ricciardi²; Victoria Miller⁴; ¹Air Force Research Laboratory; ²UES, Inc; ³Wright State University; ⁴University of Florida

3:20 PM

Lattice Correspondences in Martensitic Transformation and Twinning in NiTi Shape Memory Alloy: *Bin Li*¹; ¹University of Nevada, Reno

3:40 PM

Phase-field Modeling and Design of Elastocaloric Effect in Shape Memory Alloys and Composites: *Cheikh Cisse*¹; Mohsen Asle Zaeem¹; ¹Colorado School of Mines

4:00 PM Break**4:20 PM**

The Effect of Precipitate Size on the Thermo-mechanical Properties of Ni-Ti-Hf-Al Shape Memory Alloys: *Ching-Chien Chen*¹; Shivam Tripathi¹; Alexandra Loaiza¹; David Bahr¹; Alejandro Strachan¹; Michael Titus¹; ¹Purdue University

4:40 PM

Microstructural Evolution in Oligocrystalline Fe-Mn-Al-Ni Shape Memory Alloys: *Hande Ozcan*¹; Daniel Salas¹; Ji Ma²; Ren Yang³; Yuri Chumlyakov⁴; Ibrahim Karaman¹; ¹Texas A&M University; ²University of Virginia; ³Argonne National Laboratory; ⁴Tomsk State University

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Additive Manufacturing and Data-Driven Approaches

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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Tuesday PM | March 1, 2022
263C | Anaheim Convention Center

Session Chair: Kathy Lu, Virginia Polytechnic Institute and State University

2:30 PM

A Bayesian Approach to the Eagar-Tsai Model for Melt Pool Geometry Predictions: *Brendan Whalen*¹; Prasanna Balachandran¹; ¹University of Virginia Materials Informatics

2:50 PM Invited

From Ultrafast Sintering with and without Electric Fields to Electrochemically Controlled Microstructural Evolution: *Jian Luo*¹; ¹University of California, San Diego

3:20 PM

Surface Chemistry Changes Resulting from Ti-6Al-4V Feedstock Powder Reuse in Electron Beam Additive Manufacturing: *Nicholas Derimow*¹; Justin Gorham¹; May Martin¹; Jake Benzing¹; Ryan White¹; Nikolas Hrabe¹; ¹National Institute of Standards and Technology

3:40 PM

The Effects of Melt Pool Geometry on Microstructure Development during Additive Manufacturing: *Alexander Chadwick*¹; Peter Voorhees¹; ¹Northwestern University

4:00 PM Break**4:20 PM**

Understanding of Agglomeration and Chemical Reactions of CoAl₂O₄ Inoculants in IN718 Processed by Selective Laser Melting: *I-Ting Ho*¹; Kai-Chun Chang²; Dhruv Tiparti¹; An-Chou Yeh²; Sammy Tin³; ¹Illinois Institute of Technology; ²National Tsing Hua University; ³University of Arizona

4:40 PM

Understanding Powder Morphology and Its Effect on Flowability in Additive Manufacturing through Machine Learning Techniques: *Srujana Rao Yarasi*¹; Anthony Rollett¹; Elizabeth Holm¹; ¹Carnegie Mellon University

5:00 PM

Synthesis and Consolidation of CoCr+X (X=SiC or WC) Milled Powder for Additive Manufacturing: *Madelyn Madrigal-Camacho*¹; Guillermo Aguilar¹; Suveen Mathaudhu¹; ¹University of California-Riverside

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications — Functional Materials and 2D/3D Devices IV

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Tuesday PM | March 1, 2022
303C | Anaheim Convention Center

Session Chairs: Yong Kong, University of Utah; Changyong Cao, Michigan State University; Pooran Joshi, Oak Ridge National Laboratory

2:30 PM Invited

Plasmonic and Nanocomposite Material Enabled Low Cost Optical Fiber Sensing for Electrical Asset Monitoring: *Paul Ohodnicki*¹; Yang-Duan Su¹; ¹University of Pittsburgh

2:55 PM Invited

3D Printing of Electrochemical Biosensors: A New World of Detecting Pathogens in Seconds: *Md. Azahar Ali*¹; Chunshan Hu¹; Sanjida Jahan¹; Bin Yuan¹; M. Sadeq Saleh¹; Rahul Panat¹; ¹Carnegie Mellon University

3:20 PM

Unconventional Low-viscosity Direct Ink Writing: Surface Force-driven Deposition of Polyelectrolyte-based Membranes: *Guy Cordonier*¹; KmProttoy Piash¹; Oishi Sanyal¹; Konstantinos Sierros¹; ¹West Virginia University

3:40 PM

On Depositing Chromium-nitride Patterns by Magnetic Guided Physical Vapor Deposition: *Santiago Vargas*¹; Diana Galeano¹; Carlos Castano¹; ¹Virginia Commonwealth University

LIGHT METALS

Recycling and Sustainability in Cast Shop Technology: Joint Session with REWAS 2022 — Recycling and Sustainability Joint Session with REWAS 2022

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

Program Organizers: Mertol Gökelma, Izmir Institute of Technology; Stephen Instone, Speira GmbH

Tuesday PM | March 1, 2022
209A | Anaheim Convention Center

Session Chair: Rauan Meirbekova, DTE

2:30 PM Introductory Comments

2:35 PM

Effect of Compaction and Thermal De-coating Pre-treatments on the Recyclability of Coated and Uncoated Aluminium: *Alicia Vallejo Olivares*¹; Solveig Høgåsen¹; Anne Kvithyld²; Gabriella Tranell¹; ¹Norwegian University of Science and Technology; ²SINTEF

2:55 PM

Innovative Utilization of Aluminum-based Secondary Materials for Production of Metallurgical Silicon and Alumina-rich Slag: *Harald Philipson*¹; Gjermund L. Solbakk¹; Maria Wallin¹; Kristian Etienne Einarsrud¹; Gabriella Tranell¹; ¹Norwegian University of Science and Technology

3:15 PM

Use of Incinerator Bottom Ash (IBA) in Aluminium Recycling: *Martin Syvertsen*¹; Thomas Ludwig²; Snorre Rist²; Kjerstin Ellingsen¹; ¹SINTEF Industry; ²Hydro Aluminium

ENERGY & ENVIRONMENT

REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian — Innovations in Materials Design, Processing and Recycling

Sponsored by: TMS: Recycling and Environmental Technologies Committee, TMS: Aluminum Committee

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Brajendra Mishra, Worcester Polytechnic Institute; Bart Blanpain, KU Leuven; Adam Powell, Worcester Polytechnic Institute; Mertol Gökelma, Izmir Institute of Technology; Camille Fleurialt, Eramet Norway

Tuesday PM | March 1, 2022
211A | Anaheim Convention Center

Session Chair: Elsa Olivetti, Massachusetts Institute of Technology

2:30 PM Introductory Comments

2:35 PM Invited

Current Perspectives in Metal Based Additive Manufacturing: *Benjamin MacDonald*¹; Enrique Lavernia²; Carl Soderhjelm¹; Diran Apelian¹; ¹University of California, Irvine; ²National Academy of Engineering

3:00 PM Invited

Informatics Driven Materials Innovation for a Regenerative Economy: *Krishna Rajan*¹; ¹University at Buffalo- State University of New York

3:25 PM Invited

Nanotechnology Enabled Solidification Processing for Sustainability: *Xiaochun Li*¹; ¹University of California, Los Angeles

3:50 PM Invited

Sustainability of Feedstock in Additive Manufacturing: *Dan Thoma*¹; Frank Pfefferkorn¹; Marcus Jackson²; Aishwarya Deshpande¹; Phalgun Nelaturu¹; Zahabul Islam¹; ¹University of Wisconsin-Madison; ²NASA Ames Research Center

4:15 PM Break

4:30 PM Invited

The Ecosystem for Materials Innovation in Advanced Manufacturing: *Aaron Birt*¹; ¹Solvus Global

4:55 PM Invited

The Framework for Establishing a Collaborative Resource Recovery and Recycling Research Center: A Tribute to Professor Diran Apelian: *Sean Kelly*¹; ¹Solvus Global, LLC

5:20 PM Invited

The Circular Economy in Practice: A Case Study in Li-ion Battery Recycling and Materials Re-integration: *Eric Gratz*¹; ¹Battery Resources

ENERGY & ENVIRONMENT

REWAS 2022: Recovering the Unrecoverable — Complex Scrap, By-products and Residues

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

Program Organizers: Mertol Gökelma, Izmir Institute of Technology; Elsa Olivetti, Massachusetts Institute of Technology; Camille Fleuriault, Eramet Norway; John Howarter, Purdue University; Takanari Ouchi, University of Tokyo; Gisele Azimi, University of Toronto; Kerstin Forsberg, KTH Royal Institute of Technology; Hong Peng, University of Queensland

Tuesday PM | March 1, 2022

211B | Anaheim Convention Center

Session Chairs: Takanari Ouchi, University of Tokyo; Kerstin Forsberg, KTH - Royal Institute of Technology

2:30 PM Introductory Comments

2:35 PM Invited

BlueMetals Technology – Experience from Commissioning E-Scrap Recycling Plants: *Timm Lux*¹; Markus Reuter¹; Rolf Degel¹; Frank Kaussen¹; Nikolaus Borowski¹; ¹Sms Group GmbH

3:05 PM Invited

Physicochemistry of Lithium-ion Battery Recycling Processes: *Alexandre Chagnes*¹; ¹Universite De Lorraine-Georess

3:35 PM

Characterisation of Hyperaccumulators for Lithium Recovery from Ancient Mine Soils: *Lorna Anguilano*¹; Uchechukwu Onwukwe¹; Danny Aryani¹; Jesus Ojeda Ledo²; Guido Lingua³; Valentina Gianotti³; Alessandra Devoto⁴; ¹Brunel University London; ²Swansea University; ³Universita' del Piemonte Orientale; ⁴Royal Holloway University London

3:55 PM Break

4:15 PM

Shifting the Burden of Selectivity from Chemical to Physical Separation Processes via Selective Sulfidation: *Caspar Stinn*¹; Antoine Allanoire¹; ¹Massachusetts Institute of Technology

4:35 PM

Pre-study of the Dissolution Behavior of Silicon Kerf Residue in Steel: *Adamantia Lazou*¹; David Nilssen¹; Mertol Gökelma²; Maria Wallin¹; Gabriella Tranell¹; ¹Norwegian University of Science and Technology; ²Izmir Institute of Technology

4:55 PM

Investigation of Hydrometallurgical Recycling Parameters of WC-Co Cutting Tool Scraps: *Hakan Kusdemir*¹; Onuralp Yücel¹; Ahmet Turan²; *Kagan Benzesik*³; ¹Istanbul Technical University; ²Yeditepe University; ³Istanbul Technical University

5:15 PM

Recovery of Copper, Iron and Alumina from Metallurgical Waste by Use of Hydrogen: *Casper Van Der Eijk*¹; *Halvor Dalaker*¹; ¹SINTEF

ENERGY & ENVIRONMENT

REWAS 2022: Decarbonizing the Materials Industry — Alternative Reduction and Carburization Sources

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee, TMS: Energy Committee, TMS: Process Technology and Modeling Committee, TMS: Aluminum Committee

Program Organizers: Camille Fleuriault, Eramet Norway; Christina Meskers, Norwegian University of Science and Technology (NTNU); Mertol Gökelma, Izmir Institute of Technology; Elsa Olivetti, Massachusetts Institute of Technology; Jesse White, Elkem Carbon Solutions; Chukwunwike Iloeje, Argonne National Laboratory; Neale Neelameggham, IND LLC

Tuesday PM | March 1, 2022

212A | Anaheim Convention Center

Session Chair: Jesse White, Elkem Carbon Solutions

2:30 PM Introductory Comments

2:35 PM Invited

Hlsarna: A Technology to Meet Both the Climate and Circularity Challenges for the Iron and Steel Industry: *Johan van Boggelen*¹; ¹Tata Steel

3:05 PM

Tecno-economic Pre-feasibility Study of a Hydrogen Plasma Based Ferromanganese Plant: *Halvor Dalaker*¹; Nils Eldrup¹; Roar Jensen¹; Rannveig Kvande¹; ¹Sintef

3:25 PM Invited

PreMa-project Development of New Technologies to Reduce CO2 Emissions in Mn-alloy Production: *Eli Ringdalen*¹; ¹Sintef

3:55 PM Break

4:15 PM

Towards Green Ferroalloys: Replacement of Fossil Reductants in the Pre-reduction Process of Chromite by Bio-based Alternatives: *Marcus Sommerfeld*¹; Bernd Friedrich¹; ¹IME Process Metallurgy and Metal Recycling, Institute of RWTH Aachen University

4:35 PM Invited

Pyrometallurgy-based Research Conducted at Mintek towards Decarbonizing the Metals Industry: *Joilet Steenkamp*¹; Pieter Johannes Andries Bezuidenhout²; Itumeleng Thobadi²; Lunia Malaka²; Susanna Hockaday³; Glen Michael Denton²; Buhle Xakalashe²; Elias Matinde⁴; Thokozile Penelope Kekana²; Sonwabo Bambazala²; Aditya Kale²; Quinn Gareth Reynolds⁴; ¹Mintek; University of the Witwatersrand; ²Mintek; ³University of Stellenbosch; ⁴Mintek; University of Stellenbosch

5:05 PM

Solid Oxide Membrane (SOM) Based Technology for Carbon-free Efficient Production of Solar-grade Silicon: *Haoxuan Yan*¹; Michelle Sugimoto¹; Uday Pal¹; Adam Powell²; ¹Boston University; ²Worcester Polytechnic Institute

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — Advanced Characterization II: Multi-modal Analysis Techniques

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Tuesday PM | March 1, 2022
207C | Anaheim Convention Center

Session Chairs: Kaila Bertsch, Lawrence Livermore National Laboratory; Kelly Nygren, Cornell University/CHESS; Stephen House, University of Pittsburgh/ECC; Khalid Hattar, Sandia National Laboratory; Josh Kacher, Georgia Institute of Technology

2:30 PM Invited

Connecting Plasticity to Hydrogen Embrittlement Using High Energy Synchrotron X-rays: Timothy Long¹; Kelly Nygren²; *Matthew Miller*¹; ¹Cornell University; ²Cornell High Energy Synchrotron Source

3:00 PM Invited

Graph-based Analysis of Deforming Polycrystals: *Darren Pagan*¹; Austin Benson²; Matthew Kasemer³; ¹Pennsylvania State University; ²Cornell University; ³University of Alabama

3:30 PM Invited

Slip Transfer at Grain Boundaries Investigated with 2-D and 3-D Experimental Measurements: *Thomas Bieler*¹; Harsha Phukan¹; Chelsea Edge¹; Zhuowen Zhao¹; Ruxin Xu²; Martin Crimp¹; Philip Eisenlohr¹; Carl Boehlert¹; ¹Michigan State University; ²Argonne National Laboratory

4:00 PM Break

4:15 PM Invited

Incorporating Dislocations into the Simulation of EBSD Patterns: *Marc De Graef*¹; ¹Carnegie Mellon University

4:45 PM Invited

Visualization and Analysis in Additive Manufacturing: *Anthony Rollett*¹; ¹Carnegie Mellon University

NANOSTRUCTURED MATERIALS

Self-organizing Nano-architected Materials — Mechanical Properties and Advanced Characterization

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Tuesday PM | March 1, 2022
260C | Anaheim Convention Center

Session Chairs: Erica Lilleodden, Helmholtz-Zentrum hereon; Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory

2:30 PM Invited

Architected Nanocomposites with Exceptional Energy Dissipation: *Lorenzo Valdevit*¹; Jens Bauer¹; Marti Sala Casanovas¹; ¹University of California, Irvine

3:00 PM

Mechanical Properties of Two Photon Lithographed Structures Made Using Nanocluster-based Resins: *John Kulikowski*¹; Qi Li¹; David Doan¹; Wendy Gu¹; ¹Stanford University

3:20 PM

Persistence of Crystal Orientations across Sub-micron-scale "Super-grains" in Self-organized Cu-W Nanocomposites: Kelvin Xie¹; *Digvijay Yadav*¹; Dexin Zhao¹; Arun Devaraj²; Michael Demkowicz²; ¹Texas A&M University; ²Pacific Northwest National Lab

3:40 PM Break

4:00 PM Invited

Characterization of Particle Impact and Pore Formation in Directed Energy Deposition via In-situ, Highspeed Imaging and Micro X-ray Computed Tomography: *Samantha Webster*¹; Jian Cao¹; Newell Moser²; Edward Garboczi²; Sarah Wolff³; Kamel Fezzaa⁴; Tao Sun⁵; ¹Northwestern University; ²National Institute of Standards and Technology; ³Texas A&M University; ⁴Argonne National Laboratory; ⁵University of Virginia

4:30 PM

3-dimensionally Ordered Interpenetrating Tungsten-silicon Oxycarbide Nanocomposites for High-temperature Applications: *Kevin Schmalbach*¹; Zhao Wang¹; R. Lee Penn¹; David Poerschke¹; Antonia Antoniou²; Andreas Stein¹; Nathan Mara¹; ¹University of Minnesota; ²Georgia Institute of Technology

4:50 PM Brief break for prepare for reception

5:00 PM Reception

MECHANICS & STRUCTURAL RELIABILITY

Structural Metamaterials — Session IV

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

Program Organizers: Amy Wat, Lawrence Livermore National Laboratory; Brad Boyce, Sandia National Laboratories; Xiaoyu Zheng, University of California, Los Angeles; Fabrizio Scarpa, University of Bristol; Robert Ritchie, University of California, Berkeley

Tuesday PM | March 1, 2022
304A | Anaheim Convention Center

Session Chair: To Be Announced

4:00 PM

Multi-phase Viscoelastic Kirigami Plates: *Shahram Janbaz¹*; Corentin Coulais¹; ¹Universiteit van Amsterdam

4:20 PM

3D-printable Cactus and Spider-silk Hydrogel Composites for Next Generation Multifunctional and Sustainable Energy Absorptive Metamaterials: *Graham Day¹*; Qicheng Zhang¹; Gianni Comandini¹; Adam Perriman¹; Fabrizio Scarpa¹; ¹University of Bristol

4:40 PM

Sequential Deformation in Metamaterials Tuned by Elastoplastic Buckling: *Wenfeng Liu¹*; Shahram Janbaz¹; Corentin Coulais¹; ¹University of Amsterdam

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — Irradiation-Corrosion of Materials in Light Water Reactors II

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Tuesday PM | March 1, 2022
202A | Anaheim Convention Center

Session Chair: To Be Announced

2:30 PM Invited

Decoupling of Ion Irradiation Effects on the Corrosion Rate of Zirconium Alloys: Experiment and Modelling: *Marc Tupin¹*; ¹CEA

3:00 PM Invited

Modeling Zircaloy Oxidation and Hydridation under Irradiation: What Can be Learned from Physical Models and Simulations: *Jaime Marian¹*; ¹University of California, Los Angeles

3:30 PM

Ion Irradiation Study of Polymer Derived SiFeOC-C-SiC Composite: *Kathy Lu¹*; Sanjay Kumar Singh¹; ¹Virginia Polytechnic Institute and State University

3:50 PM Invited

Dramatic E-beam Enhancement of Zircalloy-4 Corrosion: *David Bartels¹*; ¹Notre Dame University

4:20 PM Break

4:40 PM

Understanding the Hydrogen Pickup Mechanism of M5Framatome under Ion Irradiation: *Benoit Queyrel¹*; Michael Jublot¹; Frantz Martin¹; Francois Jomard²; Marc Tupin¹; ¹Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA); ²Universite de Versailles St-Quentin-en-Yvelines

5:00 PM Invited

Electrochemical Behavior of Fuel Cladding under In-situ UV Irradiation: *Adrien Couet¹*; Taeho Kim¹; Antoine Ambard²; ¹University of Wisconsin-Madison; ²Electricite de France

5:30 PM

Atomic Level Mechanisms Underlying Hydrothermal Corrosion of Silicon Carbide in Nuclear Reactors: *Jianqi Xi¹*; Dane Morgan¹; Izabela Szlufarska¹; ¹University of Wisconsin-Madison

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Microstructure, Mechanisms & Property II

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Laverna, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Tuesday PM | March 1, 2022
262A | Anaheim Convention Center

Session Chairs: Cem Tasan, Massachusetts Institute of Technology; Hyoungh Seop Kim, Pohang University of Science and Technology; Terry Lowe, Colorado School of Mines

4:00 PM Invited

Heterostructured V-Ti-Ni Alloy Containing Superelastic Nanoprecipitates: *C. Tasan¹*; Jaclyn Cho¹; ¹Massachusetts Institute of Technology

4:30 PM

Mechanical Behavior of Heterostructured Fe Films with Precisely Defined Bimodal Architectures: *Rohit Berlia¹*; Jagannathan Rajagopalan¹; ¹Arizona State University

4:50 PM

Introducing Gradient Structure to a CrMnFeCoNi High-entropy Alloy for Superior Mechanical Properties: *Nazmul Hasan¹*; Xianghai An¹; Yuntian Zhu²; Xiaozhou Liao¹; ¹University of Sydney; ²City University of Hong Kong

ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials — Soft Magnetic Materials

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

Program Organizers: Emily Rinko, Iowa State University; Iver Anderson, Iowa State University Ames Laboratory; Markus Chmielus, University of Pittsburgh; Emma White, DECHEMA Forschungsinstitut; Deliang Zhang, Northeastern University; Andrew Kustas, Sandia National Laboratories; Kyle Johnson, Sandia National Laboratories

Wednesday AM | March 2, 2022
262C | Anaheim Convention Center

Session Chair: Kyle Johnson, Sandia National Laboratories

8:30 AM Introductory Comments

8:35 AM

Laser Additive Manufacturing of Fe-Co and Fe-Si Based Soft Magnetic Alloys: Andrew Kustas¹; Donald Susan¹; Todd Monson¹; Kyle Johnson¹; Mark Wilson¹; Erin Barrick¹; Jonathan Pegues¹; Shaun Whetten¹; Raymond Puckett¹; ¹Sandia National Laboratories

8:55 AM Invited

Structure-processing-magnetic Property Interrelationships in Additively Manufactured FeCo-2V and Fe-80Ni-5Mo Soft Magnetic Alloys: Samad Firdosy¹; Nick Ury¹; Andrew Kustas²; Jay Carroll²; Dan Tung²; Donald Susan²; J.P. Borgonia¹; Ryan Conversano¹; Bryan Mcenerney¹; Vilupanur Ravi³; Robert Dillon¹; ¹NASA Jet Propulsion Laboratory; ²Sandia National Laboratories; ³California State Polytechnic University

9:25 AM

Reduction of Power Losses in SLM Printed FeSi6.5 Alloy by Geometry Optimizing: Przemyslaw Zackiewicz¹; Adrian Radon¹; Bartosz Jozwik¹; Lukasz Hawelek¹; Marcin Polak¹; Magdalena Steczkowska-Kempka¹; Adam Pilsniak¹; Aleksandra Kolano-Burian¹; ¹Lukasiewicz IMN

9:45 AM Invited

X-ray and Neutron Scattering Reveals Insights into the Formation and Thermal Stability of Metastable Disordered Phases in FeCo and FeSi: Chris Fancher¹; Andrew Kustas²; ¹Oak Ridge National Laboratory; ²Sandia National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — Fatigue Modeling and Prediction

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

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

Wednesday AM | March 2, 2022
258B | Anaheim Convention Center

Session Chair: Nima Shamsaei, Auburn University

8:30 AM Invited

Predicting Structural Integrity of Additively Manufactured Parts Using Probabilistic Damage Tolerance: Robert McClung¹; ¹Southwest Research Institute

9:00 AM

Predictive Modeling of Fracture in Anisotropic and Porous Materials: Amine Benzerga¹; Vigneshwaran Radhakrishnan¹; ¹Texas A&M University

9:20 AM

Information-rich Fatigue Fracture Surface to Evaluate Additive Manufacturing Parameters: David Scannapieco¹; Austin Ngo¹; Collin Sharpe¹; Hunter Taylor²; Joseph Pauza³; Enrique Garibay²; Evan Diwald³; Christian Gobert³; Ryan Wicker²; Anthony Rollett³; Jack Beuth³; John Lewandowski¹; ¹Case Western Reserve University; ²University of Texas at El Paso; ³Carnegie Mellon University

9:40 AM

Effects of Process Parameters on Fatigue Behavior and Defect Characteristics in LPBF Ti-6Al-4V: Austin Ngo¹; David Scannapieco¹; Hunter Taylor²; Ryan Wicker²; Joseph Pauza³; Anthony Rollett³; Jack Beuth³; John Lewandowski¹; ¹Case Western Reserve University; ²University of Texas at El Paso; ³Carnegie Mellon University

10:00 AM Break

10:20 AM Invited

Candidate Methods to Assess Structural Integrity of Higher-criticality AM Components: James Sobotka¹; Robert McClung¹; ¹Southwest Research Institute

10:50 AM

Size Effect on the Ultrasonic Fatigue Behavior of Laser-powder Bed Fusion 316L: Megan Trombley¹; Qianying Shi¹; John Allison¹; ¹University of Michigan

11:10 AM

Rapid Characterization and Comparison of the Cyclic Response of Laser Powder Bed Fusion Additive Manufactured Inconel 718 Samples Using Spherical Microindentation: Camilla Johnson¹; Aaron Stebner¹; Surya R. Kalidindi¹; ¹Georgia Institute of Technology

11:30 AM

Quantifying the Influence of Scan Strategy on the Microstructure and Fatigue Properties of SLM Inconel 718 Thin Walls: Connor Varney¹; Paul Rottmann¹; ¹University of Kentucky

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications IV — Processing and Advanced Materials Enabled by Additive Manufacturing

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

Program Organizers: Isabella Van Rooyen, Pacific Northwest National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University; Michael Kirka, Oak Ridge National Laboratory

Wednesday AM | March 2, 2022
261B | Anaheim Convention Center

Session Chairs: Xiaoyuan Lou, Auburn University; Kumar Sridharan, University of Wisconsin-Madison

8:30 AM Invited

3D Printing Energetics for Gun Propulsion Technology: *David Bird*¹; Elbert Caravaca²; Joseph Laquidara²; Ravindra Nuggehalli³; ¹Picatinny Arsenal, US Army Combat Capabilities Development Command (CCDC); New Jersey Institute of Technology ; ²Picatinny Arsenal, US Army Combat Capabilities Development Command (CCDC); ³New Jersey Institute of Technology

9:00 AM

Effective Sensitization Treatment for High-performance Steel Parts Made by Laser Powder Bed Fusion: *Mitra Shabani*¹; Soumya Sridar¹; Robert Hoffman²; Noah Sargent¹; Owen Hildreth²; *Wei Xiong*¹; ¹University of Pittsburgh; ²Colorado School of Mines

9:20 AM

Co-design of Parts and Processing for Additively Manufactured Heat Exchangers: *Nicholas Lamprinakos*¹; Ziheng Wu¹; Junwon Seo¹; Srujana Rao Yarasi¹; Anthony Rollett¹; ¹Carnegie Mellon University

9:40 AM Invited

Ballistic Additive Manufacturing -- Versatile Solid-state Fabrication: *Glenn Daehn*¹; Jianxiong Li¹; Yu Mao¹; Blake Barnett¹; K. Sajun Prasad¹; Anupam Vivek¹; ¹Ohio State University

10:10 AM Break**10:30 AM**

Compositionally Graded Joint of 316L Stainless Steel to A508 Low Alloy Steel by Additive Manufacturing: *Xiaoyuan Lou*¹; Josh Le¹; Houshang Yin¹; Jingfan Yang¹; ¹Auburn University

10:50 AM

Direct Ink Writing of Ultra High Temperature Ceramics: *Swetha Chandrasekaran*¹; Amy Wat¹; Qi Rong Yang¹; James Cahill¹; Wyatt Du Frane¹; Joshua Kuntz¹; Marcus Worsley¹; ¹Lawrence Livermore National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — In Situ Monitoring of Directed Energy Deposition Processes

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Wednesday AM | March 2, 2022
258A | Anaheim Convention Center

Session Chair: Sneha Narra, Carnegie Mellon University

8:30 AM Invited

Porosity Formation, Evolution, and Solidification in Powder-blown Directed Energy Deposition Additive Manufacturing Using High-speed Synchrotron X-ray Imaging: *Sarah Wolff*¹; Hui Wang¹; Mahsa Valizadeh¹; Marwan Haddad¹; Benjamin Gould²; ¹Texas A&M University; ²Argonne National Laboratory

9:00 AM

Blown Powder Additive Manufacturing Process Replicator for High Speed Optical, Infra-red and Synchrotron X-ray Imaging: *Sebastian Maruss*¹; Yunhui Chen¹; Samuel Clark²; Robert Atwood³; Veijo Honkimäki⁴; Alexander Rack⁴; Ben Saunders⁵; Martyn Jones⁵; Peter Lee¹; ¹University College London; ²Argonne National Laboratory; ³Diamond Light Source; ⁴European Synchrotron Radiation Facility; ⁵Rolls-Royce plc.

9:20 AM

In-situ Synchrotron X-ray Diffraction Experiments to Study the Role of Solid-state Thermal Cycling on Microstructure Formation during Metal AM: *Steve Gaudez*¹; Wolfgang Pantleon²; Manas V. Upadhyay¹; ¹CNRS UMR7649 Ecole Polytechnique; ²Technical University of Denmark

9:40 AM

Characterizing Void Morphology in Single-track Builds of Directed Energy Deposition Using New Image Processing Techniques for X-ray Computed Tomography Data Sets: *Newell Moser*¹; Edward Garboczi¹; Samantha Webster²; Jian Cao²; ¹National Institute of Standards and Technology; ²Northwestern University

10:00 AM Break**10:15 AM**

Deep Learning for Real-time Non-destructive Inter-layer Quality Control during Additive Manufacturing Process: Steven Hespeler¹; Michael Juhasz²; Ehsan Dehghan-Niri¹; *Jeffrey Riemann*²; ¹New Mexico State University; ²FormAlloy Technologies, Inc.

10:35 AM Invited

Overview of Modelling for Deformation Temperature and Stress Prediction for Wire Arc Large Scale Additive Manufacturing: *Andrzej Nycz*¹; Yousub Lee¹; Srdjan Simunovic¹; Luke Meyer¹; Chris Masuo¹; William Carter¹; Mark Noakes¹; ¹Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III – Beyond the Beam - Fundamental Science to Novel Processes

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Wednesday AM | March 2, 2022
263B | Anaheim Convention Center

Session Chair: Markus Chmielus, University of Pittsburgh

8:30 AM Introductory Comments

8:35 AM

Modeling Sintering Processes with Continuum Approaches: *Thaddeus Low*¹; Basil Paudel²; ¹Ansys, Inc; ²University of Pittsburgh

8:55 AM

Atomistic and Mesoscale Modeling of Sintering Kinetics in Solid-state Additive Manufacturing: *Fadi Abdeljawad*¹; Omar Hussein¹; ¹Clemson University

9:15 AM

Interface Formation during Metal 3D Printing: From Individual Droplets to 3D Parts: *Negar Gilani*¹; Nesma Aboulkhair¹; Marco Simonelli¹; Ian Ashcroft¹; Richard Hague¹; ¹University of Nottingham

9:35 AM

Additive Manufacturing Assisted by Subtractive Sintering of Powder Components: *Maricruz Carrillo*¹; Eugene Olevsky¹; Geuntak Lee¹; Charles Maniere¹; ¹San Diego State University

9:55 AM Break

10:15 AM

In Situ Observation of Melt Pool in Ultrasonic Vibration-assisted Directed Energy Deposition: *Salma El-Azab*¹; Aleksandra Vyatskikh¹; Sen Jiang¹; Cheng Zhang¹; Lorenzo Valdevit¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California, Irvine

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development – Titanium Alloys

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Wednesday AM | March 2, 2022
261A | Anaheim Convention Center

Session Chair: Jiadong Gong, QuesTek

8:30 AM

High Speed In-situ Alloying of Ti34Nb via Laser Powder Bed Fusion: *Sheng Huang*¹; R. Lakshmi Narayan²; Joel Heang Kuan Tan³; Swee Leong Sing¹; Wai Yee Yeong¹; ¹Nanyang Technological University; ²Indian Institute of Technology Delhi; ³Freelance

8:50 AM

Hydrogen-aided Microstructural Engineering of Additively Manufactured Ti-6Al-4V Alloy: *Lara Draelos*¹; Peeyush Nandwana²; James Paramore³; Brady Butler³; Ankit Srivastava¹; ¹Texas A&M University; ²Oak Ridge National Laboratory; ³Army Research Laboratory

9:10 AM

In Situ Monitoring and Post Operando Analysis of Additive Manufactured Dissimilar Alloys: AlSi10Mg and Ti6Al4V: *Caterina Iantaffi*¹; Yunhui Chen¹; Maureen Fitzpatrick¹; Marta Majkut²; Bratislav Lukic²; Alexander Rack²; Kudakwashe Jakata²; Martina Meisnar³; Thomas Rohr³; Eral Bele¹; Peter D. Lee¹; ¹University College London; ²ESRF; ³ESA-ESTEC

9:30 AM

Microstructure Investigation of Ti15Mo and Compositionally Graded Ti-Ti15Mo Alloys Prepared by Additive Manufacturing: *Tomas Krajnak*¹; Miloš Janecek¹; Dalibor Preisler¹; Josef Stráský¹; Michal Brázda²; Jaroslav Vavrik²; Jan Džugan²; ¹Charles University; ²COMTES FHT a.s.

9:50 AM Break

10:05 AM

Tailored Microstructures in a Laser-processed Metastable Beta-Ti Alloy Using Enforced Epitaxial Growth: *Wenhao Lin*¹; Ji Ma¹; ¹Mse/University of Virginia

10:25 AM

Understanding the Effect of Solute Elements on the Evolution of Equiaxed and Columnar Grains in AM Processed Beta Titanium Alloys: *Mohan Sai Kiran Nartu*¹; Srinivas Aditya Mantri¹; Brian Welk²; Narendra Dahotre¹; Hamish Fraser²; Rajarshi Banerjee¹; ¹University of North Texas; ²Ohio State University

10:45 AM

Powder Blown Directed Energy Deposition of Nickel-titanium Shape Memory Alloys: Process-structure-property Relationship: *Dyuti Sarker*¹; Samad Firdosy²; Nicholas Ury²; James Tsangarides¹; Lauren Holm¹; Aaron Stebner¹; ¹Georgia Institute of Technology; ²NASA Jet Propulsion Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — Microstructural Features II

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

Program Organizers: Meysam Haghsheenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Wednesday AM | March 2, 2022
260A | Anaheim Convention Center

Session Chairs: Kavan Hazeli, The University of Arizona; Andrew Birnbaum, US Naval Research Laboratory (NRL)

8:30 AM

Understanding the Influence of Microstructure and Voids during Induced Spall Failure of Additive Manufactured Stainless Steel: *Josh Kacher*¹; *Katie Koube*¹; *Taylor Sloop*¹; *Kevin Lamb*²; *Suresh Babu*³; ¹Georgia Institute of Technology; ²Y-12 National Security Complex; ³University of Tennessee Knoxville

8:50 AM

Effect of Skin Microstructure on the Bending Properties of Additively Manufactured IN625 Beams: *Arunima Banerjee*¹; *Sara Messina*²; *William Musinski*³; *Paul Shade*³; *Marie Cox*³; *Matthew Begley*²; *Kevin Hemker*¹; ¹Johns Hopkins University; ²UCSB; ³Air Force Research Laboratory

9:10 AM

Effect of LPBF Parameters on Post Heat Treatment Microstructure and Sub-sized Tensile Properties of LPBF Inconel 718: *Jayaraj Radhakrishnan*¹; *Punit Kumar*²; *Upadrasta Ramamurty*²; ¹Nanyang Technological University; ²NTU

9:30 AM

Microstructure and Mechanics of Hydrogel Enabled Additively Manufactured Metals and Metal Alloys: *Rebecca Gallivan*¹; *Max Saccone*¹; *Thomas Tran*¹; *Julia Greer*¹; ¹California Institute of Technology

9:50 AM Break

10:10 AM

On the Influence of the Representative Volume Elements Size on Predicting Dislocation Microstructure Evolution in Laser Additive Manufacturing Metals: *Markus Sudmanns*¹; *Jaafar El-Awady*¹; ¹Johns Hopkins University

10:30 AM

Temperature-dependent Evolution of Dislocation Microstructure and Mechanical Properties of SLM-316L Stainless Steel: *Markus Sudmanns*¹; *Andrew Birnbaum*²; *Yejun Gu*¹; *Athanasios Iliopoulos*²; *John Michopoulos*²; *Jaafar El-Awady*¹; ¹Johns Hopkins University; ²US Naval Research Laboratory

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Nuclear Fuels Thermo-physical Properties - Experiment

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Wednesday AM | March 2, 2022
202B | Anaheim Convention Center

Session Chair: Tsvetoslav Pavlov, Idaho National Laboratory

8:30 AM Invited

Accelerating Nuclear Fuel Qualification through Multiscale Models: *Joshua White*¹; *Tammie Nelson*¹; *David Andersson*¹; ¹Los Alamos National Laboratory

9:00 AM

Diffusion Coefficients of Zr- and Cr-based Binary Systems for Simulation of Cr-coated Zircaloy Nuclear Fuel Cladding: *Ella Kartika Pek*¹; *Wei Zhong*¹; *Alexander Butler*¹; *Ji-Cheng Zhao*¹; ¹University of Maryland, College Park

9:20 AM

Thermo-physical Properties of the Ternary (U2Cr)N3 Phase: *Yulia Mishchenko*¹; *Denise Adorno Lopes*¹; *Elina Charatsidou*¹; ¹KTH Royal Institute of Technology

9:40 AM

Thermal Transport Behavior of Pristine and Zirconium-doped Alpha-Uranium: *Zilong Hua*¹; *David Hurley*¹; ¹Idaho National Laboratory

10:00 AM Break

10:10 AM

Bulk Thermal Conductivity Measurement of Fuels and Surrogates: *Kunal Mondal*¹; *Scott Middlemass*¹; *Peng Xu*¹; *Isabella van Rooyen*¹; ¹Idaho National Laboratory

10:30 AM

The Influence of Radiation-induced Microstructural Defects on the Optical and Elastic Properties of Ceramic Nuclear Fuels: *Amey Khanolkar*¹; *Zilong Hua*¹; *Cody Dennett*¹; *Joshua Ferrigno*²; *Marat Khafizov*²; *J. Mann*³; *David Hurley*¹; ¹Idaho National Laboratory; ²The Ohio State University; ³Air Force Research Laboratory

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session V

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Taran, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Wednesday AM | March 2, 2022
207A | Anaheim Convention Center

Session Chairs: Donovan Leonard, Oak Ridge National Laboratory; Martin Diehl, KU Leuven

8:30 AM Invited

Full Field Crystal Plasticity Simulations of Measured Microstructures: Going 3D: *Martin Diehl*¹; Nikhil Prabhu¹; ¹KU Leuven

9:00 AM

Identification of Crystal Plasticity Model Parameters by Multi-objective Optimization Integrating Texture Evolution: *Daniel Savage*¹; Marko Knezevic²; Zhangxi Feng²; ¹Los Alamos National Laboratory; ²University of New Hampshire

9:20 AM Invited

Centimeter to Nanometer Materials Characterization Informed Phase Field Modeling of Mechanical Failure in 6022/EK100 Linear Friction Stir Welds: *Donovan Leonard*¹; Kubra Karayagiz²; Adam Powell²; Brajendra Mishra²; Qingli Ding²; Piyush Upadhyay³; Tim Skrzek⁴; ¹Oak Ridge National Laboratory; ²WPI; ³PNNL; ⁴Magna International Inc.

9:50 AM Break

10:05 AM

A Thermo-elasto-viscoplastic Finite Element Model to Study Polycrystalline Evolution during Metal AM: *Nikhil Mohanan*¹; Jérémy Bleyer²; Thomas Helfer³; *Manas Upadhyay*¹; ¹LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris; ²Navier Laboratory, CNRS, École des Ponts ParisTech; ³DEC, CEA

10:25 AM

Meso-scale Characterization and Strain-gradient Enabled Simulation of the Multi-strain Path Deformation of AA6016-T4: *Rishabh Sharma*¹; Md Zahidul Sarkar²; Dane Sargeant¹; Marko Knezevic²; Michael Miles³; David Fullwood³; ¹Brigham Young University Student; ²University of New Hampshire; ³Brigham Young University

10:45 AM

Modeling and Experimental Characterization of Intragranular Residual Stresses, Statistically Stored and Geometrically Necessary Dislocations: *Ritwik Bandyopadhyay*¹; Sven Gustafson¹; Hemant Sharma²; Peter Kenesei²; Michael Sangid¹; ¹Purdue University; ²Argonne National Laboratory

ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings — Coating Technologies and Surface Structuring

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Ramana Chintalapalle, University of Texas at El Paso; Adele Carrado, IPCMS - CNRS Université de Strasbourg; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougou, Cnrs - Is2m; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Wednesday AM | March 2, 2022
252B | Anaheim Convention Center

Session Chairs: Ramana Chintalapalle, University of Texas at El Paso; David Bird, US Army

8:30 AM Introductory Comments

8:40 AM Keynote

Multimaterials for Advanced Structural Applications: *Gerhard Ziegmann*¹; Maximilian Feyrer¹; Sebastian Sdrenka²; Tobias Fischer¹; ¹Clausthal University Of Technology

9:20 AM

Investigation of Pineapple Leaf Fiber Reinforced Natural Rubber by Dynamic Mechanical Properties: *Karine Mougou*¹; Budsaraporn Surajarusarn²; Gautier Schrodj¹; Taweechai Amornsakchai²; ¹CNRS - IS2M; ²Mahidol University

9:40 AM

Microstructural Characterization and Vibration Damping Behavior of Al-NiTi Composites: *Namrata Gangil*¹; Arshad Siddiquee²; Sameera Mufazzal²; S. M. Muzakkir²; Sachin Maheshwari³; ¹Ajay Kumar Garg Engineering College; ²Jamia Millia Islamia; ³Netaji Subhas University of Technology

10:00 AM Break

10:20 AM

Improvement of Corrosion Resistance of A36 Steel Using SiC and TiB₂ Thermally Sprayed Coatings: *Abhijeeth Nagaraj*¹; *Adarsha H*¹; Hariprasad S A¹; Ramkumar N P¹; ¹Jain University

10:40 AM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Sustainability and Energy

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Wednesday AM | March 2, 2022
212B | Anaheim Convention Center

Session Chairs: Surojit Gupta, University of North Dakota; Kamala Raghavan, US Department of Energy

8:30 AM

Synthesis and Electrochemical Studies of Sodium B'' - $Al_2O_3/10Sc1CeZr$ Composite as a Two Independent Phase Mixed Ion Conductor: Pooya Elahi¹; Taylor Sparks¹; ¹University of Utah

8:50 AM Invited

Design Paradigm for Manufacturing Functional Materials from Environmentally Benign Precursors: Surojit Gupta¹; ¹University of North Dakota

9:15 AM Invited

In-situ Surface Modification of Biocompatible 3D Printed Polylactic Acid (PLA) and PLA Composites Using Plasma Micro-discharge: Sankha Banerjee¹; Saquib Ahmed²; Deidra Hodges³; Edbertho Leal-Quiros⁴; ¹California State University, Fresno; ²State University of New York at Buffalo State; ³Florida International University; ⁴University of California, Merced

9:35 AM

Long-term Stability Improvement of Perovskite Solar Cells through a Solvent-free Encapsulation Method: Manuel Salado¹; David Payno¹; Shahzada Ahmad¹; ¹BC Materials

CHARACTERIZATION

Advanced Real Time Imaging — Energy and Biomaterials

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

Program Organizers: Jinichiro Nakano, US Department of Energy - National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, Kth Royal Institute of Technology; David Veyssset, Stanford University; Pranjal Nautiyal, University of Pennsylvania

Wednesday AM | March 2, 2022
206A | Anaheim Convention Center

Session Chair: Tanaji Paul, Florida International University

8:30 AM Invited

Real-time Optical Visualization of Battery Reactions and Processes: Nian Liu¹; ¹Georgia Institute of Technology

8:50 AM

High Temperature In Situ Imaging and Strain Measurement during Synthesis of Monolithic Zirconium Hydride Components: Thomas Nizolek¹; Caitlin Taylor¹; Erik Luther¹; Aditya Shivprasad¹; Tarik Saleh¹; ¹Los Alamos National Laboratory

9:10 AM

Evaluating Cellular-level Inhomogeneity through High-frequency Ultrasound -- A Computational Study: Koushik Paul¹; Leila Ladani¹; ¹Arizona State University

9:30 AM

Phase Evolution in Water at High Pressures from XRD and Raman Spectroscopy: A Combined MD Simulation and Experimental Investigation: Ali K. Shargh¹; Shanti Deemyad²; Niaz Abdolrahim¹; Saveez Saffarian²; ¹University of Rochester; ²University of Utah

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — Structures and Mechanical Properties I and 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM | March 2, 2022
251A | Anaheim Convention Center

Session Chairs: Veerle Keppens, University of Tennessee; Lei Lu, Chinese Academy of Sciences; Michael Widom, Carnegie Mellon University; Liang Jiang, Yantai University

8:30 AM Invited

Synthesis and Properties of High Entropy Oxide Ceramics: *Veerle Keppens*¹; ¹University of Tennessee

8:50 AM Invited

Gradient Cell Structured High-entropy Alloy with Superior Mechanical Behavior: *Lei Lu*¹; Qingsong Pan¹; liangxue Zhang¹; Rui Feng²; Peter K Liaw³; ¹Chinese Academy of Sciences; ²Oak Ridge National Laboratory; ³The University of Tennessee

9:10 AM Invited

Dynamic Deformation Behaviors in Single BCC Phase Refractory High-entropy Alloys: *Chanho Lee*¹; Mathew Hayne¹; Peter Liaw²; Nan Li¹; Saryu Fensin¹; ¹Los Alamos National Laboratory; ²The University of Tennessee

9:30 AM Invited

A High-throughput Strategy to Study Phase Stability, Microstructure Development and Mechanical Properties in Complex Concentrated Alloys: *Mu Li*¹; Zhaohan Zhang¹; Katharine Padilla¹; Rohan Mishra¹; *Katharine Flores*¹; ¹Washington University in St. Louis

9:50 AM Break

10:10 AM Invited

Small-scale Deformation Behavior of Multi-principal Element Alloys: *Shristy Jha*¹; Saideep Muskeri¹; Sundeep Mukherjee¹; ¹University of North Texas

10:30 AM

Composition- and Grain-size-dependent Hydrogen Uptake and Its Effect on Plastic Deformation of Face-centered Cubic High-entropy Alloys: *Yakai Zhao*¹; Jeong-Min Park²; Upadrasta Ramamurty¹; Jae-il Jang²; ¹Nanyang Technological University; ²Hanyang University

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — Structures and Characterization 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM | March 2, 2022
251B | Anaheim Convention Center

Session Chairs: Wei Chen, Illinois Institute of Technology; Yi-Chia Chou, National Chiao Tung University

8:30 AM Invited

Microstructural Inversion Accompanied by B2 to hP18 Phase Transformation in a BCC Based Refractory Complex Concentrated Alloy: *Abhishek Sharma*¹; Sriswaroop Dasari¹; Vishal Soni¹; Oleg Senkov²; Daniel Miracle³; Rajarshi Banerjee¹; ¹University of North Texas; ²UES Inc.; ³Air Force Research Laboratory

8:50 AM Invited

Slip Localization in the Refractory High Entropy Alloy HfNbTaTiZr at Room Temperature: *Marie Charpagne*¹; J.C. Stinville¹; Fulin Wang²; Tresa Pollock³; ¹University of Illinois; ²Jiaotong University; ³University of California Santa Barbara

9:10 AM Invited

Microstructure and Mechanical Properties of Medium-entropy Alloys with High-density Nano Precipitates: *CheWei Tsa*¹; Hung-Chih Liu¹; Pai-Keng Shen¹; Jein-Wei Yeh¹; Cheng-Yao Huang¹; Hung-Wei Yen¹; ¹National Tsing Hua University, Department of Materials Science and Engineering,

9:30 AM

Electron Diffraction-based Studies of Ordering and Mechanical Behavior in FCC and BCC Multi-principal Element Alloys: *Daniel Foley*¹; David Beaudry¹; Elaf Anber¹; Yevgeny Rakita Shlafstein¹; Partha Das²; Simon Billinge³; Andrew Matejunas⁴; Carolina Frey⁵; Leslie Lamberson⁴; Tresa Pollock⁵; Irene Beyerlein⁵; Garritt Tucker⁴; Chris Weinberger⁶; Mitra Taheri¹; ¹Johns Hopkins University; ²NanoMEGAS SPRL; ³Columbia University; ⁴Colorado School of Mines; ⁵University of California, Santa Barbara; ⁶Colorado State University

9:50 AM Break

10:10 AM

Characterization of High-entropy Titanate Pyrochlore Oxide Single Crystals: *Candice Kinsler-Fedon*¹; Lauren Nuckols¹; Anamul Haq Mir²; David Mandrus³; Yanwen Zhang¹; William Weber¹; Veerle Keppens¹; ¹The University of Tennessee, Knoxville; ²University of Huddersfield

10:30 AM

Size Effects in a Dual Phase High Entropy Alloy: *Junaid Ahmed*¹; Matthew Daly¹; ¹UIC

10:50 AM

A High-throughput Investigation of Microstructure-property Relationships in NbVZr: *Katharine Padilla*¹; Mu Li¹; Zhaohan Zhang¹; Rohan Mishra¹; Katharine Flores¹; ¹Washington University in St. Louis

MATERIALS DESIGN

Advances in Titanium Technology — Deformation Behavior in Ti Alloys II

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Wednesday AM | March 2, 2022
252A | Anaheim Convention Center

Session Chair: Zachary Kloenne, Ohio State University

8:30 AM

Anomalous $c+a$ Dislocation Activity in TIMETAL-407: *Zachary Kloenne¹; Gopal Viswanathan¹; Michael Loretto²; Hamish Fraser¹; ¹Ohio State University; ²University of Birmingham*

8:50 AM

Heterogeneous and Cooperative Deformation in Two-phase Titanium Alloys: Slip Initiation, Transfer, and Their Effects on Strain Localization: *Shaolou Wei¹; Cem Tasan¹; ¹Massachusetts Institute of Technology*

9:10 AM

Strengthening of Ti-6Al-4V/TiC Composites: *Pavlo Markovsky¹; Dmytro Savvakyn¹; Olexandr Stasyuk¹; Matthew Mecklenburg²; Vianey Ellison³; Sergey Prikhodko³; ¹G.V. Kurdyumov Institute for Metal Physics, NAS of Ukraine; ²University of Southern California, Los Angeles; ³University of California Los Angeles*

9:30 AM

The Effect of Sample Size and Plastic Behavior on the Validity of Sub-scale Mechanical Testing of Titanium Alloys: *James Paramore¹; Laura Moody¹; Xinzhu Zheng²; Ankit Srivastava²; Brady Butler¹; ¹US Army Research Laboratory; ²Texas A&M University*

9:50 AM

Modeling Local Stress States Near Microtextured Regions in Ti64 and Implications on Dwell Fatigue Life: *Joseph Wendorf¹; Jean-Charles Stinville¹; Marie-Agathe Chappagne¹; McLean Echlin¹; Andrew Polonsky²; Paul Dawson³; Tresa Pollock¹; ¹University of California Santa Barbara; ²Sandia National Laboratories; ³Cornell University*

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Material Design III

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Wednesday AM | March 2, 2022
256A | Anaheim Convention Center

Session Chair: Tiankai Yao, Idaho National Laboratory

8:30 AM

Neural Message Passing for Prediction of Abnormal Grain Growth in Monte Carlo Simulations of Polycrystalline Materials: *Ryan Cohn¹; Elizabeth Holm¹; ¹Carnegie Mellon University*

8:50 AM

Application of Compositionally-restricted Attention-based Network (CrabNet) for Screening Candidate Dispersed Phases for Designing High Strength Alloys: *Trupti Mohanty¹; Fan Zhang²; K. S. Ravi Chandran¹; Taylor D. Sparks¹; ¹University of Utah; ²CompuTherm, LLC*

9:10 AM

Feature Selection and Interpretation for Machine Learning Models: Reducing the Dimensionality of Complex Concentrated Alloys: *Zachary McClure¹; Austin Hernandez¹; Michael Titus¹; Alejandro Strachan¹; ¹Purdue University*

9:30 AM

Efficient Optimization of Variable and Uncertain Additive Manufacturing Processes Using Machine Learning: *Maher Alghalayini¹; Ali Khosravani²; Surya Kalidindi³; Chris Paredis¹; Fadi Abdeljawad¹; ¹Clemson University; ²Multiscale Technologies; ³Georgia Institute of Technology*

9:50 AM Break**10:10 AM**

Uncertainty Quantification and Propagation in Prediction of Solid-liquid Interfacial Properties and Solidification Microstructures: *Sepideh Kavousi¹; Mohsen Asle Zaeem¹; ¹Colorado School of Mines*

10:30 AM

Understanding Fission Gas Bubble Distribution, Lanthanide Transportation, and Thermal Conductivity Degradation in Neutron-irradiated a-U Using Machine Learning: *Tiankai Yao¹; Lu Cai¹; Fei Xu²; Fidelma Dilemma¹; Michael Benson¹; Daniel Murray¹; Cynthia Adkins¹; Joshua Kane¹; Min Xian³; Luca Capriotti¹; ¹Idaho National Laboratory; ²Grand View University; ³University of Idaho*

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — ML Algorithms and Their Applications I

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendeleev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Wednesday AM | March 2, 2022
253A | Anaheim Convention Center

Session Chairs: Garritt Tucker, Colorado School of Mines; Enrique Martinez Saez, Clemson University

8:30 AM Invited

Capturing Nanoscale Lattice Variations by Applying AI-powered Computer Vision Techniques on Synthetic X-ray Diffraction Data: *Niaz Abdulrahim*¹; ¹University of Rochester

9:00 AM

Application of Information Theory in Molecular Dynamics Simulations: *Khaled Talaat*¹; Osman Anderoglu¹; ¹University of New Mexico

9:20 AM

Clustering Algorithms for Nanomechanical Property Mapping and Resultant Microstructural Constituent Quantification: *Bryer Sousa*¹; Christopher Vieira²; Rodica Neamtu¹; Danielle Cote¹; ¹Worcester Polytechnic Institute

9:40 AM

Materials Design, Model Calibration, and Multi-fidelity Modeling with Latent Map Gaussian Processes: *Ramin Bostanabad*¹; ¹University of California, Irvine

10:00 AM Break

10:20 AM

Comparing Transfer Learning to Feature Optimization in Microstructure Classification: *Taylor Sparks*¹; Debanshu Banerjee²; ¹University of Utah; ²Jadavpur University

10:40 AM

Improving Autonomous Data Collection by Iterative Learning Control as Applied to a Robomet.3D Mechanical Serial-sectioning System: *Damian Gallegos-Patterson*¹; Claus Danielson²; Jonathan Madison¹; ¹Sandia National Laboratories; ²University of New Mexico

11:00 AM

Chemistry and Processing History Prediction from Materials Microstructure by Deep Learning: *Amir Abbas Kazemzadeh*¹; Mahmood Mamivand¹; ¹Boise State University

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications X — Session V

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

Program Organizers: Hsin-Jay Wu, National Chiao Tung University; Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Cnrs Crismat Unicaen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Takao Mori, National Institute For Materials Science; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology; Pai-chun Wei, National Taiwan University

Wednesday AM | March 2, 2022
303D | Anaheim Convention Center

Session Chairs: Wan-Ting Chiu, Tokyo Institute of Technology; Franck Gascoin, Cnrs Crismat Unicaen

8:30 AM Invited

Niobium Chalcogenides: Phases Stability and Transport Properties: *Franck Gascoin*¹; Hugo Bouteiller¹; David Berthebaud²; Sylvain Letonquesse²; Takao Mori³; Amélie Galodé⁴; Louise Goodwin⁴; ¹Cnrs Crismat Unicaen; ²CNRS LINK; ³NIMS; ⁴University of Caen

8:50 AM

Rhombohedral Distortion Elicits High-performance GeTe Thermoelectrics: *Chen Bo-Chia*¹; Kuang-Kuo Wang²; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University; ²National Sun Yat-sen University

9:10 AM Invited

Computational Understanding and Design of Carrier Lifetime in Solar Absorber Materials: *Geoffroy Hautier*¹; ¹Dartmouth

9:30 AM Concluding Comments

BIOMATERIALS

Biological Materials Science — Biological Materials Science V

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Wednesday AM | March 2, 2022
204B | Anaheim Convention Center

Session Chairs: David Restrepo, The University of Texas at San Antonio; Jing Du, Penn State University

8:30 AM

Cellulose-hemicellulose-lignin Interaction in Coconut Endocarp: *Sharmi Mazumder*¹; Ning Zhang¹; ¹The University of Alabama

8:50 AM

Polymer Interfaces with Small-scale Biological Systems and the Impact on Sperm Viability: *Jeffrey Bates*¹; Kenneth Aston¹; Benjamin Emery¹; Ashwin Velraj¹; Abhishek Pachauri¹; Parker Toews¹; Meredith Humphreys¹; ¹University of Utah

9:10 AM

Bioinspired Self-strengthening Tape Junctions: *Ben Skopic*¹; Hannes Schniepp¹; ¹William & Mary

9:30 AM

Investigation of Multiscale Hierarchical Structure and Micromechanical Properties of Cholla Cactus: *Swapnil Morankar*¹; Amey Luktuke¹; Sridhar Niverty¹; Hamidreza Torbati-Sarraf¹; Yash Mistry²; Clint Penick³; Dhruv Bhate²; Nikhilesh Chawla¹; ¹Purdue University; ²Arizona State University; ³Kennesaw State University

BIOMATERIALS

BioNano Interfaces and Engineering Applications – Bionano Interfaces & Engineering Applications III

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

Program Organizers: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Wednesday AM | March 2, 2022
201A | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM Invited

Alloy Design via 3D Printing for Metallic Implants: *Amit Bandyopadhyay*¹; Susmita Bose¹; ¹Washington State University

9:10 AM Invited

Bioinspired Interface for Titanium Implants: *Malcolm Snead*¹; Candan Tamerler²; Casey Chen¹; ¹Usc, Center For Craniofacial Mol Biol Ostrow School Of Dentistry Of; ²University of Kansas

9:40 AM

Computational Investigation of DNA-scaffolded Squaraine Dye Aggregates: *German Barcenas*¹; Lawrence Spear¹; Lan Li¹; ¹Boise State University

10:00 AM Break**10:20 AM**

Computational Modeling of Cyanine Dyes Attached to DNA Scaffolds: *Austin Biaggne*¹; Lan Li¹; ¹Boise State University

ADVANCED MATERIALS

Bulk Metallic Glasses XIX – Atomic Structure

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Wednesday AM | March 2, 2022
253C | Anaheim Convention Center

Session Chairs: Michael Atzmon, University of Michigan; Jinwoo Hwang, Ohio State University; Peter Derlet, Paul Scherrer Institut

8:30 AM

Investigating the Structural Origin of the Change in Ductility of Zr-Cu-Co-Al Metallic Glasses Using 4-dimensional Scanning Transmission Electron Microscopy: *Soohyun Im*; Pengyang Zhao¹; Yuchi Wang²; Geun Hee Yoo³; Eun Soo Park³; Yunzhi Wang²; Jinwoo Hwang²; ¹Shanghai Jiao Tong University; ²The Ohio State University; ³Seoul National University

8:50 AM Invited

Determining the Three-dimensional Atomic Structure of Metallic Glass: *Jianwei (John) Miao*¹; ¹Univ of California Los Angeles

9:15 AM

Structural Origin of Ultrastable Metallic Glasses: Zhen Lu¹; Akihiko Hirata²; *Mingwei Chen*³; ¹WPI-AIMR, Tohoku University; ²Waseda University; ³Johns Hopkins University

9:35 AM

X-ray Techniques to Study the Interplay of Short- and Long-range Structural Ordering in Zr and Pd Bulk Metallic Glasses: *Alex Dommann*¹; Aurelio Borzi¹; Antonia Neels¹; ¹Empa

9:55 AM Discussion on atomic structure of metallic glasses

LIGHT METALS

Cast Shop Technology – Safety / Furnace

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

Program Organizers: Stephen Instone, Speira GmbH; Mertol Gökelman, Izmir Institute of Technology; Samuel Wagstaff, Oculatus; Dmitry Eskin, Brunel University

Wednesday AM | March 2, 2022
209A | Anaheim Convention Center

Session Chair: Anne Kvithyld, SINTEF AS

8:30 AM

Dew Point Monitoring and Alarm System for Meltable Storage: *John Zeh*¹; Keaton Davenport¹; Cameron Crick¹; ¹Logan Aluminum Inc.

8:55 AM

Evaluation of Breathability of Molten Metal PPE Fabrics: Robert Wagstaff¹; Sarah Walker²; *Samuel Wagstaff*¹; ¹Oculatus Consulting; ²Rolling Boulder Design

9:20 AM

Aluminium Melting Process Pptimization with SmartMelt, a Digital Tool for Real-time Operational Guidance: *Amin Rostamian*¹; Mario Salgado¹; Marc Bertherat²; Jean-Luc Desbiolles¹; Michel Rappaz³; ¹Novamet Sarl; ²Constellium; ³MRC Consulting

9:45 AM

Continuous Chemical Analysis of Molten Aluminum: *Kristjan Leosson*¹; Rauan Meirbekova¹; Sveinn Gudmundsson¹; Georges Salloum-Abou-Jaoude²; ¹DTE; ²Constellium C-TEC

10:10 AM Break**10:25 AM**

Bauxite & Alumina: Now and In the Future: *Lavinya Kugaswaran*¹; ¹International Aluminium Institute

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Metallurgical Processing Analysis and Characterization

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhamayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Wednesday AM | March 2, 2022
207B | Anaheim Convention Center

Session Chairs: Rajiv Soman, Eurofins EAG Laboratories; Mariyappan Arul Kumar, Los Alamos National Laboratory

8:30 AM Introductory Comments

8:35 AM

Investigation of MRO Clusters in Molten Marginal Metallic Glasses: *Can Okuyucu*¹; Doguhan Sariturk¹; Ilkay Kalay²; Yunus Kalay¹; ¹Middle East Technical University; ²Çankaya University

8:55 AM

Study on the Degradation Behavior of Organic Humic Acid from the Wastewater by Refractory High-titanium Slag after Metallurgical Transformation: Yubi Wang¹; Bingbing Liu¹; Shengpeng Su¹; Guihong Han¹; Yanfang Huang¹; ¹Zhengzhou University

9:15 AM

Study on Efficient Burdening for Preparation of Fused Calcium Magnesium Phosphate Fertilizer from Low-grade Phosphate Ores: Tingting Wang¹; Luyi Li¹; Cuihong Hou¹; Haobin Wang¹; Shouyu Gu¹; Jie Wang¹; ¹Zhengzhou University

9:35 AM

Characterization of Nano-crystalline Metallurgical-grade Silicon Prepared from Rice Husk Ash: *Benedict Ayomanor*¹; Cookekey Iyen²; Ifeoma Iyen²; Vitalis Mbah¹; Daniel Anyaogu¹; Daniel Dawuk¹; Sunday Anikoh¹; Matthew Omonokhua¹; Suleiman Ndiriza¹; ¹Federal Polytechnic Nasarawa; ²Federal University Wukari, Nigeria.

9:55 AM Break

10:10 AM

Characteristics of Placer Gold from Glacial Sediment: *Bowen Li*¹; ¹Michigan Technological University

10:30 AM

Chemical Analysis of Mineral Surfaces Using Digital Image Processing: Mizraim Flores¹; Juan Gonzalez¹; Abdon Aparicio¹; Gildardo Godínez¹; Karime González²; ¹UNIVERSIDAD TECNOLÓGICA DE TULANCINGO; ²Instituto Tecnológico de Saltillo

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Solidification/Additive Manufacturing

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadhodaei, University Of Illinois At Chicag; Eva Zarkadoulas, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Wednesday AM | March 2, 2022
255C | Anaheim Convention Center

Session Chairs: Eva Zarkadoulas, ORNL; Damien Tournet, IMDEA Materials Institute

8:30 AM

Multiscale Dendritic Needle Network Study of the Effect of Buoyant Liquid Flow on Dendritic Growth Kinetics: *Thomas Isensee*²; Damien Tournet²; ¹IMDEA Materials Institute & Universidad Politécnica de Madrid; ²IMDEA Materials

8:50 AM

Machine Learning-assisted High-throughput Exploration of Interface Energy Space in Multi-phase-field Model with CALPHAD Potential: *Vahid Attari*¹; Raymundo Arroyave¹; ¹Texas A&M University

9:10 AM

Capturing the Undercooling for Solidification of Inoculated FCC Metals: *Mark O'Masta*²; Eric Clough¹; John Martin¹; ¹HRL Laboratories LLC

9:30 AM

Simulation of Evolving Microstructure in Additive Manufacturing of Al-Si Alloys Using Phase Field Modeling: *Abdur Al Azad*¹; Philip Cardiff¹; David Browne¹; ¹University College Dublin

9:50 AM Break

10:10 AM

Modelling Informed Strategy for the Additive Manufacturing of High-strength Al-alloys: *Giuseppe Del Guercio*¹; William Reynolds¹; Adam Clare¹; Marco Simonelli¹; ¹University of Nottingham

10:30 AM

Simulation of Molten Pool Dynamics during Metallic Additive Manufacturing: *Lu Wang*; Wentao Yan¹; ¹National Univeristy of Singapore

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — Crystal Plasticity, Micro-mechanics & Environmental Behavior

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Wednesday AM | March 2, 2022
304B | Anaheim Convention Center

Session Chairs: Andrew Wessman, University of Arizona; Mark Hardy, Rolls-Royce

8:30 AM

Grain Scale Deformation Study of a Nickel-based Superalloy under Thermo-mechanical Fatigue Utilizing Crystal Plasticity Simulations and High-energy X-ray Diffraction Microscopy: *Brandon Mackey¹; Ritwik Bandyopadhyay¹; Sven Gustafson¹; Michael Sangid¹; ¹Purdue University*

8:50 AM

A Framework to Enable Location-specific Analysis of Components by Incorporating Microstructural Information during the Product Design Cycle: *Saikiran Gopalakrishnan¹; Ritwik Bandyopadhyay¹; Michael Sangid¹; ¹Purdue University*

9:10 AM

Temperature Dependence of Tensile and Fatigue Properties of Additively Manufactured Ni-base Superalloys: A Comparative Study: *Reza Ghiaasiaan¹; Arun Poudel¹; Nabeel Ahmad¹; Muztahid Muhammad¹; Paul Gradl²; Shuai Shao¹; Nima Shamsaei¹; ¹Auburn University; ²NASA Marshall Space Flight Center*

9:30 AM

The Effect of Environment on the Near-crack Deformation Induced during Dwell Fatigue of a Ni-base Superalloy: *Zachary Harris¹; Philippa Reed²; James Burns¹; ¹University of Virginia; ²University of Southampton*

9:50 AM Break**10:10 AM**

Frictional Ignition of Superalloys in High-pressure, High-temperature Oxygen: *Zachary Cordero¹; Andres Garcia-Jimenez¹; ¹Massachusetts Institute of Technology*

10:30 AM

Contributions of Oxidation and Creep to High Temperature Fatigue Crack Susceptibility in Waspaloy: *Alex Jennion¹; Zachary Harris¹; James Burns¹; ¹University of Virginia*

10:50 AM

Microstructural and Mechanical Aspects of Damage Mechanisms in Dwell-fatigue in Inconel 718: *Melanie Bordes-Czaplicki¹; Jonathan Cormier²; Patrick Villechaise²; Vincent Roue³; ¹Safran Aircraft Engines - Institut Pprime; ²Institut Pprime; ³Safran Aircraft Engines*

11:10 AM

Numerical Studies to Predict the Fracture Behavior due to Stress Corrosion Cracking under Different Environmental Conditions: *Sorabh Singhal¹; Yogeshwar Jasra¹; Pardeep Kumar²; Ravindra Kumar Saxena¹; ¹Sant Longowal Institute of Engineering and Technology; ²R. V. Industries*

SPECIAL TOPICS

DMMM4 — All-Summit Keynote Session

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday AM | March 2, 2022
Grand Ballroom F | Anaheim Marriott

Session Chairs: Clarissa Yablinsky, Los Alamos National Laboratory; Aerial Murphy-Leonard, The Ohio State University

8:30 AM Introductory Comments**8:40 AM Keynote**

The Road to Equity and Inclusion: Lessons Learned on the Journey: *Viola Acoff¹; ¹University of Alabama, Tuscaloosa*

9:45 AM Break

10:00 AM Panel Discussion: Voices of TMS A panel of diverse TMS members will build upon the discussion introduced in the Keynote Presentation through their own stories and perspectives, with ample opportunity for questions and engagement by attendees. Panel members include: Lawrence Fung, Gabriel Ilevbare, Suveen Mathaudhu, and Raul Rebak. Moderated by Clarissa Yablinsky

11:00 AM Small Group Discussion and Sharing This segment of the program will provide attendees with the opportunity to reflect upon the lessons learned in this session through directed discussion.

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Plasticity / Modeling and Simulation I

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Wednesday AM | March 2, 2022
304D | Anaheim Convention Center

Session Chairs: Marc Meyers, University of California San Diego; Jeremy Millett, Awe Plc

8:30 AM

Contrasting the Shock Response of Typical Face Centred Cubic and Body Centred Cubic Single Crystals: *Jeremy Millett¹; Saryu Fensin²; Yu-Lung Chiu³; Glenn Whiteman¹; George Gray²; ¹Awe Plc; ²Los Alamos National Laboratory; ³University of Birmingham*

8:50 AM

Anomalous Strain Rate History Effects in TRIP and TWIP Steels: *Christopher Meredith¹; Daniel Field¹; Daniel Magagnosc¹; Timothy Walter¹; Jeffrey Lloyd¹; Krista Limmer¹; ¹Army Research Laboratory*

9:10 AM

Multi-mechanism Models for Impact on Ceramics: *Nilanjan Mitra*¹; Weixin Li¹; K T Ramesh¹; ¹Johns Hopkins University

9:30 AM

Modeling Dislocation Evolution in High Velocity Microparticle Impacts: *Kevin Larkin*¹; Abigail Hunter¹; Miles Buechler¹; ¹Los Alamos National Laboratory

9:50 AM Break

10:05 AM

A Twinning Model Based on Dislocation Kinetics for Polycrystalline Beryllium under Dynamic Loading Conditions: *Nitin Daphalapurkar*¹; Darby Luscher¹; Daniele Versino¹; ¹Los Alamos National Laboratory

10:25 AM

Spall of Tin and Its Sensitivity to Microscale Behaviors – A Computational Study: *Kazem Alidoost*¹; Nathan Barton¹; Garry Maskaly¹; Fady Najjar¹; ¹Lawrence Livermore National Laboratory

10:45 AM

Mechanical Properties of a Model Co-continuous Two-phase Metal Composite: *Lauren Poole*¹; Avery Samuel¹; Frank Zok¹; ¹University of California-Santa Barbara

11:05 AM

Simulations of Laser-driven Metal Microjet Formation and Their Interactions: *Kyle Mackay*¹; Fady Najjar¹; Alison Saunders¹; Hye-Sook Park¹; Suzanne Ali¹; Jon Eggert¹; Jeremy Horwitz¹; Brandon Morgan¹; Yuan Ping¹; Camelia Stan¹; ¹Lawrence Livermore National Lab

11:25 AM

Effect of Surfaces on Dislocation Mobility in the Transonic Regime: *Ta Duong*¹; Michael J. Demkowicz²; ¹Texas A&M University

11:45 AM

High Strain-rate Nanoindentation Testing of Soft and Hard Model Materials: *Benjamin Hackett*¹; Christopher Walker¹; Wesley Higgins¹; Sudharshan Phani Pardhasaradhi²; Warren Oliver³; George Pharr¹; ¹Texas A&M University; ²International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI); ³KLA Corporation

CORROSION

Environmental Degradation of Multiple Principal Component Materials — Design, Modeling, Simulation, and Machine Learning

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; ShinYoung Kang, Lawrence Livermore National Laboratory; XiaoXiang Yu, Northwestern University; Vilupanur Ravi, California State Polytechnic University Pomona; Christopher Weinberger, Colorado State University; Elizabeth Opila, University of Virginia; Bai Cui, University of Nebraska-Lincoln; Mark Weaver, University of Alabama; Bronislava Gorr, Karlsruhe Institute of Technology (KIT); Srujan Rokkam, Advanced Cooling Technologies Inc

Wednesday AM | March 2, 2022
201C | Anaheim Convention Center

Session Chairs: Xiao-xiang Yu, Northwestern University; Shinyoung Kang, Lawrence Livermore National Laboratory

8:30 AM

Modeling Preferential Dissolution during Aqueous Corrosion of Multi-principal Element Alloys: *Kang Wang*¹; Bi-Cheng Zhou¹; ¹University of Virginia

8:50 AM

Interpretable Machine Learning to Understand Corrosion in Complex Compositional Alloys: *Timothy Hartnett*¹; Angela Gerard¹; Prasanna Balachandran¹; John Scully¹; ¹University Of Virginia

9:10 AM Invited

Corrosion Resistance of Al-Cr-Ti Containing Compositionally Complex Alloys: *Samuel Inman*¹; Jie Qi²; Mark Wischhusen¹; Sean Agnew²; Joseph Poon²; John Scully¹; ¹Department of Materials Science and Engineering- University of Virginia; ²Department of Physics- University of Virginia

9:40 AM

Computational Investigation of the Trends that Govern the Coefficient of Thermal Expansion in Rare-earth Silicates: *Mukul Ayyasamy*¹; ¹University of Virginia

10:00 AM Break

10:20 AM

Oxygen Modulation of Miscibility and Ordering in BCC Nb-Ti-Zr Alloys: *Michael Waters*¹; David Beaudry²; Yevgeny Shlafstein²; Elaf Anber²; Mitra Taheri²; James Rondinelli¹; ¹Northwestern University; ²Johns Hopkins University

10:40 AM

Machine Learning Potential for High Entropy Alloys: *Qiang Zhu*¹; Yanxun Howard¹; Pedro Santos¹; Xiaoxiang Yu²; Yunjiang Wang³; ¹University of Nevada Las Vegas; ²Northwestern University; ³State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences

11:00 AM

Modeling and Design of CoCrFeNi Multi-principle Element Alloys on Their Aqueous Corrosion Resistance via First Principle Calculations: *Zhengyu Zhang*¹; Liping Liu¹; Tianyou Mou¹; Hongliang Xin¹; Wenjun Cai¹; ¹Virginia Polytechnic Institute and State University

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Corrosion Fatigue and Cracking

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Wednesday AM | March 2, 2022
201D | Anaheim Convention Center

Session Chairs: Jenifer Locke, Ohio State University; Wenjun Cai, Virginia Tech

8:30 AM Invited

Correlating Crack Tip pH to Corrosion Fatigue Performance in Al Alloys: *Jenifer Locke*¹; Katrina Catledge¹; Gabriella Montiel¹; Mary Cefaratti²; David Schrock¹; Saba Esmaeely¹; ¹Ohio State University; ²Wittenberg University

9:05 AM

Effects of Atmospheric Corrosion on Corrosion Fatigue of AA7085-T7451: Investigating the Role of Surface Salts, Varied Humidity, and Temperature: *Brandon Free*¹; Jason Niebuhr²; Nathan Houser²; Sarah Galyon Dorman²; Jenifer (Warner) Locke¹; ¹The Fontana Corrosion Center, The Ohio State University; ²SAFE Inc.

9:25 AM Invited

Designing Robust Aluminum Alloys and Structures Resistant to Simultaneous Surface Stress and Corrosion: *Wenjun Cai*¹; ¹Virginia Polytechnic Institute and State University

10:00 AM Break

10:20 AM

Investigation of Fundamental Mechanical and Electrochemical Mechanism during the Tribocorrosion Process of Aluminum Using Experiments and Simulations: *Kaiwen Wang*¹; Wenjun Cai¹; ¹Virginia Polytechnic Institute and State University

10:40 AM

Investigating the Effect of Polarization on SCC Resistance of AA6111 and the Role of Crack Tip pH: *Katrina Catledge*¹; Gabriella Montiel¹; Saba Esmaeely²; *Jenifer Locke*¹; ¹The Ohio State University; ²DNV

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multi-Mechanical Interactions during Extreme Environment Fatigue Loading

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Jean-Charles Stinville, University of Illinois Urbana-Champaign; Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Orion Kafka, NIST

Wednesday AM | March 2, 2022
254B | Anaheim Convention Center

Session Chair: Brian Wisner, Ohio University

8:30 AM Invited

Damage Manifestation in Hydrogen-assisted Fatigue: *Matthew Connolly*¹; May Martin¹; Robert Amaro²; Peter Bradley¹; Damian Lauria¹; Jun-Sang Park³; Zack Buck¹; Andrew Slifka¹; ¹National Institute of Standards and Technology; ²Advanced Materials Testing & Technologies; ³Argonne National Laboratory

8:50 AM

Spatial and Temporal Slip Heterogeneity in Ti-7Al as a Function of Oxygen Content and Crystallographic Ordering: *Felicity Dear*¹; Rachel Lim²; Darren Pagan²; Joel Bernier³; Yilun Xu¹; Thomas McAuliffe¹; David Rugg⁴; Fionn Dunne²; David Dye¹; ¹Imperial College London; ²Pennsylvania State University; ³Lawrence Livermore National Laboratory; ⁴Rolls-Royce plc

9:10 AM

Model the Initiation of Hot Cracking during Laser Welding of Al6061: *Guannan Tang*¹; Anthony Rollett¹; ¹Carnegie Mellon University

9:30 AM

Atomic Mechanism of Near Threshold Fatigue Crack Growth in Vacuum: *Mingjie Zhao*¹; Wenjia Gu¹; Derek Warner¹; ¹Cornell University

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Functional Bio-Nanomaterials & Biosensors I

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Wednesday AM | March 2, 2022
260B | Anaheim Convention Center

Session Chairs: Yong Lin Kong, University of Utah; Michael Cai Wang, University of South Florida

8:30 AM

Investigation of the Capturing Mechanism of Aerosols on Functional Polymeric Fiber Matrix: *Noori Na*¹; Abiral Regmi¹; Jiyoung Chang¹; ¹University of Utah

8:50 AM Keynote

3D Printing Bionic Devices: *Michael McAlpine*¹; ¹University of Minnesota

9:35 AM Invited

Rapid and Scalable Fabrication of Hierarchical Multiscale Nanocomposite Films for Bone Tissue Repair and Infection Control: *Amanda Clifford*¹; ¹The University of British Columbia

10:05 AM Break

10:25 AM Keynote

Electrical Detection and Characterization of Individual Molecules with Single Nanometer-scale Pores: *John Kasianowicz*¹; Jessica Benjamini²; Kenneth Rubinson³; Haiyan Wang⁴; ¹USF Tampa; ²Columbia University; ³Wright State University; ⁴Southeast University

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Special Interfaces: Twins, Laminates, etc

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Wednesday AM | March 2, 2022
304C | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Liang Qi, University of Michigan, Ann Arbor

8:30 AM Invited

Twin-boundary Structural Phase Transitions in Elemental Titanium: Mohammad Hooshmand¹; Ruopeng Zhang²; Yan Chong¹; Enze Chen¹; Timofey Frolov³; David Olmsted¹; Andrew Minor¹; Mark Asta¹; ¹University of California, Berkeley; ²Lawrence Berkeley National Laboratory; ³Lawrence Livermore National Laboratory

9:00 AM Invited

Migration Free Energy of Twin Boundaries and Other Crystalline Defects: David Rodney¹; Yuji Sato²; Arnaud Allera¹; Thomas Swinburne³; ¹Lyon University; ²Tokyo University; ³Aix Marseille University

9:30 AM

Thermal Stability and Mechanical Behavior of Immiscible Cu-Ag/Fe Triphase Multilayers with Triple Junctions: Tongjun Niu¹; Yifan Zhang²; Jaehun Cho¹; Nicholas Richter¹; Tianyi Sun¹; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University; ²Los Alamos National Laboratory

9:50 AM

Disconnection-mediated Transition in Segregation Structure at Twin Boundaries: A Molecular Dynamic Simulation of Platinum-gold System: Chongze Hu¹; Douglas Medlin¹; Remi Dingreville¹; ¹Sandia National Laboratories

10:10 AM Break

10:25 AM Invited

Disconnections and Other Defects Associated with Twin Interfaces: Jian Wang¹; ¹University of Nebraska-Lincoln

10:55 AM

Nudged Elastic Band-based Modeling of Stress-dependent Twin Boundary Migration in Magnesium: Kehang Yu¹; Xin Wang¹; Subhash Mahajan²; Timothy Rupert¹; Irene Beyerlein³; Penghui Cao³; Julie Schoenung¹; Enrique Lavernia⁴; ¹University of California, Irvine; ²University of California, Davis; ³University of California, Santa Barbara; ⁴National Academy of Engineering

11:15 AM

Amorphous/Crystalline Interfaces in Nanomultilayers: Kyle Russell¹; ¹University of Southern California

ADVANCED MATERIALS

High Performance Steels — Modeling and Computation in Steels Research

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung; Benjamin Adam, Oregon State University

Wednesday AM | March 2, 2022
252C | Anaheim Convention Center

Session Chairs: Allie Glover, Los Alamos National Laboratory; Chris Finfrock, Colorado School of Mines

8:30 AM

First Principles Calculations of Structural Point-defect Calculations in Austenitic Stainless Steels: Edwin Antillon¹; Noam Bernstein¹; Michelle Johannes¹; ¹Naval Research Laboratory

8:55 AM

ICME Design of β -NiAl + Cu + VC Triple Nano-precipitate Strengthened Austenitic Steel: Colin Stewart¹; Paul Lambert²; Richard Fonda¹; Keith Knipling¹; Patrick Callahan¹; ¹US Naval Research Laboratory; ²US Naval Surface Warfare Center, Carderock Division

9:20 AM

Modeling Liquid Metal Embrittlement Cracks in Cross-tension Spot Weld Testing for Advanced High Strength Steels: Kayla Molnar¹; Matthew Zappulla¹; Kip Findley²; ¹Los Alamos National Laboratory; ²Colorado School of Mines

9:45 AM

Using Computer Vision to Predict Mechanical Properties of High Temperature Alloys: Nan Gao¹; Zongrui Pei²; Youhai Wen²; Michael Gao²; Elizabeth Holm¹; ¹Carnegie Mellon University; ²NETL

10:10 AM Break

10:25 AM

Computational Design of a High Strength High Toughness Fully-austenitic TRIP Steel: Amit Behera¹; Dana Frankel¹; Fan Meng¹; Peter Jacobson¹; Greg Olson¹; ¹QuesTek Innovations LLC

10:50 AM

Properties and Performance of Fe-Mn-Al-C Alloys as a Function of Composition: Krista Limmer¹; Daniel Field¹; Katherine Sebeck²; ¹DEVCOM Army Research Laboratory; ²DEVCOM Ground Vehicle Systems Center

LIGHT METALS

Magnesium Technology — Characterization and Joining, Machining, and Forming

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Wednesday AM | March 2, 2022
210A | Anaheim Convention Center

Session Chairs: Suveen Mathaudhu, Colorado School of Mines; Domonkos Tolnai, Helmholtz-Zentrum Hereon; Alan Luo, The Ohio State University; Vineet Joshi, Pacific Northwest National Laboratory

8:30 AM

Characterization of Binary Solute Contributions to Cyclic Deformation in Magnesium Alloys by High Energy X-ray Diffraction: *Duncan Greeley*¹; Mohammadreza Yaghoobi¹; Katherine Shanks²; Darren Pagan²; Veera Sundararaghavan¹; John Allison¹; ¹University of Michigan; ²Cornell High Energy Synchrotron Source

8:50 AM Invited

To Fail or Not to Fail: Norbert Hort¹; *Petra Maier*²; ¹Helmholtz-Zentrum Hereon; ²University of Applied Sciences Stralsund

9:10 AM

Microstructure Evolution of AZ31B Mg Alloy during Bi-axial Fatigue Loading: *Sugrib Shaha*¹; Dwayne Toscano²; Hamid Jahed²; ¹Georgia Institute of Technology; ²University of Waterloo

9:30 AM

Wire-based Additive Manufacturing of Magnesium Alloys: *Stefan Gneiger*¹; Daniel Koutny²; Sascha Senck³; Martin Schnall¹; Nikolaus Papenberg³; Thomas Klein¹; ¹Light Metals Technologies Ranshofen; ²Brno University of Technology; ³University of Applied Sciences Upper Austria

9:50 AM Break

10:10 AM

Nanomechanical Analysis and Fractography of Extruded Mg-Dy-Nd Based Alloy Influenced by Solution Heat Treatment: *Petra Maier*¹; Asta Richter²; Benjamin Clausius¹; Norbert Hort³; ¹University of Applied Sciences Stralsund; ²University of Applied Sciences Wildau; ³Helmholtz-Zentrum Hereon

10:30 AM

Dissimilar Metal Micro Friction Stir Welding of Magnesium AZ31 to Aluminum 6061: *Eisha Khalid*¹; Vasanth Shunmugasamy¹; Bilal Mansoor¹; ¹Texas A&M University at Qatar

10:50 AM

Friction Stir Extrusion of AZ31 Magnesium Alloy Rod: *Maryam Al-Budainain*¹; Vasanth Shunmugasamy²; Bilal Mansoor²; ¹Texas A&M University; ²Texas A&M University at Qatar

11:10 AM

Determining the Contributions of Dynamic Recrystallization and Deformation Mechanisms to the Weak Textures Observed in As-deformed Mg-Zn-Ca Alloys: *Tracy Berman*¹; Mohammadreza Yaghoobi¹; John Allison¹; ¹University of Michigan

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — General Materials and Chemistry I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Wednesday AM | March 2, 2022
203B | Anaheim Convention Center

Session Chair: Michael Short, MIT

8:30 AM

Recovery of Purified Cerium Metal via Metallurgical Reduction after Chlorination-based Purification: *Sierra Freitas*¹; Mario Alberto Gonzalez²; Chao Zhang²; Devin Rappleye³; Michael Simpson¹; ¹University of Utah; ²Lawrence Livermore National Laboratory; ³Brigham Young University

8:50 AM

Electrochemical Sensor for Real-time O₂-concentration Measurements of a Direct Oxide Reduction: *Forest Felling*¹; Mario Gonzales¹; Chao Zhang²; Devin Rappleye³; Michael Simpson¹; ¹University of Utah; ²Lawrence Livermore National Laboratory; ³Brigham Young University

9:10 AM

Crystal Structure Evolution of UCl₃ from Room Temperature to Melting: *Sven Vogel*¹; A. David R. Andersson¹; Marisa J. Monreal¹; J. Matthew Jackson¹; S. Scott Parker¹; Gaoxue Wang¹; Ping Yang¹; Jianzhong Zhang¹; ¹Los Alamos National Laboratory

9:30 AM

System for Chemical Analysis of Molten Salts: *Diego Zometa Panigua*¹; ¹NEXT Lab

9:50 AM Break

10:10 AM

The Versatile Forced Convection Fluoride Loop (VeFoCoFLoop): *Stephen Raiman*¹; Randi Mazza¹; Aslak Stubsgaard²; Thomas Pedersen²; ¹Texas A&M University; ²Copenhagen Atomics

10:30 AM

Thermophysical Property Measurements and Modeling of Molten Salts: *Ryan Gallagher*¹; Can Agca¹; Abbey McAlister¹; Paul Rose¹; Alex Martin¹; Jake McMurray¹; N. Dianne Bull Ezell¹; Shane Henderson¹; Robert Lefebvre¹; ¹Oak Ridge National Laboratory

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Session V

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Wednesday AM | March 2, 2022
253B | Anaheim Convention Center

Session Chairs: Le Zhou, Marquette University; Hanlei Zhang, University of Pittsburgh

8:30 AM Invited

FeNiMnAl(Cr) and FeCoMnAl Multi-principal Component Alloys: Ian Baker¹; ¹Dartmouth College

8:55 AM

An Experience in Development of Modified Invar Alloy: Building the Capacity of Overhead Power Transmission Lines: Ashmita Patra¹; Narahari Satyanarayana¹; Gayatri Yadav¹; ¹Mishra Dhatu Nigam Ltd

9:15 AM

Predicting the Columnar-to-equiaxed Transition during Additive Manufacturing of Concentrated Multicomponent Alloys: Christopher Hareland¹; Gildas Guillemot²; Oriane Senninger²; Charles-André Gandin²; Peter Voorhees¹; ¹Northwestern University; ²CEMEF - Centre de Mise en Forme des Matériaux

9:35 AM Invited

Characterization of the Microstructure and Deformation Substructure evolution in Additively Manufactured High-entropy Alloys via Correlative EBSD and ECCT: Zhangwei Wang¹; Ji Gu¹; Lin Guo¹; Yong Liu¹; Min Song¹; ¹Central South University

MATERIALS PROCESSING

Materials Processing Fundamentals — Process Studies and Optimizations

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Jonghyun Lee, Iowa State University; Adrian Sabau, Oak Ridge National Laboratory; Fiseha Tesfaye, Åbo Akademi University

Wednesday AM | March 2, 2022
213D | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM

Thermoelectric Magnetohydrodynamic Control of Melt Pool Dynamics and Microstructure Evolution in Direct Energy Deposition Additive Manufacturing: Xianqiang Fan¹; Tristan Fleming²; David Rees¹; Yuze Huang¹; Yunhui Chen¹; Sebastian Marussi¹; Robert Atwood³; Andrew Kao⁴; Peter Lee¹; ¹University College London; ²Queen's University; ³Diamond Light Source Ltd; ⁴University of Greenwich

8:55 AM

Significance of Post-processing Subtransus Heat Treatment on the Microstructure and Mechanical Behavior of Additively Manufactured Ti-6Al-4V Alloy: Abbas Mohammadi¹; Bonnie Whitney¹; Akshatha Chandrashekar Dixith¹; Anthony Spangenberg¹; Cory Cunningham²; Jared Gross²; Austin Mann³; Diana Lados¹; ¹Worcester Polytechnic Institute; ²Boeing Additive Manufacturing; ³Boeing Research & Technology

9:15 AM

Development of Activated Carbon from Coconut Shell as AN Absorbent in a Refrigeration Thermodynamic Cycle: Ademola Agbeleye¹; Manasseh Oyekeye¹; ¹University of Lagos

9:35 AM

Strategies for the Upgrade of a TBZC Product (Tetra Basic Zinc Chloride) by Selective Removal of the Impurity Chlorine: Lukas Hoeber¹; Thomas Hoffbauer²; Rana Ahmed³; Stefan Steinlechner¹; ¹CDL for Selective Recovery of Minor Metals Using Innovative Process Concepts; ²Andritz Metals; ³Montanuniversität Leoben

9:55 AM Break

10:15 AM

Pulsed Electric Current Joining of Oxide-dispersion-strengthened Austenitic Steels: Fei Wang¹; Xueliang Yan¹; Xin Chen¹; Nathan Snyder¹; Michael Nastasi²; Khalid Hattar³; Bai Cui¹; ¹University of Nebraska-Lincoln; ²Texas A&M University; ³Sandia National Laboratories

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — Radiation Effects in High Heat Flux Materials II

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Wednesday AM | March 2, 2022
203A | Anaheim Convention Center

Session Chairs: Jaime Marian, University of California, Los Angeles; William Cunningham, Stony Brook University

8:30 AM

Deuterium Trapping and Release from Irradiation-induced Voids in Tungsten: Theory and Experimental Validation: Mikhail Zibrov¹; Klaus Schmid¹; ¹Max Planck Institute for Plasma Physics

8:50 AM

Strain and Thermal Gradient Effects on the Transport Properties of Intrinsic Defects and Impurities in Tungsten: Enrique Martinez Saez¹; Bochuan Sun¹; Dimitrios Maroudas²; Nithin Mathew³; Danny Perez³; Sophie Blondel⁴; Dwaipayan Dasgupta⁴; Brian Wirth⁴; ¹Clemson University; ²University of Massachusetts; ³Los Alamos National Laboratory; ⁴University of Tennessee, Knoxville

9:10 AM

Reduced Interstitial Mobility in W Based Transition Metal Ternary Systems: Youngguk Shin¹; Byeongchan Lee¹; Keonwook Kang²; ¹Kyung Hee University; ²Yonsei University

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Structural Materials Characterization & Modelling II

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Wednesday AM | March 2, 2022
204A | Anaheim Convention Center

Session Chairs: Michael Rushton, Bangor University; Conor Oscar Galvin, LANL

8:30 AM Invited

Development of Direct and Indirect Ab Initio Radiation Damage Models: *Par Olsson*¹; Ebrahim Mansouri¹; Qigui Yang¹; Elin Toijer¹; Par Olsson²; ¹KTH Royal Institute of Technology; ²Malmö University

9:00 AM

Effective Bias of Cavities in BCC Fe: As Revealed by Atomistic Calculations: *Yuhao Wang*¹; Fei Gao¹; Brian Wirth²; ¹University of Michigan - Ann Arbor; ²University of Tennessee, Knoxville

9:20 AM

Implementation of a Damage Degradation Function for Creep Predictions within a FFT-based Framework: *Nathan Beets*¹; Paul Christodoulou²; M. Arul Kumar¹; Ricardo Lebensohn¹; Laurent Capolungo¹; ¹Los Alamos National Laboratory; ²University Of California Santa Barbara

9:40 AM

On the Diffusion of Hydrogen Atoms towards Notch Tips in Zirconium Polycrystals: A CPFE Analysis: *Alireza Tondro*¹; Hamidreza Abdolvand¹; ¹University of Western Ontario

10:00 AM Break**10:20 AM**

Atomistic Simulation Study of the Effect of Hydride Morphology on the Ductility of Polycrystalline Zirconium: *Hadi Ghaffarian*¹; Ye-eun Na¹; Dongchan Jang¹; ¹Korea Advanced Institute of Science and Technology (KAIST)

10:40 AM Invited

Oxygen and Carbon Defects in Uranium and Plutonium Nitride: Navaratnarajah Kuganathan¹; Conor Galvin¹; *Robin Grimes*¹; ¹Imperial College London

11:05 AM

Temperature Sensitive Dislocation Dynamics Modeling of Hardening and Embrittlement: *Aaron Kohnert*¹; Laurent Capolungo¹; ¹Los Alamos National Laboratory

11:25 AM

Radiation-Induced Segregation in Binary Alloy Systems Examined Via Phase Field Simulations: *Daniel Vizoso*¹; Chaitanya Deo¹; Remi Dingreville²; ¹Georgia Institute of Technology; ²Sandia National Laboratories

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Small Scale and In Situ Testing

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Wednesday AM | March 2, 2022
262B | Anaheim Convention Center

Session Chairs: Mohsen Zaeem, Colorado School of Mines; Shraddha Vachhani, Iowa State University

8:30 AM Invited

In Situ Nanoscale Mechanical Testing to Isolate the Effect of Grain Boundary and Linear Complexions: *Timothy Rupert*¹; ¹University of California, Irvine

9:00 AM

Understanding the Role of Surface Faceting in Metallic Nanoparticles via In Situ TEM Compression: *Soodabeh Azadehghanjbar*¹; Ruikang Ding¹; Andrew Baker¹; Ingrid Padilla Espinosa²; Ashlie Martini²; Tevis Jacobs¹; ¹University of Pittsburgh; ²University of California Merced

9:20 AM

Nanostructured Metallic Glasses from Colloidal Nanoparticles: *Melody Wang*¹; Wendy Gu¹; Mehrdad Kiani¹; ¹Stanford University

9:40 AM

Direct Observation of Intermittent Dislocation Motions and Deformation Mechanisms in Nanocrystalline Molybdenum: *Haw-Wen Hsiao*¹; Jia-Hong Huang²; Jian Min Zuo¹; ¹University of Illinois; ²National Tsing Hua University

10:00 AM Break**10:20 AM Invited**

In Situ Nanomechanical Testing to Understand the Role of Grain Boundary Structure in Materials: *Nan Li*¹; Saryu Fensin¹; Abigail Hunter¹; Darby Luscher¹; ¹Los Alamos National Laboratory

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Session IV

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Wednesday AM | March 2, 2022
206B | Anaheim Convention Center

Session Chairs: David Rowenhorst, Naval Research Laboratory; Ashley Bucsek, University of Michigan

8:30 AM Invited

High Energy X-ray Diffraction – Seeing Data through a Model: *Matthew Miller*¹; ¹Cornell University

9:00 AM Invited

In Situ 3D Characterization and Crystal Plasticity Modeling of Martensite Formation in Austenitic Steels
: *Todd Hufnagel*¹; *Ye Tian*¹; ¹Johns Hopkins University

9:30 AM

Modeling In-situ X-ray Diffraction of Dislocation Evolution during Selective Laser Melting of 316L Stainless Steels with Discrete Dislocation Dynamics and GPU-accelerated Raytracing: *Dylan Madisetti*¹; *Markus Sudmanns*¹; *Christopher Stiles*²; *Jaafar El-Awady*¹; ¹Johns Hopkins University; ²Johns Hopkins University Applied Physics Laboratory

9:50 AM Break

10:10 AM Invited

The Development of a Laboratory-scale High-energy Diffraction Microscopy Instrument: *Ashley Bucsek*¹; *Reza Roumina*¹; *Anasuya Adibhatla*²; *Robert Drake*³; ¹University of Michigan; ²Excillum Inc.; ³Proto Mfg.

10:40 AM Invited

Using High Energy X-rays to Investigate the Evolution of Plastic Strain and Damage in Additively Manufactured 316L Stainless Steel: *David Rowenhorst*¹; *Ariel Leonard*²; ¹Naval Research Laboratory; ²Ohio State University

MATERIALS DESIGN

Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis — Techniques Related to Metal-based Composite Materials

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

Program Organizers: Srivatsan Tirumalai, The University of Akron; Pradeep Rohatgi, University of Wisconsin; Simona Hunyadi Murph, Savannah River National Laboratory

Wednesday AM | March 2, 2022
256B | Anaheim Convention Center

Session Chair: Tirumalai Srivatsan, The University of Akron

8:30 AM Invited

Effects of Oxide Ceramic Addition on Biocompatibility of Titanium: *Sushant Ciliveri*¹; *Indranath Mitra*¹; *Susmita Bose*¹; *Amit Bandyopadhyay*¹; ¹Washington State University

8:55 AM Invited

Micro-scale In-situ Mechanical Testing and Nano-CT Characterization of Directed Energy Deposited Hybrid AL/AL3Ni Composite Foam Materials: *Baolong Zheng*¹; *Xin Wang*¹; *Dongxu Liu*¹; *Lizhi Sun*¹; *Enrique Lavernia*²; *Julie Schoenung*¹; ¹University of California, Irvine; ²National Academy of Engineering

9:20 AM Invited

Modification of Bi2Te3 Nanowires-based Composites for Enhanced Flexible Thermoelectric Films: *Jaeyun Moon*¹; *Matthew Pusko*¹; ¹University of Nevada Las Vegas

9:40 AM Invited

Vapor-phase Infiltration Synthesis of Functional Organic-inorganic Hybrid Nanocomposites: *Chang-Yong Nam*¹; ¹Brookhaven National Laboratory

10:00 AM Break

10:15 AM

Insights into Salt-flux Reaction Synthesis Using Synchrotron-based 3D Nanotomography: *Aaron Gladstein*¹; *Jonathan Goettsch*¹; *Caleb Reese*¹; *Ashwin Shahani*¹; *Alan Taub*¹; ¹University of Michigan

SPECIAL TOPICS

Nix Award and Lecture Symposium: Recent Advances in Nanoindentation and Small-Scale Mechanical Testing — Nix Award II

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

Program Organizers: Wendelin Wright, Bucknell University; Gang Feng, Villanova University

Wednesday AM | March 2, 2022
259A | Anaheim Convention Center

Session Chairs: Wendelin Wright, Bucknell University; Gang Feng, Villanova University; Kevin Hemker, Johns Hopkins University

8:30 AM Invited

2021 William D Nix Award Lecture: Nanoindentation - The Next Generation: *George Pharr*¹; ¹Texas A&M University

9:30 AM Invited

Correlating the Small Scale Mechanical Behavior and the Evolving 3D-microstructure by In Situ Laue Tomography: Jean-Baptiste Molin¹; Patric Gruber²; Jean-Sebastien Micha²; *Christoph Kirchlechner*¹; ¹Karlsruhe Institute of Technology; ²ESRF

10:00 AM Break Coffee Break**10:30 AM Invited**

Nanoindentation as a Reliable Tool for Measuring Surface Free Energy Over Five Orders of Magnitude: Edoardo Rossi¹; P. Sudharshan Phani²; R. Guillemet³; Julie Cholet³; Doriane Jussey³; W.C. Oliver⁴; *Marco Sebastiani*¹; ¹Roma Tre University; ²International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI); ³Thales Research & Technology; ⁴KLA Corporation

11:00 AM Invited

Size Effects in the Plastic Deformation and Fracture of Strontium Titanate: *Karsten Durst*¹; Javaid Farhan²; Xufei Fang¹; ¹TU Darmstadt; ²National University of Sciences and Technology, Islamabad

11:30 AM Invited

Nanoindentation in an Electrochemical Cell: Electro-chemo-mechanical Coupling: *Erica Lilleodden*¹; ¹Helmholtz-Zentrum Geesthacht

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Non-Ferrous Alloys

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Wednesday AM | March 2, 2022
255B | Anaheim Convention Center

Session Chair: Ramasis Goswami, Naval Research Laboratory

8:30 AM

Precipitation Behavior of Strengthening Phases in a High Temperature Aluminum-cerium Alloy: *Opemipo Adetan*¹; Dinc Erdeniz¹; ¹University of Cincinnati

8:50 AM

Time Resolved In-situ Small Angle X-ray Scattering Clarifies the Competition between Continuous and Discontinuous Precipitation in U-6wt%Nb: *Nathan Peterson*¹; Erik Watkins²; Don Brown²; Bjorn Clausen²; Travis Carver²; Jun-Sang Park³; Sean Agnew¹; ¹University of Virginia; ²Los Alamos National Laboratory; ³Argonne National Laboratory - Advanced Photon Source

9:10 AM

The Role of Non-hydrostatic Stress State in the α to β Phase Transformation in Ti: *Khanh Dang*¹; Laurent Capolungo¹; Carlos Tome¹; ¹Los Alamos National Laboratory

9:30 AM

Precipitation Behavior in a Laser-glazed Powder-processed Icosahedral-phase-strengthened Aluminum Alloy: *Mingxuan Li*¹; Hannah Leonard¹; Sarshad Rommel¹; Cain Hung¹; Thomas Watson²; Tod Policandriotes³; Rainer Hebert¹; Mark Aindow¹; ¹University of Connecticut; ²Pratt & Whitney; ³Collins Aerospace

9:50 AM Break**10:10 AM**

Shuffle Transformation in Titanium Alloys: Wenrui Zhao¹; Dian Li¹; Yufeng Zheng¹; ¹University of Nevada-Reno

10:30 AM

The Effect of Grain Size on Quasi-static and Dynamic Strength: *Jenna Krynicki*¹; Laszlo Kecskes¹; Christopher DiMarco¹; Jake Diamond¹; Zhigang Xu²; K.T. Ramesh¹; Timothy Weihs¹; ¹Johns Hopkins University; ²North Carolina A&T State University

10:50 AM

The Impact of Al on the SRO, LRO, and Clustering of Elements within a CoFeNi High Entropy Alloy: *Jaimie Tiley*¹; Soumya Nag¹; Ke An¹; Joerg Neuefeind¹; Jonathan Poplawsky¹; Sriswaroop Dasari²; Rajarshi Banerjee²; ¹Oak Ridge National Laboratory; ²University of North Texas

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Sintering

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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Wednesday AM | March 2, 2022
263C | Anaheim Convention Center

Session Chairs: Eugene Olevsky, San Diego State University; Hang Yu, Virginia Polytechnic Institute and State University

8:30 AM Invited

Gravitation Effects on Sintering: *Elisa Torresani*¹; Randall German¹; Eugene Olevsky¹; ¹San Diego State University

9:00 AM

Gravity-affected Sintering of 3D-printed Powder Components: *Eugene Olevsky*¹; Elisa Torresani¹; Randall German¹; ¹San Diego State University

9:20 AM

Powder Metallurgy Fabrication of ZrH_x Moderator and U-ZrH_x Moderated Nuclear Fuel: *Caitlin Taylor*¹; Erik Luther¹; Adrian Wagner²; Thomas Nizolek¹; Aditya Shivprasad¹; Tarik Saleh¹; ¹Los Alamos National Laboratory; ²Idaho National Laboratory

9:40 AM Invited

Sintering Based Production of Complex Shapes by the Coupling of Additive Manufacturing and Spark Plasma Sintering: *Charles Maniere*¹; Geuntak Lee²; Elisa Torresani³; Sylvain Marinel¹; Lise Durand⁴; Claude Estournès⁵; Eugene A. Olevsky³; ¹Normandie University, ENSICAEN, UNICAEN, CNRS, CRISMAT, 14000, Caen, France; ²Powder Technology Laboratory, San Diego State University, San Diego, USA; ³Powder Technology Laboratory, San Diego State University, San Diego, USA; ⁴CEMES, CNRS UMR 8011, Université de Toulouse, 29 rue Jeanne Marvig, 31055 Toulouse, France; ⁵CIRIMAT, CNRS-INP-UPS, Université Toulouse 3 – Paul Sabatier 118 route de Narbonne, F-31062 Toulouse cedex 9, France

10:10 AM Break**10:30 AM**

Stable Temperature Regulation in Spark Plasma Sintering Simulations: *Runjian Jiang*¹; Elisa Torresani¹; Eugene Olevsky¹; ¹San Diego State University

10:50 AM

Transparent Al₂O₃ Fabricated by Energy Efficient Spark Plasma Sintering: *CheolWoo Park*¹; Elisa Torresani¹; Eugene A Olevesky¹; Chris Haines²; ¹San Diego State University/College of Engineering; ²US Army DEVCOM

11:10 AM

Sintering Anisotropy of Binder Jetting 316L: *Alberto Cabo Rios*¹; Eduard Hryha²; Eugene Olevsky¹; Peter Harlin³; ¹SDSU; ²Chalmers University of Technology; ³Sandvik Additive Manufacturing

11:30 AM

Surface Modification of Micro Powders Using Plasma-based Reactors for Sintering of Copper-Chromium Alloys: *Santiago Vargas*¹; Diana Galeano¹; Carlos Castano¹; ¹Virginia Commonwealth University

LIGHT METALS

Primary Aluminum Industry - Energy and Emission Reductions: An LMD Symposium in Honor of Halvor Kvande — Energy and Emission Reductions I: An LMD Symposium in Honor of Halvor

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

Program Organizer: Arne Ratvik, SINTEF

Wednesday AM | March 2, 2022
208A | Anaheim Convention Center

Session Chairs: Guðrún Sævarsdóttir, University of Iceland; Arne Ratvik, SINTEF Industry

8:30 AM Introductory Comments

8:35 AM

Vaporization of Fluorides from Aluminium Cells. Part I: Theoretical Study on Replacement of Aluminium Fluoride and Soda: *Asbjørn Solheim*¹; *Samuel Senanu*¹; ¹SINTEF Industry

9:00 AM

Vaporization of Fluorides from Aluminium Cells. Part II: Treatment of Spent Potlining in a Laboratory Furnace: *Camilla Sommerseth*¹; Samuel Senanu¹; Henrik Gudbrandsen¹; Stein Rørvik¹; Per Eidem²; Asbjørn Solheim¹; Morten Isaksen³; Ellen Myrvold⁴; ¹SINTEF Industry; ²SINTEF Helgeland; ³Hydro Aluminium AS; ⁴Alcoa Mosjøen

9:25 AM

Scale Formation in Primary Aluminium Production: *Morten Isaksen*¹; Nancy Holt¹; ¹Hydro Aluminium AS

9:50 AM Break

10:05 AM

Sampling and Analysis Methodology Review to Report Total PFC Emissions: *Luis Espinoza-Nava*¹; Julie Young¹; ¹Alcoa Technical Center

10:30 AM

Reflections on the Low Voltage Anode Effect in Aluminium Electrolysis Cells: *Asbjørn Solheim*¹; ¹SINTEF Industry

10:55 AM

Environmental Enhancement of Potroom Processes by Using a Machine Vision System: *Alexey Zherdev*¹; *Alexey Svoevskiy*¹; Vitaliy Pingin¹; *Yuriy Shtefanyuk*¹; Valentin Shakhmatov¹; ¹UC RUSAL

MATERIALS DESIGN

Recent Investigations and Developments of Titanium-containing High Entropy Alloys — Session I

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

Program Organizers: Masahiko Ikeda, Kansai University; Masato Ueda, Kansai University; Carl Boehlert, Michigan State University; Peter Liaw, University of Tennessee

Wednesday AM | March 2, 2022
251C | Anaheim Convention Center

Session Chairs: Masato Ueda, Kansai University; Peter Liaw, University of Tennessee; Masahiko Ikeda, Kansai University; Carl Boehlert, Michigan State University

8:30 AM Invited

Biocompatible Titanium Containing Medium and High Entropy Alloys: *Konstantinos Georgarakis*¹; *Kimoon Konakoglou*¹; *Martin Stiehler*¹; Mark Jolly¹; ¹Cranfield University

8:50 AM

In-situ Laser-deposited Ti-based High Entropy Alloys for Aerospace Applications: *Modupeola Dada*¹; Patricia Popoola¹; Samson Adeosun²; Ntombi Mathe²; Sisa Pityana²; Thembisile Dlamini²; Raji Sadiq³; ¹Tshwane University of Technology; ²Council for Scientific and Industrial Research; ³Yaba College of Technology, Lagos Nigeria

9:10 AM Invited

Gas Tungsten Arc Welding of Cr_{29.7}Co_{29.7}Ni_{35.4}Al₄Ti_{1.2} (at.%) High Entropy Alloy: *Joao Oliveira*¹; Francisco Coury²; ¹FCT-UNL; ²UFSCAR

9:30 AM Invited

Evolution of Microstructure and Deformation Substructure in Al₁Mo_{0.5}Nb₁Ta_{0.5}Ti₁Zr₁, a Refractory HEA Alloy with Disordered BCC Precipitates Embedded in a Continuous Ordered B2 Matrix: *Gopal Viswanathan*¹; Jean-Philippe Couzinie²; Zachary Kloenne¹; Brian Welk¹; Oleg Senkov³; Hamish Fraser¹; ¹The Ohio State University; ²The Ohio State University; Université Paris Est ICMPE; ³UES Inc.

ENERGY & ENVIRONMENT

REWAS 2022: Automation and Digitalization for Advanced Manufacturing — Use of Artificial Intelligence for Improved Process Control & Optimization

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

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Alexandra Anderson, Gopher Resource; Mertol Göknelma, Izmir Institute of Technology; Camille Fleurialt, Eramet Norway

Wednesday AM | March 2, 2022
212A | Anaheim Convention Center

Session Chairs: Alexandra Anderson, Gopher Resource; Luca Montanelli, Massachusetts Institute of Technology

8:30 AM Introductory Comments**8:35 AM Keynote**

Digitalizing the Circular Economy (CE): From Reactor Simulation to System Models of the CE: *Markus Reuter*¹; Neill Bartie¹; ¹SMS Group

9:15 AM

AI/Data Mining in Materials Manufacturing: *Elsa Olivetti*¹; ¹Massachusetts Institute of Technology

9:35 AM

Factors to Consider when Designing Aluminium Alloys for Increased Scrap Usage: *Luca Montanelli*¹; ¹Massachusetts Institute of Technology

9:55 AM Break**10:15 AM Invited**

An Automated Recycling Process of End-of-life Lithium-ion Batteries Enhanced by Online Sensing and Machine Learning Techniques: Liurui Li¹; Maede Maftouni¹; Zhenyu Kong¹; Zheng Li¹; ¹Virginia Polytechnic Institute and State University

10:45 AM

Steel Production Efficiency Improvements by Digitalization: *Markus Schulte*¹; Bill Emling¹; ¹SMS Group

11:05 AM

Development of Virtual Die Casting Simulator for Workforce Development: John Moreland¹; Kyle Toth¹; John Estrada¹; Junyi Chen¹; Na Zhu¹; *Chenn Zhou*¹; ¹Purdue University Northwest

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — Environmental Degradation II: Stress Corrosion Cracking, Corrosion, and Liquid Metal Embrittlement

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Wednesday AM | March 2, 2022
207C | Anaheim Convention Center

Session Chairs: Kaila Bertsch, Lawrence Livermore National Laboratory; Bai Cui, University of Nebraska- Lincoln; Kelly Nygren, Cornell University/CHESS; May Martin, National Institute of Standards and Technology; Shuai Wang, Southern University of Science and Technology

8:30 AM Invited

Liquid Metal Embrittlement: Mechanisms at Small Scales: *Thierry Auger*¹; ¹CNRS

9:00 AM Invited

On the Path to Understanding Stress Corrosion Crack Initiation of Austenitic Alloys in High Temperature Water: *Gary Was*¹; Drew Johnson²; Wejun Kuang³; Diana Farkas⁴; Ian Robertson⁵; ¹University of Michigan; ²Idaho National Laboratory; ³Xi'an Jiaotong University; ⁴Virginia Tech; ⁵University of Wisconsin

9:30 AM Invited

Understanding Basic Properties and Degradation Mechanisms of Materials Using Ion Beams: *Steven Zinkle*¹; Ling Wang²; Yan-Ru Lin¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

10:00 AM Break**10:15 AM Invited**

Special Effects Testing and Advanced Characterization for the Development of a Multi-scale Model of Corrosion Fatigue Crack Growth that Incorporates Environmental Effects: *Bryan Miller*¹; ¹Naval Nuclear Laboratory

10:45 AM Invited

Validated Theory-guided Design of Refractory Multi-principal-element Alloys with Oxidation-resistant Coatings: *Duane Johnson*¹; Prashant Singh¹; Andrey Smirnov¹; Gaoyuan Ouyang¹; Jun Cui¹; RanRan Su²; John Perepezko²; Matt Kramer¹; ¹Iowa State University Ames Laboratory; ²University of Wisconsin

NANOSTRUCTURED MATERIALS

Self-organizing Nano-architected Materials — Applications and Functional Properties

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Wednesday AM | March 2, 2022
260C | Anaheim Convention Center

Session Chairs: Erkin Seker, University of California, Davis; Ian McCue, Northwestern University

10:00 AM

Coarsening Mechanisms in Surface-doped Nanoporous Metals: Jesse Ko¹; Ian McCue²; Zhiyong Xia¹; ¹Johns Hopkins University Applied Physics Laboratory; ²Northwestern University

10:20 AM Invited

High Energy and Power Density Batteries Enabled by Electrodeposition and Self-assembly: Paul Braun¹; ¹University of Illinois

10:50 AM Invited

Nanoporous Gold: From an Ancient Material to Biomedical Devices: Erkin Seker¹; ¹University of California, Davis

11:20 AM

Elasto-plastic NiTi Nanofoams for Potential Elastocaloric Cooling Applications Using Molecular Dynamics: Arne Klomp¹; Karsten Albe¹; ¹TU Darmstadt

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — Irradiation-Corrosion of Materials in Molten Salts and Liquid Metal

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Wednesday AM | March 2, 2022
202A | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM

On the Use of Corrosion Electrochemistry in Understanding Materials Corrosion in Molten FLiNaK Salts: Ho Lun Chan¹; Elena Romanovskaia¹; Raluca Scarlat²; Peter Hosemann²; John Scully¹; ¹University of Virginia; ²University of California Berkeley

8:50 AM

Effect of Ion Irradiated Microstructure on Molten Salt Corrosion of Hastelloy N: Hazel Gardner¹; Ryan Schoell²; Jie Qiu³; Fedi Fehri²; Michael Moody¹; Peter Hosemann³; Djamel Kaoumi²; David Armstrong¹; ¹University of Oxford; ²North Carolina State University; ³University of California, Berkeley

9:10 AM

Characterizing Commercial Alloys Undergoing Simultaneous Molten Salt Corrosion and Proton Irradiation: Nouf Almousa¹; Weiyue Zhou¹; Kevin Woller¹; Micheal Short¹; ¹Massachusetts Institute of Technology

9:30 AM

One-dimensional Wormhole Morphology Induced by Molten Salt Corrosion in Ni-Cr Alloy: Yang Yang¹; Weiyue Zhou²; Sheng Yin³; Sarah Wang⁴; Qin Yu³; Matthew Olszta⁵; Daniel Schreiber⁵; Jim Ciston³; John Scully⁶; Robert Ritchie³; Mark Asta³; Ju Li²; Michael Short²; Andrew Minor³; ¹The Pennsylvania State University; ²Massachusetts Institute of Technology; ³Lawrence Berkeley National Laboratory; ⁴University of California, Berkeley; ⁵Pacific Northwest National Laboratory; ⁶University of Virginia

9:50 AM Break

10:10 AM Invited

In-situ Measurement and Analysis of Structural Alloy Corrosion in Liquid Metals: Peter Hosemann¹; Jie Qiu¹; Franziska Schmied¹; John Scully²; Yongqiang Wang³; Blas Uberuaga³; Djamel Kaoumi⁴; Farida Selim⁵; Rasheed Auguste¹; Junsoo Han²; ¹University of California, Berkeley; ²University of Virginia; ³Los Alamos National Laboratory; ⁴University of North Carolina; ⁵Bowling Green University

10:40 AM

Investigating Radiation-altered Corrosion in Liquid Lead: Michael Short¹; Weiyue Zhou¹; Nouf Almousa¹; Kevin Woller¹; Djamel Kaoumi²; Ryan Schoell²; Felix Hofmann³; Mark Lapington³; Minyi Zhang³; Michael Moody³; Angus Wilkinson³; ¹Massachusetts Institute of Technology; ²North Carolina State University; ³Oxford University

11:00 AM

In situ Monitoring of Corrosion Progression under Irradiation in the Irradiation-Corrosion Experiment (ICE): Franziska Schmidt¹; Matthew Chancey²; Yongqiang Wang²; Peter Hosemann¹; ¹University of California-Berkeley; ²Los Alamos National Laboratory

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Processing & Microstructure

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiati, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Wednesday AM | March 2, 2022
262A | Anaheim Convention Center

Session Chairs: David Field, Washington State University; Suveen Mathaudhu, Colorado School of Mines; Nobuhiro Tsuji, Kyoto University

8:30 AM

Influence of High-pressure Torsion-induced Strain on Electrical Conductivity and Wear Resistance: Evander Ramos¹; Takahiro Masuda²; Zenji Horita²; Suveen Mathaudhu¹; ¹University of California-Riverside; ²Kyushu University

9:00 AM

Designed Heterostructures in AZ31 Using Linear Corrugated Straightening: Mueed Jamal¹; Gunnar Blaschke¹; David Field¹; ¹Washington State University

9:20 AM Invited

Superplastic Response of Accumulatively Roll-bonded Aluminum Sheets: Kester Clarke¹; Amy Clarke¹; Brady McBride¹; ¹Colorado School of Mines

9:50 AM

Breaking the Strength-toughness Barrier through Impact-induced Recrystallization of Single-crystal Silver Microcubes: Claire Griesbach¹; Jizhe Cai¹; Ramathasan Thevamaran¹; ¹University of Wisconsin Madison

MATERIALS PROCESSING

12th International Symposium on High Temperature Metallurgical Processing — Preparation of Alloys and Materials/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; Jesse White, Elkem Carbon Solutions; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, Jiangxi University of Science and Technology; Onuralp Yücel, Istanbul Technical University; Ender Kesinkilic, Atılım University; Tao Jiang, Central South University; Morsi Mahmoud, King Fahd University of Petroleum & Minerals

Wednesday PM | March 2, 2022
213A | Anaheim Convention Center

Session Chairs: Onuralp Yücel, Istanbul Technical University; Ender Kesinkilic, Atılım University

2:00 PM Introductory Comments

2:05 PM

Evaluation of Aluminum White Dross: Ilayda Öner¹; Buse Polat¹; Selçuk Kan¹; Kagan Benzesik¹; Onuralp Yücel¹; ¹Istanbul Technical University

2:25 PM

Investigation of Microstructure and Mechanical Properties of Ferritic Stainless Steels Joined by Laser Welding: Gunseli Güç¹; Onuralp Yücel²; ¹Istanbul Technical University/Arçelik; ²Istanbul Technical University

2:45 PM

Pelletizing of Iron Ore with High Iron Grade and Low Silicon Content: Yan Zhang¹; ¹Shougang Group

3:05 PM

Optimization of Allihn Condensers for Distillation of Ethanol: Sarah Gandu¹; Clement Gonah¹; Adele Garkida¹; ¹Ahmadu Bello University

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — Novel Methods

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

Program Organizers: Verena Maier-Kiener, Montanuniversität Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Wednesday PM | March 2, 2022
259B | Anaheim Convention Center

Session Chairs: Daniel Gianola, University of California, Santa Barbara; Benoit Merle, University Erlangen-Nuremberg (Fau)

2:00 PM Invited

Optimization of Segregation-engineered Nanocrystalline Al Alloys Using Nanomechanical Testing: Daniel Gianola¹; ¹University of California-Santa Barbara

2:25 PM

Using Machine Learning Approaches to Enable Insights in Nanoindentation Tip Wear: Claus Trost¹; Stanislav Zak¹; Sebastian Schaffer²; Megan Cordill¹; ¹Erich Schmid Institute of Materials Science; ²Wolfgang Pauli Institute, Faculty of Mathematics and University of Vienna Research Platform MMM Mathematics - Magnetism - Materials

2:45 PM

Correlation between Electrical Contact Resistance, Deviation from Elastic Unloading and Phase Transformation in Silicon: Ben Beake¹; Tim Jochum¹; ¹Micro Materials Ltd.

3:05 PM

A Novel Nanoindentation Protocol to Characterize Surface Free Energy of Superhydrophobic Nanopatterned Materials: Edoardo Rossi¹; Pardhasaradhi Sudharshan Phani²; Warren Oliver³; Marco Sebastiani¹; ¹Università degli Studi Roma Tre; ²International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI); ³KLA Corporation

3:25 PM Break

3:40 PM

A Multi-modal Mapping Approach to Enable Correlative Compositional, Crystallographic and Mechanical Property Analysis: Hazel Gardner¹; Christopher Magazzeni¹; Phillip Gopon²; Katharine Fox³; Michael Moody¹; Paul Bagot¹; David Armstrong¹; ¹University of Oxford; ²University of Leoben; ³Rolls-Royce plc

4:00 PM

Your Default Load Function May be Working Against You and What To Do About It: Michael Maughan¹; Evan Allen¹; Marzyeh Moradi²; ¹University of Idaho; ²KLA Corporation

ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials — Shape Memory Alloys

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

Program Organizers: Emily Rinko, Iowa State University; Iver Anderson, Iowa State University Ames Laboratory; Markus Chmielus, University of Pittsburgh; Emma White, DECHEMA Forschungsinstitut; Deliang Zhang, Northeastern University; Andrew Kustas, Sandia National Laboratories; Kyle Johnson, Sandia National Laboratories

Wednesday PM | March 2, 2022
262C | Anaheim Convention Center

Session Chair: Markus Chmielus, University of Pittsburgh

4:00 PM Introductory Comments

4:05 PM

Microstructure of Additively Manufactured Magnetic Shape Memory Alloys: Jakub Toman¹; Tyler Paplham¹; Pierangeli Rodriguez de Vecchis¹; Aaron Acierno¹; Amir Mostafaei²; Erica Stevens¹; *Markus Chmielus*¹; ¹University of Pittsburgh; ²Illinois Institute of Technology

4:25 PM

Controlled Shape-morphing Metallic Components for Deployable Structures: *Gianna Valentino*¹; Ian McCue²; Steven Storck¹; Morgana Trexler¹; ¹Johns Hopkins University Applied Physics Lab; ²Northwestern University

4:45 PM

Selective Laser Melting of NiTi: Experiments and Modeling to Correlate Hatch Spacing, Texture, Residual Stress, and Superelastic Response: *Peter Anderson*¹; Natalie Zeleznik¹; Alejandro Hinojos¹; Mohammadreza Nematollahi²; Narges Shayesteh³; Soheil Saedi⁴; Mohammad Elahinia²; Haluk Karaca⁵; James Cawley⁵; Michael Mills¹; ¹Ohio State University; ²University of Toledo; ³University of Texas at Arlington; ⁴University of Arkansas at Little Rock; ⁵University of Kentucky

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — 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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Wednesday PM | March 2, 2022
258B | Anaheim Convention Center

Session Chairs: Orion Kafka, National Institute of Standards and Technology (NIST); Nik Hrabe, National Institute of Standards and Technology (NIST)

2:00 PM Invited

Designing Printable Alloys for Fatigue Strength: Gregory Olson¹; *Jiadong Gong*; Gary Whelan¹; ¹Massachusetts Institute of Technology

2:30 PM

Micromechanical Modeling of Porosity Defects in Additively Manufactured Alloys: *Krzysztof Stopka*¹; Michael Sangid¹; ¹Purdue University

2:50 PM

Fatigue Crack Initiation Behavior of Laser Beam Powder Bed Fused IN718: Mohammad Dodaran¹; Muztahid Muhammad¹; *Shuai Shao*¹; Nima Shamsaei¹; ¹Auburn University

3:10 PM

Experiments to Enable Expert-informed Machine Learning of Fatigue Performance of DMLM Ti-6Al-4V: *Samuel Present*¹; Laura Dial²; Thomas Straub³; Chris Eberl³; Kevin Hemker¹; ¹Johns Hopkins University; ²General Electric Research Laboratory; ³Fraunhofer Institute for Mechanics of Materials IWM

3:30 PM Break

3:50 PM Invited

Microstructure-based Fatigue Studies on Additive-manufactured Materials: *Jiadong Gong*¹; Gary Whelan¹; Abhinav Saboo¹; Greg Olson¹; ¹Questek Innovations LLC

4:20 PM

Comparison of Statistical Predictors of Additive Manufacturing Process-induced Defects Using Fractography and Metallography: *David Scannapieco*¹; Austin Ngo¹; Collin Sharpe¹; Mahya Shahabi²; Sneha Narra³; John Lewandowski¹; ¹Case Western Reserve University; ²Worcester Polytechnic Institute; ³Carnegie Mellon University

4:40 PM

A Method to Predict Critical Pore/Defect Size in Laser Powder Bed Fusion Additively Manufactured Ti-6Al-4V Parts: Mahya Shahabi¹; Austin Ngo²; *David Scannapieco*²; John Lewandowski²; Sneha Prabha Narra³; ¹Worcester Polytechnic Institute; ²Case Western Reserve University; ³Carnegie Mellon University

5:00 PM

Fatigue Modeling Approaches for Additively Manufactured Ti-6Al-4V: *Sushant Jha*¹; Matthew Krug²; Luke Sheridan²; Patrick Golden²; Mark Benedict²; Nathan Bryant¹; Jessica Orr¹; ¹University of Dayton Research Institute; ²US Air Force Research Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Titanium and Nickel-based Alloys/Modeling

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

Program Organizers: Sneha Prabha Narra, Carnegie Mellon University; Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh

Wednesday PM | March 2, 2022
263A | Anaheim Convention Center

Session Chairs: Badri Narayanan, Lincoln Electric Company; Jonathan Pegues, Sandia National Laboratories; Jonah Klemm-Toole, Colorado School of Mines

2:00 PM Invited

Heat Treatment Effects on Mechanical Properties of Wire Arc Additive Manufactured and Electron Beam Additive Manufactured Ti-6Al-4V: *Jonathan Pegues¹; Shaun Whetten¹; Andrew Kustas¹; William Dannemann¹; ¹Sandia National Laboratories*

2:40 PM

Process-structure-property Study on CP-Ti (Grade 2) Produced via High Deposition AM Laser-hot Wire: *Hannah Sims¹; John Lewandowski¹; ¹Case Western Reserve University*

3:00 PM

Prior- β Grain Structure Control of Ti-6Al-4V WAAM in the As-deposited Condition: *James Wainwright¹; Stewart Williams¹; Jialuo Ding¹; Alec Davis²; ¹Cranfield University; ²University of Manchester*

3:20 PM Break**3:40 PM**

Formation of Multiple Necks in Wire-based Electron Beam Additively Manufactured Ti-6Al-4V Pulled in Uniaxial Tension: *Daniel Lewis¹; Michael Hurst²; James Paramore²; Brady Butler²; ¹Texas A&M University; ²Army Research Lab*

4:00 PM

The Effects of CoAl₂O₄ on the Microstructural Evolution of Inconel 718 Processed by Direct Energy Deposition: *Dhruv Tiparti¹; Tilo Buerger²; Fred Carter²; Sammy Tin³; ¹Illinois Institute of Technology; ²DMG Mori Advanced Solutions; ³University of Arizona*

4:20 PM

Design for Metal Large-scale Additive Manufacturing: Mitigation of Bending Deformation on Curved Sheet: *Yousub Lee¹; Andrzej Nycz¹; Srdjan Simunovic¹; Luke Meyer¹; Derek Vaughan¹; William Carter¹; ¹Oak Ridge National Laboratory*

4:40 PM

Process Optimization in Metal Additive Manufacturing Using Image Processing and Statistical Analysis: *Faiyaz Ahsan¹; Jafar Razmi¹; Leila Ladani¹; ¹Arizona State University*

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — Advanced Microstructural Characterization of AM Alloys

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Wednesday PM | March 2, 2022
258A | Anaheim Convention Center

Session Chair: Fan Zhang, National Institute of Standards and Technology

2:00 PM Invited

In-operando X-ray Scattering Diagnostics to Observe Morphological Transformations during Additive Manufacturing: *Joshua Hammons¹; Aiden Martin¹; Aurelien Perron¹; Nicholas Calta¹; Hunter Henderson¹; Michael Nielsen¹; Trevor Willey¹; Manyalibo Matthews¹; Scott McCall¹; Jonathan R.I. Lee¹; ¹Lawrence Livermore National Laboratory*

2:30 PM

In-situ Heat Treatment of Additively Manufactured Ti-6Al-4V: *Donald Brown¹; Maria Strantz²; Gennadi Rafailov³; Eloisa Zepeda-Alarcon⁴; Darren Pagan⁵; ¹Los Alamos National Laboratory; ²Lawrence Livermore National Laboratory; ³Ben Gurion University; ⁴Nevada Nuclear Security Site; ⁵Penn State University*

2:50 PM

Precipitate Evolution in DED 316L Stainless Steel Due to Solid State Thermal Cycling: A 3D synchrotron X-ray Nanotomography Study: *Steve Gaudez¹; Meriem Ben Haj Slama²; Juan Guillermo Santos Macias¹; Eva Hériré²; Mario Scheel³; Manas V. Upadhyay⁴; ¹CNRS UMR7649 Ecole Polytechnique; ²CNRS UMR8579 Centrale Supélec; ³Synchrotron SOLEIL, ANATOMIX*

3:10 PM

In Situ Synchrotron Analysis of Aging in Commercial High Strength 7000 Series Additive Aluminum Alloys: *John Martin¹; Darby LaPlant¹; Fan Zhang²; David Beaudry³; Patrick Callahan⁴; ¹HRL Laboratories LLC; ²NIST; ³John's Hopkins University; ⁴NRL*

3:30 PM

Effect of Heat Treatments on Fabricated Wire and Arc Additive Manufacturing Parts of Stainless Steel 316: Microstructure and Synchrotron X-ray Diffraction Analysis: *Joao Oliveira¹; ¹FCT-UNL*

3:50 PM Break**4:05 PM**

In-situ Characterization of Residual Strain Relaxation of Additively Manufactured Inconel 625 through Energy-resolved Neutron Imaging: *Anton Tremsin¹; Yan Gao²; Ade Makinde²; Hassina Bilheux³; Jean Bilheux³; Ke An³; Takenao Shinohara⁴; Kenichi Oikawa⁴; ¹University of California at Berkeley; ²General Electric Global Research Center; ³ORNL; ⁴Japan Atomic Energy Agency*

4:25 PM

High-throughput Surface Characterization to Identify Processing Defect Boundaries in Additively Manufactured Materials: *Ankur Kumar Agrawal¹; Dan Thoma¹; ¹University of Wisconsin-Madison*

4:45 PM

Multimodal Characterization of L-PBF 316L Stainless Steel: David Sprouster¹; M Ouyang¹; W Cunningham¹; G Halada¹; D Olds²; A Pattammattel²; H Yan²; Y Chu²; E. Dooryhee²; S. Storck³; J Trelewicz²; ¹Stony Brook University; ²Brookhaven National Laboratory; ³Johns Hopkins University

5:05 PM

In-situ TEM Heating-cooling Experiments to Study Precipitate Evolution in DED 316L Steel: Meriem Ben Haj Slama¹; Eva Hérpré²; Lluís Yedra³; Manas Upadhyay⁴; ¹LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris & MSSMat, CNRS, CentraleSupélec, Université Paris-Saclay; ²MSSMat, CNRS, CentraleSupélec, Université Paris-Saclay; ³IN2UB, Department of Electronics and Biomedical Engineering, University of Barcelona & MSSMat SPMS, CNRS, CentraleSupélec, Université Paris-Saclay; ⁴LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III — Beyond the Beam - Student Session

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Wednesday PM | March 2, 2022
263B | Anaheim Convention Center

Session Chair: Paul Prichard, Kennametal Inc.

2:00 PM Introductory Comments

2:05 PM

Investigating Process-structure-property Relationships of 17-4 PH Stainless Steel Fabricated via Laser Beam Powder Bed Fusion (LB-PBF), Laser Powder Directed Energy Deposited (LP-DED), and Metal Binder Jetting (MBJ) Methods: P.D. Nezhadfar¹; Benoit Verquin²; Fabien Lefebvre²; Christophe Reynaud²; Maxime Robert²; Paul Gradl³; Shuai Shao¹; Nima Shamsaei¹; ¹Auburn University; ²CETIM; ³NASA Marshall Space Flight Center

2:25 PM

Modeling of Effect of Powder Spreading on Green Body Dimensional Accuracy in Additive Manufacturing by Binder Jetting: Andrii Maximenko¹; Ifeanyichukwu Olumori¹; A Maidaniuk¹; Eugene Olevsky¹; ¹San Diego State University

2:45 PM

Topological Toughness in Additively Manufactured Ceramic Architected Materials: Raphael Thiriaux¹; Alexander Dupuy¹; Lorenzo Valdevit¹; ¹University of California Irvine

3:05 PM

Effect of Powder Heat Treatment on Fatigue Performance of Free Standing AA7075 Cold Spray: Christopher Williamson¹; Arthur Webb¹; James Jordon¹; Luke Brewer¹; ¹The University of Alabama

3:25 PM Break

3:45 PM

Finite Element Analysis of High-strain-rate Deformation: Elizabeth Hodges¹; Victor Champagne²; Robert Hyers¹; ¹University of Massachusetts-Amherst; ²Cold Spray Innovations International

4:05 PM

Processing and Characterization of Tantalum Powders for Cold Spray: Griffin Turner¹; James Paramore²; Kelvin Xie¹; Brady Butler²; ¹Texas A&M University; ²DEVCOM - Army Research Laboratory

4:25 PM

Material Flow and Microstructure Evolution during Additive Friction Stir Deposition of Aluminum Alloys: Mackenzie Perry¹; Hang Yu¹; ¹Virginia Polytechnic Institute

4:45 PM

Microstructure Evolution Pathway in Solid-state Additive Manufacturing of Copper: Robert Griffiths¹; David Garcia²; Hang Yu¹; ¹Virginia Polytechnic Institute; ²Pacific Northwest National Laboratory

5:05 PM Concluding Comments

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — Ferrous Alloys

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Wednesday PM | March 2, 2022
261A | Anaheim Convention Center

Session Chair: Atieh Moridi, Cornell

2:00 PM

In-situ Tempering of Ferrous Martensite during Laser Powder Bed Fusion: William Hearn¹; Kristina Lindgren¹; Eduard Hryha¹; ¹Chalmers University of Technology

2:20 PM

Developing High-temperature High-strength Laser Powder-bed Fusion Austenitic Steels: Sebastien Dryepondt¹; Kinga Unocic¹; Rangasayee Kannan¹; Peeyush Nandwana¹; Marie Romedenne¹; Patxi Fernandez-Zelaia¹; Michael Lance¹; Arun Devaraj²; Jia Liu²; ¹Oak Ridge National Laboratory; ²Pacific Northwest National Laboratory

2:40 PM Invited

High Strength Fe-C-Cu Alloys for Laser Powder Bed Fusion: Andrew Bobel¹; Louis Hector¹; Lee Casalena²; ¹General Motors; ²Thermo Fisher Scientific

3:00 PM

Additive Manufactured Stainless Steel Nanocomposites with Uniform Dispersion of Nanoparticles: Minglei Qu¹; Luis Izet Escano¹; Qilin Guo¹; Lianyi Chen¹; ¹University of Wisconsin-Madison

3:20 PM Break

3:35 PM

Melt Pool Scale Modeling of Solidification Kinetics and Its Effects on Stainless Steel Microstructures for Laser Powder Bed Fusion: Joseph Aroh¹; P. Chris Pistorius¹; Anthony Rollett¹; ¹Carnegie Mellon University

3:55 PM

Microstructure and Mechanical Properties of a Multipurpose High-strength High-toughness Martensitic Steel Produced via Selective Laser Melting: Amir Farkoosh¹; Daniel Bechetti²; Matthew Sinfield²; David Seidman¹; ¹Northwestern University; ²Naval Surface Warfare Center Carderock (NSWCC) Division

4:15 PM

Printability and Defects in Steels Printed by Laser Powder Bed Fusion: Amaranth Karra¹; Yining He¹; Sraavya Ranga¹; Maarten de Boer¹; Bryan Webler¹; ¹Carnegie Mellon University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — Monitoring and Imaging/Nanoindentation Mapping

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

Program Organizers: Meysam Haghshenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Wednesday PM | March 2, 2022
260A | Anaheim Convention Center

Session Chairs: Aerial Leonard, Ohio State University; Jordan Weaver, National Institute of Standards and Technology

2:00 PM Introductory Comments

2:05 PM

Plastic Strain Visualization and Analysis of Laser Processed Nickel Single Crystals and Polycrystalline 316L: Andrew Birnbaum¹; Athanasios Iliopoulos¹; Anna Rawlings¹; John Steuben¹; John Michopoulos¹; ¹US Naval Research Laboratory

2:25 PM

Deformation and Microstructure Development in DED-AM Structures via Dark Field X-ray Microscopy and In Situ Imaging: Yunhui Chen¹; Yuanbo Tang²; David Collins³; Samuel Clark⁴; Wolfgang Ludwig⁵; Raquel Rodriguez-Lamaz⁵; Carsten Dettels⁵; Roger Reed²; Can Yildirim⁵; Peter Lee⁶; Philip Withers¹; ¹University of Manchester; ²University of Oxford; ³University of Birmingham; ⁴Advanced Photon Source; ⁵ESRF; ⁶University College London

2:45 PM

Melt Pool-scale Monitoring of Laser Powder Bed Fusion: Jack Beuth¹; Christian Gobert¹; Syed Uddin¹; Guadalupe Quirarte¹; David Guirguis¹; Luke Scime²; Conrad Tucker¹; Jonathan Malen¹; ¹Carnegie Mellon University; ²Oak Ridge National Laboratory

3:05 PM

Multi Length-scale In-situ Monitoring of AM Processes: Towards Prediction of Local Defects and Properties: Paul Hooper¹; ¹Imperial College London

3:25 PM Break

3:45 PM

Mechanical Microscopy of Additively-manufactured Steels Using High-speed Nanoindentation: Jeffrey Wheeler¹; Marius Wagner²; Léa Deillon²; Markus Bambach²; Ralph Spolenak²; ¹FemtoTools AG, Furtbachstrasse 4, CH-8107 Buchs/ZH, Switzerland; ²ETH Zurich

4:05 PM

A Nanomechanical Approach to Reveal the Origins of Superior Intergranular Cracking Resistance in Irradiated Additively-manufactured Stainless Steel: Xiaoyuan Lou¹; Jingfan Yang¹; Laura Hawkins²; Lingfeng He²; Daniel Schwen²; ¹Auburn University; ²Idaho National Laboratory

4:25 PM

Micromechanical Study of Microstructurally Heterogeneous and Hierarchical Additive Manufactured Material Using High-resolution Nanoindentation Mapping: Abhijeet Dhal¹; Rajiv Mishra¹; ¹University of North Texas

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Thermo-physical and Microstructure Properties of TRISO and ThO₂

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Wednesday PM | March 2, 2022
202B | Anaheim Convention Center

Session Chair: David Frazer, Idaho National Laboratory

2:00 PM

Advanced Characterization of Oxidation Behavior of TRISO Fuel SiC Coating: Haiming Wen¹; Adam Bratten¹; Visharad Jalan¹; ¹Missouri University of Science and Technology

2:20 PM

Microstructural Characterization of the Porous Pyrocarbon Buffer Layer in TRISO Fuel Particles: Claire Griesbach¹; Tyler Gerczak²; Kumar Sridharan¹; Yongfeng Zhang¹; Ramathasan Thevamaran¹; ¹University of Wisconsin-Madison; ²Oak Ridge National Laboratory

2:40 PM

Correlating Atomic Scale Microstructure with Mechanical Properties in Low-density Pyrocarbon Used in TRISO Particle Fuel Buffer Layer: Yongfeng Zhang¹; Claire Griesbach¹; Ramathasan Thevamaran¹; Kumar Sridharan¹; Tyler Gerczak²; Wen Jiang³; Karim Ahmed⁴; ¹University of Wisconsin; ²Oak Ridge National Laboratory; ³Idaho National Laboratory; ⁴Texas A&M University

3:00 PM

An Atomistically-informed Cluster Dynamics Approach for Defect Evolution in ThO₂ under Irradiation: Sanjoy Mazumder¹; Maniesha Singh¹; Tomohisa Kumagai¹; Anter El-Azab¹; ¹Purdue University

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session VI

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasa, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Wednesday PM | March 2, 2022
207A | Anaheim Convention Center

Session Chairs: Peter Hedstrom, KTH; Yuki Yamamoto, Oak Ridge National Laboratory

2:00 PM

Enhanced Predictive Modelling of Laser Weld Failure Using 3D Characterization of 304L: Andrew Polonsky¹; Mary Arnhart¹; Alyssa Skulborstad¹; Helena Jin¹; Kyle Karlson¹; Jonathan Madison¹; ¹Sandia National Laboratories

2:20 PM

Investigation of the Microstructure and Plastic Deformation of AM 316L Stainless Steels: Marissa Linne¹; Jean-Baptiste Forien¹; Nicolas Bertin¹; Margaret Wu¹; Sylvie Aubry¹; Tatu Pinomaa²; Anssi Laukkanen²; Kirubel Teferra³; Nathan Barton¹; Y. Morris Wang¹; Thomas Voisin¹; ¹Lawrence Livermore National Laboratory; ²VTT Research Centre of Finland; ³US Naval Research Laboratory

2:40 PM Invited

Modeling Precipitation in Alloy 347H for the XMAT Project: Michael Glazoff¹; Jianguo Yu¹; Michael Gao²; Yukinori Yamamoto³; Q.Q. Ren³; Jonathan Poplawsky³; Michael Brady³; Laurent Capolungo⁴; ¹Idaho National Laboratory; ²NETL; ³ORNL; ⁴LANL

3:10 PM Invited

Characterization of Microstructure Evolution and Micromechanics Behavior of Steels with Metastable Austenite during Uniaxial Tensile Loading: Peter Hedström¹; Benjamin Neding¹; ¹KTH

3:40 PM Break

3:55 PM

Study of Microstructure Evolution due to Solid-state Thermal Cycling during AM via Laser-integrated Scanning Electron Microscopy: Juan Guillermo Santos Macias¹; Alexandre Tanguy¹; Manas Upadhyay¹; ¹Ecole Polytechnique

ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings — Coating Technologies and Surface Structuring for Tools

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Ramana Chintalapalle, University of Texas at El Paso; Adele Carrado, IPCMS - CNRS Université de Strasbourg; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougou, Cnrs - Is2m; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Wednesday PM | March 2, 2022
252B | Anaheim Convention Center

Session Chairs: Heinz Palkowski, TU-Clausthal IMET; Karine Mougou, CNRS- IS2M

4:00 PM Introductory Comments

4:10 PM

Performance of nc-ALTiN/Si3N4 and ZrO2/Al2O3 Coated Carbide Inserts in Dry Turning of AISI304 Stainless Steel: Kaushik V Prasad¹; Sharma SC²; Adarsha H¹; Deepak J¹; ¹Jain University; ²Director, National Assessment and Accreditation Council

4:30 PM

In-air Polymerization and Crosslinking of Monomers during Electro Spray Deposition: Catherine Nachtigal¹; Michael Grzenda¹; Jonathan Singer¹; ¹Rutgers University

4:50 PM

Polymeric Coatings Embedded with Green Anti-corrosive Pigment for Corrosion Inhibition of Steel: Muddasir Nawaz¹; Abdul Shakoor¹; Ramazan Kahraman¹; M. F. Montemor²; ¹Center for Advanced Materials, Qatar University; ²Universidade de Lisboa

5:10 PM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Sensors, Power, and Multifunctional Applications — Developments in Soft Magnetic Materials

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

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Eric Theisen, Metglas Inc.; Huseyin Ucar, California Polytechnic University, Pomona; Yongmei Jin, Michigan Technological University

Wednesday PM | March 2, 2022
213B | Anaheim Convention Center

Session Chair: Alex Leary, NASA GRC

2:00 PM Invited

Accelerated Design of Fe-based Soft Magnetic Materials Using Machine Learning and Stochastic Optimization: Raymundo Arroyave¹; Yuhao Wang¹; Tanner Kirk¹; Yefan Tian¹; Joseph Ross¹; Ron Noebe²; ¹Texas A&M University; ²NASA Glenn Research Center

2:30 PM

Development of a CoFe - Al_2O_3 Soft Magnetic Composite Using Spark Plasma Sintering: Calvin Belcher¹; Baolong Zheng¹; Benjamin MacDonald¹; Eric Langlois²; Benjamin Lehman²; Diran Apelian¹; Todd Monson²; Enrique Lavernia³; ¹University of California Irvine; ²Sandia National Laboratory; ³National Academy of Engineering

2:50 PM

Domain Refined Amorphous Ribbon Technology for Core Loss Reduction: Eric Theisen¹; ¹Metglas Inc.

3:10 PM

Two-step Annealing of FeNi-based Metal Amorphous Nanocomposites: Kevin Byerly¹; Yuval Krimer¹; Charudatta Phatak²; Eric Theisen³; Michael McHenry¹; ¹Carnegie Mellon University; ²Argonne National Laboratory; ³Metglas, Inc.

3:30 PM Break

3:45 PM

Flash Annealing of FeNi-based Metal Amorphous Nanocomposite: James Egbu¹; Ahmed Talaat²; Kevin Byerly¹; Paul Ohodnicki²; Michael McHenry¹; ¹Carnegie Mellon University; ²University of Pittsburgh

4:05 PM

Radio Frequency Thermal Processing of Soft Magnetic Alloys: Ahmed Talaat¹; David Greve²; Tyler Paplham¹; Paul Ohodnicki¹; ¹Mechanical Engineering & Materials Science, University of Pittsburgh, PA 15261, USA; ²DWGreve Consulting, Sedona, AZ, 86351, USA & Electrical & Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, USA

4:25 PM

Investigation of Magnetic Behaviour of Spinel Ferrites using First Order Reversal Curves (FORC): Suraj Mullurkara¹; Ahmed Talaat¹; Brad Dodrill²; Paul Ohodnicki¹; ¹University of Pittsburgh; ²Lake Shore Cryotronics

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Energy Conversion and Energy Storage Student

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Wednesday PM | March 2, 2022

212B | Anaheim Convention Center

Session Chairs: Scott Roberts, Sandia National Laboratory; Johanna Nelson Weker, SLAC National Accelerator Laboratory

2:00 PM

Experimental and Computational Investigations of the Multiple Impurities Effects on the SOFC Cathode Materials: Rui Wang¹; Lucas Parent²; S. Pamir Alpay²; Srikanth Gopalan³; Yu Zhong¹; ¹Worcester Polytechnic Institute; ²University of Connecticut; ³Boston University

2:20 PM

Joining and Oxidation of Haynes 282 Superalloy Microtubes for High-performance Heat Exchanger Applications: Narayanan Murali¹; Xiaochun Li²; ¹University of California, Los Angeles

2:40 PM

Magnesium Hydride Slurry Aerospace Fuel with Net-zero or Net-negative Emissions: Yi Jie Wu¹; Jake Scarponi¹; Jagannath Jayachandran¹; Adam Powell¹; ¹Worcester Polytechnic Institute

3:00 PM

Prevention of Thermal Runaway in Li-ion Batteries Using Machine Learning Model Prediction: Meghana Sudarshan¹; Alexey Serov¹; Casey Jones¹; Vikas Tomar¹; ¹Purdue University

3:20 PM Break

3:40 PM

Use of Internal Thermal Sensors in Lithium-ion 18650 Battery Packs for Analysis of Individual Cell Temperatures during Cycling: Casey Jones¹; Vikas Tomar¹; ¹Purdue University

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — Structures and Mechanical Properties III

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday PM | March 2, 2022

251A | Anaheim Convention Center

Session Chairs: Eric Lass, University of Tennessee-Knoxville; Jeffery Gibeling, University of California, Davis

2:00 PM

Mechanisms of Creep in NiCoCr and ODS-NiCoCr Multi-principal Element Alloys: Gianmarco Sahragard-Monfared¹; Timothy Smith²; Jeffery Gibeling¹; ¹University of California, Davis; ²NASA Glenn Research Center

2:20 PM

Strain Partitioning Enables Excellent Tensile Ductility in Precipitated Heterogeneous High-entropy Alloys with Gigapascal Yield Strength: Feng He¹; ¹State Key Laboratory of Solidification Processing

2:40 PM

Solidification Behavior and Mechanical Performance of Ductile Mn35Fe5Co20Ni20Cu20 MPEA Brazing Filler: Benjamin Schneiderman¹; Andrew Chuang²; Olivia DeNonno¹; Jonah Klemm-Toole¹; Zhenzhen Yu¹; ¹Colorado School of Mines; ²Advanced Photon Source - Argonne National Laboratory

3:00 PM

Investigation of $\text{Al}_2(\text{Co}, \text{Cr}, \text{Fe}, \text{Ni})_{14}$ Precipitation Strengthened Transition Metal High Entropy Alloys: Serena Beauchamp¹; Eric Lass¹; T. G. Nieh¹; ¹University of Tennessee Knoxville

3:20 PM Break

3:40 PM

Improved Properties of Non-equiatomic MnFeCoNiCu HEA Compared to Its Equiatomic Counterpart: Tibra Das Gupta¹; Artashes Ter-Isahakyan¹; Thomas Balk¹; ¹University of Kentucky

4:00 PM

Tailoring High Entropy Alloys for Advanced Technology Fuel (ATF) Coatings: Jack Wilson¹; Lee Evitts¹; Michael Rushton¹; William Lee¹; David Goddard²; Simon Middleburgh¹; ¹Bangor University; ²National Nuclear Laboratory

4:20 PM

Effect of Valence Electron Concentration on the Mechanical Properties of Non-equiatomic Refractory Multi-principal Element Alloys: Taohid Bin Nur Tuhser¹; Daryl Chrzan²; Andrew Minor²; Mark Asta²; Thomas Balk¹; ¹University of Kentucky; ²Lawrence Berkeley National Laboratory

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — Alloy Design and Modeling

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday PM | March 2, 2022
251B | Anaheim Convention Center

Session Chairs: E-Wen Huang, National Yang Ming Chiao Tung University; Saryu Fensin, Los Alamos National Laboratory

2:00 PM Invited

Data-driven Discovery of High-entropy Alloys: George Kim¹; Chanhoo Lee²; Peter Liaw³; Wei Chen¹; ¹Illinois Institute of Technology; ²Los Alamos National Lab; ³University of Tennessee

2:20 PM Invited

Predicting Fundamental Properties of Refractory Multicomponent Alloys Using Electronic Descriptors and Statistical Learning: Yong-Jie Hu¹; Christopher Tandoc¹; Liang Qi²; Peter Liaw³; ¹Drexel University; ²University of Michigan; ³University of Tennessee

2:40 PM Invited

Development of Novel Refractory High-entropy Alloys via High-throughput Alloy-design Approach: Saryu Fensin¹; Chanhoo Lee²; James Valdez¹; Nan Li¹; ¹Los Alamos National Laboratory

3:00 PM Invited

Magnetism in Metastable and Annealed HEAs of (FeNiCrMn): Nan Tang¹; Elizabeth Quigley¹; Walker Boldman¹; Cameron Jorgensen¹; Rémi Koch¹; Daniel O'Leary¹; Hugh Medal¹; Philip Rack¹; Dustin Gilbert¹; ¹University of Tennessee

3:20 PM Break

3:40 PM

Combination of High Throughput Experiments and ICME Approaches to Discover the Composition Space for Lightweight High Entropy Alloys: Shengyen Li¹; John Macha¹; Mirella Vargas¹; Michael Miller¹; ¹Southwest Research Institute

4:00 PM

Polymetallic MOF Derived High Entropy FeCoNiMnMo/NC Nanoparticles for Efficient Alkaline Hydrogen Evolution Reactions: Shiqi Wang¹; Feng Fang¹; ¹Southeast University

4:20 PM

Multiscale Modeling and Design of High Entropy Alloys: Justin Almeida¹; Jide Oyerinde¹; Philip Yuya¹; Ioannis Mastorakos¹; ¹Clarkson University

MATERIALS DESIGN

Advances in Titanium Technology — Advanced Manufacturing of Ti Alloys

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Wednesday PM | March 2, 2022
252A | Anaheim Convention Center

Session Chair: To Be Announced

2:00 PM

Microstructure Evolution in Additively Manufactured Ti-5Al-5Mo-5V-3Cr Alloy: Veronica Anghel¹; Ramon Martinez¹; Jillian Bennett¹; William Anderson¹; John Carpenter¹; Ben Brown²; ¹Los Alamos National Laboratory; ²Kansas City National Security Campus

2:20 PM

Using Defects to Inform on Physical Phenomena in EBM Ti-6Al-4V across Scanning Strategies: Katie O'Donnell¹; Maria Quintana¹; Matthew Kenney¹; Peter Collins¹; ¹Iowa State University

2:40 PM

Thermohydrogen Refinement of Microstructure of AM Titanium Components: Michael Hurst¹; James Paramore¹; Brady Butler¹; Daniel Lewis¹; Laura Moody¹; ¹United States Army Research Laboratory

3:00 PM

Thermohydrogen Refinement of Microstructure (THRM) to Improve the Performance of Material Extrusion Additively Manufactured Ti-6Al-4V: Brady Butler¹; Daniel Lewis²; Michael Hurst¹; James Paramore¹; ¹US Army Research Laboratory; ²Texas A&M University

3:20 PM Break

3:40 PM

Titanium Metal Matrix Composites via Selective Laser Melting: William Hixson¹; Howard Stone²; James Coakley¹; ¹University of Miami; ²University of Cambridge

4:00 PM

Triggering New Deformation Mechanisms in Ti Alloys by Heat Treatments: A Step Forward into the Improvement of the Ductility and Work-hardening of 3D Printed Parts: Odeline Dumas¹; Loïc Malet¹; Frédéric Prima²; Stéphane Godet¹; ¹Université Libre De Bruxelles; ²PSL Research University, Chimie ParisTech, CNRS, Institut de Recherche de Chimie Paris

4:20 PM

Microstructural Scale Evolution of Titanium Alloys during Additive Manufacturing: Alec Saville¹; Adam Creuziger²; Jake Benzing²; Sven Vogel³; Amy Clarke¹; ¹Colorado School of Mines; ²National Institute of Standards and Technology; ³Los Alamos National Laboratory

4:40 PM

Mechanical Behavior of Ti Alloys in Relation to the Microstructure across Lengthscales: Anais Huet¹; Thomas Yvinec¹; Tiphaine Giroud¹; Azdine Nait-Ali¹; Joseph Wendorf²; Jean-Charles Stinville²; McLean Echlin²; Tresa Pollock²; Jonathan Cormier¹; Loïc Signor¹; Patrick Villechaise¹; Mikael Gueguen¹; Samuel Hemery¹; ¹Institut Pprime; ²UCSB

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Constitutive Modeling/Cracks

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Wednesday PM | March 2, 2022
256A | Anaheim Convention Center

Session Chairs: Karl Garbrecht, University of Utah; Remi Dingreville, Sandia National Laboratories

2:00 PM

Data-driven Approaches for Understanding Fatigue Damage Initiation: *Akhil Thomas*¹; Ali Durmaz¹; Chris Eberl²; Harald Sack³; ¹Fraunhofer IWM; ²University of Freiburg; ³FIZ Karlsruhe

2:20 PM

A Statistical Perspective for Predicting Polycrystalline Strength with Machine Learning: *Yejun Gu*¹; Christopher Stiles²; Jaafar El-Awady³; ¹IHPC, Johns Hopkins University; ²Johns Hopkins University Applied Physics Laboratory; ³Johns Hopkins University

2:40 PM

A Physics-informed Regularization Approach for Machine Learning Derivation of Constitutive Models: *Karl Garbrecht*¹; Jacob Hochhalter¹; ¹University of Utah

3:00 PM

A Data-driven Approach for Improving the Existing Gurson Material Damage Model Using Genetic Programming for Symbolic Regression: *Donovan Birky*¹; Jacob Zamora¹; John Emery²; Coleman Alleman²; Brian Lester²; Geoffrey Bomarito³; Jacob Hochhalter¹; ¹University of Utah; ²Sandia National Laboratories; ³NASA

3:20 PM

Convolutional Neural Networks to Expedite Predictions of Volume Requirements in Studies of Microstructurally Small Cracks: *Karen Demille*¹; Ashley Spear¹; ¹University of Utah

3:40 PM Break

4:00 PM

Importance of the Choice of Constitutive Model for Full Field Crystal Plasticity Simulations: A Comparison of Predictions of the Voce and the Dislocation Density Based Hardening Laws: *Chaitali Patil*¹; Supriyo Chakraborty¹; Stephen Niezgoda¹; ¹The Ohio State University

4:20 PM

Graph Neural Network Framework to Emulate Multiple Crack Propagation and Coalescence: *Roberto Aguiar*¹; Vinamra Agrawal¹; Davide Guzzetti¹; ¹Auburn University

4:40 PM

Accelerating Phase-field Based Predictions via Surrogate Models Trained by Machine Learning Methods: *Remi Dingreville*¹; David Montes de Oca Zapiain¹; James Stewart¹; Chongze Hu¹; Shawn Martin¹; ¹Sandia National Laboratories

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Nano, Micro and Macro Scale Algorithms and Their Applications

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Wednesday PM | March 2, 2022
253A | Anaheim Convention Center

Session Chairs: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis

2:00 PM

An Examination of the Dislocation Orientation Distribution Function as Test for CDD Theories: *Jose Manuel Torres Lopez*¹; Joseph Anderson²; Anter El-Azab²; ¹University of Rochester; ²Purdue University

2:20 PM

FFT-based Polycrystal Plasticity Modelling: New Implementations and Integration with 3-D Imaging Techniques: *Ricardo Lebensohn*¹; Miroslav Zecevic¹; ¹Los Alamos National Laboratory

2:40 PM

Simulating Dislocation Transport at Experimental Time Scales Using a Time-explicit Runge-Kutta Discontinuous Galerkin Finite Element Scheme: *Manas Upadhyay*¹; Jérémy Bleyer²; Vincent Taupin³; Stéphane Berbenni³; ¹LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris; ²Navier Laboratory, CNRS, École des Ponts ParisTech; ³LEM3, CNRS, Université de Lorraine

3:00 PM

Computational Modeling of Dual Phase Titanium Armor: *Collin Roberts*¹; ¹University of California Los Angeles

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Mechanical Properties: Characterization, Modelling, and Extrusion

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Wednesday PM | March 2, 2022
208B | Anaheim Convention Center

Session Chair: Carly Romnes, University of Illinois at Urbana-Champaign

2:00 PM

Fabrication of Aluminum Alloy 6063 Tubing from Secondary Scrap with Shear Assisted Processing and Extrusion: *Brandon Taysom*¹; Md. Reza-E-Rabby¹; Xiaolong Ma¹; Massimo DiCiano²; Tim Skszek²; Scott Whalen¹; ¹Pacific Northwest National Laboratory; ²Magna International

2:25 PM

Effect of Extrusion Parameters and Heat Treatment on Strength Performance of Low Sc 5181 Alloy: *Alexander Gradoboev*¹; Dmitry Ryabov¹; Roman Vakhromov¹; Victor Mann²; Aleksandr Krokhin²; ¹Lmti Llc (Uc Rusal); ²UC RUSAL

2:50 PM

Influence of the Mg/Si Ratio on Speed Extrusion of 6XXX Alloys: *Alexander Gradoboev*¹; *Irina Matveeva*¹; Dmitry Ryabov¹; Roman Vakhromov¹; Victor Mann²; Aleksandr Krokhin²; ¹Lmti Llc (Uc Rusal); ²UC RUSAL

3:15 PM Break

3:30 PM

Weldability Study of AlMg5ScZr Alloys versus Common 5083 Alloy: *Dionysios Spathis*¹; John Tsiros¹; Andreas Mavroudis¹; Vassilis Stergiou²; ¹ELVAL SA; ²Hellenic Aerospace Industry SA

3:55 PM

Modeling of Springback Behavior in AA6016-T4 Sheet via an Elastoplastic Self-consistent Model Incorporating Backstress: *Dane Sargeant*¹; Zahidul Sarkar²; Rishabh Sharma¹; Marko Knezevic²; David Fullwood¹; Michael Miles¹; ¹Brigham Young University; ²University of New Hampshire

BIOMATERIALS

Biological Materials Science — Biological Materials Science VI

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Wednesday PM | March 2, 2022
201B | Anaheim Convention Center

Session Chair: Jeffrey Bates, The University of Utah

4:00 PM

Micromechanical and Microstructural Studies of Wavy Enamel in the Grinding Dentition of Hadrosaurid Dinosaurs: Understanding Its Remarkable Damage Tolerance and Fracture Resistance: *Soumya Varma*¹; Yi Lee²; Shane Johnson³; D. G. Harlow⁴; Tomas Grejtak⁵; Brandon Krick⁵; Tyler Hunt⁵; Gregory Erickson⁵; Manish Jain⁶; Johann Schwiedrzik⁶; Johann Mitchler⁶; Daniele Casari⁶; Sandip Basu⁷; Shraddha Vachani¹; Sid Pathak¹; Arun Devraj⁸; ¹Iowa State University; ²Exxon Mobile; ³University of Nevada Reno; ⁴Lehigh University; ⁵Florida State University; ⁶EMPA; ⁷Bruker Nano Surfaces; ⁸Pacific Northwest National Laboratory

4:20 PM

Dynamic Finite Element Analysis of QPD Crack Detection in Natural Teeth: *Jie Shen*¹; Omid Komari¹; Aboozar Mapar²; Cherilyn Sheets³; James Earthman¹; ¹University of California Irvine; ²Perimetrics, Inc.; ³Newport Coast Oral Facial Institute

4:40 PM

Enhancing Biocompatibility of Zinc Nanocomposites with Improved Nanoparticle Incorporation: *Jingke Liu*¹; Chase Linsley¹; Yuxin Zeng¹; Benjamin Wu¹; Xiaochun Li¹; ¹University of California Los Angeles

BIOMATERIALS

BioNano Interfaces and Engineering Applications — Bionano Interfaces & Engineering Applications IV and V

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

Program Organizers: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Wednesday PM | March 2, 2022
201A | Anaheim Convention Center

Session Chair: To Be Announced

2:00 PM Keynote

Bioinspired Wear-resistant Triboelectric Nanodevice for Biomechanical Energy Harvesting: *Ming-Zheng Huang*¹; An-Rong Chen¹; Naveen Tiwari¹; Yung-Hsin Chen¹; *Zong-Hong Lin*¹; ¹National Tsing Hua University

2:40 PM Invited

Reverse Engineering Spider Silk by Disassembly and Assembly: *Dinidu Perera*¹; Linxuan Li¹; Qijue Wang¹; *Hannes Schniepp*¹; ¹William & Mary

3:10 PM

Peptide-mediated Remineralizable Collagen Fibrils as a Model for Dentin Repair: *Nilan Kamathewatta¹; Quang Ye¹; Paulette Spencer¹; Candan Tamerler¹; ¹The University of Kansas*

3:30 PM

Controlled Synthesis of Polystyrene/Citrate Capped AuNPs Microparticles for the Colorimetric Detection of Hg²⁺ Ions through Aptamer-target Interaction: *Ana Ulloa¹; Min Zhao²; Qiyue Liang²; George Chiu³; Jan Allebach²; Lia Stanciu¹; ¹Purdue University-Materials Engineering; ²Purdue University- ECE; ³Purdue University*

LIGHT METALS

Cast Shop Technology — Shape Casting

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

Program Organizers: Stephen Instone, Speira GmbH; Mertol Gökkelma, Izmir Institute of Technology; Samuel Wagstaff, Oculatus; Dmitry Eskin, Brunel University

Wednesday PM | March 2, 2022

209A | Anaheim Convention Center

Session Chair: Stephen Instone, Speira GmbH

2:00 PM

Energy Resilient Foundries: The “Small is beautiful” Projects: *Mark Jolly¹; Konstantinos Salonitis¹; Emanuele Pagone¹; Michail Papanikolaou¹; Prateek Saxena¹; ¹Cranfield University*

2:25 PM

The Effect of the Holding Time on the Microstructure of Gd-containing AlSi7Mg Alloys: *Özen Gürsoy¹; Giulio Timelli¹; ¹Department of Management and Engineering, University of Padova*

2:50 PM

Effects of Casting Temperature and Iron Content on the Microstructure of Hypoeutectic A380 Aluminum Alloy: *Reza Haghighyeghi¹; Giulia Scampone²; Özen Gürsoy²; Giulio Timelli²; ¹Volvo Truck; ²Padova University*

3:15 PM

Effect of Heat Treatment on Mechanical Properties of Er, Dy and Eu Modified A356 Alloy: *Onur Ernam¹; Tarik Sekban¹; Oguzhan Tugan¹; Kerem Dizdar²; Hayati Sahin²; Derya Dispinar²; ¹Istanbul Technical University; ²Fosco*

ENERGY & ENVIRONMENT

Composite Materials for Sustainable Eco-Friendly Applications — Eco-Friendly Composite Materials-Recycled Materials

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Simona Hunyadi Murph, Savannah River National Laboratory

Wednesday PM | March 2, 2022

211A | Anaheim Convention Center

Session Chair: Brian Wisner, Ohio University

2:00 PM Invited

4D Printable Terpene/Terpenoid Photopolymers For Upcycling Commodity Polystyrene Towards A Circular Economy: *Andrew Weems¹; ¹Ohio University-Main Campus*

2:20 PM

Cadmium (II) Removal from Aqueous Solution by Magnetic Biochar Composite Produced from KOH Modified Poplar Sawdust Biochar: *Lei Zhang¹; Yongsheng Zhang¹; Yanfang Huang¹; Guihong Han¹; Hafiza Sana¹; Shengpeng Su¹; ¹Zhengzhou University*

2:40 PM

Efficient Removal of Molybdenum from Ultra-low Concentration Solutions via Fe(III) Chelating Precipitation: Precipitation Sludge for MoFe Alloy Production via Metallurgical Reduction: *Bei Zhang¹; Bingbing Liu¹; Yanfang Huang¹; Guihong Han¹; Yubi Wang¹; Shengpeng Su¹; ¹Zhengzhou University*

3:00 PM

Characterization on the Electrochemical Property of the Ion Flotation Sludges after Thermal Treatment: *Guihong Han¹; Jingwen Wang¹; Bingbing Liu¹; Ze Yang¹; Yanfang Huang¹; ¹Zhengzhou University*

ENERGY & ENVIRONMENT

Composites for Energy Applications: Materials for Renewable Energy Applications 2022 — Electrochemical Storage and Conversion

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

Program Organizers: Patrick Ward, Savannah River National Laboratory; Joseph Teprovich, California State University Northridge; Anthony Thompson, Savannah River National Laboratory; Simona Hunyadi Murph, Savannah River National Laboratory

Wednesday PM | March 2, 2022

210D | Anaheim Convention Center

Session Chair: Joseph Teprovich, California State University Northridge

2:00 PM Invited

Co-infiltration of Solid Oxide Fuel Cell Anodes with Ni/Mixed Ionic and Electronic Conducting Catalyst Nanoparticles: *Soumendra Basu¹; Jillian Rix¹; Srikanth Gopalan¹; Uday Pal¹; ¹Boston University*

2:30 PM Invited

Aperiodic Three-dimensional Tricontinuous Conductor-insulator-conductor Nanocomposite for Use as High Energy Density Nanocapacitor: *Eric Detsl¹; Samuel Welborn¹; John Corsi¹; Jeff DeHosson²; ¹University of Pennsylvania; ²University of Groningen*

3:00 PM

Genetic Manipulation of M13 Bacteriophage for Enhancing the Efficiency of Virus-inoculated Perovskite Solar Cells with a Certified Efficiency of 22.3%: *Il Jeon¹; ¹Pusan National University*

3:20 PM Break

3:40 PM Invited

Nanocomposites for Gel and Solid Polymer Electrolytes in Lithium Batteries: *Reza Shahbazian-Yassar¹; ¹University of Illinois at Chicago*

4:10 PM

Polymer Templating Method for the Formation of Hierarchically Porous Nitrogen-rich Tin-carbon Composite Anodes: *Jason Weeks¹; ¹University of Texas at Austin*

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Phase Transformation/Microstructure Modeling

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoulou, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Wednesday PM | March 2, 2022
255C | Anaheim Convention Center

Session Chair: Kubra Karayagiz, Worcester Polytechnic Institute

2:00 PM Invited

Morphological Evolution of Surface Instabilities during Vapor Co-deposition of Phase-separating Alloy Films: *Rahul Raghavan¹; Pei En Chen¹; Yang Jiao¹; Kumar Ankit¹; ¹Arizona State University*

2:30 PM

High Performance Cahn-Hilliard Solver for Advanced Microstructure Modeling: *Kubra Karayagiz¹; David Montiel²; Siamak G. Faal¹; Marcus Sarkis-Martins¹; Adam Powell¹; ¹Worcester Polytechnic Institute; ²University of Michigan*

2:50 PM Invited

Thermodynamic Investigation of Multicomponent Chloride Molten Salts for Spent Fuel Processing: *Liangyan Hao¹; Soumya Sridar¹; Thomas Kirtley²; Ethan Schneider²; Elizabeth Sooby²; Wei Xiong¹; ¹University of Pittsburgh; ²University of Texas at San Antonio*

3:20 PM

Phase-field Model of Precipitation Processes with Spontaneous Coherency Loss: *Tianle Cheng¹; Youhai Wen²; ¹U.S. Department of Energy, National Energy Technology Laboratory / NETL Site Support Contractor; ²U.S. Department of Energy, National Energy Technology Laboratory*

3:40 PM Break

4:00 PM

CALPHAD Modeling of Double Ordering: *Yijia Gu¹; Kyaw Hla Saing Chak¹; Julia Medvedeva¹; ¹Missouri University of Science and Technology*

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — Directionally Solidified Ni Based Superalloys & Fe Based Superalloys

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Wednesday PM | March 2, 2022
304B | Anaheim Convention Center

Session Chairs: Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research

4:00 PM Invited

Very High Cycle Fatigue Properties of CoNi- and Ni-based Single-crystal Superalloys: *Alice Cervellon¹; Tresa Pollock²; Chris Torbet²; ¹Institut Pprime; ²University of California Santa Barbara*

4:30 PM

On the Influence of γ' -particle Size on the Yield Stress Anomaly in Ni-base Single Crystal Superalloys: *Marc Sirrenberg¹; David Bürger¹; Alireza Parsa¹; Gunther Eggeler¹; ¹Ruhr-University Bochum*

4:50 PM

Mechanistic Modeling of Thermal Creep Response of 347H Stainless Steel: Effect of Microstructure and Chemistry: *Mariyappan Arul Kumar¹; Ricardo Lebensohn¹; Laurent Capolungo¹; ¹Los Alamos National Laboratory*

SPECIAL TOPICS

DMMM4 — Career Development Tools and Strategies

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday PM | March 2, 2022
Grand Ballroom F | Anaheim Marriott

Session Chairs: Ashleigh Wright, University of Illinois Urbana-Champaign; Blythe G. Clark, Sandia National Laboratories; Mark Carroll, Tenneco

2:00 PM Invited

Bruised But Not Broken: Storytelling as a Method to Share to the Experiences and Persistence Strategies of African American Women in Engineering Degree Programs: *Stacie LeSure¹; ¹Engineers for Equity, LLC*

2:50 PM

Peer-to-Peer Mentoring to Support Career Development: *Blythe Clark¹; ¹Sandia National Laboratories*

3:10 PM

Tools and Strategies to Succeed in Your Career with the Attributes of an Effective Leader: *Saleem Al Dajani*¹; Ibrahim Almojel²; ¹MIT/UCB-NE; ²Saudi Industrial Development Fund

3:30 PM Break

4:00 PM Panel Discussion on Career Development: Join our invited speaker alongside several of our TMS members as they share insights into career development. Learn how they have invested in their own and others' career development, hear ideas for how to expand your career horizons, and ask questions about career development from this group of panelists devoted to supporting retention of diversity in STEM. Panel members include: Stacie LeSure, Gabriel Lievabare, JC Zhao, and Amit Misra. Moderated by Blythe Clark.

5:00 PM Career Development for a Diverse Workforce: Networking Event: Join us for a networking event focused on sharing best practices to support career development for a diverse workforce. Whether you have lots of experience in career development or are just starting on your journey, we would love to have your perspective and questions at this session. Tables will be arranged to focus on key topics, and there will be opportunity to rotate tables and topics through the event. Participants can expect to leave inspired and connected to new contacts from across TMS.

SPECIAL TOPICS

DMMM4 — STEM Outreach Case Studies and Best Practices

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday PM | March 2, 2022
Grand Ballroom H, J, K | Anaheim Marriott

Session Chairs: Megan Cordill, Erich Schmid Institute of Materials Science; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University

2:00 PM Invited

Building Effective STEM Outreach Programs: *Jessica Krogstad*¹; ¹University of Illinois at Urbana-Champaign

2:30 PM Invited

Materials Calisthenics: Harnessing Your Interests to Inspire Diverse Audiences: *Suveen Mathaudhu*¹; ¹Colorado School of Mines / Pacific Northwest National Laboratory

3:00 PM

Designing Inclusive Research Experiences for Undergraduates: A Case Study on the Stanford Materials Science and Engineering REU Program: *Rajan Kumar*¹; Abby Carbone¹; ¹Stanford University

3:20 PM What's next? - Megan Cordill, Erich Schmid Institute

3:30 PM Break

4:00 PM Outreach Activities: Hands-on activities lead by session speakers and TMS members for participants to perform at their own pace. The activities include materials science-based demonstrations for children and adults, new teaching methods to engage students, and short-term project planning for undergraduates.

5:00 PM Evaluating Outreach Activities: After the hands-on activities, comments, suggestions, and feedback is anticipated from the participants. Additionally, what have others done for STEM outreach? What has worked and what has not? Panel members include: Suveen Mathaudhu, Rajan Kumar, and Abby Carbone. Moderated by: Megan Cordill

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Modeling and Simulation II

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Wednesday PM | March 2, 2022
304D | Anaheim Convention Center

Session Chairs: Saryu Fensin, Los Alamos National Laboratory; Douglas Spearot, University of Florida

2:00 PM

Understanding the Implications of Finite Specimen Size on the Interpretation of Dynamic Experiments for Polycrystalline Metals through Direct Numerical Simulations: *Bryan Zuanetti*¹; Darby Luscher¹; Cynthia Bolme¹; Kyle Ramos¹; ¹Los Alamos National Laboratory

2:20 PM

Phase Transformation of Aluminum under Ramp Loading Compression; A Combined Atomistic Simulation and Experimental Study: *Lijie He*¹; Danae Polsin¹; Shuai Zhang¹; Gilbert Collins¹; *Niaz Abdulrahim*¹; ¹University of Rochester

2:40 PM

Shockwave Propagation and Attenuation in Poly(ethylene glycol) Diacrylate Hydrogels: *Ke Luo*¹; Ghatu Subhash¹; *Douglas Spearot*¹; ¹University of Florida

3:00 PM

Mechanisms Responsible for Kinking in Layered Crystalline Solids: *Gabriel Plummer*¹; Xingyuan Zhao¹; Leslie Lamberson¹; Garritt Tucker¹; ¹Colorado School of Mines

3:20 PM Break

3:35 PM

Understanding the Phase Transformation Mechanisms of Fe-based Microstructures at the Atomic Scales: *Avanish Mishra*¹; Jonathan Lind²; Mukul Kumar²; Avinash Dongare¹; ¹University of Connecticut; ²Lawrence Livermore National Laboratory

3:55 PM

Reduction of Richtmyer-Meshkov Instabilities via Layered Explosive Charge Design: *Michael Hennessey*¹; H. Springer¹; Jon Belof¹; ¹Lawrence Livermore National Laboratory

CORROSION

Environmental Degradation of Multiple Principal Component Materials — Aqueous Corrosion and Embrittlement

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; ShinYoung Kang, Lawrence Livermore National Laboratory; XiaoXiang Yu, Northwestern University; Vilupanur Ravi, California State Polytechnic University Pomona; Christopher Weinberger, Colorado State University; Elizabeth Opila, University of Virginia; Bai Cui, University of Nebraska-Lincoln; Mark Weaver, University of Alabama; Bronislava Gorr, Karlsruhe Institute of Technology (KIT); Srujan Rokkam, Advanced Cooling Technologies Inc

Wednesday PM | March 2, 2022
201C | Anaheim Convention Center

Session Chairs: Wenjun Cai, Virginia Tech; Bai Cui, University of Nebraska-Lincoln

2:00 PM

The Tribocorrosion Behaviors of Al_{0.1}CrCoFeNi Multi-principal Element Alloys in Different pH Conditions: Jia Chen¹; *Wenbo Wang¹*; Wenjun Cai¹; ¹Virginia Polytechnic Institute and State University

2:20 PM

Localized Corrosion Resistance of Ni-Cr-Co-Fe-Mo MPE Alloys in Aqueous and Methanolic Environments: Angeire Huggins Gonzalez¹; *Narasi Sridhar²*; Ramgopal Thodla¹; ¹DNV; ²MC Consult LLC

2:40 PM

Equivalent Hydrogen Fugacity during Electrochemical Charging of Nickel Single Crystal: Comparison with Gaseous Hydrogen Charging: *Clara Juillet¹*; Jiaqi Li¹; Caroline Traisnel¹; Marie Landeiro Dos Reis¹; Jamaa Bouhattate¹; Abdelali Oudriss¹; Laurent Briottet²; Xavier Feaugas¹; ¹Laboratoire des Sciences de l'Ingénieur pour l'Environnement (LaSIE); ²Univ Grenoble Alpes, CEA, LITEN, DTCH, LCA

3:00 PM Invited

Exploring Hydrogen-induced Martensitic Transformation and Twinning Effects Metastable Fe-Mn-Co-Cr High Entropy Alloys: C. Tasan¹; Maria Ronchi¹; Haoxue Yan¹; ¹Massachusetts Institute of Technology

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Corrosion and Degradation in Harsh Environments 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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Wednesday PM | March 2, 2022
201D | Anaheim Convention Center

Session Chairs: C. Cem Tasan, Massachusetts Institute of Technology; Yanfei Gao, University of Tennessee

2:00 PM Invited

Hydrogen Effects in Metals: New Tools, New Insights: C. Tasan¹; Jinwoo Kim¹; Haoxue Yan¹; ¹Massachusetts Institute of Technology

2:35 PM

Alloy and Process Modification for Reduced Hydrogen Sensitivity of High Hardness Steel: *William Williams¹*; Shiraz Mujahid¹; Shane Brauer¹; Haley Doude¹; Kevin Doherty²; Daniel Field²; Krista Limmer²; Hongjoo Rhee¹; ¹Mississippi State University; ²CCDC Army Research Laboratory

2:55 PM

Role of Accumulated Plastic Strain on Grain Boundary Corrosion of Steel: *Amir Abdelmawla¹*; Kaustubh Kulkarni¹; Ashraf Bastawros¹; ¹Iowa State University

3:15 PM

Mechanisms of Mitigating Chloride-induced Stress Corrosion Cracking of Austenitic Steels by Laser Shock Peening: Yongchul Yoo¹; Xueliang Yan¹; Fei Wang¹; Qiuchi Zhu¹; Yongfeng Lu¹; *Bai Cui¹*; ¹University of Nebraska-Lincoln

3:35 PM Break

3:55 PM Invited

On the Critical Role of Localized Oxidation Processes in High Temperature Failures under Cyclic Thermomechanical Loading Conditions: *Yanfei Gao¹*; ¹University of Tennessee-Knoxville

4:30 PM

Corrosion and Mechanical Characterization of Friction-stir Welded Joints between Aluminum and Magnesium Alloys: *Qingli Ding¹*; Kübra Karayagiz¹; Brajendra Mishra¹; Adam C Powell¹; Donovan Leonard²; ¹Worcester Polytechnic Institute; ²Oak Ridge National Laboratory

4:50 PM

Modeling of Corrosion and Mechanical Failure in Friction Stir Welded Magnesium-aluminum Vehicle Joints: *Kubra Karayagiz¹*; Adam Powell¹; Qingli Ding¹; Donovan Leonard²; Piyush Upadhyay³; Brajendra Mishra¹; ¹Worcester Polytechnic Institute; ²Oak Ridge National Laboratory; ³Pacific Northwest National Laboratory

SPECIAL TOPICS

Frontiers of Materials Award Symposium Session: Data-Driven, Machine-learning Augmented Design and Novel Characterization for Nano-architected Materials — A Special Award Session for Symposium: Self-organizing Nano-architected Materials

Program Organizer: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory

Wednesday PM | March 2, 2022
260C | Anaheim Convention Center

Session Chairs: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University

2:00 PM Invited

Designing Nano-architected Materials with a Machine-learning Augmented Framework: Chonghang Zhao¹; Cheng-Chu Chung¹; Yu-chen Karen Chen-Wiegart²; ¹Stony Brook University; ²Stony Brook University / Brookhaven National Laboratory

2:30 PM

"Big Data" Characterization of Material Properties and High Temperature Kinetics: James Horwath¹; Peter Voorhees²; Eric Stach¹; ¹University of Pennsylvania; ²Northwestern University

2:50 PM Invited

Discovery of Nanocomposite Phase Change Memory Materials via Closed-loop Autonomous Combinatorial Experimentation: Ichiro Takeuchi¹; ¹University of Maryland

3:20 PM Break

3:40 PM Invited

Intelligent Design of Additively Manufactured Architected Materials: Mitra Taheri¹; ¹Johns Hopkins University

4:10 PM

Machine Learning Based Hierarchical Multi-scale Modeling of Mechanical Deformation for Metal-matrix-nano-composites: Md Shahrier Hasan¹; Wenwu Xu¹; ¹San Diego State University

4:30 PM

Accelerated Discovery of Multi-phase Refractory Alloys through Machine Learning Surrogate Models of CALPHAD: Samuel Price¹; Ian McCue¹; Jonah Erlebacher²; ¹Northwestern University; ²Johns Hopkins University

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Functional Bio-Nanomaterials & Biosensors II

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Wednesday PM | March 2, 2022
260B | Anaheim Convention Center

Session Chairs: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah

2:00 PM

Spatial Control of Laser Induced Graphene Morphology on Flexible Substrates: Moataz Abdulhafez¹; Golnaz Tomaraei¹; Ki-Ho Nam¹; Mostafa Bedewy¹; ¹University of Pittsburgh

2:20 PM

Joining Graphene-modified Textile Fiber Sensors via Nanosolder Melting and Interconnection: Edward Fratto¹; Ramaswamy Nagarajan¹; Xuejun Lu¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

2:40 PM Keynote

Skin-interfaced Wearable Biosensors: Wei Gao¹; ¹California Institute of Technology

3:25 PM Break

3:45 PM

Multi-scale Numerical Modelling of Nanoparticle Transport across the Placental Barrier on Placenta-on-a-chip Physical Model: Hongwei Liu¹; Anisa Khan¹; Moustafa Ali¹; Hagar Labouta¹; Pooneh Maghoul¹; ¹University of Manitoba

4:05 PM

Machine Learning Analysis of Spectral Data Using Bacteria for Signal Amplification: Hong Wei¹; Yixin Huang¹; Peter Santiago¹; Allon Hochbaum¹; Regina Ragan¹; ¹University of California Irvine

4:25 PM

Optically Active Nanoparticles in Protein Corona Studies: Max Anikovskiy¹; ¹University of Calgary

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Alloying, Solute Segregation, and Precipitation: Part II

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Wednesday PM | March 2, 2022
304C | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Xiaofeng Qian, Texas A&M University

2:00 PM Invited

Disordered Interfacial Features as Local Equilibrium States Capable of Modifying Nanocrystalline Metals: *Timothy Rupert*¹; ¹University of California, Irvine

2:30 PM

The Role of Grain Boundary Metastability in Solute Segregation: Insights from Atomistic and Machine Learning Studies: *Fadi Abdeljawad*¹; Yasir Mahmood¹; Enrique Martinez²; ¹Clemson University

2:50 PM

Exploring the Structure and Chemistry Contributions to Interfacial Segregation in NbMoTaW with High-throughput Atomistic Simulations: *Ian Geiger*¹; Timothy Rupert¹; ¹University of California Irvine

3:10 PM

Using Grain Boundary Segregation Spectra to Design for Nanocrystalline Stability: *Malik Wagih*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

3:30 PM Break

3:45 PM Invited

Unraveling Mechanisms of Interface Diffusion and Interfacial Creep in Metals and Metal-ceramic Composites: *Ian Chesser*¹; Raj Koju¹; Yuri Mishin¹; ¹George Mason University

4:15 PM

Solute Drag in Regular Solution Alloys: Self-similarity and the Role of Grain Boundary Structure: *Fadi Abdeljawad*¹; Malek Alkayali¹; ¹Clemson University

4:35 PM

Segregation-assisted Concentration Modulation within Grain Boundaries: *Longsheng Feng*¹; Di Qiu²; Kamal Kadirvel¹; Pengyang Zhao³; Suliman Dregia¹; Yunzhi Wang¹; ¹The Ohio State University; ²Shanghai University; ³Shanghai Jiao Tong University

4:55 PM

Machine Learning-assisted Prediction of Interfacial Segregation in a Refractory Multi-principal Element Alloy: *Doruk Aksoy*¹; Timothy Rupert¹; ¹University of California, Irvine

ADVANCED MATERIALS

High Performance Steels — Damage and Fracture in Steels

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut Fuer Eisenforschung; Benjamin Adam, Oregon State University

Wednesday PM | March 2, 2022
252C | Anaheim Convention Center

Session Chairs: Kayla Molnar, Los Alamos National Laboratory; Louis Hector, General Motors

2:00 PM

In-situ Investigation of Strain Partitioning and Localization in a Dual Phase Steel Up to and Beyond Necking: *Hyunseok Oh*¹; Krista Biggs¹; Onur Güvenç¹; Hassan Ghassemi-Armaki¹; Narayan Pottore¹; Cemal Cem Tasan¹; ¹Massachusetts Institute of Technology

2:20 PM

Strain Path Dependence of Microstructural Strain Path Development: An Experimental-numerical Study on Dual-phase Steels: *Julian Rackwitz*¹; Onur Güvenç¹; Cem Tasan¹; ¹Massachusetts Institute of Technology

2:40 PM

Microstructure and Mechanism Based Lifetime Predictions in Various Weldment Failures Under Complex Thermomechanical Conditions: *Yi Yang*¹; Yanfei Gao¹; Jorge Penso²; Zhili Feng³; ¹University of Tennessee Knoxville; ²Shell; ³Oak Ridge National Laboratory

3:00 PM

Strain Partitioning Analysis during Tensile Tests in Intercritically Deformed Steels: *Unai Mayo*¹; Nerea Isasti¹; Jose Rodriguez-Ibabe¹; Pello Uranga¹; ¹CEIT and TECNUN (University of Navarra)

3:20 PM Break

3:35 PM

Tensile Behaviour and Martensitic Transformations in a Cold Rolled Medium Mn Steel: *Thomas Kwok*¹; ¹Imperial College London

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — General Materials and Chemistry II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Wednesday PM | March 2, 2022
203B | Anaheim Convention Center

Session Chair: Stephen Raiman, Texas A&M University

2:00 PM

High-throughput and Machine Learning Accelerated Discovery of Corrosion-resistant Alloy for Molten Salt Applications: *Yafei Wang*¹; Bonita Goh¹; Phalgun Nelaturu¹; Thien Duong²; Najlaa Hassan¹; Raphaelle David¹; Michael Moorehead¹; Santanu Chaudhuri²; Jason Hattrick-Simpers³; Dan Thoma¹; Kumar Sridharan¹; Adrien Couet¹; ¹University of Wisconsin-Madison; ²Argonne National Laboratory; ³National Institute of Standard and Technology

2:20 PM

Mechanisms and Model Development for Molten Salt Corrosion: *Jinsuo Zhang*¹; ¹Virginia Polytechnic Institute and State University

2:40 PM

In-situ Corrosion Monitoring of 316 SS L Natural Convection Loop by Radioactive Isotope Tracking: *Yafei Wang*¹; Cody Falconer¹; Aeli Olson¹; Jonathan Engle¹; Brian Kelleher²; Kumar Sridharan¹; Adrien Couet¹; ¹University of Wisconsin-Madison; ²TerraPower, LLC

3:00 PM

Thermal Gradient Mass Transport Corrosion in Molten Chloride Salts: *Brian Kelleher*¹; Sean Gagnon¹; Ivan Mitchell¹; ¹Terrapower

3:20 PM Break

3:40 PM

Thermodynamic Properties of Gd-Bi Alloys Determined by EMF Measurements in LiCl-KCl-GdCl₃ Electrolyte: *Stephanie Castro Baldivieso*¹; Nathan Smith¹; Sanghyeok Im¹; Hojong Kim¹; ¹Penn State University

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Session VI

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Wednesday PM | March 2, 2022
253B | Anaheim Convention Center

Session Chairs: Yan Li, Dartmouth College; Victoria Miller, University of Florida

2:00 PM Invited

Alloy Design/Modification, Powder Feedstock Atomization and Process Optimization Modeling for Additive Manufacturing by Laser Powder Bed Fusion: *Yongho Sohn*¹; Jeongmin Woo¹; Abhishek Mehta¹; Kevin Graydon¹; Thinh Huynh¹; Nathalia Diaz¹; Asif Mahmud¹; ¹University of Central Florida

2:25 PM

Microstructure Prediction of Additively Manufactured 316L Using Heat Transfer, Thermodynamic, and Solidification Models: *Charles Smith*¹; Olivia Denonno¹; Matthew Schreiber¹; Anthony Petrella¹; Amy Clarke¹; Zhenzhen Yu¹; Jonah Klemm-Toole¹; ¹Colorado School of Mines

2:45 PM

A New CALPHAD-based Approach to Develop Chromium and Nickel Equivalencies for Austenitic Stainless Steels: *Benjamin Sutton*¹; Nathan Daubenmier¹; Antonio Ramirez²; ¹Ohio State University

3:05 PM

Microstructural Evolution of Compositionally Graded Proton Irradiated 316 Stainless Steel as a High Throughput Alloy: *Laura Hawkins*¹; Jingfan Yang²; Xiaoyuan Lou²; Miao Song³; Yongfeng Zhang⁴; Daniel Schwen¹; Lin Shao⁵; Lingfeng He¹; ¹Idaho National Laboratory; ²Auburn University; ³University of Michigan; ⁴University of Wisconsin - Madison; ⁵Texas A&M University

3:25 PM Break

3:40 PM

Material Interdiffusion and Necking between Dissimilar Nanoporous Metal Interfaces: *Natalya Kublik*¹; Stanislaw Niazorau¹; Sridhar Niverty²; Nikhilesh Chawla²; Bruno Azeredo¹; ¹Arizona State University; ²Purdue University

4:00 PM

A Numerical and Experimental Study of Simultaneous Topology/Orientation Optimization via SOMP and Principal Stress Directions: *Bailey Brown*¹; Brett Compton²; Natasha Vermaak¹; Nadim Hmeidat²; Jackson Wilt²; Xiu Jia¹; ¹Lehigh University; ²University of Tennessee, Knoxville

4:20 PM

Designing Photopolymer Inks from Low Viscosity Newtonian Resins: *Andrew Weems*¹; ¹Ohio University-Main Campus

4:40 PM

Shear Assisted Processing and Extrusion (ShAPETM) for Manufacturing of Copper-graphene Composites for Ultra-high Electrical Conductivity: Emphasis on Microstructural Evolution: *Bharat Gwalani¹; Xiao Li¹; Woongjo Choi¹; Aditya Nittala¹; Julian Escobar¹; Joshua Silverstein¹; William Frazier¹; Keerti Kappagantula¹;*
¹Pacific Northwest National Laboratory

MATERIALS PROCESSING

Materials Processing Fundamentals — Numerical Process Simulations/Process Thermodynamics

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Jonghyun Lee, Iowa State University; Adrian Sabau, Oak Ridge National Laboratory; Fiseha Tesfaye, Åbo Akademi University

Wednesday PM | March 2, 2022
213D | Anaheim Convention Center

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM

Analytical and Numerical Study on Martensitic Coatings by Cold-spraying Austenitic Stainless Steel: *Cal Vin Wong¹; Christian Widener²; Dennis Helfrich³; Victor Champagne³; Jonghyun Lee¹;*
¹Iowa State University; ²VRC Metal Systems; ³ARL Cold Spray Center

2:25 PM

Ultrasonics in Levitating Droplets: *Catherine Tonry¹; Valdis Bojarevics¹; Georgi Djambazov¹; Andrew Kao¹; Koulis Pericleous¹;*
¹University of Greenwich

2:45 PM

VOF-based CFD Simulation of a Pilot-scale TSL Furnace: *Daniele Obiso¹; Markus Reuter²; Andreas Richter³;*
¹Cic Virtuhcon, Tubaf; ²SMS group GmbH; ³TU Bergakademie Freiberg

3:05 PM

Finite Element Analysis Modeling of Gravity-driven Multiple Effect Thermal System (G-METS) Distillation for Efficient Low-cost Magnesium Refining: *Armaghan Ehsani Telgerafchi¹; Daniel McArthur¹; Gabriel Espinosa¹; Madison Rutherford¹; Adam Powell¹;*
¹David Dussault²; ¹Worcester Polytechnic Institute; ²Elemental Brewing Company

3:25 PM Break

3:45 PM

Study on the Interface Structure and Element Distribution of Manganese-containing Slag: *Xiaobo He¹; Lijun Wang¹; Kuochih Chou¹;*
¹University of Science and Technology Beijing

4:05 PM

Experimental Phase Diagram Study in CaO-MgO-V2O5 System: *Guishang Pei¹; Lilian Yang¹; Dapeng Zhong¹; Junyi Xiang¹; Xuwei Lv¹;*
¹Chongqing University

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — Radiation Effects in FeCr Alloys and ODS Steels

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Wednesday PM | March 2, 2022
203A | Anaheim Convention Center

Session Chairs: Gary Was, University of Michigan; William Cunningham, Stony Brook University

2:00 PM

Post-irradiation Examination of High-dose Ion Irradiated MA956 ODS Alloy: *Yu Lu¹; Yaqiao Wu¹; Ramprashad Prabhakaran²; Megha Dubey¹; Lin Shao³; Jing Wang²; Dalong Zhang²;*
¹Boise State University/Center for Advanced Energy Studies; ²Pacific Northwest National Laboratory; ³Texas A&M University

2:20 PM Invited

Low Temperature Hardening-embrittlement in Neutron Irradiated ODS Steels: *Arunodaya Bhattacharya¹; Samara Levine²; Xiang Chen¹; Takashi Nozawa³; Steven Zinkle²; Yutai Katoh¹;*
¹Oak Ridge National Laboratory; ²University of Tennessee; ³National Institutes for Quantum and Radiological Science and Technology (QST)

2:50 PM Invited

Recent Progress in Understanding Fundamental Radiation Degradation Processes: *Steven Zinkle¹; Yan-Ru Lin¹; Yajie Zhao¹; Samara Levine¹; Yao Li¹; Zehui Qi¹; Arunodaya Bhattacharya¹; Shradha Agarwal¹;*
¹University of Tennessee

3:20 PM Break

3:45 PM

Effect of Cr and He on Cavity Swelling in Dual-Ion Irradiated High Purity Fe-Cr Alloys: *Yan-Ru Lin¹; Arunodaya Bhattacharya²; Jean Henry³; Steven Zinkle¹;*
¹University of Tennessee; ²Oak Ridge National Laboratory; ³CEA

4:05 PM Invited

Synergies between H and He in Radiation-induced Swelling of Candidate Fusion Blanket Materials: *Logan Clowers¹; Zhijie Jiao¹; Gary Was¹;*
¹University of Michigan

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Novel Nuclear Materials & Characterization II

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Wednesday PM | March 2, 2022
204A | Anaheim Convention Center

Session Chairs: Joshua White, LANL; Robert Ritchie, Lawrence Berkeley National Laboratory

2:00 PM

Helium Implantation Responses of Co-deposited Copper-tungsten Nanocomposites: *Kelvin Xie*¹; Digvijay Yadav¹; Michael Demkowicz¹; ¹Texas A&M University

2:20 PM

A Case Study on Radiation-induced Degradation of High-entropy Alloys: *Matheus Araujo Tunes*¹; Osman El-Atwani¹; Stuart Maloy¹; ¹Los Alamos National Laboratory

2:40 PM

In Situ Microstructural Evolution in Face-centered Cubic Compositionally Complex Alloys under Dual-beam Heavy-ion Irradiation: *Calvin Parkin*¹; Michael Moorehead¹; Kumar Sridharan¹; Weiying Chen²; Meimei Li²; Adrien Couet¹; ¹University of Wisconsin-Madison; ²Argonne National Laboratory

3:00 PM

Hydrogen Accommodation in the TiZrNbHfTa High Entropy Alloy: *Christopher Moore*¹; Jack Wilson¹; Michael Rushton¹; Jack Astbury²; Simon Middleburgh¹; ¹Bangor University; ²Tokamak Energy Ltd

3:20 PM Break

3:40 PM

Effect of Residual Strain on Short Time Oxidation Behavior of Machined 304 Stainless Steel in High Temperature, High Pressure Deaerated Water: *Rachel Turfitt*¹; Bryan Webler¹; ¹Carnegie Mellon University

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Nanomechanics-coupled Material Physics

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Wednesday PM | March 2, 2022
204B | Anaheim Convention Center

Session Chairs: Douglas Stauffer, Bruker Nano Inc.; Katherine Jungjohann, Sandia National Laboratories

2:00 PM Invited

Impact of Hydrogen on Dislocation Nucleation and Strength in bcc Fe-Cr Alloys: *Gerhard Dehm*¹; Jing Rao¹; Maria Jazmin Duarte¹; ¹MPI Eisenforschung

2:30 PM

Micro-mechanical Characterization of Geometric and Defect Dependent Responses in 3D Kirigami Polymer Structures: *Jungkyu Lee*¹; Kian Bashandeh²; Andreas Polycarpou²; ¹Bruker Nano Surfaces Division; ²Texas A&M University

2:50 PM Invited

Nanoscale Characterization of Electrochemical-mechanical Mechanisms with Electron Microscopy: *Katherine Jungjohann*¹; Daniel Long¹; Katharine Harrison¹; Laura Merrill¹; Zach Milne¹; Khalid Hattar¹; ¹Sandia National Laboratories

3:20 PM Break

3:40 PM

Thermal Stability of Nanocrystalline NiYZr Alloys: *Saurabh Sharma*¹; Kris Darling²; Vikrant Beura¹; Yashaswini Karanth¹; Kiran Solanki¹; ¹Arizona State University; ²Army Research Laboratory

4:00 PM

Molecular Dynamics Modeling of Helium Nanobubble Growth in Irradiated Copper Matrix: *Ali K. Shargh*¹; Ognjen Bosic¹; Niaz Abdulrahim¹; ¹University of Rochester

4:20 PM

Understanding the Local Structure-property Relationships of Pb-Sn Solders in Terrestrial vs. Microgravity Environments: *Manish Kumar*¹; Sid Pathak¹; ¹Iowa State University Ames

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Session V

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Wednesday PM | March 2, 2022
206B | Anaheim Convention Center

Session Chairs: Nathan Johnson, Stanford University; Eric Payton, Air Force Research Laboratory

2:00 PM Invited

A Predictive Capability for Mechanical Behavior of Additively Manufactured Lattice Structures: John Carpenter¹; Donald Brown¹; Vimal Chaitanya²; Borys Drach²; Zachary Paesani²; *Nathan Johnson*³; Jenny Wang⁴; Maria Strantza⁴; ¹Los Alamos National Laboratory; ²New Mexico State University; ³SLAC National Accelerator Laboratory; ⁴Lawrence Livermore National Laboratory

2:30 PM Invited

Toward Improved Constitutive Behavior Models Sensitive to High Strength Steel Microstructures through Advancements in Data Analysis Tools: *Eric Payton*¹; ¹Air Force Research Laboratory

3:00 PM

A Numerical Study on Surface Effect in Hexagonal Slip Activity: *Ruxin Zhang*¹; Thomas Bieler¹; Philip Eisenlohr¹; ¹Michigan State University

3:20 PM Break

3:40 PM

Inferring Dynamic Mechanical Properties of Materials Using a Combination of High-rate Machining Experiments and Simulations: *Umair Bin Asim*¹; Michael Demkowicz¹; Ankit Srivastava¹; ¹Texas A&M University

4:00 PM

Strain Localization in Metastable Beta Ti Alloys in Relation to the Beta Structure: *Azdine Nait-Ali*²; Anaïs Huet¹; Samuel Hemery¹; ¹Isae-Ensma

MATERIALS DESIGN

Microstructural Templates Consisting of Isostructural Ordered Precipitate / Disordered Matrix Combinations: Microstructural Evolution and Properties — Session III

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; Bharat Gwalani, Pacific Northwest National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Jessica Krogstad, University of Illinois at Urbana-Champaign; Ashley Paz Y Puente, University of Cincinnati; Keith Knipling, Naval Research Laboratory; Matthew Steiner, University of Cincinnati

Wednesday PM | March 2, 2022
254A | Anaheim Convention Center

Session Chairs: Ashley Puente, University of Cincinnati; Keith Knipling, Naval Research Laboratory

2:00 PM Introductory Comments

2:05 PM Invited

Comparison of γ and B2 Precipitates and Their Influence on the Mechanical Behavior of FeNiCoAl-based High-entropy Alloys: Cheng Zhang¹; Benjamin MacDonald¹; Mingjie Xu¹; *Enrique Lavernia*¹; ¹University of California, Irvine

2:35 PM Invited

Understanding the Role of Chemistry on Planar Fault Energies in A3B Compositions: *K V Vamsi*¹; Tresa Pollock¹; ¹University of California, Santa Barbara

3:05 PM Invited

Optimizing Composition and Microstructure in Compositionally Complex Alloys Possessing bcc and B2 Mixtures: Zachary Kloenne¹; Brian Welk¹; Kamalnath Kadirvel¹; Gopal Viswanathan¹; Jean-Philippe Cousinie¹; Yunzhi Wang¹; *Hamish Fraser*¹; ¹The Ohio State University

3:35 PM Break

3:55 PM

Precipitation of Ordered B2 Precipitates in BCC $Al_{27}CrMnTiV$ High-entropy Alloys: *Keith Knipling*¹; Patrick Callahan¹; David Beaudry¹; ¹Naval Research Laboratory

4:25 PM

Bcc-Superalloys Microstructure Templates: Tungsten to Titanium to Iron: *Alexander Knowles*¹; ¹University of Birmingham

4:55 PM

The Microstructural Design and Thermomechanical Processing of Compositionally Complex Alloys: *Mark Wischhusen*¹; Samuel Inman¹; Jie Qi¹; Joseph Poon¹; John Scully¹; Jishnu Bhattacharyya¹; Alireza Zargarani²; Sean Agnew¹; ¹University of Virginia; ²Pohang University of Science and Technology

5:20 PM Concluding Comments

SPECIAL TOPICS

Nix Award and Lecture Symposium: Nanomechanics and Mechanomaterials — Nix Award III

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

Program Organizers: Wendelin Wright, Bucknell University; Gang Feng, Villanova University

Wednesday PM | March 2, 2022
259A | Anaheim Convention Center

Session Chairs: Gang Feng, Villanova University; Wendelin Wright, Bucknell University; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

2:00 PM Invited

2022 William D Nix Award Lecture: Mechano-materials: Engineering Mechanical Properties of Materials with Internal Interfaces and Lightweight Structures: *Huajian Gao*¹; ¹Nanyang Technological University

3:00 PM Invited

Release with Ease – Bioinspired Designs for Placing Micro-objects: *Eduard Arzt*¹; Xuan Zhang¹; Yue Wang¹; René Hensel¹; ¹INM – Leibniz Institute for New Materials and Saarland University

3:30 PM Break Coffee Break**4:00 PM Invited**

Modeling Programmable Drug Delivery in Bioelectronics with Electrochemical Actuation: *Yonggang Huang*¹; ¹Northwestern University

4:30 PM Invited

Materials by Design: Three-dimensional (3D) Nano-architected Meta-materials: *Julia Greer*¹; ¹California Institute of Technology

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Modeling and Simulations

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Wednesday PM | March 2, 2022
255B | Anaheim Convention Center

Session Chair: Vahid Tari, ATI

2:00 PM

Atomistic Modeling of -Fe₂C Carbide Precipitation Kinetics in Fe-C System: *Helena Zapolsky*¹; *Felix Schwab*¹; Renaud Patte¹; Gilles Demange¹; Armen Khachatryan²; ¹Cnrs, Gpm, Umr 6634; ²Rutgers University NJ, USA

2:20 PM

An Molecular Dynamics Simulation Study of the Interface Migration Mechanism during B2-B33 Transformation in Ni₅₀Zr₅₀ Alloy: *Huajing Song*¹; M.I. Mendelev²; ¹Los Alamos National Laboratory; ²Ames Laboratory

2:40 PM

Modeling of Phase Transformation Kinetics in Ti-6Al-4V Alloy during Additive Manufacturing: *Adrian Boccardo*¹; Xinyu Yang²; Damien Tourret³; Javier Segurado⁴; Mingming Tong²; Seán Leen²; ¹Mechanical Engineering, School of Engineering, College of Science and Engineering, National University of Ireland Galway, Galway, Ireland. I-Form Advanced Manufacturing Research Centre, National University of Ireland Galway, Galway, Ireland. IMDEA Materials Institute, Madrid, Spain; ²Mechanical Engineering, School of Engineering, College of Science and Engineering, National University of Ireland Galway, Galway, Ireland. I-Form Advanced Manufacturing Research Centre, National University of Ireland Galway, Galway, Ireland; ³IMDEA Materials Institute, Madrid, Spain; ⁴IMDEA Materials Institute, Madrid, Spain. Universidad Politécnica de Madrid (UPM), Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos, Madrid, Spain

3:00 PM

Phase Field Simulations of Microstructural Evolution Using the PRISMS-PF Framework: *David Montiel*¹; Stephen DeWitt¹; John Allison¹; Katsuyo Thornton¹; ¹University of Michigan

3:20 PM Break**3:40 PM**

A Strain-induced Austenite to Martensite Transformation Kinetics Law Implemented in Crystal Plasticity for Predicting Strain-path Sensitive Deformation of Stainless Steels: *Marko Knezevic*¹; Zhangxi Feng¹; ¹University of New Hampshire

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Powder Material Studies

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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Wednesday PM | March 2, 2022
263C | Anaheim Convention Center

Session Chairs: Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

2:00 PM

Redox Chemistry of Surface-engineered CeO₂ Nanocrystals: Catalytic and Electrochemical Applications: Yifan Wang¹; Zhen Wei¹; *Ruigang Wang*¹; ¹The University of Alabama

2:20 PM Invited

Particle-based Nanostructured Ceramics for Tailored Functional and Mechanical Properties: *Diletta Giuntini*¹; Buesra Bor²; Alexander Plunkett²; Berta Domenech²; Gerold Schneider²; ¹Eindhoven University of Technology; ²Hamburg University of Technology

2:50 PM

Silicon Oxycarbide Coatings on Zirconia Microspheres Using a Fluidized Bed Coating Process: *Kathy Lu*¹; Sanjay Singh¹; ¹Virginia Polytechnic Institute and State University

3:10 PM

Rapid Solidification of Ultrasonically Atomised Aluminium Melt: Shazamin Shahrani¹; Tungky Subroto²; Dmitry Eskin²; Iakovos Tzanakis¹; John Durodola¹; Georges Salloum-Abou-Joude³; *Abhinav Priyadarshi*¹; ¹Oxford Brookes University; ²Brunel University; ³Constellium

3:30 PM Break

3:50 PM

Understanding Mechanisms Behind Morphological Changes in Gas Atomized Powders after Laser Irradiation: *Jonathan Skelton*¹; Connor Headley¹; Eli Sullivan¹; James Fitz-Gerald¹; Jerrold Floro¹; ¹University of Virginia

LIGHT METALS

Primary Aluminum Industry - Energy and Emission Reductions: An LMD Symposium in Honor of Halvor Kvande — Energy and Emission Reductions II: An LMD Symposium in Honor of Halvor

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

Program Organizer: Arne Ratvik, SINTEF

Wednesday PM | March 2, 2022
208A | Anaheim Convention Center

Session Chair: Arne Ratvik, SINTEF Industry

2:00 PM Introductory Comments

2:05 PM

A Historical Review of Aluminum Reduction Cell Start-up and Early Operation: *Michel Reverdy*¹; Vinko Potocnik²; ¹Emirates Global Aluminium; ²Vinko Potocnik Consultant Inc.

2:30 PM

Direct and Indirect CO₂ Equivalent Emissions from Primary Aluminium Production: Halvor Kvande¹; *Gudrun Saevarsdottir*²; Barry Welch³; ¹Norwegian University of Science & Technology; ²Reykjavik University; ³University of Auckland, Auckland, New Zealand, and University of New South Wales

2:55 PM

Gas Recycling and Energy Recovery. Future Handling of Flue Gas from Aluminium Electrolysis Cells: *Samuel Senanu*¹; Asbjørn Solheim¹; Rune Lødeng¹; ¹SINTEF

3:20 PM

The TMS Industrial Aluminum Electrolysis Course – History, Development of Contents, and Future: Halvor Kvande¹; Stephen Lindsay²; Vinko Potocnik³; Alton Tabereaux⁴; Barry Welch⁵; *Michel Reverdy*; ¹Norwegian University of Science & Technology; ²Hatch. Previously; Alcoa Inc.; ³Potocnik Consultant Inc.; ⁴Smelting Consultant; ⁵University of Auckland and University of New South Wales

3:45 PM Panel Discussion

ENERGY & ENVIRONMENT

REWAS 2022: Automation and Digitalization for Advanced Manufacturing — Advanced Process Simulation, Visualization and Measurement Techniques

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

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Alexandra Anderson, Gopher Resource; Mertol Gökelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway

Wednesday PM | March 2, 2022
211B | Anaheim Convention Center

Session Chair: Alexandra Anderson, Gopher Resource

2:00 PM Introductory Comments

2:05 PM Invited

Digitalization for Advanced Manufacturing through Simulation, Visualization and Machine Learning: *Chenn Zhou*¹; John Moreland¹; Armin Silaen¹; Tyamo Okosun¹; Nicholas Walla¹; Kyle Toth¹; ¹Purdue University Northwest

2:35 PM Invited

Computational Methodology to Simulate Pyrometallurgical Processes in a Secondary Lead Furnace: Vivek Rao¹; Vineet Kumar¹; *Alexandra Anderson*²; Joseph Grogan²; ¹Oak Ridge National Laboratory; ²Gopher Resource

3:05 PM

Determining the Bubble Dynamics of a Top Submerged Lance Smelter: *Avinash Kandalam*¹; Markus Reinmöller¹; Michael Stelter¹; Markus Reuter¹; Alexandros Charitos¹; ¹TU Bergakademie Freiberg

ENERGY & ENVIRONMENT

REWAS 2022: Decarbonizing the Materials Industry — Carbon Capture, Utilization and Storage

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee, TMS: Energy Committee, TMS: Process Technology and Modeling Committee, TMS: Aluminum Committee

Program Organizers: Camille Fleuriault, Eramet Norway; Christina Meskers, Norwegian University of Science and Technology (NTNU); Mertol Gökelma, Izmir Institute of Technology; Elsa Olivetti, Massachusetts Institute of Technology; Jesse White, Elkem Carbon Solutions; Chukwunwike Iloeje, Argonne National Laboratory; Neale Neelameggham, IND LLC

Wednesday PM | March 2, 2022
212A | Anaheim Convention Center

Session Chair: Camille Fleuriault, Eramet Norway

2:00 PM Introductory Comments

2:05 PM Invited

The Carbon Age: Reimagining the Lifecycle of Fuels and Materials: *Jonah Erlebacher*¹; Shashank Lakshman¹; Jonathan Horlyck¹; Gina Greenidge¹; ¹Johns Hopkins University

2:35 PM

Field Demonstration of the Reversa Mineral Carbonation Process Using Coal and Natural Gas Flue Gas Streams: *Dale Prentice¹; Iman Mehdipour²; Gabriel Falzone³; Stephen Raab²; Dante Simonetti¹; Gaurav Sant¹; ¹University of California; ²CarbonBuilt; ³RCAM Technologies*

2:55 PM

Pilot Scale Test of Flue Gas Recirculation for the Silicon Process: *Vegar Andersen¹; Ingeborg Solheim²; Heiko Gaertner²; Bendik Sægrov-Sorte²; Kristian Einarsrud¹; Gabriella Tranell¹; ¹NTNU; ²Sintef*

3:15 PM Break

3:35 PM

Carbon Footprint Reduction Opportunities in the Manganese Alloys Industry: *Camille Fleuriault¹; Kåre Bjarte Bjelland¹; ¹Eramet Norway*

3:55 PM

Effect of Moisture and High Temperature to Separation Properties of Mixed Matrix Membranes: *Dragutin Nedeljkovic¹; ¹American University of the Middle East*

4:15 PM Invited

CO₂ as Raw Material for Chemical and Fuel Productions through Electrocatalysis: *Di-Jia Liu¹; ¹Argonne National Laboratory*

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — Microstructure-Deformation Relationships

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Wednesday PM | March 2, 2022

207C | Anaheim Convention Center

Session Chairs: Kaila Bertsch, Lawrence Livermore National Laboratory; Josh Kacher, Georgia Institute of Technology; Stephen House, University of Pittsburgh/ECC; Blythe Clark, Sandia National Laboratory

2:00 PM Invited

The Influence of Microstructural Anisotropy and Strain Rate on the Shear Response of 6061 And 7039 Aluminum Alloys: *George Gray¹; ¹Los Alamos National Laboratory*

2:30 PM Invited

Uncovering the Limits of Grain Boundary Stability through In Situ and In Operando Characterization: *Mitra Taheri¹; Jaime Marian²; David Srolovitz³; ¹Johns Hopkins University; ²University of California, Los Angeles; ³The University of Hong Kong*

3:00 PM Invited

In-situ Materials Micromechanics at Extreme Rates above 10⁶ s⁻¹: *Christopher Schuh¹; ¹Massachusetts Institute of Technology*

3:30 PM Break

3:45 PM Invited

Grain Boundary Diffusion in Stainless Steel from Atomistic Simulations: *Diana Farkas¹; ¹Virginia Polytechnic Institute*

4:15 PM Invited

On the Evolution of Dislocation Structures in Irradiated Ferritic-Martensitic Steels: *G. Robert Odette¹; Ben Eftink²; Jack Haley³; David Sprouster⁴; ¹University of California-Santa Barbara; ²Los Alamos National Laboratory; ³Oxford University; ⁴Stoneybrook University*

4:45 PM Invited

Insight into Deformation of Irradiated Materials through Combined Molecular Dynamics and In-situ TEM Studies: *Brian Wirth¹; ¹University of Tennessee*

5:15 PM Invited

The Roles of Layering and Interfaces in Radiation Resistance of MAX and MAB Phase Materials: *Izabela Szlufarska¹; Hongliang Zhang¹; Jianqi Xi¹; Ranran Su¹; Jun Kim¹; ¹University of Wisconsin-Madison*

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — Irradiation Effects in Oxides

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Wednesday PM | March 2, 2022

202A | Anaheim Convention Center

Session Chair: To Be Announced

2:00 PM

Investigation on the Impact of Proton-irradiation on Vibrational Properties of LiNbO₃ with Raman Spectroscopy: *Saqeeb Adnan¹; Maha Yazbeck¹; Yuzhou Wang²; Marat Khafizov¹; ¹The Ohio State University; ²Idaho National Laboratory*

2:20 PM

In Situ Observations of the Amorphization Behavior of Fe₂O₃, Cr₂O₃, and Al₂O₃ under Ion Irradiation: *Angelica Lopez Morales¹; Ryan Schoell¹; Tiffany Kaspar²; Ben Derby³; Nan Li³; Dan Schreiber²; Djamel Kaoumi¹; ¹North Carolina State University; ²Pacific Northwest National Laboratory; ³Los Alamos National Laboratory*

2:40 PM

Heavy-ion Irradiation Induced Cation Intermixing in Lanthanide Pyrochlores: *Benjamin Derby¹; Yogesh Sharma²; Matthew Chancey¹; James Valdez¹; Matthew Schneider¹; Yongqiang Wang¹; Aiping Chen¹; Blas Uberuaga¹; Nan Li¹; Cortney Kreller¹; Matthew Janish¹; ¹Los Alamos National Laboratory*

3:00 PM

Study of Irradiation Defects Annealing in Thermally Grown Oxides by In Situ Raman Spectroscopy: *Benoit Queylat¹; Taeho Kim¹; Adrien Couet¹; ¹University of Wisconsin, Madison*

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Processing, Microstructure & Property I

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Wednesday PM | March 2, 2022
262A | Anaheim Convention Center

Session Chairs: Megumi Kawasaki, Oregon State University; Klaus-Dieter Liss, Guangdong Technion – Israel Institute of Technology; Hang Yu, Virginia Polytechnic Institute and State University

2:00 PM Invited

Solid-state Additive Manufacturing of Ultrafine-grained Alloys via Additive Friction Stir Deposition: *Hang Yu¹; Hunter Rauch¹; ¹Virginia Polytechnic Institute and State University*

2:30 PM

Influence of Strain Gradients in Heterostructured Nanomaterials: *Daniel Goodelman¹; Andrea Hodge¹; ¹University of Southern California*

2:50 PM

Control of Layer Instabilities during ARB Processing of Iron-based FCC/BCC Metallic Laminates: *Thomas Nizolek¹; Rodney McCabe¹; Cody Miller¹; Yifan Zhang¹; Nan Li¹; Daniel Coughlin²; John Carpenter¹; ¹Los Alamos National Laboratory; ²United States Steel Corporation*

3:10 PM

Effect of Nanostructuring in Additive-manufactured 316L Stainless Steel on Structural Relaxation Examined by In-situ Heating Neutron Diffraction Analysis: *Jae-Kyung Han¹; Xiaojing Liu²; Yusuke Onuki³; Yulia Kuzminova⁴; Stanislav Evlashin⁴; Klaus-Dieter Liss²; Megumi Kawasaki¹; ¹Oregon State University; ²Guangdong Technion – Israel Institute of Technology; ³Ibaraki University; ⁴Skolkovo Institute of Science and Technology*

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — Thin Films & Confinement Effects

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

Program Organizers: Verena Maier-Kiener, Montanuniversitaet Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Thursday AM | March 3, 2022
204B | Anaheim Convention Center

Session Chairs: Benoit Merle, University Erlangen-Nuremberg (Fau); Andrea Hodge, University of Southern California

8:30 AM Invited

Analyzing Thin Film Strength and Thermo-mechanical Behavior by Wedge Indentation and Bi-metal Beams: *Daniel Kiener¹; Markus Alfreider¹; Benjamin Seligmann¹; ¹University of Leoben*

8:55 AM

An Improved Technique for Accurate Mechanical Characterization of Free-standing Films and Its Applications: *Gang Feng¹; Lu An¹; Dong Zhou¹; Bo Li¹; ¹Villanova University*

9:15 AM Invited

Mechanics of Non-equilibrium Thin Films: *Graham Cross¹; ¹Trinity College Dublin*

9:40 AM

Nanomechanical Evaluation of Porous Polymeric Thin Films: *Robert Green-Warren¹; Luc Bontoux¹; Zongling Ren²; Noah MacAllister¹; Shalaka Tendolkar¹; Lin Lei¹; Jae-Hwang Lee²; Assimina Pelegri¹; Jonathan Singer¹; ¹Rutgers University; ²University of Massachusetts*

10:00 AM Break

10:20 AM Invited

Mechanical Deformation in Nanomultilayers: *Andrea Hodge¹; ¹University of Southern California*

10:45 AM

Bulk Metallic Glass Ductility Trends Are Revealed by High Data Rate Experiments: *Jordan Sickle¹; Wesley Higgins²; Wendelin Wright³; George Pharr²; Karin Dahmen¹; ¹University of Illinois; ²Texas A&M University; ³Bucknell University*

11:05 AM

Application of Nanoindentation Strain Rate Jump Tests to Measure Strain Rate Sensitivity of Single Crystal Tungsten and Microcrystalline Cellulose: *Kevin Schmalbach¹; Albert Lin¹; Daniel Bufford²; Chenguang Wang¹; Changquan Calvin Sun¹; Nathan Mara¹; ¹University of Minnesota; ²Sandia National Laboratories*

11:25 AM

Size-dependent Indentation Behavior and Geometrically Necessary Dislocation Structures of Single-crystalline Tungsten: *Jin Wang¹; Ruth Schwaiger¹; ¹Forschungszentrum Juelich GmbH*

ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials — Unique Consolidation and Computational Processing

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

Program Organizers: Emily Rinko, Iowa State University; Iver Anderson, Iowa State University Ames Laboratory; Markus Chmielus, University of Pittsburgh; Emma White, DECHEMA Forschungsinstitut; Deliang Zhang, Northeastern University; Andrew Kustas, Sandia National Laboratories; Kyle Johnson, Sandia National Laboratories

Thursday AM | March 3, 2022
262C | Anaheim Convention Center

Session Chair: Emily Rinko, Iowa State University

8:30 AM Introductory Comments

8:35 AM Invited

Iron Nitride Based Soft Magnets through Spark Plasma Sintering: *Todd Monson*¹; Tyler Stevens¹; Stanley Atcitty¹; Baolong Zheng²; Calvin Belcher²; Yizhang Zhou²; Enrique Lavernia²; ¹Sandia National Laboratories; ²University of California, Irvine

9:05 AM

Additive Manufacturing as a Hybrid Synthesis-joining Method to Optimize Magnetic and Mechanical Properties of Dissimilar Alloys: *Donald Susan*¹; Andrew Kustas¹; Rick Kellogg¹; Dale Cillessen¹; Bradley Salzbrenner¹; ¹Sandia National Laboratories

9:25 AM

Selective Laser Melting of NiZnCu-ferrite Soft Magnetic Composites: Process-property Relationships: *Joseph Sopcisak*¹; Caleb Andrews²; Li Ma¹; Ryan Carter¹; Mitra Taheri²; ¹Johns Hopkins University Applied Physics Laboratory; ²Johns Hopkins University

9:45 AM Break

10:05 AM

The Development of a Machine Learning Guided Process for the Additive Manufacturing of Thermoelectric Materials: *Connor Headley*¹; Roberto Herrera del Valle¹; Ji Ma¹; Prasanna Balachandran¹; Vijayarabathi Ponnambalam²; Dylan Kirsch³; Saniya LeBlanc²; Joshua Martin³; ¹University of Virginia; ²George Washington University; ³National Institute for Standards and Technology

10:25 AM

Deep Learning with Generative Adversarial Network for Ti-6Al-4V Surface Roughness Improvement in Direct Energy Deposition Process: *Im Doo Jung*¹; Tae Kyeong Kim¹; Hyo Kyung Sung¹; Jung Gi Kim¹; Hyung Sub Kim¹; ¹UNIST

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — Heat Treatment Development

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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Thursday AM | March 3, 2022
258B | Anaheim Convention Center

Session Chair: Mohsen Seifi, ASTM International/Case Western Reserve University

8:30 AM Invited

Mechanical Behaviour of Additively Manufactured Al-Alloys: Impact of Post-processing: *Moataz Attallah*¹; ¹University of Birmingham

9:00 AM

Fatigue Resistance Improvement of Laser Powder Bed Fusion AlSi10Mg by Post-processing: *Juan Guillermo Santos Macias*¹; Chola Elangeswaran²; Brecht Van Hooreweder²; Jean-Yves Buffière³; Brigitte Bacroix⁴; David Tingaud⁴; Grzegorz Pyka¹; Lv Zhao¹; Aude Simar¹; ¹UCLouvain; ²KU Leuven; ³Université de Lyon; ⁴Université Paris 13

9:20 AM

The Study on Microstructural Evolution during Post-processing of Additively Manufactured Ti64: *Bryan Naab*¹; Denis Dowling¹; Mert Celikin¹; ¹University College Dublin

9:40 AM

Tailoring Hot Isostatic Pressing Treatments to Homogenize Process-dependent Microstructures and Mechanical Properties of Electron Beam Melted Ti-6Al-4V Parts: *Jake Benzing*¹; Nik Hrabe¹; Enrico Lucon¹; Tim Quinn¹; Julius Bonini²; Chad Beamer³; Magnus Ahlfors³; ¹National Institute of Standards and Technology; ²Lucideon Consulting; ³Quintus Technologies

10:00 AM Break

10:20 AM Invited

Cold Spray for Aircraft Structural Repair: *Sarah Galyon Dorman*¹; Justin Rausch¹; Moriah Ausherman¹; Scott Fawaz¹; ¹SAFE Inc

10:50 AM

Effects of Process Parameters, Post-processing, and Defects on Tension and Fatigue Properties of LPBF AlSi10Mg: *Austin Ngo*¹; Collin Sharpe¹; Varthula Jayasekera²; Brett Conner³; Holly Martin²; Christopher Tuma¹; John Lewandowski¹; ¹Case Western Reserve University; ²Youngstown State University; ³Honeywell Federal Manufacturing & Technologies

11:10 AM

Effects of Processing Parameters and Heat Treatments on the Mechanical Properties of SS316L Parts Repaired by Laser Metal Deposition: *Thomas Cailloux*¹; Wilfried Pacquentin¹; Narasimalu Srikanth²; Hicham Maskrot¹; Frédéric Schuster¹; Kun Zhou²; Fanny Balbaud¹; ¹CEA; ²Nanyang Technological University

11:30 AM

Effects of Process Parameters, Defects, and HIP Processing on S-N Fatigue of LPBF AlSi10Mg: Collin Sharpe¹; Austin Ngo¹; Christopher Tuma²; Michael Shinohara¹; Holly Martin¹; John Lewandowski¹; ¹Case Western Reserve University

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — Advanced Mechanical Characterization of AM Alloys

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Thursday AM | March 3, 2022
258A | Anaheim Convention Center

Session Chair: Donald Brown, Los Alamos National Laboratory

8:30 AM

In Situ Synchrotron Characterization of the Fatigue Behavior of WE43 Mg Porous Scaffolds for Biomedical Applications: Dolores Martin¹; Guillermo Dominguez²; Muzi Li¹; Federico Sket¹; Monica Echeverry-Rendón¹; Felix Benn²; Alexander Kopp²; Jon Molina-Aldareguia¹; Javier Llorca³; ¹IMDEA Materials Institute; ²Meotec; ³IMDEA Materials Institute & Technical University of Madrid

8:50 AM

Investigating the Impact and Evolution Porosity of LPBF Ti6Al4V Using In-situ Mechanical/XCT Testing: Hossein Talebinezhad¹; Ralf Fischer¹; Barton Prorok¹; ¹Auburn University

9:10 AM

Cellular Structures Strengthening Mechanisms and Thermal Stability of L-PBF Stainless Steel 316L: Jean-Baptiste Forien¹; Aurelien Perron¹; Sylvie Aubry¹; Nicolas Bertin¹; Amit Samanta¹; Alexander Baker¹; Y. Morris Wang¹; Marissa Linne¹; Margaret Wu¹; Nathan Barton¹; Thomas Voisin¹; ¹Lawrence Livermore National Laboratory

9:30 AM

On the Effects of Additive Manufacturing Process Parameters on the Performance of Hastelloy-X: A Neutron Diffraction Experiment and CPFE Modeling: Ahmed Aburakhia¹; Ali Bonakdar²; Marjan Molavi-Zarandi³; Joe Keller⁴; Hamidreza Abdolvand¹; ¹Western University; ²Siemens Energy Canada Limited; ³National Research Council; ⁴ISIS Neutron and Muon Source User Office

9:50 AM Break

10:05 AM

In-situ Process Monitoring for Laser Powder Bed Fusion: A Data-driven Approach: Anant Raj¹; Dongli Huang¹; Benjamin Stegman¹; Hany Abdel-Khalik¹; Xinghang Zhang¹; John Sutherland¹; ¹Purdue University

10:25 AM

In-situ Residual Strain Monitoring in Metal Additive Manufacturing: Sandra Cabeza Sanchez¹; Burak Ozcan¹; Thilo Pirling¹; Thomas Hansen¹; Ines Puente Orench²; ¹ILL; ²ILL, CSIC

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — Other Alloys

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Thursday AM | March 3, 2022
261A | Anaheim Convention Center

Session Chair: Orlando Rios, University of Tennessee

8:30 AM

Additive Manufacturing of AlCu0.5FeNiCoCr High-Entropy Alloy: Bandar AlMangour¹; ¹King Fahd University of Petroleum and Minerals

8:50 AM

Laser Powder Bed Fusion Additive Manufacturing of Pure Copper (Cu) Metal: Maryam Sadeghilaridjani¹; Leila Ladani¹; ¹Arizona State University

9:10 AM

Rapid Design and Evaluation of Compositionally Complex Alloys by Combining Additive Manufacturing with Machine Learning Methods: Phalgun Nelaturu¹; Jason Hattrick-Simpers²; Michael Moorehead¹; Santanu Chaudhuri³; Adrien Couet¹; Dan Thoma¹; ¹University of Wisconsin; ²National Institute of Standards and Technology; ³Argonne National Laboratory

9:30 AM

Site-specific Grain Boundary Engineering of Additively Manufactured Stainless Steel: Shubo Gao¹; Matteo Seita¹; ¹Nanyang Technological University

9:50 AM Break

10:05 AM

Versatile Additive Manufacturing of Metals and Alloys via Hydrogel Infusion: Max Saccone¹; Daryl Yee²; Rebecca Gallivan¹; Kai Narita¹; Julia Greer¹; ¹Caltech; ²MIT

10:25 AM

Comparison of Multiple Rapid Solidification Techniques to Accelerate Stainless Steel Alloy Development in Additive Manufacturing: Zachary Hasenbusch¹; Johnathan Roze¹; Andy Deal²; Ben Brown²; Davis Wilson²; Laurentiu Nastac¹; Luke Brewer¹; ¹University of Alabama; ²Honeywell FM&T

10:45 AM

Mechanical Behavior of Functionally Integrated Materials Produced by Directed Energy Deposition: Benjamin MacDonald¹; Baolong Zheng¹; Sen Jiang¹; Penghui Cao¹; Lorenzo Valdevit¹; Enrique Lavernia²; Julie Schoenung¹; ¹University of California, Irvine; ²National Academy of Engineering

11:05 AM

Efficacy of Elemental Mixing for In Situ Alloyed Al-33wt%Cu during Laser Powder Bed Fusion: Jonathan Skelton¹; Eli Sullivan¹; James Fitz-Gerald¹; Jerrold Floro¹; ¹University of Virginia

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — Defects and Damage/Deformation Mechanisms and Mechanical Properties

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

Program Organizers: Meysam Haghshenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Thursday AM | March 3, 2022
260A | Anaheim Convention Center

Session Chairs: Robert Lancaster, Swansea University; Jordan Weaver, National Institute of Standards and Technology

8:30 AM

Deciphering the Fundamental Cause of Shape Distortion in Sintering-based Additive and Non-additive Manufacturing Processes: *Sandra Ritchie*¹; Sasa Kovacevic¹; Prith Deshmukh¹; Sinisa Mesarovic¹; Rahul Panat¹; ¹Carnegie Mellon University

8:50 AM

Mechanical Properties of Tantalum Cold Sprayed Deposits: Insight Into the Interstitial Hydrogen Content and Powder Size Distribution Effects: *Mahsa Amiri*¹; Klia Soto Leytan¹; Daniel R. Mumm¹; Lorenzo Valdevit¹; ¹University of California, Irvine

9:10 AM

Deformation Mechanism of Selective Laser Melted 316L Stainless Steel and Its Cellular Substructure Dependence: *Feng He*¹; ¹State Key Laboratory of Solidification Processing

9:30 AM

Capturing the Effects of Grain Boundaries and Interplat Boundaries on Deformation Behavior of Cold Sprayed Components: *Yubraj Paudel*¹; Ryan Cochran¹; Shiraz Mujahid¹; Kyle Considine¹; Hongjoo Rhee¹; ¹Mississippi State University

9:50 AM Break

10:10 AM

Probing Heterogeneous Mechanical Properties in AM Materials Due to Melt Pool Boundaries: *John Fite*¹; Timothy Weihs²; John Slotwinski¹; Suhas Eswarappa Prameela²; ¹JHU Applied Physics Lab; ²Johns Hopkins University

10:30 AM

Hardening Rate Dependent Deformation Behavior of Additively Manufactured Inconel 718 during Nano-scratch: *Mustafa Rifat*¹; Saurabh Basu¹; ¹Pennsylvania State University

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session VII

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Thursday AM | March 3, 2022
207A | Anaheim Convention Center

Session Chairs: Jay Carroll, Sandia National Laboratories; Mitra Taheri, Johns Hopkins University

8:30 AM Invited

Accessing Order-dependent Defect Distributions Using Novel Diffraction Techniques: *Mitra Taheri*¹; ¹Johns Hopkins University

9:00 AM

A Thermo-mechanical Model for Dislocation Dynamics in Transient Heterogeneous Temperature Fields: *Manas Upadhyay*¹; ¹LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris

9:20 AM

The Role of GNDs in Memory Response of FCC and BCC Metals during Deformation: *Tristan Russell*¹; David Fullwood¹; Robert Wagoner²; Sobhan Nazari Tiji²; Guowei Zhou³; ¹Brigham Young University; ²Ohio State University; ³Shanghai Jiao Tong University

9:40 AM

Low kV EBSD & Physics-based Modeling of Dislocation Cell Structures in Aluminum: *Toby Francis*¹; Chaoyi Zhu¹; Elizabeth Holm¹; Marc De Graef¹; ¹Carnegie Mellon University

10:00 AM Break

10:15 AM Invited

Dominant Microstructural Features Impacting Failure in Additively Manufactured AlSi10Mg: *Jay Carroll*¹; Christopher Laursen¹; Philip Noell¹; John Emery¹; David Moore¹; Garrett Pataky²; ¹Sandia National Laboratories; ²Clemson University

10:45 AM

Improving 2D Diffraction Peak Detection Using Shannon Entropy: *Kieran Nehil-Puleo*¹; Jonathan Tischler²; *Philip Eisenlohr*¹; ¹Michigan State University; ²Argonne National Laboratory

11:05 AM

Exploring Plastic Deformation and Color of Metals with Mathematical Morphology: *Michael Glazoff*¹; ¹Idaho National Laboratory

11:25 AM

Use of Spherical Nanoindentation Protocols to Study the Anisotropic Mechanical Response of α - β Single Colonies in Ti-6Al-4V Alloy: *Soumya Mohan*¹; Adam Pilchak²; Surya Kalidindi¹; ¹Georgia Institute of Technology; ²Air Force Research Laboratory

11:45 AM

Advanced Characterization of Mock High Explosive: *Summer Camerlo*¹; William Wallace¹; Gus Becker¹; Amy Clarke¹; Kester Clarke¹; ¹Colorado School of Mines

ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings — Thin Films and Nanostructures for Optoelectronics I

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Ramana Chintalapalle, University of Texas at El Paso; Adele Carrado, IPCMS - CNRS Université de Strasbourg; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougín, Cnrs - Is2m; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Thursday AM | March 3, 2022
252B | Anaheim Convention Center

Session Chairs: Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougín, Cnrs - Is2m

8:30 AM Introductory Comments

8:40 AM

(CrMoTaVNb)Si₂: A Novel Single-phase High Entropy Silicide Material: Aleksandra Vyatskikh¹; Benjamin MacDonald²; Leonardo Velasco³; Alexander Dupuy²; Enrique Lavernia²; Julie Schoenung²; Horst Hahn³; ¹University of California Irvine; ²University of California Irvine; ³Karlsruhe Institute of Technology

9:00 AM Invited

Ellipsometry Characterization of Plasmonic Responses of Nanoparticles: Aotmane En Naciri¹; ¹Université de Lorraine

9:30 AM

Fabrication of Carbon Encapsulated Si Nano-particles for High Performance Li-ion Batteries: Aamna Hameed¹; Abhishek Lokhande¹; Daniel Choi¹; ¹Khalifa University of Science and Technology

9:50 AM Break

10:10 AM Invited

Bandgap Emission of Czochralski-silicon Coated with Spin-coated Silica Using Various Catalysis: Sufian Abedrabbo¹; El Mostafa Benchafia¹; Ahmad Al-Qawasmeh¹; Nuggehalli Ravindra²; Anthony Fiory³; ¹Khalifa University; ²New Jersey Institute of Technology; ³Integron Solutions LLC

10:40 AM

Radiative Properties of Polymers: Airefeto Sadoh¹; Samiha Hossain¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

11:00 AM

Enhancing Light Emission Properties of c-Si by Developing Stresses on Silicon Surface via Sol-gel Ceramic Coatings: Ali Abdullah¹; El Mostafa Benchafia¹; Daniel Choi¹; Sufian Abedrabbo¹; ¹Khalifa university

11:20 AM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Sensors, Power, and Multifunctional Applications — Nanoscale Magnetism and High Coercivity Materials

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

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Eric Theisen, Metglas Inc.; Huseyin Ucar, California Polytechnic University, Pomona; Yongmei Jin, Michigan Technological University

Thursday AM | March 3, 2022
213B | Anaheim Convention Center

Session Chair: Yongmei Jin, Michigan Technological University

8:30 AM

Evolution of Magnetic Properties during the Post-annealing Process for the Sintered (NdLa)-(FeCo)-B Based Magnets: Wei Tang¹; Jing Wang¹; Kinjal Gandha¹; Xubo Liu¹; Kevin Dennis¹; Ikenna Nlebedim¹; Ryan Ott¹; Scott McCall²; David Parker³; Jun Cui⁴; ¹Ames Laboratory; ²Lawrence Livermore National Laboratory; ³Oak Ridge National Laboratory; ⁴Iowa State University

8:50 AM Invited

Metal-organic Magnets with Large Coercivity and Ordering Temperatures up to 242°C: Itziar Oyarzabal¹; Panagiota Perlepe²; Aaron Mailman³; Morgane Yquel²; Mikhail Platunov⁴; Iurii Dovgaliuk⁵; Mathieu Rouzières²; Philippe Negrier⁶; Denise Mondieig⁶; Elizaveta A. Sutinina⁷; Dourges Marie-Anne⁸; Sébastien Bonhommeau⁸; Rebecca A. Musgrave²; Kasper Pedersen²; Dmitry Chernyshov⁵; Fabrice Wilhelm⁴; Andrei Rogalev⁴; Corine Mathonière⁹; Rodolphe Clérac²; ¹BCMaterials - Ikerbasque; ²Centre de Recherche Paul Pascal; ³University of Jyväskylä; ⁴ESRF-The European Synchrotron; ⁵ESRF - Swiss-Norwegian Beamline; ⁶Laboratoire Ondes et Matière d'Aquitaine - CNRS / Univ. Bordeaux; ⁷University of Bath; ⁸ISM - CNRS / Univ. Bordeaux; ⁹ICMCB - CNRS / Univ. Bordeaux

9:20 AM

Quantum-confined Charge Transfer that Enhances Magnetic Anisotropy in Lanthanum M-type Hexaferrites: Churna Bhandari¹; Durga Paudyal¹; ¹Ames Laboratory

9:40 AM

Additive Manufacturing of 3D Metallic Structures: An Environmental-friendly Way of Printing Cellulose-based Metallic Inks: Bosco Rodriguez¹; Daniel Salazar¹; D. Payno¹; Volodymyr Chernenko²; ¹BCMaterials; ²BCMaterials; Ikerbasque, Basque Foundation for Science

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Energy Conversion and Energy Storage MIX II

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Thursday AM | March 3, 2022
212B | Anaheim Convention Center

Session Chair: Peter Godart, Massachusetts Institute of Technology

8:30 AM Invited

3D Printed Carbon and Graphene Aerogels for Energy Storage Applications: Swetha Chandrasekaran¹; Dun Lin²; Bin Yao²; Jean-Baptiste Forien¹; Juergen Biener¹; Victor Beck¹; Yat Li²; Marcus Worsley¹; ¹Lawrence Livermore National Laboratory; ²University of California, Santa Cruz

8:50 AM Invited

Bulk Ferroelectric Metamaterial with Enhanced Piezoelectric and Biomimetic Mechanical Properties from Additive Manufacturing: Jun Li¹; ¹University of Wisconsin-Madison

9:10 AM Invited

Continuous Process for Harvesting Energy from Aluminum Scrap via Liquid-metal Activation: Peter Godart¹; Douglas Hart¹; ¹Massachusetts Institute of Technology

9:30 AM

Machine Learning-driven Analytics for Solid-state Batteries: Debanjali Chatterjee¹; Bairav S. Vishnugopi¹; Partha P. Mukherjee¹; ¹Purdue University

9:50 AM Break

10:10 AM

Use of Machine Learning Methods to Predict Remaining Useful Life of Lithium-ion Batteries after Experiencing Non-catastrophic Nail Puncture: Casey Jones¹; Meghana Sudarshan¹; Alex Serov¹; Vikas Tomar¹; ¹Purdue University

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | March 3, 2022
251A | Anaheim Convention Center

Session Chairs: Jianxun Hu, Honda Development & Manufacturing of Americas; Baldur Steingrimsen, Imagars LLC

8:30 AM Invited

A Comparison of the Sliding Wear of Carbon-doped Fe_{40.4}Ni_{11.3}Mn_{34.8}Al_{7.5}Cr₆ and CoCrFeMnNi High Entropy Alloys with 316 Stainless Steel at 293 K and Cryogenic Temperatures: Ian Baker¹; F.E. Kennedy¹; Y. Ye¹; J. D. Bonilla Toledo¹; R.R. White¹; R.L. Barry¹; X. Guo²; S.P. Ringer³; H. Chen³; W. Zhang⁴; Y. Liu⁴; M. Song⁴; ¹Dartmouth College; ²School of Materials Science and Engineering, Central South University; ³The University of Sydney; ⁴Central South University

8:50 AM Invited

Thermodynamics and Phase Transformations in Refractory Complex Concentrated Superalloys: Eric Lass¹; ¹University of Tennessee-Knoxville

9:10 AM

Antimicrobial Properties of a Multicomponent Alloy: Anne Murray¹; Daniel Bryan¹; David Garfinkle¹; Cameron Jorgensen¹; Eric Lass¹; Easo George²; Ying Yang²; Philip Rack¹; Tom Denes¹; Dustin Gilbert¹; ¹University of Tennessee; ²Oak Ridge National Lab

9:30 AM Invited

Development of Multi-principal-element Alloys and the Applications in Dissimilar Metals Welding: Jianxun Hu¹; Peiyong Chen²; Xuesong Fan²; John Bohling²; Chanho Lee³; Peter Liaw²; Carl Lundin²; A. M. M. Abdelmotagaly⁴; Zhenzhen Yu⁴; ¹Honda Manufacturing & Development, Americas; ²University of Tennessee; ³Los Alamos National Laboratory; ⁴Colorado School of Mines

9:50 AM Break

10:10 AM

Spinodal Decomposition in Multi-component Alloys: Shalini Koneru¹; Kamalnath Kadirvel¹; Yunzhi Wang¹; ¹The Ohio State University

10:30 AM Invited

Compositionally Complex Ceramics (CCCs): Jian Luo¹; ¹University of California, San Diego

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM | March 3, 2022
251B | Anaheim Convention Center

Session Chairs: Fritz Körmann, TU Delft; Ganesh Balasubramanian, Lehigh University

8:30 AM

Expediting the Materials Discovery Process of MPEAs through Efficient Coupling of High-throughput Density Functional Theory, Molecular Dynamics and Machine Learning Techniques: *Jacob Startt*¹; Mitchell Wood¹; Sean Donegan²; Remi Dingreville¹; ¹Sandia National Labs; ²Air Force Research Lab

8:50 AM

Machine Learning Enabled Defect Energies Prediction in Concentrated Alloys: Anus Manzoor¹; Gaurav Arora¹; *Dilpuneet Aidhy*¹; ¹University of Wyoming

9:10 AM

Exploration of Refractory Complex Concentrated Alloys through the Use of High-throughput Calculations and Experimentation: *Austin Hernandez*¹; Sharmila Karumuri¹; Sona Avetian¹; Zachary McClure¹; Logan Ware¹; Alejandro Strachan¹; Ilias Bilionis¹; Kenneth Sandhage¹; Michael Titus¹; ¹Purdue University

9:30 AM

Revealing Strengthening Mechanisms in Refractory Multi-principal Elements Alloys: *Xinyi Wang*¹; Francesco Maresca²; Penghui Cao¹; ¹University of California, Irvine; ²University of Groningen

9:50 AM Break

10:10 AM

Factors Affecting Stacking Fault Energy in Concentrated Alloys Using Density Functional Theory and Machine Learning: *Gaurav Arora*¹; Anus Manzoor¹; Dilpuneet Aidhy¹; ¹University Of Wyoming

10:30 AM

Machine Learning Guided Descriptor Selection for Predicting Corrosion Resistance in Multi-principal Element Alloys (MPEAs): *Ankit Roy*¹; M. F. N. Taufique²; Hrishabh Khakurel³; Ram Devanathan²; Duane Johnson⁴; Ganesh Balasubramanian¹; ¹Lehigh University; ²Pacific Northwest National Lab; ³The University of Texas at Arlington; ⁴Ames Laboratory

MATERIALS DESIGN

Advances in Titanium Technology — General Topics in Ti Alloys

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Thursday AM | March 3, 2022
252A | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM

Hierarchical a Microstructure in a Metastable β Ti-5Al-5Mo-5V-3Cr Alloy: *Dian Li*¹; Wenrui Zhao¹; Xing Zhang²; Stoichko Antonov³; Yiliang Liao²; Yufeng Zheng¹; ¹University of Nevada, Reno; ²Iowa State University; ³Max-Planck-Institut für Eisenforschung GmbH

8:50 AM

The Influence of Fe and Al on the Microstructure and Mechanical Performance of Ti-Cr Alloys: *Joann Ballor*¹; Jonathan Poplawsky²; Elizabeth Kautz³; Bharat Gwalani³; Arun Devaraj³; Alexandra Zevalkink¹; Scott Misture⁴; Masahiko Ikeda⁵; Carl Boehlert¹; ¹Michigan State University; ²Oak Ridge National Laboratory; ³Pacific Northwest National Laboratory; ⁴Alfred University; ⁵Kansai University

9:10 AM

A Comparative Study on Mechanical Properties of Additively Manufactured Titanium Alloys: Mohammad Yasin¹; *Arash Soltani-Tehrani*; Meysam Haghshenas²; Shuai Shao¹; Nima Shamsaei¹; ¹Auburn University; ²University of Toledo

9:30 AM

Development of a Phenomenological Equation to Predict Yield Strength in Additively Manufactured Ti-5Al-5V-5Mo-3Cr: *Andrew Temple*¹; Madison Harrington¹; Peter Collins¹; ¹Iowa State University

9:50 AM

Microstructural and Mechanical Properties Structural Repairs of near α and near β Titanium Alloys by Additive Friction Stir Deposition: *Christopher Williamson*¹; Zack Tew¹; Malcolm Williamson¹; James Jordon¹; Paul Allison¹; ¹The University of Alabama

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Data Mining/Microstructure

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Thursday AM | March 3, 2022
256A | Anaheim Convention Center

Session Chair: Darren Pagan, Pennsylvania State University

8:30 AM Invited

Making the Most of What We've Got: Designing Microstructural Data Sets for AI Applications: *Elizabeth Holm*¹; ¹Carnegie Mellon University

9:00 AM

Generating Discrete Dislocation Dynamics Structures from Experimental μ XRD Images Using Graph-based Neural Networks: *Dylan Madisetti*¹; Christopher Stiles²; Jaafar El Awady¹; ¹Johns Hopkins University; ²Johns Hopkins University Applied Physics Laboratory

9:20 AM

Efficient Generation of Arbitrary N-field Microstructures from 2-point Statistics Using Multioutput Gaussian Random Fields: *Andreas Robertson*¹; Surya Kalidindi¹; ¹Georgia Institute of Technology

9:40 AM

One-stage Simulation of EBSD Patterns over Multiple Parameters through a CVAE-GAN Model: *Zihao Ding*¹; Marc Graef¹; ¹Carnegie Mellon University

10:00 AM Break

10:20 AM

Spatiotemporal Prediction of Microstructure by Deep Learning: *Amir Abbas Kazemzadeh*¹; Mahmood Mamivand¹; ¹Boise State University

10:40 AM

A Generalized Spherical Harmonics-based Procedure for the Interpolation of Partial Datasets of Orientation Distributions to Enable Crystal Mechanics-based Simulations: *Marko Knezevic*¹; Russell Marki¹; Kyle Brindley²; Sven Vogel²; Rodney McCabe²; ¹University of New Hampshire; ²Los Alamos National Laboratory

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — ML Algorithms and Their Applications II

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendeleev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Thursday AM | March 3, 2022
253A | Anaheim Convention Center

Session Chairs: Enrique Martinez Saez, Clemson University; Sam Reeve, Oak Ridge National Laboratory

8:30 AM

Designing Thin Film Microstructures via Neuroevolution Guided Time-dependent Processing Protocols: *Saaketh Desai*¹; Remi Dingreville¹; ¹Sandia National Laboratories

8:50 AM

Application of Vision Transformers in Tomography Image Segmentations of AM Parts: *Saber Nemat*¹; Les Butler¹; Shengmin Guo¹; ¹Louisiana State University

9:10 AM

Neural Network Models of Phase Field Simulations: *Haiying Yang*¹; Michael Demkowicz¹; ¹Texas A&M University

9:30 AM

Random Forest Regressor Models for the Prediction of Novel Alloy Corrosion Performance: *Bonita Goh*¹; Yafei Wang²; Phalgun Nelaturu²; Thien Duong³; Dan Thoma²; Jason Hattrick-Simpers⁴; Santanu Chaudhuri³; Adrien Couet²; ¹University of Wisconsin Madison; ²University of Wisconsin Madison; ³Argonne National Laboratory; ⁴National Institute of Standards and Technology

9:50 AM Break

10:10 AM

Predicting Temperature-dependent Oxide Redox Reactions with Machine-learning Augmented First-principles Calculations: José Garrido Torres¹; Vahe Gharakhanyan¹; Tobias Hoffmann Eegholm¹; Nongnuch Artrith¹; *Alexander Urban*¹; ¹Columbia University

10:30 AM

Using Machine Learning Methods to Decode VO_x Diffractograms: *Saaketh Desai*¹; Suvo Banik²; Haidan Wen²; Subramanian Sankaranarayanan²; Remi Dingreville¹; ¹Sandia National Laboratories; ²Argonne National Laboratory

LIGHT METALS

Aluminum Reduction Technology — Cell Design and New Processes

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

Program Organizers: Kristian Etienne Einarsrud, Norwegian University of Science and Technology; Stephan Broek, Boston Metal; Mertol Göknelma, Izmir Institute of Technology; Dmitry Eskin, Brunel University

Thursday AM | March 3, 2022
209B | Anaheim Convention Center

Session Chair: Camilla Sommerseth, SINTEF Industry

8:30 AM Introductory Comments

8:35 AM

Preparation of Aluminum Master Alloys by Electrolytic Co-deposition in Hall-Héroult Cells: *Xiangwen Wang*¹; ¹Alcoa Corporation

9:00 AM

Direct Production of Aluminum Manganese and Silicon Alloys in Aluminum Reduction Cells, A Laboratory Test: *Gudrun Saevarsdottir*¹; Omar Awayassa²; Rauan Meirbekova³; Geir Haarberg²; ¹Reykjavik University; ²NTNU; ³DTE

9:25 AM

Trace Elements in Aluminium Smelting Carbon Dust and Their Extraction: Aleksandr Shimanski¹; *Andrey Yasinskiy*¹; Vladimir Losev¹; Olga Buyko¹; Yakov Kazantsev¹; Nataliya Simonova¹; ¹Siberian Federal University

9:50 AM Break

10:05 AM

Developing and Implementing an Efficient Forced Cooling Network at Aluminerie Alouette: *Diego Oitabén*¹; Jules Côté²; Marc Gagnon²; Alain Charbonnier³; Patrice Verdu³; Olivier Martin³; François Riffaud¹; Alexandre Lamoureux¹; André Felipe Schneider¹; Julien Samson¹; Simon Poirier¹; ¹Hatch; ²Aluminerie Alouette; ³Rio Tinto

ADVANCED MATERIALS

Bulk Metallic Glasses XIX — Glass-forming Ability and the Glass Transition

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Thursday AM | March 3, 2022
253C | Anaheim Convention Center

Session Chairs: Yonghao Sun, Chinese Academy of Sciences; Paul Voyles, University of Wisconsin

10:00 AM Invited

Surface Mobility of Metallic Glass Thin Films Controls Glass Phase Stability and Crystallization: Debaditya Chatterjee¹; Ajay Annamareddy¹; Chengrong Cao¹; Yuhui Li¹; John Perepezko¹; Lian Yu¹; Dane Morgan¹; *Paul Voyles*¹; ¹University of Wisconsin

10:25 AM

Inside Glass Tormation: The Pathway of Metallic Liquids to Vitrification Monitored in Situ by Ultrafast High-energy Synchrotron X-ray Diffraction: *Martin Stiehler*¹; Mark Jolly¹; Konstantinos Georgarakis¹; ¹Cranfield University

10:45 AM

Structural Influences on Glass Forming Ability in Mg-Ni-Y: *Carter Francis*¹; Janine Erickson¹; John Sunderland¹; Chengrong Cao¹; Dan Thoma¹; John Perepezko¹; Paul Voyles¹; ¹University of Wisconsin Madison

11:05 AM Discussion on glass formation of metallic glasses

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Advanced Characterization Methods II

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Thursday AM | March 3, 2022
207B | Anaheim Convention Center

Session Chairs: Kelvin Xie, Texas A&M University; Rajiv Soman, Eurofins EAG Materials Science LLC

8:30 AM Introductory Comments

8:35 AM

Analysis of MoNbTi and HfNbTaTiZr Refractory High Entropy Alloys by Atom Probe Tomography: *Patrick Callahan*¹; David Beaudry²; Keith Knipling¹; ¹US Naval Research Laboratory; ²Johns Hopkins University

8:55 AM

On the Phase Composition, Properties and Application of AlMgB14-based Materials: Ilya Zhukov¹; *Pavel Nikitin*¹; Alexander Vorozhtsov¹; ¹Tomsk State University

9:15 AM

TEM Characterization of an AS7G06 Alloy with Several Heat Treatments: *Nicolas Bello*¹; Cassiopée Galy²; Céline Larignon²; Joël Douin¹; ¹CEMES-CNRS; ²IRT Saint Exupéry

9:35 AM

Sample Preparation Influence on a Direct Artificially Aged Al-Si-Mg Alloy Elaborated by Laser Beam Melting: *Nicolas Bello*¹; Cassiopée Galy²; Céline Larignon²; Joël Douin¹; ¹CEMES-CNRS; ²IRT Saint Exupéry

9:55 AM

Ion-irradiation-induced Property Change in FeCr: Hardness, Thermal Diffusivity and Lattice Strain: *Kay Song*¹; Suchandrima Das¹; Abdallah Reza¹; Nicholas Phillips²; Ruqing Xu³; Hongbing Yu⁴; Kenichiro Mizohata⁵; David Armstrong¹; Felix Hofmann¹; ¹University of Oxford; ²Paul Scherrer Institut; ³Argonne National Laboratory; ⁴Canadian Nuclear Laboratories; ⁵University of Helsinki

ENERGY & ENVIRONMENT

Composite Materials for Sustainable Eco-Friendly Applications — Eco-Friendly Composites - Naturally Sourced Materials

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Simona Hunyadi Murph, Savannah River National Laboratory

Thursday AM | March 3, 2022
211A | Anaheim Convention Center

Session Chair: Ioannis Mastorakos, Clarkson University

8:30 AM

Additive Manufacturing with Wood-based Composites for Building Construction Applications: *Michael Maughan*¹; Conal Thie¹; Berlinda Orji¹; Robert Carne¹; Tais Mitchell¹; Kenneth Baker¹; Armando McDonald¹; ¹University of Idaho

8:50 AM

Designing Novel MicroNano Concrete as Subsurface Hydraulic Barrier Materials Using Shale Rocks as Templates: *Cody Massion*¹; Vamsi S.K. Vissa¹; Yunxing Lu²; Dustin Crandall³; Andrew Bunker²; Mileva Radonjic¹; ¹Oklahoma State University; ²University of Pittsburgh; ³National Energy Technology Laboratory

9:10 AM

Prediction of the Mechanical Properties of Epoxy-snail Shell Particulate (ESSP) Composites Using Artificial Neural (ANN) Method: *Ademola Agbeleye*¹; Harrison Onovo¹; ¹University of Lagos

9:30 AM

Biodegradability of Bioplastic Films with Manihot Esculenta Starch in Natural Environment: *Harrison Onovo*¹; Ademola Agbeleye¹; Ruth Nnaji¹; Esther Towolawi¹; ¹University of Lagos, Nigeria

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Phonons and Other Excitations/Diffusion and Kinetics

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoulia, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Thursday AM | March 3, 2022
255C | Anaheim Convention Center

Session Chairs: Sara Kadkhodaei, University of Illinois at Chicago ; Liang Qi, University of Michigan

8:30 AM

Understanding the Role of Anharmonic Phonons in Diffusion of bcc Metal: *Seyyedfaridoddin Fattahpour*¹; Sara Kadkhodaei¹; ¹University of Illinois at Chicago

8:50 AM

Phonon and Thermodynamic Properties of Defected-ThO₂ and (U,Th)O₂: *Maniesha Singh*¹; Tomohisa Kumagai²; Anter El-Azab¹; ¹Purdue University; ²Central Research Institute of Electric Power Industry

9:10 AM

Matryoshka Phonon Twinning in γ -Ga₂O₃: *Bin Wei*¹; Qingan Cai²; Qiyang Sun²; Yaokun Su²; Ayman Said³; Doug Abernathy⁴; Jiawang Hong⁵; *Chen Li*²; ¹Henan Polytechnic University; ²University of California-Riverside; ³Argonne National Laboratory; ⁴Oak Ridge National Laboratory; ⁵Beijing Institute of Technology

9:30 AM Invited

First-principles Investigations of Corrosion Mechanisms of Lightweight Metals: *Liang Qi*¹; Mingfei Zhang¹; Louis Hector Jr.²; Aditya Sundar¹; Ganlin Chen¹; ¹University of Michigan; ²General Motors Research and Development

10:00 AM Break**10:20 AM**

Simplified and Robust Diffusion Coefficient Models for Reliable Diffusion (Atomic Mobility) Databases: *Wei Zhong*¹; Qiaofu Zhang²; Ji-Cheng Zhao¹; ¹University of Maryland; ²QuesTek Innovations LLC

10:40 AM

Role of Electrical and Chemical Stimuli on the Electrical Responses of Resistive RAM and Neuromorphic Computing Devices: A Phase Field Study: *Arijit Roy*¹; Pil-Ryung Cha¹; ¹Kookmin University

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — New Material & Design Considerations

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Thursday AM | March 3, 2022
263A | Anaheim Convention Center

Session Chairs: Jonathan Cormier, ISAE-ENSMA & Institut Pprime; Jean Charles Stinville, University of Illinois at Urbana-Champaign

8:30 AM

Tensile Ductility and Plastic Deformation Behavior of Polycrystalline Refractory Multi-principal Element Alloys: *Leah Mills*¹; Jean-Charles Stinville¹; Marie-Agathe Charpagne¹; Carolina Frey¹; Valéry Valle²; Noah Philips³; Daniel Gianola¹; Tresa Pollock¹; ¹University of California-Santa Barbara; ²Pprime Institut-Université de Poitiers; ³ATI Specialty Alloys and Components

8:50 AM

Composition and Heat Treatment Modifications of a New Low-cost Ni Base Wrought Alloy for Improved Creep Resistance and Elevated Temperature Ductility: *Ning Zhou*¹; Filip Van Weereld¹; Gian Colombo¹; ¹Carpenter Technology Corporation

9:10 AM

A Comparative Analysis of the Low-cycle Fatigue Behaviors of HAYNES 244 Alloy and Waspaloy: *Michael Fahrman*¹; ¹Haynes International

9:30 AM

Deformation Twinning during Elevated Temperature Testing in HAYNES® 244® Alloy: *Thomas Mann*¹; Michael Fahrman²; Michael Titus¹; ¹Purdue University; ²Haynes Intl

9:50 AM

An In-situ SEM Elevated-temperature Investigation of Serrated Plastic Flow in a CoCrFeNiW-C Alloy: *Shaolou Wei*¹; Daniel Moriarty¹; Cem Tasan¹; ¹Massachusetts Institute of Technology

SPECIAL TOPICS

DMMM4 — Combating Biases in STEM

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Thursday AM | March 3, 2022

Grand Ballroom H, J, K | Anaheim Marriott

Session Chairs: Lauren Garrison, Oak Ridge National Lab; Jonathan Madison, Sandia National Laboratories

8:30 AM

Mitigating Implicit Bias as Individuals and Institutions: *Blythe Clark*¹; *Olivia Underwood Jackson*¹; ¹Sandia National Laboratories

9:10 AM Learn By Playing: The Buffalo Card Game: Unconscious bias can have negative effects, but the first stage of changing it is recognizing your own opinions and biases. Join us for playing Buffalo, a card game designed by Tiltfactor to subtly challenge your own stereotypes and unconscious bias through play. The card game will be played in small groups with a facilitator. No prior experience or knowledge about card games or unconscious bias is necessary to participate. We will discuss the science behind the game design, participant reactions to the game, and how you could facilitate playing the game at your own institution or event.

Facilitator: Jonathan Madison

10:00 AM Break

10:20 AM

Leveraging a Strengths-based Approach to Diversity and Inclusion: *Kathryn Thomas*¹; ¹Idaho State University

11:05 AM Unconscious Bias Scenario Discussions: How does unconscious bias impact your experiences at work? Participate in small group discussions of scenarios relevant to the minerals, metals, and materials professions. If you have attended the other sessions in this track, this will be a chance to put what you have learned into practice and share your own experiences. If this is your first introduction to the topic, it is a great way to help you start to recognize unconscious bias around you and how you can take actions to mitigate it.

Facilitator: Victoria Miller

SPECIAL TOPICS

DMMM4 — The Invisible Pipeline: Recruitment/Retention of Underrepresented Minorities

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Thursday AM | March 3, 2022

Grand Ballroom F | Anaheim Marriott

Session Chairs: Aerial Murphy-Leonard, The Ohio State University; Mark Carroll, Tenneco

8:30 AM Invited

Stop Playing Diversity with Underrepresented Minority Faculty: *Ashleigh Wright*¹; ¹University of Illinois at Urbana-Champaign

9:30 AM

Inclusion in STEM in Latin America and Case Studies from Colombia: *Henry Colorado*¹; Elkin Gutierrez²; Pedro León Simanca¹; ¹Universidad de Antioquia; ²Universidad Antonio Nariño

9:50 AM Break

10:20 AM Invited

Building an Inclusively Diverse Workforce at Idaho National Laboratory: *Gabriel Ilevbare*¹; Toni Carter¹; Julie Ulrich¹; Ryan Carroll¹; ¹Idaho National Laboratory

11:00 AM Building the Pipeline – Addressing Diversity Issues in Materials Science and Beyond: Finding creative solutions and developing new technologies requires diverse and talented teams. There are many challenges in recruiting and retaining diverse students and employees as many organizations still struggle to implement recruitment strategies that actually work or fail to foster supportive, inclusive environments, where all members regardless of background can contribute and succeed. The panel will discuss physical and invisible barriers as well as institutional policies that create and maintain systemic disparities in underrepresented and marginalized groups.

The panel includes Aerial D. Murphy-Leonard, Ohio State University; Olivia Underwood Jackson, Sandia National Laboratories; Michele Manuel, University of Florida; Victoria Miller, University of Florida; and Michael Rawlings, TMS.

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Ejecta, RMI, RT & Jetting / Shear

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Thursday AM | March 3, 2022
263C | Anaheim Convention Center

Session Chairs: Arun Shukla, University of Rhode Island; Vikas Prakas, Washington State University

8:30 AM

Experimental & Computational Development of Shallow Bubble Collapse as an Ejecta Production Mechanism: *Garry Maskaly¹; Fady Najjar¹; Gerald Stevens²; William Turley²; Matthew Staska²; Brandon LaLone²; Thomas Hartsfield³; ¹Lawrence Livermore National Lab; ²NNSS STL; ³Los Alamos National Lab*

8:50 AM

Ejecta and Melting Produced by High Velocity Impact of Steel Microparticles: *Jasper Lienhard¹; David Veyssset²; Keith Nelson¹; Christopher Schuh¹; ¹MIT; ²Stanford University*

9:10 AM

3D Hydrodynamics Computations of High-areal Mass Ejecta Production from Shallow Bubble Collapse Mechanism: *Fady Najjar¹; Garry Maskaly¹; Gerald Stevens²; W. Dale Turley²; Brandon LaLone²; Matthew Staska²; Ruben Valencia²; David Brantley¹; ¹Lawrence Livermore National Laboratory; ²MSTS-STL*

9:30 AM

In Situ X-ray Diffraction of Shock Driven Sn Microjets: *David Bober¹; Jonathan Lind¹; Alison Saunders¹; Minta Akin¹; Fady Najjar¹; ¹Lawrence Livermore National Laboratory*

9:50 AM

Determining Constitutive Properties of Metals under Extreme Deformation Conditions Using Cutting: *Harshit Chawla¹; Shwetabh Yadav²; Hrayer Aprahamian¹; Dinakar Sagapuram¹; ¹Department of Industrial and Systems Engineering, Texas A&M University; ²Department of Civil Engineering, Indian Institute of Technology Hyderabad*

10:10 AM Break

10:25 AM

Dynamic Response of Polycrystalline Pure Magnesium under Pressure and Shear Plate Impact Loading at Elevated Temperatures: *Vikas Prakash¹; ¹Washington State University*

10:45 AM

In-situ SEM High Strain Rate Testing of Mg Micropillars with TEM Postmortem Analysis: *Zhaowen Lin¹; Daniel Magagnosc²; Jianguo Wen³; Chung-Seog Oh⁴; Sang-Min Kim⁵; Horacio Espinosa¹; ¹Northwestern University; ²The Army Research Laboratory; ³Argonne National Laboratory; ⁴Kumoh National Institute of Technology; ⁵Korea Institute of Machinery and Materials*

11:05 AM

Understanding the Ejecta Dynamics in Gas Cells for Shallow Bubble Collapse Mechanism: *Georges Akiki¹; Garry Maskaly¹; Fady Najjar¹; Gerald Stevens²; William Turley²; Brandon LaLone²; Matthew Staska²; ¹Lawrence Livermore National Laboratory; ²Special Technologies Laboratory*

CORROSION

Environmental Degradation of Multiple Principal Component Materials — High Temperature Corrosion

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; ShinYoung Kang, Lawrence Livermore National Laboratory; XiaoXiang Yu, Northwestern University; Vilupanur Ravi, California State Polytechnic University Pomona; Christopher Weinberger, Colorado State University; Elizabeth Opila, University of Virginia; Bai Cui, University of Nebraska-Lincoln; Mark Weaver, University of Alabama; Bronislava Gorr, Karlsruhe Institute of Technology (KIT); Srujan Rokkam, Advanced Cooling Technologies Inc

Thursday AM | March 3, 2022
201C | Anaheim Convention Center

Session Chairs: Bronislava Gorr, Karlsruhe Institut für Technologie; Mathias Galetz, Dechema

8:30 AM

Dynamic and Chemical Processes Associated with Deposit-induced Corrosion Testing at Elevated Temperatures: *Preston Nguyen¹; Brian Gleeson¹; ¹University of Pittsburgh*

8:50 AM Invited

Enhanced Oxidation Resistance of (Mo95W5)85Ta10(TiZr)5 Refractory Multi-principal Element Alloy up to 1300°C: *Ranran Su¹; Hongliang Zhang¹; Gaoyuan Ouyang²; Longfei Liu¹; Jun Cui²; Duane Johnson²; John Perepezko¹; ¹Department of Materials Science and Engineering, University of Wisconsin-Madison; ²Ames Laboratory, U.S. Department of Energy at Iowa State University*

9:20 AM

Investigation of Low Temperature Oxidation Behavior of MoNbTaW Thin Films: *Robert Quammen¹; Paul F. Rottmann¹; Taohid Bin Nur Tuhser¹; ¹University of Kentucky*

9:40 AM

Oxidation of Different High Entropy Alloys Under the Influence of Water Vapour: *Mary-Lee Brückner¹; Lukas Mengis¹; Emma White¹; Mathias Galetz¹; ¹DECHEMA-Forschungsinstitut*

10:00 AM Break

10:20 AM

Joining of FeCrAl Based Alloys for Lead Cooled Fast Reactor Applications: *Brandon Bohanon¹; Shuprio Ghosh¹; Cemal Cakez¹; Khalid Talaat¹; Jake Noltensmeyer¹; Md Mehadi Hassan¹; Osman Anderoglu¹; Keith Woloshun²; Stu Maloy²; Cetin Unal²; ¹University of New Mexico; ²Los Alamos National Laboratory*

10:40 AM

Optimization of Multicomponent Rare Earth Silicate Environmental Barrier Coating Properties: *Mackenzie Ridley¹; Kathleen Tomko¹; David Olson¹; Patrick Hopkins¹; Elizabeth Opila¹; ¹University of Virginia*

11:00 AM Invited

Exploring Untapped Potential in High Entropy Alloys: Combinatorial Exploration in Corrosive Environments: *Mitra Taheri¹; ¹Johns Hopkins University*

CORROSION

Environmentally Assisted Cracking: Theory and Practice — Corrosion and Degradation in Harsh Environments 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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Thursday AM | March 3, 2022
201D | Anaheim Convention Center

Session Chairs: Rongjie Song, Idaho National Laboratory; Srujan Rokkam, Advanced Cooling Technologies

10:00 AM

Composition and Morphology of C1018 Carbon Steel Coupons Retrieved from High Temperature Water Injection Well: *Mohammad Haque*¹; *Rajesh Saini*²; *Khaled Al-Muhammadi*²; *Ahmed Bukhamseen*²; ¹Aramco Services Company; ²Saudi Aramco

10:20 AM

Sensitization Responses along Different Directions of 5XXX Series Aluminum Alloy Plate Microstructures: *Matthew Steiner*¹; *Likun Sun*¹; *Syeda Noor E Sumaiya*¹; ¹University of Cincinnati

10:40 AM Invited

Physics-based Modeling of Corrosion Crack Dynamics and Fracture: A Case for Meshless Peridynamics Approach: *Srujan Rokkam*¹; *Masoud Behzadinasab*²; *Max Gunzburger*³; *Sachin Shanbhag*³; *Nam Phan*⁴; ¹Advanced Cooling Technologies, Inc.; ²Brown University; ³Florida State University; ⁴Naval Air Systems Command

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Functional Energy Nanomaterials: Electrochemistry & Sustainability

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Thursday AM | March 3, 2022
260B | Anaheim Convention Center

Session Chairs: Sarah Ying Zhong, University of South Florida; Min-Kyu Song, Washington State University

8:30 AM

The Influence of Magnetic Moment on Chemical Activity for Design of Hierarchical Electrochemical Systems: *Chloe Groome*¹; *Huong Ngo*¹; *Jie Li*¹; *Ruqian Wu*¹; *Regina Ragan*¹; ¹University of California Irvine

8:50 AM Invited

MOF-derived Metal Oxide Composites for High Performance Energy Storage: *Tae-Sik Oh*¹; ¹Auburn University

9:15 AM

Porous Assemblies of 2-D MnO₂ Nanosheets and Their Conversion to 1-D Tunnel Structures: *Peter Metz*¹; *Alec Ladonis*¹; *Peng Gao*¹; *Madeleine Flint*¹; *Scott Mixture*¹; ¹Alfred University

9:35 AM Invited

3D Carbon Nanotube Sponges: Surface Treatments for Improving the Performances of Energy Storage and Mechanical Properties: *Choongho Yu*¹; ¹Texas A&M University

10:00 AM Break

10:20 AM Invited

Electrochemical Imaging of Precisely Defined Redox and Reactive Nanomaterials: *Venkateshkumar Prabhakaran*¹; ¹Pacific Northwest National Laboratory

10:45 AM Keynote

Electrochemical Behaviors of Two-dimensional Materials for Energy Applications: *Jun Lou*¹; ¹Rice University

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Microstructures: Crystallography, GB Network, Phase Diagram, etc

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Thursday AM | March 3, 2022
263B | Anaheim Convention Center

Session Chairs: Yue Fan, University of Michigan, Ann Arbor; Eric Homer, Brigham Young University

8:30 AM Invited

Grain Boundary "Phase" Diagrams: *Jian Luo*¹; ¹University of California, San Diego

9:00 AM

Characterization of the Structure and Chemistry of Grain Boundaries and Heterointerfaces in Multiphase High Entropy Oxides Processed by Heat Treatment: *Hasti Vahidi*¹; *Alexander Dupuy*¹; *Justin Cortez*¹; *Julie Schoenenung*¹; *William Bowman*¹; ¹University of California Irvine

9:20 AM

Calculating Representative and Statistical Volume Elements for Grain Boundary Networks Using 3D Microstructural Data: *Jeremy Green*¹; *Nathan Miller*¹; *Oliver Johnson*¹; ¹Brigham Young University

9:40 AM

5D Grain Boundary Energy Landscapes, Paths and Correlations from Bayesian Inference: *Sterling Baird*¹; *Eric Homer*¹; *David Fullwood*¹; *Oliver Johnson*¹; ¹Brigham Young University

10:00 AM

Percolation Behavior of Three-dimensional Grain Boundary Networks: *Jiwoong Kang*¹; Ashwin Shahani¹; ¹University of Michigan

10:20 AM Break

10:35 AM Invited

Relationships between Grain Boundary Crystallographic Structure and Grain Boundary Properties: *Gregory Rohrer*¹; ¹Carnegie Mellon University

11:05 AM

Spanning the 5D Space of Grain Boundaries: A Comprehensive Database of Computed Aluminum Grain Boundary Structures and Their Interface Energy: *Braxton Owens*¹; Lydia Serafin¹; Derek Hensley¹; Jay Spendlove¹; Gus Hart¹; Eric Homer¹; ¹Brigham Young University

11:25 AM

Motion of a Dislocation Boundary in Thermal Annealing Resolved with Dark-field X-ray Microscopy: *Leora Dresselhaus-Marais*¹; Can Yildirim²; Henning Poulsen³; Carsten Detlefs²; Grethe Winther³; ¹Stanford University; ²ESRF; ³DTU

11:45 AM

Study of the Evolution of the Grain Boundary Network Using Spectral Graph Theory: *Jose Nino*¹; Oliver Johnson¹; ¹Brigham Young University

ADVANCED MATERIALS

High Performance Steels — Alloy and Thermo-mechanical Process Design

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung; Benjamin Adam, Oregon State University

Thursday AM | March 3, 2022

252C | Anaheim Convention Center

Session Chairs: Tomas Scuseria, Colorado School of Mines; Cem Tasan, MIT

8:30 AM

Multi-stage Welding Cycles for Resistance Spot Welding of Advanced Martensitic Steels: *Emmitt Fagerstrom*¹; Benjamin Hilpert²; Holger Schubert²; Bharat Balasubramanian¹; Luke Brewer¹; ¹University of Alabama; ²Mercedes-Benz

8:50 AM

Impact of Alloy Composition on the Hot Ductility of Steel during Continuous Casting: *Alyssa Stubbers*¹; Thomas Balk¹; ¹University of Kentucky

9:10 AM

Custom Designed Tapered-rolling Process Enables Hard Steels with Mixed-mode Cracking Resistance: *Gianluca Roscioli*¹; Cemal Tasan¹; ¹Massachusetts Institute of Technology

9:30 AM

Large Strain Ambient Temperature Rolling Reduction of an Ultra-high Strength Steel: *Joshua Edwards*¹; Thomas Kozmel²; Jeffrey Lin²; Suveen Mathaudhu¹; ¹Colorado School of Mines; ²QuesTek Innovations LLC

9:50 AM Break

10:05 AM

Understanding Composition Dependence of Deformation Microstructure in Hydrogen Resistant Austenitic Steels: *Quinten Yurek*¹; ¹University of Illinois

LIGHT METALS

Magnesium Technology — Surface Protection, Corrosion and Degradation

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Thursday AM | March 3, 2022

210A | Anaheim Convention Center

Session Chairs: Kiran Solanki, Arizona State University; Regine Willumeit-Römer, Helmholtz-Zentrum Hereon

8:30 AM

Flexible Surface Treatment Technology to Enable Temporary SCC Prevention for Mg Dissolvable Alloys: *Lei Zhao*¹; Wenhan Yue¹; Jiaxiang Ren¹; Tim Dunne¹; Peng Cheng¹; Huailiang Liu¹; ¹CNPCL USA

8:50 AM

Enhanced Corrosion Resistance of an AZ31 Magnesium Alloy through Shear Extrusion: *Vikrant Beura*¹; Vineet Joshi²; Kiran Solanki¹; ¹Arizona State University; ²Pacific Northwest National Laboratory

9:10 AM

Active Corrosion Protection Surfaces Based on Layered Double Hydroxides Nanocontainers: A Computational Study: *Xuejiao Li*¹; Christian Feiler¹; Tim Würger²; Robert Meißner²; Daniel Höche¹; Mikhail Zheludkevich¹; ¹Helmholtz-Zentrum Hereon; ²Hamburg University of Technology

9:30 AM Invited

Novel Laboratory-scale In Situ Methods for Studying Mg Alloy Degradation: *Dmytro Orlov*¹; ¹Lund University

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Materials Design and Processing Optimization: Session VII

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Thursday AM | March 3, 2022

253B | Anaheim Convention Center

Session Chairs: Victoria Miller, University of Florida; Yan Li, Dartmouth College

8:30 AM Invited

Role of Interstitial and Minor Alloying Element Additions on Microstructural Evolution in Additively Manufactured Materials: *Todd Palmer*¹; ¹Pennsylvania State University

8:55 AM

Solidification Behavior of Additively Manufactured Martensitic Precipitation-hardenable Stainless Steels: *Melanie Buziak*¹; Eric Lass¹; ¹University of Tennessee Knoxville

9:15 AM

Healing Damage in Friction Stir Processed Mg₂Si Reinforced Al Alloy: *Mariia Arseenko*¹; Florent Hannard¹; Lipeng Ding²; Ankush Kashiwar¹; Elie Paccou³; Lv Zhao⁴; Grzegorz Pyka¹; Hosni Idrissi¹; Williams Lefebvre³; Julie Villanova⁵; Eric Maire⁶; *Julie Gheysen*¹; Aude Simar¹; ¹Universite Catholique De Louvain; ²Nanjing Tech University; ³Université de Rouen; ⁴Huazhong University of Science and Technology; ⁵ESRF; ⁶INSA Lyon

9:35 AM

Material Flow Behavior Prediction of Additive Friction Stir Deposition Using Smoothed Particle Hydrodynamics: *George Stubblefield*¹; Kirk Fraser²; Thomas Robinson³; Ning Zhu³; Ryan Kinser³; James Tew³; Bret Cordle³; James Jordon³; Paul Allison³; ¹The Engineer Research and Development Center; ²National Research Council Canada; ³The University of Alabama

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — ODS Steel and Tungsten Alloy Development

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Thursday AM | March 3, 2022
203A | Anaheim Convention Center

Session Chairs: Iver Anderson, Iowa State University Ames Laboratory; Eric Lang, Sandia National Laboratories

8:30 AM

Fabrication of an Oxide Dispersion Strengthened Ferritic Steel Using Solid Stir Technology: *Pranshu Varshney*¹; Kumar Kandasamy²; Nilesh Kumar¹; ¹University of Alabama; ²Enabled Engineering

8:50 AM Invited

Promoting Oxide Dispersion Strengthening in Ferritic Steels Made with GARS Powder for High-shear Powder Consolidation and for L-PBF: *Iver Anderson*¹; E. Cockburn¹; T.R. Riedemann¹; Ralph Napolitano¹; ¹Ames Laboratory (USDOE), Iowa State University

9:20 AM

Alternative ODS Steel Manufacturing with Gas Atomization Reaction Synthesis (GARS) and Friction-based Processing: *Dalong Zhang*¹; Jens Darsell¹; Glenn Grant¹; Iver Anderson²; Xiaolong Ma¹; Jing Wang¹; Danny Edwards¹; Wahyu Setyawan¹; Takuya Yamamoto³; Robert Odette³; ¹Pacific Northwest National Laboratory; ²Ames Laboratory; ³University of California-Santa Barbara

9:40 AM

In-situ TEM of the Microstructure and He Behavior of AM W Alloys: *Eric Lang*¹; Ian McCue²; W.S. Cunningham³; Jason Trelewicz³; Khalid Hattar¹; ¹Sandia National Laboratories; ²Northwestern University; ³Stonybrook University

10:00 AM

Microstructural Transitions during Powder Metallurgical Processing of Solute Stabilized Nanostructured Tungsten Alloys: *Nicholas Olynik*¹; Sean Mascarenhas¹; David Sprouster¹; Chad Parish²; Jason Trelewicz¹; ¹Stony Brook University; ²Oak Ridge National Laboratory

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — Thin Films and Multilayers

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Thursday AM | March 3, 2022
262B | Anaheim Convention Center

Session Chairs: Matthew Daly, University of Illinois at Chicago; Megan Cordill, Erich Schmid Institute

8:30 AM Invited

The Role of Thin Film Architecture to Enhance Fracture Resistance: *Megan Cordill*¹; ¹Erich Schmid Institute of Materials Science

9:00 AM

Investigating Role of Interfaces on Deformation Behavior of Metallic Nanolaminates Using Dislocation Dynamics Simulations: *Aritra Chakraborty*¹; Abigail Hunter¹; Laurent Capolungo¹; ¹Los Alamos National Laboratory

9:20 AM

Strain-rate Dependent Deformation Mechanisms in Multilayer Cu/Mo Thin Films: *Bibhu Prasad Sahu*¹; Amit Misra¹; George M. Pharr²; ¹University of Michigan; ²Texas A&M University

9:40 AM

Orientation Dependence of Strength and Ductility in Nanolaminates Containing Interfaces with Three Dimensional Character: *Justin Cheng*¹; Shuozhi Xu²; Zezhou Li¹; Jonathan Poplawsky³; J. Kevin Baldwin⁴; Irene Beyerlein²; Nathan Mara¹; ¹University of Minnesota Twin Cities; ²University of California Santa Barbara; ³Oak Ridge National Laboratory; ⁴Los Alamos National Laboratory

10:00 AM Break

10:20 AM

Mechanistic-design of Multilayered Nanocomposites: Hierarchical Metal-MAX Materials for Tunable Strength and Toughness: *Skye Supakul*¹; Garritt Tucker²; Siddhartha (Sid) Pathak¹; ¹Iowa State University; ²Colorado School of Mines

10:40 AM

Mechanical Behavior of Optimized Transparent Nanomultilayers: *Danielle White*¹; Edoardo Rossi²; Marco Sebastiani²; Andrea Hodge¹; ¹University of Southern California; ²Roma Tre University

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Session VI

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Thursday AM | March 3, 2022
206B | Anaheim Convention Center

Session Chairs: Ankit Srivastava, Texas A&M University; Isabel Crystal, Lawrence Livermore National Laboratory

8:30 AM

In-situ SEM Investigation of Thermally Induced Cracking in Shape Memory Ceramics: *Isabel Crystal*¹; Haoxue Yan²; Christopher Schuh²; ¹Lawrence Livermore National Laboratory; ²Massachusetts Institute of Technology

8:50 AM

Determination of Fracture Toughness Using the Compression Fracture Technique: *Carl Cady*¹; Cheng Liu¹; ¹Los Alamos National Laboratory

9:10 AM

X-ray Microbeam Characterization of Electromigration Process in Al(0.25wt% Cu) Interconnect: *Ping-Chuan Wang*¹; Kieran Cavanagh¹; ¹SUNY New Paltz

9:30 AM

Achieving the Maximum Modulus of Resilience in Polymer Nanocomposites via Sequential Infiltration of Metal Oxides: *Zhongyuan Li*¹; Nikhil Tiwale²; Ashwanth Subramanian²; Ying Li¹; Chang-Yong Nam²; Seok-Woo Lee¹; ¹University of Connecticut; ²Brookhaven National Laboratory

9:50 AM Break

10:10 AM

Characterization of the Role of Lath Boundaries in Lath Martensitic Steel Using In-situ Micro-pillar Compression Tests: *Ye-Eun Na*¹; Hadi Ghaffarian¹; Dongchan Jang¹; ¹KAIST

10:30 AM

Super-fast Fabrication of Micropillar Arrays Using Laser FIB Combination for More Statistically Relevant Micropillar Compression Tests: *Fang Zhou*¹; Tobias Volkenandt¹; Tim Schubert²; Nicholas Randall³; Timo Bernthaler²; ¹Carl Zeiss Microscopy GmbH; ²Aalen University; ³Alemnis AG

10:50 AM

In Situ Observation of Room Temperature Crack-healing in an Atomically Layered Ternary Carbide: Hemant Rathod¹; Thierry Ouisse²; Miladin Radovic¹; *Ankit Srivastava*¹; ¹Texas A&M University; ²Université Grenoble Alpes

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Solidification and Microstructural Evolution/General Topic

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Thursday AM | March 3, 2022
255B | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM

Growth Competition between Columnar Dendritic Grains - The Role of Microstructural Length Scales: *Elaheh Dorani*¹; Kaihua Ji¹; Gildas Guillemot²; Charles-Andre Gandin²; Alain Karma¹; ¹Northeastern University; ²MINES ParisTech

8:50 AM

Growth, Coarsening, and Fragmentation of Dendritic Microstructures in Metallic Materials: *Tiberiu Stan*¹; Zachary Thompson¹; Peter Voorhees¹; ¹Northwestern University

9:10 AM

The Structural Evolution of the Metastable Ni₂₃B₆ Phase during Rapid Solidification of Undercooled Ni-B Melts: *Lianjie Liu*¹; ¹Shanghai Jiao Tong University

9:30 AM

In Situ Interrogation of Dynamic Microstructural Evolution during Friction Stir Processing of Al - 4 at.% Si: *Julian Escobar*¹; Arun Bhattacharjee¹; Jorge dos Santos²; Jan Herrnring²; Luciano Bergmann²; Peter Staron²; Benjamin Klusemann¹; Bharat Gwalani²; Suveen Mathaudhu¹; Cynthia Powell¹; Arun Devaraj¹; ¹Pacific Northwest National Laboratory; ²Helmholtz-Zentrum Hereon

9:50 AM Break

10:10 AM

In-situ Observation of Coupled Growth Morphologies in Organic Peritectics under Pure Diffusion Conditions: *Johann Mogeritsch*¹; ¹Montanuniversitaet Leoben

10:30 AM

Understanding Microstructural Evolution in Powder Bed Fusion Additive Manufacturing: Observations of Phase Transformation in Ti-6Al-4V Using In Situ TEM Heating Experiments: *Sriram Vijayan*¹; Carolin Fink¹; Joerg Jinschek¹; ¹The Ohio State University

10:50 AM

Experimental Investigation of Ni2Cr Long-range Ordering in Ni-Cr-Fe Based Model and Commercial Alloys: *Nicholas Aerne*¹; David Sprouster²; Julie Tucker¹; ¹Oregon State University; ²Stony Brook University

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — In-situ and Multi-modal Characterization of Environmental Degradation (Contributed)

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Thursday AM | March 3, 2022
207C | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM

An Experimental-numerical Approach to Investigate Hydrogen Effects on Dislocations: *Haixue Yan*¹; Qingjie Li¹; Jinwoo Kim¹; Ju Li²; C. Cem Tasan¹; ¹Massachusetts Institute of Technology

8:50 AM

In Situ Investigation of the Role of Slip in Crack Initiation in Hydrogen Embrittled Alloy 725: *Mengying Liu*¹; Lai Jiang²; Michael Demkowicz²; ¹Washington and Lee University; ²Texas A&M University

9:10 AM

In-situ 4D-STEM Imaging of Mechanical Deformation in Medium Entropy Alloy (MEA) and Bulk Metallic Glass (BMG): *Yang Yang*¹; Sheng Yin²; Qin Yu²; Ruopeng Zhang²; Mark Asta²; Robert Ritchie²; Andrew Minor²; ¹The Pennsylvania State University; ²Lawrence Berkeley National Laboratory

9:30 AM

In Situ TEM Studies on the Radiation Response of Cu with Nanovoids: Cuncai Fan¹; Rayaprolu Goutham Sreekar Annadanam¹; Zhongxia Shang¹; Meimei Li²; Anter El-Azab¹; *Xinghang Zhang*¹; ¹Purdue University; ²Argonne National Laboratory

9:50 AM

Revealing Hidden Defects via Stored Energy Measurements of Radiation Damage: *Charles Hirst*¹; Fredric Granberg²; Penghui Cao³; Scott Middlemas⁴; R. Kemp¹; Ju Li¹; Kai Nordlund²; Michael Short¹; ¹Massachusetts Institute of Technology; ²University of Helsinki; ³University of California, Irvine; ⁴Idaho National Laboratory

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — Advanced Techniques for Fundamental Understanding of Irradiation-Corrosion Processes

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Thursday AM | March 3, 2022
202A | Anaheim Convention Center

Session Chair: To Be Announced

8:30 AM Invited

The Coupled Effects of Irradiation and Corrosion on Materials: *Blas Uberuaga*¹; ¹Los Alamos National Laboratory

9:00 AM Invited

The Role of In Situ Analytical Electron Microscopy in Understanding the Behaviour of Structural Materials in Nuclear Power Systems: Examples and Opportunities: *M Grace Burke*¹; Joven Lim²; ¹University of Manchester; ²UK Atomic Energy Authority

9:30 AM

4D-STEM and Atomic Resolution Analysis of He-rich Gas Bubbles Formed in Au Thin Films via He-ion Irradiation: *Sean Mills*¹; Andrew Minor¹; ¹University of California-Berkeley

9:50 AM Break

10:10 AM

Quantification of the Oxidizing Effects of Neutron Activation Reactions in FLiBe: *Lorenzo Vergari*¹; Ryan Hayes¹; Massimiliano Fraton¹; Raluca Scarlat¹; ¹University of California- Berkeley

10:30 AM

Modelling the Primary Damage in Nickel and Nickel Based Alloys: Influence of Cascade Energy and Morphology in Displacement Cascades: *Adithya Nair*¹; Charlotte Becquart²; Christophe Domain³; Andrée De Backer²; ¹Univ. Lille, CNRS, INRAE, Centrale Lille, UMR 8207 - UMET - Unité Matériaux et Transformations, F-59000 Lille, France; ²Univ. Lille, CNRS, INRAE, Centrale Lille, UMR 8207 - UMET - Unité Matériaux et Transformations, F-59000 Lille, France; EDF-CNRS Joint Laboratory EM2VM Study and Modeling of the Microstructure for Ageing of Materials (France); ³EDF R&D - MMC, Moret sur Loing (France); EDF-CNRS Joint Laboratory EM2VM Study and Modeling of the Microstructure for Ageing of Materials (France)

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Processing, Microstructure & Property II**Sponsored by:** TMS: Shaping and Forming Committee**Program Organizers:** Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Laverna, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong**Thursday AM | March 3, 2022**
262A | Anaheim Convention Center**Session Chair:** To Be Announced**8:30 AM Invited****Bulk Nanostructured Metallic Materials with Superior Multifunctional Properties:** Ruslan Valiev¹; *Xiaozhou Liao*; ¹UFA State Aviation Technical University**9:00 AM****Deformation Mechanisms of Laser Rapid Solidified Al-Si Heterostructures:** *Bingqiang Wei*¹; Wenqian Wu¹; Amit Misra²; Jian Wang¹; ¹University of Nebraska-Lincoln; ²University of Michigan**9:20 AM****Significance of Grain Refinement on Micro-mechanical Properties and Structures of Additive-manufactured CoCrFeNi High-entropy Alloy:** *Jae-Kyung Han*¹; Yulia O. Kuzminova²; Stanislav A. Evlashin²; Jae-il Jang³; Klaus-Dieter Liss⁴; Megumi Kawasaki¹; ¹Oregon State University; ²Skolkovo Institute of Science and Technology; ³Hanyang University; ⁴Guangdong Technion - Israel Institute of Technology**9:40 AM****Strengthening Mechanisms in Dilute Ultrafine-grained Ag Alloys Processed by Top-down and Bottom-up Approaches:** *Erik Sease*¹; Evander Ramos¹; Peter Jacobson²; Manuel Esparragoza²; Thomas Kozmel²; Suveen Mathaudhu³; ¹University of California Riverside; ²Questek Innovations LLC; ³University of California, Riverside/Pacific Northwest National Laboratory**10:00 AM Break****10:20 AM****Strength Softening Mitigation in Bimodal Nanostructured Metals:** *Han Wang*¹; Penghui Cao¹; ¹University of California, Irvine**10:40 AM****Evolution of Microstresses during Elasto-plastic Transition under In Situ Tensile Loading of Harmonic Structure Materials by Synchrotron X-ray Diffraction:** *Elis Sjogren*¹; Wolfgang Pantleon²; Ulrich Lienert³; Zoltan Hegedüs³; Kei Ameyama⁴; Dmyto Orlov¹; ¹Lund University; ²Technical University of Denmark; ³Deutsches Elektronen-Synchrotron; ⁴Ritsumeikan University

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — Characterization of Advanced Materials Systems**Sponsored by:** TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee**Program Organizers:** Verena Maier-Kiener, Montanuniversitaet Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University**Thursday PM | March 3, 2022**
259B | Anaheim Convention Center**Session Chairs:** Karsten Durst, TU Darmstadt; Graham Cross, Trinity College Dublin**2:00 PM Invited****Best Practices for Berkovich Nanoindentation in Hard Biological Tissues:** Joseph Jakes¹; *Donald Stone*²; ¹USDA FS Forest Products Laboratory; ²University of Wisconsin - Madison**2:25 PM****Nanoindentation of Supercrystalline Nanocomposites:** *Diletta Giuntini*¹; Shiteng Zhao²; Buesra Bor³; Cong Yan³; Alexander Plunkett³; Gerold Schneider³; ¹Eindhoven University of Technology; ²University of California Berkeley; ³Hamburg University of Technology**2:45 PM****Characterization of Grain Boundaries in Geological Materials Using Micromechanical Testing:** *Diana Avadani*¹; Lars Hansen²; Katharina Marquardt³; Ed Darnbrough¹; David Armstrong¹; Angus Wilkinson¹; ¹University of Oxford; ²University of Minnesota; ³Imperial College London**3:05 PM****A Comparative Study of Fracture Toughness Measurements in Two Silicate Glasses Using Nanoindentation:** *Yvonne Dieudonné*¹; George Pharr¹; ¹Texas A&M University**3:25 PM Break****3:45 PM****Nanoindentation of NiTi Shape Memory Alloys:** *Gunther Eggeler*¹; ¹Ruhr-Universität Bochum**4:05 PM****Determination of Constitutive Properties for Shape Memory Alloys from Nanoindentation Response:** *Xuesong Gao*¹; Daniel Hong¹; Harshad Paranjape²; Wei Zhang¹; Peter Anderson¹; ¹The Ohio State University; ²Confluent Medical Technologies, Inc**4:25 PM****Assessing Segregation-induced Softening in Nanocrystalline Stabilized NiP by Nanoindentation:** *Ilias Bikmukhametov*¹; Thomas Koenig¹; Garritt Tucker²; Gregory Thompson¹; ¹University of Alabama; ²Colorado School of Mines

ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials — Overcoming Build Challenges, Feedstock to Thermal Treatments

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

Program Organizers: Emily Rinko, Iowa State University; Iver Anderson, Iowa State University Ames Laboratory; Markus Chmielus, University of Pittsburgh; Emma White, DECHEMA Forschungsinstitut; Deliang Zhang, Northeastern University; Andrew Kustas, Sandia National Laboratories; Kyle Johnson, Sandia National Laboratories

Thursday PM | March 3, 2022
262C | Anaheim Convention Center

Session Chair: Iver Anderson, Iowa State University Ames Laboratory

2:00 PM Introductory Comments

2:05 PM

Mechanical Alloying and Characterization of Al₂Ni₅Co₆Fe₆Sm_{0.2} High-entropy Alloy: Afsaneh Darvish Motevali¹; Majid Vaseghi¹; Mahmood Sameezadeh¹; ¹Shahid Beheshti University

2:25 PM

Improved Near-infrared Absorption for Additive Manufacturing Feedstock Using Reduced Graphene Oxide: Chu Lun Alex Leung¹; Iuliia Elizarova²; Mark Isaacs¹; Shashidhara Marathe³; Eduardo Saiz²; Peter D. Lee¹; ¹University College London; ²Imperial College London; ³Diamond Light Source Ltd

2:45 PM

Additive Manufacturing of a Composite Made of Al 5083 Matrix and Encapsulated ZnAl Particles: Baolong Zheng¹; David Svetlizky²; Sen Jiang¹; Yizhang Zhou¹; Lorenzo Valdevit¹; Noam Eliaz²; Enrique Lavernia³; Julie Schoenung¹; ¹University of California, Irvine; ²Tel-Aviv University; ³National Academy of Engineering

3:05 PM

Growth Optimization of Single Crystal Fibers of Congruently and Incongruently Melting Garnets via Laser Heated Pedestal Growth Method: Dolendra Karki¹; Edward Clover Hoffman¹; Paul R. Ohodnicki¹; ¹University of Pittsburgh

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — Environmental and Corrosion Effects

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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Thursday PM | March 3, 2022
258B | Anaheim Convention Center

Session Chair: Mohsen Seifi, ASTM International/Case Western Reserve University

2:00 PM Invited

Environmental Cracking Behavior of Additively Manufactured 17-4PH Stainless Steel: James Burns¹; Trevor Shoemaker¹; ¹University of Virginia

2:30 PM

Machining vs Heat Treatment in Additive Manufacturing of Ti6Al4V Alloy: Alireza Dareh Baghi¹; Shahrooz Nafisi²; Reza Hashemi²; Heike Ebendorff-Heidepriem¹; Reza Ghomashchi¹; ¹The University of Adelaide; ²Flinders University

2:50 PM

The Elevated Temperature Creep, Fatigue and Fracture Behavior of Additively Manufactured Inconel 718: Michael Kassner¹; Theophil Oros¹; Kee-Ahn Lee²; Thien Phan³; Lyle Levine³; Andrea Hodge¹; ¹University of Southern California; ²Inha Univ.; ³NIST

3:10 PM

On Fatigue Performance of Al-Cu-Mg-Ag-Ti-B Alloy: Additive Manufactured Versus Cast: Maryam Avateffazeli¹; Md Faysal Khan²; Shuai Shao²; Nima Shamsaei²; Meysam Haghshenas¹; ¹University of Toledo; ²Auburn University

3:30 PM Break

3:50 PM Invited

Accelerated Corrosion Behavior of Cold Spray Deposited AA2024 and AA7075 and Implications for Mechanical Performance: Gregory Kubacki¹; Ozymandias Agar¹; Munsu Kim¹; Sheri Stanke²; Christine Sanders²; Rachel Black³; Sean Kane³; Luke Brewer¹; ¹The University of Alabama; ²Naval Research Laboratory; ³Naval Air Systems Command

4:20 PM

Short-crack Growth Behavior in Additively Manufactured AlSi10Mg: Robert Rhein¹; Qianying Shi²; J Wayne Jones²; Srinivasan Arjun Tekalur¹; Jason Carroll¹; Kathleen Chou¹; ¹Eaton Corporation; ²University of Michigan

4:40 PM

High Cycle Fatigue Behaviour of Additively Manufactured 316L Austenitic Stainless Steel: Punit Kumar¹; Jayaraj Radhakrishnan¹; James McKinnell²; Upadrasta Ramamurthy¹; ¹NTU Singapore; ²HP Inc.

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — Special Topics

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

Program Organizers: Meysam Haghshenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Thursday PM | March 3, 2022
204B | Anaheim Convention Center

Session Chairs: Suveen Mathaudhu, Colorado School of Mines ; Sezer Ozerinc, Middle East Technical University

2:00 PM

Harnessing Non Equilibrium Processing in Additive Manufacturing: Kathryn Small¹; Markus Suddmans²; Anna Rawlings³; Ian McCue⁴; Jaafar El-Awady²; *Mitra Taheri*²; ¹John Hopkins University; ²Johns Hopkins University; ³U.S. Naval Research Laboratory; ⁴Northwestern University

2:20 PM

Intentional and Unintentional Spatial Variation in Laser Powder Bed Fusion: *Joy Gockel*¹; Cherish Lesko²; Anna Dunn²; Daniel Young²; Luke Sheridan³; ¹Colorado School of Mines; ²Wright State University; ³Air Force Research Laboratory

2:40 PM

Multi-scale Dynamic Strain Measurement and Machine Learning Optimization to Uncover Solidification Dynamics of Ti-5553 L-PBF Melt Pools: *Caleb Andrews*¹; Maria Strantza²; Nicholas Calta²; Tae Wook Heo²; Saad Khairallah²; Rongpei Shi²; Manyalibo Matthews²; Mitra Taheri¹; ¹Johns Hopkins University; ²Lawrence Livermore National Laboratory

3:00 PM

Strategies for Functional Grading Using Additive Manufacturing: *Moataz Attallah*¹; ¹University of Birmingham

3:20 PM Break**3:40 PM**

Investigations of Toughening Mechanisms in Nanoarchitected Polymers: *Lucas Meza*¹; Zainab Patel¹; ¹University of Washington

4:00 PM

Quasi-static Mechanical Properties of As-printed Thin Wall Inconel 718 Manufactured with Laser Powder Bed Fusion: Effects of Thickness and Hot Isostatic Pressing: *Paul Paradise*; Nikki Van Handel¹; Samuel Temes¹; Anushree Saxena¹; Dhruv Bhate¹; ¹Arizona State University

4:20 PM

Investigating the Influence of Scan Strategy and Small-scale Geometrical Complexity on the Microstructure and Mechanical Properties of Thin Wall SLM IN718: Connor Varney¹; *Paul Rottmann*¹; ¹University of Kentucky

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session VIII

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Thursday PM | March 3, 2022
207A | Anaheim Convention Center

Session Chairs: Kyle Johnson, Sandia National Laboratories; Amy Clarke, Colorado School of Mines; Aritra Chakraborty, Los Alamos National Laboratory

2:00 PM Invited

Multiscale Characterization of Metallic Alloy Microstructures and Links to Properties: *Amy Clarke*¹; Benjamin Ellyson¹; Likith Sri Ranga Jai¹; John Copley¹; Kester Clarke¹; Jonah Klemm-Toole¹; Kamel Fezzaa²; Francisco Coury³; ¹Colorado School of Mines; ²Argonne National Laboratory; ³Federal University of São Carlos

2:30 PM

Estimation of Micro-Hall-Petch Coefficients in Mg-4Al as a Function of Grain Boundary Parameters: *Mohsen Taheri Andani*¹; Aaditya Lakshmanan¹; Yung Suk Jeremy Yoo¹; Veera Sundararaghavan¹; John Allison¹; Amit Misra¹; ¹University of Michigan

2:50 PM

The Early Stage of Deformation-induced Dislocation Patterning Studied by DFXM: *Albert Zelenika*; Can Yildirim¹; Carsten Detlefs¹; Henning Poulsen²; Grethe Winther²; ¹ESRF; ²DTU

3:10 PM Invited

Capturing Deformation Mechanisms in Additively Manufactured Parts through High-fidelity Modeling and In Situ Computed Tomography: *Kyle Johnson*¹; Thomas Ivanoff¹; Philip Noell¹; Nathan Heckman¹; John Emery¹; ¹Sandia National Laboratories

3:40 PM Break**3:55 PM**

Coupling In-situ SEM Experiments with Acoustic Emission to Unravel the Underlying Deformation Mechanism in Metals: *Mostafa Omar*¹; Jaafar El-Awady¹; ¹Johns Hopkins University

4:15 PM

Grain Environment Dependent Deformation Twinning in a TWIP Steel: A 3DXRD Study: *James Ball*¹; Stefan Michalik¹; Oxana Magdysyuk¹; Thomas Connolley¹; David Collins²; ¹Diamond Light Source; ²University of Birmingham

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Sensors, Power, and Multifunctional Applications — Structures and Properties of Multifunctional Magnetic Materials

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

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Eric Theisen, Metglas Inc.; Huseyin Ucar, California Polytechnic University, Pomona; Yongmei Jin, Michigan Technological University

Thursday PM | March 3, 2022
213B | Anaheim Convention Center

Session Chair: Daniel Salazar, BCMaterials

2:00 PM Invited

Current Challenges on Magnetic Sensors for Bio Applications Based on Giant Magnetoimpedance: *Eduardo Fernandez Martin*¹; Nerea Lete Segura²; Alfredo Garcia-Arribas²; ¹BCMaterials; ²Universidad del Pais Vasco (UPV/EHU)

2:30 PM

Heusler Alloys: Past, Properties, New Alloys, and Mechanical Properties: *Sheron Tavares*¹; Marc Meyers¹; ¹University of California San Diego

2:50 PM

Spontaneous Exchange Bias in a Metamagnetic Heusler Alloy Thin Film: Vasileios Alexandrakis¹; Ivan Rodriguez Aseguinolaza²; Dimitrios Anastasakos¹; Jose Manuel Barandiaran²; Volodymyr Chernenko³; Jose Maria Porro³; ¹NCSR "Demokritos"; ²University of the Basque Country (UPV/EHU); ³BCMaterials

3:10 PM

Effect of Mesoscale L₂ Domain Size on the Nucleation of Thermoelastic Martensitic Transformation in Ni₄₅Co₅Mn_{36.7}In_{13.3} Magnetic Shape Memory Alloys: *Juan Lago*¹; Woohyun Cho¹; Daniel Salas¹; Yijia Zhang¹; Ibrahim Karaman¹; Patrick Shamberger¹; ¹Texas A&M University

3:30 PM Break

3:45 PM

Crack Detection in Structural Material Using Phase Transforming Magnetic Particles: *Woohyun Cho*¹; Ibrahim Karaman¹; ¹Texas A&M University

4:05 PM

Magneto-mechanical Properties and Magneto-caloric Behaviour of Rapidly Solidified Melt-spun Ni₅₀Mn₂₈Ga₂₂ Heusler Alloy: Deepak Satapathy¹; P Babu²; Imaddin Al-Omari³; Shampa Aich¹; ¹Indian Institute of Technology; ²UGC-DAE Consortium for Scientific Research; ³Sultan Qaboos University

4:25 PM

Enhanced Magnetostriction in Galfenol through Dilute Ce-doping: Alexander Baker¹; Hunter Henderson¹; Emily Moore¹; Mohammad Islam²; Yumi Ijiri³; Matthew Willard²; Scott McCall¹; *Alfred Amon*¹; ¹Lawrence Livermore National Laboratory; ²Case Western Reserve University; ³Oberlin College and Conservatory

4:45 PM

Phase Stability of Fe-Ga-Ce-Zr Alloys: *Emily Moore*¹; Devika Nandwana²; Alexander Baker¹; Mohammad Islam³; Hunter Henderson¹; Yumi Ijiri⁴; Matthew Willard³; Scott McCall¹; ¹Lawrence Livermore National Laboratory; ²Case Western Reserve University; ³Case Western Reserve University; ⁴Oberlin College

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — Additive Manufacturing and Other Techniques

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | March 3, 2022
251A | Anaheim Convention Center

Session Chairs: Wen Chen, University of Massachusetts-Amherst; Duckbong Kim, Tennessee Technological University

2:00 PM

Nanostructured Oxide-dispersion-strengthened CoCrFeMnNi High Entropy Alloys: Processing, Microstructures, and Thermal Stability: Xiang Zhang¹; Fei Wang¹; Xueliang Yan¹; Xing-Zhong Li²; Khalid Hattar²; *Bai Cui*¹; ¹University of Nebraska-Lincoln; ²Sandia National Laboratories

2:20 PM

Experimental Investigations of an Additively Manufactured Multi-principal Element Alloy with Extraordinarily High Strength: *Morgan Jones*¹; Jonathan Pegues¹; Michael Melia¹; Ping Lu¹; Frank DelRio¹; Raymond Puckett¹; Iver Anderson²; Emma White²; Duane Johnson²; Prashant Singh²; Andrew Kustas¹; Irene Beyerlein³; ¹Sandia National Laboratories; ²Ames Laboratory; ³University of California Santa Barbara

2:40 PM

Additive Manufacturing and Mechanical Properties of Al18Co30Cr10Fe10Ni32 Eutectic Multi-principal Elements Alloy Fabricated by Laser-powder Bed Fusion: Abhishek Mehta¹; *Thinh Huynh*¹; Kevin Graydon¹; Asif Mahmud¹; Yongho Sohn¹; ¹University of Central Florida

3:00 PM

Mapping Processability in the Family of Additive Manufacturing for MPEAs: *Praveen Sreeramagir*¹; Hengrui Zhang²; Wei Chen²; Ganesh Balasubramanian¹; ¹Lehigh University; ²Northwestern University

3:20 PM

Oxidation Characteristic of Complex Concentrated Alloys FeAlCrV and FeAlCrMo: *Eliška Jaca*¹; Peter Minárik¹; Josef Pešicka¹; Stanislav Daniš¹; Adam Hotar²; ¹Charles University; ²Technical University of Liberec

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — Modeling 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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM | March 3, 2022
251B | Anaheim Convention Center

Session Chairs: Seungha Shin, University of Tennessee; Dustin Allen Gilbert, University of Tennessee

2:00 PM

High Thermal Stability B2 Precipitates in a Ru-containing Multi-principal Element Alloy: *Carolina Frey*¹; Ravit Silverstein¹; Tresa Pollock¹; ¹University of California Santa Barbara

2:20 PM

Effects of Short-range Order on Thermodynamic Properties of Al_xCoCrFeNi High-entropy Alloys: *Md Abdullah Al Hasan*¹; Seungha Shin¹; Peter Liaw¹; Dustin Gilbert¹; ¹University of Tennessee

2:40 PM

Local Configuration Effects on Vibrational Properties of BCC MPEAs: *Sarah O'Brien*¹; Matthew Beck¹; ¹University of Kentucky

3:00 PM

Melting Temperature Prediction of Multi-principal Elements Alloys Using Ab-initio Calculations: *Saswat Mishra*¹; Alejandro Strachan¹; ¹Purdue University

3:20 PM

A Method to Predict Fluctuations in the Fault Energy Landscape of FCC Solid Solutions: *Ritesh Jagatramka*¹; Chu Wang¹; Matthew Daly¹; ¹University of Illinois at Chicago

3:40 PM Break

4:00 PM

The Impact of Short-range Order on Atomic Diffusions in Multi-principal Elements Alloys: *Bin Xing*¹; William Bowman¹; Penghui Cao²; ¹Department of Materials Science and Engineering, University of California, Irvine; ²Department of Mechanical and Aerospace Engineering, University of California, Irvine

4:20 PM

Vacancy Defects: Formation Energy and Migration Paths in Multi-principal-element Alloys (MPEAs): *Ankit Roy*¹; Prashant Singh²; Ganesh Balasubramanian¹; Duane Johnson²; ¹Lehigh University; ²Ames Laboratory

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Material Design IV

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Thursday PM | March 3, 2022
256A | Anaheim Convention Center

Session Chair: Jason Gibson, University of Florida

2:00 PM

Coping with Materials Variance Using Transfer Learning: *Ali Riza Durmaz*¹; Aurèle Goetz¹; Martin Müller²; Akhil Thomas¹; Pierre Kerfriede³; ¹Fraunhofer IWM; ²Universität des Saarlandes; ³Mines ParisTech (PSL University)

2:20 PM

Comparison of Human, Machine Learning, and Common Optimization Approaches on Grain Boundary Networks: *Christopher Adair*¹; Oliver Johnson¹; Emily Beatty¹; Hayley Evans¹; Seth Holladay¹; Derek Hansen¹; ¹Brigham Young University

2:40 PM

Design of a Scalable Interatomic Potential for GST+C Device Modeling: *Zachary Mcclure*¹; Alejandro Strachan¹; Robert Appleton¹; David Adams²; ¹Purdue University; ²Sandia National Laboratory

3:00 PM

Combined Clustering and Regression for Predicting Melting Temperatures of Solids: *Vahe Gharakhanyan*¹; José Garrido Torres¹; Ethan Eisenberg¹; Snigdhasu Chatterjee²; Dallas Trinkle³; Alexander Urban¹; ¹Columbia University; ²University of Minnesota; ³University of Illinois at Urbana-Champaign

3:20 PM Break

3:40 PM

Ultra-fast and Interpretable Machine-learning Potentials with Application to Structure Prediction: *Stephen Xie*¹; Matthias Rupp²; Richard Hennig¹; ¹University of Florida; ²University of Konstanz

4:00 PM

Mining Structure-property Linkage in Nanoporous Materials Using an Interpretative Deep Learning Approach: *Haomin Liu*¹; *Niaz Abdulrahim*¹; ¹University of Rochester

ADVANCED MATERIALS

Bulk Metallic Glasses XIX — Novel Alloys, Processing or Manufacturing Methods

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Thursday PM | March 3, 2022
253C | Anaheim Convention Center

Session Chairs: Jan Schroers, Yale University; Jörg Löffler, ETH Zurich

2:00 PM Invited

Lab-scale Injection Molding of Bulk Metallic Glasses: *Douglas Hofmann*¹; Scott Roberts²; ¹NASA Jet Propulsion Laboratory; ²NASA Jet Propulsion Laboratory

2:25 PM

The Secondary Glass Phase in High Fragility PtCuP Bulk Metallic Glass: *Sydney Corona*¹; Jong Na²; Qi An³; William Goddard¹; Konrad Samwer⁴; William Johnson¹; ¹California Institute of Technology; ²Glassmetal Technologies; ³University of Nevada, Reno; ⁴University of Göttingen

2:45 PM

Towards Qualifying Bulk Metallic Glasses for Spacecraft Components: *Punnathat Bordeenithikasem*¹; Douglas Hofmann¹; Richard Otis²; Robert Dillon¹; ¹NASA Jet Propulsion Laboratory

3:05 PM Discussion on novel alloys and processing of metallic glasses

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Role of Defects in Phase Stability and Transformations

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoulou, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Thursday PM | March 3, 2022
255C | Anaheim Convention Center

Session Chairs: Eva Zarkadoulou, Oak Ridge National lab.; Shahriyar Keshavarz, NIST

2:00 PM Invited

Signatures of the Effects of Defects on the Bulk Moduli of Crystalline Solids: *Saryu Fensin*¹; Richard Hoagland¹; ¹Los Alamos National Laboratory

2:30 PM

A First-principles Analysis of the Temperature Dependence of Stacking Fault Energies and Cross-slip Barrier in Mg and Its Alloys: *Julian Brodie*¹; Maryam Ghazisaeidi¹; ¹Ohio State University

2:50 PM

Effect of Electric Fields on Bulk and Surface Driven Dislocation Behavior in fcc Metals: *Soumendu Bagchi*¹; Danny Perez¹; ¹Los Alamos National Laboratory

3:10 PM

Does Vibrational Motion Explain the Latent Heat of Melting in Materials?: *Camille Bernal*¹; Claire Saunders¹; Stefan Lohaus¹; Doug Abernathy²; Brent Fultz¹; ¹California Institute of Technology; ²Oak Ridge National Laboratory

3:30 PM Break

3:50 PM

Thermodynamic Explanation of the Invar Effect by Computation and Experiments: *Stefan Lohaus*¹; Matthew Heine²; Pedro Guzman¹; Camille Bernal¹; Olle Hellman³; David Broido²; Brent Fultz¹; ¹California Institute of Technology; ²Boston College; ³Linköping University

4:10 PM

Entropic Effects on Thermally Activated Dislocation Cross-slip: *Yifan Wang*¹; Wei Cai¹; ¹Stanford University

SPECIAL TOPICS

DMMM4 — All-Summit Closing Plenary: Engaging Those with Physical, Cognitive or Sensory Challenges

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Thursday PM | March 3, 2022
Grand Ballroom F | Anaheim Marriott

Session Chairs: Mitra Taheri, Johns Hopkins University; Aerial Murphy-Leonard, The Ohio State University

2:00 PM Invited

Maximizing the Potential of Neurodiversity in the Employment and Educational Settings: *Lawrence Fung*¹; ¹Stanford University School of Medicine

2:40 PM

Accessibility for Disability: A Case Study of Graduate Colloquia during the COVID-19 Pandemic: *Claire Saunders*¹; Camille Bernal¹; Brent Fultz¹; ¹California Institute of Technology

3:00 PM

Breaking Down Geographical Barriers: Virtual and Non-standard Recruiting Efforts for Graduate Engineering at Purdue: *Brenden Hamilton*¹; Benjamin Stegman¹; Rosemary Son¹; Juan Carlos Verduzco Gastelum¹; Robynne Paldi¹; Jared Gohl¹; Nicholas Richter¹; ¹Purdue University

3:30 PM Wrap up of DMMM4: *Aerial Murphy-Leonard*, Ohio State University

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Energetic Materials and High Explosives

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Thursday PM | March 3, 2022
263C | Anaheim Convention Center

Session Chairs: Benjamin Morrow, Los Alamos National Laboratory; Georges Akiki, Lawrence Livermore National Laboratory

2:00 PM

Energy Localization during the Shock Compression of Nanoscale Plastically Bonded Explosives from All-atom Simulations: *Brenden Hamilton*¹; Tongtong Shen¹; Michael Sakano¹; Lorena Alzate-Vargas²; Chunyu Li¹; Alejandro Strachan¹; ¹Purdue University; ²Oak Ridge National Lab

2:20 PM

Characterization of Dynamic Hydrostatic Constitutive Response of Closed-cell PVC Foams Using Water Filled Shock Tube and 3D DIC: Piyush Wanchoo¹; Shyamal Kishore¹; Arun Shukla¹; ¹URI

2:40 PM

Simultaneous Lattice Strain and Bulk Strain Measurements during Thermal Cycling of PBX 9502: *Matthew Schmitt*¹; Bjorn Clausen¹; Travis Carver¹; Sven Vogel¹; John Yeager¹; ¹Los Alamos National Laboratory

3:00 PM

Development of New, Robust Mock Materials for PBX 9502: *Alexandra Burch*¹; Matthew Herman¹; Amanda Duque¹; John Yeager¹; ¹Los Alamos National Laboratory

3:20 PM Break**3:35 PM**

Comparison of Deflagration Modes in a Granular Energetic Material due to Spherical and Planar Impact: *Meghana Sudarshan*¹; Ayotomi Olokun¹; Abhijeet Dhiman¹; Vikas Tomar¹; ¹Purdue University

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Functional Energy Nanomaterials: Lithium-based Energy Storage

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woonchul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Thursday PM | March 3, 2022
260B | Anaheim Convention Center

Session Chairs: Min-Kyu Song, Washington State University; Woonchul Lee, University of Hawaii at Manoa

2:00 PM Invited

2D Materials for Lithium Batteries: *Reza Shahbazian-Yassar*¹; ¹University of Illinois at Chicago

2:25 PM Invited

Real-time Observations of Chemo-mechanical Behaviors of Si-based Anodes for Advanced Lithium-ion Batteries: *Jung-Hyun Kim*¹; ¹The Ohio State University

2:50 PM Keynote

Lithium Dendrite Growth and Stress Generation in Solid-state Batteries: *Sulin Zhang*¹; ¹Penn State

ADVANCED MATERIALS

High Performance Steels — Microstructure Evolution in Steels

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut Fuer Eisenforschung; Benjamin Adam, Oregon State University

Thursday PM | March 3, 2022
252C | Anaheim Convention Center

Session Chairs: Jonah Klemm-Toole, Colorado School of Mines; Benjamin Adam, Portland State University

2:00 PM

Co-optimization of Mechanical, Thermal, and Oxidation Properties in Steels for Energy Conversion Systems: *Dean Pierce*¹; Govindarajan Muralidharan¹; Artem Trofimov¹; Hsin Wang¹; Michael Tess²; Katie Sebeck²; Eric Gingrich²; Gerald Byrd²; Allen Haynes¹; ¹Oak Ridge National Laboratory; ²Ground Vehicles Systems Center

2:20 PM

Loading/Unloading Yielding Behavior in 304 Stainless Steel: *Melissa Thrun*¹; Christopher Finrock¹; Amy Clarke¹; Kester Clarke¹; ¹Colorado School of Mines

2:40 PM

Low-density Steels: Influence of Al Content and Processing on Microstructure and Properties in Medium-Mn Steels: *Tomas Scuseria*¹; Kelcey Garza²; Dean Pierce³; Amrinder Gill²; Jerry Arnold²; Amy Clarke¹; Kester Clarke¹; ¹Colorado School of Mines; ²Cleveland-Cliffs Inc.; ³Oak Ridge National Laboratory

3:00 PM

On the Phase Stability, Mechanical Properties, and Deformation Mechanisms of an Equiatomic CrFeNi Medium-entropy Alloy: *Mike Schneider*¹; Guillaume Laplanche¹; ¹Ruhr-University Bochum

3:20 PM Break

3:35 PM

Non-metallic Precipitates Evolution Mechanism of Fe-3.0wt%Si Steel: *Huilan Sun*¹; Zimo Bi¹; Di Zhang¹; Zhihong Guo¹; Bo Wang¹; ¹Hebei University of Science and Technology

LIGHT METALS

Magnesium Technology — Computational Materials Engineering

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Thursday PM | March 3, 2022
210A | Anaheim Convention Center

Session Chairs: Sean Agnew, University of Virginia; Christopher Barrett, Mississippi State University

2:00 PM

First-principles Investigation of Early-stage Precipitation in Mg-Sn and Mg-Zn Alloys: Du Cheng¹; Kang Wang¹; *Bi-Cheng Zhou*¹; ¹University of Virginia

2:20 PM

A Predictive Multisurface Approach to Damage Modeling in Mg Alloys: *Vigneshwaran Radhakrishnan*¹; Amine Benzerga¹; ¹Texas A&M University

2:40 PM

Phase Field Modeling of Deformation Twinning and Dislocation Slip Interaction in Polycrystalline Solids: *Eric Ocegueda*¹; Kaushik Bhattacharya¹; ¹California Institute of Technology

3:00 PM

PRISMS-plasticity: Recent Advancements for Simulating Deformation of Mg Alloys: *Mohammadreza Yaghoobi*¹; Aaditya Lakshmanan¹; Zhe Chen¹; Duncan A. Greeley¹; John E. Allison¹; Veera Sundararaghavan¹; ¹University of Michigan

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — Advanced Materials and Interfaces

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Thursday PM | March 3, 2022
203A | Anaheim Convention Center

Session Chairs: Lance Snead, Stony Brook University; Jason Trelewicz, Stony Brook University

2:00 PM Invited

High-performance Superconductors for High Field Magnets for Compact Fusion: *Venkat Selvamani*¹; ¹University of Houston

2:30 PM

Radiation Effects and Thermal Stability in Ferritic Steels and High Entropy Alloys: *Eda Aydogan*¹; Osman El-Atwani²; Koray Iroc¹; Stuart Maloy²; Eren Kalay¹; ¹Middle East Technical University; ²Los Alamos National Laboratory

2:50 PM Invited

Composite Shielding for Advanced Fusion Systems: *Lance Snead*¹; Steven Zinkle²; Jason Trelewicz¹; Ethan Peterson³; David Sprouster¹; Bin Cheng¹; ¹Stony Brook University; ²University of Tennessee, Knoxville; ³MIT

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Fuels & Claddings II

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Thursday PM | March 3, 2022
204A | Anaheim Convention Center

Session Chairs: Simon Middleburgh, Bangor University; Peng Xu, INL

2:00 PM

Microscale Thermal Conductivity and Residual Stress Measurements in TRISO Particle Coatings: *Alexander Leide*¹; Miriam Mowat²; James Pomeroy¹; Roland Simon²; Mark Davies³; Dave Goddard⁴; Martin Kuball¹; Dong Liu¹; ¹University of Bristol; ²Thermap Solutions; ³Ultra Safe Nuclear Corporation; ⁴National Nuclear Laboratory

2:20 PM

Mesoscale Modeling of the Relationships between Microstructure and Mechanical Properties in the Porous Pyrocarbon Buffer Layer for TRISO Particle Fuel: *Mohammed Goma Abdoelatef*¹; Claire Griesbach²; Kumar Sridharan²; Ramathasan Thevamaran²; Gerczak Tyler³; Wen Jiang⁴; karim Ahmed¹; ¹Texas A&M University; ²University of Wisconsin; ³Oak Ridge National Laboratory; ⁴Idaho National Laboratory

2:40 PM

Effect of Nb Alloying and Thermo-mechanical Processing on the Anisotropic Biaxial Creep Behavior of Zircaloy Cladding: *Mahmoud Hawary*¹; K. Murty¹; ¹North Carolina State University

3:00 PM

Size-dependent Radiation Damage Mechanisms in Nanowires and Nanoporous Structures: Daniel Vizoso¹; Maria Kosmidou²; T. John Balk²; Khalid Hattar³; Chaitanya Deo¹; *Remi Dingreville*³; ¹Georgia Institute of Technology; ²University of Kentucky; ³Sandia National Laboratories

3:20 PM Break

3:40 PM

Investigation of Elemental Segregation and Precipitation in Ion-irradiated Advance Austenitic Alloy A709 Using Advance Techniques: *Dominic Piedmont*¹; Xiang Liu²; Hyosim Kim³; Frank Garner⁴; Lin Shao⁴; T.-L. Sham⁵; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²Zhejiang University; ³Los Alamos National Laboratory; ⁴Texas A&M University; ⁵Argonne National Laboratory

Visit the Poster Sessions in the TMS2022 Exhibit Hall

View a changing display of posters in the TMS2022 Exhibit Hall (Hall C) during exhibit hours. Then join us for two separate presentation sessions, grouped by topic areas, on Monday and Tuesday evening. Presenters will be on hand during these sessions to discuss their work.

POSTER SESSION I

Monday, February 28
5:30 p.m. to 7:00 p.m.

FEATURING POSTERS ON:

Advanced Materials
Corrosion
Electronic Materials
Energy & Environment (including REWAS 2022 Symposia)
Light Metals
Materials Processing
Mechanics and Structural Reliability
Nanostructured & Heterostructured Materials

POSTER SESSION II

Tuesday, March 1
5:30 p.m. to 7:00 p.m.

FEATURING POSTERS ON:

Additive Technologies
Biomaterials
Characterization
Materials Design
Nuclear Materials
Physical Metallurgy

MATERIALS PROCESSING

12th 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; Jesse White, Elkem Carbon Solutions; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, Jiangxi University of Science and Technology; Onuralp Yücel, Istanbul Technical University; Ender Keskinilic, Atılım University; Tao Jiang, Central South University; Morsi Mahmoud, King Fahd University of Petroleum & Minerals

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Ailiang Chen, Central South University; Ender Keskinilic, Atılım University

F-4: Effect of Humic Acid-based Binder on the Properties of Vanadium-titanium Magnetite Oxidized Pellets: *Jin Zhang*¹; ¹Central South University

F-9: Phosphorus Migration Behavior in the Process of Converter Slag Gasification Dephosphorization: *Chenxiao Li*¹; Yuekai Xue¹; Shuai Tong¹; Kaixuan Zhang¹; ¹North China University of Science and Technology

F-10: Prediction Model of Calcium Addition in SPHC Steel Refining Process: *Zhiqiang Du*¹; *Nan Wang*¹; ¹Northeastern University

F-11: Simulation Study on Top Blowing Combustion in Iron Bath Smelting Reduction: *Panfeng Wang*¹; *Nan Wang*¹; ¹Northeast University

F-12: Thermodynamic Study on Modification Converter Slag Using Hot Blast Furnace Slag: *YuZhu Pan*¹; Dajun Luo¹; Xiang Yuan¹; Gaoming Liang¹; Jingxin Wang¹; Pengcheng Zhang¹; ¹Hunan ValinXiangtan Iron & Steel Co.,Ltd.

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — EPD 2022 Technical Division Graduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPG-1: Challenges for Molten Oxide Electrolysis in Reduced Gravity: *Matthew Humbert*¹; Akbar Rhamdhani¹; Geoff Brooks¹; Chad Hargrave¹; ¹Swinburne University of Technology

SPG-2: Decopperization Study for Steel Recycling: *Hyunsoo Jin*¹; Brajendra Mishra¹; ¹Worcester Polytechnic Institute

SPG-3: Influence of Graphene Nano Sheets on Friction and Wear Behaviour of Aluminum A380 Nanocomposite Produced by Powder Metallurgy: *Hanieh Sajjadpour*¹; Mohammad Alipour¹; ¹Tabriz University

SPG-4: Investigating of the Microstructure and Mechanical Properties of Al- A380 Nanocomposite Reinforced with SiC Nanoparticles Produced by Powder Metallurgy: *Ali Mohammadi*¹; Mohammad Alipour¹; ¹Tabriz University

SPG-5: Investigating of the Wear Behavior of Al- A380 Nanocomposite Reinforced with SiC Nanoparticles Produced by Powder Metallurgy: *Ali Mohammadi*¹; Mohammad Alipour¹; ¹Tabriz University

SPG-6: Recycling of CrC-nichrome Coated Stainless Steel by Remelting and Addition of Alloys with Validation from Mathematical Modelling: *Akanksha Gupta*¹; Brajendra Mishra¹; ¹Worcester Polytechnic Institute

SPG-7: Sustainable Process Flowsheet for Recovery of Value added Products from Bauxite Residue: *Himanshu Tanvar*¹; Brajendra Mishra¹; ¹Worcester Polytechnic Institute

SPG-8: The Effect of Graphene Nano Sheets on Microstructure and Mechanical Properties of Aluminum A380 Nanocomposite Produced by Powder Metallurgy: *Hanieh Sajjadpour*¹; Mohammad Alipour¹; ¹Tabriz University

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — FMD 2022 Technical Division Graduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPG-10: Assessing the Bio-stability of miRNA Conjugated Metal and Metal Oxide Nanoparticles via Electroanalysis: *Chaimae El Ghzaoui*¹; Craig Neal¹; Elayaraja Kolanthai¹; Yifei Fu¹; Udit Kumar¹; Carlos Zgheib²; Kenneth Liechty²; Sudipta Seal¹; ¹University of Central Florida; ²University of Colorado Denver School of Medicine and Children's Hospital Colorado

SPG-11: Crumpled MoS₂ Flexoelectric Energy Harvester: *Yeageun Lee*¹; Hyung Jong Bae¹; Md Haque¹; SungWoo Nam²; ¹University of Illinois at Urbana-Champaign; ²University of California, Irvine

SPG-12: Dual miRNAs Functionalized Cerium Oxide for Angiogenesis and Anti-inflammatory: *Elayaraja Kolanthai*¹; Aadith Menon¹; Balaashwin Babu¹; Yifei Fu¹; Udit Kumar¹; Craig Neal¹; Kenneth Liechty²; Sudipta Seal¹; ¹University of Central Florida; ²University of Colorado Denver School of Medicine and Children's Hospital Colorado

SPG-13: Engineering Ce³⁺ State in Cerium Oxide Nanoparticles Under The Presence of a Reducing Sugar: *Balaashwin Babu*¹; Elayaraja Kolanthai¹; Craig Neal¹; Udit Kumar¹; Sudipta Seal¹; ¹University of Central Florida

SPG-16: Study of Anti-inflammatory miRNA146a Loading on Cerium Oxide Nanoparticles with Different Surface Facet: *Yifei Fu*¹; Elayaraja Kolanthai¹; Craig Neal¹; Udit Kumar¹; Carlos Zgheib²; Kenneth Liechty²; Sudipta Seal¹; ¹University of Central Florida; ²University of Colorado Denver

SPG-17: Upconversion Nanomaterials (UCNPs) Based Self-sterilizing Surfaces with Efficacy Against SARS-CoV-2: *Udit Kumar*¹; Candace Fox¹; Craig Neal¹; Elayaraja Kolanthai¹; kritika kedarinath¹; Balaashwin Babu¹; Erik Marcelo¹; Yifei Fu¹; Griffith Parks¹; Sudipta Seal¹; ¹University of Central Florida

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — FMD 2022 Technical Division Undergraduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPU-2: Exploring the Synthetic Plastic Degradation Capabilities of SURF and Rapid City Wastewater Microbes: *Brianna Hoff¹*; Paycen Harroun¹; Tanvi Govil¹; David Salem¹; Rajesh Sani¹; ¹South Dakota School of Mines & Technology

SPU-3: Investigation of Nanoparticle Size Effects on the Dielectric Properties of Functionalized Barium Titanate: *Evan Flitz¹*; Emma Cooper²; Eduardo De Anda²; Halie Kim²; Zoe Kedzierski²; Albert Dato²; Todd Monson³; ¹Pomona College; ²Harvey Mudd College; ³Sandia National Laboratories

SPU-4: Medical Applications of Polymer Coated Cannulas: *Catalina Lizarazo¹*; Christopher Batich¹; Malisa Sarntinoranont¹; Nagarajan Rajagopal¹; Katherine Ryland¹; Kenna Hildenbrand¹; ¹University of Florida

SPU-5: Thermomechanical Clamp for Curing Low- Dielectric Dry Films: *Ethan Shackelford¹*; Pragna Bhaskar¹; Mohanalingam Kathaperumal¹; Madhavan Swaminathan¹; ¹Packaging Research Center

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — LMD 2022 Technical Division Graduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPG-18: A Promising Orthopedic Implant Material with Enhanced Corrosion Resistance, Mechanical Properties, Osteogenic and Antibacterial Activity: Mg-Sc-Sr Alloy: *Nadia Aboutalebianaraki¹*; Sudipta Seal¹; Mehdi Razavi¹; ¹University of Central Florida

SPG-19: Development of Equiaxed Titanium Alloys in Additive Manufacturing: *Nevin Taylor¹*; ¹Ohio State University

SPG-20: Effects of Cu on the Interfacial Stability of Nanoprecipitates in Al-Zn-Mg-Cu Alloys from First-principles Investigations: *Yu-ning Chiu¹*; Chung-yi Yu²; Shih-kang Lin¹; ¹National Cheng Kung University; ²China Steel Corp, Aluminum Prod R&D Sect

SPG-21: Fatigue Behavior of Fastener Holes in High-strength Aluminum Plates Repaired by Additive Friction Stir Deposition: *Ismail Hidalgo¹*; Paul Allison¹; Brian Jordon¹; Malcolm Williams¹; Jacob Strain¹; Bret Cordle¹; Troy Pierson¹; Jacob Williamson¹; James Tew¹; ¹The University of Alabama

SPG-22: Microstructural Evolution during Post Processing of Additively Manufactured 7050 Aluminum Alloy and Its Effect on Corrosion Behavior: *Rupesh Rajendran¹*; Crosby Owens²; David Spain²; Preet Singh¹; ¹Georgia Institute of Technology; ²Northrop Grumman Aeronautics Systems

SPG-23: Prior Grain Boundary Alpha in BASCA Ti-17: *Mathew Cohen¹*; ¹The Ohio State University

SPG-24: Thermomechanical Processing of Aluminum-Cerium Alloys: *Elizabeth Heon¹*; Eric Lass¹; ¹University of Tennessee Knoxville

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — LMD 2022 Technical Division Undergraduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPU-6: Bubble Raft Education: *Drew Davidson¹*; ¹University of Florida

SPU-7: Investigate the Effect of Crystallographic Orientation on the Mechanical and Corrosion Properties of Copper Single Crystals: *Devin Davis¹*; ¹University of North Texas

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — MPMD 2022 Technical Division Graduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPG-28: Microstructure and Mechanical Properties of Eutectic Ni-Ce and Ni-Ce-Al Alloys: *Syeda Bushra Haider¹*; Elizabeth Heon¹; Eric Lass¹; ¹University of Tennessee, Knoxville

SPG-29: Production via Machining and Rolling of High resistivity Electrical Steel: *B. Stiven Puentes¹*; James Mann¹; Srinivasan Chandrasekar¹; Kevin Trumble¹; ¹Purdue University

SPG-32: Water Transport through Porous Membranes - Modeling and Experiments: *Harjot Singh¹*; Nicholas Ury¹; Jaewan Bae¹; Ali Mehrabi²; Naira Khosravian²; Vilupanur Ravi¹; ¹California Polytechnic State University Pomona; ²Avery Dennison

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — MPMD 2022 Technical Division Undergraduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPU-8: COMSOL-generated Weld Heat Transfer Models For Automation of Infrared Thermography Non-destructive Testing (IR-TNDT) Image Analysis: *Savannah Horowitz¹*; Brittani Maskley¹; Michele Manuel¹; ¹University of Florida

SPU-9: Mechanochemistry for Creation of Functional Surface Treatments: *Jennifer Johnson¹*; William Cross¹; James Tomich¹; Grant Crawford¹; Jon Kellar¹; ¹South Dakota School of Mines and Technology

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — SMD 2022 Technical Division Graduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPG-33: Computational Modeling of Non-equilibrium Phenomena in Laser Additive Manufacturing Using Molecular Dynamics: Gurmeet Singh¹; Veera Sundararaghavan¹; ¹University of Michigan

SPG-34: Development of a Generalized Fatigue Assessment Approach for Steel Castings: Bret Cordle¹; James Jordon¹; Paul Allison¹; Hayley Brown²; Jacob Williamson¹; ¹The University of Alabama; ²Steel Founders Society of America

SPG-35: Discovering the Corrosion Mechanism of Chromium in High-temperature LiF-NaF-KF Molten Salts for Gen-IV Molten Salt Reactor Applications: Ho Lun Chan¹; Elena Romanovskaia¹; Minsung Hong²; Peter Hosemann²; John Scully¹; ¹University of Virginia; ²University of California Berkeley

SPG-36: Effect of Oxide Impurities on Corrosion of Materials in Molten Fluoride Salt: Krishna Moorthi Sankar¹; Preet Singh¹; ¹Georgia Institute of Technology

SPG-39: Mechanical Behavior of a Next-generation Steel (AF9628) Printed via Directed Energy Deposition: Ankita Roy¹; Ravi Haridas¹; Rajiv Mishra¹; B McWilliams¹; Clara Mock¹; K Cho¹; ¹University of North Texas

SPECIAL TOPICS

2022 Technical Division Student Poster Contest — SMD 2022 Technical Division Undergraduate Student Poster Contest

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

SPU-10: Correlating Grain Boundary Energy to Abnormal Grain Growth Using Atomic Force Microscopy: Molly Kole¹; Bryan Conry¹; Prabal Tiwari¹; William Burnett¹; Amanda Krause¹; ¹University of Florida

SPU-11: Model Based Control of Microstructure for Additive Manufacturing 316L Stainless Steel: Matthew Michalek¹; Daniel Moser¹; Theron Rodgers¹; ¹Sandia National Laboratories

SPU-12: Quantitative Analysis of Microstructure in the Ti-6Al-4V Alloy Using Scanning Electron Microscopy: Sydney Fields¹; Dian Li¹; Yufeng Zheng¹; ¹University of Nevada, Reno

ADVANCED MATERIALS

2D Materials – Preparation, Properties & Applications – Poster Session

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Ramana Chintalapalle, University of Texas; Sufian Abedrabbo, Khalifa University

A-1: Preparation and Electro-sorption Performance of Lotus Petiole-based Activated Carbon: Zhongmei Miao¹; Mengyao Ma¹; Wencui Chai¹; ¹Zhengzhou University

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond – Poster Session

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

Program Organizers: Verena Maier-Kiener, Montanuniversitaet Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-1: High-speed Indentation for 3D Mapping of Nanoporous Gold: Kerry Baker¹; T Balk¹; ¹University of Kentucky

H-2: Investigating the Strain Rate Dependence of Hardness of Cu/Mo Nanolaminate Films Using Conventional and High Strain Rate Nanoindentation Methods: Wesley Higgins¹; Christopher Walker¹; Benjamin Hackett¹; George Pharr¹; ¹Texas A&M University

H-3: Nanoindentation of Semi-crystalline and Amorphous Thermoplastics: Petra Christöfl¹; Caterina Czibula²; Michael Berer¹; Christian Teichert³; Gerald Pinter³; Gernot Oreski¹; ¹PCCL; ²Graz University of Technology; ³Montanuniversitaet Leoben

ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings — Poster Session

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Ramana Chintalapalle, University of Texas at El Paso; Adele Carrado, IPCMS - CNRS Université de Strasbourg; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougin, Cnrs - Is2m; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougin, CNRS- IS2M

A-2: Corrosion Behaviour of an Aisi 4140 Steel Nitrided by Plasma in a Seawater Medium Solution: *Ariosto Medina*¹; Jesús Valdes¹; Claudio Aguilar²; Engelbert Huape¹; ¹Universidad Michoacana de San Nicolás de Hidalgo; ²Universidad Técnica Federico Santa María

A-3: Incorporation of Metallic Nanoparticles into Alkyd Resin: A Review of their Coating Performance: *Ikhazuagbe Ifijen*¹; *Muniratu Maliki*²; Stanley Omorogbe¹; Ibrahim Danjuma¹; ¹Rubber Research Institute of Nigeria; ²Department of Chemistry, Edo University Iyamho, Edo State, Nigeria

A-4: Nanostructured Graphene Thin Films: A Brief Review of Their Fabrication Techniques and Corrosion Protective Performance: *Ikhazuagbe Ifijen*¹; Oscar Aghedo²; Ifeanyi Odiachi³; Stanley Omorogbe¹; Ekebafé Olu⁴; Innocent Onuguh⁵; ¹Rubber Research Institute of Nigeria; ²University of Benin, P.M.B. 1154, Benin City, Nigeria; ³Department of Science Laboratory Technology, Delta State Polytechnic Ogwashi-Uku, Nigeria; ⁴University of Lagos; ⁵Department of Chemistry, Igbinedion University, Okada, Edo State, Nigeria

A-5: The Design of Coatings Developed Using Polyetherimide and Nanocomposites Thereof for Corrosion Protection of Base Metals: *Tiffany Sill*¹; Rachel Davidson¹; Lacey Douglas¹; Viswanathan Kalyanaraman²; Nikhil Verghese²; Kapil Sheth²; Sarbajit Banerjee¹; ¹Texas A&M University; ²Sabic

A-6: The Effect of Additives in Hybrid Zr-based Chemical Conversion Coating on the Surface Morphology Chemical Compositions and Corrosion Resistance
: *Cheng-Chu Chung*¹; Xiaoyang Liu¹; Donald Vonk²; Bruce Ravel³; Kim Kisslinger⁴; Xiao Tong⁴; Gary Halada¹; Stanislas Petrash²; Kate Foster²; Yu-chen Chen-Wiegart¹; ¹Stony Brook University; ²Henkel Corporation; ³National Institute of Standards and Technology; ⁴Brookhaven National Laboratory

A-7: Tribocorrosion Performance of Polymer-derived Ceramic Coatings on 304 Stainless Steel: *Wenbo Wang*¹; Senam Tamakloe¹; Wenjun Cai¹; Kathy Lu¹; ¹Virginia Polytechnic Institute and State University

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — Poster Session

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Soumendra Basu, Boston University; Jung Pyung Choi, Pacific Northwest National Laboratory

D-2: Crystal Facet-controlled SnS Photocathodes for Bias-free Photoelectrochemical Solar Water Splitting: *Hyungsoo Lee*¹; Jaemin Park¹; Young Sun Park¹; Juwon Yun¹; *Jooho Moon*¹; ¹Yonsei University

D-3: Degradation Characteristics of PU Foam in District Heating Pipe under Accelerated Aging Condition: *Hyung-Gyu Kim*¹; Jooyong Kim²; Hea-Yong Lee²; Jonghun Yoon¹; ¹Hanyang University; ²Korea District Heating Corporation(KDHC)

D-7: On Recent Development in Two-dimensional Transition Metal Dichalcogenides for Applications in Hydrogen Evolution Reaction: *Chukwudike Ukeje*; ¹

D-8: Study on a Short Process Method for Preparation of 3.5 Valence Vanadium Electrolyte: *Zhengtuan Li*¹; Lanjie Li¹; Heli Wan²; ¹Chengde Iron and Steel Group Co., Ltd, HBIS Group Co.,LTD.; ²National Engineering Laboratory for Vacuum Metallurgy

NANOSTRUCTURED MATERIALS

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

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Amit Pandey, Lockheed Martin Space; Saurabh Puri, Microstructure Engineering; Amber Srivastava, Indian Institute of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-6: Synthesis and Characterization of Mesoporous Copper Cobalt Oxide (CuCo₂O₄) Using Inverse Micelle Method: *Sung Gue Heo*¹; Kyoung-Tae Park²; Soong Ju Oh³; Seok-Jun Seo²; ¹Kitech/ Korea University; ²Korea Institute of Industrial Technology; ³Korea University

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — Poster Session

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

A-12: KMC Modeling of Screw Dislocation Strength in Equiatomic bcc Refractory Alloys: Xinran Zhou¹; Jaime Marian¹; Sicong He¹; ¹UCLA

A-13: Phase Transition Zones in Compositionally Complex Alloy Films: Daniel Goodelman¹; Andrea Hodge¹; ¹University of Southern California

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Poster Session

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Kathy Lu, Virginia Polytechnic Institute and State University; Dipankar Ghosh, Old Dominion University

F-13: Atomistic Modeling of Hot-press Sintering of AlN Nanoceramics: Aoyan Liang¹; Chang Liu¹; Paulo Branicio¹; ¹University of Southern California

F-14: Determining the Processing Conditions for Fe Metal Exsolution and Phase-decomposition of Doped CaTiO₃ for Catalysis Applications: Jason Luong¹; Komal Syed¹; William Bowman¹; ¹University of California, Irvine

F-15: Incorporation of Ornamental Stone Waste into Red Ceramics: Mariane de Aguiar¹; Monica Gadioli¹; Francisco Vidal¹; Kayrone de Almeida¹; ¹CETEM

F-16: Microstructure and Mechanical Properties of Mechanically Alloyed and Spark Plasma Sintered NbC-Ni Cermets: Supreeth Gaddam¹; Surekha Yadav¹; Amit Behera²; Qiaofu Zhang²; Fan Meng²; Noriaki Arai²; Zaynab Mahbooba²; Rajiv Mishra¹; ¹University of North Texas; ²QuesTek Innovations LLC

F-17: Participation of Nitrosamide in the Selective Catalytic Reduction of Nitrogen Oxides over Cu/SSZ-13: Anna Getley¹; Furio Cora¹; Jasper Berry-Gair¹; Chu Lun Alex Leung¹; ¹University College London

F-19: Purity Improvement According to Batch and Continuous Hot Chlorination Processes of Natural Quartz Powder: Jong Ho Kim¹; ¹Rist

F-20: Technological Behavior of Ceramics Incorporating Powdered Waste from Ornamental Stone: Maria Angélica Sant'Ana¹; Mônica Gadioli¹; ¹CETEM

F-22: Three-dimensional Interconnected Porous Titanium Dioxide Ceramic for High-temperature Thermal Storage: Siyi Zhao¹; Jinhong Li¹; ¹China University of Geosciences, Beijing

MATERIALS PROCESSING

Advances in Surface Engineering IV — Poster Session

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

Program Organizers: Arif Mubarak, PPG; Bharat Jasthi, South Dakota School of Mines & Technology; Tushar Borkar, Cleveland State University; Mary Lyn Lim, PPG Industries; Rajeev Gupta, North Carolina State University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Mohammad Umar Farooq Khan, Texas A&M University

F-23: Plasma Functionalization of Packaging Waste Derived Sustainable Carbon for Composite Reinforcement: Vijaya Rangari¹; Zaheeruddin Mohammed¹; Shaik Jeelani¹; ¹Tuskegee University

F-24: Role of Surface Mechanical Attritions Processing Conditions on the Corrosion Behavior of Aluminum 7075 Alloys: Vikrant Beura¹; Kiran Solanki¹; ¹Arizona State University

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications X — Poster Session

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

Program Organizers: Hsin-Jay Wu, National Chiao Tung University; Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Cnrs Crismat Unicaen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Takao Mori, National Institute For Materials Science; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology; Pai-chun Wei, National Taiwan University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

C-1: Flexible n-type Chalcopyrite/PEDOT:PSS/Graphene Hybrid Film for Thermoelectric Device Harvesting Low Grade Heat: Yanan Wang¹; Hong Pang¹; Quansheng Guo¹; Naohito Tsujii¹; Takao Mori¹; ¹National Institute for Materials Science

C-2: Ternary Phase Diagram and Thermoelectric Performance of Bi-doped GeTe: *Chen Bo-Chia*¹; Kuang-Kuo Wang²; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University; ²National Sun Yat-sen University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — Poster Session

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

E-2: Corrosion Evaluations of Aluminium for Pre-painted Products with Alternative Alloys and Comparable Test Methods: Yusuf Özçetin¹; Ezgi Ipek¹; Koray Dündar¹; Cemre Kocahakimoglu²; Sümbüle Sagdiç¹; *Ali Ulus*¹; ¹ASAS Aluminum I. Company; ²AkzoNobel Kemipol I. Company

E-3: Development and Analysis of Near Shape Powder Processed Aluminum Alloy Materials: *Steven Johnson*¹; William Caron¹; ¹Central Connecticut State University

E-5: Effect of Step Aging Conditions on Mechanical Properties of AlMgSi Alloy Profiles for Automotive Industry: Osman Halil Çelik¹; Mehmet Bugra Guner¹; *Zeynep Tutku Özen*¹; Ilyas Artunç Sari¹; ¹Asas Aluminium

E-6: Effects of Different Homogenization Conditions on High Strength Al-Mg-Si Alloys with Cu Addition: Mehmet Bugra Guner¹; Gökrem Özçelik¹; Tolga Demirkiran¹; Osman Halil Çelik¹; *Zeynep Tutku Özen*¹; Baris Akin¹; Esra Kaymak Aksu¹; ¹Asas Aluminium

E-7: Evaluation of As-built Properties of Aluminum Alloys Manufactured Using Various Directed Energy Deposition Techniques: *Carly Romnes*¹; Omar Mireles²; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²NASA Marshall Space Flight Center

E-8: Experimental and Modelling Investigation of Oxide Layer Fragmentation and Metal Micro-extrusion Behavior during Cold Rolling of Aluminum Alloy: *Mahsa Navidrad*¹; John Plumeri¹; Wojciech Misiolok¹; Masashi Watanabe¹; Wojciech Stepniowski¹; ¹Lehigh University

E-10: Joining of Aluminum Alloy 6061 Using Additive Friction Stir Deposition: *Jacob Strain*¹; Malcolm Williams¹; Christopher Williamson¹; Ryan Kinser¹; Paul Allison¹; James Jordon¹; ¹The University of Alabama

E-11: New 6xxx Al-Mg-Si Alloy with High Formability for Structural Automotive Parts and Suitable for E-mobility Applications: *Gregor Michael*¹; Zahra Tazimoghdam¹; Angela Thum¹; Josef Berneder¹; ¹AMAG Rolling GmbH

E-12: Optimization of Twin Roll Casting Method of 5XXX Series Alloys for Automotive Applications Possible to be Produced with 6XXX Series Alloy: *Gorkem Demir*¹; ¹Asas Aluminyum Sanayi Ve Ticaret A.S

E-14: Solid Stir Extrusion: An Innovative Solid-state Extrusion Process: *Anurag Gumaste*¹; Sanya Gupta¹; Supreeth Gaddam¹; Ravi Sankar Haridas¹; Rajiv Mishra¹; Kumar Kandasamy²; Brandon McWilliams³; Kyu Cho³; ¹University of North Texas Denton; ²Enabled Engineering; ³CCDC Army Research Laboratory

E-15: TEM Dislocation Interaction with the Microstructure of an Al-Si-Mg Alloy Elaborated by Laser Beam Melting: *Nicolas Bello*¹; Malo Jullien¹; Cassiopée Galy²; Céline Larignon²; Joël Douin¹; ¹CEMES-CNRS; ²IRT Saint Exupéry

E-16: The Study on the Relationship with Rolling Condition and Properties in Al Alloys: *Sun Ki Kim*¹; Taeyang Kwak²; Changhee Cho³; Jinkyu Lee¹; Youngjig Kim⁴; ¹NICELMS Co., Ltd; ²Ruantech Co., Ltd; ³Korea Institute of Industrial Technology; ⁴Sungkyunkwan Univ.

ADVANCED MATERIALS

Bulk Metallic Glasses XIX — Poster Session

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Katherine Flores, Washington University; Robert Maass, BAM and UIUC

A-14: A Molecular Dynamics Study of the Evolution of Medium-range Ordering in Liquid Metals: *Doguhan Saritürk*¹; Can Okuyucu¹; Yunus Kalay¹; ¹Middle East Technical University

A-19: High Metalloid Containing Ti-based Metallic Glasses for Biomedical Applications: *Baran Sarac*¹; Eray Yüce¹; Florian Spieckermann²; Amir Rezvan¹; Jürgen Eckert²; ¹Erich Schmid Institute of Materials Science; ²Montanuniversität Leoben

A-20: Investigating the Fundamentals of Incipient Spall via Bulk Metallic Glasses with Laser-driven Micro-flyer Experiments: *Christopher DiMarco*¹; Ethen Lund²; Gavin Mackay¹; Laszlo Kecskes¹; Jan Schroers²; K.T. Ramesh¹; ¹Johns Hopkins University; ²Yale University

A-22: The Mechanical Properties of Al-Tb Nanocrystalline Marginal Metallic Glass Composite: *Can Okuyucu*¹; Doguhan Saritürk¹; Tolga Ulucan²; Mohammad Abboud³; Amir Motallebzadeh⁴; Sezer Özerinç¹; Ilkay Kalay⁵; Yunus Kalay¹; ¹Middle East Technical University; ²Max-Planck-Institut für Kohlenforschung; ³Bilkent University; ⁴Koç University; ⁵Çankaya University

ENERGY & ENVIRONMENT

Composite Materials for Sustainable Eco-Friendly Applications — Poster Session

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Simona Hunyadi Murph, Savannah River National Laboratory

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Brian Wisner, Ohio University

D-9: Effect of Thermal Conductivity on the Mechanical Behavior of Marginal Construction Waste as a Structural Material for Recycled Pavements: *Liliana Hernandez Garcia*¹; Henry Colorado¹; ¹Universidad de Antioquia

D-10: High Strain Rate Compression Response of Curaua/Aramid Epoxy Laminate Hybrid Composites for Ballistic Helmets: Natalin Meliande¹; Lucio Nascimento¹; *Sergio Monteiro*¹; ¹IME

D-12: Removal of Fluoride from Aqueous Solution by NH₂-MIL-101(AU): *Xinhui Liu*¹; Wenjuan Wang¹; Guihong Han¹; Yanfang Huang¹; Bingbing Liu¹; Shengpeng Su¹; ¹Zhengzhou University

D-13: Study on the Application of Modified MOFs to the Treatment of Simulated Metallurgical Wastewater: *Junpeng Zuo*¹; Guihong Han¹; Wenjuan Wang¹; Yanfang Huang¹; Bingbing Liu¹; Shengpeng Su¹; ¹Zhengzhou University

D-14: The Response of Curaua/Aramid Epoxy Laminate Hybrid Composites to Ballistic Impact by Fragment Simulating Projectiles: Natalin Meliande¹; Lucio Nascimento¹; *Sergio Monteiro*¹; ¹IME

D-15: Thermal Aging Evaluation of Epoxy Composites Reinforced with Figue Fabric Using Thermogravimetric Analyses: Michelle Oliveira¹; Elisa de Brito²; Foluke de Assis³; Fernanda da Luz¹; Sergio Monteiro¹; *Wendell Bezerra*¹; ¹Military Institute Of Engineering; ²Institute of Macromolecules Professor Eloisa Mano (IMA); ³Navy Research Institute (IPqM)

D-16: Utilizing Spent Espresso Grounds for Composite Filaments with Improved Thermal Properties: *Shardai Johnson*¹; Vijaya Rangari¹; ¹Tuskegee University

ENERGY & ENVIRONMENT

Composites for Energy Applications: Materials for Renewable Energy Applications 2022 — Poster Session

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

Program Organizers: Patrick Ward, Savannah River National Laboratory; Joseph Tepovich, California State University Northridge; Anthony Thompson, Savannah River National Laboratory; Simona Hunyadi Murph, Savannah River National Laboratory

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Anthony Thompson, Savannah River National Laboratory

D-17: Fabrication of Novel LiCrTiO₄-MWCNTs Based Composite Electrodes for Flexible Li Ion Batteries: *Prerna Chaturvedi*¹; Amarsingh Bhabu Kanagaraj¹; Daniel Choi¹; ¹Khalifa University

D-18: Preparation of Coal Liquefaction Residue/PAN Composite Carbon Nanofibers by Electrostatic Spinning: *Xiao-Yan Zhang*¹; Tong-Xin Qiao¹; Peng Li¹; ¹Zhengzhou University

D-20: Seebeck Analysis of ALD Synthesized Thermoelectric Thin Films: Sadiya Tahsin¹; Jameson Crouse²; Helmut¹; *Abdelmageed Elmustafa*¹; ¹Old Dominion University; ²Dept. of Physics, College of William and Mary, Williamsburg, VA 23187

MATERIALS PROCESSING

Defects and Properties of Cast Metals IV — 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; Andrew Kao, University of Greenwich; Kyle Fezi, Fort Wayne Metals

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

F-26: Correlation between Purification Effect and Surface Segregation of Impurities in Aluminium at High Temperatures: *Jin-Kyu Lee*¹; Sun-Ki Kim¹; ¹Nice LMS Co., LTD

F-27: Modeling the Bonding and Structure of Non-metallic Inclusions within a Nickel Matrix during Forging: *Brandon Mackey*¹; Thomas Siegmund¹; Michael Sangid¹; ¹Purdue University

F-28: The Mechanical Properties and Microstructural of Cast Zinc though Aluminum Inoculation by Ultrasonic Treatment: *Dachao Wu*¹; Zhilin Liu¹; Zhaojin Fan¹; Tian Huang¹; ¹Central south university

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — Poster Session

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

G-1: Developing Methods for Microstructural Control of Ni-Cr Binary Alloys: *Diego Macias*¹; Mohammad Umar Farooq Khan¹; Stephen Raiman¹; ¹Texas A&M University

G-2: The Efficacy of Using Flat Plate Oxidation Data as a Proxy for Active Crack Tip Behavior in Waspaloy: *Alex Jennion*¹; Zachary Harris¹; James Burns¹; ¹University of Virginia

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — Poster Session

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, Army Research Laboratory; Marc Meyers, University of California San Diego; George Gray, Los Alamos National Laboratory; Neil Bourne, The University of Manchester

G-4: An Improved Method for High Strain Rate Nanoindentation Testing Using Piezoelectric Load Cell Measurements: *Christopher Walker*¹; Benjamin Hackett¹; Sudharshan Pardhasaradhi²; Warren Oliver³; George Pharr¹; ¹Texas A&M University; ²ARCI; ³KLA Corporation

G-5: Atomistic Investigation of Stress Release Mechanisms of Aramid Fibers: *Emily Gurniak*¹; Subodh Tiwari¹; Aiichiro Nakano¹; Rajiv Kalia¹; Priya Vashishta¹; Paulo Branicio¹; ¹University of Southern California

G-7: Deformation Mechanism of Laser Direct Metal Deposited Cu-Fe Alloy under High Strain Rate Condition: *Arya Chatterjee*¹; Wesley Higgins²; Ethan Sprague¹; George Pharr²; Amit Misra¹; ¹University of Michigan; ²Texas A&M University

G-10: Dynamic Compressive Response of Hot-pressed Boron Carbide: Understanding the Role of Microstructural Heterogeneities: *Arezo Zare*¹; Amartya Bhattacharjee¹; Qi Rong Yang²; Kent Christian²; Richard Haber²; Lori Graham-Brady¹; Matt Shaeffer¹; K.T. Ramesh¹; ¹Johns Hopkins University; ²Rutgers University

G-12: Equibiaxial Strength Testing of Lithium Hydride: *Gabriella King*¹; Christian Bustillos¹; Wyatt Du Frane¹; Joshua Kuntz¹; ¹LLNL

G-14: High Strain-rate Strength Response of Single Crystal Tantalum through In-situ Hole Closure Imaging Experiments: *Jonathan Lind*¹; Robert Carson¹; Nicolas Bertin¹; Matthew Nelms¹; ¹Lawrence Livermore Laboratory

G-15: In Situ Analysis of Shear Bands and Fracture in Metals: *Shwetabh Yadav*¹; *Harshit Chawla*²; Dinakar Sagapuram²; ¹Department of Civil Engineering, Indian Institute of Technology Hyderabad; ²Department of Industrial & Systems Engineering, Texas A&M University

G-16: Influence of Microstructure on Radial Expansion of 4340 SS Cylinders: *Carl Trujillo*¹; Saryu Fensin¹; George Gray¹; ¹Los Alamos National Laboratory

G-18: Modeling Shock Wave Propagation Using a Moving Window CAC Framework: *Alexander Davis*¹; Vinamra Agrawal¹; ¹Auburn University

G-19: Phase Transformation in Cu: *Nilanjan Mitra*¹; ¹Johns Hopkins University

G-20: Polymer Mechanics under High Pressure: *Jennifer Jordan*¹; Daniel Casem²; *Eric Brown*¹; Blake Sturtevant¹; ¹Los Alamos National Laboratory; ²CCDC US Army Research Laboratory

G-22: Shock Response of Titanium Containing Helium Bubbles: *Sarah Stevenson*¹; Saryu Jindal Fensin²; Peter Hosemann¹; ¹University of California Berkeley; ²Los Alamos National Laboratory

G-23: Shock-driven Foamed Metals for Studying Shallow Bubble Collapse: *Eric Stallcup*¹; Garry Maskaly¹; Fady Najjar¹; Gerald Stevens²; William Turley²; Brandon La Lone²; Matthew Staska²; ¹Lawrence Livermore National Laboratory; ²MSTS Special Technologies Laboratory

CORROSION

Environmental Degradation of Multiple Principal Component Materials — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; ShinYoung Kang, Lawrence Livermore National Laboratory; XiaoXiang Yu, Northwestern University; Vilupanur Ravi, California State Polytechnic University Pomona; Christopher Weinberger, Colorado State University; Elizabeth Opila, University of Virginia; Bai Cui, University of Nebraska-Lincoln; Mark Weaver, University of Alabama; Bronislava Gorr, Karlsruhe Institute of Technology (KIT); Srujan Rokkam, Advanced Cooling Technologies Inc

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

B-1: Evaluating the Influences of Microstructural Attributes on the High Temperature Oxidation of a AlCoCrFeNi High Entropy Alloy: *Michael Pavel*¹; Mark Weaver¹; ¹Univ of Alabama Tuscaloosa

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Bai Cui, University of Nebraska-Lincoln

B-3: Hydrogen Embrittlement in Ni-base Superalloy 718: *Hamza Khalid¹*; Bilal Mansoor²; ¹Texas A&M University; ²Texas A&M University at Qatar

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — Poster Session

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-8: Hydrothermal Synthesis of ZnO Nanorod Arrays for Gas Sensing: P. Kojo Amoah¹; Jordan Shields²; Helmut Baumgart¹; Y.S. Obeng³; *Abdelmageed Elmustafa¹*; ¹Old Dominion University; ²College of William and Mary; ³National Institute of Standards and Technology

H-9: Strain-induced Reversible Phase Transitions in 2D Transition Metal Dichalcogenides: *Zhewen Yin¹*; Anjun Hu¹; Md Rubayat-E Tanjil¹; Ossie Douglas¹; Mahabubur Rahman²; Huijuan Zhao²; Michael Cai Wang¹; ¹University of South Florida; ²Clemson University

H-10: The Interaction Dynamics and Binding Strength of Proteins on Gold Nanoparticles: *Tushar Upreti¹*; ¹University of Manitoba

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — Poster Session

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: To Be Announced

G-27: Fractal-like Grain Exfoliation in Liquid-metal-activated Aluminum-water Reactions: *Peter Godart¹*; Douglas Hart¹; ¹Massachusetts Institute of Technology

G-28: Investigation of the Effect of Heating Rate on the Recrystallization of Deformed Samples of Polycrystalline High-purity Niobium: *Zackery Thune¹*; Nathan Fleming¹; Conor McKinney¹; Elizabeth Nicometo¹; Thomas Bieler¹; ¹Michigan State University

G-29: Numerical Determination of the GND Footprint of Dislocation Loops: Connecting Atomistic Descriptions with Experimental Observations: *Sicong He¹*; Jaime Marian¹; ¹University of California, Los Angeles

G-30: The Dimensionality of Absorbed Defects Dictates GB Response to Irradiation: *Chang-Yu Hung¹*; James Nathaniel¹; Emily Hopkins¹; Khalid Hattar²; Mitra Taheri¹; ¹Johns Hopkins University; ²Sandia National Laboratories

G-31: The Effect of Grain Boundaries on High-temperature Microstructure Evolution in Cu/Nb Composites: *Emmeline Sheu¹*; Jon Baldwin²; Michael Demkowicz¹; ¹Texas A&M University; ²Los Alamos National Laboratory

SPECIAL TOPICS

Late News Poster Session — Advanced Materials

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

A-23: Computational Discovery of Ultra-high Strength BCC Refractory Metal-based MPEAs: *Kate Elder¹*; Joel Berry¹; Aurelien Perron¹; Hunter Henderson¹; Jibril Shittu¹; Zachary Sims¹; Scott McCall¹; Joseph McKeown¹; ¹Lawrence Livermore National Laboratory

A-24: Geometric Analysis of the Growth Front of Iron Borides Fe₂B in AISI-1018 Steel: *Katia Andrade Michel¹*; ¹

A-25: High Solid Content Porous Cordierite with Controllable Structure Prepared by Pickering Emulsion Technology: *Xuezhuan Luan¹*; ¹Shenyang University

A-26: Microstructural Analysis of the Casting Defects in the Low Pressure Turbine Blades: *Rafal Cygan¹*; Lukasz Rakoczy²; Mirosław Antosz²; Dorota Wyrobek²; Tomasz Szczech²; ¹Consolidated Precision Products Poland; ²AGH University of Science and Technology

A-27: Self-healing Behavior of Fe-Ni Base Superalloy Based on Spontaneous Segregation of Boron: *Chamil Kim¹; WooChul Kim¹; YongJoo Kim¹; WonTae Kim²; Do Hyang Kim¹; ¹Yonsei University; ²Cheongju University*

A-28: Software Design for ICME, PSPP and Multiscale: *Deepankar Pal¹; Grama Bhashyam¹; ¹ANSYS*

SPECIAL TOPICS

Late News Poster Session — Corrosion

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

B-4: Corrosion Evaluation of Cold Spray Materials on SS304L Material: *Timothy Montoya¹; Erin Karasz²; Jason Taylor¹; Kenneth Ross²; Rebecca Schaller¹; ¹Sandia National Laboratories; ²Pacific Northwest National Laboratory*

SPECIAL TOPICS

Late News Poster Session — Electronic Materials

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

C-4: Correlation between Crystallographic Microstructure of Electrodeposits and Adsorption of Additives through Electrochemical Calculations at Feature Scale: *Han-Kyun Shin¹; Yeon-Soo Jung¹; Hyun Park¹; Hyojong Lee¹; ¹Dong-A University*

C-5: Effect of Antimony on the Microstructure Evolution and Mechanical Properties of Near Eutectic Sn-Bi and Sn-Bi-Ag Alloys: *Hannah Fowler¹; Raiyo Aspiandiar²; Yaohui Fan¹; Sukshitha Achar Puttur Lakshminarayana¹; Ganesh Subbarayan¹; John Blendell¹; Carol Handwerker¹; ¹Purdue University; ²Intel*

SPECIAL TOPICS

Late News Poster Session — Energy & Environment (including REWAS 2022 Symposia)

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

D-29: DFT Studies on the HER Activity, Electronic Structure, and Bonding Properties of the Boride $\text{Mo}_x\text{V}_x\text{-1B}_2$ ($0 < x < 1$): *Johan Yapo¹; Eunsoo Lee¹; Boniface Fokwa¹; ¹University of California Riverside*

D-30: Electricity Properties of Foam Insulation Materials: *Ibrahim Gunes¹; ¹Istanbul University Cerrahpasa*

D-31: Extraction of Strategic Metals from Spent Catalyst by Using Integrated Hydrometallurgical Approach: *Rajesh Kumar Jyothi¹; Jong Hyuk Jeon¹; In-Hyeok Choi²; Ana Belen Cueva-Sola¹; Jin-Young Lee¹; Hee-Nam Kang¹; ¹Korea Institute of Geoscience & Mineral Resources; ²HANNAE for T (Spent Catalyst Recycling Company),*

D-32: Influence of the Dielectric Constant of $\text{Ba}(1-x)\text{Sr}(x)\text{TiO}_3$ and Flux Mediated Ion Doping on Photoreactivity: *Nnamdi Ene¹; Gregory Rohrer¹; Paul Salvador¹; ¹Carnegie Mellon University*

D-33: Iron-rich Layered Chalcogenide $\text{Fe}_5\text{Ge}_2\text{Te}_2$ for Highly Efficient Hydrogen Evolution: *Diana Luong¹; Eunsoo Lee¹; Amir Rezaie¹; Johan Yapo¹; Boniface Fokwa¹; ¹University of California, Riverside*

D-34: Molybdenum Borocarbide (Mo_2BC) as a New Electrocatalyst for Hydrogen Evolution Reaction: *Eunsoo Lee¹; Boniface Fokwa¹; ¹University of California, Riverside*

D-35: Study on the Gasification Reactivity of Hypercoal Coke: *Jun Zhao¹; Xiaolin Song¹; Haibin Zuo²; ¹China University of Mining and Technology; ²University of Science and Technology Beijing*

SPECIAL TOPICS

Late News Poster Session — Light Metals

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

E-29: Development of Heat Dissipation Housing for Sensing Device through Material Development and Prediction of Heat Dissipation Phenomenon: *JiHyeon Byeon¹; JungHan Kim¹; CheolJin Yoon¹; SungHo Kim¹; SangHo Hwang¹; Oeon Kwon¹; ¹Gyeongbuk Institute of IT Convergence Industry Technology*

E-30: Influence of Atmosphere and Temperature on PAH Emission from Green Anode Paste: *Kamilla Arnesen¹; Thor Aarhaug²; Kristian Einarsrud¹; Gabriella Tranell¹; ¹Norwegian University of Science and Technology; ²SINTEF*

E-32: Microstructure and Mechanical Properties of Al-Cu-Ca Based Alloys with Sn Addition: *Jung Han Kim¹; JiHyeon Byeon¹; Cheol-Jin Yoon¹; Sung-Ho Kim¹; Sang-Ho Hwang¹; O-Eon Kwon¹; ¹Gyeongbuk Institute of IT Convergence Industry Technology*

E-33: Newly Developed Ceramic Foam Filters for Filtration and Hydrogen Removal in Aluminum Casthouses: *Alexander Mach¹; Frank Reusch¹; Claus Disser¹; Jochen Schnelle¹; Marcel Rosefort²; Phil Jankowski²; Giuseppe Esposito²; ¹Drache; ²TRIMET*

E-34: The Modification Effect of Ultrasonic Irradiation Amplitude during Melt Treatment on Al_3Zr Compounds: *Jincheng Sun¹; Sergey Komarov¹; Takuya Yamamoto¹; ¹Tohoku University*

SPECIAL TOPICS

Late News Poster Session — Materials Processing

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

F-34: A Study on the Role of Crystal Shape on the Freeze-ling Growth and Stability: *Gaëlle Butin¹; Lennart Scheunis²; Bart Blanpain¹; Annelies Malfliet¹; ¹KU Leuven; ²Umicore*

F-36: Development of Austenitic Stainless Steel with TWIP Effect: *Pavel Podany¹; Tomas Studecky¹; Radek Prochazka¹; ¹COMTES FHT*

F-37: Effect of Modifiers on Charge Dissipation and Properties of Electrosprayed Melting Gels: *Kelly Hughes¹; Michael Grzenda¹; Alfusainey Samateh²; Andrei Jitianu²; Jonathan Singer¹; ¹Rutgers University; ²City University of New York*

F-40: Enhancing Mechanical Properties of Molybdenum with Equal Channel Angular Extrusion Processing: *Ekaterina Maynor¹; David Foley²; James Paramore¹; Kelvin Xie¹; Brady Butler¹; ¹Texas A&M University; ²Shear Form, Inc.*

F-41: From Long-term Aging to Rapid Annealing – The Heat Treatment Optimization of Melt-spun $\text{Fe}_{81}\text{Ni}_4\text{Cu}_1\text{B}_{14}$ Alloy. Crystal Structure and Magnetic Properties Evolution: *Lukasz Hawelek*¹; Tymon Warski¹; Marcin Polak¹; Adam Piłsniak¹; Magdalena Steczkowska-Kempka¹; Anna Wojcik²; Aleksandra Kolano-Burian²; ¹Lukasiewicz Research Network - Institute of Non-Ferrous Metals; ²Institute of Metallurgy and Materials Science Polish Academy of Sciences

F-42: Study of the Sub-surface Thermal and Plastic Strain Distribution during Laser Shock Peening of Aerospace Grade Alloys – Simulation and Experiments: *Ayan Bhowmik*¹; Varad Choudhari¹; Niroj Maharjan²; ¹Indian Institute of Technology Delhi; ²Advanced Remanufacturing and Technology Centre

F-43: X-ray Decomposition of PET Nanoparticles as an Alternative Process to Decontaminate Water Resources: *Leonardo Batista Capaverde Silva*¹; J.V. Rojas²; Maria C. Molina Higgins¹; ¹The Pennsylvania State University; ²Virginia Commonwealth University

SPECIAL TOPICS

Late News Poster Session – Mechanics & Structural Reliability

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

G-34: Strain-dependent Dislocation Density Formation in 4130 Steel Studied by Neutron Diffraction: *Zachary Buck*¹; Matthew Connolly¹; May Martin¹; Damian Lauria¹; Peter Bradley¹; Yan Chen²; Andrew Slifka¹; ¹National Institute of Standards and Technology; ²Oak Ridge National Laboratory

SPECIAL TOPICS

Late News Poster Session – Nanostructured Materials

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-28: Carbon Nanotubes Reinforced WC-Co Hard Alloys: *Guolong Tan*¹; Chenglong Li²; Xijun Wu³; ¹Wuhan University of Technology; ²Nostan Comapny; ³Zhejiang University

H-29: Enhancing HER Performance of Transition Metal Borides (TMBs) Nanoparticles Synthesized with Excess Sn Flux: *Sang Bum Kim*¹; Boniface Fokwa¹; ¹University of California, Riverside

H-30: Evidence for Nanoindentation Induced Dynamical Recovery in Aluminum: *Yuwei Zhang*¹; George Pharr¹; ¹Texas A&M University

H-31: Evolution of Microstructure and Crystallographic Texture of Ni-Mn-Ga Melt-spun Ribbons Exhibiting 1.15% Magnetic Field-induced Strain: *Anna Wójcik*¹; Robert Chulist¹; Maciej Kowalczyk²; Przemysław Zackiewicz³; Paweł Czaja¹; Norbert Schell⁴; Wojciech Maziarz¹; ¹Institute of Metallurgy and Materials Science PAS; ²The Faculty of Materials Science and Engineering, Warsaw University of Technology; ³Lukasiewicz Research Network—Institute of Non-Ferrous Metals; ⁴Institute of Materials Physics, Helmholtz-Zentrum Geesthacht

H-32: Fabrication of $\text{NiFe}(\text{CO}_3)(\text{OH})_2$ Composite Nano-sheet Arrays for Supercapacitor: *Kyung Mox Cho*¹; Kwang Ho Kim¹; ¹Pusan National University

H-33: Hydrothermally Processed $\text{Ni}(\text{OH})_2$ Nano-sheet Electrode for Supercapacitor: *Kyung Mox Cho*¹; *Kwang Ho Kim*¹; ¹Pusan National University

H-34: Low-cost Solution Processed Facile h-MoO₃ Synthesis for Heterojunction Diode: *Surendra Kumar*¹; *Kamal Rudra*²; Abhishek Kumar Singh³; Sanjai Singh¹; Pramod Kumar¹; ¹Indian Institute of Information Technology-Allahabad; ²University of Michigan; ³Rajiv Gandhi Institute of Petroleum Technology

H-35: Microscratch Characterization of Multilayered Cu-Nb Produced by Accumulative Roll Bonding: *Hamed Zeinalabedini*¹; *Sezer Ozerinc*¹; ¹Middle East Technical University

H-36: Multiferroism of La Modified M-type Hexaferrites: *Guolong Tan*¹; Congcong Duan²; Nan Nan²; ¹Wuhan University of Technology; ²Wuhan University of Technology

LIGHT METALS

Magnesium Technology – Poster Session

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

E-17: A Parametric Study of the Role of Basal-prismatic $\langle a \rangle$ Dislocation Interactions in Dynamic Strain Aging in Mg Alloys: *Mohammed Shabana*¹; *Jishnu Bhattacharyya*¹; *Sean Agnew*¹; ¹University of Virginia

E-18: Corrosion Properties of Friction Stir Processed Cast Mg-alloys: *Rajib Kalsar*¹; *David Garcia*¹; *Hrshikesh Das*¹; *Venkateshkumar Prabhakaran*¹; *Glenn Grant*¹; *Darrell Herling*¹; *Mageshwari Komarasamy*¹; *Vineet Joshi*¹; ¹Pacific Northwest National Laboratory

E-19: Effect of ECAP on Corrosion Properties of ZK40 Magnesium Alloy for Biodegradable Load-bearing Applications: *Hamza Ghauri*¹; *Marwa AbdelGawad*¹; *Matthew Vaughan*²; *Bilal Mansoor*¹; *Ibrahim Karaman*¹; *Hans Maier*³; ¹Texas A&M University at Qatar; ²Texas A&M University; ³Leibniz Universität Hannover

E-20: Effect of Minimum Quantity Lubrication on Machinability of Magnesium RZ5 Alloy: A Comparative study: *Arabinda Meher*¹; *Manas Mahapatra*¹; ¹IIT Bhubaneswar

E-21: Mechanical and Microstructural Behavior of Rolled AZ31B Magnesium Alloy Subjected to Multiaxial Stress State: *Luiz Carneiro*¹; *Qin Yu*²; *Yanyao Jiang*³; ¹University of Nevada Reno; ²Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley; ³University of Nevada Reno

E-22: Phase-field Modeling of the Effects of Second Phases on the Corrosion of Mg Alloys: *Yanjun Lyu*¹; *David Montiel*¹; *Stephen Dewitt*¹; *Alexander Chadwick*¹; *Katsuyo Thornton*¹; ¹University of Michigan

E-23: Possibility of Joining Explosively Welded AA1050/AZ31 Clad Plates Using FSW/Laser Hybrid Method: *Marcin Wachowski*¹; *Robert Kosturek*¹; *Krzysztof Grzelak*¹; *Janusz Torzewski*¹; *Ireneusz Szachogluchowicz*¹; ¹Military University of Technology

E-24: Primary Production of Magnesium via Molten Salt Electrolysis with Reactive Cathode: *Madison Rutherford*¹; *Armaghan Telgerafchi*¹; *Nicholas Masse*¹; *Lucien Wallace*¹; *Gabriel Espinosa*¹; *Adam Powell*¹; ¹Worcester Polytechnic Institute

E-25: Process-structure-property-performance Relationship of Solid-state Additively Manufactured Magnesium Alloy WE43: *Malcolm Williams¹; Thomas Robinson¹; Christopher Williamson¹; Ryan Kinser¹; Paul Allison¹; James Jordon¹; ¹University of Alabama*

E-27: Towards High Hardness and Corrosion Resistant Mg Alloys Using High-energy Ball Milling: *Mohammad Umar Farooq Khan¹; Taban Larimian²; Tushar Borkar²; Rajeev Gupta³; ¹Texas A&M University; ²Cleveland State University; ³North Carolina State University*

E-28: Understanding Mechanisms of Electrocrystallization in Mg-based Batteries: *Rachel Davidson¹; Stefany Angarita-Gomez¹; Perla Balbuena¹; Sarbajit Banerjee¹; ¹Texas A&M University*

MATERIALS PROCESSING

Materials Processing Fundamentals — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Jonghyun Lee, Iowa State University; Adrian Sabau, Oak Ridge National Laboratory; Fiseha Tesfaye, Åbo Akademi University

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

F-33: Phase Equilibria in the Ag-Ge-Bi-Te System and Thermodynamic Properties of the $n\text{GeTe}\backslash 215\text{mBi}_2\text{Te}_3$ ($n, m = 1-4$) Layered Compounds: *Mykola Moroz¹; Fiseha Tesfaye²; Pavlo Demchenko³; Myroslava Prokhorenko⁴; Orest Pereviznyk³; Bohdan Rudyk⁴; Lyudmyla Soliak⁴; Daniel Lindberg⁵; OLEksandr Reshetnyak³; Leena Hupa²; ¹National University of Water and Environmental Engineering; ²Åbo Akademi University; ³Ivan Franko National University of Lviv; ⁴Lviv Polytechnic National University; ⁵Aalto University*

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — 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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-12: Atomistic Modeling of the Mechanical Behavior of Gradient Nanoglasses: *Suyue Yuan¹; Paulo Branicio¹; ¹USC*

H-13: Dynamic Mechanical Properties of High-entropy Alloys: *Aomin Huang¹; ¹Univerisity of California San Diego*

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications — Poster Session

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

C-6: Mechanical Characterization of Oxide Dispersed Stainless Steels via Direct Ink Writing: *Havva Aysal¹; Konstantinos Sierros¹; Brian Paul²; Chih-Hung Chang²; ¹West Virginia University; ²Oregon State University*

NANOSTRUCTURED MATERIALS

Self-organizing Nano-architected Materials — Poster Session

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

H-14: Characterization of Dealloyed Gradient Nanoporous Foams: *Karina Hemmendinger¹; Andrea Hodge¹; ¹University of Southern California*

H-15: In-situ Observation of Ligament Coarsening in Nanoporous Gold: *Kerry Baker¹; T Balk¹; ¹University of Kentucky*

H-16: Kinetics of Peritectic Melting: *Mingwang Zhong¹; Longhai Lai¹; Alain Karma¹; ¹Northeastern University*

H-19: Unveiling Phase Transition in Solid-state Dealloyed Thin Films Using Autonomous Synchrotron X-ray Characterization: *Cheng-Chu Chung¹; Chonghang Zhao¹; Marcus Noack²; Kedar Manandhar³; Joshua Lynch⁴; Hui Zhong¹; Ming Lu⁴; Mingzhao Liu⁴; Jianming Bai⁴; Philip Maffettone⁴; Daniel Olds⁴; Masafumi Fukuto⁴; Ichiro Takeuchi³; Sanjit Ghose⁴; Thomas Caswell⁴; Kevin Yager⁴; Yu-Chen Chen-Wiegart¹; ¹Stony Brook University; ²Lawrence Berkeley National Laboratory; ³University of Maryland; ⁴Brookhaven National Laboratory*

MECHANICS & STRUCTURAL RELIABILITY

Structural Metamaterials — Poster Session

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

Program Organizers: Amy Wat, Lawrence Livermore National Laboratory; Brad Boyce, Sandia National Laboratories; Xiaoyu Zheng, University of California, Los Angeles; Fabrizio Scarpa, University of Bristol; Robert Ritchie, University of California, Berkeley

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

G-32: Coated Nano- and Micro-lattices via Magnetron Sputtering: *Adie Alwen¹; Alina Garcia Taormina¹; Andrea Hodge¹; ¹University of Southern California*

G-33: Gaussian Process Regression as a Surrogate Model for the Computation of Dispersion Relations: *Alexander Ogren¹; Berthy Feng¹; Katherine Bouman¹; Chiara Daraio¹; ¹California Institute of Technology*

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Poster Session I

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-21: Effect of Severe Plastic Deformation Processes on the Microstructure, Texture and Mechanical Property of Nb-1Zr Alloy: *Soumita Mondal¹; Surendra Makineni¹; Apu Sarkar²; Pradipta Ghosh³; Rajeev Kapoor²; Satyam Suwas¹; ¹Indian Institute of Science, Bangalore; ²Bhabha Atomic Research Center; ³Indian Institute of Technology Gandhinagar*

H-22: Energy Absorption Performance of Functionally Graded High Strength Steel: *Adam Tyedmers¹; Hatem Zurob¹; Bosco Yu¹; Moisei Bruhis¹; ¹McMaster University*

H-24: Enhancing Mechanical Performance of Commercial Al Alloy by Tailoring Their Microstructural Heterogeneity: *Khaled Adam¹; Ahmed Mohammed²; Mohammed Aldlemy³; ¹Kennesaw State University; ²Collage of Mechanical Engineering Technology; ³Collage of Mechanical Engineering Technology*

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — Poster Session II

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Monday PM | February 28, 2022
Exhibit Hall C | Anaheim Convention Center

H-25: Microstructure Evolution Kinetics and Strengthening Mechanisms of the Partially Recrystallized High Entropy Alloys: *Feng He¹; Zhongsheng Yang¹; Zhijun Wang¹; ¹State Key Laboratory of Solidification Processing*

H-26: New Strategies for the Control, Study, and Scale-up of Surface Nanocrystallization: *Samuel Scott¹; Mark Atwater¹; ¹Liberty University*

H-27: Structural Evolution during Nanostructuring of Additive-manufactured 316L Stainless Steel by High-pressure Torsion: *Isshu Lee¹; Jae-Kyung Han¹; Xiaojing Liu²; Yulia Kuzminova³; Stanislav Evlashin³; Klaus-Dieter Liss²; Megumi Kawasaki¹; ¹Oregon State University; ²Guangdong Technion - Israel Institute of Technology; ³Skolkovo Institute of Science and Technology*

ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials — Poster Session

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

Program Organizers: Emily Rinko, Iowa State University; Iver Anderson, Iowa State University Ames Laboratory; Markus Chmielus, University of Pittsburgh; Emma White, DEHEMA Forschungsinstitut; Deliang Zhang, Northeastern University; Andrew Kustas, Sandia National Laboratories; Kyle Johnson, Sandia National Laboratories

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

J-1: Development of NiTiMo Alloys Using Powder Blown Laser Direct Energy Deposition Additive Manufacturing: *Nathaniel Lies¹; ¹Georgia Institute of Technology*

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — 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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Nik Hrabe, National Institute of Standards and Technology (NIST)

J-5: Evaluation of Heat-treated Microstructure and Mechanical Properties of Al-Zn-Mg-Cu Plates Repaired via Additive Friction Stir-deposition: Dustin Avery¹; Conner Cleek¹; Brandon Phillips¹; M Y Rekha¹; Ryan Kinser¹; Harish Rao¹; Paul Allison¹; Luke Brewer¹; James Jordon¹; ¹The University of Alabama

J-7: Monitoring Additive Manufacturing Process Stability with Bayesian Change-point Detection on High-Throughput Tensile Test Data: Stefan Colton¹; Brad Boyce²; Aaron Stebner¹; ¹Georgia Institute of Technology; ²Sandia National Laboratories

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications IV — Poster Session

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

Program Organizers: Isabella Van Rooyen, Pacific Northwest National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University; Michael Kirka, Oak Ridge National Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Subhashish Meher, Idaho National Laboratory

J-8: Creep Resistance of Al-Ce Binary Alloys Produced by Casting and Additive Manufacturing: Jillian Stinehart¹; Le Zhou¹; ¹Marquette University

J-10: Investigation in Multi-layer and Multi-element Alloy Wire-arc Additive Manufacturing Cladding: Nicholas Brubaker¹; Soumya Mandal²; Ritesh Sachan²; Michael Maughan¹; ¹University of Idaho; ²Oklahoma State University

J-11: Microstructural and Mechanical Investigation of IN718 Nickel-based Superalloy Fabricated via Laser-based Additive Manufacturing (LBAM): Hassan Ghorbani¹; Mohammad Eizadinia¹; Hiwa Khled²; Behnam Rasti¹; ¹University of Tehran; ²Sharif University

J-12: Microstructure Evolution and Mechanical Properties of Selective Laser Melted SB-CoNi-10 Superalloy: Evan Raeker¹; Sean Murray¹; Kira Pusch¹; Chris Torbet¹; Tresa Pollock¹; ¹University of California, Santa Barbara

J-13: Printing Nano Inks and Process Control for Plasma Jet Printer: Carl Karlsson¹; Kunal Mondal¹; Michael McMurtrey¹; ¹Idaho National Laboratory

J-14: Process-property Relationship for Fabricating Complex Heat Exchanger Geometry via Laser Powder Bed Fusion Additive Manufacturing: Junwon Seo¹; Ziheng Wu¹; Nicholas Lamprinakos¹; Srujana Rao Yarasi¹; Anthony Rollett¹; ¹Carnegie Mellon University

J-15: Quantifying Equiaxed Versus Epitaxial Solidification in CMSX-4 Single Crystal Superalloy Processed by Laser Powder Bed Fusion Using Single-tracks: Runbo Jiang¹; Zhongshu Ren²; Joseph Aroh¹; Amir Mostafaei³; Benjamin Gould⁴; Tao Sun²; Anthony Rollett¹; ¹Carnegie Mellon University; ²University of Virginia; ³Illinois Institute of Technology; ⁴Argonne National Laboratory

J-16: Understanding Microstructure Evolution of High Temperature Ni Alloys Across Additive Manufacturing Processes: Jonah Klemm-Toole¹; Juan Gonzalez²; Luc Hagen¹; Andrew Wessman²; Zhenzhen Yu¹; Amy Clarke¹; ¹Colorado School of Mines; ²University of Arizona

J-17: Understanding Process-structure-property Linkages in Electron Beam Melted Haynes 282: Avantika Gupta¹; Sriram Vijayan¹; Joerg Jinschek¹; Carolin Fink¹; ¹The Ohio State University

J-18: Understanding the Process-structure-property Correlation in Additively Manufactured IN718 Alloy: Saurabh Sharma¹; Kristopher Darling²; Kiran Solanki¹; ¹Arizona State University; ²Army Research Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Poster Session

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

Program Organizers: Sneha Prabha Narra, Carnegie Mellon University; Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

J-19: Hybrid Additive Manufacturing of the Ni Super Alloy Inconel 718: Matjaz Godec¹; Simon Malej¹; Darja Feizpour¹; Crtomir Donik¹; Matej Balažic²; Damjan Klobcar³; Laurent Pambaguian⁴; Marjetka Conradi¹; Aleksandra Kocijan¹; ¹Institute of Metals and Technology; ²Balmar; ³Faculty for Mechanical Engineering, University of Ljubljana; ⁴ESA European Space Research and Technology Centre

J-20: Modelling and Analysis of Single-pass Laser Cladded High Speed Steel Considering Phase Transformation Effects: Ke Ren¹; Yiming Rong¹; Zhichao (Charlie) Li²; Gang Wang³; ¹Harbin Institute of Technology; ²Deformation Control Technology, Inc.; ³Tsinghua University

J-21: Numerical Modeling of Non-equilibrium Partitioning in Copper-iron Binary Systems Manufactured by Direct Metal Deposition (DMD): Daniel Yin¹; Amit Misra¹; Jyoti Mazumder¹; ¹University of Michigan

J-22: Repair of High Hard Steel Using Similar Filler Material by a Solid-state Additive Manufacturing Approach: Troy Pierson¹; ¹The University of Alabama

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III — Poster Session

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

J-23: Additive Friction Stir Deposition of Al_{0.04}CoCrFeNi High Entropy Alloy: *Michael Amling*¹; Malcolm Williams¹; Paul Allison¹; Mark Weaver¹; ¹University of Alabama

J-24: Temperature Influence on Microstructure and Mechanical Behavior during Deposition of Solid-state Additively Manufactured Aluminum Alloy 7050: *James Tew*¹; Malcolm Williams¹; Christopher Williamson¹; Ryan Kinser¹; Bret Cordle¹; James Jordon¹; Paul Allison¹; ¹The University of Alabama

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — Poster Session

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

J-25: Can Hot Cracking in LPBF Steel be Mitigated by Controlling the Powder Recoating Speed?: *Tan-Phuc Le*¹; Qingyang Lu¹; Shubo Gao¹; Jay Carroll²; Matteo Seita¹; ¹Nanyang Technological University; ²Sandia National Laboratories

J-26: Deformation Behavior of Powder Bed Fusion Additive Manufactured Ti6Al4V Alloy at High Temperatures: *Md Jamal Mian*¹; Jafar Razmi¹; Leila Ladani¹; ¹Arizona State University

J-27: Design and Analysis of Metal Based Brake Caliper Using FEA and Simufact for Its Development Using Additive Manufacturing: *Swapnil Kumar*¹; Sundar Atre¹; ¹University of Louisville

J-28: Effect of Hot Isostatic Pressing on the Microstructure of Directionally Solidified Nickel Alloy after SLM: *Evgenii Borisov*¹; Anna Gracheva¹; Vera Popovich²; Anatoly Popovich¹; ¹SPbPU; ²TU Delft

J-29: Effect of Porosity and Composition on Mechanical and Biological Properties of Additively Manufactured Titanium Alloy: *Sushant Ciliveri*¹; Indranath Mitra¹; Susmita Bose¹; Amit Bandyopadhyay¹; ¹Washington State University

J-31: Geometric Effects on Microcracking in Superalloys Produced by Laser Powder Bed Fusion: *Marcus Lam*¹; ¹Monash University

J-32: Investigation of Solidification Kinetics and Its Effect on Mechanical Response of IN718 Fabricated via Selective Laser Melting: *Digvijay Parganiha*¹; Priyanka Agrawal¹; Ravi Sankar Haridas¹; Rajiv S. Mishra¹; Hirotsugu Kawanaka²; Shinji Matsushita²; Yusuke Yasuda²; Seung Hwan C. Park²; Wei Yuan³; ¹University of North Texas, Denton; ²Research & Development Group, Hitachi Ltd, Japan; ³Research & Development Division, Hitachi America Ltd.

J-33: Mechanism of Oxygen-induced Hot Cracking of IN738 during Additive Manufacturing: *KenHee Ryou*¹; Boryung Yoo¹; Pyuck-Pa Choi¹; ¹Korea Advanced Institute of Science and Technology

J-36: Tailoring the Preferred Texture of SS316L & IN718 in Laser Bed Powder Fusion: *Prosenjit Biswas*¹; Ji Ma¹; ¹University of Virginia

J-37: The Development of a Directed Energy Deposition (DED) Printability Framework for Improving Part Density and Performance in a 316L Stainless Steel: *Matthew Vaughan*¹; Michael Elverud¹; Jiahui Ye¹; Peter Marcos¹; Raiyan Seede¹; Sean Gibbons²; Raymundo Arroyave¹; Alaa Elwany¹; Ibrahim Karaman¹; ¹Texas A&M University; ²Air Force Research Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — Poster Session

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

Program Organizers: Meysam Haghsheenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Meysam Haghsheenas, University of Toledo

J-38: A Small Punch Test Study of Additively Manufactured AlSi10Mg: *Ziv Ungarish*¹; Matan Tubul¹; Tal Yehuda¹; ¹Nuclear Research Center Negev

J-39: Crack-free Three-dimensional Electrical Interconnects 3D Printed on Soft PDMS Substrates: *Jacob Brennenman*¹; Derya Tansel¹; Gary Fedder¹; Rahul Panat¹; ¹Carnegie Mellon University

J-41: Effects of Processing Parameters on Residual Stresses in Commercially Pure Ti: *Claire Adams*¹; Kellen Traxel¹; Amit Bandyopadhyay¹; David Field¹; ¹Washington State University

J-42: Investigating Microstructural Features of 304L Stainless Steel Friction-stir Weld with Indentation Methods: *Michael Maughan*¹; Nicolene van Rooyen¹; Madhumanti Bhattacharyya¹; Indrajit Charit¹; ¹University of Idaho

J-43: Microstructure Characterization of As-sprayed and Post-processed Cold-spray Materials: *Ryan Cochran*¹; Shiraz Mujahid¹; Yubraj Paudel¹; Kyle Considine¹; Hongjoo Rhee¹; ¹Center for Advanced Vehicular Systems at Mississippi State University

J-44: Probing the Mechanism of Healing Micropores in Additive Manufacturing Al-Li Alloys Using High Resolution X-ray Computed Tomography: *Junsheng Wang*¹; *Chenpeng Xue*¹; ¹Beijing Institute of Technology

J-45: The Effect of Extrusion and Aging on the Mechanical Properties of Additively Manufactured AlSi10Mg: *Adi Benartzy*¹; Gal Hadad¹; Arie Bussiba²; Moshe Nahmany²; ¹Ben Gurion University; ²N.R.C.N

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: David Frazer, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley

N-1: 3D Reconstruction and Quantification of Oxide Nano-porosity in Zirconium Alloys: *Hongliang Zhang*¹; Adrien Couet¹; Taeho Kim¹; William Howland²; ¹University of Wisconsin-Madison; ²Naval Nuclear Laboratory

N-2: An Experimentally Validated Mesoscale Model for the Effective Thermal Conductivity of UZr Fuels: Monika Singh¹; Timothy Coffman¹; Fergany Badry¹; Moiz Butt¹; Mohammed Gomaa Abdoelatef¹; Katie Anderson²; James Jewell²; Rory R. Kennedy²; Collin J. Knight²; Mitchell Meyer²; Sean McDeavitt¹; *Karim Ahmed*¹; ¹Texas A&M University; ²Idaho National Laboratory

N-4: Atomistic Modeling of Transport Properties and Interaction with Point Defects of a-U Tilt Grain Boundaries: *Khadija Mahbuba*¹; Benjamin Beeler¹; Andrea Jokisaari²; ¹North Carolina State University; ²Idaho National Laboratory

N-5: Characterization of Additively Manufactured UO₂ Fuel Pellets with Pulsed Neutron Techniques and 450 keV X-ray CT: *Sven Vogel*¹; Donald W. Brown¹; Bjorn Clausen¹; Alexander M. Long¹; Erik B. Watkins¹; D. Cort Gautier¹; Cheryl Kendall¹; Cheng Sun²; Chuting Tan²; ¹Los Alamos National Laboratory; ²Idaho National Laboratory

N-6: Characterization of Nuclear Materials from the Millimeter to the Nanometer: *Robert Ulfig*¹; Anne-Sophie Robbes¹; Paula Peres¹; ¹Cameca Instruments Inc.

N-7: Investigation of the Impact the 3D Fission Product Structure has on the Local Thermal Conductivity in FBR MOX Fuel: *Casey McKinney*¹; Tsvetoslav Pavlov²; Assel Aitkaliyeva¹; ¹University of Florida; ²Idaho National Laboratory

CHARACTERIZATION

Advanced Real Time Imaging — Poster Session

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

Program Organizers: Jinichiro Nakano, US Department of Energy - National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webber, Carnegie Mellon University; Wangzhong Mu, Kth Royal Institute of Technology; David Veyssset, Stanford University; Pranjal Nautiyal, University of Pennsylvania

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

L-1: Ultrasonic Doppler Velocimetry Technique for Investigation of Flows in Liquid Metal Batteries: Jonathan Cheng¹; Ibrahim Mohammad¹; *Bitong Wang*¹; Jarod Forer¹; Douglas Kelley¹; ¹University of Rochester

BIOMATERIALS

Advances in Biomaterials for 3D Printing of Scaffolds and Tissues — Poster Session

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

Program Organizers: Changxue Xu, Texas Tech University; Jun Yin, Zhejiang University; Zhengyi Zhang, Huazhong University of Science and Technology; Yifei Jin, University of Nevada Reno

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Changxue Xu, Texas Tech University

K-1: Gingerol – Curcumin Loaded Magnesium – Zinc Doped Calcium Phosphate Based Scaffolds and Coatings for Bone Tissue Engineering Applications: *Arjak Bhattacharjee*¹; Susmita Bose¹; ¹W. M. Keck Biomedical Materials Research Lab, Washington State University

MATERIALS DESIGN

Advances in Titanium Technology — Poster Session

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

M-1: About Dislocation Density Distribution in Titanium Alloys after Hot-deformation in the α + β Domain: *Matheus Brozovic Gariglio*¹; Nathalie Bozzolo²; Daniel Pino Muñoz³; ¹Mines ParisTech – PSL University, CEMEF – Centre for Material Forming

M-2: Anisotropy in Tensile Properties of Ti-10V-2Fe-3Al Metastable β Alloy : An Effect of the β Structure: *Tiphaine Giroud*¹; Samuel Hemery²; Patrick Villechaise³; ¹Institut Prime – ENSMA

M-4: Microstructural Evolution and Mechanical Properties of Additively Manufactured Commercially-pure Grade 2 Titanium after Post-process Heat Treatment: *Ralf Fischer*¹; Greyson Harvill¹; Hossein Talebinezhad²; Barton Prorok¹; ¹Auburn University

M-5: Microstructure in the Selective Laser Melted Ti-48Al-2Cr-2Nb Alloy: *Dian Li*¹; Wenrui Zhao¹; Xing Zhang²; Yiliang Liao²; Yufeng Zheng¹; ¹University of Nevada, Reno; ²Iowa State University

M-7: Young Modulus and Micro-characterization of Ternary Titanium Alloys for Biomedical Applications: *Marcos da Silva*¹; Carlos Grandini²; Raul de Araújo³; Pedro Bazaglia Kuroda²; ¹IFSP; ²Unesp

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — Poster Session

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

M-8: A Data-driven Surrogate Model for Fast Predicting the U-10Mo Fuel Grain Structures during the Hot Rolling and Annealing Processes: *Yucheng Fu*¹; William Frazier¹; Kyoo Choi¹; Lei Li²; Zhijie Xu¹; Vineet Joshi¹; Ayoub Soulami¹; ¹Pacific Northwest National Laboratory

M-9: Determination of Aluminum Mechanical Properties Using Small Punch Test and Advanced Numerical Methods: *Matan Tubul*¹; Ziv Ungarish¹; Shay Amar¹; Eytan Kochavi²; ¹Negev Nuclear Research Center; ²Ben Gurion University of the Negev (on Sabbatical leave from NRCN)

M-10: Investigating the Suitability of Tableau Dashboards and Decision Trees for Particulate Materials Science and Engineering Data Analysis: *Bryer Sousa*¹; Richard Valente¹; Aaron Krueger¹; Eric Schmid¹; Danielle Cote¹; Rodica Neamtu¹; ¹Worcester Polytechnic Institute

M-11: Machine Learning Based Prediction of Melting Temperature and Coefficient of Thermal Expansion Coefficient Using SciGlass Datasets: *Jong Ho Kim*¹; ¹Rist

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Poster Session

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Mohsen Asle Zaeem, Colorado School of Mines

M-12: Discrete Stochastic Model of Point Defect-dislocation Interaction

for Simulating Dislocation Climb: *Cameron Mcelfresh*¹; Yinan Cui²; Sergei Dudarev³; Giacomo Po⁴; Sylvie Aubry⁵; Nicolas Bertin⁵; Jaime Marian¹; ¹University of California, Los Angeles; ²Tsinghua University; ³United Kingdom Atomic Energy Authority, Culham Science Centre; ⁴University of Miami; ⁵Lawrence Livermore National Laboratory

M-13: Finite Element Level-set Methods to Study Microstructural Evolution during Recrystallization and Grain Growth: *Daniel Pino Munoz*¹; Marc Bernacki¹; Nathalie Bozzolo¹; ¹Mines ParisTech, PSL University

M-14: Smoke Detection in Ladle Hot Repair Process Based on Convolution Neural Network: *Yanming Zhang*¹; Jialu Wu¹; Mujun Long¹; Wei Guo¹; Huamei Duan¹; Dengfu Chen¹; ¹Chongqing University

BIOMATERIALS

Biological Materials Science — Poster Session

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Ning Zhang, The University of Alabama; Jeffrey Bates, The University of Utah

K-2: Alternative Method for Diagnosing Cystic Fibrosis Using Fluoresce: *Cassidy Holdeman*¹; ¹University of Utah

K-3: Bio-inspired Impact Resistant Coatings: *Taige Hao*¹; Wei Huang¹; Robin James¹; Paige Romero¹; Taifeng Wang¹; Devis Montroni¹; David Kisailus¹; ¹University of California, Irvine, Materials Science and Engineering Department

K-4: Biodegradable Hotmelt Pressure Sensitive Adhesive: *Amelia Heiner*¹; ¹University of Utah

K-5: Biodegradable Superabsorbent Polymers: *Kaylon Draney*¹; *Jeffrey Bates*¹; ¹University of Utah

K-6: Biomedical Surface Treatment of Non-toxic Ti-Zr-Mo-Sn Shape Memory Alloys by Micro-arc Oxidation: *Yeon-Wook Kim*¹; ¹Keimyung University

K-9: Effect of Nb, Zr and Ta Content on Properties of Ti-Nb-Ta-Zr-O: *Kristián Šalata*¹; Dalibor Preisler¹; Lucie Bodnárová²; Petr Harcuba¹; Miloš Janeček¹; Josef Stráský¹; ¹Charles University, Department of Physics of materials; ²Institute of Thermomechanics, Czech Academy of Sciences

K-11: Impact Resistance for Wind Energy Blades Using Biomimetic Helicoidal Structure: *Paige Romero*¹; Robin James¹; David Kisailus¹; *Naresh Kakur*¹; ¹University of California, Irvine

K-12: Preliminary Characterization of the Structure and Composition of Brazilian Cattle Hooves for Bioinspiration: *Wendell Bruno Almeida Bezerra*¹; Benjamin Lazarus²; Fernanda Santos da Luz¹; Ulisses Oliveira Costa¹; Sergio Neves Monteiro¹; Fabio da Costa Garcia Filho¹; ¹Military Institute Of Engineering - Ime; ²UCSD

K-13: Reinforced Freeze-cast Structures Using Uniform Magnetic Fields: *Josh Fernquist*¹; Henry Fu¹; Steven Naleway¹; ¹University of Utah

BIOMATERIALS

BioNano 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; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

K-14: AuNps Tailored Microneedle Based Point of Care Device Fabrication for Hormonal Sensing: *Shubhangi Shukla*¹; ¹NCSU

K-15: Potentiometric Immunosensor for the Selective Thyroxine Detection Using Cu-MOF@PANI Composite in Serum Samples: *Mradula Mradula*¹; Rocky Raj¹; Sunita Mishra¹; ¹CSIR-Central Scientific Instruments Organization

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — Poster Session

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Rajiv Soman, Eurofins EAG Materials Science LLC

L-3: Analysis of Mechanical Behavior, Failure Mode and Displacement of Concrete Block Structural Masonry Prisms with Variation in Grouting: *Valber Pinheiro*¹; Jonas Alexandre²; Niander Cerqueira²; ¹UENF; ²Centro Universitário Redentor

L-4: Analysis of Mechanical Properties and Curing of Soil-cement Brick with Incorporation of Stone Residue: *Natália Tavares Gomes*¹; Jonas Alexandre¹; Niander Cerqueira²; ¹UENF; ²Centro Universitário Redentor

L-5: Analysis of the Influence of Hydrated Lime Addition on Soil-cement Bricks: *Bruno Silva*¹; Jonas Alexandre¹; Niander Cerqueira²; ¹UENF; ²Centro Universitário Redentor

L-6: Antifungal Efficacy of AgNPs-Clay Infused into LDPE Films: *Washington Ollani*¹; Fabio Puscetdu²; Duclerc Parra¹; ¹Nuclear and Energy Research Institute; ²Santa Cecilia University

L-7: Application of Grinding, Pyrometallurgical Pretreatment and Silver Leaching of Mineral Tailings from the State of Morelos, Mexico: *Jesús Iván Martínez-Soto*¹; Aislinn M. Teja-Ruiz¹; Miguel Pérez-Labra¹; Martín Reyes-Pérez¹; Gustavo Urbano-Reyes¹; Víctor Reyes-Cruz¹; José Angel Cobos-Murcia¹; Julio Cesar Juárez T.¹; ¹Universidad Autónoma del Estado de Hidalgo

L-8: Ballistic Properties of Novel Epoxy Composite Reinforced with Sedge Fibers (*Cyperus malaccensis*): Lucas Neuba¹; Andressa Teixeira¹; Raí Junio¹; Matheus Ribeiro¹; Thuane Silva¹; Sergio Monteiro¹; Wendell Bezerra¹; ¹Instituto Militar de Engenharia

L-9: Cause Analysis of Edge Scratch Defects of Cold Rolled Wide Steel Strip in Continuous Annealing Furnace: *He Mingsheng*¹; Yuan Li¹; Jun Li¹; Rongjin Xia¹; Guangqiang Wu¹; Rong Du¹; ¹R&D Center of Wuhan Iron & Steel Co Ltd.

L-10: Characterization and Basic Properties of Vine-root "Heteropis flexuosa" as Potential Polymer Composite Reinforcement: Juliana Cunha¹; Lucio Fabio Nascimento¹; Fernanda da Luz¹; Sergio Monteiro¹; Valdir da Veiga Junior¹; Veronica Candido²; ¹Instituto Militar de Engenharia; ²Federal University of Pará

L-12: Characterization of Chiral Spin Structures in Pt/Co/Ni Based Magnetic Superlattices: *Nisrit Pandey*¹; Maxwell Li¹; Marc De Graef¹; Vincent Sokalski¹; ¹Carnegie Mellon University

L-13: Characterization of Clays from Southern Espírito Santo State in Brazil: *Maria Angélica Sant'Ana*¹; Mônica Gadioli¹; ¹CETEM

L-14: Charpy Impact on Polymer Composites Reinforced with Titica Vine Fibers: Juliana Cunha¹; Lucio Fabio Nascimento¹; Wendell Bezerra¹; Sheron Tavares²; Sergio Monteiro¹; ¹Military Institute of Engineering; ²UCSD

L-15: Chemical Analysis of Graphene Oxide Coating on Hemp Fibers for Engineering Application: *Matheus Ribeiro*¹; Pedro Henrique Da Silveira¹; Thuane Da Silva¹; Lucas Neuba¹; Sergio Monteiro¹; ¹Military Institute Of Engineering

L-17: Devitrification Behavior of Al-RE based Ternary Metallic Glasses: Emel Erdal¹; Doguhan Sariturk¹; Can Okuyucu¹; Ilkay Kalay²; Yunus Kalay¹; ¹Middle East Technical University; ²Cankaya University

L-18: Effects of Natural Aging on Fique Fabric Reinforced Epoxy Composites: An Analysis by Charpy Impact Energy: Michelle Oliveira¹; Artur Pereira¹; Fabio Garcia Filho¹; Noan Simonassi¹; Lucio Nascimento¹; Fernanda da Luz¹; Sergio Monteiro¹; Wendell Bezerra¹; ¹Military Institute Of Engineering

L-19: Evaluation of Ballistic Behavior and Natural Aging of Epoxy Matrix Composites and Fique Fabric for Potential Use in Bulletproof Vest: Michelle Oliveira¹; Fernanda da Luz¹; André Figueiredo¹; Sergio Monteiro¹; Wendell Bezerra¹; ¹Military Institute Of Engineering

L-20: Evaluation of the Mechanical, Physical and Chemical Characteristics of the of AISI 316 Austenitic Stainless Steel: *Niander Cerqueira*¹; Victor Souza²; ¹Centro Universitário Redentor; ²UENF

L-21: Evaluation of the Projectile's Loss Energy in Epoxy Composites Reinforced with Carnaúba Fibers: Raí Junio¹; Lucas Neuba¹; Raphael Reis¹; Sérgio Monteiro¹; Lucio Fabio Nascimento¹; Wendell Bruno Bezerra¹; ¹Military Institute of Engineering

L-25: Incorporation of Waste into Cement Matrices - A Review: Valber Pinheiro¹; Niander Cerqueira²; Afonso Azevedo¹; Jonas Alexandre¹; ¹UENF; ²Centro Universitário Redentor

L-26: Influence of Laser Scan Speed on the Diffusion and Vaporization of a Solid-state Electrolyte Produced Using Laser Powder Bed Fusion: *Leanna Hao*¹; Katherine Acord¹; Julie Schoenung¹; ¹UCI

L-28: Influence of the Sand Content on the Physical and Mechanical Properties of Metakaolin-based Geopolymer Mortars: Igor Andrade¹; Beatryz Mendes¹; Leonardo Pedroti¹; Carlos Vieira²; José Carvalho¹; ¹Federal University of Viçosa; ²State University of the Northern Rio de Janeiro

L-29: Investigation of the Use of Modified Polyaminoamide Imidazoline in Epoxy Composites: Artur Camposo Pereira¹; Michelle Souza Oliveira¹; Fabio da Costa Garcia Filho¹; Ulisses Oliveira Costa¹; Sergio Neves Monteiro¹; Wendell Bezerra¹; Noan Simonassi²; Sheron Tavares³; ¹Military Institute of Engineering; ²Universidade Estadual do Norte Fluminense Darcy Ribeiro; ³UCSD

L-30: Magnetic, Structure, and Microstructure Properties of (Sm_{0.12}Co_{0.88})₉₅Hf₅-xBx Nano-composites Ribbons: *Imaddin Al-Omari*¹; A. Raja²; T. Adhikary²; G.P. Das²; S. Ghosh²; D.K. Satapathy²; A. Oraon²; J.E. Shield³; S. Aich²; ¹Sultan Qaboos University; ²IIT-Kharagpur; ³UNL

L-31: Mechanical Analysis of Tensile Strength of PALF Reinforced Epoxy Composite: Pamela Neves¹; Lucio Fabio Nascimento¹; Sergio Monteiro¹; Wendell Bezerra¹; ¹Military Institute of Engineering

L-32: Mechanical and Microstructural Evaluation of Eco-friendly Geopolymer Produced from Chamotte and Waste Glass: Beatryz Mendes¹; Leonardo Pedroti¹; José Maria Carvalho¹; Carlos Mauricio Vieira²; Igor Klaus Andrade¹; Pedro Henrique Drumond¹; ¹Universidade Federal De Vicos; ²Universidade Estadual do Norte Fluminense Darcy Ribeiro

L-33: Dynamic-mechanical Analysis of Epoxy Matrix Composites Reinforced with Kenaf Fiber: Thuane da Silva¹; Matheus Ribeiro¹; Pedro Henrique Da Silveira¹; Wendell Bezerra¹; Lucas Neuba¹; Sergio Monteiro¹; Lucio Fabio Nascimento¹; ¹Military Institute of Engineering

L-35: Microstructural and Mechanical Response of CoCrFeNi- FCC Matrix HEA with Addition of Mo: Fabio Garcia Filho¹; Sergio Monteiro¹; Wendell Bezerra¹; Sheron Tavares¹; ¹Military Institute Of Engineering

L-36: Promising Izod Impact Resistance of Novel Epoxy Composites Reinforced with Caranan Fiber: Andressa Souza¹; Lúcio Nascimento¹; Sérgio Monteiro¹; Wendell Bezerra¹; Sheron Tavares²; ¹IME; ²UCSD

L-37: Properties and Microstructure of a Novel TiZrNbVFeCr-based Non-equiatomic HEA: Fabio Garcia Filho¹; Sergio Monteiro¹; Wendell Bezerra¹; Sheron Tavares²; ¹Military Institute of Engineering; ²UCSD

L-38: Recycling Glass Packaging into Ceramic Bricks: Geovana Carla Delaqua¹; Carlos Mauricio Fontes Vieira¹; ¹Universidade Estadual do Norte Fluminense Darcy Ribeiro

L-39: Soil-cement Brick (BSC) an Excellent Form of Incorporation of Waste and Mitigation of the Civil Construction Environmental Impact: *Niander Cerqueira*¹; Jonas Alexandre²; ¹Centro Universitário Redentor; ²UENF

L-40: Study of the Collectorless Flotation Behavior of Galena in the Presence of Ferric Ion: Martín Reyes Pérez¹; Jimena Detzamin Trejo Martínez²; Iván Alejandro Reyes Domínguez²; Mizraim Uriel Flores Guerrero³; Elia G. Palacios Beas⁴; Miguel Pérez Labra¹; Francisco Raúl Barrientos Hernández¹; Aislinn Michelle Teja Ruiz¹; Julio Cesar Juárez Tapia¹; ¹Universidad Autónoma Del Estado De Hidal; ²Universidad Autónoma de San Luis Potosí; ³Universidad Tecnológica de Tulancingo; ⁴Instituto Politécnico Nacional, IPN, ESIQIE

L-41: Study of the Potential of Clays at the Ceramist Pole of Campos dos Goytacazes – RJ, for the Production of Metakaolin: *Niander Cerqueira*¹; Valber Pinheiro²; Jonas Alexandre²; Afonso Azevedo²; Victor Souza¹; Leonardo Pedroti³; ¹Centro Universitário Redentor; ²UENF; ³UFV

L-42: Surface Modification of Jamesonite during Flotation; Effect of the Presence of Ferric Ion: Martín Reyes Pérez¹; Jazmin Terrazas Medina¹; Iván Alejandro Reyes Domínguez²; Mizraim Uriel Flores Guerrero³; Julio Cesar Juárez Tapia¹; Elia G. Palacios Beas⁴; Miguel Pérez Labra¹; Aislinn Michelle Teja Ruiz¹; Francisco Raúl Barrientos Hernández¹; ¹Universidad Autónoma Del Estado De Hidal; ²Universidad Autónoma de San Luis Potosí; ³Universidad Tecnológica de Tulancingo; ⁴Instituto Politécnico Nacional, IPN, ESIQIE

L-43: The Collectorless Flotation of Pyrrargyrite, Surface Analysis via FTIR: Martín Reyes Pérez²; Zaida Peralta García²; Iván Alejandro Reyes Domínguez²; Mizraim Uriel Flores Guerrero³; Elia G. Palacios Beas⁴; Julio Cesar Juárez Tapia¹; Miguel Pérez Labra¹; Aislinn Michelle Teja Ruiz²; Francisco Raúl Barrientos Hernández²; ¹Universidad Autónoma Del Estado De Hidalgo; ²Universidad Autónoma de San Luis Potosí; ³Universidad Tecnológica de Tulancingo; ⁴Instituto Politécnico Nacional, IPN, ESIQIE

L-44: The Elastic Constants Measurement in a Medical Ti-6Al-4V ELI Alloy by Using Ultrasonic Means: Hector Carreon¹; Maria Carreon-Garcidueñas¹; ¹Universidad Michoacana Universidad Michoacana

L-45: Thermal Analysis of Graphene Oxide Coating on Hemp Fibers for Engineering Application: Matheus Ribeiro¹; Pedro Henrique Da Silveira¹; Thuane Da Silva¹; Lucas Neuba¹; Sergio Monteiro¹; ¹Military Institute of Engineering

L-46: Thermal Analysis of PALF Reinforced Epoxy Composite TGA: Pamela Neves¹; Lucio Fabio Nascimento¹; Sergio Monteiro¹; Wendell Bezerra¹; Sheron Tavares²; ¹Military Institute of Engineering; ²University of California San Diego

L-47: Thermal and Thermomechanical Characterization of Brazilian Cattle Hooves: Wendell Bruno Almeida Bezerra¹; Benjamin Lazarus²; Fernanda Santos da Luz¹; Ulisses Oliveira Costa¹; Sergio Neves Monteiro¹; Fabio da Costa Garcia Filho¹; ¹Military Institute Of Engineering - Ime; ²UCSD

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoula, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chairs: Vahid Attari, Texas A&M University; Prashant Singh, Ames Laboratory/US Department of Energy; Mira Tadarova, Max-Planck-Institut für Eisenforschung GmbH

O-1: A CALPHAD Approach to Alloy Design for Printability and Performance When Additively Manufactured: Soumya Mohan¹; Branden Kappes²; Akansha Singh³; Ben Rafferty⁴; Jeremy Iten⁴; Sridhar Seetharaman⁵; Aaron Stebner¹; ¹Georgia Institute of Technology; ²KMMD, LLC; ³Shell Technology Center; ⁴Elementum 3D; ⁵Arizona State University

O-3: A Study on the CFD Simulation of Microbubbles Generation and Movement during the Mineral Flotation Process: Guihong Han¹; Hao Wu¹; Yanfang Huang¹; Shengpeng Su¹; Bingbing Liu¹; ¹Zhengzhou University

O-4: Analysis of the Kinetic Process of Carbothermal Reduction of ZnFe₂O₄: Ning Mao¹; Chengbo Wu¹; yang Wang¹; Zhihui Guo¹; ¹Chongqing University

O-5: Atomistic Scale Studies of Shape Memory Ceramic Bismuth Ferrite (BiFeO₃): Henan Zhou¹; Doyl Dickel¹; Michael Baskes²; Sungkwang Mun¹; Mohsen Zaeem³; ¹Center for Advanced Vehicular Systems; ²University of North Texas; ³Colorado School of Mines

O-6: Dehydrating MgO Surface to Improve Mg Corrosion Resistance: Insights From Atomistic Simulations: Chi Zhang¹; Xin Li¹; Junsheng Wang¹; ¹Beijing Institute of Technology

O-7: Identification of the Eutectic Composition in the Multicomponent Systems with the High Throughput CALPHAD Approach: Jize Zhang¹; Rui Wang¹; Yu Zhong¹; ¹Worcester Polytechnic Institute

O-8: First-principles Calculations and Thermodynamics Modeling of the Ca-Zn System: Chuliang Fu¹; Bicheng Zhou¹; ¹University of Virginia

O-9: Formation of Grain Boundaries during Polycrystalline Solidification of hcp Alloys: Ahmed Kaci Boukella¹; Maral Sarebanzadeh²; Alberto Orozco-Caballero³; Federico Sket¹; Javier Llorca²; Damien Tournet¹; ¹IMDEA Materials Institute, Madrid (Spain); ²IMDEA Materials Institute and Department of Materials Science, Polytechnic University of Madrid/Universidad Politécnica de Madrid, E.T.S. de Ingenieros de Caminos, Madrid (Spain); ³Department of Mechanical Engineering, Chemistry and Industrial Design, Polytechnic University of Madrid/Universidad Politécnica de Madrid, E.T.S. Ingeniería y Diseño Industrial, Madrid (Spain)

O-10: Grain Precipitation and Growth Model of TiN Inclusions in 22MnB5 Steel: Haohao Zhang¹; Jialu Wu¹; Wei Guo¹; Songyuan Ai¹; Mujun Long¹; Huamei Duan¹; Dengfu Chen¹; ¹Chongqing University

O-11: Numerical Modelling of Powder Spreading, Melt-pool Dynamics, and Grain Structure Evolution during Additive Manufacturing: Daniel Dreehan¹; Gowthaman Parivendhan¹; Philip Cardiff¹; Alojz Ivankovic¹; David Browne¹; ¹University College Dublin

O-12: Quantitative Electrochemical Phase-field Modeling for Corrosion of Engine Materials at High Temperature: Xueyang Wu¹; Michael Tonks¹; ¹University of Florida

O-13: Revisit the VEC Criterion with High-throughput Ab Initio Calculations: A Case Study with Al-Co-Cr-Fe-Ni System: Songge Yang¹; Yu Zhong¹; ¹Worcester Polytechnic Institute

O-14: Simulation of Steam Film Motion Process on the Surface of Zirconium Alloy Rod: Juyi Pu¹; Xiao Ping Liang¹; Shuang Liang¹; Bai Feng Luan¹; ¹Chongqing University

O-15: Structural Ordering and Dynamics of Cu-Ag Chemically Heterogeneous Solid-liquid Interface: Boqiang Wu¹; ¹School of materials science and engineer, Shanghai Jiao Tong University

O-16: Ternary Phase Diagram Determination for Understanding and Modeling of the TCP Phase Formation in Ni-based Superalloys: Chuangye Wang¹; Hui Sun²; Shunli Shang²; Zi-Kui Liu²; Ji-Cheng Zhao¹; ¹University of Maryland; ²Pennsylvania State University

O-17: The Electronic Structures of Anosovite with Different Components: Pan Deng¹; Liang Li¹; Dachun Liu¹; Xiumin Chen¹; ¹Kunming University of Science and Technology

O-18: Thermal Vibration Effects on Physical Gas Adsorption: A Computational Study: Ziyi Wang¹; Claire Saunders¹; Camille Bernal¹; Cullen Quine¹; Brent Fultz¹; ¹Caltech

O-19: Thermodynamic Assessment of the SiO₂-Y₂O₃ System: Wenke Zhi¹; Fei Wang¹; Xiaoyi Chen¹; Bin Yang¹; Yongnian Dai¹; Yang Tian¹; ¹Kunming University of Science and Technology

O-20: Uncertainty Quantification and Propagation in CALPHAD Modeling: Brandon Bocklund¹; Richard Otis²; Zi-Kui Liu¹; ¹Pennsylvania State University; ²Jet Propulsion Laboratory, California Institute of Technology

ADDITIVE TECHNOLOGIES

Foundations of Additive Manufacturing Course – Project Posters — Poster Session

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

J-46: A CFD Model to Predict the Thermo-fluid Properties of AlCoCrFeNi High Entropy Alloy in Powder-bed Laser Beam Additive Manufacturing: *Chayan Das¹; Praveen Sreeramagiri¹; Ganesh Balasubramanian¹; ¹Lehigh University*

SPECIAL TOPICS

Late News Poster Session — Additive Technologies

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

J-49: Data-driven Quality Control of Laser Directed Energy Deposition (DED): *Michael Juhasz¹; Melanie Lang¹; Jeff Riemann¹; ¹FormAlloy Technologies, Inc.*

J-51: Laser Metal Deposition (LMD) and High-speed Laser Cladding – Perspectives for Brake Discs: *Eliana Fu¹; Sabrina Vogt¹; Marco Goebel¹; ¹Trumpf*

J-52: Towards a Magnetic Field Induced Strain in Additive Manufactured NiMnGa Shape Memory Alloys: *Robert Chulist¹; Anna Wójcik¹; Maciej Kowalczyk²; Lukasz Zrodowski²; Norbert Schell³; Rafal Wróblewski²; Wojciech Maziarz¹; ¹IMMS PAS; ²Warsaw University of Technology; ³Helmholtz-Zentrum Geesthacht*

J-53: Uncovering the Deformation Pathways of an AM Ti Alloy with Engineered Duplex Microstructure: *Jennifer Bustillos¹; Atieh Moridi¹; ¹Cornell University*

SPECIAL TOPICS

Late News Poster Session — Biomaterials

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

K-16: DFT Screening of Exciton Delocalization and Coupling Properties of Dyes for Aggregate Systems: *Maia Ketteridge¹; German Barcenas¹; Austin Biagge¹; Lan Li¹; ¹Boise State University*

K-17: Electrochemical Thyroxine Detection Using Copper Metal Organic Framework and Polyaniline Composite: *Mradula Mradula¹; ¹CSIR-Central Scientific Instruments Organization*

K-18: Stretchable-ion Responsive Hydrogel and Its Rheology: *Abhishek Pachauri¹; Jeffrey Bates¹; ¹University of Utah*

SPECIAL TOPICS

Late News Poster Session — Characterization

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

L-51: An Innovative Mass Spectrometer Simplifies Elemental Characterization of Metals: *Ellen Williams¹; Jonathan Putman¹; Jeffrey Williams¹; ¹Exum Instruments*

L-52: Application of HRTEM and LTEM for Investigations of Microstructure and Magnetic Domain Structure of Nanocrystalline Fe Based Soft Magnetic Materials after Ultra-rapid Annealing Process: *Wojciech Maziarz¹; Anna Wójcik¹; Robert Chulist¹; Maciej Szlezzynger¹; Maciej Kowalczyk²; Aleksandra Kolano-Burian³; Pawel Czaja¹; ¹Institute of Metallurgy and Materials Science, Polish Academy of Sciences; ²The Faculty of Materials Science and Engineering, Warsaw University of Technology; ³Lukasiewicz Research Network—Institute of Non-Ferrous Metals*

L-53: Computer Vision for Microvia Characterization: *Nikhil Damani¹; Pragna Bhaskar¹; Mohan Kathaperumal¹; Madhavan Swaminathan¹; ¹3D Systems Packaging Research Center Georgia Institute of Technology*

L-54: Correlative Microscopy and Applied Statistics – Development of a Simultaneous Electron Diffraction and Energy Dispersive X-ray Spectroscopy Data Analysis Method to Understand Interface Populations: *Chris Bilsland¹; Andrew Barrow²; Ben Britton³; ¹Imperial College London; ²Rolls-Royce; ³Imperial College London/ University of British Columbia*

L-55: Digital Image Processing for the Analysis of Spray Coated Porous Films: *Noah McAllister¹; Robert Green-Warren¹; Jae-Hwang Lee²; Assimina Pelegri¹; Jonathan Singer¹; ¹Rutgers School of Engineering; ²University of Massachusetts Amherst*

L-56: High Resolution STEM and LM STEM DPC Studies of Ni-Mn-Ga Based Precursor Powders and 3D Printed Magnetic Shape Memory Alloys: *Pawel Czaja¹; Anna Wójcik¹; Robert Chulist¹; Maciej Kowalczyk²; Wojciech Maziarz¹; ¹Institute of Metallurgy and Materials Science PAS; ²The Faculty of Materials Science and Engineering Warsaw University of Technology*

L-57: Enhancement of Electrical, Thermal and Mechanical Properties of Epoxy-carbon Nanotube/Egg Shell Ash Particles Nanocomposites: *Suleiman Hassan¹; Sunday Aigbodion²; ¹Nigerian Institute of Mining and Geosciences; ²University of Nigeria, Nsukka, Nigeria*

L-58: Experimental and Computational Investigations of TiIrB: A New Ternary Boride with $Ti_{1-x}Rh_{2-x-y}Ir_{3-y}B_3$ -type Structure: *Kate Gibson¹; Jan Scheifers¹; Boniface Fokwa¹; ¹University of California, Riverside*

L-59: Seeing More with Machine Learning and Electron Backscatter Diffraction (EBSD): *Tom McAuliffe¹; David Dye¹; Thomas Britton²; ¹Imperial College London; ²University of British Columbia*

L-60: Study of the Martensitic Transformation by Deformation of Traction in the Steels AISI 304 through Electrical Resistivity: *Edgar Apaza Huallpa¹; Helio Goldenstein²; Esequiel Nicolas Collado Cardenas¹; Elmer Antonio Mamani Calcina¹; Juan Carlos Negron Lopez¹; Lino Reynaldo Quispe Cardenas¹; Alejandro Boris Marquez Guevara¹; Erick Omar Tunqui Labra¹; ¹Universidad Nacional de San Agustín de Arequipa, Perú; ²Universidade de São Paulo*

L-61: Thermogravimetric and FTIR Analysis of Amazonian Oils: Luana Demosthenes Demosthenes¹; Waldeir Silva Dias²; Foluke Salgado de Assis³; Kleynice kazumy de lima Yamaguchi⁴; Sergio Neves Monteiro¹; *Wendell Bruno de Almeida Bezerra*¹; ¹Military Institute of Engineering (IME); ²Universidade do Estado do Amazonas; ³Instituto de Pesquisas da Marinha; ⁴Universidade Federal do Amazonas

L-62: X-ray Tomography In-situ Mechanical Testing: *Alex Arzoumanidis*¹; ¹Psylotech

L-63: XRD and SEM Characterization of Amazon Biomass Residues: Euterpe Oleracea, Theobroma Grandiflorum and Astrocaryum Vulgare Mart: Luana Demosthenes Demosthenes¹; Waldeir Silva Dias²; Foluke Salgado de Assis³; Kleynice kazumy de lima Yamaguchi⁴; Sergio Monteiro¹; *Wendell Bruno de Almeida Bezerra*¹; ¹Military Institute of Engineering (IME); ²Universidade do Estado do Amazonas; ³Instituto de Pesquisas da Marinha; ⁴Universidade Federal do Amazonas

SPECIAL TOPICS

Late News Poster Session — Materials Design

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

M-25: AI-based Design of Daytime Radiative Cooling Materials with Record Temperature Reduction: *Quang-Tuyen Le*¹; Sih-Wei Chang²; Huyen-Anh Phan¹; An-Chen Yang³; Nan-yow Chen³; Hsueh-Li Chen²; Yu-Chieh Lo¹; Dehui Wan⁴; ¹National Yang Ming Chiao Tung University; ²National Taiwan University; ³National Center for High-Performance Computing, NARLabs, Taiwan; ⁴National Tsing Hua University

M-26: Combined Experimental and DFT Computational Study of NiTiZrCu High Temperature Shape Memory Alloy: *Tapasendra Adhikary*¹; Bharat Charan Marupalli¹; Gourab Bhattacharya¹; Akash Oraon¹; Banty Kumar¹; Shampa Aich¹; ¹IIT Kharagpur

M-27: Machine Learning-enabled Framework for the Screening of Hydrogen Storage Materials: *Amit Bundela*¹; Rahul R¹; ¹Indian Institute of Technology (Indian School of Mines) Dhanbad

M-28: Uncertainty Quantification Using Thermo-Calc's TC-Python Package: *Giancarlo Trimarchi*¹; Masoomah Ghasemi¹; Qing Chen¹; ¹Thermo-Calc Software AB

SPECIAL TOPICS

Late News Poster Session — Nuclear Materials

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

N-39: Assessing Void Swelling Resistance of Internal Reactor Materials with an Ultrarapid Photoacoustic Technique: *Nouf Almousa*¹; Benjamin Dacus¹; Kevin Woller¹; Ji Ho Shin²; Changheui Jang³; Michael Short¹; ¹Massachusetts Institute of Technology; ²Korea Advanced Institute for Science and Technology; ³Korea Advanced Institute for Science and Technology

N-41: Effect of the Surface Roughness of Tungsten on the Sputtering Yield Under Helium Irradiation: A Molecular Dynamics Study: *Hyeonho Kim*¹; Kunok Chang¹; ¹Kyung Hee University

N-42: Fabrication and Phase Analysis of U₃Si₂ and UB₂ Fuel Composites with Al and Al₂O₃ Strengthening Additions: *Geronimo Robles*¹; Joshua White²; Elizabeth Sooby¹; ¹University of Texas at San Antonio; ²Los Alamos National Laboratory

N-43: Nanoindentation Creep Testing on Austenitic Alloys: *Tianyi Chen*¹; ¹Oregon State University

N-44: Oxidation and Microstructural Characterization of Tristructural Isotropic Particles (TRISO) in High Temperature Mixed Gas Atmospheres: *Katherine Montoya*¹; Brian Brigham¹; Tyler Gerczak²; Elizabeth Sooby²; ¹University of Texas at San Antonio; ²Oak Ridge National Laboratory

N-46: ZrO₂ Corrosion Layers and Their Grain Boundary Networks: *Aaron Chote*¹; ¹Imperial College, London

SPECIAL TOPICS

Late News Poster Session — Physical Metallurgy

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

O-40: Effects of Alloying Elements on Stability of γ -Ni₃Nb Phase in Nickel Based Alloy: *Kako Tokutomi*¹; Satoru Kobayashi¹; ¹Tokyo Institute of Technology

O-41: Fe-rich Metastable Multi-principal Element Alloys: *James Frishkoff*¹; Nathan Brown¹; Madeline Rivera¹; Amy Clarke¹; Kester Clarke¹; ¹Colorado School of Mines

O-43: Microstructural Evolution during Deformation of 1 GPa Ultrahigh Strength-high Ductility Combination Austenitic Low Density Steel: *Devesh Misra*¹; Jaehyun Kim¹; L. Wei²; ¹The University of Texas at El Paso; ²Shanghai Jiatong University

O-44: The Design Strategy and Creep Properties of Cr-free Model NiCo-based Superalloys: *Victoria Tucker*¹; Sae Matsunaga¹; Michael Titus¹; ¹Purdue University

O-45: The Validity of Using the Hollomon-Jaffe Parameter to Predict Hardness of Tempered Low-carbon High-performance Stainless-steel Alloys for Nuclear Applications: *Shmuel Samuha*¹; Jeff Bickel²; Thomas Lienert³; James Valdez³; Tarasankar DebRoy⁴; Tuhin Mukherjee⁴; Stuart Maloy³; Peter Hosemann²; ¹University of California, Berkeley Nuclear Engineering, and NRCN; ²University of California, Berkeley Nuclear Engineering; ³Los Alamos National Laboratory; ⁴The Pennsylvania 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, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

N-9: Galvanic Corrosion in Containment Materials: *Nicholas Adams*¹; Kerry Rippey¹; Liam Witteman¹; Judith Vidal¹; ¹NREL

N-10: Measurement of Vapor Pressure of UCl₃ in NaCl-MgCl₂-UCl₃ via Transpiration Experiments: *Jacob Yankey*¹; Easton Sadler¹; Marisa Monreal²; Matt Jackson²; Scott Parker²; Suhee Choi¹; Mario Gonzalez¹; Michael F. Simpson¹; ¹University of Utah; ²Los Alamos National Laboratory

N-11: Methods for Recycle of Uranium in Molten Salt Reactor Fuel: *Claire Perhach*¹; ¹Caltech

N-12: Molten Salt Corrosion and Irradiation Behaviors of Cladded and Surface-treated SS316H: Matthew Weinstein¹; Hongliang Zhang¹; Cody Falconer¹; William Doniger¹; Louis Bailly-Salins¹; Alex Nelson¹; Kumar Sridharan¹; *Adrien Couet*¹; ¹University of Wisconsin-Madison

N-13: Multi-parametric Studies of Graphite Compatibility with Fluoride Salt: *Randi Mazza*¹; Stephen Raiman¹; ¹Texas A&M University

N-14: Process Optimization for the Purification of Molten Fluoride Salts via Gas Sparging: *Kyle Williams*¹; Kimberly Zabava¹; Stephen Raiman¹; ¹Texas A&M University

N-15: Revealing Local Ionic Metal Structures in Molten Salt Environments Applying X-ray Absorption Spectroscopy: *Luis Betancourt*¹; Yang Liu¹; Mehmet Topsakal¹; Ruchi Gakhar²; Michael Woods²; Phillip Halstenberg³; Santanu Roy⁴; James Wishart¹; Vyacheslav Bryantsev⁴; Anatoly Frenkel¹; Simerjeet Gill¹; ¹Brookhaven National Laboratory; ²Idaho National Laboratory; ³University of Tennessee Knoxville; ⁴Oak Ridge National Laboratory

N-16: Robust and Standardized High-temperature Molten Chloride Salt Reference Electrode: *Suhee Choi*¹; Jim Steppan²; Michael Simpson¹; ¹The University of Utah; ²HiFunda LLC

N-17: Tellurium Cracking Study in Inconel 617: *Ryan Gordon*¹; Stephen Raiman²; Lesley Frame¹; ¹University of Connecticut; ²Texas A&M University

N-18: The Reduction of Uranium Dioxide Pellet in Molten CaCl₂-CaF₂-CaO: *Nagihan Karakaya*¹; Jinsuo Zhang¹; ¹Virginia Tech

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Poster Session I

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

M-16: Effect of Nozzle Structure Parameters on Liquid Steel Flow Behavior in Slab Mold: *Sikun Peng*¹; ¹Chongqing University

M-17: Influence of Single Fold and Double Fold on the Stress and Strain of AMOLED Module: Qiuqun Wang¹; Weiwei Su¹; Di Zhang¹; *Wei Jin Ji*²; Bo Wang¹; ¹Hebei University of Science and Technology; ²Hebei Special Equipment Supervision and Inspection Institute

M-18: Microwave Dielectric Spectroscopy of Intrinsic and Doped HKUST-1 Metal-organic Framework Films: Papa K. Amoah; Zeinab Hassan¹; Helmut Baumgart²; Y.S. Obeng³; Engelbert Redel¹; *Abdelmageed Elmustafa*²; ¹Karlsruhe Institute of Technology (KIT), Institute of Functional Interfaces (IFG), Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany; ²Old Dominion University; ³Physical Measurement Laboratory, National Institute of Standards and Technology NIST

M-19: Optimization of Parameters in Modified Strain-induced Melt Activation Process for Al-7Si Alloy: *Chandan Choudhary*¹; Kanai Lal Sahoo²; Durbadal Mandal³; ¹Maharashtra Institute of Technology, Aurangabad; ²CSIR-NML Jamshedpur; ³NIT Durgapur

M-20: Phase Field Modeling Investigation of Polycrystalline Grain Growth Using a Spherical-Gaussian-Based 5-D Computational Approach: *Lenissongui Yeo*¹; Michael Costa¹; Jacob Bair¹; ¹Oklahoma State University

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — Student Poster Session II

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

M-21: Cold Spray Deposition onto CFRP with Engineered Bond Layer: *Brian Feng*¹; ¹University of Southern California

M-23: Numerical Simulation Study of Strip Floater: *Ning Mao*¹; Chengbo Wu¹; Zhihui Guo¹; ¹Chongqing University

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — Poster Session

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

N-21: Dislocation Loop Formation in Self-ion Irradiated Ultra-high Purity Fe-Cr Alloys: Yao Li¹; Arunodaya Bhattacharya²; Yajie Zhao¹; Ling Wang²; *Steven Zinkle*¹; ¹University of Tennessee Knoxville; ²Oak Ridge National Laboratory

N-24: Microstructure Deformation and Possible Densification of Tungsten in High Heat Flux Conditions: Minsuk Seo¹; Ke Wang¹; John Echols²; Leigh Winfrey¹; ¹The Pennsylvania State University; ²Oak Ridge National Laboratory

N-26: Oxide-dispersion-strengthened Steel Processing by Additive Manufacturing of Gas Atomization Reaction Synthesis (GARS) Powders: *Matthew deJong*¹; Ryan Schoell¹; Sourabh Saptarshi¹; Sarah Timmins¹; Emma White²; Iver Anderson²; Djamel Kaoumi¹; Christopher Rock¹; Timothy Horn¹; ¹North Carolina State University; ²Iowa State University

N-27: Polycrystal Homogenization Modelling Accounting for Channeling in Irradiated Metals and Alloys: *Diogo Gonçalves*¹; Maxime Sauzay¹; Laurent Dupuy¹; ¹Université Paris-Saclay, Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA)

N-28: Promoting Radiation Resistance in Metallic Solid Solutions via the Use of Multiple Synergistic Solutes: *Soumyajit Jana*¹; Thomas Schuler²; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois Urbana Champaign; ²Cea Saclay

N-29: Thermal and Mechanical Characterization of W-Cu Composites for Next Generation Fusion Devices: *Elena Tejado*¹; Alexander Müller²; Jeong-Ha You²; J.Y. Pastor¹; ¹Universidad Politécnica de Madrid; ²Max-Planck-Institut für Plasmaphysik

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — Poster Session

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

N-32: Dynamics of Helium Bubbles during Thermal Annealing: A Data-driven Approach: *Kory Burns*¹; Kayvon Tadj¹; Assel Aitkaliyeva¹; Khalid Hattar¹; Mary Scott¹; ¹University of Florida

N-34: Influence of the Bulk Chemical Composition on the Microstructure Evolution of Irradiated Chemically-tailored Nuclear RPV Steels: *Aidar Zakirov*¹; Bertrand Radigue¹; Rachid Chaouadi²; Philippe Pareige¹; ¹Groupe de Physique des Matériaux - Université de Rouen Normandie; ²SCK CEN

N-35: Investigation of Ion Irradiation Effects on Mineral Analogues of Concrete Aggregates: Zehui Qi¹; *Steven Zinkle*¹; Yann Le Pape²; Elena Rodriguez²; Xin Chen³; Gaurav Sant³; ¹University of Tennessee, Knoxville; ²Oak Ridge National Laboratory; ³University of California, Los Angeles

N-36: Stress Distribution of Disk Geometry Under Three-point Bending Tests to Evaluate Mechanical Properties of Neutron-irradiated Tungsten for Future Fusion Devices: *Trevor Marchhart*¹; Nathan Reid²; Lauren Garrison³; Jean Paul Allain¹; ¹Penn State University; ²University of Illinois; ³Oak Ridge National Laboratory

N-37: Study of Microstructure, Hydrogen Solubility and Corrosion of Ta-modified Zr-1Nb Alloys for Nuclear Applications: *Pedro Ferreirós*¹; Estefanía Savoy Polack²; Liliana Lanzani²; Paula Alonso²; Dante Quirós²; Juan Mieza²; Eugenia Zelaya³; Alexander Knowles¹; Gerardo Rubiolo³; ¹University of Birmingham; ²Comisión Nacional de Energía Atómica; ³Consejo Nacional de Investigaciones Científicas y Técnicas

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — Poster Session

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

L-48: Deformation Behaviour of Novel Beta-Ti Bcc-Super alloys: Vincent Gagneur¹; Tianhong Gu¹; Alexander Knowles¹; ¹University of Birmingham

L-50: Multiscale Mechanical Evaluation of FiberForm: Robert Quammen¹; Paul F. Rottmann¹; Connor Varney¹; ¹University of Kentucky

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Poster Session

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Mohsen Asle Zaeem, Colorado School of Mines

O-22: Carbon Transformations in Rapidly Solidified Nickel-carbon Ribbon: Gina Greenidge¹; Samuel Price¹; Jonah Erlebacher¹; ¹Johns Hopkins University

O-24: Coarsening, Dissolution and Re-precipitation in Multimodal Ni Superalloys: An In-situ Study: Muhammad Awais¹; Jan Ilavsky²; James Coakley¹; ¹University of Miami; ²Argonne National Laboratory

O-25: Contribution of the Electronic Entropy to Some Congruent and Allotropic Phase Transformations: Jonathan Paras¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

O-27: Influence of the Austenitic Grain Size on the Strength in a Medium-carbon and Low-alloy Steel: David Fernández-Sánchez²; Octavio Vázquez-Gómez¹; Alexis Gallegos-Pérez¹; Pedro Garnica-González¹; Héctor Vergara-Hernández¹; ¹Tecnológico Nacional de México / I.T. Morelia

O-29: Leveraging Solid-state Phase Transformations to Tailor Residual Stress in Additively Manufactured Metal Components: Aleksandra Vyatskikh¹; Xin Wang²; Lorenzo Valdevit²; Enrique Lavernia²; Julie Schoenung²; ¹University of California Irvine; ²University of California Irvine

O-30: Microstructural and Mechanical Property of Ti-6Al-4V/STS 304 Dissimilar Joints by Diffusion Bonding Using Hierarchical Multilayers Structure: Bo Hun Jang¹; Jin Gyu Lee¹; Jeong Pyo Lee¹; Jin Kyu Lee¹; ¹Kongju National University

O-31: Modeling Phase Transformation and Tensile Properties of Micro-alloyed Structural Steels for Fire Resistance: Fahim Khan Priorto¹; Razia Sharme¹; H. M. Mamun Rashed²; ¹Khulna University of Engineering & Technology; ²Bangladesh University of Engineering and Technology

O-32: Phase Evolution of Laser Melted Single Tracks of 316L: Anna Rawlings¹; Andrew Birnbaum¹; John Steuben¹; Athanasios Iliopoulos¹; John Michopoulos¹; ¹U.S. Naval Research Laboratory

O-33: Phase Transformations and Microstructural Evolution: George Lindemann¹; Paul Chao¹; Ashwin Shahani¹; ¹University of Michigan

O-34: Polyamorphism in a Solute-lean Al-Ce Metallic Glass: Ziliang Yin¹; ¹Center for High Pressure Science & Technology Advanced Research

O-35: The Effect of Ni Ion Implantation on the Nanoindentation Response of a Ni 50.5at%-Ti 49.5at% Shape Memory Alloy: Daniel Hong¹; Alejandro Hinojos¹; Nan Li²; Khalid Hattar³; Jeremy Schaffer⁴; Taiwu Yu¹; Yunzhi Wang¹; Michael Mills¹; Peter Anderson¹; ¹Ohio State University; ²Los Alamos National Laboratories; ³Sandia National Laboratories; ⁴Fort Wayne Metals

O-36: The Influence of Ru Addition on the Precipitation Behavior of Topologically Close-packed Phase in the Ni-based Superalloy: Sangwon Lee¹; Kyuseon Jang¹; Hosun Jun¹; Jeonghyun Do²; Pyuck-Pa Choi¹; ¹Korea Advanced Institute of Science and Technology; ²Korea Institute of Materials Science

O-37: The Microstructural Evolution of Ag-39.9at%Cu Eutectic Alloys under Different Cooling Rates: Qingyuan Qin¹; ¹Shanghai Jiaotong University

O-38: Thermodynamics of Elinvar Behavior: Pedro Guzman¹; Stefan Lohaus¹; Camille Bernal¹; Brent Fultz²; ¹California Institute of Technology

O-39: Transformation-induced Plasticity in Omega Titanium: Amir Hassan Zahir¹; Jamie Ombogo¹; Tengfei Ma¹; Pranay Chakraborty¹; Lei Cao¹; ¹University of Nevada Reno

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — 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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

Session Chair: Kathy Lu, Virginia Polytechnic Institute and State University

J-47: Induction Sintering of Copper-chromium Powders at Low-pressure Environment: *Santiago Vargas*¹; Gregory Hadley¹; Diana Galeano¹; Carlos Castano¹; ¹Virginia Commonwealth University

J-48: Simultaneously Increasing the Thermoelectric and Mechanical Properties by Developing Harmonic Structure in Bi₂Te₃ Gas Atomized Powders: *Pee-Yew Lee*¹; ¹National Taiwan Ocean University

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — Poster Session

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Tuesday PM | March 1, 2022
Exhibit Hall C | Anaheim Convention Center

N-25: HIPE: A Versatile Test Platform for Hydrogen Permeability Measurements: *Reid Bohanon*¹; Diego Macias¹; Tu Le¹; Stephen Raiman¹; ¹Texas A&M University

N-38: Development of Coatings to Provide Corrosion Resistance and Tritium Retention for Application in Nuclear Fusion Reactors: *Hazel Gardner*¹; Alice Laferrere¹; Callum Gallagher¹; David Bowden¹; ¹The UK Atomic Energy Authority

ON-DEMAND PRESENTATIONS

The following are details to help prepare for the program if you are presenting in the virtual on-demand option:

- The on-demand presentations are scheduled to be available beginning Monday, March 14 starting at 8:00 a.m. EDT.
- The presentations will be available to view through April 30, 2022.
- Presentations will be pre-recorded.
- All presentations are in Eastern US Time. Note that Sunday, March 13 is the start of Daylight Savings Time in the US. The virtual conference will automatically re-set the times to display Eastern Daylight Savings time beginning on Sunday. Eastern Daylight Savings Time is UTC-4:00.

12th International Symposium on High Temperature Metallurgical Processing — On-Demand Oral Presentations

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

Program Organizers: Zhiwei Peng, Central South University; Jiann-Yang Hwang, Michigan Technological University; Jesse White, Elkem Carbon Solutions; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, Jiangxi University of Science and Technology; Onuralp Yücel, Istanbul Technical University; Ender Keskinlik, Atılım University; Tao Jiang, Central South University; Morsi Mahmoud, King Fahd University of Petroleum & Minerals

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Numerical Simulation of the Effect of Bed Height Diameter Ratio on Gas-solid Flow Characteristics in a Side Stirred Fluidized Bed: Chuanfu Li¹; Yan Liu¹; Tingan Zhang¹; Ning Li¹; Shengyu Zhang¹; ¹Northeastern University

Smelting Reduction of FeO in Molten Slag Using Alternative Solid Carbon Sources: Theint Theint Htet¹; Zhiming Yan¹; Koen Meijer²; Zushu Li¹; ¹WMG, University of Warwick; ²Tata Steel IJmuiden

Dynamics Behaviors of Droplets Impacting on a Heated Tailings Surface: Yan Zhao¹; Liangying Wen¹; Li Su¹; Bo Liu¹; JianXin Wang¹; Liwen Hu¹; ¹Chongqing University

3D Experimental Model Study on Gas-solid Flow of Raceway in Blast Furnace: Cong Li¹; Qingguo Xue¹; Xing Peng¹; Haibin Zuo¹; Xuefeng She¹; Guang Wang¹; Jingsong Wang¹; ¹University of Science and Technology Beijing

Effect of the Injection Angle of Reducing Gas on Coal Flow and Combustion in a 50% Oxygen Blast Furnace: Xing Peng¹; Jingsong Wang¹; Zhiyao Li¹; Haibin Zuo¹; Xuefeng She¹; Guang Wang¹; Qingguo Xue¹; ¹University of Science and Technology Beijing

Decarburization and Chromium Conservation Model in AOD Refining Process of 304 Stainless Steel: Jun Cai¹; Jing Li¹; ¹University of Science and Technology Beijing

Comparative Study on the Cleanliness of Ultra-low Carbon Al-killed Steel by Different Heating Processes: Shenyang Song¹; Jing Li¹; Wei Yan¹; Jianxiao Zhang¹; ¹University of Science and Technology Beijing

Optimization of VD Refining Slag and Control of Non-metallic Inclusions for 55SiCrA Spring Steel: Chen Wang¹; Qing Liu²; Jiangshan Zhang²; Jun Chen³; Dan Lin³; Xuji Wang³; Jiancheng Zhu³; ¹University of Science and Technology Beijing; ²University of Science & Technology Beijing; ³Xiangtan Branch, Hunan Valin Iron & Steel Co., Ltd.

Structural and Magnetic Properties of Rare-earth Lanthanum-doped Cobalt Ferrites: Xijun Zhang¹; Guoqian Wang²; Xin Peng²; Sujun Lu¹; Dalin Chen¹; Yutian Ma¹; Ailiang Chen²; ¹State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization; ²Central South University

Evaluation of Processing Parameters for the Production of Tungsten Carbide in a Fluidized Bed Reactor: Maureen Chorney¹; Jerome Downey¹; K. Sudhakar¹; ¹Montana Technological University

Thermal Analysis of Potential High Entropy Alloy Binder Alternatives for Tungsten Carbide: Jannette Chorney¹; Jerome Downey¹; K. Sudhakar¹; Morgan Ashbaugh¹; Grant Wallace¹; ¹Montana Technological University

Modelling of Permanent Magnetic Field for Its Application in Electroslag Remelting: Guotao Zhou¹; Shenyang Song¹; Wei Yan¹; Jing Li¹; ¹University of Science and Technology Beijing

Contact Line Undulation Induced Capillary Interaction between Micron-sized Ce2O3 Inclusions at the Ar Gas/Liquid Steel Interface: Zilong Qiu¹; Annelies Malfliet²; Bart Blanpain²; Muxing Guo²; ¹KU Leuven; ²KU Leuven

Microstructural Evolution of Thermal Insulation Materials Prepared by Sintering of Ferronickel Slag and Fly Ash Cenosphere: Guangyan Zhu¹; Zhiwei Peng¹; Lei Yang¹; Wenxing Shang¹; Mingjun Rao¹; ¹Central South University

Influence of Aluminum on Hot Ductility of High-strength Steel: Pei Zhu¹; Lifeng Zhang²; Ying Ren¹; ¹University of Science and Technology Beijing; ²Yanshan University

Effect of Ce Content on Non-metallic Inclusions in Si-Mn Killed Stainless Steels: Lingxiao Cui¹; Lifeng Zhang²; Ying Ren¹; Ji Zhang¹; ¹University of Science and Technology Beijing; ²Yanshan University

Effect of Calcium Treatment on Non-metallic Inclusions in Steel during Refining Process: Weijian Wang¹; Lifeng Zhang²; Ying Ren¹; Yan Luo¹; Xiaohui Sun³; ¹University of Science and Technology Beijing; ²Yanshan University; ³Shanghai Meishan Iron and steel Co. Ltd

Observation on Clogging Behavior of Submerged Entry Nozzle of Al-killed Steels: Fenggang Liu¹; Qiuyue Zhou¹; Lifeng Zhang²; Ying Ren¹; ¹University of Science and Technology Beijing; ²Yanshan University

Effect of Lanthanum on Inclusions in a High Sulfur Steel: Sha Ji¹; Lifeng Zhang²; Ying Ren¹; Xindong Wang¹; ¹University of Science and Technology Beijing; ²Yanshan University

Investigation of Bubble Penetration through Interface between Immiscible Liquids: Xiangfeng Cheng¹; Baojun Zhao²; Fuming Zhang³; Gele Qing¹; Zhixing Zhao¹; ¹Shougang Research Institute of Technology; ²Jiangxi University of Science and Technology; ³Shougang Group

Improvement of Iron Coke Strength by Adding Coal Tar during Coking: Chen Yin¹; Mingxuan Song¹; Shengfu Zhang¹; ¹Chongqing University

Modification of Basic Oxygen Furnace Slag Using Iron Ore Tailing and Blast Furnace Dust: Liang Wang¹; Wei Ren¹; Xiaofang Zhang¹; Ziwen Han¹; Jinlian Li¹; ¹HBIS Group Hansteel Company

Removal of Arsenic from Molten Bearing Steel by Adding Rare Earth Lanthanum: Peng Yu¹; Wang Hongpo¹; Zhou Xiaoqing¹; ¹Chongqing University

Effect of Austenitizing and Cooling Process on Microstructure Transformation of Low-carbon Bainite Steel: Zhou Xiaoqing¹; Wang Hongpo¹; ¹Chongqing University

Experimental Study on Thermodynamics of CaO-SiO₂-Ce₂O₃-5wt.%Al₂O₃ System at 1773 K: Mengchuan Li¹; Tongsheng Zhang²; Wanlin Wang¹; Hualong Zhang¹; Rensheng Li¹; ¹Center South University; ²Central South University

Effect of Ti and Ca Content on the Characteristics of Inclusions in Si-Mn-Al Deoxidized Spring Steel: Rensheng Li¹; Tongsheng Zhang¹; Wanlin Wang¹; Mengchuan Li¹; Daoyuan Huang¹; ¹Central South University

Research on Cost System of Total Scrap EAF Steel-making Process: Bo Li¹; Ling-zhi Yang¹; Yu-feng Guo¹; Shuai Wang¹; Hang Hu¹; ¹Central South University School of Minerals Processing and Bioengineering

Calculation of Heat Loss of Furnace Body in Electric Arc Furnace Steelmaking: *Zhi-hui Li¹; Ling-zhi Yang¹; Yu-feng Guo¹; Shuai Wang¹; Hang Hu¹; ¹Central South University School of Minerals Processing and Bioengineering*

MATERIALS PROCESSING

12th International Symposium on High Temperature Metallurgical Processing — On-Demand 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; Jesse White, Elkem Carbon Solutions; Jerome Downey, Montana Technological University; Dean Gregurek, RHI Magnesita; Baojun Zhao, Jiangxi University of Science and Technology; Onuralp Yücel, Istanbul Technical University; Ender Keskinilic, Atılım University; Tao Jiang, Central South University; Morsi Mahmoud, King Fahd University of Petroleum & Minerals

Monday AM | March 14, 2022
Materials Processing | On-Demand Poster Hall

Disintegration Behavior of Vanadium–titanium Magnetite Pellets in Gas Mixtures of CO–H₂–CO₂–N₂: *Yue Wang¹; Jianbo Zhao¹; Donglai Ma¹; Qingqing Hu¹; Yongjie Liu¹; Zhixiong You¹; ¹Chongqing University*

Effect of Channel Heights on the Flow Field, Temperature Field and Inclusion Removal of Induction Heating Tundish: *Xi-qing Chen¹; Hong Xiao¹; Pu Wang¹; Peng Lan¹; Hai-yan Tang¹; Jia-quan Zhang¹; ¹University of Science & Technology Beijing*

Experimental Study on Thermal Shock Resistance of Magnesia Carbon Brick: *Changhai Lv¹; Jing Li¹; Renxiang Lv²; Shouxin Tian³; ¹University of Science and Technology Beijing; ²Jinan Ludong Refractories Company; ³Baosteel Group Central Research Institute*

Changes of SO₂, NO_x Emission and Production of Iron Ore Sintering with Steam Injection at the Surface of Sintering Bed: *Yapeng Zhang¹; Wen Pan¹; Shaoguo Chen¹; Huaiying Ma¹; Jingjun Zhao²; Zhixing Zhao¹; Huayang Liu²; ¹Shougang Group Co., LTD Research Institute of Technology; ²Shougang Jingtang United Iron & Steel Co., Ltd*

Study on Burden Mineral Phase Identification System and Prediction Model of Metallurgical Properties Based on BP Neural Network: *Qingqing Hu¹; Donglai Ma¹; Yue Wang¹; Zhixiong You¹; Xuewei Lv¹; ¹Chongqing University*

Effect of Slag Basicity on Non-metallic Inclusions in a Heavy Rail Steels: *Nan Liu¹; Lifeng Zhang²; Yanping Chu¹; Ying Ren¹; ¹University of Science and Technology Beijing; ²Yanshan University*

Distribution of Inclusions in an IF Steel Continuous Casting Slab Casted during SEN-Clogged State: *Qiuyue Zhou¹; Rikang Huang¹; Lifeng Zhang²; ¹University of Science and Technology Beijing; ²Yanshan University*

ADVANCED MATERIALS

2D Materials – Preparation, Properties & Applications — On-Demand Oral Presentations

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Keynote

Novel Approach to Wafer Scale Integration of Graphene and h-BN Related 2-D Materials: *Jagdish Narayan¹; ¹North Carolina State University*

Invited

Synthesis and Characterization of MnCo₂O₄ /GQDs Nano-composites for Super Capacitor Electrodes: *Poonam Kharangarh¹; ¹University of Delhi*

Raman and Transport Characterization of Semiconducting and Superconducting Selenide-based Transition Metal Dichalcogenides: *Kishan Jayanand¹; Anupama Kaul¹; ¹University of North Texas*

Rapid Exfoliation of Low-defectivity Graphene in Alkali Lignin Aqueous Media: *Claudio Marchi¹; Harrison Loh²; Federico Lissandrello¹; Konstantinos Sierras²; Luca Magagnin¹; ¹Politecnico di Milano; ²West Virginia University*

Immobilization of Glycine Molecules on Graphene Oxide for Enhanced Piezoelectricity: *Sabrina Binte Ashraf¹; Emmet O'Reilly²; Shaheen Sarkar²; Syed Tofail²; Fahmida Gulshan¹; Md Moniruzzaman¹; ¹Bangladesh University of Engineering and Technology; ²Bernal Institute, University of Limerick*

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — On-Demand Oral Presentations

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

Program Organizers: Verena Maier-Kiener, Montanuniversität Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Room

Invited

Determining Material Parameters from Nanoindentation Data by Inverse Methods: *Alexander Hartmaier¹; ¹ICAMS Ruhr University Bochum*

Length Scale Effects of Nanoindentation on Additively Manufactured Stainless Steel: *Kunqing Ding¹; Yin Zhang¹; David McDowell¹; Ting Zhu¹; ¹Georgia Institute of Technology*

Understanding Rate-depending Plastic Deformation under Hydrogen Influence through Advanced In-situ Electrochemical

Nanoindentation: Anna Ebner¹; Verena Maier-Kiener¹;
¹Montanuniversität Leoben

Comparison between Long-term Nanoindentation Creep Testing under Constant Load and Constant Pressure: Thomas Chudoba¹;
¹ASMEC GmbH

Factors Affecting Nanoindentation Derived Activation Parameters for PLC Effects: Henry Ovr¹; Erica Lilleodden¹; ¹Helmholtz Zentrum Hereon

Estimating the Elastic Constants of Pulp Fibers with Nanoindentation: Caterina Czibula¹; August Brandberg²; Megan Cordill³; Artem Kulachenko²; Christian Teichert⁴; Ulrich Hirn¹;
¹Institute of Bioproducts and Paper Technology, Graz University of Technology; ²KTH Royal Institute of Technology; ³Erich Schmid Institute for Materials Science, Austrian Academy of Sciences; ⁴Institute of Physics, Montanuniversität Leoben

A Novel Indentation-size-effect-based Nanoindentation Test Method Enabling Smaller Scale Testing for Safer Nuclear Structural Health Monitoring: Rohit Sharma¹; Nigel M. Jennett¹; Chris D. Hardie²; Alexandra J. Cackett²; ¹Coventry University; ²UK Atomic Energy Authority

Hardening Relationship with Hydrogen and Dislocation Structure in FeCr Alloys by In Situ Nanoindentation: Jing Rao¹; Subin Lee²; Gerhard Dehm¹; Maria Jazmin Duarte Correa¹; ¹Max-Planck-Institut für Eisenforschung G; ²Karlsruhe Institute of Technology (North)

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond — On-Demand Poster Session

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

Program Organizers: Verena Maier-Kiener, Montanuniversität Leoben; Benoit Merle, University Erlangen-Nuremberg (Fau); Erik Herbert, Michigan Technological University; Samantha Lawrence, Los Alamos National Laboratory; Nigel Jennett, Coventry University

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Poster Hall

On the Plastic Deformation Mechanisms Operating in High Purity Indium at Small Length Scales and High Homologous Temperatures: Fereshteh Mallakpour¹; Stephen Hackney¹; Erik Herbert¹; ¹Michigan Tech University

Simultaneous Nanoindentation and Acoustic Monitoring Enhanced by the Deep Learning Methodology: Antanas Daugela¹; Jurgis Daugela²; ¹Nanometronix LLC; ²Johns Hopkins University

SPECIAL TOPICS

Acta Materialia Symposium — On-Demand Poster Session: Student Award Winners in Acta Materialia Symposium

Program Organizer: Carolyn Hansson, University of Waterloo

Monday AM | March 14, 2022
Special Topics | On-Demand Room

Data-driven Design Guidelines for Ceramic Superlattices with Enhanced Fracture Resistance: Nikola Koutna¹; Alexander Brenner¹; David Holec²; Paul Mayrhofer¹; ¹TU Wien; ²Montanuniversität Leoben

A Comparative Study on Intrinsic Mobility of Incoherent and Semicohherent Interfaces during the Austenite to Ferrite Transformation: Haokai Dong¹; ¹Tohoku-Tsinghua Universities Joint Program

Engineering Highly-aligned Cardiac Patches by Electrohydrodynamically-printed Microlattices: Mao Mao¹; ¹Xi'an Jiaotong University

Machine Learned Feature Identification for Predicting Phase and Young's Modulus of Low-,Medium- and High-entropy Alloys: Ankit Roy¹; ¹Lehigh University

Evaluation of Low-stress High-temperature Creep: The Harper-Dorn Creep: Shobhit Singh¹; ¹Indian Institute of Science

Direct Observation of the Ni Stabilising Effect in Interfacial (Cu,Ni)6Sn5 Intermetallic Compounds: Flora Somidin¹; ¹University Malaysia Perlis

ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials — On-Demand Oral Presentations

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

Program Organizers: Emily Rinko, Iowa State University; Iver Anderson, Iowa State University Ames Laboratory; Markus Chmielus, University of Pittsburgh; Emma White, DECHEMA Forschungsinstitut; Deliang Zhang, Northeastern University; Andrew Kustas, Sandia National Laboratories; Kyle Johnson, Sandia National Laboratories

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Invited

Additive Manufacturing of Electrical Steels: Opportunities to Link Microstructure and Design: Alex Plotkowsk¹; Chris Fancher¹; Michael Haines²; Fred List¹; Keith Carver¹; Benjamin Stump¹; Andrew Kustas³; Peter Wang¹; John Coleman¹; Amiee Jackson¹; Suresh Babu²; Ryan Dehoff¹; ¹Oak Ridge National Laboratory; ²University of Tennessee Knoxville; ³Sandia National Laboratory

Modeling Alignment of Magnetic Particles in Functionalized Magnetic 3D Printer: Abhishek Sarkar¹; M. Paranthaman²; Cajetan Nlebedim¹; ¹Ames Laboratory; ²Oak Ridge National Laboratory

Influence of Composition and Microstructure on Magnetic Properties of Additively Manufactured Fe/Co/Ni Based Soft Magnetic Alloys: *SaiSree Varahabhatla*¹; Mohansaikiran Nartu¹; Sriswaroop Dasari¹; Abhishek Sharma¹; Varun Chaudhary¹; Srinivas Mantri¹; Raju Ramanujan¹; Rajarshi Banerjee¹; ¹University of North Texas

Mapping the Selective Laser Melting Parameter-thermophysical Property Space of a Ni51.2Ti Alloy Using a Combined Experimental and Computational Approach: *Asher Leff*¹; Nathan Hite²; Chen Zhang²; Adam Wilson¹; Raymundo Arroyave²; Alaa Elwany²; Ibrahim Karaman²; Darin Sharar¹; ¹DEVCOM Army Research Laboratory; ²Texas A&M

Additively Manufactured Nitinol for Prescribed Properties and Prediction of Its Bulk Elastic Properties by Molecular Dynamic Simulation: Jeongwoo Lee¹; *Yung Shin*¹; ¹Purdue University

Process-structure-property Relationships in Laser Powder Bed Fusion of Permanent Magnetic Nd-Fe-B: *Julan Wu*¹; Nesma Aboulkhair²; Michele Degano¹; Richard Hague¹; Ian Ashcroft¹; ¹University of Nottingham; ²University of Nottingham (UK) and Technology Innovation Institute (UAE)

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities — On-Demand Oral Presentations

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; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Invited

On the Fatigue Properties of Additively Manufactured Materials Processed at Non-optimal Conditions: *Thomas Niendorf*¹; ¹Universitaet Kassel

Invited

Probabilistic Methods for Additive Manufacturing – How to Understand and Manage the Uncertainty: Mohsen Seifi¹; *Martin White*²; Mahdi Jamshidinia²; Doug Wells³; ¹ASTM International/Case Western Reserve University; ²ASTM International; ³NASA

Effect of Surface Roughness on Fatigue Behavior of 316L Stainless Steel Produced by Binder Jetting Process: *Wei-Jen Lai*¹; Avinash Ojha¹; Zhenxuan Luo²; ¹Ford Motor Company; ²Shanghai Jiao Tong University

Mechanism-based Characterization of the Mechanical Behavior of PBF-EB Manufactured IN718 Lattice Structures: *Daniel Kotzem*¹; Tizian Arold²; Thomas Niendorf²; Frank Walther¹; ¹TU Dortmund University; ²University of Kassel

High Strain Rate Deformation of EBM-Ti-6Al-4V: Microstructure, Texture, Mechanical Properties, Fracture Surface, Deformation Mechanism, and Constitutive Modeling: *Reza Alaghmandfard*¹; Mohsen Mohammadi¹; ¹University of New Brunswick

Methodology of Low Cycle Fatigue Testing on Thin-walled Stainless Steel 316L Manufactured by Laser Powder Bed Fusion: *Cheng-Han Yu*¹; Johan Moverare¹; Ru Peng¹; Alexander Leicht²; ¹Linköping University; ²Chalmers University of Technology

Prediction of Fatigue Life Based on the Microstructure and Porosity Distribution Using the Novel Computationally Efficient Multiscale Modeling: *Mohamed Elkhateeb*¹; Yung Shin²; ¹Mansoura University; ²Purdue University

The Tensile Behavior of Additively Manufactured 17-4 PH Stainless Steel with Different Heat Treatments: *Saadi Habib*¹; Steven Mates²; Mark Stoudt²; Fan Zhang²; Olaf Borkiewicz³; ¹National Institute of Standards and Technology; ²National Institute of Standards and Technology (NIST); ³Advanced Photon Source, Argonne National Laboratory

High-throughput Characterization of the Fatigue Behavior of Additively Manufactured Metals toward Rapid Qualification: *Adam Pilchak*¹; Pawan Vedanti¹; Dan Satko¹; Ayman Salem¹; ¹Materials Resources, LLC

Load-dependent Degenerating Structures in Additively Manufactured Implants: *Dennis Milaage*¹; Kay-Peter Hoyer¹; Mirko Schaper¹; ¹Paderborn University

Effect of Post Heat Treatment on Fatigue Strength of AlSi10Mg Produced by Laser Powder Bed Fusion Process: *Wei-Jen Lai*¹; Avinash Ojha¹; Ziang Li¹; ¹Ford Motor Company

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications IV — On-Demand Oral Presentations

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

Program Organizers: Isabella Van Rooyen, Pacific Northwest National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University; Michael Kirka, Oak Ridge National Laboratory

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Invited

Process-aware Design Optimization Methods for Metal Additive Manufacturing: Albert To¹; *Praveen Vulimiri*¹; ¹University of Pittsburgh

3D Ink-extrusion Printing of Thermoelectric Materials onto Heat Exchangers: Alexander Proschel¹; *Donna Guillen*¹; Dennis Tucker¹; David Dunand²; ¹Idaho National Laboratory; ²Northwestern University

Advanced Manufacturing for the Development of Advanced In-pile Sensors and Instrumentation: *Kiyo Fujimoto*¹; Michael McMurtrey¹; Troy Unruh¹; Tommy Holschuh¹; Lance Hone¹; Patrick Moo¹; Dave Estrada²; ¹Idaho National Laboratory; ²Boise State University

Effects of Processing Conditions on Microstructure of Metals Produced via Laser Powder Bed Fusion – A Case Study on Pure Nickel: *Qingyang Lu*¹; Xiaogang Wang¹; Tan-Phuc Le¹; Jude Emil Fronda¹; Karl Davidson¹; Matteo Seita¹; ¹Nanyang Technological University

Implications of Zr Additions for High-temperature Performance of Additively Manufactured Aluminum Alloys: *Richard Michi*¹; Kevin Sisco²; Sumit Bahl¹; Ying Yang¹; Jonathan Poplawsky¹; Lawrence Allard¹; Ryan Dehoff¹; Alex Plotkowski¹; Amit Shyam¹; ¹Oak Ridge National Laboratory; ²University of Tennessee, Knoxville

In-situ Powder-directed Energy Process Control for Additively Manufactured Multi-layer, Functionally Graded Components: Calvin Downey¹; Luis Nunez²; Isabella van Rooyen²; Indrajit Charit³; Michael Maughan³; Edward Herderick⁴; ¹Idaho National Laboratory; ²Pacific Northwest National Laboratory; ³University of Idaho; ⁴Ohio State University

Process Maps Using Fluid Dynamics Models in Single-laser Tracks for Additive Manufacturing: Adrian Sabau¹; Narendran Raghavan²; Lang Yuan³; John Turner¹; Vipul Gupta⁴; ¹Oak Ridge National Laboratory; ²Los Alamos National Laboratory; ³University of South Carolina; ⁴GE Research

Surface Roughness of Metal Additive-manufactured Single-track Clads: Luis Nuñez¹; Calvin Downey¹; Isabella van Rooyen²; Indrajit Charit³; Michael Maughan³; ¹Idaho National Laboratory; ²Pacific Northwest National Laboratory; ³University of Idaho

Data-driven Modeling for Microstructure-property Relationships of 17-4 Stainless Steel: Michael Porro¹; Bin Zhang¹; Akanksha Parmar¹; Yung Shin¹; ¹Purdue University

Elevated Temperature Deformation Behavior of Al-Cu-Ce(-Zr) Alloys Produced by Laser Powder Bed Fusion Process: Sumit Bahl¹; Richard Michi¹; Kevin Sisco¹; Donovan Leonard¹; Lawrence Allard¹; Jonathan Poplawsky¹; Ryan Dehoff¹; Amit Shyam¹; Alex Plotkowski¹; ¹Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications IV — On-Demand Poster Session

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

Program Organizers: Isabella Van Rooyen, Pacific Northwest National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University; Michael Kirka, Oak Ridge National Laboratory

Monday AM | March 14, 2022
Additive Technologies | On-Demand Poster Hall

The Creep and Corrosion Performance of AM303, an Elevated Temperature Ni-superalloy Designed for Direct Metal Laser Melting: Laura Dial¹; Monica Soare¹; Bruce Pint²; Rishi Pallai²; Voramom Dheeradhada¹; ¹GE Research; ²Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — On-Demand Oral Presentations

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

Program Organizers: Sneha Prabha Narra, Carnegie Mellon University; Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Mechanical Response of Wire-arc Additively Manufactured LA100™ with and without Post-print Heat-treatments: Yukinori Yamamoto¹; Sougata Roy²; Peeyush Nandwana¹; Wei Tang¹; Andrzej Nycz¹; Mark Noakes¹; Ben Schaeffer³; Badri Narayanan³; ¹Oak Ridge National Laboratory; ²Oak Ridge National Laboratory (now with University of North Dakota); ³Lincoln Electric

Modified Inherent Strain Method for Wire Arc Additive Manufacturing: Wen Dong¹; Albert To¹; ¹University of Pittsburgh

Residual Stress, Microstructure and Characterization of Self-mated Repair of Inconel 718 Using Cold Spray Process: Hariharan Sundaram¹; Prasad Raghupatruni¹; ¹GE

Thermal Fluid Dynamics of the WAAM Bead Reshaping by Adding a Scanning Laser: Xin Chen¹; Guangyu Chen¹; Jialuo Ding¹; Yipeng Wang¹; Stewart Williams¹; ¹Cranfield University

Experimental and Numerical Assessment of H13 Tool Steel Produced by Directed Energy Deposition: Sameehan Joshi; Shashank Sharma¹; Sangram Mazumder¹; Mangesh Pantawane¹; Narendra Dahotre¹; ¹University of North Texas

A High Fidelity Melt Pool Dynamics Model with Experimental Validation Results under Various Laser Power Densities and Scanning Speeds: Kyung-min Hong¹; Corbin Grohol¹; Yung Shin¹; ¹Purdue University

Prediction of Large Domain Thermal History and Molten Pool Shape Using the Surrogate Modeling and Machine Learning: Corbin Grohol¹; Yung Shin¹; ¹Purdue University

Constitutive Modeling of Additively Manufactured Multi-phase Steel Alloys by the Crystal Plasticity Finite Element Method: Hongguang Liu¹; Yung Shin¹; ¹Purdue University

Wire Arc Processing of Stainless Steels; Microstructure and Properties: Patxi Fernandez-Zela¹; Andrzej Nycz¹; Quinn Campbell¹; Yousub Lee¹; Michael Kirka¹; ¹Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — On-Demand Poster Session

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

Program Organizers: Sneha Prabha Narra, Carnegie Mellon University; Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh

Monday AM | March 14, 2022
Additive Technologies | On-Demand Poster Hall

Microstructure Control in Wire-arc Additively Manufactured Maraging Steels: Yukinori Yamamoto¹; Peeyush Nandwana¹; Andrzej Nycz¹; Mark Noakes¹; Ben Schaeffer²; Badri Narayanan²; ¹Oak Ridge National Laboratory; ²Lincoln Electric

Reverse Engineering of Aerospace Components Utilizing Additive Manufacturing Technology: Balakrishnan Subeshan¹; Abdulaziz Abdalaziz¹; Zeeshan Khan¹; Md. Uddin¹; Muhammad Rahman¹; Eylem Asmatulu¹; ¹Wichita State University

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — On-Demand Oral Presentations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Isabella Van Rooyen, Pacific Northwest National Laboratory; Omar Mireles, NASA Marshall Space Flight Center; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Edward Herderick, Ohio State University; Matthew Osborne, Global Advanced Metals

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Thermal-chemical-fluid Flow of Dissimilar Species Mixing between Titanium and Refractory Metals: Junji Shinjo¹; Chinnapat Panwisawas²; ¹Shimane University; ²University of Leicester

Case Studies on Additive Manufacturing of Refractory Materials: Jeongwoo Lee¹; Yung Shin¹; ¹Purdue University

Electron Beam Melting Additive Manufacturing of Pure Molybdenum: Patxi Fernandez-Zelaia¹; Christopher Ledford¹; Quinn Campbell¹; Andrés Márquez Rossy¹; Donovan Leonard¹; Michael Kirka¹; ¹Oak Ridge National Laboratory

Fabrication of Pure Tungsten Using Electron Beam Powder Bed Fusion: Christopher Ledford¹; Patxi Fernandez-Zelaia²; Andres Marquez Rossy²; Julio Ortega Rojas²; Quinn Campbell²; Michael Kirka²; Yutai Kato²; ¹Oak Ridge National Laboratory; ²Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II — On-Demand Oral Presentations

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

Program Organizers: Fan Zhang, National Institute of Standards and Technology; Donald Brown, Los Alamos National Laboratory; Andrew Chuang, Argonne National Laboratory; Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Tao Sun, University of Virginia

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Invited

In-situ Temperature Measurements of Wire Based Directed Energy Deposition Additive Manufacturing Process Using Pyrometry and Cameras: Kevin Mullaney¹; Thomas Charrett¹; Stewart Williams¹; Ralph Tatam¹; ¹Cranfield University

Invited

Solidification Crack Propagation and Morphology Dependence on Processing Parameters in AA6061 from Ultra-high-speed X-ray Visualization: Nadia Kouraytem¹; Po-Ju Chiang²; Runbo Jiang²; Christopher Kantzos²; Joseph Pauza²; Ross Cunningham²; Ziheng Wu²; Guannan Tang²; Niranjana Parab³; Cang Zhao³; Kamel Fezzaa³; Tao Sun³; Anthony Rollett²; ¹Utah State University; ²Carnegie Mellon University; ³Argonne National Laboratory

Invited

In-situ Characterization of Laser Powder Bed Fusion Processes at the Stanford Synchrotron Light Source: Kevin Stone¹; ¹SLAC National Accelerator Laboratory

Predicting WAAM Material Properties via Machine Learning: Pinelopi Kyvelou¹; Leroy Gardner¹; Lei Zou²; Stasha Lauria²; Carlos Gonzales³; Filippo Gilardi⁴; Odysseas Krystalakos⁴; Amine Ammar⁵; Victor Champaney⁵; Mustafa Megahed⁶; ¹Imperial College; ²Brunel University; ³AIMEN; ⁴MX3D; ⁵ENSAM; ⁶ESI Group

Neutron Imaging Capabilities and Recent Development at High Flux Isotope Reactor: Yuxuan Zhang¹; Leslie Butler²; Hassina Bilheux¹; Kyungmin Ham²; Jean Bilheux¹; Wieslaw Strykowski²; Erik Stringfellow¹; Michael Vincent²; ¹Oak Ridge National Laboratory; ²Louisiana State University

Controlling Interdependent Meso-nanosecond Dynamics and Defect Generation Using a Digital Twin: Saad Khairallah¹; Brian Simonds²; Tao Sun³; Michael Stokes⁴; Alexey Volkov⁴; Aiden Martin¹; John Lee¹; Gabe Guss¹; Nicholas Calta¹; Joshua Hammons¹; Michael Nielsen¹; Kevin Chaput⁵; Edwin Schwalbach⁵; Megna Shah⁵; Michael Chapman⁵; Trevor Willey¹; Alexander Rubenchik¹; Andrew Anderson¹; Y. Morris Wang⁶; Manyalibo Matthews¹; Wayne King⁷; ¹Lawrence Livermore National Laboratory; ²NIST; ³University of Virginia; ⁴University of Alabama; ⁵Air Force Research Laboratory; ⁶University of California, Los Angeles; ⁷The Barnes Group Advisors

Flexible Simulation Augmentation for DED AM Using In-situ Digital Image Correlation, Multispectral Infrared Imaging, and Neutron Scattering Validation: James Haley¹; Stephan DeWitt¹; Thomas Feldhausen¹; Bruno Turcksin¹; ¹Oak Ridge National Laboratory

Keyhole Melting Regimes and Porosity Formation during Laser Powder Bed Fusion Additive Manufacturing: *Yuze Huang*¹; Tristan G. Fleming²; Chu Lun Alex Leung¹; Samuel J. Clark¹; Sebastian Marussi¹; Kamel Fezzaa³; Jakumeit Jürgen⁴; Jeyan Thiyagalingam⁵; Peter D. Lee¹; ¹University College London; ²Queen's University; ³Argonne National Laboratory; ⁴Access e.V.; ⁵Science and Technology Facilities Council

Material Processing-microstructure-mechanical Property Relationship of Supersolidus Liquid Phase Sintered Binder Jet Additively Manufactured H13 Tool Steel: *Jia Liu*¹; Rangasayee Kannan²; Dalong Zhang¹; Tingkun Liu¹; Peeyush Nandwana²; Arun Devaraj¹; ¹Pacific Northwest National Laboratory; ²Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond the Beam III — On-Demand Oral Presentations

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

Program Organizers: Brady Butler, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; James Paramore, US Army Research Laboratory; Nihan Tuncer, Desktop Metal; Markus Chmielus, University of Pittsburgh; Paul Prichard, Kennametal Inc.

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

A Multi-step Data Driven Model for Reverse Shape Compensation for Binder Jet Parts: Hao Deng¹; *Basil Paudel*¹; Albert To¹; ¹University of Pittsburgh

Microstructure and Mechanical Properties of Friction Stir Deposited SS304: *Nikhil Gotawala*¹; Neeraj Mishra¹; Amber Shrivastava¹; ¹Indian Institute of Technology Bombay

Friction and Gravity Effects during Sintering of Binder Jet Parts: *Basil Paudel*¹; Albert To¹; ¹University of Pittsburgh

Optimization of Al 6061 Powder Feedstock for Cold Spray Using a Through-process Experimental Approach: *Kyle Tsaknopoulos*¹; Bryer Sousa¹; Jack Grubbs¹; Christopher Massar¹; Matthew Gleason¹; Danielle Cote¹; ¹Worcester Polytechnic Institute

X-ray Computed Tomographic Study of Density Gradients within Binder Jet Printed H13 Components: *Dustin Gilmer*¹; Peeyush Nandwana²; Ryan Dehoff²; Tomonori Saito¹; ¹University of Tennessee Knoxville/Oak Ridge National Laboratory Bredesen Center; ²Oak Ridge National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — On-Demand Oral Presentations

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Invited

Relationship between the Solidification Behavior and Porosity in Gas-atomized Powders and Electron Beam Melted Co-Cr-Mo Alloys: *Kenta Yamanaka*¹; Shoya Aota¹; Jérôme Adrien²; Eric Maire²; Damien Fabregue²; Akihiko Chiba¹; ¹Tohoku University; ²INSA Lyon

Towards Scaling Law-based Process Screening in Laser Powder Bed Fusion by Melt Pool Control: *Theresa Hanemann*¹; Christoph Seyfert²; Astrid Rota²; Martin Heilmaier¹; ¹Karlsruhe Institute of Technology; ²EOS GmbH Electro Optical Systems

Effect of Laser Parameters on The Microstructure and Formation of TiC-Fe Cermets Fabricated through Selective Laser Melting: *Himanshu Maurya*¹; Prashanth Gokuldoss¹; Lauri Kollo¹; Marek Tarraste¹; Kristjan Juhani¹; Fjodor Sergejev¹; ¹Tallinn University of Technology

Functionally Graded Alloys from 316 Stainless Steel to Inconel 718 by Powder-based Laser Direct Energy Deposition: *Kun Li*¹; Jianbin Zhan¹; Qian Tang¹; David Zhang²; Wei Xiong³; Huajun Cao¹; ¹Chongqing University; ²Chongqing University; University of Exeter; ³University of Pittsburgh

Development of a CoNi-based Superalloy with a Focus on As-printed Microstructure: *Kira Pusch*¹; Sean Murray¹; Evan Raeker¹; Ning Zhou²; Stephane Forsik²; Tresa Pollock¹; ¹University of California, Santa Barbara; ²Carpenter Technology

High Throughput Material Characterization Framework for Additively Manufactured Graded Materials: *Karthik Adapa*¹; Christopher Saldana¹; Surya Kalidindi¹; Thomas Feldhausen²; ¹Georgia Institute of Technology; ²Oak Ridge National Laboratory

High Performance Computing to Aid the Design of Novel Ti Alloys for Additive Manufacturing: *Bala Radhakrishnan*¹; Tahany El-Wardany²; Ranadip Acharya³; ¹Oak Ridge National Laboratory; ²Raytheon Technologies Research Center; ³Collins Aerospace Applied Research and Technology

AM-based Combinatorial Approach for Site-specific Property Response: *Soumya Nag*¹; Jaimie Tiley¹; Ke An¹; Raymond Unocic¹; Jonathan Poplawsky¹; ¹Oak Ridge National Laboratory

Multi-metal 316L SS+Cu with Tailored Thermal Conductivity Manufactured via Laser Powder Bed Fusion: *Saereh Mirzababaei*¹; V. Vinay Doddapaneni¹; Kijoon Lee¹; Chih-hung Chang¹; Brian K. Paul¹; Somayeh Pasebani¹; ¹Oregon State University

Processing of Immiscible Iron-silver-materials via Laser Beam Melting: *Jan Krüger*¹; Malte Dreyer¹; Kay-Peter Hoyer¹; Mirko Schaper¹; ¹Paderborn University

Design and Development of New Titanium Metastable Alloys for Use in Laser Powder Bed Fusion: Zou Zhiyi¹; Minh-Son Pham²; Adam Clare¹; James Murray¹; Marco Simonelli¹; ¹University of Nottingham; ²Imperial College London

Development of Al-Cu-Mg and Al-Mg-Si-Zr Alloys with Improved L-PBF Processability: Filippo Beletti¹; Riccardo Casati¹; Maurizio Vedani¹; ¹Politecnico di Milano

Precipitation Strengthening Mechanism of a Ti-based Alloy Manufactured by Electron Beam Melting: Yujie Cui¹; Kenta Aoyagi¹; Kenta Yamanaka¹; Tadashi Fujieda²; Akihiko Chiba¹; ¹Tohoku University; ²Hitachi Metals, Ltd.

Preventing Mg Loss during Laser Powder Bed Fusion of an Al-Mg-Sc Alloy: Léa Deillon¹; Felix Jensch²; Frank Palm³; Markus Bambach¹; ¹ETH Zürich; ²BTU Cottbus-Senftenberg; ³Airbus Central Research & Technology

Composition Control in Laser Powder Bed Fusion Additive Manufacturing through Differential Evaporation: Meelad Ranaieifar¹; Edwin Schwalbach²; Ibrahim Karaman¹; Raymundo Arroyave¹; Alaa Elwany¹; ¹Texas A&M University; ²Air Force Research Laboratory

Parameter Development and Fabrication of Test Parts of Bronze Alloy Cu-10Sn Using Powder Bed Fusion (PBF): Michael Brand¹; Robin Pacheco¹; Colt Montgomery¹; Ryan Mier¹; ¹Los Alamos National Laboratory

Alloy Design for Additive Manufacturing: Bhaskar Majumdar¹; ¹New Mexico Institute of Mining and Technology

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development — On-Demand Poster Session

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

Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Monday AM | March 14, 2022
Additive Technologies | On-Demand Poster Hall

A 3-D Multiple-slip Crystal Plasticity Model for Precipitate Hardening in Additively Manufactured High Strength Steels: Moustafa AbdelHamid¹; Tarek Hatem²; ¹Nile University; ²The British University in Egypt

Analysis on Solidification Microstructure and Cracking Mechanism of a Matrix High-speed Steel Deposited by Direct Energy Deposition Process: Geon-Woo Park¹; Sunmi Shin¹; Byung Jun Kim¹; Wookjin Lee²; Sung Soo Park³; Jong Bae Jeon⁴; ¹Korea Institute of Industrial Technology; ²Pusan National University; ³Ulsan National Institute of Science and Technology; ⁴Dong-A University

Ceramic-metal Composites Using Ceramic 3D Printing and Centrifugal Infiltration: Shahbaz Khan¹; Ling Li¹; ¹Virginia Tech

In-situ Alloying of Ti-Zr-Nb-Sn Bio-titanium Alloys via Direct Energy Deposition: Yukyeong Lee¹; Jonghyun Jeong¹; Eun Sung Kim²; Shuanglei Li¹; Jae Bok Seol¹; Hyokyung Sung¹; Hyoung Seop Kim²; Taehyun Nam¹; Jung Gi Kim¹; ¹Gyeongsang National University; ²Pohang University of Science and Technology

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — On-Demand Oral Presentations

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

Program Organizers: Meysam Haghsheenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Mechanical Properties of Single Struts Made by Laser Powder-bed Fusion: Effects of Melt-track Transient States and Process Parameters: Behzad Fotovvati¹; Subin Shrestha¹; Kevin Chou¹; ¹University of Louisville

Designing Additive Layered Manufacturing Inspired Damage Tolerant Architectures: Deepesh Yadav¹; Tanmayee More¹; B N Jaya¹; ¹Indian Institute of Technology Bombay

The Role of Microstructure on the Creep Response of Additively Manufactured IN718 Using Crystal Plasticity: Veerappan Prithvirajan¹; M Arul Kumar¹; Laurent Capolungo¹; ¹Los Alamos National Lab

Correlating the Microstructure and Mechanical Properties of Additively Manufactured Al-Ce Alloys Using In-situ Micromechanical Testing: Tanvi Ajantiwalay¹; Richard Michie²; Amit Shyam²; Alex Plotkowski²; Arun Devaraj¹; ¹Pacific Northwest National Laboratory; ²Oak Ridge National Laboratory

Three-pronged Approach to Prediction of Polymer-additive System Rheology: Scott Muller¹; Peiyuan Gao¹; Lirong Zhong¹; Amanda Howard¹; Jaehun Chun¹; Gregory Schenter¹; ¹Pacific Northwest National Laboratory

Mechanical Response of "Meta-Polycrystalline" Steel 316L Produced by Laser Powder Bed Fusion: Karl Sofinowski¹; Mallory Wittwer¹; Matteo Seita¹; ¹Nanyang Technological University

The Effect of Defects on Additive Manufacturing Material at the Microscale -- Approaches to Manage the Consequences: Martin White¹; Mohsen Seifi¹; ¹ASTM International

Indentation-derived Mechanical Properties of Ti-6Al-2Sn-4Zr-2Mo Alloy Fabricated through Laser-powder Bed Fusion: Harish Kaushik¹; Meysam Haghsheenas²; Amir Hadadzadeh¹; ¹University of Memphis; ²University of Toledo

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena — On-Demand Poster Session

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

Program Organizers: Meysam Haghsheenas, University of Toledo; Robert Lancaster, Swansea University; Andrew Birnbaum, US Naval Research Laboratory; Jordan Weaver, National Institute of Standards and Technology; Aerial Murphy-Leonard, Ohio State University

Monday AM | March 14, 2022
Additive Technologies | On-Demand Poster Hall

Laser Scan Length: A New Parameter to Tune the Thermal Buildup in Laser Powder Bed Fusion Processes: *Qingyang Lu¹; Xiaogang Wang¹; Tan-Phuc Le¹; Jude Emil Fronda¹; Matteo Seita¹; ¹Nanyang Technological University*

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — On-Demand Oral Presentations

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Room

Invited

High-resolution Thermal Conductivity and Thermal Boundary Resistance Mapping in TRISO: *Dong Liu¹; ¹University of Bristol*

Invited

Structural Analysis of the IPyC/SiC Interface of AGR-2 Irradiated and Safety Tested TRISO Fuel: *Rachel Seibert¹; Tyler Gerczak¹; Jesse Werden¹; Darren Skitt¹; John Hunn¹; ¹Oak Ridge National Laboratory*

Invited

A Combined Molecular and Cluster Dynamics Approach to Determine Radiation Enhanced Diffusion in UMo Alloys: *Benjamin Beeler¹; Park Gyuchul²; Maria Okuniewski²; Shenyang Hu³; Zhi-Gang Mei⁴; ¹North Carolina State University; ²Purdue University; ³Pacific Northwest National Laboratory; ⁴Argonne National Laboratory*

Invited

Comparison of Observations from the Microstructure of Two High Burnup Fuel Samples Operated at Different Linear Heat Generation Rates: *Jason Harp¹; Tyler Gerczak¹; ¹Oak Ridge National Laboratory*

Invited

Thermal Conductivity Measurement of Microstructures in Irradiated Nuclear Fuels: *Yinbin Miao¹; Lakshmi Amulya Nimmagadda²; Jingyi Shi³; Kun Mo¹; Bei Ye¹; Shipeng Shu¹; Peter Mouche²; Winfried Petry³; Sanjiv Sinha²; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²University of Illinois Urbana-Champaign; ³Technical University of Munich*

High-throughput Viscosity Measurements of Molten Salts for Molten Salt Reactors: *Alexander Levy¹; Haoxan Yan¹; Federico Coppo¹; Uday Pal¹; Karl Ludwig¹; Adam Powell²; ¹Boston University; ²Worcester Polytechnic Institute*

Mesoscale Model of Gas Bubble Evolution and Creep in Monolithic UMo Fuels: *Shenyang Hu¹; Benjamin Beeler²; ¹Pacific Northwest National Laboratory; ²Idaho National Laboratory*

Synergistic Electron/Thermal Microscope for High-throughput Screening of Emerging Nuclear Materials: *Yuzhou Wang¹; Cody Dennett¹; Zilong Hua¹; Robert Schley¹; Daniel Murray¹; Geoffrey Beausoleil II¹; David Hurley¹; ¹Idaho National Laboratory*

Investigation of Damage Structure Evolution on Proton Irradiated Zr-alloys of Various Compositions Using Synchrotron X-ray Diffraction and TEM: *Ömer Koc¹; Tamas Ungár¹; Rebecca Jones²; Hattie Xu¹; Robert Harrison¹; Michael Preuss¹; Philipp Frankel¹; ¹The University of Manchester; ²Rolls-Royce*

Mesoscale Modeling of Effective Thermal Conductivity in U-Zr Fuels with Heterogeneous Phases: *Weiming Chen¹; Xian-Ming Bai¹; ¹Virginia Polytechnic Institute and State University*

Correlative APT-TEM Investigation of Defects' Influence on Thermal Diffusivity in ThO₂ Nuclear Fuel: *Amrita Sen¹; Mukesh Bachhav²; Cody Dennett²; James Mann³; Janelle Wharry¹; ¹Purdue University; ²Idaho National Laboratory; ³Air Force Research Laboratory*

Evolution of the Internal Layer Structure in Irradiated TRISO Fuel: *Tyler Gerczak¹; John Hunn¹; Grant Helmreich¹; Rachel Seibert¹; John Stempien²; Darren Skitt¹; Brian Eckhart¹; Andrew Kercher¹; ¹Oak Ridge National Laboratory; ²Idaho National Laboratory*

Experimentally Validated Model for Investigating High-burnup Structure Formation in U-Mo Fuels: *Sudipta Biswas¹; Charlyne Smith²; Brandon Miller¹; Dennis Keiser¹; Assel Aitkaliyeva²; ¹Idaho National Laboratory; ²University of Florida*

NUCLEAR MATERIALS

Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties — On-Demand Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee

Program Organizers: David Frazer, Idaho National Laboratory; Fabiola Cappia, Idaho National Laboratory; Tsvetoslav Pavlov, Idaho National Laboratory; Peter Hosemann, University of California

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Poster Hall

Propose Advanced Nuclear Fuels with High Thermal Conductivity Using Machine Learning: *Meigyoku Kin¹; Masaya Kumagai¹; Yuji Ohishi²; Eriko Sato¹; Masako Aoki¹; Ken Kurosaki¹; ¹Kyoto University; ²Osaka University*

The Effect of the Proton Irradiation Dose Rate on the Evolution of Microstructure in Zr Alloys: A Synchrotron Micro-beam X-ray and TEM Study: Ömer Koç¹; Rhys Thomas¹; Tamas Ungár¹; Zoltan Hegedues²; Robert Harrison¹; Michael Preuss¹; Philipp Frankel¹; ¹The University of Manchester; ²Deutsches Elektronen-Synchrotron (DESY)

CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — On-Demand Oral Presentations

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

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Olivia Underwood Jackson, Sandia National Laboratories

Monday AM | March 14, 2022
Characterization | On-Demand Room

Invited

Characterization of Heat-resistant Steels and Alloys for Life-prediction Modeling: Yukinori Yamamoto¹; David Hoelzer¹; Michael Lance¹; Michael Brady¹; Edgar Lara-Curzio¹; Qing-Qiang Ren²; Jonathan Poplawsky²; Arul Kumar Mariyappan³; Ricardo Lebensohn³; Laurent Capolungo³; Michael Glazoff⁴; Michael Gao⁵; Paul Jablonski⁵; Jeffrey Hawk⁵; ¹MSTD, Oak Ridge National Laboratory; ²CNMS, Oak Ridge National Laboratory; ³Los Alamos National Laboratory; ⁴Idaho National Laboratory; ⁵National Energy Technologies Laboratory

3D Orientation and Strain Mapping of Recrystallization and Micro-texture Development in Heavily Deformed Ferritic Alloys: Can Yildirim¹; Carsten Detlefs¹; Henning Poulsen²; Raquel Rodrigues-Lamas¹; Philip Cook¹; Mustafacan Kutsal¹; Melanie Gauvin³; Dominique Mangelinck⁴; Myriam Dumont⁴; Nikolas Mavrikakis³; ¹European Synchrotron Radiation Facility; ²Technical University of Denmark; ³OCAS; ⁴Aix Marseille Université

Crystal Plasticity Finite Element Simulation of Microstructural Deformation in Ultra-thin Ferritic Steel Sheet: Minh Tien Tran¹; Tri Hoang Nguyen¹; Sun-Kwang Hwang²; Ho Won Lee³; Dong-Kyu Kim¹; ¹University of Ulsan; ²Korea Institute of Industrial Technology; ³Korea Institute of Materials Science

Evolution of Sigma Phases in 347H Stainless Steels Subjected to Isothermal Aging at 750 °C: Qing-Qiang Ren¹; Yukinori Yamamoto¹; Michael Brady¹; Jonathan Poplawsky¹; ¹Oak Ridge National Laboratory

An Atomistic-to-microscale Computational Analysis of the Dislocation-interface Reaction and the Subsequent Structure Changes in Two-phase Materials under Compression and Shear: Liming Xiong¹; ¹Iowa State University

ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings — On-Demand Oral Presentations

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Ramana Chintalapalle, University of Texas at El Paso; Adele Carrado, IPCMS - CNRS Université de Strasbourg; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Karine Mougín, Cnrs - Is2m; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Keynote

Silicone Breast Implants: Grafting of a Bioactive Polymer to Improve the Bio-integration: Mylan Lam¹; Vincent Humblot²; Romain Vayron³; Véronique Migonney¹; Celine Falentin-Daudré¹; ¹Université Sorbonne Paris Nord; ²Université Bourgogne Franche-Comté; ³Université de Valenciennes

Keynote

Doping of Biomimetic Calcium-deficient Hydroxyapatite Deposited on Activated Carbon Fiber Cloth to Improve Bone Regeneration: Florian Olivier¹; Nathalie Rochet²; Sylvie Bonnamy¹; ¹ICMN/CNRS; ²IBV/INSERM

Invited

Materials for Antireflective Coatings in Photovoltaics - An Overview: Vishal Mehta¹; NM Ravindra²; Andrew Cochran¹; Cory Conkel¹; ¹Ohio Northern University; ²New Jersey Institute of Technology

Invited

Grafting Phosphonic Acid Polymers onto Titanium Implant by UV Irradiation: Caroline Pereira¹; Véronique Migonney¹; Céline Falentin-Daudré¹; ¹LBPS/CSPBAT, UMR CNRS 7244, Institut Galilée, Université Sorbonne Paris Nord

Invited

Fifty Shades of TiN: How Deposition Conditions Influence the Growth Morphology and Thereby Hardness and Especially Fracture Toughness: Paul Mayrhofer¹; Rainer Hahn¹; Alexander Kirnbauer¹; ¹TU Wien

In-situ Mapping of Local Orientation and Strain in a Fully Operable Infrared Sensor Using Dark Field X-ray Microscopy: Can Yildirim¹; Philippe Ballet²; Patrice Gergaud²; Francois Boulard²; Tao Zhou³; Raphael Pesci⁴; Tobias Schulli²; Nicolas Baier²; Thanh Nguyen²; Brellier Delphine²; ¹European Synchrotron Radiation Facility; ²CEA; ³ANL; ⁴ENSAM

Study on Surface Cracking and Interfacial Delamination of Metallic Coatings Using a Tension Test: Deepesh Yadav¹; Sanjay Sampath¹; B N Jaya¹; ¹Indian Institute of Technology Bombay

Surface Chemistry and Subsurface Microstructure of Al 2024-T3 Laser-interference Structured: Adrian Sabau¹; Harry Meyer¹; Donovan Leonard¹; ¹Oak Ridge National Laboratory

Numerical Study of Intrinsic Stresses in Perovskite-on-Si Solar Cells with Intermetallic Bonding: Seif Elbadry¹; Tarek Hatem¹; Salah Bedair²; ¹The British University in Egypt; ²North Carolina State University

Stress Evolution and Recovery in High-entropy Metal Sublattice Diborides: Alexander Kirnbauer¹; Peter Polcik²; Paul Mayrhofer³; ¹TU Wien; ²Plansee Composite Materials GmbH; ³TU Wien, Thin Film Materials Science Division

Large Scale Growth of Diamond on Surface-terminated Silicon-incorporated Diamond-like Carbon Thin Films: *Parand Riley¹; Pratik Joshi¹; Roger Narayan¹; Jagdish Narayan¹; ¹North Carolina State University*

Application of Mg/Al₂O₃ and Mg/SiO₂ Nanolaminates for Uniform and Controlled Corrosion of Biodegradable Implants: *Pratap Deshmukh¹; Sudheer Neralla¹; Jagannathan Sankar¹; Sergey Yarmolenko¹; ¹North Carolina A&T State University*

Effect of Oxygen Partial Pressure and Pulse Frequency on the Structure and Properties of Tungsten Incorporated Ga₂O₃ Films made by Pulsed Laser Deposition: *Francelia Sanchez¹; Debabrata Das²; C.V. Ramana²; ¹University of Texas at El Paso; ²UTEP*

Improvement of Hydrophilicity and Wetting Behavior on Patterned PLA Substrates by AP Plasma Treatment and APTES Grafting: *Mai Uyên¹; Po-Yu Chen¹; ¹National Tsing Hua University*

Non-reactively Sputtered Ultra-high Temperature Nb-C Coatings: *Ahmed Bahr¹; Rainer Hahn¹; Oliver Hudak¹; Tomasz wojcik¹; Jürgen Ramm²; Szilard Kolozsvári³; Eleni Ntemou⁴; Eduardo Pitthan⁴; Daniel Primetzhofer⁴; Alexander Kirnbauer⁵; Helmut Riedl-Tragenreif¹; ¹Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien; ²Oerlikon Balzers, Oerlikon Surface Solutions AG; ³Plansee Composite Materials GmbH; ⁴Department of Physics and Astronomy, Uppsala University; ⁵Institute of Materials Science and Technology, TU Wien*

ENERGY & ENVIRONMENT

Advanced Magnetic Materials for Sensors, Power, and Multifunctional Applications — On-Demand Oral Presentations

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

Program Organizers: Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Eric Theisen, Metglas Inc.; Huseyin Ucar, California Polytechnic University, Pomona; Yongmei Jin, Michigan Technological University

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Invited

Magnetization Measurements from Nanometer-sized Regions: Progress in Electron Holography: *Yasukazu Murakami¹; ¹Kyushu University*

Effect of Hot Band Annealing and Final Annealing Temperatures on the Texture, Grain Size and Magnetic Properties of 1.2 wt% Si Non-oriented Electrical Steel: *Youliang He¹; Mehdi Mehdi¹; Tihe Zhou²; Chad Cathcart²; Peter Badgley²; Afsaneh Edrissi³; ¹Canmetmaterials, Nrcan; ²Stelco Inc.; ³University of Windsor*

Custom-designed Miniature-coil Winding/Wrapping Machine: *Balraj Mani¹; Bilal Adra¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology*

High Saturation Magnetization of FeCoN Bulk Martensite: *Tomohiro Tabata¹; Matahiro Komuro¹; Yusuke Asari¹; Shinya Tamura¹; Shohei Terada¹; Satoshi Sugimoto²; ¹Hitachi, Ltd.; ²Tohoku University*

Correlation of Microstructure and Hard Magnetic Properties in Ce-Fe-B Magnet: *Xubo Liu¹; Ikenna Nlebedim¹; ¹Ames Laboratory, CMI*

Characterization of Black Box Medium Voltage, Medium Frequency, Transformers for High Power Converters: *Richard Beddingfield¹; Apoorv Agarwal¹; Subhashish Bhattacharya¹; ¹North Carolina State University*

Ordering and Its Effect on Magnetostrictive Behavior in Fe-Al Single Crystals: *Travis Willhard¹; Andrew Laroche¹; Rahulkumar Sunil Singh¹; Sivaraman Guruswamy¹; ¹University of Utah*

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — On-Demand Oral Presentations

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Keynote

Materials and Manufacturing for High Temperature Concentrating Solar Power Applications: *Kamala Raghavan¹; Vijaykumar Rajgopal¹; Nikkia McDonald¹; Avi Shultz¹; ¹US Department of Energy*

Invited

Feasibility Studies of Fully Inorganic Perovskite Cells through Experimental Degradation and Metrics Identification: Towards the Development of Hybrid Sensors for Biomedical Wearable Devices: *Saqib Ahmed¹; Sankha Banerjee²; Deidra Hodges³; ¹State University of New York at Buffalo State; ²California State University, Fresno; ³Florida International University*

Invited

Machine Learning Enables Discovery of Ternary Alloy Catalysts for Oxygen Reduction: *Youngtae Park¹; Hyuck Mo Lee¹; ¹KAIST*

Invited

Interplay between Mechanics and Electrochemistry in FeS₂ Electrode Performance: *Scott Roberts¹; Jeffrey Horner¹; ¹Sandia National Laboratories*

Invited

X-ray Characterization of Battery Degradation: *Johanna Nelson Weker¹; ¹SLAC National Accelerator Laboratory*

Multi-layered Thin-films Metal Contacts for New Generation Solar Cells: *Andriy Orlov¹; Ivan Kruhlov¹; Vitalii Yanchuk¹; Sergey Prikhodko²; Svitlana Voloshko¹; ¹National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"; ²University of California Los Angeles*

Magnetoelectrochemical Control of Interfacial Degradation during Fast Charging of LIB: *Abhishek Sarkar¹; Pranav Shrotriya²; Cajetan Nlebedim¹; ¹Ames Laboratory; ²Iowa State University*

Characterization of AlCl₃-urea Electrolyte for Speciation, Conductivity, and Electrochemical Stability and Its Application in Al-ion Batteries: *Monu Malik¹; Kok Long Ng²; Gisele Azimi¹; ¹University of Toronto; ²University of Toronto*

Ag@AgCl Core/shell Catalysts with Bumpy Surface to Enhance Oxygen Reduction Reaction: *Suyeon Choi¹; Changsoo Lee²; Jahyun Koo³; Hyuck Mo Lee¹; ¹Korea Advanced Institute of Science and Technology; ²Korea Institute of Energy Research; ³Korea University*

Photoabsorbers with Hybrid Organic-inorganic Structures for Optoelectronics and Solar Cells: *Mohin Sharma¹; Mritunjaya Parashar¹; Anupama Kaul¹; Ravindra Mehta¹; ¹University of North Texas*

Simulating Microstructure Evolution in Ni-YSZ Electrodes of Solid Oxide Cells under Operating Conditions: *Yinkai Le*¹; William Epting¹; Jerry Mason¹; Tianle Cheng¹; Harry Abernathy¹; Gregory Hackett²; Youhai Wen²; ¹US DOE National Energy Technology Laboratory, NETL support contractor; ²US DOE National Energy Technology Laboratory

Electric Field Process for Lithium Ion Batteries: Hiep Pham¹; Yufang He¹; Jie Li¹; Susmita Sarkar¹; Jonghyun Park¹; ¹Missouri University of Science and Technology

Initiatory Plating and Stripping towards the Survival of Sodium Metal Electrodes: *Susmita Sarkar*¹; Partha Mukherjee¹; ¹Purdue University

Mesoscale Analysis of Electrochemical-mechanical Interactions in Solid-state Batteries: *Bairav Vishnugopi*¹; Partha Mukherjee¹; ¹Purdue University

Impact of Low Operating Temperatures on the Performance of Li-ion Batteries: *Amani Alhammad*¹; Amarsingh Kanagaraj¹; Prerna Chaturvedi¹; Daniel Choi¹; ¹Khalifa University of Science and Technology

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2022 — On-Demand Poster Session

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Amit Pandey, Lockheed Martin Space; Kyle Brinkman, Clemson University

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Poster Hall

Thermoelectric Generators System Made with Low-cost Thermoelectric Modules for Low Temperature Waste Heat Recovery: *Manuela Castañeda Montoya*¹; Andrés Amell Arrieta¹; Henry Colorado¹; ¹Universidad de Antioquia

CHARACTERIZATION

Advanced Real Time Imaging — On-Demand Oral Presentations

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

Program Organizers: Jinichiro Nakano, US Department of Energy - National Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, Kth Royal Institute of Technology; David Veyssset, Stanford University; Pranjal Nautiyal, University of Pennsylvania

Monday AM | March 14, 2022
Characterization | On-Demand Room

Invited

In Situ Evidence of Dynamic Interactions between Droplets and Dendrites during Rapid Solidification of Immiscible Alloys: *Jianrong Gao*¹; ¹Northeastern University

Invited

Dissolution Behavior of Non-metallic Inclusions in Refining Slag Observed Using Confocal Scanning Laser Microscopes: *Ying Ren*¹; Lifeng Zhang²; Changyu Ren¹; ¹University of Science and Technology Beijing; ²Yanshan University

Invited

In Situ Observation and Investigation of the Wetting Behaviors of Mold Flux on Steel Substrate: *Lejun Zhou*¹; Yang Yang¹; Wanlin Wang¹; Hao Luo¹; Houfa Wu¹; ¹Central South University

Three-dimensional Time Evolution Behavior of Short Fatigue Crack Morphology and Crack Closure in Ti-6Al-4V Alloy Assessed Using High-energy Imaging Type CT: *Valary Tube*¹; Hiroyuki Toda¹; Akihisa Takeuchi²; Masayuki Uesugi²; ¹Kyushu University; ²Japan Synchrotron Radiation Research Institute

Ca²⁺ and pH Imaging during Dissolution of CaSiO₃ into Aqueous Solution: *Sakiko Kawanishi*¹; Hinako Nakayama¹; Jun Kawano²; Takeshi Yoshikawa³; Hiroyuki Shibata¹; ¹Tohoku University; ²Hokkaido University; ³The University of Tokyo

Evaluation of Interfacial Energy between Molten Fe- 18%Cr-9%Ni Alloy and Non-metallic Inclusion-type Oxides at 1873K: Tomoki Furukawa¹; *Noritaka Saito*²; Kunihiro Nakashima²; ¹The University of Tokyo; ²Kyushu University

In-operando Interactions of Refractory Materials with Ash/Slag from Mixed Feedstock Gasification: *Anna Nakano*¹; Kristin Tippey²; Jinichiro Nakano¹; Hugh Thomas³; Ömer Dogan³; Matthew Lambert⁴; Dana G. Goski⁴; ¹U.S. Department of Energy National Energy Technology Laboratory/ NETL Support Contractor; ²National Energy Technology Laboratory; ³U.S. Department of Energy National Energy Technology Laboratory; ⁴Allied Mineral Products, LLC

Simultaneous Extraction of Nickel and Vanadium from Petroleum Byproducts: *Jinichiro Nakano*¹; Anna Nakano¹; Ryu Takekoh²; Hugh Thomas³; ¹US Department of Energy - National Energy Technology Laboratory; ²IT-Related Chemicals Research Laboratory, Sumitomo Chemical Co., Ltd.; ³US DOE National Energy Technology Laboratory

In-situ Observation of SO₂ Gas Formation at the Magnetite/Matte Interface at 1200: *Seung-Hwan Shin*¹; Sakiko Kawanishi¹; Sohei Sukenaga¹; Junichi Takahashi²; Hiroyuki Shibata¹; ¹Tohoku University; ²SMM Co., LTD

Real Time Quantification of Nickel, Cobalt, and Manganese Concentration Using Ultraviolet-visible Spectroscopy -- A Feasibility Study: *Monu Malik*¹; Ka Ho Chan¹; Gisele Azimi¹; ¹University of Toronto

Real Time Observation of Reactive Spreading and Interfacial Reactions between Liquid AlNi Alloy and Solid Ni: *Youqing Sun*¹; Ensieh Yousefi¹; Anil Kunwar²; Nele Moelans²; David Seveno¹; Muxing Guo²; ¹KU Leuven; ²Silesian University of Technology

Evaluation of Dynamic Wetting Properties of Si/C Interface: *Yoshiki Takeuchi*¹; Shun Ueda¹; Takeshi Yoshikawa¹; Kazuki Morita¹; ¹The University of Tokyo

NANOSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — On-Demand Oral Presentations

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Amit Pandey, Lockheed Martin Space; Saurabh Puri, Microstructure Engineering; Amber Srivastava, Indian Institute of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Room

Keynote

Extraordinary Properties of Q-carbon and Diamond Related Materials: *Jagdish Narayan*¹; ¹North Carolina State University

Invited

Low-dimensional Titanium Oxynitride Thin Films and Nanowires for Water-splitting and Ultra-high Capacitance Supercapacitors Applications: *Dhananjay Kumar*¹; ¹North Carolina A&T State University

Invited

Magnetic Properties of Qausi-2D van der Waals Crystals by Protons and Photons: *Srinivasa Rao Singamaneni*¹; ¹University of Texas at El Paso

Invited

Recent Advances for Highly Stable Practical Potassium Ion Batteries: Qian Liu¹; Qingfeng Zhang¹; Chengxin Wang²; Rao Apparao³; Bingan Lu¹; ¹Hunan University; ²Sun Yat-sen University; ³Clemson University

Invited

Magneto-optical Properties of Equilibrium and Non-equilibrium Bi-metallic Materials: *Philip Rack*¹; David Garfinkel¹; Reece Emery¹; Nan Tang¹; Dustin Gilbert¹; ¹University of Tennessee

Invited

Salt-assisted Chemical Vapor Deposition Synthesis of 2D WSe₂ and Its Integration in High Performance Field-effect Transistors: *Anupama Kaul*¹; Avra Bandyopadhyay¹; ¹University of North Texas

Invited

Exploring Functional Nanomaterials at XTIP Beamline: *Nozomi Shirato*¹; ¹Argonne National Laboratory

Invited

Linking Defects with Electronic Structure, and Optoelectronic Properties in Semiconductor Thin Films: *Emila Panda*¹; ¹IIT Gandhinagar

Invited

Surrogates for Actinide Thin Film Research: *Ashutosh Tiwari*¹; Cody Dennett²; Narayan Poudel²; Krzysztof Gofryk²; ¹University of Utah; ²Idaho National Lab

Invited

Two-photon Lithography of 2D/3D Nanostructures in Polymer and Composite Matrix: *Shobha Shukla*¹; ¹IIT Bombay

Transient Laser Heating Induced Nanoscopic Surface Reconstruction in VO₂ Thin Film: *Soumya Mandal*¹; Adele Moatti²; Jagdish Narayan²; Ritesh Sachan¹; ¹Oklahoma State University; ²North Carolina State University

Tailoring the Properties of Carbon Thin Films on Flexible HDPE Substrate by Non-equilibrium Laser Annealing: *Pratik Joshi*¹; Parand Riley¹; Roger Narayan¹; Jagdish Narayan¹; ¹North Carolina State University

NANOSTRUCTURED MATERIALS

Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films — On-Demand Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Ritesh Sachan, Oklahoma State University; Amit Pandey, Lockheed Martin Space; Saurabh Puri, Microstructure Engineering; Amber Srivastava, Indian Institute of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Poster Hall

Laser Irradiation Induced Nanoscale Surface Transformations in Strontium Titanate: *Ashish Kumar Gupta*¹; Siddharth Gupta²; Soumya Mandal¹; Jagdish Narayan²; Ritesh Sachan¹; ¹Oklahoma State University; ²North Carolina State University

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — On-Demand Oral Presentations

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Keynote

Strengthening in HEAs by Solute-solute Interactions and Short-range-order: *William Curtin*¹; Shankha Nag²; Binglun Yin³; ¹Eplf Sti Igm Lamm; ²TU Darmstadt; ³Zhejiang University

Invited

Chemical Effect on the Strength of Refractory High Entropy Alloys with Severe Local Lattice Distortion: *Yang Tong*¹; Shuying Chen¹; Fanchao Meng¹; Peter Liaw²; Liang Jiang¹; ¹Yantai University; ²University of Tennessee-Knoxville

Invited

Compositionally Complicated Titanium Rich Alloy for Biomedical Application: *Poulami Bhattacharjee*¹; Ren Chung²; Hung Yen¹; ¹National Taiwan University; ²National Taipei University of Technology

Invited

Heterogeneous Ultrafine Grain Formation by Severe Plastic Deformation in CrMnFeCoNi HEAs: *Koichi Tsuchiya*¹; Jangho Yi¹; Sangmin Lee¹; Je In Lee²; ¹National Institute for Materials Science; ²Pusan National University

Invited

Hydrogen Storage Characteristics of Multi-principal Element Alloys and Composites: *Jurgen Eckert*¹; ¹Erich Schmid Institute of Materials Science

Invited

Shear Instabilities of BCC Refractory High Entropy Alloys: *Michael Widom*¹; ¹Carnegie Mellon University

Invited

Ultrafast Multilayer Combustion Synthesis of B2 Single Phase AlCoCrFeNi High Entropy Alloy Films Using Reactive Al/Ni Multilayer as Heat Source: *Anni Wang*¹; *Isabella Gallino*²; Sascha Riegler²; Yi-Ting Lin³; Nishchay Isaac⁴; Yesenia Sauni Camposano⁴; Sebastian Matthes⁴; Dominik Flock⁴; Heiko Jacobs⁴; Hung-Wei Yen³; Peter Schaaf⁴; ¹FemtoTools; ²Saarland University; ³National Taiwan University; ⁴TU Ilmenau

Invited

Predicting Temperature-dependent Ultimate Strengths of BCC High-entropy Alloys: *Baldur Steingrimsdottir*¹; *Xuesong Fan*²; Michael Gao³; Peter Liaw²; ¹Imagars LLC; ²University of Tennessee; ³National Energy Technology Laboratory

Invited

Tunable Chemical Disorder in Concentrated Alloys: Defects and Radiation Performance: *Yanwen Zhang*¹; Yuri Osetsky¹; William Weber²; ¹Oak Ridge National Laboratory; ²Department of Materials Science and Engineering, The University of Tennessee

Invited

Thermal and Irradiation-induced Grain Growth in Nanocrystalline High-entropy Alloys: *William Weber*¹; *Yanwen Zhang*²; Chinthaka Silva²; Timothy Lach²; Walker Boldman¹; Philip Rack¹; Li Jiang³; Lumin Wang³; Graeme Greaves⁴; Matheus Tunes⁴; Stephen Donnelly⁴; ¹University of Tennessee; ²Oak Ridge National Laboratory; ³University of Michigan; ⁴University of Huddersfield

Invited

Characteristics of Uniaxial Mechanical Properties of Single Crystals of FCC High- and Medium-entropy Alloys: *Haruyuki Inui*¹; Kyosuke Kishida¹; Le Li¹; ¹Kyoto University

Invited

Corrosion of Single-phase Ni-Fe-Cr-Mo-W-X Non-equimolar Multi-principal Element Alloys: *Gerald Frankel*¹; Anup Panindre¹; Yehia Khalifa¹; Christopher Taylor¹; Pin Lu²; John Scully³; ¹Ohio State University; ²Questek Innovations; ³University of Virginia

Invited

Deformation Behavior of a Multicomponent L21 Heusler Alloy: *Rui Feng*¹; Chuan Zhang²; Michael Gao³; Zongrui Pei³; Yan Chen¹; Michael Widom⁴; Ke An¹; Peter Liaw⁵; ¹Oak Ridge National Laboratory; ²Computherm, LLC; ³National Energy Technology Laboratory; ⁴Carnegie Mellon University; ⁵The University of Tennessee, Knoxville

Development of a High Entropy Alloy Alx(CoCrCuFeNi)1-x for Diverse Security Applications: *Daniel Butcher*¹; Jonathan Cullen¹; Neil Barron²; Shahin Mehraban¹; Monique Calvo-Dahlborg¹; Stephen Brown¹; Nicholas Lavery¹; ¹Swansea University; ²Zeal Innovation Ltd

Mixed Metal Oxide Reduction: A Novel Ceramic Derived Processing Route for Multi-principal Element Alloys: *Animesh Kundu*¹; Helen Chan¹; Madison Gianelle¹; ¹Lehigh Univ

Alloy Design, Microstructure Analysis, Mechanical Testing and Weldability of a Novel CoCuFeMnNi-based High Entropy Alloy: *Jacopo Flocchi*¹; Carlo Biffi²; Mauro Coduri³; Ali Mostaed⁴; Luca Patriarca⁵; Maurizio Vedani⁶; Ausonio Tuissi²; Riccardo Casati⁵; ¹Politecnico di Milano / CNR ICMATE; ²CNR ICMATE; ³University of Pavia; ⁴University of Oxford; ⁵Politecnico di Milano

Fabrication and Investigation of Lightweight Porous Titanium-containing Medium and High-entropy Alloys by Freeze Casting: *Kuan-Cheng Lai*¹; Ko-Kai Tseng¹; Jien-Wei Yeh¹; Po-Yu Chen¹; ¹National Tsing Hua University

Hydrogen-enhanced Ductility in CoCrFeMnNi High-entropy Alloy Additively Manufactured by Selective Laser Melting: *Yi Ting Lin*¹; Zhiguang Zhu²; Xianghai An³; Mui Ling Sharon Nai²; Hung Wei Yen¹; ¹National Taiwan University; ²Singapore Institute of Manufacturing Technology; ³The University of Sydney

Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties — On-Demand Poster Session

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday AM | March 14, 2022
Advanced Materials | On-Demand Poster Hall

Micro-mechanical Properties and Plastic Deformation Behavior of Refractory Low-to-High-entropy Alloys at Different Temperatures: Ping-Hsu Ko¹; Yuan-Tao Hsu¹; Chi-Huan Tung¹; Shou-Yi Chang¹; ¹National Tsing Hua University

Plastic Deformation and Defect Recovery of NiTi-based B2-phase High-entropy Intermetallic Compounds: Ya-Jing Lee¹; Ting-Ying Shih¹; Cheng-Yuan Tsai¹; Chi-Huan Tung¹; Shou-Yi Chang¹; ¹National Tsing Hua University

Study of the Nitriding Behavior of an Austenitic High Entropy Alloy Powder: Mathieu Traversier¹; Emmanuel Rigal²; Pierre-Eric Frayssines²; Xavier Boulnat³; Franck Tancrét⁴; Jean Dhers⁵; Anna Fraczkiewicz¹; ¹CNRS Lgf Umr5307 Mines Saint-Etienne; ²CEA/LITEN; ³INSA Lyon, MATEIS; ⁴Université de Nantes, IMN; ⁵FRAMATOME

Friction Stir Processing of Non Equiatomic High Entropy Alloy: Neelam Meena¹; Satya Dommati²; Vinay Deshmukh²; Nithyanand Prabhu¹; ¹IIT BOMBAY; ²Naval Materials Research Laboratory

Effect of Fe Contents on Plane Stress Fracture Toughness of Fe_x(CoCrMnNi)_{100-x} High Entropy Alloys at Cryogenic Temperature: Sangeun Park¹; Nokeun Park²; Im Doo Jung³; Jae Bok Seol¹; Jung Gi Kim¹; Hyokyung Sung¹; ¹Gyeongsang National University; ²Yeungnam University; ³Ulsan National Institute of Science and Technology

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — On-Demand Oral Presentations

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Invited
Controlling Short-range Ordering to Simultaneously Enhance Strength and Ductility of High-entropy Alloys: Shuai Chen¹; Zachary Aitken¹; Subrahmanyam Pattamatta²; Zhaoxuan Wu²; Zhigen Yu¹; David Srolovitz²; Peter Liaw³; Yong-Wei Zhang¹; ¹Institute of High Performance Computing; ²City University of Hong Kong; ³The University of Tennessee

Invited
Interplay between Dislocations and Correlated Stress Environment in Random Alloys: Pierre-Antoine Geslin¹; Ali Rida²; Enrique Martinez Saez³; David Rodney⁴; ¹CNRS / INSA-Lyon; ²Johns Hopkins University; ³Clemson University; ⁴Univ Lyon 1

Invited
Mixing and Diffusion at Internal Interfaces in High Entropy Alloys: Gerhard Wilde¹; ¹University of Munster

Invited
Understanding Chemical Short-range Ordering/Demixing Coupled with Lattice Distortion in Solid Solution High Entropy Alloy: Quanfeng He¹; Yong Yang²; ¹City University of Hong Kong; ²City University of Hong Kong

Invited
Mechanical Properties and Deformation Behavior of a Refractory Multiprincipal Element Alloy under Cyclic Loading: Jia Li¹; Jing Peng¹; Baobin Xie¹; Li Li¹; Yang Chen¹; Yuanyuan Tian¹; Fusheng Tan¹; Qihong Fang¹; Peter K. Liaw²; ¹Hunan University; ²University of Tennessee

Invited
Atomistic Simulations of Mechanical Responses and Defect Activities in B2 Low-to-high-entropy Intermetallic Compounds: Cheng-Yuan Tsai¹; Chi-Huan Tung¹; Shou-Yi Chang¹; ¹National Tsing Hua University

Invited
Beyond Configurational Entropy: A Harmonic Multi-principal Elements Alloy: Zhaowei Wan¹; Subramanyam Pattamatta¹; Jian Han¹; David Srolovitz²; ¹City University of Hong Kong; ²The University of Hong Kong

High-throughput Ion Irradiation and Microstructural Characterization of Multi-principal-element Alloys: Michael Moorehead¹; Benoit Queyhat¹; Phalgun Nelaturu¹; Daniel Murray²; Mukesh Bachhav²; Dan Thoma¹; Dane Morgan¹; Adrien Couet¹; ¹University of Wisconsin-Madison; ²Idaho National Laboratory

High-throughput Mapping and Screening of Refractory High Entropy Alloy Property Space: Brent Vela¹; Tanner Kirk²; Prashant Singh³; William Treherm¹; Kadri Atli¹; Raymundo Arroyave¹; Ibrahim Karaman¹; ¹Texas A&M University; ²QuesTek Innovations LLC; ³Ames Laboratory

Phase Field Modelling of Transformation Pathways and Microstructural Evolution in Multi-principal Element Alloys (MPEAs): Kamalnath Kadirvel¹; Zachary Kloenne¹; Jacob Jensen¹; Shalini Koneru¹; Hamish Fraser¹; Yunzhi Wang¹; ¹Ohio State University

Unveil the Origin of Segregation-assisted Hardening in CoCrNi-alloys with Varying Mo Content Using Correlative TEM/APT Microscopy: Manuel Köbrich¹; Daniel Hausmann¹; Gernot Hausch²; Steffen Neumeier¹; Mathias Göken¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg; ²Dentalex

Transformation Behavior and Superelasticity of TiZrHfNiCoCu Multi-component High-temperature Shape Memory Alloys: Izaz Rehman¹; Tae-Hyun Nam¹; ¹Gyeongsang National University

Novel Co-free Multi Principal Element Alloys (MPEAs) for Nuclear Applications: Computational Design and Experimental Evaluation: Dinesh Ram¹; Gérard Ramstein²; Anna Fraczkiewicz³; Franck Tancret⁴; ¹Université de Nantes, Institut des Matériaux de Nantes – Jean Rouxel (IMN), CNRS UMR 6502, Polytech Nantes, Rue Christian Pauc, BP 50609, 44306 Nantes Cedex 3, France & MINES Saint-Étienne, Centre SMS / LGF UMR CNRS 5307, 158, cours Fauriel, 42023 Saint-Étienne Cedex 2, France.; ²Université de Nantes, Polytech Nantes, UMR 6004 Laboratoire des Sciences du Numérique de Nantes, rue Christian Pauc, BP 50609, 44306 Nantes Cedex 3, France.; ³MINES Saint-Étienne, Centre SMS / LGF UMR CNRS 5307, 158, cours Fauriel, 42023 Saint-Étienne Cedex 2, France.; ⁴Université de Nantes, Institut des Matériaux de Nantes – Jean Rouxel (IMN), CNRS UMR 6502, Polytech Nantes, Rue Christian Pauc, BP 50609, 44306 Nantes Cedex 3, France

ADVANCED MATERIALS

Advances in Multi-Principal Elements Alloys X: Structures and Modeling — On-Demand Poster Session

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; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday AM | March 14, 2022
Advanced Materials | On-Demand Poster Hall

First-principles Study of Quaternary High Entropy Alloys Consisting of Fe-Ni-Co-Cr-Mn/Pd: Nguyen-Dung Tran¹; Lui Chang²; Ying Chen¹; ¹Tohoku University; ²The Institute of Statistical Mathematics

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — On-Demand Oral Presentations

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Invited

Differential Volume Changes During Binder Removal from Ceramics: John Halloran¹; ¹University of Michigan

Understanding the Role of Intrinsic Parameters on Microstructure and Mechanical Properties of Ice-templated Porous Sintered Electrodes for Lithium-ion Batteries: Dipankar Ghosh¹; Rohan Parai¹; Ziyang Nie²; Gary Koenig²; ¹Old Dominion University; ²University of Virginia

Synthesis and Optimization of BiFeO₃ and La Doped BiFeO₃ Prepared by Solid State Reaction Method: Subhash Sharma¹; Victor Emmanuel Alvarez Montano²; Eunice Vargas Viveros³; Rosario I Yocupicio-Gaxiola⁴; Jesus Siqueiros¹; Oscar Raymond Herrera¹; ¹Universidad Nacional Autónoma de México; ²Universidad De Sonora; ³Universidad Autónoma de Baja California; ⁴Center for Scientific Research and Higher Education at Ensenada (CICESE)

Design of New High Entropy Ceramics in the Pseudo-binary System RGaO₃-R₂Ti₂O₇: Victor Emmanuel Alvarez Montano¹; Francisco Brown¹; Subhash Sharma²; Jorge Mata Ramirez³; Ofelia Hernández Negrete¹; Javier Hernandez Paredes¹; Alejandro Durán²; ¹Universidad De Sonora; ²Universidad Nacional Autónoma de México; ³Universidad Autónoma de Baja California

Fabrication of Hierarchically-porous, Gyroid-structured Hydroxyapatite Scaffolds by a Dual-templating Method: Jui-Yuan Ho¹; Haw-Kai Chang¹; Cheng-Che Tung¹; Po-Yu Chen¹; ¹National Tsing Hua University

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — On-Demand Poster Session

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

Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Eugene Olevsky, San Diego State University; Ruigang Wang, The University of Alabama; Dipankar Ghosh, Old Dominion University

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Fabrication of Uranium Doped Yttrium Aluminium Garnets: *Brian Bettes¹; Yi Xie¹; ¹Purdue University*

Determination of Structural Parameters of Solid Solutions Type Ba₁₋₃XGd₂XTi₁₋₃XEu₄XO₃. (x = at 0.1, 0.15, 0.3 and 0.6% by Weight): *Ricardo Martinez¹; Miguel Pérez Labra¹; Francisco Raúl Barrientos Hernández¹; Martín Reyes Pérez¹; Víctor Esteban Reyes Cruz¹; Julio Cesar Juárez Tapia¹; Aislinn Michelle Teja Ruiz¹; José Ángel Cobos Murcia¹; ¹Academic Area of Earth and Materials Sciences. Autonomous University of the State of Hidalgo, UAEH*

MATERIALS PROCESSING

Advances in Surface Engineering IV — On-Demand Oral Presentations

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

Program Organizers: Arif Mubarak, PPG; Bharat Jasthi, South Dakota School of Mines & Technology; Tushar Borkar, Cleveland State University; Mary Lyn Lim, PPG Industries; Rajeev Gupta, North Carolina State University

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Effect of Laser Surface Treatment on Corrosion Behavior of AZ91D Mg Alloy: *Jiheon Jun¹; Gerald Knapp¹; Alex Plotkowski¹; Donovan Leonard¹; Yong Chae Lim¹; Michael Brady¹; ¹Oak Ridge National Laboratory*

Atmospheric Plasma Surface Processing of a 7xxx Al Alloy Surface to Improve Corrosion Resistance: *Yong Chae Lim¹; Jiheon Jun¹; Donovan Leonard¹; Harry Meyer III¹; Jong Kahk Keum¹; Michael Brady¹; Zhili Feng¹; ¹Oak Ridge National Laboratory*

Intermetallic Formation in High-temperature Al/Ni Wetting: A Molecular Dynamics Study: *Ensieh Yousefi¹; Youqing Sun¹; Anil Kunwar²; Muxing Guo¹; Nele Moelans¹; David Seveno¹; ¹KU Leuven; ²Silesian University of Technology*

Damage Evolution of HVOF Coatings under Shear Lag Test: *Deepesh Yadav¹; Sanjay Sampath¹; Jaya Balila¹; ¹IIT Bombay*

Multi-objective Machine Learning Assisted Optimization of Multi-layered PVD Coatings: *Aida Amroussia¹; Andrew Detor¹; Scott Weaver¹; Patrick Shower¹; Anteneh Kebede¹; Andrew Hoffman¹; Raul Rebak¹; ¹GE Global Research*

Ternary Transition Metal Diborides: A New Generation of Protective Coating Materials?: *Anna Hirle¹; Christoph Fuger¹; Ahmed Bahr¹; Thomas Glechner¹; Lukas Zauner¹; Oliver Hudak¹; Rainer Hahn¹; Oliver Hunold²; Peter Polcik³; Helmut Riedl⁴; ¹Christian Doppler Laboratory for Surface Engineering of High-performance Components, TU Wien; ²Oerlikon Surface Solutions AG; ³Plansee Composite Materials GmbH; ⁴TU Wien, Institute of Materials Science and Technology*

An Investigation of the Microstructure and Oil Retention of Electrolyte Jet Plasma Oxidation (EJPO) Coating: *Nasim Bahramian¹; Sina Kianfar¹; Joshua Stroh¹; Dimitry Sediako¹; Jimi Tjong²; ¹The University of British Columbia; ²University of Windsor*

Electrochemical Corrosion Tests of Aluminum 1100 Alloy Coupons in Acid Condensate Environment: *Vasundhara Shinde¹; Gaurav Argade²; Anusha Chilukuri²; Monica Gehrich²; Chirag Parikh¹; ¹Cummins Filtration Inc.; ²Cummins Inc.*

An Electrochemical Study of Ferrous and Nonferrous Materials in an Engine Coolant Environment: *Gaurav Argade¹; Anusha Chilukuri¹; Justin Perry¹; Monica Gehrich¹; Erica Raisor¹; Corey Trobaugh¹; ¹Cummins Inc.*

MATERIALS PROCESSING

Advances in Surface Engineering IV — On-Demand Poster Session

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

Program Organizers: Arif Mubarak, PPG; Bharat Jasthi, South Dakota School of Mines & Technology; Tushar Borkar, Cleveland State University; Mary Lyn Lim, PPG Industries; Rajeev Gupta, North Carolina State University

Monday AM | March 14, 2022
Materials Processing | On-Demand Poster Hall

Tribological and Wetting Behavior of Laser Shock Peened High Pressure Cold Sprayed (HPCS) Duplex 316L Stainless Steel: *Alessandro Ralls¹; Bo Mao²; Mohammadreza Daroonpravar¹; Pradeep Menezes¹; ¹University of Nevada, Reno; ²Shanghai Jiao Tong University*

Understanding the Mechanism of Laser Shock Peened Austenitic Stainless Steel Welds: *Merbin John¹; Alessandro Ralls¹; Manoranjan Misra¹; Pradeep L. Menezes¹; ¹University of Nevada, Reno*

MATERIALS DESIGN

Advances in Titanium Technology — On-Demand Oral Presentations

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

Towards Sub-nanometer Scale Characterizing the 'Real' H in Titanium Alloy - Importance of Combined Cryogenic Focused Ion Beam & Atom Probe Tomography Technique: *Yanhong Chang*¹; Wenjun Lu²; Abigail Ackerman³; David Dye³; Dirk Ponge²; Dierk Raabe²; Baptiste Gault²; ¹Institute of Materials, China Academy of Engineering Physics; ²Max Planck Institute für Eisenforschung, Düsseldorf; ³Department of Materials, Royal School of Mines, Imperial College

Invited

New Insights into Oxygen-rich Alpha Titanium Alloys for Structural Applications: Régis Poulain¹; Stéphanie Delannoy²; Ivan Guillot³; Fabienne Amann⁴; Raphaëlle Guillou⁵; Jean-Philippe Couzinié³; Lola Liliensten¹; Stoichko Antonov⁶; Baptiste Gault⁷; Frédéric De Geuser⁸; Dominique Thiaudière⁹; Jean-Luc Béchade⁵; Emmanuel Clouet⁵; *Frederic Prima*¹; ¹Chimie ParisTech; ²Chimie ParisTech, Biotech Dental; ³Université Paris Est Créteil; ⁴Chimie-ParisTech, Université Paris Est Créteil; ⁵Université Paris-Saclay, CEA; ⁶Max-Planck-Institut für Eisenforschung; ⁷Max-Planck-Institut für Eisenforschung; ⁸Université Grenoble Alpes; ⁹Synchrotron SOLEIL

Invited

Multiscale Modeling of Metal-hydrogen Interactions: A Case Study of Hydride Formation in Titanium: *Tae Wook Heo*¹; Kyoungh Eun Kweon¹; Nathan Keilbart¹; Rongpei Shi¹; Ryan Mullen¹; Brandon Wood¹; ¹Lawrence Livermore National Laboratory

Micromechanical Fracture Behavior of Distinct Interfaces in an Intermetallic TiAl Alloy: *Michael Burtscher*¹; Markus Alfreider¹; Klemens Schmuck¹; Helmut Clemens¹; Christoph Gammer²; Daniel Kiener¹; ¹Montanuniversität Leoben; ²Austrian Academy of Sciences

Beta Ti Alloys with Increased Oxygen Content and TRIP/TWIP Effect: *Josef Strasky*¹; Dalibor Preisler¹; ¹Charles University

High-temperature Oxidation Behavior of Dilute Ti-Si Alloys at 800 °C: *Thomas Valenza*¹; Emmanuelle Marquis¹; ¹University of Michigan

Grain Boundary Segregation and Its Implications Regarding the Formation of the Grain Boundary a Phase in the Metastable β -Titanium Ti-5Al-5Mo-5V-3Cr Alloy: *Stoichko Antonov*¹; T.S. Prithiv¹; Zachary Kloenne²; Rongpei Shi³; Yufeng Zheng⁴; Hamish Fraser²; Baptiste Gault¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²The Ohio State University; ³Lawrence Livermore National Laboratory; ⁴University of Nevada Reno

The Formation of Titanium Ultrafine Laminar Microstructures via Additive Manufacturing: *Marco Simonelli*¹; Yau Yau Tse²; Pere Barriobero-Vila³; Richard Hague¹; ¹University of Nottingham; ²Loughborough University; ³German Aerospace Center

Fatigue Behavior of Additively Processed, PVD Coated Ti-6Al-7Nb Alloy for Biomedical Applications: *Maxwell Hein*¹; Dominic Stangier²; David Kokalj²; Nelson Filipe Lopes Dias²; Hilke Oltmanns³; Kay-Peter Hoyer¹; Jessica Meißner³; Wolfgang Tillmann²; Mirko Schaper¹; ¹Paderborn University; ²TU Dortmund University; ³University of Veterinary Medicine Hannover

Mechanical Behavior of Ti-Ni-Fe Based B2 Pseudo Binary Intermetallic at Different Length Scales: *Subha Panda*¹; Jayant Jain²; Sudhanshu Singh¹; ¹IIT Kanpur; ²IIT Delhi

Design and Characterization of New Metastable β Ti-Mo-Zr-Sn Alloys for Biomedical Applications: *Manon Laurençon*¹; Damien Fabregue²; Akihiko Chiba³; Kenta Yamanaka³; ¹INSA de Lyon; Tohoku University; ²INSA de Lyon; ³Tohoku University

A Novel High-strength Beta Titanium Alloy Reinforced by Nanoscale Intermetallic Precipitates: *Rosie Mellor*¹; Nicholas Jones¹; Howard Stone¹; ¹University of Cambridge

Effect of Aging Treatment on Microstructure and Superelastic Properties of a High Zr-containing Ti-Zr-Nb-Sn Shape Memory Alloy: *Shuanglei Li*¹; Yeon-Wook Kim²; Jung Gi Kim¹; Tae-Hyun Nam¹; ¹Gyeongsang National University; ²Keimyung University

MATERIALS DESIGN

Advances in Titanium Technology — On-Demand Poster Session

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory

Monday AM | March 14, 2022
Materials Design | On-Demand Poster Hall

A Review on Impact Resistance of Partially Filled 3D Printed Titanium Matrix Composite Designed Aircraft Turbine Engine Fan Blade: *Daniel Okanigbe*¹; Shade Van Der Merwe¹; ¹Tshwane University of Technology

Effect of Sn on Texture Characteristics and Superelastic Behavior of β -type Ti-30Zr-10Nb-xSn (x = 0, 2, 3, 4) Texture Alloy: *Won-Tae Lee*; Yeon-Ju Ryu; Shuanglei Li; Jung-Gi Kim; Tae-Hyun Nam; ¹

Microstructure, Transformation Behavior and Superelasticity of an Aged Ti-40Ni-12Cu (at. %) Shape Memory Alloy: *Jin-hwan Lim*¹; Ji-hyun Kim¹; Jung-gi Kim¹; Tae-kyung Lee²; Shuanglei Li¹; Tae-hyun Nam¹; ¹Gyeongsang National University; ²Pusan National University

Surface Analysis, Microstructure Characterization, and ISV Modeling of Electron Beam Melted (EBM) Ti-6Al-4V: *Jared Darius*¹; Marcos Lugo¹; Daniel Kenney¹; ¹Liberty University

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — On-Demand Oral Presentations

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

Extracting and Making Use of Materials Data from Millions of Journal Articles via Natural Language Processing Techniques: *Anubhav Jain*¹; ¹Lawrence Berkeley National Laboratory

Invited

Orchestrating Multi-task Material Design Campaigns with Artificial Intelligence: *Logan Ward*¹; ¹Argonne National Laboratory

Invited

Variational System Identification of the Partial Differential Equations Governing Microstructure Evolution in Materials: Inference over Sparse and Spatially Unrelated Data: *Krishna Garikipati*¹; Xun Huan¹; Zhenlin Wang¹; ¹University of Michigan

Automatic Segmentation and Quantification of Microscopy Data Using Transfer Learning from a Large Microscopy Database: *Joshua Stuckner*¹; ¹NASA Glenn Research Center

Multi-fidelity Surrogate Modeling of Epistemic Uncertainty Arising from Microstructure Reconstruction: *Arulmurugan Senthilnathan*¹; Pinar Acar¹; ¹Virginia Tech

Thermodynamic Analysis for the Design of High-strength Aluminum Alloys at High Temperatures: Takeshi Kaneshita¹; *Shimpei Takemoto*¹; Yoshishige Okuno¹; Kenji Nagata²; Junya Inoue³; Manabu Enoki³; ¹Showa Denko K.K.; ²National Institute for Materials Science; ³The University of Tokyo

Using Machine Learning to Improve Melt Pool Prediction in Additive Manufacturing: Data Denoising and Predictive Modeling: *Yaohong Xiao*¹; Zhuo Wang¹; Lei Chen¹; ¹University of Michigan-Dearborn

Digital Image Correlation Based Machine Learning Predictions for Grain-boundary Strain Accumulation in a Polycrystalline Metal: Renato Vieira¹; *John Lambros*²; ¹Pontificia Universidade Católica do Rio de Janeiro; ²University of Illinois Urbana Champaign

Uncertainty Prediction for a Variety of Material Properties Modelled via Machine Learning: *Francesca Tavazza*¹; Kamal Choudhary¹; Brian DeCost¹; ¹National Institute of Standards and Technology

Accelerated Alloy Design by Batch Constrained Multiobjective Optimization Using Surrogate Models: Gérard Ramstein¹; *Franck Tancret*¹; ¹Université de Nantes

A Statistical-physical Framework for the Analysis of Uncertainties due to Material Parameters in Multi-physics Modelling: *Amanda Giam*¹; Jiaxiang Cai¹; Fan Chen¹; Zhisheng Ye¹; Wentao Yan¹; ¹National University of Singapore

Austenitic Parent Grain Reconstruction in Martensitic Steel Using Deep Learning: *Patxi Fernandez-Zela*¹; Andrés Márquez Rossey¹; Quinn Campbell¹; Andrzej Nycz²; Michael Kirka¹; ¹Oak Ridge National Laboratory

Semi-mechanistic Gaussian Process Model for Disentangling Structural and Chemical Influences on Material Properties: *Brian DeCost*¹; Howie Jorres¹; Jason Hattrick-Simpers²; ¹National Institute of Standards and Technology; ²University of Toronto

MATERIALS DESIGN

AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification — On-Demand Poster Session

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Anthony Rollett, Carnegie Mellon University; Francesca Tavazza, National Institute of Standards and Technology; Christopher Woodward, Air Force Research Laboratory

Monday AM | March 14, 2022
Materials Design | On-Demand Poster Hall

Applicability Domain for Prediction Models of Thermoelectric Properties Based on Similarity to Known Materials: *Masaya Kumagai*¹; Yukari Katsura²; Yuki Ando²; Atsumi Tanaka³; Koji Tsuda³; Ken Kurosaki¹; ¹Kyoto University; ²National Institute for Materials Science; ³The University of Tokyo

Direct Prediction of Mechanical Properties from X-ray Diffraction Patterns Using Machine Learning: *Naoki Hato*¹; Masaya Kumagai¹; Ken Kurosaki¹; ¹Kyoto University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — On-Demand Oral Presentations

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Garritt Tucker, Colorado School of Mines; Ebrahim Asadi, University of Memphis; Bryan Wong, University of California, Riverside; Sam Reeve, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Adrian Sabau, Oak Ridge National Laboratory

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

Physics-based Data-driven Discovery of Continuum Equations: *Celia Reina*¹; ¹University of Pennsylvania

Invited

Highly Accurate Prediction of Material Microstructure Using High-performance Phase-field Simulation and Data Assimilation: *Tomohiro Takaki*¹; ¹Kyoto Institute of Technology

Invited

Modelling Solidification with Phase-field on High-performance Computers: *Jean-Luc Fattebert*¹; John Turner¹; ¹Oak Ridge National Laboratory

Coarse-graining Techniques for Migration of Solutes around Defects: *Xiaowang Zhou*¹; Christian Nowak¹; Catalin Dan Spataru¹; Michael Foster¹; Kevin Chu²; Ryan Silles³; ¹Sandia National Laboratories; ²Georgia Institute of Technology; ³Rutgers University

Development of a New Shape Descriptor for Modeling and Uncertainty Quantification of Microstructures: *Arulmurugan Senthilnathan*¹; Pinar Acar¹; ¹Virginia Tech

ExaCA: An Exascale-capable Cellular Automata Code for Microstructure Modeling: *Matthew Rolchigo*¹; Samuel Reeve¹; John Coleman¹; Benjamin Stump¹; Alex Plotkowski¹; Jim Belak²; ¹Oak Ridge National Laboratory; ²Lawrence Livermore National Laboratory

Parameter Estimation of Phase-field Model Based on Microstructure Data and Its Uncertainty Quantification by the Adjoint Method: *Yuki Matsuura*¹; Yuhki Tsukada¹; Toshiyuki Koyama¹; ¹Nagoya University

Extending the KineCluE Code to the Computation of Transport Coefficients in Concentrated Alloys: *Pamela Camilos*¹; Thomas Schuler¹; Maylise Nastar¹; ¹Université Paris-Saclay, CEA

Calculating Cluster Diffusion Coefficients from Interatomic Potentials: *Craig Daniels*¹; Thomas Schuler²; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois; ²CEA, Université Paris-Saclay

Using 2D, Dendrite-resolved, Melt-pool-scale Phase-field Simulations of Solidification as Reference Solutions for a Multiscale Model: *Yigong Qin*¹; Yuanxun Bao¹; *Stephen DeWitt*²; Balasubramaniam Radhakrishnan²; George Biros¹; ¹University of Texas at Austin; ²Oak Ridge National Laboratory

Exascale-capable Graph Convolutional Neural Network Surrogates for Atomic Property Prediction: *Pei Zhang*¹; Sam Reeve¹; Max Lupo Pasini¹; ¹Oak Ridge National Laboratory

Development of Interatomic Potential to Study Elementary Dislocation Properties in High Entropy Alloys: The FeNiCrMn Model Alloy: *Ayobami Daramola*¹; Giovanni Bonny²; Gilles Adjnor³; Christophe Domain³; Ghiath Monnet³; Anna Fraczkiewicz¹; ¹MINES – St-Etienne – LGF UMLR 5307 CNRS – CENTRE SMS; ²SCK CEN, Nuclear Materials Science Institute, Boeretang 200, B-2400; ³EDF – Département Matériaux et Mécanique des Composants – Les Renardières Ecuelles av Renardières

Statistical Predictions of Failure in Hydrided Zirconium Materials: *Tamir Hasan*¹; Laurent Capolungo²; Mohammed Zikry¹; ¹North Carolina State University; ²Los Alamos National Laboratory

Calibrating Uncertain Parameters in Melt Pool Simulations of Additive Manufacturing: *Gerald Knapp*¹; John Coleman¹; Miroslav Stoyanov¹; Alex Plotkowski¹; ¹Oak Ridge National Laboratory

Machine Learning Models for Predictive Materials Science from Fundamental Physics: An Application to Titanium and Zirconium: *Mashroor Shafat Nitol*¹; Doyle Dickel¹; Christopher Barrett¹; ¹Mississippi State University

A Finite Difference Analysis of the Effect of Graphene Additions on the Electrical Conductivity of Polycrystalline Copper: *William Frazier*¹; Bharat Gwalani¹; Julian Escobar¹; Joshua Silverstein¹; Keerti Kappagantula¹; ¹Pacific Northwest National Laboratory

A Combined Kinetic Monte Carlo and Phase Field Approach to Modeling Thermally Activated Dislocation Motion: *Xiaoyao Peng*¹; Enrique Martinez²; Nithin Mathew¹; Darby Luscher¹; Abigail Hunter¹; ¹Los Alamos National Laboratory; ²Clemson University

A Computationally Scalable Time-parallel Approach for Melt Pool Resolved Simulations of Additive Manufacturing: *John Coleman*¹; Matt Bement¹; Alex Plotkowski²; Benjamin Stump¹; ¹Oak Ridge National Laboratory; ²Oak Ridge National LaboratoryL

A Monte Carlo Model for the Formation and Evolution of Line Compound Systems Such as SiC: *Philip Goins*¹; Anthony DiGiovanni¹; Matthew Guziewski¹; ¹Army Research Laboratory

Conventional Ti Alloys for Aircraft Landing Gear Beams and Aeroengines—A Data-driven Analysis for Selection of Ti-based Alloys and Future Directions: *Tanjore Jayaraman*¹; Ramachandra Canumalla²; ¹University of Michigan-Dearborn; ²Weldaloy Specialty Forgings

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications X — On-Demand Oral Presentations

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

Program Organizers: Hsin-Jay Wu, National Chiao Tung University; Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Cnrs Crismat Unicaen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Takao Mori, National Institute For Materials Science; Alexandra Zevalkin, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology; Pai-chun Wei, National Taiwan University

Monday AM | March 14, 2022
Electronic Materials | On-Demand Room

Invited

Defect Engineering for Enhancement and Control over Thermoelectric Materials: *Takao Mori*¹; ¹National Institute for Materials Science

Invited

Interfacial Reactions in Ni/PbSe and Ni/SnSe₂ and Couples: *Sinn-wen Chen*¹; Zhi-Kai Hu¹; Hsu-Hui Chen¹; Yohanes Hutabalian¹; ¹National Tsing Hua University

Invited

Metallic Thermoelectric Materials as Active Heat Sinks: *Mona Zabarjadi*¹; Shuai Li¹; Kyle Snyder²; ¹University of Virginia; ²CCAM

Invited

Modular Flexible Thermoelectric Generators for Ambient Energy Recovery: *Chien-Neng Liao*¹; Shih-Yao Chien¹; ¹National Tsing Hua University

Invited

Thermoelectric Properties of Nanostructured Al-doped ZnO Thin Films: *Paolo Mele*¹; ¹Shibaura Institute of Technology

Invited

Planar-type Nano Phononic Si Energy Harvesters: *Masahiro Nomura*¹; ¹University of Tokyo

Invited

Fabrication of Nanostructured Half-Heusler Compounds via Crystallization of an Amorphous Precursor: *Pyuck-Pa Choi*¹; Chanwon Jung¹; Hail Park¹; ¹KAIST

Invited

Development of Low-defect Single Crystalline Ferromagnetic Shape Memory Alloy for Magnetic Cooling and Actuation: *Wan-Ting Chiu*¹; Pimpet Srattong-On²; Masaki Tahara¹; Volodymyr Chernenko³; Hideki Hosoda¹; ¹Tokyo Institute of Technology; ²Thai-Nichi Institute of Technology; ³Department of Electricity and Electronics, University of the Basque Country (UPV/EHU) & BCMaterials, Basque Center for Materials, Applications and Nanostructures, UPV/EHU Science Park

Invited

Theory of Huge Thermoelectric Effect Based on Magnon Drag Mechanism: Application to Thin-film Heusler Alloy: *Masao Ogata*¹; Hiroyasu Matsuura¹; Takao Mori²; Ernst Bauer³; ¹University of Tokyo; ²National Institute for Materials Science, and University of Tsukuba; ³Technische Universität Wien

Invited

Enhancing Room-temperature Thermoelectric Performance of SnSe with Excess Ag: *Hsin-Jay Wu*¹; Meng-Yuan Ho¹; ¹National Chiao Tung University

Invited

Development of n-type Mg₃Sb₂-Mg₃Bi₂ Alloys for Thermoelectrics: *Kazuki Imasato*¹; Michihiro Ohta¹; G. Jeffrey Snyder²; ¹National Institute of Advanced Industrial Science and Technology; ²Northwestern University

Invited

Giant Isotopic Shift in Phonons Keeps Charge Carriers Hot Longer in a Photovoltaic Perovskite: *Michael Manley*¹; Kunlun Hong¹; Panchao Yin¹; Hsin Wang¹; Songxue Chi¹; Luke Daemen¹; Andrew May¹; Chengyun Hua¹; Raphael Hermann¹; Mark Asta²; Yao Cai²; Mahshid Ahmadi³; ¹Oak Ridge National Laboratory; ²University of California, Berkeley; ³University of Tennessee

Invited

Seebeck Coefficient Enhancement in CoSb₃-Skutterudite Induced by Constructive Magneto-composite Effects: *Cedric Bourges*¹; Wenhao Zhang¹; Bhuvanesh Srinivasan¹; Naoyuki Kawamoto¹; Masanori Mitome¹; Kazuaki Kobayashi¹; Jean-Francois Halet²; David Berthebaud²; Takao Mori¹; ¹National Institute for Materials Science; ²Laboratory for Innovative Key Materials and Structures, IRL 3629-CNRS

Invited

Thermoelectric Transport and Crystal Morphology of the Quasi-1D Zintl Ca₅M₂Sb₆: *Alexandra Zevalkin*¹; ¹Michigan State University

Invited

Integration of Si-based Micro Thermoelectric Generator Devices: *Takanobu Watanabe*¹; ¹Waseda University

Invited

Impact of Cation Substitution in (Ag_xCu_{1-x})₂ZnSnSe₄ Absorber-based Solar Cells towards 10% Efficiency: Experimental and Theoretical Analyses: *Li-Chyong Chen*¹; Shaham Quadri¹; Mohammad Qorban¹; Ying-Ren Lai¹; Ho-Thi Thong²; Amr Sabbah²; Michitoshi Hayashi¹; Cheng-Ying Chen³; Kuei-Hsien Chen²; ¹National Taiwan University; ²Academia Sinica; ³Ming Chi University of Technology

Invited

Uncovering Design Principles for Amorphous-like Heat Conduction Using Two-channel Lattice Dynamics: *Raphael Hermann*¹; Riley Hanus¹; Michael Manley¹; Janine George²; ¹Oak Ridge National Laboratory; ²Universite Catholique de Louvain

Invited

Liquid-like Ion Diffusion Leading to the Ultralow Thermal Conductivity of Ag₈SiTe₆ Argyrodite: *Pai-Chun Wei*¹; ¹Center for Condensed Matter Sciences, National Taiwan University

Invited

Relationship between Lattice-site Preference and Phase Stability in Thermoelectric Compounds Mg₂M (M: Si, Ge, Sn) and RNiSn (R: Ti, Zr, Hf): *Yoshisato Kimura*¹; Yaw Wang Chai¹; Manabu Watanabe¹; Yonghoon Lee²; ¹Tokyo Institute of Technology; ²KELK Ltd.

Invited

Combustor/Heat Exchanger-integrated Thermoelectric Power Generation System for Autonomous Robots: *Yuji Suzuki*¹; Minhyeok Lee¹; Shintaro Uchida¹; Hajime Asama¹; Keiji Nagatani¹; Shunsuke Hamasaki¹; Shota Chikushi¹; Chul-Ho Lee²; Yong Fan²; Kazuo Nagase²; Hirokuni Hachiuma³; Shinichi Fujimoto⁴; Naoki Yokoo⁵; Hiroyuki Sato⁵; Kenichi Odagawa⁵; ¹The University of Tokyo; ²National Institute of Advanced Industrial Science and Technology; ³Komatsu Ltd.; ⁴KELK Ltd.; ⁵Dainichi Co. Ltd.

Invited

Intermetallic and Chalcogenide Materials for Mid-range Temperature Thermoelectric Applications: *David Berthebaud*¹; ¹CNRS - Saint-Gobain - NIMS, IRL3629, Laboratory for Innovative Key Materials and Structures (LINK),

Invited

Ternary and Quaternary Thermoelectric Sulphides: Mechanical-alloying, Order/Disorder Phenomena, Conductive Network, Transport Properties, and Theory: *Emmanuel Guilmeau*¹; ¹CRISMAT/CNRS

Enhanced Thermoelectric Performance with High Thermal Stability in Cu-based n-type PbTe: *Ping-Yuan Deng*¹; Hsin-Jay Wu¹; Kung-Kuo Wang²; ¹National Yang Ming Chiao Tung University; ²National Sun Yat-sen University

Enhancing Thermoelectric Performance via Microstructure Engineering in GeTe Alloys: *Yi-Fen Tsai*¹; Hsin-Jay Wu¹; ¹National Chiao Tung University

Enhanced Thermoelectric Properties in Sb₂Te₃ Thin Film Modules: *Zhen-Wei Sun*¹; Albert T. Wu¹; ¹National Central University

Enhanced Thermoelectric Performance of n-type Silver Chalcogenide with Excess Ag: *You-Cheng Du*¹; Wan-Ting Yen¹; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University

Phase Equilibria of Cu-Se-Te System and Interfacial Reactions in Cu/Se, Cu/Se-20at.%Te and Cu₂Te/Se Couples: *Yohanes Hutabalian*¹; Sinn-wen Chen¹; ¹National Tsing Hua University

Light Impurity Doping and Entropy Engineering Eliciting High-performance n-type Bi₂Te₃ Thermoelectrics: *Wan-Ting Yen*¹; Hsin-jay Wu¹; ¹National Yang Ming Chiao Tung University

Phase Diagram Engineering Enables Lightly Impurity Doping for High-performance GeTe Thermoelectrics: *Szu-Chien Wu*¹; Yi-Fen Tsai¹; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University

Thermal Evolution of Internal Strain in Doped PbTe: *James Male*¹; Riley Hanus²; G. Jeffrey Snyder¹; Raphael Hermann²; ¹Northwestern University; ²Oak Ridge National Laboratory

The Effects of Hot-compression at Working Temperatures on the Physical and Mechanical Behavior of the Thermoelectric GeTe Alloy: *Gilad Guttman*¹; Shmuel Samuha¹; Reuven Gertner¹; Shlomo Harush¹; Yaniv Gelbstein²; ¹NRCN; ²Ben-Gurion University of the Negev

Achieving High Thermoelectric Performance in Hierarchical Structured Bi_{0.5}Sb_{1.5}Te₃ Alloys via Controlling the Hot Pressing Temperature: *Peyala Dharmiah*¹; Sungjae Jo¹; Yeeun Lee¹; Soon-Jik Hong¹; ¹Kongju National University

ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications X — On-Demand Poster Session

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

Program Organizers: Hsin-Jay Wu, National Chiao Tung University; Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Cnrs Crismat Unicaen; Philippe Jund, Montpellier University; Yoshisato Kimura, Tokyo Institute of Technology; Takao Mori, National Institute For Materials Science; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology; Pai-chun Wei, National Taiwan University

Monday AM | March 14, 2022
Electronic Materials | On-Demand Poster Hall

Enhancing Thermoelectric Performance via Delaying Transition Temperature in GeTe Alloys: *Yi-Fen Tsai*¹; Hsin-Jay Wu¹; ¹National Chiao Tung University

High Thermoelectric Performance in n-type PbTe Enabled by Carrier Optimization and Nano-precipitates: *Ping-Yuan Deng*¹; Kung-Kuo Wang²; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University; ²National Sun Yat-sen University

Interfacial Reactions in Ni/(Se,Te) and Ni/Pb_{1-x}Sn_xSe Couples: *Yohanes Hutabalian*¹; Hsu-Hui Chen¹; Zhi-Kai Hu¹; Sinn-wen Chen¹; ¹National Tsing Hua University

Lightly Impurity Doping and Entropy Engineering Synergy Realizing High-performance n-type Bi₂Te₃ Thermoelectrics: *Wan-Ting Yen*¹; Hsin-jay Wu¹; ¹National Yang Ming Chiao Tung University

N-type Silver Chalcogenide with Excess Ag Leading to Improved Thermoelectric Properties: *You-Cheng Du*¹; Wan-Ting Yen¹; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University

Realizing High Thermoelectric Figure of Merit of Co-doped GeTe Alloy via Phase Diagram Engineering: *Szu-Chien Wu*¹; Yi-Fen Tsai¹; Hsin-Jay Wu¹; ¹National Yang Ming Chiao Tung University

The Wurtzite CuFeS₂ Thin Film and Its Phase Transformation to Chalcopyrite for Thermoelectric Generator: *Hong Pang*¹; Cédric Bourges¹; Naohito Tsujii¹; Takahiro Baba¹; Naoki Sato¹; Tetsuya Baba¹; Takao Mori¹; ¹National Institute for Materials Science

LIGHT METALS

Alumina & Bauxite — On-Demand Oral Presentations

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

Program Organizers: Roberto Seno, Cba; Dmitry Eskin, Brunel University

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Fast Solution of Shrinking Core Model for Calcination Applications: *Vladimir Golubev*¹; Dmitriy Chistyakov¹; Dmitriy Mayorov¹; Evgeniy Fomichev¹; Iliya Blednykh¹; ¹Rusal Etc

Green Alumina: A Technological Roadmap: *Alessio Scarsella*¹; Edgar Gasafi¹; ¹Metso Outotec

Potential of Alumochloride Technology for Production of Competitive Products: *Andrei Smirnov*¹; Dmitriy Kibartas¹; Alexander Senyuta¹; Vladimir Bayanov¹; Andrey Knyazev¹; Andrey Panov¹; ¹RUSAL ETC

Removal of Fluorine, Chlorine, Nitrogen from Aluminum Dross by Wet Process: *Xinxin Zhao*¹; Yan Liu¹; Guozhi Lyu¹; Yubin Zhang²; Tingan Zhang¹; ¹Northeastern University; ²Shenyang Aluminum Magnesium Engineering Research Institute Co., Ltd.

Results of Metso: Outotec Calciner Optimizer Operation at CBA Alumina Calcination Plants: *Steffen Haus*¹; Allan Borges¹; Natalia Almeida²; Anderson Duck²; ¹Outotec GmbH & Co. KG; ²Companhia Brasileira de Alumínio

Recovery of Iron from High-iron Bayer Red Mud by Melting Reduction with Spent Cathode Carbon Block: *Xiaofei Li*¹; Tingan Zhang¹; Kun Wang¹; Guozhi Lyu¹; Xin Chen¹; ¹Northeastern University

LIGHT METALS

Aluminum Alloys, Processing and Characterization — On-Demand Oral Presentations

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Monday AM | March 14, 2022
Light Metals | On-Demand Room

An Advanced Industrial Methodology for Optimizing the Properties and the Process of Homogenization for Extruded AA2xxx & AA6xxx: *Simon Recnik*¹; Jožef Medved²; *Varuzan Kevorkijan*¹; Sandi Žist¹; ¹Impol Aluminum Industry; ²University of Ljubljana, Faculty of Natural Sciences and Engineering

Correlation between Electrochemical and Standard Testing of Aluminum Alloys: *Matjaž Finšgar*¹; Irena Lesjak²; *Varuzan Kevorkijan*²; Marko Degiampietro²; ¹University of Maribor, Faculty of Chemistry and Chemical Engineering; ²Impol Aluminum Industry

Heat-treatment Response of Al-Mg-Si Alloys with Varying Mg/Si Ratio: *Abdul Wahid Shah*¹; Seong-Ho Ha²; Young-Ok Yoon²; Shae Kwang Kim¹; ¹UST korea; ²Korea Institute of Industrial Technology

Through Thickness Localized Strain Distribution and Microstructural Characterization of Functionally Graded Al/GNP Composite Fabricated by Friction Stir Processing: *Abhishek Sharma*¹; Yoshiaki Morisada¹; Hidetoshi Fujii¹; ¹JWRI, Osaka University

Precipitation Hardening in Innovative Processing of 6xxx Aluminum Alloys: *Alexander Wimmer*¹; *Annika Haemmerle*¹; Calin Marioara²; ¹Neuman Aluminium; ²SINTEF Industry

Evolution of Work Hardening in 6xxx Aluminum Alloys in the Course of Natural Aging Following Continuous Annealing: *Christian Bollmann*¹; Chengchao Yu²; *Mehdi Lalpoor*³; Alexis Miroux³; ¹Alvance Germany GmbH; ²RWTH Aachen University; ³Alvance Aluminum Duffel BV

Co-extrusion of Dissimilar Al Alloys via Shear Assisted Processing and Extrusion: *Mageshwari Komarasamy*¹; Scott Taysom¹; Darrell Herling¹; Scott Whalen¹; ¹Pacific Northwest National Laboratory

Development of a Machine Learning Model to Predict Constitutive Behaviour of Macroseggregated A356 Alloy: *Jun Ou*¹; Shaul Avraham¹; Daan Majjer¹; Steve Cockcroft¹; ¹University of British Columbia

Multi-alloy Aluminum Tubing via Shear Assisted Processing and Extrusion: *Brian Milligan*¹; Mageshwari Komarasamy¹; Anil Battu¹; Tamas Varga¹; Anthony Guzman¹; Brandon Taysom¹; Darrell Herling¹; Scott Whalen¹; ¹Pacific Northwest National Laboratory

Quantification of Plastic Strain in the Precipitate Free Zone of Natural Aged Al-Mg-Si Alloys: *Majtaba Mansouri Aran*¹; Xiang Wang²; Nick Parson³; Warren Poole¹; ¹University of British Columbia; ²McMaster University; ³Rio Tinto Aluminium

Solubility Limit of Iron in Aluminum and Its Alloys: Role on Recrystallization, Grain Growth, Texture and Interfacial Segregation Leading to Ductile Failure: *Shigeo Saimoto*¹; Christopher Gabryel¹; Haiou Jin²; Raja Mishra³; ¹Queen's University; ²Natural Resources Canada; ³University of Waterloo

Microstructural Evolution of High Zn 7000-series Aluminum Alloy with Addition of Titanium: *Kwangjun Euh*¹; Jae-Gil Jung¹; Sang-Hwa Lee¹; Se-Hun Kim²; ¹Korea Institute of Materials Science; ²Korea Automotive Technology Institute

Effect of Post Extrusion Heat Treatment on Mechanical Property of Aluminum Alloy 2024 Tube Produced Using Shear Assisted Processing and Extrusion (ShAPE): *Md Reza-E-Rabby*¹; Tianhao Wang¹; Daniel Graff¹; Timothy Roosendaal¹; Nathan Canfield¹; Scott Whalen¹; ¹Pacific Northwest National Laboratory

In Situ Processing of Rapidly Solidified Al-33wt%Cu Droplets: *Jonas Vallotton*¹; Najia Mahdi²; Loraine Rabago¹; Hani Henein¹; ¹University of Alberta; ²Norcada Inc.

LIGHT METALS

Aluminum Alloys, Processing and Characterization – On-Demand Poster Session

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

Program Organizers: Andre Phillion, McMaster University; Dmitry Eskin, Brunel University

Monday AM | March 14, 2022
Light Metals | On-Demand Poster Hall

Interaction between Recrystallization and Second Phase Particles in Al-Mn Alloy with Impurities (Fe, Si): *Kazuha Yamase*¹; Ken-ichi Ikeda¹; Seiji Miura¹; ¹Hokkaido University

Development of High-strength 6xxx Aluminium Nanocomposites by Direct-chill Casting and Thermo-mechanical Processing: *Guangyu Liu*¹; Mahfuz Karim¹; Dmitry Eskin¹; Brian McKay¹; ¹Brunel University London

Effect of Minor Alloying Elements on Mechanical Properties of 6xxx Series Aluminum Alloy Sheets: *GyeongSeok Joo*¹; MinSang Kim¹; YongWook Song²; HyunJoo Choi²; SeHoon Kim¹; JaeHyuk Shin¹; SoonMok Choi³; ¹Korea Automotive Technology Institute; ²Kookmin University; ³Korea University of Technology & Education

A Study on the Improvement of Plastic Deformability and Thermal Conductivity of High Strength Aluminum Alloy: *Minsang Kim*¹; Gyeongseok Joo¹; Hansol Son²; HyunJoo Choi²; Sehoon Kim¹; ¹KATECH; ²Kookmin University

Fabricating Tubes with Variable Properties via Shear Assisted Processing and Extrusion: *Mageshwari Komarasamy*¹; Scott Whalen¹; Brandon Taysom¹; Timothy Roosendaal¹; Angel Ortiz¹; Glenn Grant¹; Darrell Herling¹; ¹Pacific Northwest National Laboratory

LIGHT METALS

Aluminum Reduction Technology – On-Demand Oral Presentations

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

Program Organizers: Kristian Etienne Einarsrud, Norwegian University of Science and Technology; Stephan Broek, Boston Metal; Mertol Gökölma, Izmir Institute of Technology; Dmitry Eskin, Brunel University

Monday AM | March 14, 2022
Light Metals | On-Demand Room

A Water Model Study of Alumina Feeding and Dispersion: Kristian Etienne Einarsrud¹; *Sindre Engzelius Gylver*¹; Simen Aase¹; Simen Bekkevoll¹; Sigmund Forberg¹; ¹Norwegian University of Science and Technology

Managing Power Interruptions at 360 KA Smelter: *Amit Jha*¹; Amit Gupta¹; Pratap Sahu²; Kamal Pandey²; Senthil Nath²; ¹Aditya Birla Science & Technology Company, Ltd; ²Hindalco Industries Ltd, Mahan Aluminum

A Pragmatic Model for Alumina Feeding: Stein Tore Johansen¹; Asbjørn Solheim¹; *Kurian J. Vachaparambil*¹; Kristian Etienne Einarsrud²; ¹SINTEF Industry; ²Norwegian University of Science and Technology

Statistical Model for Forecasting the Cell Replacement Rate in an Aluminum Smelter: *Sebastien Guerard*¹; Pascal Thibeault¹; ¹Rio Tinto

The Survivability of Aluminum Potlines after Lengthy Electrical Power Outages: *Alton Tabereaux*¹; ¹Consultant

Imaging Alumina Distribution Using Low-voltage Anode Effect Detections in Anodic Current: *Joan Boulanger*¹; Anne Gosselin¹; Simon Gaboury¹; Louis Guimond¹; Claude Simard¹; Alexandre Blais¹; Francis Lalancette¹; ¹Rio Tinto

Modeling of the Heat Exchange, the Phase Change, and Dissolution of Alumina Injected in Electrolysis Cells: *Thomas Roger*¹; László Kiss¹; Lukas Dion¹; Jean Francois Bilodeau²; Sébastien Guérard²; Guillaume Bonneau¹; Kirk Fraser³; ¹Université Du Quebec A Chicoutimi; ²Rio Tinto Aluminium; ³Aluminium Technology Center

Direct Production of Aluminum Titanium Alloys in Aluminum Reduction Cells, A Laboratory Test: *Geir-Martin Haarberg*¹; Omar Awayssa¹; Gudrun Saevarsdottir²; Rauan Meirbekova³; Wenting Xu¹; ¹Norwegian University of Science & Technology; ²Reykjavik University; ³DTE

Mass Transport by Waves: Physical Model with Coalescence, Fragmentation, and Displacement on a Bath-metal Interface: *Thomas Richer*¹; Lukas Dion¹; Laszlo Kiss¹; Sebastien Gerard¹; Jean-François Bilodeau¹; Guillaume Bonneau¹; Lovatianna Rakotondramanana¹; Renaud Santerre¹; ¹GRIPS

Empirical Prediction of Alumina Dissolution Rate in a Cryolitic Melt: Comparison with the Existing Literature: *Jonathan Alarie*¹; László Kiss¹; Lukas Dion¹; Martin Truchon²; Renaud Santerre³; Sébastien Guérard⁴; Jean-François Bilodeau⁴; ¹Aluminium Research Centre – REGAL, University of Quebec at Chicoutimi; ²University of Quebec-Chicoutimi; ³Technical advisor, Retired from Rio Tinto; ⁴Arvida Research and Development Centre, Rio Tinto

LIGHT METALS

Aluminum Reduction Technology Joint Session with REWAS: Decarbonizing the Metals Industry — On-Demand Oral Presentations

Sponsored by: TMS: Recycling and Environmental Technologies Committee, TMS: Aluminum Committee

Program Organizers: Mertol Gökelma, Izmir Institute of Technology; Stephan Broek, Boston Metal

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Research on Low Temperature Aluminium Electrolysis Charging Recovery System of Renewable Energy Cycle Power Generation System: *Huimin Lu*¹; Neale Neelameggham²; ¹Beijing Ofikintai Technology Co Ltd.; ²IND LLC

The Contribution and Economics of Demand Side Response towards Decarbonizing the Aluminium Industry: *Nick Depree*¹; David Wong²; David Thomas³; ¹EnPot Ltd; ²Atmolite Consulting Pty Ltd; ³Energy and Environment Ltd

Building of a Superconductor Busbar at 200 kA for an Aluminium Plant: *Wolfgang Reiser*¹; Viktor Stark¹; Till Reek¹; ¹Vision Electric Super Conductors GmbH

BIOMATERIALS

Biological Materials Science — On-Demand Oral Presentations

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Monday AM | March 14, 2022
Biomaterials | On-Demand Room

Invited

Lightweight, Strong and Tough Structural Materials Inspired from Nature and Optimized by A.I.: *Po-Yu Chen*¹; Cheng-Che Tung¹; Ashish Ghimire¹; Yen-Shuo Chen¹; Yu-Yi Lai¹; Chi-Hua Yu²; ¹National Tsing Hua University; ²National Cheng Kung University

Invited

Tuning the Cancer Microenvironment at Bone Metastasis Using the Cancer Testbed: *Kalpana Katti*¹; Sharad Jaswandkar¹; Haneesh Jasuja¹; Hanmant Gaikwad¹; Farid Solaymani¹; Jiha Kim¹; Anu Gaba²; Dinesh Katti¹; ¹North Dakota State University; ²Sanford Health

Nanoparticle Embedded Multifunctional Catheter for Multimodal Cancer Therapy: *Hiep Pham*¹; Yufang He¹; Jonghyun Park¹; ¹Missouri University of Science and Technology

Multidrug Delivery via Electrospun Core-shell Structured Nanofibers for Enhanced Post-surgical Healing: *Hiep Pham*¹; Gracie Boyer¹; Jonghyun Park¹; ¹Missouri University of Science and Technology

Cement-polymer Composite Structures Inspired by Molluscan Prismatic Layers: *Shahbaz Khan*¹; Ling Li¹; ¹Virginia Tech

Decussation in Human Enamel: Descriptions of the Complex Pattern of the Enamel Rods: *Cameron Renteria*¹; Susana Estrada Hernandez²; Juliana Fernández-Arteaga²; Jack Grimm¹; Alex Ossa²; Dwayne Arola¹; ¹University of Washington; ²Universidad EAFIT

The Influence of Reactive Oxygen Species in in Vitro Corrosion Resistance of CoCrMo: *Sangram Mazumder*¹; Mangesh V. Pantawane¹; Narendra B. Dahotre¹; ¹University of North Texas

Controlled Drug Diffusion Kinetics in HEMA-backbone Hydrogels for Ocular Disease Treatment: *Parker Toews*¹; Jeff Bates¹; ¹University of Utah

A Study of the Composition and Mechanical Properties of Aprismatic Tooth Enamel Afflicted by Amelogenesis Imperfecta: *Jack Grimm*¹; Dwayne Arola¹; ¹University of Washington

Biodegradable Molybdenum/Polybutylene Adipate Terephthalate Conductive Paste for Flexible and Stretchable Transient Electronics: *Jaeyoung Yoo*¹; Kyung-Sub Kim²; Jun-Seok Shim²; Jahyun Koo³; Seung-Kyun Kang²; Hyuck Mo Lee¹; ¹Kaist; ²Seoul National university; ³Korea university

Optimization of Multi-physical Properties of Gradient Cellular Structures Inspired by Termite Nests: *Wen-Fei Chen*¹; Cheng-Che Tung¹; Tsung-Hui Huang¹; Po-Yu Chen¹; ¹National Tsing Hua University

Mimicking the Glioblastoma Cells' Microenvironment via Anisotropic Sub-microscaled Surface Patterns and Enabling Directional Adhesion of Filopodia on Metallic Biomaterials: *Benay Uzer-Yilmaz*¹; ¹Izmir Institute of Technology

Tissue Derived Nanocomposite for Embolization: *Jingjie Hu*¹; ¹North Carolina State University

On the Intrinsic Mechanical Properties of Individual Biogenic Mineral Units in Biomineralized Skeletons: *Zhifei Deng*¹; Ling Li¹; ¹Virginia Polytechnic Institute and State University

Novel Expandable Architected Breathing Tube for Improving Airway Securement in Emergency Care: *David Restrepo*¹; Carlos Bedolla¹; James White¹; David Berard¹; R. Lyle Hood¹; ¹University of Texas at San Antonio

BIOMATERIALS

Biological Materials Science — On-Demand Poster Session

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

Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Hannes Schniepp, William & Mary

Monday AM | March 14, 2022
Biomaterials | On-Demand Poster Hall

Design of a Novel Bio-HEA for Potential Use as Orthopedical Implants: *Jhulienne Torrento*¹; Tiago de Sousa¹; Carlos Grandini¹; Diego Correa²; ¹Univ. Estadual Paulista - Laboratório de Anelasticidade e Biomateriais; ²Instituto Federal de Educação, Ciência e Tecnologia de São Paulo

Fabrication and Characterisation of Two-layered Synthetic Titanium-Chitosan Bone Scaffolds: *Lemiha Yildizbakan*¹; Vasiliki Panagiotopoulou²; Neelam Iqbal¹; Ngoc Do¹; Elena Jones¹; Peter Giannoudis¹; Animesh Jha¹; Dina Abdul Aziz¹; ¹University of Leeds; ²University of Patras

Development and Characterization of Novel Ti-Mo-Nb Alloys for Biomedical Applications: *Giovana Cardoso*¹; Carlos Roberto Grandini¹; ¹UNESP – Univ. Estadual Paulista, Laboratório de Anelasticidade e Biomateriais

BIOMATERIALS

BioNano Interfaces and Engineering Applications – On-Demand Oral Presentations

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

Program Organizers: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Monday AM | March 14, 2022
Biomaterials | On-Demand Room

Keynote

Nanostructured Metals for Miniaturized Medical Implants with Improved Biofunctionality: Ruslan Valiev¹; Nariman Enikeev¹; Benjamin Ewing²; Adam Griebel²; *Terry Lowe*³; ¹UFA State Aviation Technical University; ²Fort Wayne Metals; ³Colorado School of Mines

Invited

Mechanics of Cellular Actin Filaments: *Dinesh Katti*¹; Sharad Jaswandkar¹; Kalpana Katti¹; ¹North Dakota State University

Invited

A New Approach to the Mechanics of DNA: Atoms-to-beam Homogenization: Johannes Kalliauer¹; Gerhard Kahl¹; Stefan Scheiner¹; *Christian Hellmich*¹; ¹Vienna University Of Technology

Invited

Inductively Coupled Plasma for Cell and Microbial Interfacing Surfaces: *Vinoy Thomas*¹; ¹University of Alabama at Birmingham

Invited

Biomaterials by Design: *Chi-Hua Yu*¹; Wei Chen¹; ¹National Cheng Kung University

Designing and Optimization of Bio-inspired 3D Structures – From Ordered TPMS to Disordered Reaction Models: *Cheng-Che Tung*¹; Wen-Fei Chen¹; Chi-Hua Yu²; Shu-Wei Chang³; Chuin-Shan Chen³; Po-Yu Chen¹; ¹National Tsing Hua University; ²National Cheng Kung University; ³National Taiwan University

Antiviral Surface Topographies on Metal Surfaces: *Terry Lowe*¹; Rebecca Reiss²; Heather Slomski¹; ¹Colorado School of Mines; ²New Mexico Tech

Disrupted Osteogenesis at Bone Metastasis of Breast Cancer and Prostate Cancer: *Kalpana Katti*¹; Haneesh Jasuja¹; Dinesh Katti¹; ¹North Dakota State University

BIOMATERIALS

BioNano Interfaces and Engineering Applications – On-Demand Poster Session

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

Program Organizers: Candan Tamerler, University of Kansas; Hendrik Heinz, University of Colorado Boulder; Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Monday AM | March 14, 2022
Biomaterials | On-Demand Poster Hall

Thermal Oxidation as a Tool to Biofunctionalize Novel Biomedical Ti-based Alloys: *Diego Correa*¹; Carlos Grandini²; Luis Rocha²; Livia Sottovia²; Nilson Cruz²; Elidiane Rangel²; ¹IFSP - Campus Sorocaba; ²UNESP - Univ. Estadual Paulista

ADVANCED MATERIALS

Bulk Metallic Glasses XIX – On-Demand Oral Presentations

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Invited

Are Metallic Glasses Brittle or Ductile?: *Jan Schroers*¹; ¹Yale University

Invited

Atomic Motion in Ultrastable Metallic Glasses: *Beatrice Ruta*¹; Martin Luettich²; Konrad Samwer³; ¹Univ Lyon 1 and CNRS; ²ESRF and Goettingen University; ³Goettingen University

Invited

Relaxation Dynamics in Glass Forming Alloys: Microscopic Nature, Timescales and Aging Effects: *Eloi Pineda*¹; ¹Universitat Politècnica de Catalunya

Invited

Shear Bands in Metallic Glasses: Local Structure, Atomic Mobility and Relaxation Kinetics: *Gerhard Wilde*¹; ¹University of Muenster

Invited

STZ-vortex Unit – The Key to Understand and Control Shear Banding in Metallic Glasses: *Daniel Soper*¹; Xudong Yuan¹; Jürgen Eckert¹; ¹Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences

Invited

Size-dependent Freezing Kinetics of Bulk Metallic Glasses: *Isabella Gallino*¹; Daniele Cangialosi²; Sascha Riegler¹; Golden Kumar³; ¹Saarland University; ²Donostia International Physics Center; ³The University of Texas at Dallas

Invited

Strength-controlled Fracture of Metallic Glass at the Micrometer Scale: *Ruitao Qu*¹; Robert Maaß²; Zengqian Liu³; Robert Ritchie⁴; Zhefeng Zhang³; Cynthia Volkert⁵; Feng Liu¹; ¹Northwestern Polytechnical University; ²University of Illinois at Urbana-Champaign; ³Institute of Metal Research, Chinese Academy of Sciences; ⁴Materials Sciences Division, Lawrence Berkeley National Laboratory; ⁵Institute of Materials Physics, University of Göttingen

Invited

Systematic Identification of Local Shear Events during the Plastic Deformation of Colloidal Glasses: *Frans Spaepen*¹; ¹Harvard University

Shear Band Interactions in Bulk Metallic Glass Composites: *Jurgen Eckert*¹; ¹Erich Schmid Institute of Materials Science

Relative Contributions of Local Structural State, Elastic Perturbation, and Heat Generation to Plasticity in Metallic Glass: *Thomas Hardin*¹; ¹Sandia National Laboratories

Nature of the Medium-range Order Distinct from the Short-range Order in Metallic Liquids: *Chae Woo Ryu*¹; Takeshi Egami¹; ¹University of Tennessee

Atomic Structure of Bulk Metallic Glasses/Liquids Studied by Synchrotron-radiation X-ray Diffraction, Scanning Tunneling Microscopy and Ab-initio Molecular Dynamics Simulation: *Dmitri Louzguine*¹; ¹WPI-AMR, Tohoku University

Cryogenic Thermal Cycling of a Pd₄₃Cu₂₇Ni₁₀P₂₀ Bulk Metallic Glass: *Miguel B. Costa*¹; Juan J. Londoño²; Andreas Blatter²; Michael Carpenter³; A. Lindsay Greer¹; ¹Department of Materials Science and Metallurgy, University of Cambridge; ²Research and Development Department, PX Services; ³Department of Earth Sciences, University of Cambridge

New (Fe_{0.5}Co_{0.5})_{71.64}B_{19.104}Si_{4.776}Nb_{3.98}Cu_{0.5} Bulk Glassy Alloy: A Comprehensive Time-resolved Synchrotron X-ray Study: *Mihai Stoica*¹; Gavin Vaughan²; Jonathan Wright²; Jörg Löffler¹; ¹ETH Zurich; ²European Synchrotron Radiation Facility

Influence of Medium Range Ordering on the Deformation Behavior and Mechanical Properties of Metallic Glasses: *Yuchi Wang*¹; Pengyang Zhao²; Soohyun Im¹; Jinwoo Hwang¹; Yunzhi Wang¹; ¹The Ohio State University; ²Shanghai Jiao Tong University

Long-time Structural Evolution of a Metallic Glass at Elevated Temperature Measured by XPCS: *Birte Riechers*¹; Amlan Das²; Eric Dufresne³; Robert Maass¹; ¹Federal Institute for Materials Research and Testing (BAM); ²University of Illinois at Urbana-Champaign; ³Argonne National Laboratory

High-resolution Transmission Electron Microscopy Study of Rejuvenation in Bulk Metallic Glasses: *Iurii Ivanov*¹; Lindsay Greer¹; ¹University of Cambridge

Pressure Effects in Zr-based Super-cooled Liquids: *Wojciech Dmowski*¹; Stanislaw Gierlotka²; Geun Hee Yoo³; Eun Soo Park³; Takeshi Egami¹; ¹University of Tennessee; ²Polish Academy of Science; ³Seoul National University

Phenomenology of Viscosity and Transport in a Model Fragile Metallic Glass: *Peter Derlet*¹; Hugo Bocquet¹; Robert Maass²; ¹Paul Scherrer Institut; ²BAM

Mechanisms of Strain-hardening in Metallic Glasses: *A. Lindsay Greer*¹; Y. Li²; A. Inoue³; ¹University of Cambridge; ²Institute of Metal Research; ³Josai International University

Metallic Glacial Glass Formation by a First-order Liquid-liquid Transition: *Yonghao Sun*¹; ¹Institute of Physics, the Chinese Academy of Sciences

Strain-dependent Shear-band Structure in a Metallic Glass: *Robert Maass*¹; ¹Federal Institute for Materials Research and Testing (BAM)

Crystallization of a Au-based Bulk Metallic Glass: Influence of the Initial Glassy State: *Owain Houghton*¹; Yurii Ivanov¹; A. Lindsay Greer¹; ¹Dept. Materials Science & Metallurgy, University of Cambridge

Synchrotron X-ray Diffraction of Metallic Glass Rejuvenated under Triaxial Compression: *Nikolaos Panagiotopoulos*¹; Konstantinos Georgarakis²; Yi Li³; Alan Greer¹; ¹University of Cambridge; ²Cranfield University; ³Chinese Academy of Sciences

Statistical Analysis on Single Versus Successive Pop-ins in Nanoindentation Tests of Zr-based Bulk Metallic Glass: *Priyanka Saini*¹; Upadrasta Ramamurty²; Jae-il Jang³; R.L. Narayan¹; ¹Indian Institute of Technology; ²Nanyang Technological University; ³Hanyang University

ADVANCED MATERIALS**Bulk Metallic Glasses XIX — On-Demand Poster Session**

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

Program Organizers: Robert Maass, Federal Institute for Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Monday AM | March 14, 2022
Advanced Materials | On-Demand Poster Hall

Amorphization of Si in Al-Cu-Si Ternary Alloy System with Liquid Quenching Process: *Rui Yamada*¹; Junpei T. Okada²; Takeshi Wada²; Haruka Isano³; Tomohiro Yoshikawa³; Junji Saida¹; ¹Frontier Research Institute for Interdisciplinary Sciences, Tohoku University; ²Institute for Materials Research, Tohoku University; ³Graduate School of Engineering, Tohoku University

Bulk Intrinsic Heterogeneity of Metallic Glasses Probed by Meissner Effect: *Shubin Li*¹; *Fujun Lan*²; Qian Dong²; Qiaoshi Zeng¹; ¹Center for High Pressure Science & Technology Advanced Research; ²Shanghai Jiao Tong University

Compression Experiments on Metallic Glass Specimens of Varying Size Differentiate between Models of Plasticity: *Alan Long*¹; Wendelin Wright²; Xiaojun Gu²; *Karin Dahmen*¹; ¹University of Illinois; ²Bucknell University

Evolutionary Design of Machine-learning Predicted Bulk Metallic Glasses: *Robert Forrest*¹; A. Greer¹; ¹University of Cambridge

Microstructures and Mechanical Properties of Non-toxic TiZr-based BMG Foams with Customized Porosity for Bio-implant Application: *Po-Sung Chen*¹; Yu-Chin Liao¹; Sin-Mao Song¹; Pei-Hua Tsai¹; Jason S. C. Jang¹; Xavier Pei-Chun Wong²; Van Tai Nguyen³; ¹National Central University; ²Taipei Medical University; ³Can Tho University

LIGHT METALS

Cast Shop Technology — On-Demand Oral Presentations

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

Program Organizers: Stephen Instone, Speira GmbH; Mertol Gökelma, Izmir Institute of Technology; Samuel Wagstaff, Oculatus; Dmitry Eskin, Brunel University

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Digital Twin for Design and Optimization of DC Casting Lines: *Knut Omdal Tveito*¹; Arild Håkonsen²; ¹Hydro Aluminium; ²Hycast AS

Analytical, Numerical and Experimental Investigations of Transient Heat Conduction in Launder during Casting Process: *Akash Pakanati*¹; Knut Tveito¹; ¹Norsk Hydro

The Local Squeeze Technology for Challenging Aluminium HPDC Automotive Components: *Elisa Fracchia*¹; Federico Simone Gobber²; Claudio Mus³; Raul Pirovano⁴; Mario Rosso¹; ¹INSTM c/o Politecnico di Torino; ²Politecnico di Torino; ³Endurance Overseas; ⁴XC Engineering Srl

Quantitative Assessment of Operational Parameters on Die Temperature during an Industrial Low-pressure Die Casting Process: *Jun Ou*¹; Chunying Wei¹; Steve Cockcroft¹; Daan Majjer¹; Lin Zhu²; Lateng A²; ¹UBC; ²Dicastal Co., LTD

Casthouse Furnace Tending: A New Approach Thanks to Custom Robotics: *Jean Francois Desmeules*¹; Robert Dumont¹; ¹Dynamic Concept

Short- and Long-term Aluminum Filtration Trials with Carbon-bonded Alumina Filters: *Claudia Voigt*¹; Jana Hubáľková¹; Are Bergin²; Robert Fritzsche²; Shahid Akhtar³; Ragnhild Aune²; Christos Aneziris¹; ¹Institute Of Ceramics, Refractories And; ²Department of Materials Science and Engineering, Norwegian University of Science and Technology; ³Hydro Aluminium AS, Karmøy Primary Production

Adaptive Tempering in High Pressure Die Casting through Prediction Functions: *Torben Disselhoff*¹; Sebastian Tewes¹; Sebastian Biehl²; ¹University Duisburg-Essen; ²thermobiehl Apparatebau GmbH

Aluminum Melt Cleanliness Analysis Based on Direct Comparison of Computationally Segmented PoDFA Samples and LiMCA Results: *Robert Fritzsche*¹; Hannes Zedel¹; Trygve Schanche¹; Are Bergin²; Shahid Akhtar³; Lars Arnberg¹; Ragnhild E. Aune¹; ¹Dept. of Materials Science and Engineering, Norwegian University of Science and Technology (NTNU); ²Hydro Aluminium AS, Commercial Technology, Sunndalsøra, NORWAY; ³Hydro Aluminium AS, Karmøy Primary Production, 4265 Håvik, NORWAY

Numerical and Experimental Investigation of Heat Transfer in the Solidification-deformation Zone during Twin-roll Casting of Aluminum Strips: *Olexandr Grydin*¹; Dag Mortensen²; Moritz Neuser¹; Dag Lindholm²; Hallvard Fjær²; Mirko Schaper¹; ¹Materials Science, Paderborn University; ²Institute for Energy Technology

Microstructural Modification of a High-pressure Die-cast A380 Alloy through Friction Stir Processing and Its Effect on Mechanical Properties: *Avik Samanta*¹; Hrishikesh Das¹; David Garcia¹; Robert Seffens¹; Timothy Roosendaal¹; Anthony Guzman¹; Glenn Grant¹; Saumyadeep Jana²; ¹Pacific Northwest National Laboratory

Control Pin Refractory Reaction in High Magnesium Aluminium-melts: *Reiza Mukhlis*¹; John Grandfield²; M. Akbar Rhamdhani¹; ¹Swinburne University of Technology; ²Grandfield Technology Pty Ltd

The Great Debate - High vs Low Water Direct Chill Casting Pits - Which is Safer: *Alex Lowery*¹; ¹Wise Chem LLC

Predicted Back-meniscus Stability for the Horizontal Single Belt Casting (HSBC) with Single Impingement Feeding System: *Daniel Ricardo Gonzalez Morales*¹; Mihaela Isac¹; Roderick Guthrie¹; ¹McGill Metals Processing Center

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — On-Demand Oral Presentations

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhamyies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Monday AM | March 14, 2022
Characterization | On-Demand Room

Session Chair: Mingming Zhang, Wood Mackenzie

Direct Correlation of Frank Loop Nature and Morphology in Self-ion Irradiated Nickel: *Kan Ma*¹; Brigitte Décamps²; Anna Fraczkiewicz³; Frédéric Prima⁴; Marie Loyer-Prost¹; ¹DEN-Service de Recherches de Métallurgie Physique, CEA; ²IJCLab, Université Paris-Saclay; ³MINES Saint-Etienne, Université de Lyon; ⁴PSL Research University-Chimie ParisTech

Machine Learning Enabled Atom Tomographic Imaging of Chemical Short-range Order in Fe-18Al: *Yue Li*¹; Zhangwei Wang²; Leigh T. Stephenson¹; Baptiste Gault¹; ¹Max-Planck-Institut Fur Eisenforschung; ²Central South University

Leaching Cobalt from a Nickel-containing Copper-cobalt Zebesha Ore: *Yotamu Hara*¹; *Foibe Uahengo*¹; Rainford Hara¹; Nachikonde Fumpa¹; Alexander Old¹; Golden Kaluba¹; ¹Copperbelt University

Exploring Three Dimensional Orientation and Residual Stresses in Railway Steels: *Can Yildirim*¹; Yubin Zhang²; Erika Steyn³; Fang Liu³; Carsten Detlefs¹; Casey Jessop³; Johan Alstrom³; ¹European Synchrotron Radiation Facility; ²Technical University of Denmark; ³Chalmers University of Technology

Microstructural Characterisation of AA5083 in AA5083/SiC Co-continuous Ceramic Composites (C4) Fabricated by Gravity and Gas Pressure Infiltration: Georgia Warren¹; Jianshen Wang²; AS Prasanth²; Krishna Shankar¹; V Krishna Raj³; R Ramesh⁴; *Juan Escobedo-Diaz*¹; ¹School of Engineering and Information Technology, University of New South Wales, Canberra, Australia; ²Department of Mechanical Engineering, PSG College of Technology, Coimbatore, India; ³Department of Production Engineering, PSG College of Technology, Coimbatore, India; ⁴Department of Mechanical Engineering, PSG Institute of Technology and Applied Research, Coimbatore, India

Temperature Monitoring of Bearings in Railway Vehicles Using Infrared Thermography Technology: Jeongguk Kim¹; ¹Korea Railroad Research Institute

Interaction between Iron Ore and Magnesium Additives during Pellet Roasting Process: Lianda Zhao¹; Jingsong Wang¹; Qingguo Xue¹; Hong Su¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing

Development of Surface Tension and Heat Capacity Measurement Techniques for Molten Materials Using Aerodynamic Levitation: Yifan Sun¹; Hiroaki Muta¹; Yuji Ohishi¹; ¹Osaka University

Coking Coal Macromolecular Structural Characteristic and Its Correlations with the Compressive Strength of CaO-containing Carbon Pellets: Xiaomin You¹; Xuefeng She¹; Jingsong Wang¹; Qingguo Xue¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing

SAXS Tomography of Multilayered Al-Zn-Mg Alloy Sheets: Shan Lin¹; Hiroshi Okuda¹; ¹Kyoto University

Low-temperature Preparation and Mechanism Study of Vanadium Nitride: Yongjie Liu¹; Qingqing Hu¹; Donglai Ma¹; Yue Wang¹; Zhixiong You¹; ¹Chongqing University

Application of Flue Gas Desulfurization Waste for the Production of Geopolymer Tiles: Markssuel Marvila¹; Afonso Azevedo¹; Felipe Gama¹; Euzébio Zanelato¹; Sergio Monteiro¹; Carlos Mauricio Vieira¹; ¹Universidade Estadual do Norte Fluminense Darcy Ribeiro

Separation of Nickel and Cobalt from Nickel and Cobalt Solution by Cyanex272: Yan Ganggang¹; Wang Zibiao²; Le Dinghao²; Sun Xintao²; Zhang Xijun¹; Chen Dalin¹; ¹State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization; ²Central south university

Evolution of the Thermal Conductivity of Sintered Ag Paste as a Function of the Density, the Roughness of the Interface and Aging: Anas Sghur¹; Yann Billaud¹; Loïc Signor¹; Pascal Gadaud¹; Didier Saury¹; Xavier Milhet¹; ¹Prime Institut

High-speed X-rays for Quantitative Analyses of Dynamic Events: Andrew Brown¹; Thomas Plaisted¹; Hans Broos²; Frits Hilvers²; ¹DEVCOM U.S. Army Research Laboratory; ²TNO

Lowering the Presence of Heavy Metals in Textured Coat Using Recycled Post Consumer Glass: Andrew Adejo¹; Adele Garkida²; Clement Gonah²; Eric Opoku²; ¹Federal University of Lafia; ²Ahmadu Bello University

Adsorption of Iron, Copper, Chromium and Cadmium in Cobalt Sulfate Solution by Goethite: Sujun Lu¹; Jiang Cao²; Yuanyuan Li²; Guoju Chen¹; Priska Jesika²; Guanwen Luo²; ¹State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization; ²Central South University

Degradation of Structure and Properties of Coke in Blast Furnace: Effect of High Temperature Heat Treatment: Jingbo Chen¹; Shengfu Zhang¹; Yan Guo¹; ¹Chongqing University

Strength and Failure Characterization of the Gibeon (IVA) Iron Meteorite: Md Fazle Rabbi¹; Khaled Khafagy¹; Laurence Garvie¹; Erik Asphaug²; Desiree Cotto-Figueroa³; Aditi Chattopadhyay¹; ¹Arizona State University; ²University of Arizona; ³University of Puerto Rico at Humacao

CHARACTERIZATION

Characterization of Minerals, Metals and Materials 2022 — On-Demand Poster Session

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

Program Organizers: Mingming Zhang, Wood Mackenzie; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; 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, DEVCOM U.S. Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Zhiwei Peng, Central South University

Monday AM | March 14, 2022
Characterization | On-Demand Poster Hall

Session Chair: Mingming Zhang, Wood Mackenzie

Characterization of Slag and Growth of Ferronickel Grains during Smelting of Nickel Laterite Ore: Donglai Ma¹; Jianbo Zhao¹; Hanghang Zhou¹; Zhixiong You¹; ¹Chongqing University

Evaluation of Recyclable Thermoplastics for the Manufacturing of Wind Turbines Blades H-Darrieus: Andrés Olivera Castillo¹; Edwin Chica¹; Henry Colorado¹; ¹Universidad de Antioquia

Coking Coal Macromolecular Structural Characteristic and Its Correlations with the Compressive Strength of CaO-containing Carbon Pellets: Xiaomin You¹; Jingsong Wang¹; Xuefeng She¹; Qingguo Xue¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing

Synthesis and Electrical and Magnetic Characterization of Electroceramics Type Ba_{1-x}EuxTi_{1-x}/4O₃ (x = 0.001 and x = 0.005% by Weight Eu³⁺): Juan Hernández-Lara¹; M. Pérez-Labra¹; A. Hernández-Ramírez²; J. A. Romero-Serrano²; F. R. Barrientos-Hernández²; J.C. Juárez-Tapia³; M. Reyes-Pérez¹; V. E. Reyes-Cruz¹; ¹UAEH; ²National Polytechnic Institute

Characterization of Soil from Areas Degraded by Mining Activity in Campos dos Goytacazes-RJ, Brazil: Afonso Azevedo¹; Júlia Brainer¹; Markssuel Marvila¹; Gustavo Xavier¹; Sergio Monteiro²; ¹Universidade Estadual do Norte Fluminense; ²IME

Characterization of Mortar in Fresh State with the Addition of Acai Fiber: Afonso Azevedo¹; Diego Rocha¹; Thuany Lima¹; Markssuel Marvila¹; Euzébio Zanelato²; Jonas Alexandre¹; Sergio Neves Monteiro³; Henry Colorado⁴; ¹Universidade Estadual do Norte Fluminense; ²IFF; ³IME; ⁴Universidad de Antioquia

Comparative Study of Staining Resistance for Polished and Resined Silicatic Ornamental Rocks: Silmara Rocha¹; Evanizis Castilho²; Afonso Azevedo³; Lucas Reis³; Markssuel Marvila³; Sergio Neves Monteiro⁴; ¹IFES; ²UENF/IFES; ³Universidade Estadual do Norte Fluminense; ⁴IME

Characterization and Stain Analysis in Natural and Artificial Rocks: Marialice Freitas¹; Evanizis Castilho²; Afonso Azevedo²; José Alexandre Linhares Júnior²; Markssuel Marvila²; Sergio Neves Monteiro³; ¹IFES; ²Universidade Estadual do Norte Fluminense; ³IME

Development of Metakaolin Based Geopolymer Mortar and the Flue Gas Desulfurization (FGD) Waste: Leandro Oliveira¹; Afonso Azevedo¹; Markssuel Marvila¹; Carlos Mauricio Vieira¹; Niander Cerqueira¹; Sergio Neves Monteiro²; ¹Universidade Estadual do Norte Fluminense; ²IME

Determination of Strength to the Hard Body Impact of Raw, Resinate and Screened Ornamental Rocks: Andréia Hilário¹; Evanizis Castilho²; Afonso Azevedo³; Thuany Lima³; Markssuel Marvila³; Sergio Neves Monteiro⁴; ¹IFES; ²UENF/IFES; ³Universidade Estadual do Norte Fluminense; ⁴IME

Comparative Study of the Flexural Strength of Rock Materials for Applications in Civil Construction: Lynda Campos¹; Evanizis Castilho¹; Afonso Azevedo²; Tulane Silva²; Markssuel Marvila²; Euzébio Zanelato²; Sergio Neves Monteiro³; ¹IFES; ²Universidade Estadual do Norte Fluminense; ³IME

Study of the Determination of Hardbody Impact Resistance of Screened and Non-screened Ornamental Rocks of Different Thickness: Matheus Braga¹; Evanizis Castilho²; Afonso Azevedo³; Ariana Cruz³; Markssuel Marvila³; Sergio Neves Monteiro³; ¹IFES; ²UENF / IFES; ³Universidade Estadual do Norte Fluminense

Evaluation of Mortars with the Addition of Natural and Treated Açai Core (Euterpe Oleracea Mart.): Gabriel Monteiro¹; Afonso Azevedo²; Markssuel Marvila¹; Jorge de Brito²; Jonas Alexandre¹; Sergio Neves Monteiro³; ¹Universidade Estadual do Norte Fluminense; ²Universidade de Lisboa; ³IME

Use of Glass Waste as a Geopolymerization Reaction Activator for Ceramic Materials: Afonso Azevedo¹; Markssuel Marvila¹; Leandro Oliveira¹; Daiane Cecchin¹; Paulo Matos²; Gustavo Xavier¹; Carlos Mauricio Vieira¹; Sergio Monteiro³; ¹Universidade Estadual do Norte Fluminense; ²UFSM; ³IME

Fundamental Study on Wettability of Pure Metal Using the Low-melting Temperature Alloy - Theoretical Approach: Jun-Ichi Saito¹; Hideo Shibutani²; Yohei Kobayashi³; ¹Japan Atomic Energy Agency; ²Kurume Institute of Technology; ³National Institute of Technology, Maizuru College

Fundamental Study on Wettability of Pure Metal Using the Low-melting Temperature Alloy - Experimental Approach -: Yohei Kobayashi¹; Jun-ichi Saito²; Hideo Shibutani³; ¹National Institute of Technology, Maizuru college; ²Japan Atomic Energy Agency; ³Kurume Institute of Technology

Comparison of Ceramic Blocks Incorporated with Ornamental Rock Waste in Hoffman and Caieira Furnace: Euzébio Zanelato¹; Afonso Azevedo²; Markssuel Marvila³; Sergio Monteiro⁴; Jonas Alexandre³; ¹IFF; ²Universidade Estadual do Norte Fluminense; ³UENF; ⁴IME

Evaluation of the Rheology of Mortars with Incorporation of Ornamental Stone Waste: Euzébio Zanelato¹; Afonso Azevedo²; Markssuel Marvila²; Sergio Monteiro³; ¹IFF; ²UENF; ³IME

Characterization of Blast Furnace Slag for Preparing Activated Alkali Cements: Markssuel Marvila¹; Afonso Azevedo²; Euzébio Zanelato¹; Sergio Monteiro¹; Carlos Mauricio Vieira¹; ¹Universidade Estadual do Norte Fluminense Darcy Ribeiro

An Investigation of the Relationship between Raw Coal Caking Characteristics and Its Petrographic Properties: Yucen Kuang¹; Wei Ren²; Lechi Zhang¹; Shengfu Zhang¹; ¹Chongqing university; ²Technical Centre, Angang Steel Company Limited, Anshan, Liaoning 114021, China.

Influence of pH Regulating Additives on the Performance of Granite Waste Based Paints: Márcia Lopes¹; Leonardo Pedroti¹; Hellen Moura²; José Maria Carvalho³; José Carlos Ribeiro¹; Gustavo Nalon¹; ¹Federal University of Viçosa

ENERGY & ENVIRONMENT

Composite Materials for Sustainable Eco-Friendly Applications — On-Demand Oral Presentations

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Simona Hunyadi Murph, Savannah River National Laboratory

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

The Formation of Schwertmannite and Its Influence on Mine Environment: Yao Xiong; ¹Central South University

Characterization of PLA Bio-nanocomposites with Bacterial Cellulose Derived from Banana Peels: Erin-Nicole Scott¹; ¹Tuskegee University MSE Department

Recycling Diesel Combustion Byproducts as Anode Electrode Material for Lithium-ion Batteries: Darrell Gregory¹; Sisi Yang²; Cody Massion¹; Mileva Radonjic¹; Stephen Cronin²; Omer Ozgur Capraz¹; ¹Oklahoma State University; ²University of Southern California

Understanding Photocarrier and Gas Dynamics to Rationally Design Heterostructured Nanocatalysts for Solar CO₂ Conversion: Anthony Thompson¹; ¹Savannah River National Laboratory

ENERGY & ENVIRONMENT

Composites for Energy Applications: Materials for Renewable Energy Applications 2022 — On-Demand Oral Presentations

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

Program Organizers: Patrick Ward, Savannah River National Laboratory; Joseph Tepovich, California State University Northridge; Anthony Thompson, Savannah River National Laboratory; Simona Hunyadi Murph, Savannah River National Laboratory

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Invited

Plasmon-initiated Hydrogen Desorption: Katherine Hurst¹; Steven Christensen¹; Ashley Gaulding¹; Ana Sanz-Matias²; Pragya Verma²; Noemi Leick¹; David Prendergast²; Thomas Gennett¹; ¹National Renewable Energy Laboratory; ²Lawrence Berkeley National Laboratory

Invited

Nanoconfined Metal Hydrides as Solid-State Electrolytes and as Reversible Hydrogen Storage Materials: Vitalie Stavila¹; ¹Sandia National Laboratories

Invited

Development of Hydrogen Storage and Gas Purification Materials for Renewable Energy Applications: Godwin Severa¹; ¹University of Hawaii, Hawaii Natural Energy Institute

Invited

System Modeling of Metal Hydrides for Fuel Cell Vehicles: *Kriston Brooks*¹; Lenna Mahoney¹; ¹Pacific Northwest National Laboratory

A Review on Epoxy Filled Metallurgical Dust- phase change materials Systems for Enhanced Thermal Energy Storage: *Daniel Okanigbe*¹; ¹Tshwane University of Technology

Eutectic Electrolytes for Lithium Ion Batteries: *Nathaniel Hardin*¹; ¹SRNL

Spectroscopic Investigation of the Electronic and Excited State Properties of Para-substituted Tetraphenyl Porphyrins and Their Electrochemically Generated Ions: *Lauren Hanna*¹; Joseph Teprovich²; Patrick Ward¹; ¹Savannah River National Laboratory; ²California State University Northridge

Densification and Microstructure Features of Lithium Hydride Fabrication: *Christian Bustillos*¹; Gabriella King¹; Jaben Root¹; Joshua Kuntz¹; Wyatt Du Frane¹; ¹Lawrence Livermore National Laboratory

PHYSICAL METALLURGY**Computational Thermodynamics and Kinetics — On-Demand Oral Presentations**

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoulia, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Monday AM | March 14, 2022

Physical Metallurgy | On-Demand Room

Invited

Magnetic-field-induced Phonon Stiffening Enhances Demagnetization Entropy in a Shape Memory Alloy: *Michael Manley*¹; Paul Stonaha¹; Nick Bruno²; Ibrahim Karaman²; Raymundo Arroyave²; Douglas Abernathy¹; Songxue Chi¹; Jeffrey Lynn³; ¹Oak Ridge National Laboratory; ²Texas A&M University; ³NIST

Invited

Modelling Columnar-to-equiaxed Transition during Additive Manufacturing: *Durga Ananthanarayanan*¹; Niklas Holländer Pettersson¹; Greta Lindwall¹; ¹Kth Royal Institute Of Technology

Invited

Slow Interface Dynamics from Atomistic Simulations: *Chad Sinclair*¹; Siavash Soltani¹; Joerg Rottler¹; ¹Univ. of British Columbia

Invited

Thermodynamics of Ferroelectrics beyond Phenomenological Landau Theory: A Case Study of PbTiO₃: *Zi-Kui Liu*¹; Jinglian Du¹; Yi Wang¹; Shunli Shang¹; ¹Pennsylvania State University

Invited

Machine Learning for Inverse Crystal Structure and Topology Design: Suvo Banik¹; Troy Loeffler¹; Rohit Batra²; *Subramanian Sankaranarayanan*¹; Sukriti Manna¹; ¹University of Illinois-Chicago; ²Argonne National Lab

Invited

Uncertainty Driven Computational Thermodynamics: *Noah Paulson*¹; Joshua Gabriel¹; ¹Argonne National Laboratory

Invited

Phase Field Modelling of Microstructure Formation in Rapidly Solidified Steel: *Nikolas Provatas*¹; Salvador Valtierra Rodriguez¹; Damien Pinto¹; Michael Greenwood²; ¹McGill University; ²McMaster University

Phase-field Model of Solid Stoichiometric Compounds and Solution Phases: *Yanzhou Ji*¹; Long-Qing Chen¹; ¹Penn State University

Data-driven Magnetic Materials Modeling; Advances in Classical Molecular Dynamics: *Svetoslav Nikolov*¹; Mitchell Wood¹; Aidan Thompson¹; Julien Tranchida¹; ¹Sandia National Laboratories

Vacancy Ordering in Zirconium Carbide Explored via First-principles Calculations and Calphad: *Theresa Davey*¹; Ying Chen¹; ¹Tohoku University

Ab-initio Insights into the Impact of the Wet-synthesis Conditions on the Structure and Composition of Metal Nano-aerogels: *Mira Todorova*¹; Su-Hyun Yoo¹; Poulami Chakraborty¹; Tilmann Hickel¹; Se-Ho Kim¹; Baptiste Gault¹; Joerg Neugebauer¹; ¹Max-Planck-Institut Fuer Eisenforschung

Solute Drag Assessment of Grain Boundary Migration in Au Using Atomistic Simulations: *Ayush Suhane*¹; Daniel Scheiber²; Maxim Popov²; Vsevolod Razumovskiy²; Lorenz Romaner³; Matthias Militzer¹; ¹The Centre for Metallurgical Process Engineering, The University of British Columbia, Vancouver, Canada; ²Materials Center Leoben Forschung GmbH, Roseggerstrasse 12, 8700 Leoben, Austria; ³Department of Materials Science, University of Leoben, Leoben, Austria

Uncertainty Quantification for Ferromagnetic-Paramagnetic Phase Transition Onset by Integrating an Analytical Approach into Ising Models: *Md Mahmudul Hasan*¹; Arulmurugan Senthilnathan¹; Pinar Acar¹; ¹Virginia Tech

Multi-scale Crystal Plasticity Model for Superalloys: *Shahriyar Keshavarz*¹; Carelyn Campbell¹; Andrew Reid¹; ¹NIST

PHYSICAL METALLURGY**Computational Thermodynamics and Kinetics — On-Demand Poster Session**

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Vahid Attari, Texas A&M University; Sara Kadkhodaei, University Of Illinois At Chicag; Eva Zarkadoulia, Oak Ridge National Laboratory; Damien Tournet, IMDEA Materials Institute; James Morris, Ames Laboratory

Monday AM | March 14, 2022

Physical Metallurgy | On-Demand Poster Hall

3D-reconstruction of Sectioning Nephograms Based on Simulated Results: *Xiao Han*¹; ¹Beijing Jiaotong University

Effect of Alloying Elements on the Stability of (Cr,Zr) Intermetallic Phases: *Theresa Davey*¹; Ying Chen¹; ¹Tohoku University

Thermodynamic Database of Sm-Ti Binary System from First-principles Calculations: *Arkapol Saengdeejeing*¹; Ying Chen¹; ¹Tohoku University

Simulation and Experimental Characterization of Intragranular Ferrite Nucleation on Deformation Induced (Ti,V)(C,N) Precipitates in Microalloyed Steel: Evelyn Sobotka¹; Johannes Kreyca²; Nora Fuchs¹; Tomasz Wojcik¹; Erwin Povoden-Karadeniz¹; ¹Christian Doppler Laboratory for Interfaces and Precipitation Engineering (CDL-IPE), Institute of Materials Science and Technology, TU Wien, Vienna, Austria; ²Voestalpine Forschungsservicegesellschaft Donawitz GmbH

Evaluation of Semi-solid Shear Deformation Behavior Using the Multi-phase-field Lattice Boltzmann Method: Namito Yamamaka¹; Shinji Sakane¹; Tomohiro Takaki¹; ¹Kyoto Institute of Technology

Development of a Twin Experiment-validated Data Assimilation System for Dendrite Growth with Melt Convection Using Phase-field Lattice Boltzmann Method: Ayano Yamamura¹; Shinji Sakane¹; Munekazu Ohno²; Tomohiro Takaki¹; ¹Kyoto Institute of Technology; ²Hokkaido University

Investigation of Phase-field Data Assimilation System Using In-situ Observation Results Obtained during Dendrite Growth in Thin Films: Yuki Imai¹; Tomohiro Takaki¹; Shinji Sakane¹; Munekazu Ohno²; Hideyuki Yasuda³; ¹Kyoto Institute of Technology; ²Hokkaido University; ³Kyoto University

Multiphysics Modelling of Additively Manufactured Cellular Structures Using Selective Laser Melting: Mahmoud Elsadek¹; Tarek Hatem¹; ¹The British University in Egypt

A Tailor-made Experimental Setup for Thermogravimetric Analysis of the Hydrogen- and Carbon Monoxide- based Reduction of Iron (III) Oxide (Fe₂O₃) and Zinc Ferrite (ZnOFe₂O₃): Ulrich Brandner¹; Juergen Antrekowitsch¹; Felix Hoffelner¹; Manuel Leuchtenmueller¹; ¹Montanuniversitaet Leoben

MATERIALS PROCESSING

Defects and Properties of Cast Metals IV — On-Demand Oral Presentations

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; Andrew Kao, University of Greenwich; Kyle Fezi, Fort Wayne Metals

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Research Progress of Composite Preparation Technology of Bimetallic Wire: Chenglin Li¹; Tingan Zhang¹; Yan Liu¹; ¹Northeastern University

Porosity Defects in High Pressure Die Castings: Mechanisms and Uncertainties: Shishira Bhagavath¹; Zhixuan Gong²; Tim Wigger²; Saurabh Shah²; Shashidhara Marathe³; Bitu Ghaffari⁴; Mei Li⁴; Shyamprasad Karagadde¹; Peter Lee²; ¹Indian institute of Technology Bombay, India; ²University College London, UK; ³Diamond Light Source, UK; ⁴Ford Research and Advanced Engineering, Dearborn, USA

Probabilistic Multiscale Finite Element Model for Predicting Strength and Fracture Strain of Cast Al-Si-Mg Alloy: Woojin Jeong¹; Chanyang Kim¹; Chung-An Lee²; Hyukjong Bong³; Seung-Hyun Hong²; Myoung-Gyu Lee¹; ¹Seoul National University; ²Hyundai Motor Company; ³Korea Institute of Materials Science

Hybrid Additive Manufacturing of Island Grain Bicrystals: Logan Ware¹; Benjamin Herstein²; Yuxuan Zhang³; Hassina Bilheux³; Zachary Cordero⁴; ¹Purdue University; ²Rice University; ³Oak Ridge National Laboratory; ⁴Massachusetts Institute of Technology

Reduced-Order Multiscale Modeling of Elasto-Plastic Cast Alloys with Process-Induced Porosity: Shiguang Deng¹; Carl Soderhjelm¹; Diran Apelian¹; Ramin Bostanabad¹; ¹University of California Irvine

Modification of Cast and Wrought Aluminum Parts Using Hybrid Laser Hot-wire Manufacturing: Gerald Knapp¹; Thomas Feldhausen¹; Ying Yang¹; Benjamin Stump¹; Donovan Leonard¹; Alex Plotkowski¹; ¹Oak Ridge National Laboratory

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys — On-Demand Oral Presentations

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

Program Organizers: Mark Hardy, Rolls-Royce Plc; Jonathan Cormier, ENSMA - Institut Pprime - UPR CNRS 3346; Jeremy Rame, Safran Aircraft Engines; Akane Suzuki, GE Research; Jean-Charles Stinville, University of California, Santa Barbara; Paraskevas Kontis, Norwegian University of Science and Technology; Andrew Wessman, University of Arizona

Monday AM | March 14, 2022
Mechanics & Structural Reliability | On-Demand Room

Invited

Microstructurally-sensitive Fatigue Crack Nucleation and Growth in Nickel Single Crystals: Vassilios Karamitros¹; Duncan MacLachlan¹; Fionn Dunne¹; ¹Imperial College

Microstructural Evolution of Borides at 850\176C in a Polycrystalline Superalloy and Implications on Creep Performance: Lola Liliensten¹; Aleksander Kostka²; Sylvie Lartigue-Korinek³; Baptiste Gault⁴; Sammy Tin⁵; Stoichko Antonov⁴; Paraskevas Kontis⁴; ¹Chimie ParisTech; ²Ruhr-Universität Bochum; ³Institut de Chimie et des Matériaux Paris Est; ⁴Max-Planck-Institut für Eisenforschung GmbH; ⁵University of Arizona

Design of Cast Alumina-forming Austenitic Alloys for Extreme Environments: Yukinori Yamamoto¹; Michael Brady¹; Govindarajan Muralidharan¹; James Haynes¹; Arun Devaraj²; Bharat Gwalani²; Libor Kovarik²; ¹MSD, Oak Ridge National Laboratory; ²Pacific Northwest National Laboratory

Quantification of the Temperature and Strain Rate Dependent Evolution of Defect Structures in a CoNi-base Superalloy: Andreas Bezold¹; Nicklas Volz¹; Jan Vollhüter¹; Malte Lenz¹; Nicolas Karpstein¹; Christopher Zenk¹; Erdmann Spiecker¹; Mathias Göken¹; Steffen Neumeier¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg

Enhanced 900 °C-yield Strength in Inconel 738 Superalloys While Reducing Expensive Co Compositions: Hyo Ju Bae¹; Kwang Kyu Ko¹; Joong Eun Jung²; Jung Gi Kim¹; Hyokyung Sung¹; Jae-Bok Seol¹; ¹Gyeongsang National University; ²Korea Institute of Materials Science

Ferritic Bcc-Superalloys – Slip System Control Through Alloying: Johan Pauli Magnussen¹; David Collins¹; Alexander Knowles¹; ¹University of Birmingham

The Effect of Carbon on the Fabricability and Mechanical Performance of Nimonic 105: Martin Detrois¹; Kyle Rozman¹; Paul Jablonski¹; Jeffrey Hawk¹; ¹National Energy Technology Laboratory

Investigating the Role of Dynamic Strain Aging in 347H Steel Using Crystal Plasticity: *Veerappan Prithivirajan¹; M Arul Kumar¹; Bjorn Clausen¹; Ricardo Lebensohn¹; Laurent Capolungo¹; ¹Los Alamos National Lab*

Machining-induced Microstructural Deformation and Grain Refinement of Ni-base Superalloys under Controlled Thermal Conditions: *Andrea la Monaca¹; Dragos Axinte¹; Zhirong Liao¹; Rachid M'Saoubi²; Mark Hardy³; ¹Rolls-Royce UTC in Manufacturing and On-Wing Technology, University of Nottingham, Nottingham, NG8 1BB, United Kingdom; ²R&D Material and Technology Development, Seco Tools AB, 737 82, Fagersta, Sweden; ³Rolls-Royce plc, PO Box 31, Derby, DE24 8BJ, United Kingdom*

Strengthening via Chemical Segregation to Deformation Twin Boundaries in Co-Ni-Cr-Mo Superalloy: *Stoichko Antonov¹; Qing Tan¹; Baptiste Gault¹; ¹Max-Planck-Institut für Eisenforschung GmbH*

Coupled Diffusional-mechanical Modeling of Hydrogen Embrittlement in Polycrystalline Materials: *Sofia Yassir¹; ¹Mississippi State University*

Ultra-high Temperature Deformation in a Single Crystal Superalloy: Mesoscale Process Simulation and Micro-mechanisms: *Yuanbo Tang¹; Neil D'Souza²; Bryan Roebuck³; Phani Karamched¹; Chinnapat Panwisawas⁴; David Collins⁵; ¹University of Oxford; ²Rolls-Royce plc; ³National Physical Laboratory; ⁴University of Leicester; ⁵University of Birmingham*

Microstructure and Mechanical Properties of Rotary Friction Welded IN-600 and SS316L with Copper Interlayer: *Neeraj Mishra¹; Amber Shrivastava¹; ¹Indian Institute of Technology Bombay*

SPECIAL TOPICS

DMMM4 — On-Demand Oral Presentations

Sponsored by: TMS: Diversity, Equity, and Inclusion Committee

Program Organizers: Aerial Murphy-Leonard, Ohio State University; Mark Carroll, Federal-Mogul Powertrain; Blythe Clark, Sandia National Laboratories; K. Cunningham, ATI Specialty Alloys & Components; Lauren Garrison, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Ashleigh Wright, University of Illinois at Urbana-Champaign; Megan Cordill, Erich Schmid Institute of Materials Science; Jonathan Madison, National Science Foundation; Mitra Taheri, Johns Hopkins University; Clarissa Yablinsky, Los Alamos National Laboratory

Monday AM | March 14, 2022
Special Topics | On-Demand Room

National Laboratories' Research and Development Experience Opportunities for Diverse Scholars: *Simona Hunyadi Murph¹; ¹Savannah River National Laboratory*

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — On-Demand Oral Presentations

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Monday AM | March 14, 2022
Mechanics & Structural Reliability | On-Demand Room

Modeling Hypervelocity Impacts in Additively Manufactured Interpenetrating Composites: *Jason Allen¹; Jiahao Cheng¹; Xiaohua Hu¹; Derek Splitter¹; Amit Shyam¹; ¹Oak Ridge National Laboratory*

Energy Balance of Rapidly Deforming Foam Filled Cylindrical Shells in a High Pressure Fluid Environment: *Carlos Javier¹; Shyamal Kishore²; Koray Senol³; Arun Shukla²; ¹US Naval Undersea Warfare Center; ²University of Rhode Island; ³Edwards Lifesciences*

Multi-fidelity Machine Learning Based Approach to Predict Local Strain Response: *Tyler Dillard¹; Nolan Lewis¹; Abhijeet Dhiman¹; Vikas Tomar¹; ¹Purdue University*

In Situ X-ray Diffraction of Sapphire Single Crystals during Laser Compression and Release: *Anirudh Hari¹; Saransh Singh²; Joel Bernier²; Rohit Hari¹; Raymond Smith²; Thomas Duffy³; Todd Hufnagel¹; June Wicks¹; ¹Johns Hopkins University; ²Lawrence Livermore National Laboratory; ³Princeton University*

High Strain Rate Atomistic and Mesoscale Simulations of Ejecta Jet Formation in Cu and Sn Systems: Probing Initial Conditions for Ejecta Jet Formation: *Marco Echeverria¹; Sergey Galitskiy¹; Alison Saunders²; Tomorr Haxhimali²; Robert Rudd²; Faddy Najjar²; Avinash Dongare¹; ¹University Of Connecticut; ²Lawrence Livermore National Laboratory*

In-situ Shock Stress Field Detection Using Laser Array Raman Spectroscopy: *Abhijeet Dhiman¹; Nolan Lewis¹; Vikas Tomar¹; ¹Purdue University*

Effect of Microstructure and Strain-rate on the Out-of-plane Compressive Response of UHMWPE Composites: *Jason Parker¹; KT Ramesh¹; ¹Johns Hopkins University*

Exploring the Spall Strength of the Interface of Additively Manufactured GRCop-84 and Inconel 625 Bimetallics: *Andrew Boddorff¹; Sungwoo Jang¹; Gregory Kennedy¹; Naresh Thadhani¹; ¹Georgia Institute of Technology*

Dynamic Non-equilibrium Plastic Flow of Metals under Rapid Heating: *Steven Mates¹; ¹NIST*

Accelerating and Supersonic Dislocation in Metals under Extreme Conditions: *Daniel Blaschke¹; Khanh Dang¹; Saryu Fensin¹; Jie Chen²; Benjamin Szajewski³; Darby Luscher¹; ¹Los Alamos National Laboratory; ²N/A (formerly Los Alamos National Laboratory); ³United States Army Research Laboratory*

High Strain Rate Fracture Properties of Additively Manufactured Stainless Steel: *Kevin Lamb¹; Katie Koube²; Suresh Babu³; Josh Kacher²; Naresh Thadhani²; ¹CNS Y12 / University of Tennessee; ²Georgia Institute of Technology; ³University of Tennessee*

Data Mining the Mesoscale to Study Shock Ignition and Reaction Growth in Pressed Energetic Materials: *Judith Brown¹; Julia Hartig¹; Dan Bolintineanu¹; Mitchell Wood¹; ¹Sandia National Laboratories*

Dynamic and Spall Behavior of Model Binary Magnesium Alloys Using High-throughput Testing Protocols: *Suhas Eswarappa Prameela*¹; Debjoy Mallick¹; Christopher Walker²; Taisuke Sasaki³; Abigail Park¹; Elaine Lipkin¹; Alice Lee¹; Fanuel Mammo¹; Christopher DiMarco¹; Kazuhiro Hono³; George Pharr²; KT Ramesh¹; Timothy Weihs¹; ¹Johns Hopkins University; ²TAMU; ³NIMS

Microstructural Evolution of Pure Aluminum Revealed by In-situ Synchrotron X-ray Diffraction during Shear Deformation in a High-speed Rotational Diamond Anvil Cell: *Tingkun Liu*¹; Bharat Gwalani¹; Joshua Silverstein¹; Changyong Park²; Lei Li¹; Stas Sinogeikin³; Tamas Varga¹; Ayoub Soulam¹; Arun Devaraj¹; ¹Pacific Northwest National Laboratory; ²Argonne National Laboratory; ³DAC Tools, LLC

MECHANICS & STRUCTURAL RELIABILITY

Dynamic Behavior of Materials IX — On-Demand Poster Session

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

Program Organizers: Eric Brown, Los Alamos National Laboratory; Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Marc Meyers, University of California-San Diego; Neil Bourne, University of Manchester; Avinash Dongare, University of Connecticut; Benjamin Morrow, Los Alamos National Laboratory; Cyril Williams, US Army Research Laboratory

Monday AM | March 14, 2022
Mechanics & Structural Reliability | On-Demand Poster Hall

Machine Learning Based Approach to Modeling and Predicting Material Behavior and Failure Criteria in Composites: *Tyler Dillard*¹; Nolan Lewis¹; Abhijeet Dhiman¹; Vikas Tomar¹; ¹Purdue University

Mesoscale Modeling of Deformation Behavior of Fe-based Microstructure under Shock Loading Conditions: *Ke Ma*¹; Avinash Mishra¹; Avinash Dongare¹; ¹University of Connecticut

Modeling of Laser Interactions with Metals Using a Hybrid Atomistic-continuum Approach: *Ching Chen*¹; Sergey Galitskiy¹; Avinash Mishra¹; Avinash Dongare¹; ¹University Of Connecticut

Bulk Crystallographic Texture and Dynamic Elastic Modulus Variation in Laser Additively Manufactured Ti6Al4V: *Mangesh Pantawane*¹; Teng Yang¹; Yuqi Jin¹; Sameehan Joshi¹; Sriswaroop Dasari¹; Abhishek Sharma¹; Arkadii Krokhn¹; Srivilliputhur Srinivasan¹; Rajarshi Banerjee¹; Arup Neogi¹; Narendra Dahotre¹; ¹University of North Texas

Design of Metals and Alloys with High Spall Strengths: *Keira Frawley*¹; Harikrishna Sahu¹; Naresh Thadhani¹; Rampi Ramprasad¹; ¹Georgia Institute of Technology

DynamicTensile Testing of Cu/Ta Multilayered Metal Composites: *Liya Semenchenko*¹; Lauren Poole²; Francis Zok²; Michael Demkowicz¹; ¹Texas A&M University; ²University of California Santa Barbara

Microscale Spall Strength Measurement for CoCrFeMnNi High Entropy Alloy: *Abhijeet Dhiman*¹; Leonardo Facchini¹; Andrew Kustas²; Remi Dingreville²; Vikas Tomar¹; ¹Purdue University; ²Sandia National Laboratories

Amorphization Mechanism under Shock Loading in the Medium Entropy Alloy CoCrNi: *Wurong Jian*¹; Shuozhi Xu¹; Irene Beyerlein¹; ¹University of California, Santa Barbara

LIGHT METALS

Electrode Technology for Aluminum Production — On-Demand Oral Presentations

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

Program Organizers: Stephan Broek, Boston Metal; Dmitry Eskin, Brunel University

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Assessment of Pre-baked Anodes Homogeneity Using Acousto-ultrasonic Testing and 3D Interpolation Methods: *Daniel Rodrigues*¹; Carl Duchesne¹; Donald Picard¹; Julien Lauzon-Gauthier²; ¹Laval University; ²Alcoa Canada

Effect of Coke Type on the Partial Replacement of Coke with Modified Biocoke in Anodes Used in Primary Aluminum Production: Belkacem Amara¹; Duygu Kocaefe¹; Yasar Kocaefe¹; Dipankar Bhattacharyay¹; Jules Côté¹; André Gilbert¹; ¹University of Quebec at Chicoutimi

Ecofriendly Glue for the Aluminium Electrolysis Pot: *Benedicte Allard*¹; Regis Paulus¹; Nicolas Gros¹; Herve Mezin¹; Danny Gagnon²; Claude Fradet²; Gael Lambert³; ¹TOKAI COBEX; ²EQUIBRAS; ³ALVANCE Aluminium Dunkerque

Blocked Fluewall Detection and Improved Safety for Anti-flooding Module, A New Approach for Safer Operations of Anode Baking Furnaces: *Detlef Maiwald*¹; Frank Heinke¹; Sandra Besson²; Diane Tremblay²; Lucas Ruel²; Alexandre Gagnon²; ¹Innovatherm GmbH; ²Rio Tinto Aluminium

The Development of RUSAL's Prebake Anode Production in Support of the Company's Green Initiatives: *Viktor Buzunov*¹; Viktor Mann²; Vitaliy Yakovlev²; Yuriy Frantsev¹; Matvey Golubev¹; Valeriy Polovnikov¹; Mikhail Grinishin¹; ¹Rusal Etc; ²RUSAL

ELECTRONIC MATERIALS

Electronic Packaging and Interconnections — On-Demand Oral Presentations

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

Program Organizers: Tae-Kyu Lee, Cisco Systems; Albert T. Wu, National Central University; Won Sik Hong, Korea Electronics Technology Institute; Kazuhiro Nogita, University of Queensland; Govindarajan Muralidharan, Oak Ridge National Laboratory; David Yan, San Jose State University; Luke Wentlent, Plug Power

Monday AM | March 14, 2022
Electronic Materials | On-Demand Room

Invited

In-situ Observation of Liquid Solder Alloys and Solid Substrate Reactions Using High-voltage Transmission Electron Microscopy: Xin Fu Tan¹; Kazuhiro Nogita¹; Flora Somidin²; Stuart McDonald¹; Hiroshi Maeno³; Syo Matsumura³; ¹University of Queensland; ²Universiti Malaysia Perlis; ³Kyushu University

Invited

Power Cycling and Thermal Cycling Performance of Pressureless Silver Sintered Silicon Carbide Power Module Compared to Lead-free Solder Joint: *Won Sik Hong¹; Mi Song Kim¹; ¹Korea Electronics Technology Institute*

Characterising the Intermetallic Layer in Mixed Sn-Bi Paste/SAC BGA Solder Ball Joints: *Jiye Zhou¹; Qichao Hao¹; Xin Fu Tan¹; Stuart McDonald¹; Kazuhiro Nogita¹; ¹University of Queensland*

Characterisation of $\text{Sn}_{95}\text{Ni}_5$ Formed between Cu-xNi/Sn Couples: *Xin Tan¹; Qinfen Gu²; Michael Bermingham¹; Stuart McDonald¹; Kazuhiro Nogita¹; ¹University of Queensland; ²ANSTO*

Wire Bonding Novel 3D Air-metal Dielectric Structures with ISIG Passivation: Process Development and Reliability: *Yipin Wu¹; Pichaya Sommai¹; Joyce Christiansen-Salameh²; Jim Clatterbaugh¹; Leyla Hashemi-Sadraei¹; ¹Keysight Technologies; ²Keysight Technologies, Cornell University*

Low Temperature Solder Interconnect Board Level Shock Performance at Elevated Temperature: *Tae-Kyu Lee¹; Gnyaneshwar Ramakrishna¹; Young-Woo Lee²; Edward Ibe³; Karl Loh³; ¹Cisco Systems; ²MK Electron; ³Zymet*

Thermal Expansions of βSn and Bi in Sn-Bi Alloys: *Qichao Hao¹; Xin Fu Tan¹; Qinfen Gu²; Stuart McDonald¹; Kazuhiro Nogita¹; ¹The University of Queensland; ²Australian Synchrotron*

Electromigration Behaviors of Nanotwinned Ag Interconnects: *Chi-Shen Chen¹; Tsung Lin¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University*

Transient Liquid Phase (TLP) Bonding in Cu-Ni/Sn-0.7Cu/Cu-Ni Joints: *Nurul Razliana Abdul Razak¹; Xin Fu Tan¹; Stuart McDonald¹; Michael Bermingham¹; Hideyuki Yasuda¹; Kazuhiro Nogita¹; ¹School of Mechanical and Mining Engineering, The University of Queensland*

Corrosion Mechanism of Co-based Surface Finishing Layer: *Si-Wei Lin¹; Albert T. Wu¹; ¹National Central University*

Interfacial Reaction between Cu and In-48Sn Alloy: *Fu-Ling Chang¹; Han-Tang Hung¹; C. Robert Kao¹; ¹National Taiwan University*

Development of Silver-Tin Alloy Paste for High Power IC Packaging by High Energy Ball Milling: *Wei Chen Huang¹; Chin-Hao Tsai¹; C. Robert Kao¹; ¹National Taiwan University*

Electromigration of Cu-Cu Joints Fabricated by of Highly (111)-oriented Nanotwinned Cu: *Shih Chi Yang¹; Chih Chen¹; ¹National Yang Ming Chiao Tung University*

Cu-Cu Bonding with Silver Thin Film Capping Layer: *Hsiang Hou Tseng¹; Chih Chen¹; ¹National Yang Ming Chiao Tung University*

Low Temperature Direct Bonding in Atmosphere on Highly (111) Oriented Nanotwinned Silver: *Ching-Yao Cheng¹; Po-Hsien Wu¹; Fan-Yi Ouyang¹; ¹Dept. of Engineering & System Science, National Tsing Hua University*

Low Temperature and Pressureless Cu-to-Cu Direct Bonding by Sintering of Green Synthesized Cu Nanoparticles: *Albert T. Wu¹; Wei Liu¹; Chang-Meng Wang²; ¹National Central University; ²SHENMAO Technology Inc.*

Synchrotron X-ray Study of Cu Electromigration in A Blech Structure: *Pei-Tzu Lee¹; Cheng-Yu Lee²; Shao-Chin Tseng³; Mau-Tsu Tang³; C. Robert Kao¹; Cheng-En Ho²; ¹National Taiwan University; ²Yuan Ze University; ³National Synchrotron Radiation Research Center (NSRRC)*

Effect of Geopolymer Ceramic Reinforcement to the Microstructure Formation and Mechanical Properties of Sn-0.7Cu Solder Joint: *Mohd Izrul Izwan Ramli¹; Mohd Arif Anuar Mohd Salleh¹; Nur Nadiah Izzati Zulkifli¹; Nur Syahirah Mohamad Zaimi¹; Mohd Mustafa Albakri Abdullah¹; ¹Universiti Malaysia Perlis (UniMAP)*

Low-thermal-budget Hybrid Cu-Cu Bonding with Highly <111>-oriented Nanotwinned Cu and Polyimide: *Pin-Syuan He¹; Kai-Cheng Shie¹; Chih Chen¹; ¹National Yang Ming Chiao Tung University*

Effect of Grain Size and Stress Relaxation on Whisker Growth under Applied Pressure: *Nupur Jain¹; Piyush Jagtap¹; Allan Bower¹; Eric Chason¹; ¹Brown University*

In-situ Observations of Sn-58Bi/SAC305 Joints by Synchrotron Imaging: *Mohd Arif Mohd Salleh¹; M.I.I. Ramli¹; D.S.C. Halin¹; N. Saud¹; T. Nishimura²; H. Yasuda³; K. Nogita⁴; ¹Universiti Malaysia Perlis; ²Nihon Superior Co. Ltd; ³Kyoto University; ⁴The University of Queensland*

The Role of Lengthscale in the Creep of Sn-3Ag-0.5Cu Solder with Controlled Microstructure: *Tianhong Gu¹; Christopher Gourlay²; Ben Britton³; ¹University of Birmingham; ²Imperial College London; ³The University of British Columbia*

Thermal Cycling Reliability Tests of Cu-Cu Joints by Two-step Bonding Processes: *Jia Juen Ong¹; Kai Cheng Shie¹; Chih Chen¹; ¹National Yang Ming Chiao Tung University*

CORROSION

Environmental Degradation of Additively Manufactured Alloys — On-Demand Oral Presentations

Sponsored by: TMS Structural Materials Division, TMS; Corrosion and Environmental Effects Committee, TMS; Additive Manufacturing Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Elizabeth Trillo, Southwest Research Institute; Andrew Hoffman, GE Research; Brendy Rincon Troconis, University of Texas at San Antonio

Monday AM | March 14, 2022
Corrosion | On-Demand Room

Effect of Oxygen on Corrosion Resistance of Stainless Steel 316L Prepared by Powder Bed Fusion: *Xiaolei Guo¹; Eric Schindelholz¹; Hsien Lien Huang¹; Menglin Zhu¹; Szu-Chia Chien¹; Karthikeyan Hariharan¹; Ngan Huynh¹; Jinwoo Hwang¹; Wolfgang Windl¹; Gerald Frankel¹; ¹Ohio State University*

High Temperature Oxidation of Additively and Conventionally Manufactured Heat Resistant Steel: HK30Nb: *Marie Romedenne¹; Bruce Pint¹; Michael Lance¹; Kinga¹; Sebastien Dryepondt¹; ¹Oak Ridge National Laboratory*

CORROSION

Environmental Degradation of Additively Manufactured Alloys — On-Demand Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Additive Manufacturing Committee

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Elizabeth Trillo, Southwest Research Institute; Andrew Hoffman, GE Research; Brendy Rincon Troconis, University of Texas at San Antonio

Monday AM | March 14, 2022
Corrosion | On-Demand Poster Hall

On the Heating Rate Dependent Oxide Formation and Evolution on Laser-based Directed Energy Additively Deposited IN718: Sangram Mazumder¹; Mangesh V. Pantawane¹; Narendra B. Dahotre¹; ¹University of North Texas

CORROSION

Environmental Degradation of Multiple Principal Component Materials — On-Demand Oral Presentations

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; ShinYoung Kang, Lawrence Livermore National Laboratory; XiaoXiang Yu, Northwestern University; Vilupanur Ravi, California State Polytechnic University Pomona; Christopher Weinberger, Colorado State University; Elizabeth Opila, University of Virginia; Bai Cui, University of Nebraska-Lincoln; Mark Weaver, University of Alabama; Bronislava Gorr, Karlsruhe Institute of Technology (KIT); Srujan Rokkam, Advanced Cooling Technologies Inc

Monday AM | March 14, 2022
Corrosion | On-Demand Room

Invited

Hydrogen Embrittlement Behavior of Face-centered Cubic High-entropy Alloys: Hong Luo¹; Zhimin Pan²; Yu Fu²; Xiaogang Li²; ¹Max-Planck-Institut für Eisenforschung; ²University of Science and Technology Beijing

Invited

Nonequilibrium Solute Capture in Complex Alloys: Laurence Marks¹; ¹Northwestern University

Invited

Microstructure and Corrosion of Multi-phase Ni-Fe-Cr-Mo-W-X Multi-principal Element Alloys: Anup Panindre¹; Henk Colijn¹; Babu Viswanathan¹; Carley Goodwin¹; Daniel Huber¹; Christopher Taylor¹; Gerald Frankel¹; ¹Ohio State University

Corrosion Interactions between a Candidate Hollandite Waste Form and Stainless Steel: Chandi Mohanty¹; Keith Bryce²; Xiaolei Guo¹; Kun Yang²; Jie Lian²; Jianwei Wang³; Gerald Frankel¹; ¹The Ohio State University; ²Rensselaer Polytechnic Institute; ³Louisiana State University

Experimental and Numerical Assessment of the Corrosion Behavior of a Friction Stir Processed Equiatomic CrMnFeCoNi High Entropy Alloy in a Neutral Environment: Sam Anaman¹; Solomon Ansah¹; Sung-Tae Hong²; Min-Gu Jo³; Jin-Yoo Suh³; Heung Nam Han⁴; Minjung Kang⁵; Jong-Sook Lee⁶; Hoon-Hwe Cho¹; ¹Hanbat National University; ²University of Ulsan; ³Korea Institute of Science and Technology; ⁴Seoul National University; ⁵Korea Institute of Industrial Technology; ⁶Chonnam National University

Development of a New Aluminum Dissolvable Alloy for Hydraulic Fracturing Applications: Ezz Ahmed¹; Hani Henein¹; Ahmed Qureshi¹; Jing Liu¹; ¹University of Alberta

CORROSION

Environmentally Assisted Cracking: Theory and Practice — On-Demand Oral Presentations

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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Monday AM | March 14, 2022
Corrosion | On-Demand Room

Invited

Multiscale Modeling of Fatigue Crack Growth and Environmental Effects: Ting Zhu¹; ¹Georgia Institute of Technology

Invited

Recent Progress on Modeling Corrosion Damage with Peridynamics: Florin Bobaru¹; ¹University of Nebraska-Lincoln

Invited

Environmentally Assisted Cracking Research for Current and Advanced Nuclear Structural Materials: Rongjie Song¹; Michael McMurtrey¹; Boopathy Kombaiiah¹; Drew Johnson¹; Michael Heighes¹; Peng Xu¹; Colin Judge¹; ¹Idaho National Laboratory

Stress Corrosion Cracking Behavior of Mg-Al-Zn Alloys in Humid Air: Toshiaki Manaka¹; ¹National Institute of Technology(KOSEN), Niihama College

Cold Spray Process to Combat Potential Stress Corrosion Cracking in Used Nuclear Fuel Storage Stainless Steel Canisters: Nicholas Pocquette¹; Hwasung Yeom¹; Hemant Agiwal¹; William Bowman¹; Kenneth Ross²; John Kessler³; Gary Cannell⁴; Frank Pfefferkorn¹; Kumar Sridharan¹; ¹University of Wisconsin-Madison; ²Pacific Northwest National Laboratory; ³J Kessler and Associates; ⁴Fluor Corporation

Mitigation of Stress Corrosion Cracking in Al-Mg via Laser Shock Peening: Eric Dau¹; Matthew McMahon¹; ¹Naval Surface Warfare Center, Carderock Division

Capturing the Effect of Environment and Electrochemistry on Crack Growth of Metals and Alloys Using Density Functional Theory: Christopher Taylor¹; ¹DNV

New Insights into the Impact of Hydrogen on Monotonic/Cyclic Plasticity in Nickel Single Crystal Based on Nanoindentation Investigation: Siva Prasad Murugan¹; Abdelali Oudrissi¹; Guillaume Hachet¹; Xavier Feaugas¹; ¹La Rochelle University

Ab Initio Study of Hydrogen Embrittlement in Binary Nickel Alloys: *Aman Prasad¹; Ranim Mohamad¹; Frédéric Christien²; Franck Tancret¹; Isabelle Braems¹;* ¹Université de Nantes, Institut des Matériaux de Nantes – Jean Rouxel (IMN), CNRS UMR 6502, 2 rue de la Houssinière, BP 32229, 44322 Nantes Cedex 3, France; ²Mines Saint-Etienne, Univ Lyon, CNRS, UMR 5307 LGF, Centre SMS, F - 42023 Saint-Etienne France

Environmental Creep Behavior of a 9Cr Martensitic Steel in CO₂ and Air: *Richard Oleksak¹; Kyle Rozman¹; Jeffrey Hawk¹; Ömer Dogan¹;* ¹National Energy Technology Laboratory

In Situ Experiments to Reveal Coupling Between Stress and Hydrogen on Stress Corrosion Cracking of Fe-based Alloys: *Arun Devaraj¹; Dallin Barton¹; Tingkun Liu¹; Sten Lambeets¹; Cheng-Han Li¹; Mark Wirth¹; Daniel Perea¹; Matthew Olszta¹; Jinhui Tao¹; Tianyi Li²; Yang Ren²; Shuang Li¹; Chongmin Wang¹;* ¹Pacific Northwest National Laboratory; ²Argonne national laboratory

Effect of Irradiation on the Cracking Behavior of Stainless Steels in Light Water Reactor Environment: *Yiren Chen¹; Bogdan Alexandrescu¹; Appajosula Rao²;* ¹Argonne National Laboratory; ²Nuclear regulatory commission

Effects of Test Orientation on Environmentally-assisted Cracking of 5xxx Series Aluminum Alloys: *Yang Liu¹; John Lewandowski¹;* ¹Case Western Reserve University

Stress Corrosion Cracking Study of Fe₃₉Mn₂₀Co₂₀Cr₁₅Si₅Al₁ (at.%) Compositionally Complex Alloy in 3.5 wt.% NaCl Salt Solution: *Pranshul Varshney¹; Nilesh Kumar¹;* ¹University of Alabama-Tusaloosa

CORROSION

Environmentally Assisted Cracking: Theory and Practice — On-Demand 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, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Monday AM | March 14, 2022
Corrosion | On-Demand Poster Hall

Design and Experimental Validation of Hydrogen Trapping Features in Nickel Alloys: *Aman Prasad¹; Alixe Dreano²; Laurent Couturier¹; Frédéric Christien²; Franck Tancret¹;* ¹Université de Nantes, Institut des Matériaux de Nantes – Jean Rouxel (IMN), CNRS UMR 6502; ²Mines Saint-Etienne, Univ Lyon, CNRS, UMR 5307 LGF, Centre SMS, F - 42023

LIGHT METALS

Failure, and a Career That is Anything But: An LMD Symposium Honoring J. Wayne Jones — On-Demand Oral Presentations

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

Program Organizers: Victoria Miller, University of Florida; Michael Caton, US Air Force Research Laboratory; Nikhilesh Chawla, Purdue University; Trevor Harding, California Polytechnic State University; Paul Krajewski, General Motors Corporation; Tresa Pollock, University of California, Santa Barbara

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Redefining Liquid Metal Embrittlement: Utilizing Machine Learning to Unravel a Liquid Metal Enigma: *Justin Norkett¹;* Cameron Frampton¹; Victoria Miller¹; ¹University of Florida

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — On-Demand Oral Presentations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Jean-Charles Stinville, University of Illinois Urbana-Champaign; Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Orion Kafka, NIST

Monday AM | March 14, 2022
Materials Design | On-Demand Room

A Physics-based Machine Learning Approach to Microstructure-based Modeling of High Cycle Fatigue Life Prediction: *Dong Qian¹;* ¹The University of Texas at Dallas

SPECIAL TOPICS

Frontiers of Materials Award Symposium Session: Data-Driven, Machine-learning Augmented Design and Novel Characterization for Nano-architected Materials — On-Demand Oral Presentations

Program Organizer: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory

Monday AM | March 14, 2022
Special Topics | On-Demand Room

Autonomous X-ray Scattering for the Study of Non-equilibrium Self-assembly: Kevin Yager¹; ¹Brookhaven National Laboratory

Volumetric Nanoscale Imaging of DNA-assembled Nanoparticle Superlattices: Aaron Michelson¹; Brian Minevich¹; Hamed Emamy¹; Xiaojing Huang²; Yong Chu²; Hanfei Yan²; Oleg Gang¹; ¹Columbia University; ²National Light Source II, BNL

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Microbiologically Influenced Corrosion - How Organisms Accelerate Materials Degradation — On-Demand Oral Presentations

Program Organizer: Andrea Koerdt, Bundesanstalt für Materialforschung und Prüfung (BAM)

Monday AM | March 14, 2022
Special Topics | On-Demand Room

Session Chairs: Andrea Koerdt, Bundesanstalt für Materialforschung und Prüfung (BAM); Biwen Annie An, Bundesanstalt für Materialforschung und Prüfung (BAM)

Invited

Methanogen Induced Microbiologically Influenced Corrosion (MIC): Environmental Condition and Parameter Have a High Impact on the Corrosion Rate and Products: Andrea Koerdt¹; ¹Bundesanstalt für Materialforschung und Prüfung (BAM)

Invited

Cross-disciplinary Dialog Essential for Overcoming Challenges to Managing Microbiologically Influenced Corrosion (MIC): Richard Eckert¹; ¹Microbial Corrosion Consulting, LLC

Invited

Microbial Communities and Corrosion Across Oil and Gas Systems – Similarities and Differences: Lisa Gieg¹; ¹University of Calgary

Corrosion in Fire Protection Systems (FPS) and the Role of Microbiologically Influenced Corrosion (MIC): Nanni Noel-Hermes¹; Job Klijnsstra¹; Joost van Dam¹; ¹Endures B.V.

Deciphering the Corrosion Potential of Methanogen-induced Microbiologically Influenced Corrosion Using an Integrative Approach: Biwen An¹; Adelina-Elisa Dinter¹; Eric Deland¹; Björn Meermann¹; Andrea Koerdt¹; ¹Bundesanstalt für Materialforschung und -prüfung (BAM)

Using Polyoxometalate Materials as Multifunctional Coatings with Antimicrobial and Anticorrosive Properties: Scott Mitchell¹; ¹Instituto de Nanociencia y Materiales de Aragón

Corrosion of Stainless Steel in Deep Groundwater - Microbial and Geochemical Processes: Paulina Rajala¹; Elisa Isotahdon¹; ¹VTT Technical Research Centre of Finland Ltd.

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — On-Demand Oral Presentations

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woochul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Room

Keynote

Mickey Mouse on NanoCaffeine: Belinda Heyne¹; ¹University of Calgary

Keynote

Processing of Nanocrystalline Diamond Coatings for Biomedical Applications: Roger Narayan¹; ¹University of North Carolina

Invited

Crumpling and Assembling of 1D/2D Nanomaterials into 3D Functional Structures: Baoxing Xu¹; ¹University of Virginia

Invited

Engineered Nanoclays in Bone Tissue Engineering and Bone Metastasis of Cancer: Kalpana Katti¹; Haneesh Jasuja¹; Dinesh Katti¹; ¹North Dakota State University

Invited

In Situ Spectroscopic Characterization of the Electrode-electrolyte Interphase: Sang-Don Han¹; ¹National Renewable Energy Laboratory

Invited

LED Assisted Synthesis and Excitation of Silver Nanoparticles for Plasmon-enhanced Antibacterial Effects: Connor Bourgonje¹; Juan C. Scaiano¹; ¹University of Ottawa

Invited

Reticulated Structure of Sulfur/Nitrogen-doped Graphene Oxide for High Specific Energy Lithium/Sulfur cells: Yoon Hwa¹; ¹Arizona State University

Invited

Photoabsorbers with 2D Layered Perovskites for Bendable Optoelectronics and Solar Cells: Anupama Kaul¹; Mohin Sharma¹; ¹University of North Texas

Invited

Architecting 3D Lithium-ion Batteries: Corie Cobb¹; ¹University of Washington

Invited

Dynamic Vessel-on-a-chip Model: Bringing Bio-relevance to In Vitro Evaluation of Quantum Dots: Hagar Labouta¹; ¹University of Manitoba

Invited

In Situ Chemo-mechanical Characterization of the Formation and Oxidation of Redox Reaction Products at Nanoscale For Li-O₂ Batteries: Omer Ozgur Capraz¹; Hannah Dykes¹; ¹Oklahoma State University

In-situ Investigation of the Interface Formation between Si-terminated Diamond and a Nb₂O₅ Electron Acceptor Layer for Electronic Applications: Gabrielle Abad¹; Stephen McDonnell¹; ¹University of Virginia

MoS₂ Thermoelectrics for Sustainable Energy: Amall Ramanathan¹; ¹The University of Jordan

Nanostructured Materials: A Review on Its Application in Water Treatment: Ikhuazugbe Ifijen¹; Esther Ikhuoria²; Muniratu Maliki³; Godfrey Otabor²; Areguamen Aigbodion¹; ¹Rubber Research Institute of Nigeria; ²University of Benin, Benin City, Edo State, Nigeria; ³Department of Industrial Chemistry, Edo University Iyamho, Edo State, Nigeria

Second NIR-absorbing Gelatin Stabilized Gold Nanorods with High Media and Photothermal Stability for Photothermal Cancer Therapy: Samuel Oluwafemi¹; Thabang Lebepe¹; ¹University of Johannesburg

Facile Synthesis of Novel Quaternary Zn-Cu-In-S/ZnS QDs-mTHPP Porphyrin Conjugate and Its Photodynamic Therapy of Cancer and Antibacterial Activities: Samuel Oluwafemi¹; ¹University of Johannesburg

NANOSTRUCTURED MATERIALS

Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022 — On-Demand Poster Session

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

Program Organizers: Michael Cai Wang, University of South Florida; Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Surojit Gupta, University of North Dakota; Nasrin Hooshmand, Georgia Institute of Technology; Woonchul Lee, University of Hawaii at Manoa; Min Kyu Song, Washington State University; Simona Hunyadi Murph, Savannah River National Laboratory; Hagar Labouta, University of Manitoba; Max Anikovskiy, University of Calgary; Patrick Ward, Savannah River National Laboratory

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Poster Hall

Fabrication of Hexagonal Diamond by Aqueous Solution-based Electrochemistry: Rajakumar Sidharada Devarapalli¹; Daniel Choi¹; ¹Khalifa University

MATERIALS PROCESSING

Furnace Tapping 2022 — On-Demand Oral Presentations

Sponsored by: The Southern African Institute of Mining and Metallurgy, TMS Extraction and Processing Division, TMS; Pyrometallurgy Committee, TMS; Process Technology and Modeling Committee, TMS; Materials Characterization Committee, Industrial Advisory Committee

Program Organizers: Joalet Steenkamp, MINTEK; Dean Gregurek, RHI Magnesita; Quinn Reynolds, Mintek; Gerardo Alvear Flores, Rio Tinto; Hugo Joubert, Tenova Pyromet; Phillip Mackey, P.J. Mackey Technology, Inc.

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Invited

Aluminium Tapping and Molten Metal Handling in Primary Smelters: John Grandfield¹; Sam Wagstaff²; Bob Wagstaff²; ¹Grandfield Technology Pty Ltd.; ²Oculatus Consulting

Kansanshi Copper Smelter Isaconvert Furnace Tapping System Design, Operation and Improvements: Trevor Mwanza¹; Matthias Eggert¹; Winson Chirwa¹; Nurzhan Dyussekenov¹; Mark Prince²; Dennis Marschall³; ¹Kansanshi Mining plc; ²Glencore Technology; ³Independent Consultant

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — On-Demand Oral Presentations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Computational Materials Science and Engineering Committee, TMS; Chemistry and Physics of Materials Committee, TMS; Phase Transformations Committee

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Monday AM | March 14, 2022
Mechanics & Structural Reliability | On-Demand Room

Invited

Integrating Atomistic Modeling and In Situ Experiment to Decipher Grain Boundary Deformation Mechanisms: Ting Zhu¹; Yin Zhang¹; ¹Georgia Institute of Technology

Invited

Immiscible Phase Interfaces: Controlling Irradiation Amorphization and Void Swelling: Janelle Wharry¹; Priyam Patki²; Doruk Aksoy³; Timothy Rupert³; Wei-Ying Chen⁴; Shujuan Wang⁵; Yaqiao Wu⁵; Kristopher Darling⁶; ¹Purdue University; ²University of Michigan; ³University of California - Irvine; ⁴Argonne National Laboratory; ⁵Boise State University & Center for Advanced Energy Studies; ⁶Army Research Laboratory

Irrationalities and Non-unique Lattice Correspondences across Interfaces in Shape Memory Alloys: *Ahmedsameerkhan Mohammed¹; Sidharth Ravi¹; Wael Abuzaid²; Hiroshi Akamine³; Minoru Nishida³; Huseyin Sehitoglu¹; ¹University of Illinois Urbana Champaign; ²American University of Sharjah; ³Kyushu University*

Grain Boundaries Govern Plastic Deformation Kinetics in Nanocrystalline FCC Metals: *Yin Zhang¹; Kunqing Ding¹; Sandra Stangebye¹; Olivier Pierron¹; Joshua Kacher¹; Ting Zhu¹; ¹Georgia Institute of Technology*

Grain Boundary Wetting and Phase Transition in Al-Sn Alloy: *Priya Tiwari¹; Ranjit Dehury²; Abhay Singh Gautam²; ¹Indian Institute of Technology, Bombay; ²Indian Institute of Technology, Gandhinagar*

Slip Transfer of Dislocations Across 3D Interfaces in a Cu/Nb System: *Shuozhi Xu¹; Justin Cheng²; Zezhou Li²; Nathan Mara²; Irene Beyerlein¹; ¹University of California-Santa Barbara; ²University of Minnesota, Twin Cities*

Deformation of Lamellar FCC-B2 Nanostructures Containing Kurdjumov-Sachs Interfaces: Relation between Interfacial Structure and Plasticity: *Deep Choudhuri¹; ¹New Mexico Institute of Mining and Technology*

Characterizing the Dynamics of Ion Hopping under the Effect of a Complex Stress Field Induced by the Micrometer-level Dislocation Pileup at a Non-equilibrium Grain Boundary: *Liming Xiong¹; ¹Iowa State University*

Atom Probe Tomography Reveals Nickel's Oxygen Solubility in Grains and Grain Boundaries after Oxidation: *Jonathan Poplawsky¹; Rishi Pillai¹; QingQiang Ren¹; Andrew Breen²; Baptiste Gault³; Michael Brady¹; ¹Oak Ridge National Laboratory; ²The University of Sydney; ³Max-Planck-Institut für Eisenforschung*

Faceting in Cylindrical Grain Boundaries: *Anqi Qiu¹; Ian Chesser²; Elizabeth Holm¹; ¹Carnegie Mellon University; ²George Mason University*

A Framework for Continuum Modeling of Dislocation-grain Boundary Interactions in Polycrystalline Metals: *Subhendu Chakraborty¹; Abigail Hunter¹; Darby Luscher¹; ¹Los Alamos National Laboratory*

MECHANICS & STRUCTURAL RELIABILITY

Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior — On-Demand Poster Session

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

Program Organizers: Yue Fan, University of Michigan; Liang Qi, University of Michigan; Jeremy Mason, University of California, Davis; Garritt Tucker, Colorado School of Mines; Pascal Bellon, University of Illinois at Urbana-Champaign; Mitra Taheri, Johns Hopkins University; Eric Homer, Brigham Young University; Xiaofeng Qian, Texas A&M University

Monday AM | March 14, 2022
Mechanics & Structural Reliability | On-Demand Poster Hall

Configurational Entropy of Amorphous Undoped and Doped ZrO₂ and SiO₂: *Megan Owen¹; Michael Rushton¹; Antoine Claisse²; William Lee¹; Simon Middleburgh¹; ¹Bangor University; ²Westinghouse Electric Sweden AB*

Effect of Effective Range of Precipitate on Final Grain Radius of Grain Growth Simulation Based on the Local Curvature Multi-vertex Model: *Shota Morimoto¹; Shuichi Nakamura¹; ¹Nippon Steel*

Self-healing Mechanisms in Shape Memory Alloys: Molecular Dynamics Study: *Ahmed Shaker¹; Tarek Hatem¹; Iman EL-Mahallawi¹; ¹The British University in Egypt*

ADVANCED MATERIALS

High Performance Steels — On-Demand Oral Presentations

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung; Benjamin Adam, Oregon State University

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Small-scale Rapid Alloy Prototyping of Extra-low Carbon Steel to Investigate the Effects of Cu and Cr Residuals: *Mazher Ahmed Yar¹; Caroline Norrish¹; Jonathan Cullen¹; Lintao Zhang¹; Nicholas Lavery¹; Stephen Brown¹; Richard Underhill²; ¹Swansea University; ²Tata Steel*

Design and Characterization of Abrasion-resistant Steel Coatings for Nuclear Industry: *Lisa Rateau¹; Franck Tancret²; Anna Fraczkiwicz³; Jean Dhers¹; Gérard Ramstein⁴; ¹Framatome; ²Institut des Matériaux Jean Rouxel; ³Laboratoire Georges Friedel; ⁴Laboratoire des Sciences du Numérique de Nantes*

Design and Challenge of Cold-rolled Dual-phase Steel Strengthened by Interphase Precipitation: *Shao-Lun Lu¹; Kuo-Cheng Yang²; Ching-Yuan Huang²; Hung-Wei Yen¹; ¹National Taiwan University; ²China Steel Corporation*

Hydrogen Embrittlement Susceptibility of a High Manganese Twinning Induced Plasticity Steel Examined via Correlative Microscopy: *Heena Khanchandani¹; Leigh Stephenson¹; Dierk Raabe¹; Stefan Zaefferer¹; Baptiste Gault¹; ¹Max Planck Institute for Iron Research*

Simultaneous Enhancement of Hardness and Corrosion Resistance in Carbide-reinforced Martensitic Steels: *Kenta Yamanaka¹; Haruka Shima¹; Manami Mori²; Kazuo Yoshida¹; Yusuke Onuki³; Shigeo Sato³; Akihiko Chiba¹; ¹Tohoku University; ²National Institute of Technology, Sendai College; ³Ibaraki University*

Understanding Deformation-induced Cracking in Dual-phase Steel via the Combination of EBSD Analysis and Convolutional Neural Network: *Hung-Wei Yen¹; Po-Hsun Lin¹; Yi-Fan Hu¹; Min-Yu Tseng¹; Kuo-Cheng Yang²; Kangying Zhu³; ¹National Taiwan University; ²China Steel Corporation; ³ArcelorMittal*

Phase Field Simulations of Microstructure Evolution during Rapid Thermal Processing of High Strength Steels: *Bala Radhakrishnan¹; Gary Cola²; ¹Oak Ridge National Laboratory; ²Flash Steelworks, Inc.*

Characterization of a Complex-phase Steel by Electron Backscattering Diffraction and Atomic Force Microscopy: *Renan Lima¹; Julio Spadotto²; Flávia Tolomelli³; Omar Pandoli¹; Fernando Rizzo¹; ¹PUC-Rio; ²PUC-Rio / University of Manchester; ³CSN*

Microstructural Engineering in Dual Phase Steels -Partitioning Aspects and Correlation to Formability: *Soudip Basu*¹; Anirban Patra¹; B.N. Jaya¹; Sarbari Ganguly²; Monojit Dutta²; Indradev Samajdar¹; ¹Indian Institute of Technology, Bombay; ²Tata Steel limited, Jamshedpur

Early Stages of Liquid-metal Embrittlement in an Advanced High-strength Steel: *Yuki Ikeda*¹; Renliang Yuan²; Anirban Chakraborty³; Hassan Ghassemi-Armaki⁴; Jian-Min Zuo²; Robert Maaß¹; ¹Bundesanstalt für Materialforschung und -prüfung; ²University of Illinois Urbana-Champaign; ³ArcelorMittal Global Research and Development; ⁴General Motors R&D, Manufacturing Systems Research Laboratory

Understanding Microstructural Evolution in a Thick Gauge High Strength Niobium-microalloyed Line Pipe Steel: *Monowar Hossain*¹; Xingshuo Wen²; Michael Mulholland²; Bertram Ehrhardt³; Steven Jansto⁴; Gregory Thompson¹; Nilesh Kumar¹; ¹University of Alabama, Tuscaloosa; ²ArcelorMittal Global R&D - East Chicago; ³AM/NS Calvert AL; ⁴Research & Development Resources, Bowling Green OH

ADVANCED MATERIALS

High Performance Steels — On-Demand Poster Session

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Jonah Kleem-Toole, Colorado School of Mines; Louis Hector, General Motors Global Technical Center; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung; Benjamin Adam, Oregon State University

Monday AM | March 14, 2022
Advanced Materials | On-Demand Poster Hall

A Study on Magnetization Characteristics According to the Direction of 9%Ni Steel Sheet: Hosung Jang¹; Suheon Kim¹; Jong Bae Jeon²; Yoon Suk Choi³; *Sunmi Shin*¹; ¹Korea Institute of Industrial Technology (KITECH); ²Dong-A University; ³Pusan National University

MATERIALS DESIGN

Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment — On-Demand Oral Presentations

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

Program Organizers: Raymundo Arroyave, Texas A&M University; Wei Chen, Illinois Institute of Technology; Yong-Jie Hu, Drexel University; Tresa Pollock, University of California, Santa Barbara

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

Diffusion in Stationary and Moving Interfaces in Alloys: Raj Koju¹; Ian Chesser¹; *Yuri Mishin*¹; ¹George Mason University

Invited

Grain Boundary Stress and Localized Precipitation during Creep: *Marcel Sluiter*¹; Kai Liu¹; ¹TU Delft

Invited

Scale Bridging Materials Physics: Active Learning Workflows and Integrable Deep Neural Networks for Free Energy Function Representations in Alloys: *Krishna Garikipati*¹; Gregory Teichert¹; Anirudh Natarajan²; Sambit Das¹; Muratahan Aykol³; Vikram Gavini¹; Anton Van der Ven²; ¹University of Michigan; ²University of California at Santa Barbara; ³Toyota Research Institute

Invited

Phase Field Modeling: A Link Between Atomic-scale Interactions and Microstructures of Multiphase Materials: *Katsuyo Thornton*¹; ¹University of Michigan

Invited

Cross Phenomena and Predictions of Their Coefficients: *Zi-Kui Liu*¹; ¹Pennsylvania State University

Invited

Computational Design of Alloy Nanocatalysts: *Tim Mueller*¹; ¹Johns Hopkins University

Invited

Construction and Application of Defect Phase Diagrams: *Joerg Neugebauer*¹; Ali Zendegani¹; Tilmann Hickel¹; ¹MPI fuer Eisenforschung

MATERIALS DESIGN

ICME Case Studies: Successes and Challenges for Generation, Distribution, and Use of Public/Pre-Existing Materials Datasets — On-Demand Oral Presentations

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

Program Organizers: Stephen DeWitt, Oak Ridge National Laboratory; Vikas Tomar, Purdue University; James Saal, Citrine Informatics; James Warren, National Institute of Standards and Technology

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

The Status of ML Algorithms for Structure-property Relationships Using Matbench as a Test Protocol: *Anubhav Jain*¹; ¹Lawrence Berkeley National Laboratory

Invited

A Quest for Re-using 3D Materials Data: *Emine Gulsoy*¹; Peter Voorhees¹; ¹Northwestern University

Mg Database Project: Mapping Trends and Data Sets of Magnesium and Its Alloys for Improved Mechanical Performance: *Suhas Eswarappa Prameela*¹; Suraj Ravindran²; Burigede Liu²; Padmeya Indurkar³; Babak Ravaji⁴; Caitlyn Schuette¹; Abigail Park¹; Fanuel Mammo¹; Stephanie Hernandez¹; Timothy Weihs¹; ¹Johns Hopkins University; ²Caltech; ³University of Cambridge; ⁴University of Houston

Graph Convolutional Neural Networks for Fast, Accurate Prediction of Material Properties for Solid Solution High Entropy Alloys Using Open-source Datasets: *Massimiliano (Max) Lupo Pasini*¹; Samuel Reeve¹; Pei Zhang¹; Marko Burcul²; ¹Oak Ridge National Laboratory; ²Motion-S

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Additive Technologies

Monday AM | March 14, 2022
Additive Technologies | On-Demand Poster Hall

Wire Process Development of Laser-assisted DED of Haynes 282 Ni-based Superalloy: *Kristin Tippey*¹; Chantal Sudbrack¹; ¹National Energy Technology Laboratory

Influence of Process Parameters on Defect Formation for AA 6061 via Laser Powder Bed Fusion Additive Manufacturing: *Sivaji Karna*¹; Lang Yuan¹; Andrew Gross¹; Tianyu Zhang¹; Rimah AL-Arudi¹; Faith Buchanan¹; Timothy Krentz²; Dale Hitchcock²; ¹University of South Carolina; ²Savannah River National Laboratory

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Advanced Materials

Monday AM | March 14, 2022
Advanced Materials | On-Demand Poster Hall

Data-driven Approach to Design of Multicomponent Metallic Glasses: *Anurag Bajpai*¹; Krishanu Biswas¹; ¹Indian Institute of Technology Kanpur, India

Exploring Elastic and Plastic Anisotropy in a Refractory High Entropy Alloy utilizing Combinatorial Instrumented Indentation and Electron Backscatter Diffraction: *Abheepsit Raturi*¹; N P Gurao¹; Krishanu Biswas¹; ¹IIT Kanpur

Quasi-hydrostatic Quasi-constrained Severe Plastic Deformation of Ternary Medium Entropy Alloy: *Saumya Jha*¹; Krishanu Biswas¹; N P Gurao¹; ¹India Institute of Technology Kanpur

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Corrosion

Monday AM | March 14, 2022
Corrosion | On-Demand Poster Hall

Development of Mg₂/O Reference Electrode Chemistry for the Electrochemical Investigation of Nickel Alloy Corrosion in UCl₃ Containing Chloride Melts: *Charles Lhermitte*¹; Scott Parker¹; Matt Jackson¹; Marisa Monreal¹; ¹Los Alamos National Laboratory

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Energy & Environment (including REWAS 2022 Symposia)

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Poster Hall

Conducting Graphene Synthesis from Electronic Waste: *Anurag Bajpai*¹; Chandra Sekhar Tiwary²; Krishanu Biswas¹; ¹Indian Institute of Technology Kanpur, India; ²Indian Institute of Technology Kharagpur

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Light Metals

Monday AM | March 14, 2022
Light Metals | On-Demand Poster Hall

Formation of Macroscopic Deformation Band in Porous Metals with Unidirectional Pores: *Mahiro Sawada*¹; Shinsuke Suzuki¹; ¹Waseda University

Ultrasonically-induced Microstructural Refinement during Casting of an Al-Si-Mg Alloy: *Katherine Rader*¹; Jens Darsell¹; Jon Helgeland¹; Nathan Canfield¹; Aashish Rohatgi¹; ¹Pacific Northwest National Laboratory

Effect of Cooling Rate on EN AW 6082 Alloys: Tansu Guven¹; Emrah Ozdogru¹; *Hilal Colak*¹; ¹Tri Metallurgy

Improved Room Temperature Formability of High Strength Al Sheets Using Friction Stir Processing: Hrishikesh Das¹; *Piyush Upadhyay*¹; Wahaz Nasim¹; Mert Efe¹; ¹Pacific Northwest National Laboratory

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Materials Processing

Monday AM | March 14, 2022
Materials Processing | On-Demand Poster Hall

A Novel Electrolytic Process for the Production of Cu Metal from Chalcocite in CuCl – KCl Molten Salt at 473 K: *Tae-Hyuk Lee*¹; Jungshin Kang¹; ¹KIGAM

Manufacturing of Bulk Nanocrystalline Al-Mg Alloys Using High-pressure Cold Spray Technique for High-strength Lightweight Applications: *Amanendra Kushwaha*¹; Manoranjan Misra¹; Pradeep Menezes¹; ¹University of Nevada, Reno

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Mechanics and Structural Reliability

Monday AM | March 14, 2022

Mechanics & Structural Reliability | On-Demand Poster Hall

Crystal Plasticity Analysis of Temperature-sensitive Dwell Fatigue in Ti-6Al-4V Alloy for an Aero-engine Fan Disk: *Liangwei Yin*¹; Osamu Umezawa¹; ¹Yokohama National University

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Nanostructured Materials

Monday AM | March 14, 2022

Nanostructured Materials | On-Demand Poster Hall

Mechanical and Sorption Indices of ZnO-rGO Hybrid Filled Natural Rubber Nanocomposites: *Olu Ekebafe*¹; Emeka Nworie²; Hauwa Mahmud²; Stanley Omorogbe³; ¹University of Lagos; ²Auchi Polytechnic; ³Rubber Research Institute of Nigeria

SPECIAL TOPICS

Late News Poster Session — On-Demand Poster Session: Nuclear Materials

Monday AM | March 14, 2022

Nuclear Materials | On-Demand Poster Hall

Defect Structure Classification of Neutron-irradiated Graphite Using Supervised Machine Learning: *Jiho Kim*¹; Kunok Chang¹; ¹Kyung Hee University

LIGHT METALS

Magnesium Technology — On-Demand Oral Presentations

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Monday AM | March 14, 2022

Light Metals | On-Demand Room

Keynote

The Comparability of In Vitro and In Vivo Experiments for Degradable Mg-implants: *Regine Willumeit-Romer*¹; Stefan Bruns¹; Heike Helmholtz¹; Norbert Hort¹; Diana Krueger¹; Yu Sun¹; Bjoern Wiese¹; Berit Zeller-Plumhoff¹; ¹Helmholtz-Zentrum Hereon

Invited

Multi-functional Ceramic Coatings for Corrosion Protection of Magnesium Alloys: *Beatriz Mingo*¹; Yue Guo²; Safiya Al Abri¹; Allan Matthews¹; Aleksey Yerokhin¹; ¹The University of Manchester

Invited

Development of Flame-retardant Wrought Magnesium Alloys and Application of the Alloys to High-speed Railway Body: *Yasumasa Chino*¹; Kazunori Shimizu²; Futoshi Kido³; Takeshi Ishikawa⁴; Makoto Taguchi⁵; Hisashi Mori¹; Takao Horiya⁶; ¹National Institute of Advanced Industrial Science and Technology; ²Sankyo Tateyama, Inc.; ³Fuji Light Metal Co., Ltd.; ⁴Japan Transport Engineering Company; ⁵Kawasaki Heavy Industries, Ltd.; ⁶Innovative Structural Materials Association

On the Mechanical Behaviors of Extruded AZ61A Magnesium Alloy Tube under Cyclic Torsion: *Xiaodan Zhang*¹; Qin Yu²; *Huamiao Wang*¹; ¹Shanghai Jiao Tong University; ²Lawrence Berkeley National Laboratory

Towards Improving Cold Formability of Concentrated Mg-Al-Zn-Ca Alloy Sheet: *Mingzhe Bian*¹; Xinsheng Huang¹; Yasumasa Chino¹; ¹National Institute of Advanced Industrial Science and Technology

A Method for Crystal Plasticity Model Parameter Calibration Based on Bayesian Optimization: *Xiaochuan Sun*¹; Huamiao Wang¹; ¹Shanghai Jiao Tong University

The Role of Ordered Phases in Enhanced Ductility of RE Based Mg Alloys: *Henry Ovi*¹; Erica Lilleodden¹; ¹Helmholtz Zentrum Hereon

Investigation on the Effect of Si Addition in Controlling the Microstructure of Mg-4wt%Al-4wt%RE Alloy: *Vigneshwar Hari*¹; *Dongdong Qu*¹; Trevor Abbott²; Kazuhiro Nogita¹; ¹The University of Queensland; ²MIT University

Microstructure and Texture Analysis of Dissimilar Friction Stir Welded AZ31 Mg and Al 6061 Joint: *Nikhil Gotawala*¹; Amber Shrivastava¹; ¹Indian Institute of Technology Bombay

Influence of Third Alloying Element on Dislocation Slip and Twinning Activities in Mg-Nd Based Alloys: *Xun Zeng*¹; Dietmar Letzig²; Karl Kainer³; Dikai Guan¹; Sangbong Yi²; ¹The University of Sheffield; ²Institute of Material and Process Design, Helmholtz – Zentrum Hereon; ³Light Elements Engineering, Foundry and Automation, Wroclaw University of Science and Technology

Accelerated Micromechanical Response Prediction Using a Deep Network-based Surrogate Model: *Wei Dai*¹; Huamiao Wang¹; ¹Shanghai Jiao Tong University

Effect of Microstructural Refinement and Na Addition on Hydrogenation Kinetics of Cast Mg-Al-La Alloy during the First Hydrogen Absorption Process: *Manjin Kim*¹; Stuart McDonald¹; Yahia Ali¹; Trevor Abbott²; Kazuhiro Nogita¹; ¹The University of Queensland; ²Magontec Ltd.

Effective Dispersion of Stable Quasicrystals in ZW82 and ZA63 Alloys for Strengthening: *Karel Tesar*¹; Hidetoshi Somekawa²; *Alok Singh*²; ¹Czech Technical University in Prague; ²National Institute for Materials Science

Characterizing Precipitate Composition and Grain Boundary Segregation Behavior in Mg-alloys: *Qianying Shi*¹; John Allison¹; ¹University of Michigan

In-situ Analysis on Formation and Development of LPSO-like Nanostructures in Dilute MgYZn and MgGdZn Alloys: *Hiroshi Okuda*¹; Michiaki Yamasaki²; Yoshihito Kawamura²; ¹Kyoto University; ²Kumamoto University

Exploring the Microstructure-property Relationship of Mg-AL-Mn Alloys Enhanced via Friction Stir Processing: *David Garcia*¹; Hrishikesh Das¹; Xiaolong Ma¹; Timothy Roosendaal¹; Vineet Joshi¹; Darrell Herling¹; Mageshwari Komarasamy¹; Glenn Grant¹; ¹Pacific Northwest National Laboratory

Improving the Corrosion Behavior and Mechanical Properties of Biodegradable Mg-Zn-Zr Alloys through ECAP for Usage in Biomedical Applications: *Waleed El-Garaihy Nasr¹; Abdulrahman Alateyah¹; Majed Alawad²; Talal Aljohani³; ¹Qassim University; ²King Abdulaziz City for Science and Technology; ³King Abdulaziz City for Science and Technology*

Development of Magnesium-lithium Based Alloys for Space Applications: The Relationship between Precipitation Hardening and Damping Capacity: *Florian Schott¹; David McKeown¹; Li Jin²; Mert Celikin¹; ¹University College Dublin; ²Shanghai Jiao Tong University*

Assessment of Extruded Magnesium Tubing for Absorbable Stent Production: *Adam Griebel¹; Gregory Hayes²; Robert Werkhoven²; Roman Menze³; Jeremy Schaffer¹; ¹Fort Wayne Metals; ²Complex Materials; ³MeKo Laser Material Processing*

High Performance Mg-4Al-4RE (RE = Cerium and Lanthanum) Die-casting Alloy: *Hua Qian Ang¹; Suming Zhu¹; Trevor Abbott²; Mark Easton¹; ¹RMIT University; ²Magontec Limited*

Unraveling Mg <c+a> Slip Using Neural Network Potentials: *Christopher Barrett¹; Mashroor Nitol¹; Doyle Dickel¹; ¹Mississippi State University*

The Effect of Scandium on the Electronic and Transport Properties of MgO: *Amall Ramanathan¹; ¹The University of Jordan*

Quantifying the Influence of Coarse Intermetallic Particles on Twin Transmission: *Benjamin Anthony¹; Victoria Miller¹; ¹University of Florida*

Water Adsorption and Surface Atom Dissolution on Zn, Al, Ce Doped Mg Surfaces: *Qin Pang¹; Miao Song¹; Rajib Kalsar¹; Vineet Joshi¹; Peter Sushko¹; ¹Pacific Northwest National Laboratory*

LIGHT METALS

Magnesium Technology — On-Demand Poster Session

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

Program Organizers: Petra Maier, University of Applied Sciences Stralsund; Steven Barela, Terves, Inc; Victoria Miller, University of Florida; Neale Neelameggham, IND LLC

Monday AM | March 14, 2022
Light Metals | On-Demand Poster Hall

Effect of CO₂ Annealing Treatments on Corrosion Behavior of AZ91D Mg Alloy: *Gyoung Gug Jang¹; Jiheon Jun¹; Michael Brady¹; ¹Oak Ridge National Laboratory*

Effect of Different Mold Materials on the Solidification Rate and Microstructure of Magnesium Alloy Plate Castings: *Amjad Javaid¹; ¹Natural Resources Canada*

Role of Ca & Y in Corrosion Resistance of SEN Magnesium Alloys: *Bong Sun You¹; Sang Kyu Woo²; Young Min Kim¹; ¹Korea Institute of Materials Science; ²Helmholtz-Zentrum Geesthacht, Max-Planck-Straße 1, Geesthacht*

Twinning, Detwinning and Crack Initiation in Compression-compression Fatigue of Extruded Magnesium Alloy AZ31: *Yoshikazu Nakai¹; Shoichi Kikuchi²; Kaito Asayama¹; Hayata Yoshida¹; ¹Kobe University; ²Shizuoka University*

The Effects of Annealing Treatment on Microstructure and Mechanical Properties of the Extruded Mg-1.3Zn-0.5Ca Alloy: *Honglin Zhang¹; Zhigang Xu¹; Sergey Yarmolenko¹; Jagannathan Sankar¹; ¹North Carolina Agricultural and Technical State University*

Effect of Single Pass Differential Speed Rolling on the Dynamic Recrystallization, Microstructure and Mechanical Properties of Mg5Zn: *Christopher Hale¹; ¹North Carolina Agricultural and Technical State University*

Constitutive Modeling of Rolled AZ31 Magnesium with Temperature and Texture Dependence: *Daniel Kenney¹; Marcos Lugo¹; Jared Darius¹; ¹Liberty University*

ENERGY & ENVIRONMENT

Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring Matthew J. Kramer — On-Demand Oral Presentations

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

Program Organizers: Scott McCall, Lawrence Livermore National Laboratory; Ryan Ott, Ames Laboratory

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Invited

Synthesis and Stabilization of Magnetic Nanoparticles of Rare-earth Metal Alloys: *Shouheng Sun¹; ¹Brown University*

Magnetoelastic Interactions Reduce Hysteresis in Soft Magnets: *Negar Ahani¹; Ananya Renuka Balakrishna¹; ¹University of Southern California*

HDDR Treatment on Nd₂Fe₁₄B-based Magnets in the Presence of an Applied Magnetic Field: *Zachary Tener¹; Xubo Liu²; Ikenna Nlebedim²; Matthew Kramer²; Michael McGuire¹; Michael Kesler¹; ¹Oak Ridge National Laboratory; ²Ames Laboratory*

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — On-Demand Oral Presentations

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Room

Thermochemistry of Iodine-containing Molten Reciprocal Salts: *Mina Azizih¹; Juliano Pinto¹; Clara Dixon¹; Jacob Yingling¹; Johnathon Ard¹; Amir Mofrad¹; Matthew Christian¹; Theodore Besmann¹; ¹University of South Carolina*

Wetting Properties of Molten Salts at Material Interface for Reactor Applications: *Michael Woods¹; Christopher Wolfe²; Toni Karlsson¹; Ruchi Gakhar¹; ¹Idaho National Laboratory; ²University of New Mexico*

Electrochemical Determination of Thermodynamic and Kinetic Properties of Ni^{2+} in FLiNaK Molten Salt: *Nathan Smith*¹; Stephen Lombardo¹; Hojong Kim¹; Shunli Shang¹; Zi-Kui Liu¹; ¹Pennsylvania State University

Research Progress in the Development of a Molten-salt Forced-circulation Loop: *Guiqiu Zheng*¹; Guanyu Su¹; Nesrin Cetiner¹; David Carpenter¹; ¹Massachusetts Institute of Technology

Generation of Corrosion-related Component Thermodynamic Values for a Molten Salt Reactor Thermodynamic Database (MSTDB-TC) and Example Applications: *Theodore Besmann*¹; Jacob Yingling¹; Julianio Schorne-Pinto¹; Johnathan Ard¹; Mina Azizih¹; Matthew Christian¹; Amir Mofrad¹; Mahmut Aslani¹; Clara Dixon¹; Kyle Foster¹; Jake McMurray²; Ruchi Gakhar³; ¹University of South Carolina; ²Oak Ridge National Laboratory; ³Idaho National Laboratory

Electrochemical Studies of Structural Alloy Corrosion in LiF-NaF-KF (FLiNaK) at 700 °C: *William Doniger*¹; Adrien Couet¹; Kumar Sridharan¹; ¹University of Wisconsin-Madison

Development of Corrosion Resistant Metallic Coatings for Molten Salt Nuclear Reactors: *Elizabeth Trillo*¹; Ronghua Wei¹; Xihua He¹; ¹Southwest Research Institute

Data-driven Models for Corrosion of Structural Alloys in Molten Chloride Salts: *Christopher Taylor*¹; Brett Tossey¹; ¹DNV

Development of Novel Methods for Purification of Fluoride Salts: *Dino Sulejmanovic*¹; Bruce Pint¹; ¹Oak Ridge National Laboratory

Stainless Steel Compatibility in Flowing Fluoride Salts: *Bruce Pint*¹; Yi-Feng Su¹; Cory Parker¹; Dino Sulejmanovic¹; Stephen Raiman¹; ¹Oak Ridge National Laboratory

Molecular Structure of Molten Fluoride Salts for Nuclear Energy by Diffraction Measurements and Ab-initio Simulations: *David Sprouster*¹; G Zheng²; D Olds³; S-C Lee⁴; Y Zhang⁴; B Khaykovich²; ¹Stony Brook University; ²Massachusetts Institute of Technology; ³Brookhaven National Laboratory; ⁴University of Illinois Urbana-Champaign

Temperature-dependent Dealloying Mechanisms and Morphology Evolutions in Eutectic Molten Chloride Salts: *Touraj Ghaznavi*¹; Roger Newman¹; ¹University of Toronto

High-throughput Measurements of Alloy Properties to Enable Long-term Corrosion Simulations: *Nathaniel Hoyt*¹; Jicheng Guo¹; ¹Argonne National Laboratory

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — On-Demand Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee

Program Organizers: Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Michael Short, Massachusetts Institute of Technology

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Poster Hall

Electrical Conductivity of 1-Butyl-3-Methylimidazolium Chloride (BMIC) and Aluminum Chloride (AlCl_3) Ionic Liquid Electrolytes: *Aninda Nafis Ahmed*¹; Md Khalid Nahian¹; Ramana Reddy¹; ¹University of Alabama Tuscaloosa

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — On-Demand Oral Presentations

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

High-fidelity Modeling of Multi-material Additive Manufacturing: *Wentao Yan*¹; Yanming Zhang¹; Zeshi Yang¹; Lu Wang¹; ¹National University of Singapore

Invited

Improving Powder Feedstock for Metal Additive Manufacturing: *Danielle Cote*¹; Kyle Tsakopoulos¹; Jack Grubbs¹; Christopher Massar¹; Matthew Gleason¹; Bryer Sousa¹; Matthew Siopis²; ¹Worcester Polytechnic Institute; ²CCDC Army Research Laboratory

Invited

Additive Manufacturing of Aluminium: Alloy Design and Machine Learning Assisted Process Optimization: *Xiaopeng Li*¹; Qian Liu¹; Jay Kruzic¹; ¹University of New South Wales

ExaCA Workflow and Microstructure Modeling as Part of the ExaAM Framework: *Matthew Rolchigo*¹; Jim Belak²; Samuel Reeve¹; John Coleman¹; Gerry Knapp¹; Robert Carson²; Alex Plotkowski¹; Lyle Levine³; Eddie Schwalbach⁴; ¹Oak Ridge National Laboratory; ²Lawrence Livermore National Laboratory; ³National Institute of Standards and Technology; ⁴Air Force Research Laboratory

Experimental Determination of Forming Limit Diagram for AISI 304: *Krishna Raju*¹; Abhishek Kumar¹; Sushil Kumar Mishra¹; Narasimhan K¹; ¹IIT, Bombay

Effect of the Casting Process on the Microstructure and Mechanical Properties of a Cast Ni-based Alloy: *Govindarajan Muralidharan*¹; Shivakant Shukla¹; Jiten Shah²; Jim Myers³; ¹Oak Ridge National Laboratory; ²PDA LLC; ³Metaltek International

A Machine Learning Based Methodology to Predict the Build Quality of Metallic Alloys Additively Manufactured by Laser Powder Bed Fusion: *Jeongmin Woo*¹; Kevin Graydon¹; Yongho Sohn¹; ¹University of Central Florida

Design of a High Temperature Precipitates for a Complex Concentrated Alloy Using Model Ternary Alloys: *Jaimie Tiley*¹; Soumya Nag¹; Ercan Cakmak¹; Fan Zhang²; Y Wang³; Pania Newell³; ¹Oak Ridge National Laboratory; ²Computherm LLC; ³University of Utah

Texture Gradients and Asymmetries in ShAPE Processed ZK60 Magnesium: *Benjamin Schuessler*¹; Dalong Zhang¹; Nicole Overman¹; Jens Darsell¹; Vineet Joshi¹; ¹Pacific Northwest National Laboratory

Designing Ultra-conductors Using Solid Phase Processing: Keerti Kappagantula¹; Aditya Nittala¹; William Frazier¹; Kashi Subedi²; Xiao Li¹; Woongjo Choi¹; Bharat Gwalani¹; Joshua Silverstein¹; Julian Atehortua¹; Hrishikesh Das¹; Frank Kraft²; David Drabold²; Glenn Grant¹; ¹Pacific Northwest National Laboratory; ²Ohio University

MATERIALS DESIGN

Materials Design and Processing Optimization for Advanced Manufacturing: From Fundamentals to Application — On-Demand Poster Session

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

Program Organizers: Wei Xiong, University of Pittsburgh; Dana Frankel, QuesTek Innovations LLC; Gregory Olson, Massachusetts Institute of Technology

Monday AM | March 14, 2022
Materials Design | On-Demand Poster Hall

Friction Assisted Dissimilar Solid State Joining of Aluminum and Copper Pipes: *Ji-Won Kang*¹; Tu-Anh Bui-Thi¹; Sung-Tae Hong¹; Heung-Nam Han²; ¹University of Ulsan; ²Seoul National University

New Methodologies for Grain Boundary Detection in EBSD Data of Microstructures: *Richard Catania*¹; ¹Virginia Tech

MATERIALS PROCESSING

Materials Processing Fundamentals — On-Demand Oral Presentations

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Jonghyun Lee, Iowa State University; Adrian Sabau, Oak Ridge National Laboratory; Fiseha Tesfaye, Åbo Akademi University

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Anomalous Temperature Effect on Diffusion-controlled Solidification Time during Diffusion Brazing: *Oluwadara Afolabi*¹; Olanrewaju Ojo¹; ¹University of Manitoba

Comprehensive Recovery of Pressure Acid Leaching Residue of Zinc Sulfide Concentrate: *Guiqing Liu*¹; Bangsheng Zhang²; Zhonglin Dong³; Fan Zhang²; Fang Wang²; Tao Jiang³; Bin Xu³; ¹Northeastern University; ²Jiangsu BGRIMM Metal Recycling Science & Technology Co. Ltd; ³Central South University

Time Variation of Concentration-dependent Interdiffusion Coefficient: *Osamudiamen Olaye*¹; Olanrewaju Ojo¹; ¹University of Manitoba

Study of Y-Fe₄N Material Annealing through Molecular Dynamics Modeling: *Jianxin Zhu*¹; Guannan Guo¹; Jian-Ping Wang¹; ¹University of Minnesota

Potentiostatic Electrodeposition of Ti-Al Alloy with 40% Titanium from the Lewis Acidic 1-butyl-3-methylimidazolium Chloride-aluminum Chloride Ionic Liquid Electrolyte: *Pravin Shinde*¹; Yuxiang Peng¹; Ramana Reddy¹; ¹The University of Alabama

Thermodynamic Properties of Sulfur in the CaO- $\text{AlO}_{1.5}$ -CeO_{1.5} Slag System at 1873 K: *Masaya Higuchi*¹; Kazuki Morita¹; ¹The University of Tokyo

Evaluation of Phase Relations for the Al-Cu-Mg-Si-Zn System around Eutectic Composition: *Yusuke Kageyama*¹; Kazuki Morita¹; ¹The University of Tokyo

Prediction of Distribution of Composition of Inclusion in Continuous Casting Bloom of the Heavy Rail Steel Coupling Element Segregation, Heat Transfer and Kinetics: *Yuexin Zhang*¹; Wei Chen²; Jujin Wang¹; Yadong Wang¹; Wen Yang¹; Ying Ren¹; *Lifeng Zhang*²; ¹University of Science and Technology Beijing; ²Yanshan University

Voltammetric Investigations of the Dissolution of Copper in Acidic Cupric Chloride Solutions Containing Additional Dissolved Cuprous Ions: *Nadine Koerbler*¹; Eva Gerold¹; Stefan Luidold¹; Thomas Krivec¹; Jolanta Klocek¹; Helmut Antrekowitsch¹; ¹Montanuniversität of Leoben

Site Preference of Ti in 6H-SiC: A Combined Photoluminescence and Theoretical Calculation Study: *Hui Chen*¹; Kazuki Morita¹; ¹University of Tokyo

Measurement of Thermodynamic Property of Mg in Molten Iron at 1823 K by Transpiration Method: *Tomoya Nakamura*¹; Akiko Nakajima¹; Kazuki Morita¹; ¹Graduate School of Engineering, The University of Tokyo

MATERIALS PROCESSING

Materials Processing Fundamentals — On-Demand Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Jonghyun Lee, Iowa State University; Adrian Sabau, Oak Ridge National Laboratory; Fiseha Tesfaye, Åbo Akademi University

Monday AM | March 14, 2022
Materials Processing | On-Demand Poster Hall

Phase and Microstructural Analysis of In-situ Derived Alumina-TiB₂ Composites: *Evangelos Daskalakis*¹; ¹University of Leeds

Parametric Study of Mold Electromagnetic Stirring: Effects of Load Condition and Copper Resistivity: *Qilan Li*¹; *Lifeng Zhang*²; Jing Zhang²; ¹University of Science and Technology Beijing; ²Yanshan University

Effect of Laser Heat Treatment and Nitrogen Content in Shielding Gas on Precipitation of Widmanstätten Austenite in Lap Laser Welds of Duplex Stainless Steels: *Yunxing Xia*¹; Kenshiro Amatsu¹; Fumikazu Miyasaka¹; Hiroaki Mori¹; ¹Osaka University

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — On-Demand Oral Presentations

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Room

Invited

Development, Production, and Qualification of Berrylide Neutron Multiplier Parts for the He Cooled Breeding Blanket: *Ramil Gaisin¹; Michael Duerrschnebel¹; Michael Klimenkov¹; Pavel Vladimirov¹; Sergey Udartsev²; ¹Karlsruhe Institute for Technology; ²Ulba Metallurgical Plant*

Invited

In-situ TEM of Quantum De-trapping and Transport of SIA Clusters in Tungsten: *Kazuto Arakawa¹; ¹Shimane University*

Invited

Microstructural Examination of Radiation Damage in Tungsten: *Michael Klimenkov¹; Ute Jäntschi¹; Ramil Gaisin¹; Steffen Antusch¹; Michael Rieth¹; Hans-Christian Schneider¹; Dmitry Terentyev²; Wouter Van Renterghem²; ¹Karlsruhe Institute of Technology; ²Belgian Nuclear Research Centre*

Invited

Neutron Irradiated Tungsten Defect, Surface Chemistry, and Microstructural Characterization: *Chase Taylor¹; Masashi Shimada¹; Yasuhisa Oya²; ¹Idaho National Laboratory; ²Shizuoka University*

Invited

Self-passivating SMART Alloys for a Fusion Power Plant: *Andrey Litnovsky¹; Felix Klein¹; Xiaoyue Tan¹; Jan W. Coenen¹; Gerald Pintsuk¹; Christian Linsmeier¹; Jesus Gonzalez-Julian¹; Martin Bram¹; Ivan Povstugar¹; Thomas W. Morgan²; Yuri M. Gasparyan³; Alexey Suchkov³; Diana Bachurina³; Duc Nguyen-Manh⁴; Mark R. Gilbert⁴; Damian Sobieraj⁵; Jan Wrobel⁵; Joven Lim⁴; Pawel Bittner¹; Anicha Reuban¹; ¹Forschungszentrum Juelich; ²DIFFER Dutch Institute for Fundamental Energy Research; ³National Research Nuclear University MEPhI; ⁴CCFE, United Kingdom Atomic Energy Authority; ⁵Warsaw University of Technology*

Invited

Development of Tungsten Heavy Alloy Composites for Fusion Applications: *Wahyu Setyawan¹; Ba Nguyen¹; Weilin Jiang¹; Md Alam²; James Haag IV³; Jing Wang¹; Laila El-Guebaly⁴; Dalong Zhang¹; Ramprasad Prabhakaran¹; Charles Henager Jr.¹; G. Odette²; Mitsu Murayama³; ¹Pacific Northwest National Laboratory; ²University of California at Santa Barbara; ³Virginia Tech; ⁴University of Wisconsin*

Neutron Radiation Enhanced Grain Growth in Tungsten and Tungsten Alloys under Mixed Spectrum Neutron Irradiation: *Hanns Gietl¹; Takaaki Koyanagi¹; Xunxiang Hu¹; Yutai Katoh¹; ¹Oak Ridge National Laboratory*

Characterization of Atomic-scale Defects in Neutron Irradiated Silicon Carbide: *Takaaki Koyanagi¹; David Sprouster²; Xunxiang Hu¹; Yutai Katoh¹; ¹Oak Ridge National Laboratory; ²Stony Brook University*

Novel Transitional Layer Structure between Reduced Activation Ferritic Martensitic Steels and Tungsten for Fusion Reactors: *Tim Graening¹; Ishtiaque Robin²; Ying Yang¹; Lizhen Tan¹; Yutai Kato¹; ¹Oak Ridge National Laboratory; ²University of Tennessee Knoxville*

Tensile Properties and Microstructure of Neutron Irradiated Tungsten Fibers for Fusion Materials Application: *Lauren Garrison¹; John Echols¹; Johann Riesch²; Hans Gietl¹; Maxim Gussev¹; ¹Oak Ridge National Laboratory; ²Max-Planck-Institut für Plasmaphysik, Garching*

Effect of He Plasma Exposure on Recrystallization and Properties of W: *Dhriti Bhattacharyya¹; Calvin Hoang²; Matthew Thompson³; Cormac Corr³; ¹Australian Nuclear Science and Technology Organization; ²University of New South Wales; ³Australian National University*

Anomalous Precipitation of Cr in Fe-rich Ferritic Steels under Irradiation in Presence of C and N Impurities: First Principles Modeling and Experimental Observations: *Mark Fedorov¹; Jan Wróbel¹; Andrew London²; Krzysztof Kurzydłowski³; Sergei Dudarev²; Duc Nguyen-Manh²; ¹Warsaw University of Technology; ²Culham Centre for Fusion Energy, United Kingdom Atomic Energy Authority; ³Bialystok University of Technology*

First-principles Calculations of Tungsten-based Alloys under Fusion Power Plant Conditions: *Yichen Qian¹; Mark Gilbert²; Lucile Dezerald³; David Cereceda¹; ¹Villanova University; ²Culham Centre for fusion Energy; ³Universite de Lorraine*

Multi-scale Model for Segregation of Transmutation-generated Solutes in Neutron Irradiated Tungsten: *Duc Nguyen-Manh¹; Matthew Lloyd²; Jan Wrobel³; Michael Klimenkov⁴; Luca Messina⁵; Sergei Dudarev¹; Enrique Martinez⁶; Charlotte Becquart⁷; Christophe Domain⁸; ¹UK Atomic Energy Authority; ²University of Oxford; ³Warsaw University of Technology; ⁴Karlsruhe Institute of Technology; ⁵CEA Cadarache; ⁶Clemson University; ⁷Univ. Lille; ⁸EDF-R&D*

Liquid Metal Compatibility Evaluations for Fusion Applications: *Bruce Pint¹; Marie Romedenne¹; Jiheon Jun¹; ¹Oak Ridge National Laboratory*

NUCLEAR MATERIALS

Materials Systems for the Future of Fusion Energy — On-Demand Poster Session

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

Program Organizers: Jason Trelewicz, Stony Brook University; Kevin Field, University of Michigan; Takaaki Koyanagi, Oak Ridge National Laboratory; Yuanyuan Zhu, University of Connecticut; Dalong Zhang, Pacific Northwest National Laboratory

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Poster Hall

Molecular Dynamics Simulations of Hydrogen and Nitrogen Implantation in Tungsten: *Mary Alice Cusentino¹; Mitchell Wood¹; Aidan Thompson¹; ¹Sandia National Laboratories*

Modelling and Experimental Study of Yttrium Segregation in Smart Alloys as Plasma Facing Materials: *Duc Nguyen-Manh¹; Damian Sobieraj²; Jan Wrobel²; Mark Gilbert¹; Joven Lim¹; Ivan Povstugar³; Felix Klein³; Andrey Litnovsky³; ¹UK Atomic Energy Authority; ²Warsaw University of Technology; ³Forschungszentrum Jülich GmbH*

Heavy Ion Irradiation Studies on an Additively Manufactured 316LN Stainless Steel at Elevated Temperatures: *Zhongxia Shang¹; Cuncai Fan¹; Yinmin Wang²; Lin Shao³; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University; ²University of California, Los Angeles; ³Texas A&M University*

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — On-Demand Oral Presentations

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Room

Invited

A Comprehensive Study of Responses of SiC Materials to Neutron Irradiation for ATF Cladding Application: *Takaaki Koyanagi¹; Christian Petrie²; Jose' Arregui Mena¹; Hsin Wang¹; Yutai Katoh¹; ¹Oak Ridge National Laboratory*

Invited

Advances in SiGA® Development for Nuclear Applications: *Sean Gonderman¹; Kirill Shapovalov¹; George Jacobsen¹; Lucas Borowski¹; Shaobin Fan¹; Rolf Haefelfinger¹; Christian Deck¹; Jack Gazza¹; Christina Back¹; ¹General Atomics*

Invited

Small Scale Mechanical Testing of Irradiated Cladding and Fuel for Nuclear Reactors: *David Frazer¹; Fabiola Cappia¹; Daniel Murray¹; Cameron Howard¹; Yachun Wang¹; Fei Teng¹; Jatuporn Burns¹; ¹Idaho National Laboratory*

Creep Performance of IronClad Accident Tolerant Fuel Cladding: *Evan Dolley¹; Wanming Zhang¹; Dan Lutz¹; Russ Fawcett¹; Raul Rebak¹; ¹GE Research/GE Power*

Effect of Free Surface on Displacement-cascade Damage in Neutron Irradiated Nickel: *Michele Fullarton¹; Giridhar Nandipati¹; Ram Devanathan¹; David Senior¹; ¹Pacific Northwest National Laboratory*

Effects of Low-temperature Neutron Irradiation, Hydrogen Charging, and Post-weld Heat Treatment on Tensile Properties of Welded Zircaloy-4: *John Echols¹; Nate Reid¹; Lauren Garrison¹; ¹Oak Ridge National Laboratory*

Uranium Nitride/Uranium Boride Composite Materials: *Joel Turner¹; James Buckley¹; Robert Worth¹; Tim Abram¹; ¹University of Manchester*

Simulation of Shearing-induced Edge and Interfacial Fractures in U-10Mo Monolithic Fuel Plates: *Lei Li¹; Kyoo Sil Choi¹; Kenneth Johnson¹; Vineet Joshi¹; Ayoub Soulam¹; ¹Pacific Northwest National Laboratory*

Phase Stability in FeCrAl Alloys: Mapping the Miscibility Gap and Understanding the Impact of Alpha Prime Precipitation on Material Properties: *Rajnikant Umretiya¹; Andrew Hoffman¹; Raul Rebak¹; ¹GE Research*

Microstructure and Surface Chemistry of FeCrAl Alloys Accident Tolerant Fuel Cladding Subjected to Fast Heating Rate in Aqueous Environment: *Rajnikant Umretiya¹; Donghwi Lee²; Mark Anderson²; Raul Rebak¹; Jessica Rojas³; ¹GE Research; ²University of Wisconsin-Madison; ³Virginia Commonwealth University*

Interface Characterization of an Explosion Welded Stainless Steel-clad Plate for Neutron Irradiation Studies: *Nathan Reid¹; John Echols²; Lauren Garrison²; Jean Paul Allain³; ¹University of Illinois at Urbana-Champaign; ²Oak Ridge National Laboratory; ³Pennsylvania State University*

Diffusion in Doped and Undoped Amorphous Zirconia: *Megan Owen¹; Michael Rushton¹; Lee Evitts¹; Antoine Claisse²; Mattias Puide²; William Lee¹; Simon Middleburgh¹; ¹Bangor University; ²Westinghouse Electric Sweden AB*

Effects of Steel Composition and Grain Size on Diffusion with Neodymium: *Brian Bettes¹; Yi Xie¹; ¹Purdue University*

Development of PVD Cr Coatings for Hydrothermal Corrosion Resistance of SiC-SiC_f Fuel Cladding in LWRs: *Kyle Quillin¹; Hwasung Yeom¹; Tyler Dabney¹; Evan Willing¹; Taeho Kim¹; Sergey Chemerisov²; Christian Deck³; Adrien Couet¹; Kumar Sridharan¹; ¹University of Wisconsin-Madison; ²Argonne National Laboratory; ³General Atomics*

Role of Powder Microstructure and Mechanical Properties on Deposition and Properties of Cold Spray Cr Coatings: *Tyler Dabney¹; Kyle Quillin¹; Hwasung Yeom¹; Kumar Sridharan¹; ¹University of Wisconsin-Madison*

Manufacturing of Oxide Dispersion Strengthened (ODS) Steel Fuel Cladding Tubes Using Cold Spray Technology: *Hwasung Yeom¹; Vishnu Ramasawmy¹; Xinwu Liu¹; David Hoelzer²; Stuart Maloy³; Peter Hosemann⁴; Kumar Sridharan¹; ¹University of Wisconsin-Madison; ²Oak Ridge National Laboratory; ³Los Alamos National Laboratory; ⁴University of California-Berkeley*

Progress on Experimental Investigation of Degradation Mechanisms of ATF Coated Cladding under Transient Conditions: *Hwasung Yeom¹; Tyler Dabney¹; David Kamerman²; Michelle Bales³; Logan Crevelt⁴; Zhen Li⁴; Anthony Evans⁴; Brent Heuser⁴; Kumar Sridharan¹; ¹University of Wisconsin-Madison; ²Idaho National Laboratory; ³U.S. Nuclear Regulatory Commission; ⁴University of Illinois Urbana-Champaign*

Microstructure, Mechanical Properties, and Irradiation Response of Fe-Cr-Ni-based Multi-principal Element Alloys: *Marcus Parry¹; Cheng Sun¹; Wen Jiang¹; Boopathy Kombariah¹; Colin Judge¹; Seongtae Kwon¹; Ovidiu Toader²; Gary Was²; Taylor Sparks³; ¹Idaho National Laboratory; ²University of Michigan; ³University of Utah*

Deconvoluting Properties of Additively Manufactured Alloy 718 Utilizing Coupled Microscopy and Machine Learning: *Stephen Teller¹; Ty Austin²; Kurt Terrani¹; ¹Oak Ridge National Laboratory; ²University of Tennessee - Knoxville*

The Interaction between an Extended Edge Dislocation and a Helium Bubble in Copper: *Wurong Jian¹; Shuozhi Xu¹; Yanqing Su²; Irene Beyerlein¹; ¹University of California, Santa Barbara; ²Utah State University*

Phase-field Simulations of Fission Gas Bubbles in High Burnup UO₂ to Inform Engineering-scale Fuel Performance Modeling: *Larry Aagesen¹; David Andersson²; Sudipta Biswas¹; Michael Cooper²; Kyle Gamble¹; Wen Jiang¹; ¹Idaho National Laboratory; ²Los Alamos National Laboratory*

Unraveling the Early Stage Ordering of Krypton Solid Bubbles in Molybdenum: A Multi-modal Study: *Ericmoore Jossou¹; Anton Schneider²; Cheng Sun³; Yongfeng Zhang²; Shirish Chodankar¹; Dmytro Nykypanchuk¹; Jian Gan³; Lynne Ecker¹; Simerjeet Gill¹; ¹Brookhaven National Laboratory; ²University of Wisconsin; ³Idaho National Laboratory*

Modeling High-temperature Corrosion of Zirconium Alloys Using the Extended Finite Element Method: *Wen Jiang*¹; Louis Bailly-Salins²; Benjamin Spencer¹; Adrien Couet²; ¹Idaho National Laboratory; ²University of Wisconsin-Madison

NUCLEAR MATERIALS

Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials — On-Demand Poster Session

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

Program Organizers: Dong Liu, University of Bristol; Peng Xu, Idaho National Laboratory; Simon Middleburgh, Bangor University; Christian Deck, General Atomics; Erofil Kardoulaki, Los Alamos National Laboratory; Robert Ritchie, University of California, Berkeley

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Poster Hall

Microstructural and Mechanical Properties of Hot Deformation Behavior of Zr-4 Alloy: *Gaurav Singh*¹; Raviraj Verma¹; Vishnu Narayanan KI²; Umesh Arora²; R Jayaganthan¹; ¹Indian Institute of Technology Madras; ²NFC Hyderabad

Investigation of Degradation Mechanism of Accident Tolerant Fuel (ATF) Coated Cladding Concepts during Interim Storage and Transportation of Used Nuclear Fuels: *Evan Willing*¹; Hwasung Yeom¹; Tyler Dabney¹; Kumar Sridharan¹; Andrew Nelson²; Tim Graening²; ¹University of Wisconsin Madison; ²Oak Ridge National Laboratory

Formation of UN in U-Mo Systems by Mechanical Alloying: *James Zillinger*¹; Nathan Jerred¹; Adrian Wagner¹; Samrat Choudhury²; Indrajit Charit²; ¹Idaho National Laboratory; ²University of Idaho

Impact Fretting Wear Behavior of Cr-alloy Coating Layer for Accident-tolerant Fuel cladding: *Youngho Lee*¹; Dong-Jun Park¹; Yang-IL Jung¹; Sung-Chan Yoo¹; Hyun_Gil Kim¹; ¹Korea Atomic Energy Research Institute

Comparison of Neutron Irradiation Effects in PM-HIP and Cast Grade 91 Steel: *Sri Sowmya Panuganti*¹; Yu Lu²; Sheng Cheng³; Megha Dubey³; Yangyang Zhao¹; Caleb Clement¹; Donna Guillen⁴; David Gandy⁵; Janelle Wharry¹; ¹Purdue University; ²Boise State University; ³Boise State University; ⁴Idaho National Laboratory; ⁵Electric Power Research Institute

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — On-Demand Oral Presentations

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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Room

Invited

In Situ Nanomechanics of Deformation Twinning: *Ting Zhu*¹; Yin Zhang¹; ¹Georgia Institute of Technology

Invited

Precipitate Looping and Shearing at the Nanoscale: *William Curtin*¹; Yi Hu¹; Daniel Marchand¹; ¹Epfl Sti Igm Lamm

Invited

Analyzing Lamellar Level Correlations between Mechanical Behavior and Composition in Mouse Bone: *Shraddha Vachhani*¹; Surya Kalidindi²; Siddhartha Pathak¹; ¹Iowa State University; ²Georgia Institute of Technology

Invited

Mechanistic-design of Multilayered Metal-metal and Metal-ceramic Nanocomposites for Tunable Strength and Toughness: *Siddhartha (Sid) Pathak*¹; ¹Iowa State University

Theoretical Development of Continuum Dislocation Dynamics with Reactions: Preliminary Results: *Kyle Starkey*¹; Anter El-Azab¹; Thomas Hochrainer²; ¹Purdue University; ²Graz University of Technology

Development of Neural Network Potential for MD Simulation and Evaluation of Mechanical Property: *Takeru Miyagawa*¹; Akio Yonezu¹; Kazuki Mori²; Nobuhiko Kato²; ¹Chuo University; ²ITOCHU Techno-Solutions Corporation (CTC)

Ligament-size Effect of Time-dependent Plasticity in Nanoporous Gold under Controlled Surface Coated Layer: *Hansol Jeon*¹; Eunji Song¹; Ju-Young Kim¹; ¹Unist

Molecular Dynamics Simulations on Nanosuspension Droplet Impact: *Baiou Shi*¹; Siddharth Ravi¹; ¹Pennsylvania State University Erie

Atomistic Mechanism of Stress Modulated Phase Transition in Monolayer MoTe2: *Wei Gao*¹; ¹University of Texas at San Antonio

NANOSTRUCTURED MATERIALS

Mechanical Behavior at the Nanoscale VI — On-Demand 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, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Matthew Daly, University of Illinois-Chicago; Douglas Stauffer, Bruker Nano Surfaces & Metrology; Wei Gao, University of Texas at San Antonio; Changhong Cao, McGill University; Mohsen Asle Zaeem, Colorado School of Mines

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Poster Hall

Correlation of Crack Propagation with Mechanical Properties of Parent Phases and Softened Phases in Bearing Steels under Rolling Contact Fatigue: *Eunji Song*¹; Hansol Jeon¹; Ju-Young Kim¹; ¹UNIST

CHARACTERIZATION

Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling — On-Demand Oral Presentations

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Shailendra Joshi, University of Houston; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC

Monday AM | March 14, 2022
Characterization | On-Demand Room

Invited

Integrated Discrete Dislocation Plasticity Modelling, HR-EBSD and TEM Characterisation of Ti Dwell Fatigue: Yilun Xu¹; Sudha Joseph¹; Phani Karamchad¹; David Dye¹; *Fionn Dunne*¹; ¹Imperial College

Atomistic Insight into Cumulative Twin-solute Interactions in Mg Alloys: *Yang Hu*¹; Vladislav Turlo²; Dennis Kochmann¹; ¹ETH Zurich; ²Empa

In-situ TEM Observation of Shear Induced Microstructure Evolution in Cu-Nb Alloy: *Shuang Li*¹; Matthew Olszta¹; Lei Li¹; Bharat Gwalani¹; Ayoub Soulami¹; Cynthia Powell¹; Suveen Mathaudhu¹; Arun Devaraj¹; Chongmin Wang¹; ¹Pacific Northwest National Laboratory

Micro-mechanical Investigation of a High-pressure Torsion Processed Nano-crystalline WCu Composite: *Michael Burtscher*¹; Markus Alfreider¹; Klemens Schmuck¹; Daniel Kiener¹; ¹Montanuniversitaet Leoben

In-situ Digital Image Correlation Study to Reveal Cyclic Plastic Strain Localizations in Stainless Steel 316L: *Elif Cansu Kursun*¹; Koenraad G.F. Janssens¹; Philippe Spätig¹; ¹Paul Scherrer Institute

Effect of Hole Shape and Pattern Orientation on Mechanical Behaviour of Two-dimensional Micro-lattice through In Situ Micro-tensile Testing: *Dhriti Bhattacharyya*¹; Alan Xu¹; Michael Saleh¹; ¹Australian Nuclear Science and Technology Organization

Tensile and Fatigue Testing of Metallic Thin Films with Ultra-thin Passivation Layers: *Sunkun Cho*¹; Ho Jang Kim¹; Yu Hyun Park¹; Gi-Dong Sim¹; ¹KAIST

The Mechanical Behavior of Passivated Al and Al-C Thin Films: *Hojang Kim*¹; Injong Oh¹; Gi-Dong Sim¹; ¹KAIST

A Rapid Testing Method for Evaluating Strain-path Sensitivity: *Anastasia Vrettou*¹; David Collins¹; ¹University of Birmingham

MATERIALS DESIGN

Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis — On-Demand Oral Presentations

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

Program Organizers: Srivatsan Tirumalai, The University of Akron; Pradeep Rohatgi, University of Wisconsin; Simona Hunyadi Murph, Savannah River National Laboratory

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Keynote

Shape-selective Palladium-based Nanomaterials: *Simona Hunyadi Murph*¹; ¹Savannah River National Laboratory

Invited

A Study on Thermal Properties of Composite Metal Foams for Applications in Tank Cars Carrying Hazardous Materials: *Afsaneh Rabiei*¹; ¹North Carolina State University

Invited

Engineered Nano-antenna Susceptors as Efficient Platforms for Efficient Uptake and Release of Analytes: *Simona Hunyadi Murph*¹; ¹Savannah River National Laboratory

Role and Potential of Copper Nanocomposites for Use in Power and Electrical Systems: An Overview: *Yue-Hao Choong*¹; Krishnan Manickavasagam¹; Manoj Gupta¹; Srivatsan Tirumalai²; ¹National University of Singapore; ²The University of Akron

Wireless, Self-powered Stretchable Sensing System Based on Laser-induced Graphene Composites: *Huanyu Cheng*¹; ¹Pennsylvania State University

In Situ Study of Spontaneous Nanocrystallization of Intermetallics for Interconnection of High-power Electronics: *Ying Zhong*¹; Chunqing Wang²; ¹University of South Florida; ²Harbin Institute of Technology

Characterization of Metal-matrix Composites Synthesized by Reactive Melt Penetration of SiO₂-based Preforms in Molten Al-Ti and Al-Fe Alloys: *Constantin Solomon*¹; Anthony Yurcho²; Matthias Zeller³; Timothy Wagner¹; ¹Youngstown State University; ²Zekelman Industries; ³Purdue University

Manufacturing of Nano-reinforced Aluminium Composites by a Combination of Stir Mixing, Ultrasonic Processing and High-pressure Die Casting: *Guangyu Liu*¹; Mahfuz Karim¹; Dmitry Eskin¹; Brian McKay¹; ¹Brunel University London

Novel Nanophotocatalysts for Detection and Remediation of Contaminated Ecosystems: *Simona Hunyadi Murph*¹; ¹Savannah River National Laboratory

Development of Coating Methods of Fiber Reinforced for Different Matrix Composites for Industrial Applications: *Emel Çaliskan*¹; Kaan Ipek²; Derya Dispinar³; Erol Ince¹; ¹Istanbul Cerrahpasa University; ²Teknik Alüminyum San. Tic. A.Ş.; ³Istanbul Technical University

MATERIALS DESIGN

Microstructural Templates Consisting of Isostructural Ordered Precipitate / Disordered Matrix Combinations: Microstructural Evolution and Properties — On-Demand Oral Presentations

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; Bharat Gwalani, Pacific Northwest National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Jessica Krogstad, University of Illinois at Urbana-Champaign; Ashley Paz Y Puente, University of Cincinnati; Keith Knipling, Naval Research Laboratory; Matthew Steiner, University of Cincinnati

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Invited

Microstructural Engineering in NiCoCr Medium Entropy Alloys: Nithin Baler¹; Abdulla Samin M V¹; *Surendra Kumar Makineni*²; ¹Indian Institute of Science Bangalore; ²Indian Institute of Science Bangalore

Invited

Precipitate Strengthening and Stabilization Mechanisms in Cast and Additively Manufactured Al-Cu-Mn-Zr Alloys: *Jonathan Poplawsky*¹; Richard Michi¹; Sumit Bahl¹; Brian Milligan²; Patrick Shower³; Lawrence Allard¹; Matthew Chisholm¹; Dongwon Shin²; Kevin Sisco⁴; Alex Plotkowski¹; Ryan Dehoff¹; Allen Haynes¹; Amit Shyam¹; ¹Oak Ridge National Laboratory; ²Colorado School of Mines; ³GE Global Research; ⁴University of Tennessee, Knoxville

Invited

On the Detailed Morphological and Chemical Evolution of Phases during Laser Powder Bed Fusion and Common Post-processing Heat Treatments of IN718: Sophie Primig¹; *Vitor Riell*²; Alessandro Piglion²; Minh-Son Pham²; ¹University of New South Wales; ²Imperial College London

Invited

The Origin and Stability of Nanostructural Hierarchy in Nickel-base Superalloys: *Subhashish Meher*¹; Larry Aagesen¹; Tresa Pollock²; L. J. Carroll¹; ¹Idaho National Laboratory; ²University of California, Santa Barbara

Invited

Design of Precipitation Strengthened Metastable High Entropy Alloys: *K. G. Pradeep*¹; ¹Indian Institute of Technology Madras

Seeing the Shearing of Short-range Order with Dislocations in the High-entropy Alloy: *Jae-Bok Seol*¹; Jongun Moon²; Hyo Ju Bae¹; Jae Wung Bae³; Hyokyung Sung¹; Jung Gi Kim¹; Hyoung Seop Kim²; ¹Gyeongsang National University; ²POSTECH; ³Max-Planck-Institut für Eisenforschung GmbH

SPECIAL TOPICS

Moving Forward from a Pandemic: How the Field of Materials Science Has Adapted (2022 Student-led Symposium) — On-Demand Oral Presentations

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Christine Smudde, University of California, Davis; Jared Stimac; Mingwei Zhang, University of California, Davis

Monday AM | March 14, 2022
Special Topics | On-Demand Room

Learning from the Pandemic: *Justine Johannes*¹; Gilbert Herrera¹; P Randall Schunk¹; Jeffrey Nelson¹; ¹Sandia National Laboratories

Supporting Educators through Software during Remote Teaching: *Kaitlin Tyler*¹; ¹ANSYS

The Interrupted University: Lessons from Engineering Design in Response to the Covid-19 Pandemic: *Sunniva Collins*¹; ¹Case Western Reserve

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI — On-Demand Student Poster Session

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chaohong Wang, National Chung Cheng University; Chih Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; A.S.Md Abdul Haseeb, University of Malaya; Vesa Vuorinen, Aalto University; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Monday AM | March 14, 2022
Electronic Materials | On-Demand Poster Hall

Interfacial Reactions in the Sn/C194 and Sn-3.0Ag-0.5Cu/C194 Couples: Yee-Wen Yen¹; Jun Wen¹; *You-Yan Li*²; Xin-Bin Hu¹; ¹National Taiwan University of Science and Technology

ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI — On-Demand Oral Presentations

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chaohong Wang, National Chung Chung University; Chih Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; A.S.Md Abdul Haseeb, University of Malaya; Vesa Vuorinen, Aalto University; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Monday AM | March 14, 2022
Electronic Materials | On-Demand Room

Invited

Mesoscale Simulations Guiding Data-driven Design of Electronic Materials: Anil Kunwar¹; Johan Hektor²; Upadesh Subedi³; Nele Moelans⁴; ¹Silesian University of Technology; ²Malmö University; ³Tribhuvan University; ⁴KU Leuven

Invited

Data-driven Rational Design of Conductive Copper-based Alloys with High Performance: Jianxin Xie¹; Huadong Fu¹; ¹University of Science and Technology Beijing

Invited

Failure Analysis and Prediction of Solder Microbumps due to Side Wetting and Electromigration by 3D X-ray: Po-Ning Hsu¹; Chih Chen¹; Kai-Cheng Hsieh¹; Tzu-Wen Lin¹; Cheng-Che Wu¹; Nien-Ti Tsou¹; Yu-Chieh Lo¹; Nan-Yo Chen²; Mia Wu³; Yong-Fen Hsieh³; K. N. Tu⁴; ¹National Yang Ming Chiao Tung University; ²National Center for High-performance Computing, Taiwan; ³Materials Analysis Technology Inc.; ⁴UCLA/City University of Hong Kong

Phase Transformation Temperatures of Sn-based Solder Alloys: Sinn-wen Chen¹; Jun-xiang Liu¹; ¹National Tsing Hua University

Electric Current-assisted Treatment for 7075 Aluminum Alloy to Withstand High-speed Impact: Shih-kang Lin¹; Yu-chen Liu¹; Yu-ching Chen¹; Yu-ning Chiu¹; ¹National Cheng Kung University

Electronic Material Properties Exploration Using Machine Learning: In Effective Charge, Hardness, and Dissipation Factor: Yu-chen Liu¹; Shih-kang Lin¹; ¹National Cheng Kung University

Solution-processed Perovskite Photoabsorbers with Mixed Cations for Improved Stability in Solar Cells: Mritunjaya Parashar¹; Mohin Sharma¹; Anupama Kaul¹; Kishan Jayanand¹; ¹University of North Texas

Filp-chip Encapsulation with Hybrid Organic-inorganic Passivation of Perovskite Solar Cells: Tse-Lin Lai¹; ¹National Central University

Cu Sintering Process Modified by Adding a Low Temperature Liquid Sintering Step: Bo Rong Huang¹; ¹National Central University

Bi Orientation-dependence and Mechanical Properties in a Sn-Bi-Ag Low-temperature Lead-free Solder: Chih-Han Yang¹; Yu-chen Liu¹; Yuki Hirata²; Hiroshi Nishikawa²; Shih-kang Lin¹; ¹National Cheng Kung University; ²Osaka University

Self-healing Kirkendall Voids at the Joint Interface between Sn and <111> Oriented and Nano-twinned Cu: Shiqi Zhou¹; Yubo Zhang¹; Yue Gao¹; Li-Yin Gao¹; Zhi-Quan Liu¹; ¹Shenzhen Institutes of Advanced Technology, CAS

Interfacial Reaction between In Coated Cu Sheet and ENIG Substrate: Hiroshi Nishikawa¹; Jianhao Wang²; Kento Kariya³; Noriyuki Masago³; ¹Osaka University; ²Nanjing University of Aeronautics and Astronautics; ³Rohm Co., Ltd.

Interfacial Reaction between Sn-rich Solder and FeCoNiCu High-entropy Alloy: Yu-An Shen¹; Sheng-Wen Chen¹; Hao-Zhe Chen¹; ¹Feng Chia University

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — On-Demand Oral Presentations

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Monday AM | March 14, 2022
Physical Metallurgy | On-Demand Room

Invited

Microstructural Evolution and Nanoprecipitation Behaviour of a Selective Laser Melted, 18% Ni Maraging 300 Steel: Gopi Kompelli¹; Angelos Nikolaidis¹; David de Castro¹; Adriana Eres Castellanos¹; Isaac Toda Caraballo¹; David San Martin¹; Jose Antonio Jimenez¹; Esteban Urones Garrote²; Rosalia Rementeria³; Carlos Capdevila⁴; Francisca Caballero¹; ¹CENIM-CSIC; ²Universidad Complutense de Madrid; ³ArcelorMittal Global R&D

Atomistic Modeling of Phase Stability and Transformations due to the Presence of Precipitates in High and Medium Entropy Alloys: Eva Zarkadoulas¹; Ying Yang¹; Albina Borisevich¹; Easo George¹; ¹Oak Ridge National Laboratory

Influence of Cluster Hardening on Strength and Strain Hardening Behavior of Various Aluminum Alloys: Philip Aster¹; Lukas Stemper¹; Florian Schmid¹; Peter Uggowitzer¹; Stefan Pogatscher¹; ¹Montanuniversität Leoben

A Combinatorial Approach to Investigate Abnormal Grain Growth Behavior in Cu-Al-Mn Shape Memory Alloys: Hyoungrok Lee¹; Sheng Xu¹; Toshihiro Omori¹; Ryosuke Kainuma¹; ¹Tohoku University

On the Precipitation Behavior of γ -TiAl from a Supersaturated β_0 -TiAl Matrix in an Intermetallic Ti-44Al-7Mo (at.%) Alloy: Gloria Graf¹; Christoph Gammert²; Simon Fellner²; Johanna Byloff¹; David Holec¹; Helmut Clemens¹; Petra Spoerk-Erdely¹; ¹University of Leoben; ²Erich-Schmid-Institut für Materialwissenschaft der ÖAW

Cementite Decomposition in 100Cr6 Bearing Steel during High-pressure Torsion: Influence of Composition, Size, Morphology and Matrix Hardness: Kiranbabu Sriakulapu¹; Lutz Morsdorf¹; Po-Yen Tung¹; Michael Herbig¹; ¹Max-Planck-Institut für Eisenforschung

Decoupling of Strain and Temperature Effects on Microstructural Evolution during High Shear Strain Deformation: Anqi Yu¹; Julian Escobar Atehortua¹; Krassimir Bozhilov²; Jia Liu¹; Mayur Pole¹; Joshua Silverstein¹; Sundeep Mukherjee³; Suveen Mathaudhu⁴; Arun Devaraj¹; Bharat Gwalani¹; ¹Pacific Northwest National Laboratory; ²University of California, Riverside; ³University of North Texas; ⁴Colorado School of Mines

Processing Electroceramics in the Transmission Electron Microscope: Jenna Wardini¹; Jairo Gonzalez²; George Harrington²; William Bowman¹; ¹University of California Irvine; ²Kyushu University

Phase Field Simulations of Direct Aging of a Rapidly Solidified Ni-Fe-Nb Alloy: *Bala Radhakrishnan*¹; Sarma Gorti¹; Ranadip Acharya²; ¹Oak Ridge National Laboratory; ²Collins Aerospace Applied Research and Technology

Role of Phosphorus in Irradiated Microstructure Evolution of a Binary Fe-P Model Alloy by TEM In Situ Irradiation: *Patrick Warren*¹; Wei-Ying Chen²; Ling Wang³; Janelle Wharry¹; ¹Purdue University; ²Argonne National Laboratory; ³Materials Science and Technology Division

The Effect of Low-temperature Aging on the Microstructure and Mechanical Behavior of Martensitic Ti-Nb Alloy: *Marissa Linne*¹; Rohini Sankaran¹; Sharon Torres¹; Joseph Mckeown¹; Amanda Wu¹; ¹Lawrence Livermore National Laboratory

Lattice Point Defects: A Vacancy in Phase Transformation Models: *Estelle Meslin*¹; Maylise Nastar¹; Lisa Belkacémi¹; Marie Loyer-Prost¹; ¹Cea

Thermoelastic Martensitic Transformation in Mn-rich Mn-Cu-Al BCC Alloys: *Tatsuya Ito*¹; Xiao Xu¹; Toshihiro Omori¹; Ryosuke Kainuma¹; ¹Tohoku University

Kinetics of γ Evolution in a Model Ni-based Alloy: *Govindarajan Muralidharan*¹; Shivakant Shukla¹; Donovan Leonard¹; Balasubramanian Radhakrishnan¹; Jonathan Poplawsky¹; Matt Frith²; Jan Ilavsky²; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory

Z-phase Formation in a 12% Cr Tempered Martensite Ferritic Steel during Long Term Creep: *Johan Westraadt*¹; William Goosen¹; Aleksander Kostka²; Hongcai Wang²; Gunther Eggeler²; ¹Nelson Mandela University; ²Ruhr-Universität

Nucleation of Coupled Body-centered-cubic and Closed-packed Structures in Liquid Ni-Cr Alloys: *Deep Choudhuri*¹; ¹New Mexico Institute of Mining and Technology

Effect of Micro-segregation of Alloying Elements on the Precipitation Behaviour in Laser Surface Engineered Alloy 718: *Srinivas Aditya Mantri*¹; SriSwaroop Dasari¹; Abhishek Sharma¹; Mangesh Pantawane¹; Narendra Dahotre¹; Rajarshi Banerjee¹; Srikumar Banerjee²; ¹University of North Texas; ²Homi Bhabha National Institute, Bhabha Atomic Research Centre

Investigating the Dynamic Precipitation of AZ91 Alloy during Friction Stir Processing (FSP): *Xiaolong Ma*¹; Hrishikesh Das¹; David Garcia¹; Ethan Nickerson¹; Timothy Roosendaal¹; Mageshwari Komarasamy¹; Glenn Grant¹; ¹Pacific Northwest National Laboratory

Multiscale Model for Colony Breakdown Prediction in Two-phase Titanium Alloys: *Benjamin Begley*¹; Victoria Miller¹; ¹University of Florida

Deformation Enabled Precipitation in Magnesium Alloys during Hot Compression: *Suhas Eswarappa Prameela*¹; Yannick Hollenweger²; Peng Yi¹; Steven Lavenstein¹; Roshan Plamthottam¹; Alec Davis³; Joey Chen¹; Joseph Robson³; Jaafar El-Awady¹; Michael Falk¹; Dennis Kochmann²; Timothy Weihs¹; ¹Johns Hopkins University; ²ETH Zurich; ³The University of Manchester

High Speed Rotational Diamond Anvil Cell for in situ Analysis of Shear Deformation Induced Microstructural Evolution and Phase Transformation: A Multimodal Experimental and Computational study: *Arun Devaraj*¹; Tingkun Liu¹; Changyong Park²; Stanislav Sinogeikin³; Matthew Olszta¹; Bharat Gwalani¹; Lei Li¹; Wenkai Fu¹; Qin Pang¹; Nanjung Chen¹; Ayoub Soulami¹; Yulan Li¹; Shenyang Hu¹; Peter Sushko¹; Suveen Mathaudhu¹; Cynthia Powell¹; ¹Pacific Northwest National Laboratory; ²Argonne National Laboratory; ³DAC tools

Quantitative Assessment of Short-range Order in Fe-Al and Fe-Ga Alloy Single Crystals: *Rahul Kumar Sunil Singh*¹; Andrew Laroche¹; Travis Willhard¹; Sivaraman Guruswamy¹; ¹University of Utah

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — On-Demand Poster Session

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

Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Ramasis Goswami, Naval Research Laboratory; Saurabh Puri, Microstructure Engineering; Eric Payton, Air Force Research Laboratory; Bij-Na Kim, Carpenter Additive; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville

Monday AM | March 14, 2022
Physical Metallurgy | On-Demand Poster Hall

Microstructure Evolution of HK40 and HP40 Heat Resistant Steels after Isothermal Aging: *Victor Lopez-Hirata*¹; Eduardo Perez-Badillo¹; Maribel Saucedo-Muñoz²; Hector Dorantes-Rosales¹; Carlos Ferreira-Palma¹; Diego Rivas-Lopez¹; ¹Instituto Politecnico Nacional-ESIQIE

Coupled Effects of Shear and Temperature on Intermixing in Cu-Ni Multilayers: *Qin Pang*¹; Jenna Bilbrey¹; Arun Devaraj¹; Suveen Mathaudhu²; Peter Sushko¹; ¹Pacific Northwest National Laboratory; ²Colorado School of Mines

Precipitation Process during Isothermal Aging of an Austenitic Stainless Fe-12Cr-10Mn-12Ni-5Mo-0.24N-0.03C Steel and Its Effect on the Mechanical Properties: Maribel Saucedo-Muñoz¹; *Victor Lopez-Hirata*¹; Erika Avila-Davila¹; Felipe Hernandez-Santiago¹; Jose Villegas-Cardenas¹; ¹Instituto Politecnico Nacional-ESIQIE

Microstructure Rearrangements in Magnesium Alloys upon Thermo-mechanical Processing Studied by Advanced In-situ Synchrotron X-ray Diffraction: *Xiaoqing Liu*¹; Emil Zolotoyabko²; Klaus-Dieter Liss¹; ¹Guangdong Technion – Israel Institute of Technology; ²Technion – Israel Institute of Technology

Elastic Inhomogeneity Effects on Spinodal Decomposition in Ternary Alloys: *Jitin Nair*¹; Abinandanan T A¹; ¹Indian Institute of Science

Overview of the Non-isothermal Recrystallization in Cold-rolled Low-carbon Steels during Low-rate Annealing: *Ivon Alanis-Fuerte*¹; Octavio Vázquez-Gómez¹; Pedro Garnica-González¹; Edgar López-Martínez²; Héctor Vergara-Hernández¹; ¹Tecnológico Nacional de México / I.T. Morelia; ²Universidad del Istmo

Morphological Evolution of Internally Twinned Martensite in Laser Additively Manufactured Ti6Al4V: *Mangesh Pantawane*¹; Shashank Sharma¹; Abhishek Sharma¹; SriSwaroop Dasari¹; Srikumar Banerjee¹; Rajarshi Banerjee¹; Narendra Dahotre¹; ¹University of North Texas

The Effect of Irradiation Induced Defects on Martensitic Transformation in NiTi Shape Memory Alloys: *Taiwu Yu*¹; Alejandro Hinojos¹; Daniel Hong¹; Peter Anderson¹; Michael Mills¹; Yunzhi Wang¹; ¹Ohio State University

Phase Transformation upon Low Temperature Nitriding of Co-Cr Alloys: *Maryam Akhlaghi*¹; Stefan Martin²; Johannes Dallmann¹; Rainer Hock¹; Carolin Körner¹; Andreas Leineweber²; ¹Friedrich-Alexander University Erlangen-Nuremberg (FAU); ²TU Bergakademie Freiberg

Advanced Characterization of High-temperature Oxygen-induced Phase Evolution in NbTiZr: *David Beaudry*¹; Daniel Foley¹; Elaf Anber¹; Jean-Philippe Couzinié²; Loïc Perrière²; Keith Knippling³; Christopher Pasco¹; Tyrel McQueen¹; Michael Waters⁴; James Rondinelli¹; Mitra Taheri¹; ¹Johns Hopkins University; ²University Paris-Est Créteil; ³U.S. Naval Research Laboratory; ⁴Northwestern University

Kinetic Monte Carlo Simulations of Solute Clustering in Multicomponent Al Alloys: *Zhucong Xi*¹; Louis Hector²; Amit Misra¹; Liang Qi¹; ¹University of Michigan; ²GM Global Technical Center

Coarsening Behavior of Hierarchical B2 Precipitates in a High Entropy Alloy: *Subhashish Meher*¹; Thomas Lillo¹; ¹Idaho National Laboratory

ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — On-Demand Oral Presentations

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; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Pacific Northwest National Laboratory

Monday AM | March 14, 2022
Additive Technologies | On-Demand Room

Invited

Microdroplet-based Manufacturing of Metal-organic Frameworks Powder Materials: Fundamentals and Applications: *Weining Wang*¹; ¹Virginia Commonwealth University

Invited

Particle Packing in Powder Spreading for Selective Laser Melted Additive Manufacturing Using the Discrete Element Method: Priscilla Ng¹; *Xuan Wang*¹; Thomas Mackin¹; ¹California Polytechnic State University San Luis Obispo

Rapid Solidification Behavior of Cast Ni-based Superalloy IN-100 by EBM Process: *Yusaku Hasebe*¹; Takehito Hagiwara¹; Satoru Ohsaki¹; Kazuya Kubo¹; Cheng Yang¹; Kenta Aoyagi¹; Kenta Yamanaka¹; Akihiko Chiba¹; ¹The Japan Steel Works Ltd

Investigating Particle Size-shape Effects on Flowability and Moisture Content of Metallic Powders after Environmental Exposure for Additive Manufacturing Applications: *Jack Grubbs*¹; Brent Ditzler¹; Aaron Birt²; Danielle Cote¹; ¹Worcester Polytechnic Institute; ²Solvus Global

Analysis of Additive Manufacturing Powders' Behaviors Using Discrete Element Method-based Simulation: *Safwat Shenouda*¹; ¹Lawrence Livermore National Laboratory

MATERIALS PROCESSING

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — On-Demand Oral Presentations

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

Program Organizers: Ma Qian, Royal Melbourne Institute of Technology; James Paramore, US Army Research Laboratory; David Yan, San Jose State University; Gang Chen, University of Science and Technology Beijing

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Invited

Cost Down and Plain Design of High-performance Titanium via Additive Manufacturing: *Gang Chen*¹; Wangwang Ding¹; Qiying Tao¹; Mingli Qin¹; Xuanhui Qu¹; ¹University of Science and Technology Beijing

LIGHT METALS

Primary Aluminum Industry - Energy and Emission Reductions: An LMD Symposium in Honor of Halvor Kvande — On-Demand Oral Presentations

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

Program Organizer: Arne Ratvik, SINTEF

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Halvor Kvande: An Academic Ambassador in Aluminum Between China and Norway: *Bingliang Gao*¹; Zhaowen Wang¹; Zhongning Shi¹; Naixiang Feng¹; ¹Northeastern University

Ready-to-Use Cathodes in High Amperage Technologies: Markus Pfeffer¹; *Oscar Vera Garcia*¹; Frank Hiltmann¹; Seweryn Mielnik¹; Peter Wang¹; Louis Bugnion²; Laure von Kaenel²; Mao Jihong³; Ban Yungang³; ¹Tokai COBEX GmbH; ²NOVALUM SA; ³NEUI

MATERIALS PROCESSING

Rare Metal Extraction and Processing — On-Demand Oral Presentations

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

Program Organizers: Takanari Ouchi, University of Tokyo; Gisele Azimi, University of Toronto; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Alafara Baba, University of Ilorin; Hong Peng, University of Queensland

Monday AM | March 14, 2022
Materials Processing | On-Demand Room

Keynote

Development of New Extractants for Platinum Group Metal Ions in Hydrochloric Acid Solutions: *Hirokazu Narita*¹; ¹National Institute of Advanced Industrial Science & Technology

Keynote

Direct Synthesis of Intermetallic Compounds through Thermo-reduction and Electrochemical Deposition: *Shuhan Wang*¹; *Chao Du*²; *Xin Lu*¹; *Osamu Takeda*¹; *Hongmin Zhu*¹; ¹Tohoku University; ²Anhui University of Science and Technology

Keynote

Research Progress in Biohydrometallurgy of Rare Metals and Heavy Nonferrous Metals with an Emphasis on China: *Jianzhi Sun*¹; *Bowei Chen*²; *He Shang*²; *Xiaolan Mo*²; *Jiankang Wen*²; ¹GRINM Resources and Environment Tech. Co., Ltd.; ²GRINM Resources and Environment Tech. Co., Ltd

Invited

Development of Molten Salt Electrolysis of MgO Using a Metal Cathode and Vacuum Distillation to Produce Ultra-high Purity Mg Metal: *Jungshin Kang*¹; *Tae-Hyuk Lee*¹; *Hyeong-Jun Jeoung*¹; *Dong-Hee Lee*¹; *Young Min Kim*²; *Kyung-Woo Yi*³; *Toru H. Okabe*⁴; *Jin-Young Lee*¹; ¹Korea Institute of Geoscience and Mineral Resources; ²Korea Institute of Materials Science; ³Seoul National University; ⁴The University of Tokyo

Invited

A Highly Selective Metal-organic Complex Collector for Efficient Mineral Flotation: *Wei Sun*¹; *Zhao Wei*¹; *Haisheng Han*¹; ¹Central South University

Method for Producing High Purity LiOH.H₂O Using Ba(OH)₂: *Hongting Liu*¹; *Gisele Azimi*¹; ¹University of Toronto

Bionanominig: A Revised Insight into Processing of South Africa's Complex Gold Ores: *Daniel Okanigbe*¹; ¹Tshwane University of Technology

Extraction of Rare Earth Metals from Coal Ash Using Mild Lixiviants in a Single Step Process: *Riya Banerjee*¹; *Saswati Chakladar*¹; *Sanchita Chakravarty*¹; ¹CSIR-National Metallurgical Laboratory

Rare Earth Elements Adsorption to Gypsum in Hydrometallurgical Processes: *Farzaneh Sadri*¹; *Ahmad Ghahreman*¹; ¹Queen's University

Electrochemical Reduction of Iron Oxides in Aqueous NaOH Electrolyte Including Iron Residue from Nickel and Zinc Electrowinning Processes: *Geir-Martin Haarberg*¹; *Bo Qin*¹; *Babak Khalaghi*²; ¹Norwegian University of Science & Technology; ²SINTEF Norlab

Extraction Behaviors of Vanadium(V) with Unacidified- and Acidified-N1923 from a Real Leachate of Vanadium-titanomagnetite: *Liu Lei*¹; *Liu Zhaobo*²; *Pu Nianwen*¹; *Fu Yunfeng*²; *Zhang Zhongyu*¹; *Du Shangchao*²; *Du Guoshan*²; *Sun Ninglei*²; *Wang Dehua*²; *Li Xiaoyan*²; ¹Sichuan Xingming Energy and Environmental Protection Technology Co., Ltd.; ²China ENFI Engineering Corporation

Study on Pre-removal Antimony from Antimony-gold Concentrate Using Slurry Electrolysis: *Yonglu Zhang*¹; *Chengyan Wang*¹; *Xiaowu Jie*²; *Wei Gao*²; *Shufeng Ruan*²; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing; ²BGRIMM Technology Group

CO₂ Optimized Recovery of Special Metals from Precipitation Residue by Selective Chlorination: *Stefan Steinlechner*¹; *Lukas Hoerber*¹; ¹Montanuniversitat Leoben

Novel Environmentally Friendly Leaching Process for Vanadium and Tungsten Recovery from Spent SCR Catalyst: *Jong Hyuk Jeon*¹; *Ana Belen Cueva Sola*²; *Rajesh Kumar Jyothi*¹; *Jin-Young Lee*¹; ¹Korea Institute of Geoscience and Mineral Resources; ²University of Science and Technology

Extraction for Neodymium from NdFeB Magnet Using Supercritical Carbon Dioxide and Organophosphorus Ligands: *Nattanai Kunanusont*¹; *Jiakai Zhang*²; *Yusuke Shimoyama*¹; *Gisele Azimi*²; ¹Tokyo Institute of Technology; ²University of Toronto

Extraction of Cerium, Lanthanum, and Neodymium from Alluvial Gold Mining Waste from the Bagre-Nechí Mining District in Colombia: *Lover Echeverry*¹; ¹Universidad de Nacional de Colombia

Development of Antagonistic Solvent Extraction Systems for Selective Separation of Copper, Cobalt and Nickel in Ammoniacal Solution: *Kurniawan Kurniawan*¹; *Jae-chun Lee*²; *Jonghyun Kim*¹; *Ha Bich Trinh*³; *Sookyung Kim*²; ¹Korea University of Science and Technology, Resources Recycling, KIGAM campus; ²Korea Institute of Geoscience and Mineral Resources (KIGAM); ³Kangwon National University

Fundamental Study of a Novel Electrolytic Process Using a Cu Cathode in MgF₂-LiF-KCl Molten Salt for Producing Mg Metal from MgO: *Hyeong-Jun Jeoung*¹; *Tae-Hyuk Lee*¹; *Kyung-Woo Yi*²; *Jin-Young Lee*¹; *Young Min Kim*³; *Toru H. Okabe*⁴; *Jungshin Kang*¹; ¹Korea Institute of Geoscience and Mineral Resources; ²Seoul National University; ³Korea Institute of Materials Science; ⁴The University of Tokyo

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications — On-Demand Oral Presentations

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | March 14, 2022
Electronic Materials | On-Demand Room

Invited

Corona-enabled Electrostatic Printing (CEP) for Ultra-fast R2R Manufacturing of Binder-free Multifunctional E-skins: *Ying Zhong*¹; *Zijian Weng*¹; ¹University of South Florida

Invited

Effect of Dichloroethane on the Electronic Transport Behavior in Semiconducting MoS₂ Temperature: Ravindra Mehta¹; Kishan Jyanand¹; Anupama Kaul¹; ¹University of North Texas

Invited

Design of Materials for Advanced Energy Storage: Cengiz Ozkan¹; ¹University of California

Invited

Additive Manufacturing of Smart Materials: Zhangxian Deng¹; ¹Boise State University

Invited

Plenty of Room Under the Skin: A Wearable's Perspective: Sheng Xu¹; ¹University of California San Diego

Multiprinter Additive Manufacturing of Flexible Thermoelectric Energy Harvesters Using Colloidal Nanoparticles: Ariel Briggs¹; Tony Varghese¹; Jacob Manzi¹; Curtis Hill²; Harish Subbaraman³; David Estrada⁴; ¹Boise State University; ²ESSCA/ Quantitech NASA MSFC; ³Boise State University, Center for Advanced Energy Studies; ⁴Boise State University, Center for Advanced Energy Studies, Idaho National Laboratory

ELECTRONIC MATERIALS

Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications — On-Demand Poster Session

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

Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Yong Lin Kong, University of Utah; Tolga Aytug, Oak Ridge National Laboratory; Konstantinos Sierros, West Virginia University; Changyong Cao, Michigan State University; David Estrada, Boise State University; Nuggehalli Ravindra, New Jersey Institute of Technology

Monday AM | March 14, 2022
Electronic Materials | On-Demand Poster Hall

Additive Manufacturing and Characterization of Surface Acoustic Wave Devices: Nicholas McKibben¹; Blake Ryel¹; Alex Draper¹; David Estrada¹; Zhangxian Deng¹; ¹Boise State University

A Comparative Study on Supercapacitors Formed with Different Graphene Based Hybrid Nanostructured Materials: Tasnim Mahjabin¹; Md. Abdullah Al Amin¹; ¹Bangladesh University of Engineering and Technology

MATERIALS DESIGN

Recent Investigations and Developments of Titanium-containing High Entropy Alloys — On-Demand Oral Presentations

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

Program Organizers: Masahiko Ikeda, Kansai University; Masato Ueda, Kansai University; Carl Boehlert, Michigan State University; Peter Liaw, University of Tennessee

Monday AM | March 14, 2022
Materials Design | On-Demand Room

Keynote

Single-crystal Mechanical Properties of Equiatomic and Non-equiatomic High-entropy Alloys: Haruyuki Inui¹; Kyosuke Kishida¹; ¹Kyoto University

Invited

Design and Characterization of Novel Ti-Zr-Nb-Mn-Fe Medium and High Entropy Alloys for Biomedical Applications: Nour Eldabab¹; Mohamed Gepreel¹; ¹Egypt-Japan University of Science & Technology

Invited

Effect of Elemental Combination on Microstructure and Mechanical Properties of Refractory Medium Entropy Alloys: Shuhei Yoshida¹; Qian He¹; Hideyuki Yasuda¹; Nobuhiro Tsuji¹; ¹Kyoto University

Invited

Designing Porous Refractory High Entropy Alloy Using the Dealloying Method: Hidemi Kato¹; Soo-Hyun Joo²; Ilya Okulov³; Takeshi Wada¹; ¹Imr, Tohoku University; ²Dankook University; ³University of Bremen

Invited

A Data-driven Analysis for Selection of Ti-containing High Entropy Alloys and Future Directions: Ramachandra Canumalla¹; Tanjore Jayaraman²; ¹Weldaloy Specialty Forgings; ²University of Michigan-Dearborn

Invited

Solidification Microstructure of High Entropy Alloys Composed with 3d Transition Metal and Silicon: Toru Maruyama¹; Mei Fukuzawa¹; ¹Kansai University

Predicting the Compositions of an Al-Co-Fe-Ni-Ti High-entropy System by the Calculation of Phase Diagrams Method Coupled with High-throughput Computations: Sin-Yi Chen¹; Chu-Hsuan Wang¹; Yee-Wen Yen¹; Peter Liaw²; ¹NTUST; ²University of Tennessee

Enhanced Mechanical Properties of Ti60(NbVCr)34Al6 Medium Entropy by Thermomechanical Treatment: Po-Sung Chen¹; Yu-Chin Liao¹; Sin-Mao Song¹; Pei-Hua Tsai¹; Jason S. C. Jang¹; ¹National Central University

Phase Stability and the Role of Ti in W-Ta-Ti-Cr-V High-entropy Alloys from the First Principles Thermodynamic Study with Experimental Validation: Damian Sobieraj¹; Jan Wrobel¹; Tomasz Rygiel¹; Grzegorz Cieslak¹; Magdalena Plocinska¹; Krzysztof Kurzydowski¹; Duc Nguyen-Manh²; ¹Warsaw University of Technology; ²United Kingdom Atomic Energy Authority

LIGHT METALS

Recycling and Sustainability in Cast Shop Technology: Joint Session with REWAS 2022 — On-Demand Oral Presentations

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

Program Organizers: Mertol Gökelma, Izmir Institute of Technology; Stephen Instone, Speira GmbH

Monday AM | March 14, 2022
Light Metals | On-Demand Room

Process-related Characterization of the Influence of the Die Design on the Microstructure and the Mechanical Properties of Profiles Made from Directly Recycled Hot Extruded EN AW-6060 Aluminum Chips: *Alexander Koch*¹; Sarah Laskowski¹; Frank Walther¹; ¹TU Dortmund University, Chair of Materials Test Engineering (WPT)

Recycling Aluminum Casting Alloy Scrap Using Molten Salt Electrolysis: *Xin Lu*¹; Kyosuke Watanabe¹; Osamu Takeda¹; Hongmin Zhu¹; ¹Tohoku University

Towards Formulation of AlSi10Mg Alloy from Incinerator Bottom Ash: *Astrid Marthinsen*¹; Joachim Graff¹; Martin Syvertsen¹; Kjerstin Ellingsen¹; Mohammed M'hamdi¹; ¹SINTEF

ADVANCED MATERIALS

Refractory Metals — On-Demand Oral Presentations

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

Program Organizers: Eric Taleff, University of Texas at Austin; Lauren Garrison, Oak Ridge National Laboratory; Alexander Knowles, University of Birmingham

Monday AM | March 14, 2022
Advanced Materials | On-Demand Room

Invited

Thermal Stability of Thin Rolled Potassium-doped Tungsten Sheets at Temperatures between 1100 °C and 1400 °C: *Ditlev Tarras Madsen*¹; Umberto Ciucani¹; Andreas Hoffmann²; *Wolfgang Pantleon*¹; ¹Technical University of Denmark; ²Plansee SE

Development of Novel Chromium-superalloys Strengthened by B2 Intermetallic Precipitates: *Kan Ma*¹; Jóhan Magnussen¹; Anke Ulrich²; Till König²; Mathias Galetz²; Alexander Knowles¹; ¹University of Birmingham; ²DEHEMA-Forschungsinstitut

Grain Boundary Segregation Engineering in Technically Pure Molybdenum Examined via Three-point Bending Tests: *Severin Jakob*¹; Thomas Weissenboeck¹; Anton Hohenwarter¹; Alexander Lorich²; Wolfram Knabl²; Reinhard Pippan³; Helmut Clemens¹; Verena Maier-Kiener¹; ¹Montanuniversität Leoben; ²Plansee SE; ³Erich-Schmid-Institute of Materials Science, Austrian Academy of Sciences

Tungsten Grain Optimization and Composite Fabrication for Use in Fusion Reactors: *Lauren Garrison*¹; John Echols¹; Nathan Reid¹; ¹Oak Ridge National Laboratory

Studies on the Phase Formation of Cobalt Contacted with Zinc Vapour: *Melanie Leitner*¹; Eva Gerold¹; Stefan Luidold¹; Christoph Czettel²; Christian Storf²; ¹Montanuniversität Leoben; ²CERATIZIT Austria GmbH

ENERGY & ENVIRONMENT

REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian — On-Demand Oral Presentations

Sponsored by: TMS; Recycling and Environmental Technologies Committee, TMS; Aluminum Committee

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Brajendra Mishra, Worcester Polytechnic Institute; Bart Blanpain, KU Leuven; Adam Powell, Worcester Polytechnic Institute; Mertol Gökelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Invited

Recycled Cathode Materials Enabled Superior Performance for Lithium-ion Battery: *Yan Wang*¹; ¹Worcester Polytechnic Institute

Invited

The Discharge Crucible Method: Update on Experimental Design, Measurements, and Orifice Wetting: *Hani Henein*¹; ¹University of Alberta

Invited

Advances in Powder Metallurgy: *Danielle Cote*¹; ¹Worcester Polytechnic Institute

Invited

Three Binders and Three Precast Elements from What Was Once Called "Residue": *Yiannis Pontikes*¹; Glenn Beersaerts¹; Roberto Eduardo Murillo Alarcón¹; Jorn Van De Sande¹; Tobias Hertel¹; ¹KU Leuven

ENERGY & ENVIRONMENT

REWAS 2022: Energy Technologies and CO2 Management — On-Demand Oral Presentations

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

Program Organizers: Fiseha Tesfaye, Åbo Akademi University; Lei Zhang, University of Alaska Fairbanks; Donna Guillen, Idaho National Laboratory; Ziqi Sun, Queensland University of Technology; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC; Mingming Zhang, Wood Mackenzie; Dirk Verhulst, Consultant, Extractive Metallurgy and Energy Efficiency; Shafiq Alam, University of Saskatchewan; Mertol Gökkelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway; Chukwunwike Iloeje, Argonne National Laboratory

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Invited

Thermoeconomics and Dynamics of Orange Hydrogen Production, an Energy Matter: Neale Neelameggham¹; Ganesan Subramanian²; Praveen Kalamegham³; ¹IND LLC; ²Sai Systems LLC; ³Workrise

Invited

Heat Island Mitigation Strategy for Urban Areas Using Phase Change Materials (PCM): Ganesan Subramanian¹; Neale Neelameggham¹; ¹Independent Consultant

Review on Hydrotalcite-derived Material from Waste Metal Dust, a Solid Adsorbent for CO2 Capture: Challenges and Opportunities in South African Coal Fired Thermal Plant: Daniel Okanigbe¹; Olawale Popoola¹; Abimbola Popoola¹; ¹Tshwane University of Technology

Power to Hydrogen the Prospects of Green Hydrogen Production Potential in Africa: Nour Aboseada¹; Tarek Hatem¹; ¹The British University in Egypt

Synthesis Methods for Nanoparticle Morphology Control in Clean Energy Applications: Joy Morin¹; Kiyo Fujimoto¹; Arin Preston¹; Donna Guillen¹; ¹Idaho National Laboratory

Copper in Biomass Fuels and Its Effect on Combustion Processes: Fiseha Tesfaye¹; Daniel Lindberg²; Mykola Moroz³; Leena Hupa¹; Mikko Hupa¹; ¹Åbo Akademi University; ²Aalto University; ³National University of Water and Environmental Engineering

Development of a Thermodynamic Model for Chromates, Molybdates, Tungstates and Vanadates Involved in the Corrosion of Steels (Fe, Cr, Ni, Mo, W, V) at High Temperatures in Atmospheres Containing O-H-S-C-Cl and Alkaline Salts: Sara Benalia¹; Christian Robelin¹; Patrice Chartrand¹; ¹École Polytechnique Montréal

Modes of Operation, Design, and Experiments in a Laboratory Solar Convective Furnace System: Vishwa Deepak Kumar¹; Laltu Chandra²; Piyush Sharma³; Rajiv Shekhar³; ¹IIT Jodhpur; ²IIT (BHU) Varanasi; ³IIT (ISM) Dhanbad

ENERGY & ENVIRONMENT

REWAS 2022: Poster Session — On-Demand Poster Session

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

The Research Status and Progress on the Utilization of Coal Fly Ash: A Review: Joseph Nyarko-Appiah¹; Wenzhou Yu¹; Peng Wei¹; Hao Chen¹; ¹Chongqing University

Recovery of Rare Earth Elements from Nd-Fe-B Magnet through Selective Chlorination Using Zinc Chloride: Kyung-Hwan Lim¹; Chan Uk Choi¹; Gyeonghye Moon²; Tae-Hyuk Lee¹; Jungshin Kang¹; ¹Korea Institute of Geoscience and Mineral Resources; ²HANNAE For T

KIGAM Technology for the Recovery of NdFeB Waste Magnet and Manufacturing Scraps: Kyeong Woo Chung¹; Ho-sung Yoon¹; Chul-joo Kim¹; Rina Kim¹; Byunchul Lim²; ¹Korea Institute of Geoscience and Mineral Resources; ²SungLim Rare Earth Metal Co. Ltd.

Recovery of Lithium from Black Cathode Active Materials of Discarded Lithium-ion Batteries (LIBs): Pankaj Choubey¹; Rukshana Parween¹; Rekha Panda¹; Om Shankar Dinkar¹; Manis Kumar Jha¹; ¹CSIR-National Metallurgical Lab

Selective Separation of Molybdenum from Leaching Solution of Spent Catalyst by Solvent Extraction with TBP: Kunpeng Shi¹; Yanfang Huang¹; Guihong Han¹; Shengpeng Su¹; ¹Zhengzhou University

Recycling of Automobile Discarded Ceramic Converters for Pt-group Metals' Recovery through Pressure CN-leaching: Sadiya Ilyas¹; Hyunjung Kim¹; Rajiv Srivastava²; ¹Jeonbuk National University; ²Dai Hoc Duy Tan

Fe-Si Alloy Preparation and Alumina Extraction from Red Mud and Silica Fume via Vacuum Carbothermal Reduction: Peng Wei¹; Wenzhou Yu¹; Hao Chen¹; Joseph Emmanuel Nyarko-Appiah¹; ¹Chongqing University

Geopolymers Made of Construction and Demolition Waste: Current Trends and Perspectives: Angelica Cardoza Herrera¹; Henry Colorado¹; ¹Universidad de Antioquia

Advanced Process of Waste Glass Bottle for the Production of Recycled Glass Aggregate and Cullet: Hoon Lee¹; Hansol Lee¹; Kwanho Kim¹; ¹Korea Institute of Geoscience and Mineral Resources

ENERGY & ENVIRONMENT

REWAS 2022: Recovering the Unrecoverable — On-Demand Oral Presentations

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

Program Organizers: Mertol Göknelma, Izmir Institute of Technology; Elsa Olivetti, Massachusetts Institute of Technology; Camille Fleuriault, Eramet Norway; John Howarter, Purdue University; Takanari Ouchi, University of Tokyo; Gisele Azimi, University of Toronto; Kerstin Forsberg, KTH Royal Institute of Technology; Hong Peng, University of Queensland

Monday AM | March 14, 2022
Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Session Chair: To Be Announced

Invited

Recent Trend on the Studies of Recycling Technologies of Rare Earth Metals: *Osamu Takeda*¹; Xin Lu¹; Hongmin Zhu¹; ¹Tohoku University

Invited

Recycling of Tungsten by Molten Salt Processes: *Tetsuo Oishi*¹; ¹Aist

Invited

Recycling Technologies Developed at KIGAM: *Jin-Young Lee*¹; Kyeong Woo Chung¹; Hong-In Kim¹; SooKyung Kim¹; Shun Myung Shin¹; Ho-Seok Jeon¹; ¹Korea Institute of Geoscience and Mineral Resources

Invited

Setting New Standards for Circular Economy in the Cement Industry: *Michael Klitzsch*¹; Martin Geith¹; ¹RHI Magnesita

Invited

Recycling of Electronic Wastes, Waste Batteries and Rare Metal Wastes in China: *Li Qinxian*¹; ¹Jingmeng GEM Co., Ltd.

Yellow Phosphorus Production from Phosphoric Acid by Carbothermic Reduction: *Huafang Yu*¹; Ryoko Yoshida²; Yasushi Sasaki¹; Tetsuya Nagasaka¹; ¹Tohoku University; ²DOWA

Leaching of Rare Earth Elements from Phosphogypsum Using Mineral Acids: *Sicheng Li*¹; Monu Malik¹; Gisele Azimi¹; ¹University of Toronto

Recovery of Terbium, Europium, and Yttrium from Waste Fluorescent Lamp Using Supercritical Fluid Extraction: *Jiakai Zhang*¹; John Anawati¹; *Gisele Azimi*¹; ¹University of Toronto

Characterization and Thermal Treatment of Eggshell and Olive Stones for Heavy Metals Removal in Mining Environmental Liabilities Sites: *Mery Gomez-Marroquin*¹; Henry Colorado²; Dalia Carbonel-Ramos³; Jhony Huarcaya-Nina³; Stephany Esquivel-Lorenzo³; Alfredo Ceroni-Gallosa³; Hugo Chirinos-Collantes³; ¹FIGMM UNI; ²University of Antioquia - UDEA; ³FIA UNI

Characterization and Thermal Treatment of Electric Arc Furnace Dusts Generated during Steel Production in Peruvian Industries: *Mery Gomez-Marroquin*¹; Jose Carlos D'Abreu²; Roberto de Avillez²; Sonia Letichevsky²; Kim Phatti - Satto¹; Abraham Terrones - Ramirez¹; ¹FIGMM UNI; ²PUC-Rio

Utilization of Copper Nickel Sulfide Mine Tailings for CO₂ Sequestration and Enhanced Nickel Sulfidization: *Fei Wang*¹; David Dreisinger¹; Glenn Barr²; ¹The University of British Columbia; ²Twin Metals Minnesota LLC

Extraction of Nickel from Recycled Lithium-ion Batteries: *Meng Shi*¹; Sabrina Reich²; Ankit Verma³; John Klaehn¹; Luis Diaz¹; Tedd Lister¹; ¹Idaho National Laboratory; ²Michigan State University; ³University of Kansas

Recovery of Precious Metal Silver from Scrap Computer Keyboards: *Rekha Panda*¹; Om Shankar Dinkar¹; Pankaj Kumar Choubey¹; Rukshana Parween¹; Manis Kumar Jha¹; Devendra Deo Pathak²; ¹CSIR-National Metallurgical Laboratory, INDIA; ²Indian Institute of Technology (ISM) Dhanbad, INDIA

Efficient Steel Mill Dust Recycling – Aiming For Zero Waste: *Juergen Antrekowitsch*¹; ¹University of Leoben

Deoxidation of Titanium Using Cerium Metal and Its Oxyhalide Formation: *Gen Kamimura*¹; Takanari Ouchi¹; Toru Okabe¹; ¹The University of Tokyo

Adaptability of the ISASMELT™ Technology for the Sustainable Treatment of Wastes: *Benjamin Hogg*¹; Damian Corrie¹; Brad Barter¹; Stanko Nikolic¹; Stuart Nicol¹; ¹Glencore Technology

Estimation of the Generation and Value Recovery from E-waste Printed Circuit Boards: Bangladesh Case Study: *Md Khairul Islam*¹; Nawshad Haque²; Michael Somerville²; Mark Pownceby²; Suresh Bhargava¹; James Tardio¹; ¹Royal Melbourne Institute of Technology; ²CSIRO

A Green Process to Acquire a High Purity Rare Earth Elements Leach Liquor from Nd-Fe-B Magnets by Caustic Digestion and Roasting Processes: *Rina Kim*¹; *Kyeong Woo Chung*¹; Ho-Sung Yoon¹; Chul-Joo Kim¹; Yujin Park¹; ¹Korea Institute of Geoscience and Mineral Resources (KIGAM)

An Innovative Separation Process for Spent Lithium-ion Battery Using Three-stage Electrodialysis: *Ka Ho Chan*¹; Monu Malik¹; Gisele Azimi¹; ¹University of Toronto

Development of Technology for Recycling Large-capacity Lithium-ion Batteries for EV,ESS: *Hongin Kim*¹; Jeong-Soo Sohn²; Soo-Kyung Kim²; Dong-hyo Yang²; Suk-hyun Byun³; ¹KIGAM/Convergence Research Center for DMR; ²KIGAM/Mineral Resource Division; ³SungEel HiTech.

Recovery of Molybdenum from Metallurgical Wastewater by Fe(III) Coagulation and Precipitation Flotation Process: *Bei Zhang*¹; Bingbing Liu¹; Yanfang Huang¹; Guihong Han¹; Yifan Du¹; Shengpeng Su¹; ¹Zhengzhou University

Treatment of Benzohydroxamic Acid Wastewater by Fe(III) as Chelator Precipitation Flotation Process: *Yifan Du*¹; Guihong Han¹; Yanfang Huang¹; Bingbing Liu¹; Wenjuan Wang¹; Bei Zhang¹; ¹Zhengzhou University

Maximizing the Efficiency of By-product Treatment by Multi Metal Recovery and Slag Valorization: *Gustav Hanke*¹; Jürgen Antrekowitsch¹; Fernando Castro²; Helmut Krug³; ¹Montanuniversität Leoben; ²University of Minho; ³R+M Ressourcen + Management GmbH

ENERGY & ENVIRONMENT

REWAS 2022: Sustainable Production and Development Perspectives — On-Demand Oral Presentations

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

Program Organizers: Mertol Gökelma, Izmir Institute of Technology; Mingming Zhang, Wood Mackenzie; Elsa Olivetti, Massachusetts Institute of Technology; Gerardo Alvear, Glencore Technology; Camille Fleuriault, Eramet Norway

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

A Review of Comprehensive Utilization of Copper Slag of China: Jun Hao¹; Zhihe Dou¹; Tingan Zhang¹; Kun Wang¹; ¹Northeastern University

From Aluminium Industry Waste to Soil Amendment for Cash Crops and Fertiliser for Lowbush Blueberry: Julie Élie Guérin¹; Lotfi Khiari²; Abdelkarim Lajili²; Claude Villeneuve³; Patrick Faubert³; Marie-Christine Simard¹; Marc-André Seguin¹; Jean Lavoie¹; Stéphane Poirier¹; ¹Rio Tinto; ²Laval University; ³Université du Québec à Chicoutimi

Validation of an Innovative On-line Legionella Detection Technology in Water-cooling Systems: Marie-Christine Simard¹; Geneviève Doyer¹; ¹Rio Tinto

ENERGY & ENVIRONMENT

REWAS 2022: Automation and Digitalization for Advanced Manufacturing — On-Demand Oral Presentations

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

Program Organizers: Elsa Olivetti, Massachusetts Institute of Technology; Alexandra Anderson, Gopher Resource; Mertol Gökelma, Izmir Institute of Technology; Camille Fleuriault, Eramet Norway

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Refractory Lifetime Prediction in Industrial Processes with Artificial Intelligence: Nikolaus Voller¹; Christoph Pichler¹; Christine Wenzl¹; Gregor Lammer¹; ¹RHI Magnesita

Audio Signal Processing for Quantitative Moulding Material Regeneration: Philine Kerst¹; Sebastian Tewes¹; ¹University of Duisburg-Essen

Evolution of Process Models to Digital Twins: Alex Holtzapfel¹; ¹Metsim International, LLC, USA

ENERGY & ENVIRONMENT

REWAS 2022: Decarbonizing the Materials Industry — On-Demand Oral Presentations

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee, TMS: Energy Committee, TMS: Process Technology and Modeling Committee, TMS: Aluminum Committee

Program Organizers: Camille Fleuriault, Eramet Norway; Christina Meskers, Norwegian University of Science and Technology (NTNU); Mertol Gökelma, Izmir Institute of Technology; Elsa Olivetti, Massachusetts Institute of Technology; Jesse White, Elkem Carbon Solutions; Chukwunwike Iloeje, Argonne National Laboratory; Neale Neelameggham, IND LLC

Monday AM | March 14, 2022

Energy & Environment (including REWAS 2022 Symposia) | On-Demand Room

Iron-ore Reduction Using Green Hydrogen: A Study for Recycling Wastes in Egyptian Steel Industry: Abdelrahman Aboseada¹; Tarek Hatem¹; ¹The British University in Egypt

Supercritical Carbonation of Steelmaking Slag for the CO₂ Sequestration: Jihye Kim¹; Gisele Azimi¹; ¹University of Toronto

Biomass as a CO₂-neutral Carbon Substitute for Reduction Processes in Metallurgy: Christian Dornig¹; Jürgen Antrekowitsch¹; ¹Montanuniversität Leoben

CHARACTERIZATION

Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson — On-Demand Oral Presentations

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Kaila Bertsch, Lawrence Livermore National Laboratory; Khalid Hattar, Sandia National Laboratories; Josh Kacher, Georgia Institute of Technology; Bai Cui, University of Nebraska-Lincoln; Benjamin Eftink, Los Alamos National Laboratory; Stephen House, University of Pittsburgh; May Martin, National Institute of Standards and Technology; Kelly Nygren, Cornell High Energy Synchrotron Source; Blythe Clark, Sandia National Laboratories; Shuai Wang, Southern University of Science and Technology

Monday AM | March 14, 2022

Characterization | On-Demand Room

Invited

Crack-tip Shielding by Dislocations Analyzed by HVEM and Its Effect on Fracture Toughness and Hydrogen Embrittlement: Kenji Higashida¹; Masaki Tanaka¹; ¹Kyushu University

Invited

In Situ TEM with Ion Irradiation at the IVEM-Tandem: Past, Present and Future: Meimei Li¹; Mark Kirk¹; Wei-Ying Chen¹; Pete Baldo¹; Richard Sisson¹; ¹Argonne National Laboratory

Invited

Quantitative 3-D Imaging of Damage Evolution in High-temperature Composite Materials, at Temperature under Load, Using In Situ X-ray Computed Micro-tomography with Digital Volume Correlation: *Dong Liu*¹; Paul Forna Kreutzer¹; Jon Ell²; Robert Ritchie²; ¹University of Bristol; ²University of California, Berkeley

Invited

Some Challenges in Length and Time Scaling for Modeling Dislocations and Interface Reactions: *David McDowell*¹; ¹Georgia Institute of Technology

Invited

Ian Robertson's Impact on Materials Science: *John Vetrano*¹; ¹US Department of Energy

Invited

Sluggish Diffusion in Concentrated Solid-solution Alloys: Seeing is Believing: *Yanwen Zhang*¹; ¹Oak Ridge National Laboratory

Invited

Creep and Fracture Characterization in the TEM Using Full-field Measurement Methods and Finite Element Analyses: Yiguang Zhang¹; Shen Dillon²; *John Lambros*¹; ¹University of Illinois Urbana Champaign; ²University of California, Irvine

Invited

Using Environmental Transmission Electron Microscopy to Understand the Fundamentals of Metal Oxidation: *Eric Stach*¹; ¹University of Pennsylvania

Invited

Seeing in 3D and 4D - Advancing the Understanding of Recrystallization: *Dorte Juul Jensen*¹; ¹Technical University of Denmark

Zinc-Aluminum-Magnesium Coatings for Automotive Industry: Corrosion Analysis on Cross-sections via a New Scanning Electrochemical Microscopy Technique
: *Marilia Bolsanello*¹; Javier Izquierdo²; Rejane Maria da Silva¹; Ricardo M. Souto²; Jesualdo Luiz Rossi¹; Andrea Abreu²; ¹IPEN/CNEN-SP; ²Universidad de La Laguna

Various Hydrogen/Deuterium Charging Methods for Site Specific APT Specimens: *Heena Khanchandani*¹; Leigh Stephenson¹; Dierk Raabe²; Stefan Zaefferer¹; Baptiste Gault¹; ¹Max Planck Institute for Iron Research

NANOSTRUCTURED MATERIALS**Self-organizing Nano-architected Materials — On-Demand Oral Presentations**

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Monday AM | March 14, 2022

Nanostructured Materials | On-Demand Room

Invited

Synthesis and Catalytical Properties of Nanoporous Copper Silver Films via Magnetron Co-sputtering: *I-Chung Cheng*¹; Yu-Shuo Lee¹; Jia-Hao Lai¹; ¹National Taiwan University

Invited

Biomimetic Nanocomposites: Hierarchical Structural Designs, Mechanical Properties, and Multifunctionality: *Ling Li*¹; ¹Virginia Polytechnic Institute

Invited

Anomalous Low Modulus of the Interpenetrating-phase Composites Synthesized by Liquid Metal Dealloying: *Ilya Okulov*¹; Jana Wilmers²; Pierre-Antoine Geslin³; Henry Ovri⁴; Soo-Hyun Joo⁵; Hidemi Kato⁶; ¹Leibniz Institute for Materials Engineering - IWT; ²University of Wuppertal; ³CNRS-Université de Lyon-Tohoku University; ⁴Helmholtz-Zentrum Hereon; ⁵Dankook University; ⁶Institute for Materials Research, Tohoku University

Invited

Fabrication, Integration, and Performance of Nanoporous Metals in Electrochemical Energy Devices: *Joshua Snyder*¹; ¹Drexel University

Invited

Nanoporous Materials for Energy and Environmental Applications: *Mingwei Chen*¹; ¹Johns Hopkins University

Liquid Metal Dealloying: Formation and Coarsening: *Pierre-Antoine Geslin*¹; Takeshi Wada²; Hidemi Kato³; ¹CNRS / INSA-Lyon; ²Tohoku University

Processing of Nanoporous FeCr by Liquid Metal Dealloying Technique Observed by In Situ X-ray Tomography and X-ray Diffraction: *Morgane Mokhtari*¹; Christophe Le Bourlot²; Jérôme Adrien²; Anne Bonnin³; Wolfgang Ludwig⁴; Pierre-Antoine Geslin²; Takeshi Wada⁵; Jannick Duchet-Rumeau⁶; Hidemi Kato⁵; Eric Maire²; ¹LGP, ENIT/INPT, Université de Toulouse; ²MATEIS Laboratory, INSA-Lyon; ³Swiss Light Source, Paul Scherrer Institute; ⁴European Synchrotron Radiation Facility; ⁵Institute for Materials Research, Tohoku University; ⁶IMP Laboratory, INSA-Lyon

Magnetic Nanopillars by Self-assembled Block Copolymer Templating: *Aleksander Mshar*¹; Daniel Arnold²; Oreoluwa Agede¹; Allen Owen¹; Subhadra Gupta¹; ¹University of Alabama; ²University of Alabama at Huntsville

A General Elastic Model for Self-Assembled Metal-oxide Vertical Aligned Nanocomposite (VAN) Thin Films: Kyle Starkey¹; *Ahmad Ahmad*²; Juanjuan Lu¹; Robynne-Lynn Paldi¹; Haiyan Wang¹; Anter El-Azab¹; ¹Purdue University West Lafayette

Superinsulation Nanoporous Material, Silica and Biosourced Aerogels Observed in 3D Down to the Nanoscale with Electron Tomography: *Genevieve Foray*¹; Louis-marie Lebas¹; Lucian Roiban¹; ¹MATEIS, INSA Lyon

Hierarchical Grain Structure in Low Stacking-fault Energy Metals for Highly Tough Nanoporous Metal: *Eunji Song*¹; Hansol Jeon¹; Ju-Young Kim¹; ¹Department of Materials Science and Engineering, UNIST

NANOSTRUCTURED MATERIALS**Self-organizing Nano-architected Materials — On-Demand Poster Session**

Program Organizers: Yu-chen Karen Chen-Wiegart, Stony Brook University / Brookhaven National Laboratory; Ian McCue, Northwestern University; Erica Lilleodden, Helmholtz-Zentrum hereon; Pierre-Antoine Geslin, CNRS / INSA-Lyon; Qing Chen, Hong Kong University of Science & Technology

Monday AM | March 14, 2022

Nanostructured Materials | On-Demand Poster Hall

Mechanical Behavior of Nanoporous Gold with Ligament-size Effect under Tension and Compression: *Hansol Jeon*¹; Eunji Song¹; Ju-Young Kim¹; ¹UNIST

MECHANICS & STRUCTURAL RELIABILITY

Structural Metamaterials — On-Demand Oral Presentations

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

Program Organizers: Amy Wat, Lawrence Livermore National Laboratory; Brad Boyce, Sandia National Laboratories; Xiaoyu Zheng, University of California, Los Angeles; Fabrizio Scarpa, University of Bristol; Robert Ritchie, University of California, Berkeley

Monday AM | March 14, 2022
Mechanics & Structural Reliability | On-Demand Room

High-stiffness Metamaterial Composite Structure with Plate Reinforced Strut-microlattice: *Manash Baishya*¹; Bikram Sahariah¹; Nelson Muthu¹; Prasenjit Khanikar¹; ¹Indian Institute of Technology Guwahati

Design of 2D-Mechanical Metamaterials with Spinodal Topologies: *Kiara McMillan*¹; Dogacan Öztürk²; Pinar Acar¹; ¹Virginia Tech; ²University of Alaska Fairbanks

Engineering Splat Based Features for Improved Damage Tolerance in Brittle Metamaterials: *Deepesh Yadav*¹; Tanmayee More¹; B N Jaya¹; ¹IIT Bombay, Powai

Structural Locking in Multimodal Origami Metamaterials: *Damiano Pasini*¹; ¹McGill University

Viscoelastic Dynamics of Polymeric Phononic Materials: *Anastasiia Krushynska*¹; ¹University of Groningen

Sensitivity and Uncertainty Quantification Analysis in Phononic Metamaterials through Complex-Variable Finite Element Method: *David Restrepo*¹; Juan Navarro¹; Juan Velasquez¹; Harry Millwater¹; Matthew Balcer¹; ¹University of Texas at San Antonio

Investigation on Mechanical Properties of Honeycomb-based Cellular Solids and Cylindrical Shells with Structural Hierarchy: *Ching-Han Hsu*¹; Cheng-Che Tung¹; Po-Yu Chen¹; ¹National Tsing Hua University

Controlling Failure with Fractal Chiral Metamaterials: *Fabrizio Scarpa*¹; Wenjiao Zhang²; Robin Neville¹; Dayi Zhang³; ¹University of Bristol; ²Northeast Agricultural University; ³Beihang University

NUCLEAR MATERIALS

Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials — On-Demand Oral Presentations

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

Program Organizers: Djamel Kaoumi, North Carolina State University; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California, Berkeley; Stephen Raiman, Texas A&M University; Raluca Scarlat, University of California, Berkeley; Aaron Kohnert, Los Alamos National Laboratory; Ryan Schoell, North Carolina State University; Philip Edmondson, Oak Ridge National Laboratory; Celine Cabet, Commissariat à l'Energie Atomique

Monday AM | March 14, 2022
Nuclear Materials | On-Demand Room

Radiation Stability of Nanostructured Yttrium Stabilized Zirconia: *Santanu Ghosh*¹; ¹IIT Delhi

Ni Oxidation by CO₂ and Its Impact on D₂ Ingress: A Nanoscale Study by In-Situ Atom Probe Tomography: *Sten Lambeets*¹; Elizabeth Kautz¹; Karen Kruska¹; David Senor¹; Daniel Perea¹; Arun Devaraj¹; ¹Pacific Northwest National Laboratory

Quantifying Radiation Enhanced Diffusion in Model Oxides with Isotopic Tracers and Atom Probe Tomography: *Kayla Yano*¹; Aaron Kohnert²; Tiffany Kaspar¹; Sandra Taylor¹; Steven Spurgeon¹; Hyosim Kim²; Yongqiang Wang²; Blas Ueberuaga²; Daniel Schreiber¹; ¹Pacific Northwest National Laboratory; ²Los Alamos National Laboratory

Defects and Disorder in Swift Heavy Ion-irradiated, Fluorite-derived Complex Oxides: *Devon Drey*¹; Eric O'Quinn¹; Will Cureton¹; Igor Gussev¹; Maik Lang¹; ¹University of Tennessee at Knoxville

Effect of Phosphorus (P) on Precipitation and Segregation Behavior in Neutron Irradiated Reactor Pressure Vessel Steels: *Mukesh Bachhav*¹; Emmanuelle Marquis²; Anshul Kamboj²; Megha Dubey³; G. Robert Odette⁴; ¹Idaho National Laboratory; ²University of Michigan; ³Boise State University; ⁴University of California

NANOSTRUCTURED MATERIALS

Ultrafine-grained and Heterostructured Materials (UFGH XII) — On-Demand Oral Presentations

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Room

Keynote

2022 Institute of Metals Lecture/Robert Franklin Mehl Award: Schwarz Crystal Structures in Extremely Fine-grained Metals: *Ke Lu*¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

Invited

Micro-macro Synergy Effects in Harmonic Structure Steels Design: *Kei Ameyama*¹; ¹Ritsumeikan University

Invited

Unravelling the Strengthening Effects of Microstructural Heterogeneities: *Ting Zhu*¹; Yin Zhang¹; ¹Georgia Institute of Technology

Invited

Ultra-strong Low Carbon Nano-steel Produced by Heterostructure and Interstitial Mediated Warm Rolling: *Hao Zhou*¹; ¹Nanjing University of Science and Technology

Invited

Copper and Brass Laminate and Lamella Materials: Probing the Fundamental Deformation Mechanisms of Heterostructured Materials: *Xiaolong Ma*¹; Xiaotian Fang²; Chongxiang Huang³; Yuntian Zhu⁴; ¹Pacific Northwest National Laboratory; ²Ames Laboratory; ³Sichuan University; ⁴City University of Hong Kong

The Impact of Hydrogen on the Deformation Behavior of Nanostructured Iron and Nickel: *Marlene Kapp*¹; Jürgen Eckert¹; Reinhard Pippan¹; Oliver Renk¹; ¹Erich-Schmid-Institute of Materials Science

Defect and Substructure Evolution in Nanocrystalline Cu/Ni Composites under Continuous Shear Deformation and Thermal Annealing: *NanJun Chen*¹; Shenyang Hu¹; Arun Devaraj¹; Wahyu Setyawan¹; Peter Sushko¹; Suveen Mathaudhu²; ¹Pacific Northwest National Laboratory; ²University of California, Riverside

Structural Characterization and Thermal Evolution of Severe Plastic Deformation Processed Materials, by Advanced Synchrotron and Neutron Methods: *Klaus-Dieter Liss*¹; Xiaojing Liu¹; Jae-Kyung Han²; Yusuke Onuki³; Malte Blankenburg⁴; Megumi Kawasaki²; ¹Guangdong Technion - Israel Institute of Technology (GTIIT); ²Oregon State University; ³Ibaraki University; ⁴Deutsches Elektronen Synchrotron (DESY)

Ultrahigh-strength and Ductile High-entropy Alloys with Coherent Nano-lamellar Architectures: *Zengbao Jiao*¹; ¹The Hong Kong Polytechnic University

Achieving Large Super-elasticity through Changing Relative Easiness of Deformation Modes in Ti-Nb-Mo Alloy by Ultra-grain Refinement: Bingjie Zhang¹; Mingda Huang¹; Chong Yan²; Wenqi Mao³; Wu Gong³; Ruixiao Zheng⁴; Yu Bai⁵; Dong Wang¹; Qiaoyan Sun¹; Yunzhi Wang⁶; *Nobuhiro Tsuji*²; ¹Xi'an Jiaotong University; ²Kyoto University; ³JAEA J-PARC Center; ⁴Beihang University; ⁵Dalian University of Technology; ⁶Ohio State University

Microstructure, Texture and Mechanical Properties of cp-Ti Processed by Rotational Constrained Bending: *Milos Janecek*¹; Tomáš Krajnák¹; Peter Minárik¹; Jozef Veselý¹; Petr Cejpek¹; Jeno Gubicza²; Dalibor Preisler¹; Georgy Raab³; Arseniy Raab³; ¹Charles University; ²Eötvös Loránd University; ³Ufa State Aviation Technical University

Origin of Extra Strengthening in Gradient Nanotwinned Metals: *Yin Zhang*¹; Zhao Cheng²; Linfeng Bu³; Hengan Wu³; Lei Lu²; Ting Zhu¹; ¹Georgia Institute of Technology; ²Institute of Metal Research, Chinese Academy of Sciences; ³University of Science and Technology of China

Strengthening and Improving Fracture Toughness of Tungsten-copper Nanocomposites: *Klemens Schmuck*¹; Markus Alfreider¹; Daniel Kiener¹; ¹Montanuniversität Leoben

Hetero-deformation Induced (HDI) Stress in Heterostructured Materials: What We Know and Need to Know: *Yuntian Zhu*¹; ¹City University of Hong Kong

High-strength Gradient-microstructure Steels by Additive Manufacturing: *Wenqi Liu*¹; Zaiqing Que²; Roy Björkstrand¹; Mika Salmi¹; Jouni Partanen¹; Junhe Lian¹; ¹Aalto University; ²VTT Technical Research Centre of Finland Ltd

High Load Sliding, Deformation Microstructures, Strength, and Hardening for Gradient Bulk Nanostructures: *Darcy Hughes*¹; ¹Sandia National Laboratories (ret.)

Severely Deformed Stainless Steel Reveals an Anomaly in Thermal Expansion Behavior: *Oliver Renk*¹; Robert Enzinger²; Christoph Gammner¹; Daniel Scheiber³; Wolfgang Sprengel²; Reinhard Pippan¹; Jürgen Eckert¹; Lorenz Romaner⁴; Andrei Ruban⁵; ¹Erich Schmid Institute; ²Graz University of Technology; ³Materials Center Leoben; ⁴Montanuniversität Leoben; ⁵KTH Royal Institute of Technology

NANOSTRUCTURED MATERIALS**Ultrafine-grained and Heterostructured Materials (UFGH XII) — On-Demand Poster Session**

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Penghui Cao, University of California, Irvine; Xiaoxu Huang, Chongqing University; Enrique Lavernia, University of California, Irvine; Xiaozhou Liao, University of Sydney; Lee Semiatin, Material Resources LLC; Nobuhiro Tsuji, Kyoto University; Caizhi Zhou, University of South Carolina; Yuntian Zhu, City University of Hong Kong

Monday AM | March 14, 2022
Nanostructured Materials | On-Demand Poster Hall

On the Underlying Mechanisms in Binary Ni-based Nanocrystalline Alloys: *Keerti Pandey*¹; Atul Chokshi¹; ¹Indian Institute of Science

Investigation of Microstructural Inhomogeneity and Mechanical Characteristics of Severely Deformed Copper Sheet: *Nikhil Tripathi*¹; Swapnil Sawalkar¹; Kallol Mondal¹; Shashank Shekhar¹; ¹IIT Kanpur

Microstructure Evolution in Additively Manufactured and High-pressure Torsion Processed High-entropy Alloys during Heating as Characterized by Neutron Diffraction: *Xiaojing Liu*¹; Jae-Kyung Han²; Yusuke Onuki³; Yulia O Kuzminova⁴; Stanislav A Evlashin⁴; Megumi Kawasaki²; Klaus-Dieter Liss¹; ¹Guangdong Technion - Israel Institute of Technology; ²Oregon State University; ³Ibaraki University; ⁴Skolkovo Institute of Science and Technology

Ultrafine d-ferrite and Transformation-induced Plasticity in Laser Melting Deposition Processed 304L Austenitic Stainless Steel: *Jung Gi Kim*¹; Jonghyun Jeong¹; Yukyeong Lee¹; Jeong Min Park²; Dong Jun Lee³; Hyoung Seop Kim²; Taehyun Nam¹; Hyokyung Sung¹; Jae Bok Seol¹; ¹Gyeongsang National University; ²Pohang University of Science and Technology; ³Korea Institute of Materials Science

Effect of Processing Temperature on the Microstructure and Mechanical Properties Changes of High-pressure Torsion Processed AL7075 Alloy: *Juhee Oh*¹; Sangeun Park¹; Hyo Ju Bae¹; Sujung Son²; Hyoung Seop Kim²; Jae Bok Seol¹; Hyokyung Sung¹; Jung Gi Kim¹; ¹Gyeongsang National University; ²Pohang University of Science and Technology

Deformation Mechanism of Magnesium Alloy with Heterogeneous Ultrafine Structures Composed of Soft and Hard Domains: *Jongbin Go*¹; Myeong-Heom Park¹; Si Gao¹; Nobuhiro Tsuji¹; ¹Kyoto University

In-situ X-ray Diffraction Study on Tensile Deformation of TRIP-assisted Metastable Austenitic Fe-Ni-C Steel: *Sungsoon Kang*¹; Si Gao¹; Wenqi Mao²; Yu Bai³; Myeongheom Park¹; Hiroki Adachi⁴; Masugu Sato⁵; Nobuhiro Tsuji¹; ¹Kyoto University; ²J-PARC center; ³Dalian University of Technology; ⁴University of Hyogo; ⁵Japan Synchrotron Radiation Research Institute (JARI)

A

- Aagesen, L 85, 251, 254
Aarhaug, T 65, 188
Aarnæs, T 77
Aaron, D 68
Aase, S 227
Abad, G 242
Aba-perea, P 74, 75
Abbott, T 246, 247
Abboud, M 62, 184
AbdelGawad, M 189
AbdelHamid, M 212
Abdeljawad, F 13, 54, 109, 114, 145
Abdel-Khalik, H 155
Abdelmawla, A 72, 143
Abdelmotagaly, A 87, 158
Abdoelatef, M 29, 85, 178, 194
Abdolrahim, N 88, 112, 115, 142, 148, 174
Abdolvand, H 124, 155
Abdulaziz, A 210
Abdul Aziz, D 228
Abdulhafez, M 41, 49, 144
Abdullah, A 157
Abdullah, M 238
Abdul Razak, N 238
Abedljawad, F 52
Abedrabbo, S 4, 28, 57, 157, 181, 206
Abelson, J 76
Abere, V 31
Abernathy, D 162, 175, 234
Abernathy, H 216
Aboseada, A 263
Aboseada, N 261
Aboueella, H 72
Aboukhatwa, M 53
Aboulkhair, N 84, 109, 208
Aboutalebianaraki, N 180
Abramova, M 80
Abram, T 251
Abranovic, B 83
Abreu, A 264
Abu-Odeh, A 10
Aburakhia, A 155
Abuzaid, W 243
Acar, P 223, 224, 234, 265
Achar Puttur Lakshminarayana, S 188
Acharya, R 211, 256
Achuthan, A 84
Acierno, A 7, 131
Ackerman, A 33, 222
Acoff, V 118
Acord, K 197
Adachi, H 266
Adair, C 174
Adam, B 97, 121, 145, 166, 176, 243, 244
Adam, K 191
Adams, B 65
Adams, C 193
Adams, D 8, 18, 27, 52, 174
Adams, N 201
Adapa, K 211
Adebola, O 77
Adejo, A 232
Adeosun, S 127
Adetan, O 126
Adeyemi, C 49
Adhikary, T 197, 200
Adibhatla, A 125
Adjanor, G 224
Adkins, C 114
Admal, N 97
Adnan, S 29, 152
Adorno Lopes, D 30, 110
Adra, B 215
Adrien, J 211, 264
Aerne, N 168
Afolabi, O 249
Afrouzian, A 27, 46
Agar, O 171
Agarwal, A 23, 28, 84, 87, 215
Agarwal, S 147
Agbeleye, A 123, 162
Agca, C 122
Agede, O 264
Aghedo, O 182
Agiwal, H 5, 239
Agnew, S 119, 126, 149, 177, 189
Agrawal, A 15, 34, 132
Agrawal, P 54, 83, 101, 193
Agrawal, V 27, 138, 186
A. Greeley, D 177
Aguiar, R 138
Aguilar, C 182
Aguilar, G 84, 102
Ahani, N 247
Ahlfors, M 154
Ahli, N 35
Ahmad, A 264
Ahmadikia, B 57
Ahmadi, M 225
Ahmad, N 118
Ahmad, S 112
Ahmed, A 248
Ahmed, E 239
Ahmed, J 113
Ahmed, k 178
Ahmed, K 29, 85, 134, 194
Ahmed, R 123
Ahmed, S 77, 112, 215
Ahsan, F 132
Aich, S 173, 197, 200
Aidhy, D 159
Aifantis, E 28
Aigbodion, A 242
Aigbodion, S 199
Aindow, M 45, 126
Ai, S 198
Aitkaliyeva, A 56, 194, 202, 213
Aitken, Z 219
Ajantiwalay, T 72, 212
Akamine, H 243
Akanji, F 49
Akbari, M 82
Akhlaghi, M 256
Akhmadieva, A 34
Akhtar, S 23, 62, 231
Akiki, G 164, 176
Akin, B 184
Akin, M 164
Akman, A 95
Aksoy, D 145, 242
Akter, A 9, 30
Akthar, S 231
A, L 231
Alabi, A 49
Alabin, A 34, 91
Al Abri, S 246
Alaghmandfard, R 208
Al Amin, M 259
Alam, M 250
Alamo, F 77
Alam, S 24, 26, 49, 77, 258, 261
Alanis-Fuerte, I 256
Alarcón, R 260
Al-Aridi, R 245
Alarie, J 227
Alateyah, A 247
Alawad, M 247
Al Azad, A 117
Albe, K 10, 58, 129
Al-Buainain, M 122
Alcala de Villarroel, E 92
Al Dajani, S 142
Aldlemy, M 191
Alexander, J 35, 59
Alexandrakis, V 173
Alexandeanu, B 240
Alexandre, J 196, 197, 232, 233
Alfreider, M 25, 153, 222, 253, 266
Alghalayini, M 114
Alhammadi, A 216
Ali, A 28
Alidoost, K 119
Ali, M 4, 62, 103, 144
Alipour, M 179
Ali, S 38, 119
Ali, Y 246
Al Jabri, N 35, 95
Aljohani, T 247
Alkali, V 32
Alkayyali, M 145
Allain, J 202, 251
Allanore, A 9, 24, 57, 63, 87, 104, 112, 194, 203, 216

- Allaparti, T10
 Allard, B.237
 Allard, L. 208, 209, 254
 Allebach, J140
 Alleman, C.26, 138
 Allen, E130
 Allen Gilbert, D174
 Allen, J236
 Allen, M.56
 Allera, A.121
 Allison, J36, 40, 43, 57, 67, 69, 78,
 107, 122, 150, 172, 246
 Allison, P... 5, 15, 46, 83, 159, 167, 180,
 181, 184, 190, 192, 193
 Alman, D 9, 57, 87, 112, 194, 216
 AlMangour, B5, 155
 Almeida Bezerra, W. 92, 196, 198
 Almeida, J137
 Almeida, N226
 Almojel, I142
 Almousa, N129, 200
 AlMousa, N129
 Al-Muhammadi, K.165
 Al-Omari, I173, 197
 Alonso, P202
 Alonzo, A26
 Alpay, S136
 Al-Qawasmeh, A57, 157
 Alrehaili, H82, 84
 Alrizqi, M33
 Alsaati, A47
 Al Shehhi, S35
 Alstrom, J231
 Alvarado, A50
 Alvarado-Orozco, J66
 Alvarez, D41
 Alvarez Montano, V220
 Alvear Flores, G 18, 41, 68, 96, 242
 Alvear, G77, 263
 Alwen, A11, 191
 Alyousif, O16
 Alzate-Vargas, L176
 Amann, F222
 Amara, B237
 Amaro, R120
 Amar, S63, 195
 Amatsu, K249
 Ambard, A106
 Amell Arrieta, A216
 Ameyama, K 30, 170, 266
 Amiri, M55, 156
 Amling, M193
 Ammar, A210
 Amoah, P187, 201
 Amon, A173
 Amornsakchai, T111
 Amroussia, A221
 Anaman, S239
 Ananthanarayanan, D234
 Anastasakos, D173
 Anawati, J262
 An, B.241
 Anber, E 113, 119, 256
 Andani, M78
 Anderoglu, O 54, 63, 115, 164
 Andersen, V152
 Anderson, A41, 123, 128, 147, 151,
 190, 210, 249, 263
 Anderson, D51
 Anderson, I.. 43, 48, 107, 131, 154, 167,
 171, 173, 191, 202, 207
 Anderson, J34, 138
 Anderson, K77, 194
 Anderson, M54, 251
 Anderson, P. 24, 131, 170, 203, 256
 Anderson, W.137
 Andersson, A122
 Andersson, D 85, 98, 110, 251
 Andersson, J38, 82
 Ando, Y223
 Andrade, I197
 Andrade Michel, K.187
 Andresen, P39
 Andrews, C154, 172
 Andrews, W27
 Andrieu, E64
 Andriyana, A47
 Aneziris, C 50, 62, 231
 Angarita-Gomez, S190
 Angell, J56
 Ang, H247
 Anghel, V137
 Anguilano, L104
 Angus, J83
 Anikoh, S117
 Anikovskiy, M...17, 41, 68, 96, 120, 144,
 165, 176, 187, 241, 242
 Anjantiwalay, T24
 An, K10, 32, 73, 88, 126, 132,
 211, 218
 Ankamah-Kusi, S15
 Ankit, K141
 An, L.153
 Annadanam, R169
 Annamareddy, A161
 An, Q62, 175
 Ansah, S239
 Anthony, B247
 Anthony, T76
 Antillon, E121
 Antoniou, A105
 Antonissen, J78
 Antonov, S33, 59, 85, 89, 114, 137,
 159, 195, 222, 235, 236
 Antosz, M187
 Antrekowitsch, H96, 249
 Antrekowitsch, J 235, 262, 263
 Antusch, S250
 An, X106, 218
 Anyaogu, D117
 Aoki, M213
 Aota, S211
 Aoyagi, K212, 257
 Aparicio, A117
 Apaza Huallpa, E199
 Apelian, D 50, 84, 89, 103, 136, 235
 Apparao, R217
 Appel, P27
 Appleton, R47, 174
 Aprahamian, H164
 Arai, N61, 183
 Arakaki, A92
 Arakawa, K250
 Araujo, A97, 121, 145, 166, 176,
 243, 244
 Ard, J247, 248
 Arevalo, L18
 Argade, G33, 221
 Argibay, N100
 Argyrakis, C14
 Ariza, P34
 Arkenberg, G9
 Arkhipov, A95
 Armstrong, D 129, 130, 161, 170
 Arnaudov, N43
 Arnberg, L62, 231
 Arnesen, K188
 Arnhart, M58, 135
 Arnold, D264
 Arnold, J177
 Arnold, M41
 Aroh, J 6, 133, 192
 Arola, D228
 Arold, T208
 Arora, G159
 Arora, U252
 Arregui Mena, J251
 Arroyave, R...13, 19, 42, 50, 56, 69, 88,
 90, 98, 117, 135, 193, 208,
 212, 220, 234, 244
 Arróyave, R56
 Arsenko, M55, 167
 Arteaga, V63
 Artrith, N160
 Artusio-Glimpse, A55
 Arul Kumar, M...8, 30, 56, 57, 85, 94,
 111, 117, 135, 141, 156,
 172, 212, 214, 236
 Arunachalam, A58
 Aryanfar, A80
 Aryani, D104
 Arzoumanidis, A200
 Arzt, E150
 Asadi, E... 12, 34, 60, 90, 115, 138, 160,
 195, 223
 Asadikiya, M26
 Asama, H225

- Asari, Y215
 Asayama, K247
 Ashbaugh, M.205
 Ashcroft, I109, 208
 Ashkenazy, Y.52
 Ashraf, S.206
 Asim, U149
 Askari, H28
 Aslani, M248
 Asle Zaeem, M4, 12, 14, 22, 24, 34,
 45, 47, 60, 72, 74, 75, 90, 100, 102,
 114, 115, 124, 126, 138, 148, 150, 160,
 167, 168, 190, 195, 203, 223, 252, 253,
 255, 256
 Asmatulu, E.210
 Aspandiar, R188
 Asphaug, E.232
 Assis, F.200
 Asta, M.10, 14, 42, 51, 69, 88, 121,
 129, 137, 169, 225
 Astbury, J.148
 Aster, P.255
 Aston, K.115
 Atcitty, S.154
 Atehortua, J.248
 Athanasiou, C42
 Athchasi, J.91
 Atli, K.220
 Atre, S.193
 Attallah, M.154, 172
 Attari, V.13, 37, 63, 88, 93, 117, 141,
 162, 175, 198, 234
 Atwater, M.48, 191
 Atwood, R.23, 48, 55, 108, 123
 Atzmon, M116
 Aubry, S.135, 155, 195
 Auger, T.95, 128
 Auguste, R.129
 Aune, R23, 36, 62, 86, 231
 Aushman, M154
 Austin, T251
 Autenrieth, D16
 Autrey, T93
 Avadanii, D170
 Avateffazeli, M171
 Averbach, R.13, 42, 52, 73, 202, 224
 Avery, D.83, 192
 Avetian, S.159
 Avila-Davila, E256
 Avraham, S226
 Awais, M73, 203
 Awasthi, P54
 Awayassa, O.161
 Awayssa, O227
 Axinte, D236
 Aydogan, E50, 177
 Ayers, N.82
 Ayinla, K77
 Aykol, M244
 Ayomanor, B117
 Aysal, E.49
 Aysal, H190
 Aytug, T25, 49, 76, 103, 190, 258, 259
 Ayyasamy, M.119
 Azadehnanjbar, S.100, 124
 Azeem, M23
 Azekenov, T.68
 Azeredo, B.51, 76, 146
 Azevedo, A197, 232, 233
 Azimi, G.24, 49, 104, 215, 217, 258,
 262, 263
 Azizha, M.247, 248
 Aziz, T61
- ## B
- Baak, N.40
 Baba, A.24, 26, 49, 77, 258, 261
 Baba, T.226
 Babinský, T17
 Babu, B.179
 Babu, P.173
 Babu, S.110, 207, 236
 Babuska, T.100
 Bach, A.80
 Bachhav, M5, 213, 219, 265
 Bachmann, F.30
 Bachurina, D.250
 Back, C.251
 Bacroix, B.154
 Badgley, P215
 Badry, F29, 194
 Bae, H.179, 235, 254, 266
 Bae, J.180, 254
 Baek, S60
 Bagchi, S.175
 Bagdasarian, I92
 Bagot, P130
 Bahl, S67, 208, 209, 254
 Bahr, A.11, 215, 221
 Bahramian, N221
 Bahr, D.5, 45, 102
 Bahzad, M68
 Baier, N214
 Bai, J.190
 Bailly-Salins, L201, 252
 Baird, S.12, 34, 165
 Bair, J201
 Baishya, M.265
 Bai, X213
 Bai, Y266
 Bai, Z27
 Baiz, S.89
 Bajpai, A.245
 Baker, A100, 124, 155, 173
 Baker, I.14, 123, 158
 Baker, K162, 181, 190
 Baker, S.11, 21, 32, 59, 88, 183,
 220, 221
 Balachandran, P60, 63, 102, 119, 154
 Balachandran, S90
 Balasubramanian, B.166
 Balasubramanian, G.32, 58, 82, 159,
 173, 174, 199
 Balazic, M82
 Balažic, M192
 Balbaud, F154
 Balbuena, P190
 Balcer, M265
 Baldo, P80, 263
 Baldwin, J.88, 167, 187
 Baldwin, K.50
 Bale, H30, 36, 46
 Balema, V58
 Baler, N254
 Bales, M.251
 Balila, J.221
 Balke, T56
 Balk, T51, 136, 137, 166, 178,
 181, 190
 Ballet, P214
 Ball, J172
 Ballor, J.159
 Balogun, A.77
 Bambach, M134, 212
 Bambazala, S.105
 Bamney, D.18
 Bandyopadhyay, A10, 27, 46, 48, 62,
 83, 116, 125, 193, 217
 Bandyopadhyay, R111, 118
 Banerjee, A90, 110
 Banerjee, D49, 87, 90, 115
 Banerjee, P.58
 Banerjee, R7, 33, 46, 73, 88, 89, 97,
 101, 109, 113, 126, 149, 208,
 237, 254, 256, 258
 Banerjee, S.9, 57, 112, 182, 190,
 215, 256
 Banik, S160, 234
 Banner, P88
 Banvolgyi, G4
 Bao, Y.224
 Baral, P.29, 52
 Barandiaran, J173
 Barber, R52
 Barbosa, T95
 Barcenás, G116, 199
 Barela, S.19, 70, 122, 166, 177, 189,
 246, 247
 Baris, J27
 Barkey, M.15
 Barnett, B.108
 Barnhart, B82
 Barr, C8, 18, 52
 Barrett, C.177, 224, 247
 Barr, G262

- Barrick, E. 54, 74, 75, 107
 Barrientos Hernández, F. . . 197, 198, 221
 Barrientos-Hernández, F. 232
 Barriobero-Vila, P. 222
 Barrios, A. 22, 23, 27
 Barrios Santos, A. 52
 Barron, N. 22, 72, 218
 Barrow, A. 199
 Barry, R. 158
 Barsoum, M. 38, 72
 Bartel, C. 47
 Bartels, D. 106
 Barter, B. 262
 Bartie, N. 77, 128
 Bartolucci, S. 17
 Barton, D. 240
 Barton, N. 94, 119, 135, 155
 Bashandeh, K. 148
 Basit, M. 23
 Baskar Kannan, S. 30
 Basker Kannan, S. 14
 Baskes, M. 19, 198
 Bastawros, A. 72, 143
 Basu, J. 23
 Basu, K. 58
 Basu, S. 9, 30, 57, 86, 112, 136, 139,
 140, 156, 158, 182, 215, 216, 244
 Bateman, O. 61
 Bates, J. 21, 115, 139, 196, 199, 228
 Batich, C. 180
 Batista Capaverde Silva, L. 189
 Batista, G. 61
 Batra, R. 234
 Battu, A. 227
 Bauer, E. 12, 60, 225
 Bauer, J. 105
 Baumgart, H. 187, 201
 Baumgart, P. 34
 Bawane, K. 20, 27, 44
 Baxter, G. 48
 Bayanov, V. 226
 Bayes, M. 75
 Bazaglia Kuroda, P. 195
 B. Costa, M. 230
 Beake, B. 29, 130
 Beals, R. 34
 Beamer, C. 81, 154
 Bean, G. 84
 Beatty, E. 174
 Beauchamp, S. 136
 Beaudry, D. 113, 119, 132, 149,
 161, 256
 Beausoleil, G. 72
 Beausoleil II, G. 213
 Béchade, J. 222
 Bechetti, D. 133
 Becker, C. 89, 97
 Becker, G. 47, 156
 Beckermann, C. 14
 Beckett, D. 95
 Beck, M. 52, 174
 Beck, S. 83
 Beck, V. 158
 Beckwith, C. 63
 Becquart, C. 169, 250
 Bedair, S. 214
 Beddingfield, R. 215
 Bedewy, M. 17, 41, 49, 68, 144
 Bedolla, C. 228
 Beechem, T. 100
 Beeler, B. 8, 22, 98, 194, 213
 Beersaerts, G. 260
 Beese, A. 29, 82
 Beets, N. 124
 Begley, B. 67, 256
 Begley, M. 110
 Behara, S. 19, 47
 Behera, A. 121, 183
 Behzadinasab, M. 165
 Beidaghi, M. 49
 Beirau, T. 81
 Bekkevoll, S. 227
 Belak, J. 224, 248
 Belcher, C. 136, 154
 Bele, E. 79, 109
 Belelli, F. 212
 Belkacémi, L. 256
 Bellah, M. 100
 Bello, N. 161, 184
 Bellon, P. 13, 18, 42, 52, 69, 97, 121,
 145, 165, 187, 202, 224, 242, 243
 Belof, J. 142
 Bement, M. 224
 Benalia, S. 261
 Benartzy, A. 194
 Benchafia, E. 57, 157
 Benedict, M. 131
 Ben Haj Slama, M. 132, 133
 Beniya, I. 93
 Benjamini, J. 120
 Bennett, J. 137
 Benn, F. 155
 Benson, A. 105
 Benson, M. 114
 Benzerga, A. 34, 107, 177
 Benzesik, K. 104, 130
 Benzing, J. 47, 53, 55, 81, 97, 102,
 137, 154
 Beran, G. 12
 Berard, D. 228
 Berbenni, S. 138
 Berer, M. 181
 Berez, J. 21
 Bergheau, J. 29, 52
 Bergin, A. 62, 231
 Berglund, I. 21
 Bergmann, L. 47, 168
 Berlia, R. 106
 Berman, T. 36, 43, 67, 70, 122
 Birmingham, M. 238
 Bernacki, M. 195
 Bernal, C. 62, 63, 98, 175, 198, 203
 Berneder, J. 184
 Bernholdt, D. 85, 99
 Bernier, J. 40, 72, 120, 236
 Bernstein, N. 121
 Bernthaler, T. 168
 Berriel, S. 58
 Berry-Gair, J. 183
 Berry, J. 32, 37, 187
 Berry, L. 77
 Berthebaud, D. 115, 225
 Bertherat, M. 116
 Bertin, N. 78, 135, 155, 186, 195
 Bertsch, K. 26, 51, 66, 78, 105, 128,
 152, 169, 263
 Besmann, T. 247, 248
 Besson, S. 237
 Betancourt, L. 201
 Bettés, B. 221, 251
 Beura, V. 11, 89, 148, 166, 183
 Beuth, J. 83, 107, 134
 Bewlay, B. 64
 Beyerlein, I. 8, 30, 56, 57, 85, 111,
 113, 121, 135, 156, 167, 172,
 173, 214, 237, 243, 251
 Bezerra, W. 92, 185, 197, 198, 200
 Bezold, A. 235
 Bezuidenhouta, P. 105
 Bhabu Kanagaraj, A. 185
 Bhagavatam, A. 84
 Bhagavath, S. 235
 Bhandari, C. 157
 Bharadwaj Vishnubhotla, S. 100
 Bhargava, S. 262
 Bhashyam, G. 188
 Bhaskar, P. 180, 199
 Bhate, D. 35, 51, 82, 116, 172
 Bhattacharjee, A. 41, 47, 62, 92, 168,
 186, 194
 Bhattacharjee, P. 218
 Bhattacharya, A. 147, 202
 Bhattacharya, D. 97
 Bhattacharya, G. 200
 Bhattacharya, K. 177
 Bhattacharya, S. 215
 Bhattacharyay, D. 237
 Bhattacharyya, D. 22, 45, 72, 125, 149,
 168, 203, 250, 253
 Bhattacharyya, J. 149, 189
 Bhattacharyya, M. 193
 Bhattiprolu, V. 55
 Bhave, C. 70
 Bhowmick, S. 73
 Bhowmik, A. 189
 Bhundiya, H. 82
 Bhuwalka, K. 78

Biaggne, A	86, 116, 199	Bocquet, H.	230	Bouhattate, J	143
Bian, M.	246	Boddapati, J.	79	Boukellal, A.	90, 198
Bibhanshu, N.	45	Boddorff, A	236	Boulanger, J.	227
Bickel, J	53, 200	Bodlos, R	25	Boulard, F	214
Bickle, J	81	Bodnárová, L.	196	Boulmat, X	219
Bieberdorf, N.	51	Boechler, N	13	Bouman, C.	56
Biehl, S	231	Boehlert, C	57, 105, 127, 159, 259	Bouman, K.	27, 191
Bieler, T	57, 105, 149, 187	Boese, M	92	Bouobda Moladje, G	42
Biener, J	79, 158	Boesl, B	23, 84, 87	Bourges, C.	225
Biffi, C	89, 218	Bohanon, B	164	Bourgès, C.	226
Biggs, K	46, 145	Bohanon, R	204	Bourgonje, C.	241
Bijjala, S	54	Bohling, J.	158	Bourne, N	15, 38, 65, 94, 118, 142, 164, 176, 186, 236, 237
Bikmukhametov, I	170	Bohn, A	33	Bouteiller, H	115
Bilbrey, J.	256	Bojarevics, V.	37, 91, 147	Bovid, S	39
Bilheux, H	132, 210, 235	Boldman, W	137, 218	Bowden, A.	21
Bilheux, J	132, 210	Boleininger, M	99	Bowden, D.	204
Bilionis, I	159	Bolinteanu, D	236	Bower, A	5, 238
Billaud, Y	232	Boller, E	93	Bowman, W.	31, 45, 88, 165, 174, 183, 239, 255
Billinge, S.	113	Bollmann, C	226	Boyce, B	8, 13, 18, 23, 27, 51, 52, 79, 81, 106, 191, 192, 265
Bilodeau, A	21	Boll, T.	50	Boyer, G	228
Bilodeau, J	227	Bolme, C	142	Bozeman, S	39
Bilsland, C	199	Bolsanello, M.	264	Bozhilov, K	255
Bin Nur Tuhser, T.	164	Bolukbasi, M.	72	Bozzolo, N.	14, 195
Biribilis, N.	16	Bomarito, G.	138	Bracamonte, L.	91
Bird, D	4, 31, 76, 108, 111	Bonacuse, P	23	Bracker, G	93
Birky, D	138	Bonakdar, A.	155	Bradley, P.	120, 189
Birnbaum, A	84, 110, 134, 156, 172, 193, 203, 212, 213	Bong, H	235	Bradshaw, A.	13
Biros, G	224	Bonhommeau, S	157	Brady, E	25
Birt, A.	104, 257	Bonilla Toledo, J	158	Brady, M.	135, 214, 221, 235, 243, 247
Biswas, K	245	Bonini, J.	154	Braems, I	240
Biswas, P	193	Bonnamy, S	214	Braga, M.	233
Biswas, S.	213, 251	Bonneau, G	227	Brainer, J	232
Bittner, P	250	Bonnin, A	264	Bram, M.	250
Bi, Z	177	Bonny, G	224	Brandberg, A.	207
Bjelland, K.	152	Bonora, N	65	Brand, M	212
Björkstrand, R.	266	Bontoux, L.	153	Brandner, U.	235
Black, R	171	Boraie, M.	95	Branicio, P.	183, 186, 190
Blais, A.	227	Borana, J	96	Brantley, D.	164
Blaiszik, B	9	Bor, B	150, 170	Bratten, A.	134
Blankenburg, M	266	Bordas-Czaplicki, M	17, 118	Brauer, S.	143
Blanpain, B	28, 50, 76, 77, 103, 188, 205, 260	Bordas, R.	38	Braun, P	129
Blaschke, D	236	Bordeenithikasem, P	175	Braymiller, S	76
Blaschke, G	130	Bordia, R	48	Brázda, M	109
Blatter, A	230	Borenstein, C.	52	Breen, A	243
Blednykh, I	226	Borges, A	226	Brennan, P.	64
Blendell, J.	188	Borg, J.	15	Brennecke, J.	87
Bleskov, I	97	Borgonia, J.	107	Brenneman, J.	193
Bleyer, J	111, 138	Borisevich, A.	255	Brenner, A	207
Blobaum, K	80	Borisov, E.	193	Breumier, S	74, 75
Blondel, S.	85, 99, 123	Borkar, T	7, 11, 33, 89, 183, 190, 221	Brewer, L	5, 55, 83, 133, 155, 166, 171, 192
Bloom, W.	39	Borkiewicz, O	208	Briggs, A	4, 76, 259
Bobaru, F	239	Borowski, L	251	Brigham, B.	200
Bobel, A	133	Borowski, N.	104	Brillo, J.	93
Bober, D.	164	Borzi, A	116	Brindley, K.	160
Boccardo, A.	150	Bose, S	10, 46, 62, 91, 92, 116, 125, 193, 194	Bringa, E	65
Bo-Chia, C.	115, 184	Bosic, O	148		
Bocklund, B.	37, 93, 198	Bostanabad, R.	115, 235		
		Boswell, J	53		

- Brinkman, K 9, 30, 57, 86, 112, 136,
158, 182, 215, 216
- Briottet, L143
- Brito, M96
- Britton, B199, 238
- Britton, D18
- Britton, T199
- Britt, S9
- Brock, J46
- Broderick, S32, 87
- Brodie, J175
- Brodnik, N19
- Broek, S35, 39, 61, 65, 91, 95, 161,
227, 228, 237
- Broido, D175
- Brooks, G179
- Brooks, K234
- Broos, H232
- Brown, A13, 36, 63, 92, 117, 161,
196, 231, 232
- Brown, B137, 146, 155
- Brown, D6, 8, 55, 83, 108, 126, 132,
149, 155, 194, 210
- Brown, E15, 38, 65, 94, 118, 142, 164,
176, 186, 236, 237
- Browne, D117, 198
- Brown, F220
- Brown, H181
- Brown, J60, 236
- Brown, N200
- Brown, S218, 243
- Brown, Z34
- Brozovic Gariglio, M195
- Brubaker, N192
- Brückner-Foit, A67
- Brückner, M164
- Bruhis, M191
- Bruno, N234
- Bruns, S246
- Brunsvik, A65
- Bryan, C95
- Bryan, D158
- Bryant, N131
- Bryantsev, V201
- Bryce, K239
- Brziak, P61
- Buchanan, D40
- Buchanan, F245
- Buckingham, R14
- Buckley, J251
- Buck, Z120, 189
- Bucsek, A36, 125
- Buechler, M119
- Buergel, T132
- Buffière, J154
- Bufford, D8, 52, 59, 153
- Bugnion, L257
- Bui, H90
- Bui, P32
- Bui-Thi, T249
- Bukhamseen, A165
- Bu, L266
- Bülbül, F67
- Bull Ezell, N122
- Bundela, A200
- Bunger, A77, 162
- Burch, A5, 13, 176
- Burcul, M244
- Bürger, D141
- Burgstaller, C86
- Burke, J49
- Burke, M51, 169
- Burlot, G14
- Burnett, W181
- Burns, J26, 95, 118, 171, 186, 251
- Burns, K202
- Burrows, A68
- Burtscher, M222, 253
- Bush, R95
- Bushra Haider, S180
- Bussiba, A194
- Bustillos, C186, 234
- Bustillos, J21, 199
- Butcher, D218
- Butin, G188
- Butler, A110
- Butler, B7, 52, 55, 83, 109, 114, 132,
133, 137, 188, 193, 211
- Butler, L160, 210
- Butt, M85, 194
- Buyko, O161
- Buziak, M167
- Buzunov, V237
- Byeon, J188
- Byerly, K136
- Byler, D22, 59
- Byloff, J255
- Byrd, G176
- Byun, S262
- Byun, T44
- C**
- Caballero, F255
- Cabet, C80, 106, 129, 152, 169, 204, 265
- Cabeza Sanchez, S155
- Cabo Rios, A127
- Cabrera, I34
- Cackett, A207
- Cady, C168
- Cagle, M97
- Cahill, J11, 108
- Cai, J130, 205, 223
- Cai, L114
- Cailloux, T154
- Cai, Q162
- Cai, W33, 86, 119, 120, 143, 164, 175,
182, 186, 239
- Cai, Y225
- Cakez, C164
- Cakmak, E33, 88, 248
- Calabro, R17
- Caldwell, A9
- Caliari, F66
- Çaliskan, E254
- Callahan, P64, 121, 132, 149, 161
- Callisti, M64
- Calta, N55, 132, 172, 210
- Calvo-Dahlborg, M218
- Camerlo, S156
- Camilos, P224
- Campbell, C43, 98, 234
- Campbell, I57
- Campbell, Q209, 210, 223
- Campos, L233
- Camposo Pereira, A197
- Cance, D91
- Candido, V92, 197
- Canfield, N227, 245
- Canfield, P45
- Cangialosi, D229
- Canik, J99
- Cannell, G239
- Canova, K76
- Cantor, B31
- Canumalla, R224, 259
- Cao, B89
- Cao, C22, 25, 45, 49, 72, 76, 100,
103, 124, 148, 161, 167, 190,
252, 253, 258, 259
- Cao, G43
- Cao, H211
- Cao, J105, 108, 232
- Cao, L39, 57, 89, 203
- Cao, P24, 27, 30, 52, 80, 106,
121, 129, 153, 155, 159, 169,
170, 174, 191, 265, 266
- Capdevila, C255
- Capolungo, L8, 18, 51, 52, 56, 57, 94,
124, 126, 135, 141, 167, 212,
214, 224, 236
- Cappia, F8, 29, 56, 71, 85, 110,
134, 194, 213, 251
- Capraz, O57, 233, 242
- Capriotti, L56, 114
- Caravaca, E76, 108
- Carbone, A142
- Carbonel-Ramos, D262
- Cardiff, P117, 198
- Cardoso, G229
- Cardoza Herrera, A261
- Caris, J70
- Carmona Saldarriaga, L86
- Carneiro, L189
- Carne, R162
- Caro, A58
- Caron, W184

Carpenter, D	248	Celio, H	87	Chartron, J	92
Carpenter, J	13, 36, 63, 92, 117, 137, 149, 153, 161, 196, 231, 232	Cereceda, D	250	Chason, E	238
Carpenter, M	230	Ceroni-Galloso, A	262	Chatterjee, A	186
Carpick, R	68, 100	Cerqueira, N	196, 197, 232	Chatterjee, D	158, 161
Carrado, A	86, 89, 111, 135, 157, 182, 214	Cerreta, E	23, 80	Chatterjee, S	174
Carreño, F	8	Cervellon, A	40, 64, 141	Chattopadhyay, A	232
Carreno, J	7	Cetiner, N	248	Chattopadhyay, K	23
Carreon-Garcidueñas, M	198	Chadha, C	13	Chaturvedi, P	185, 216
Carreon, H	198	Chadwick, A	27, 102, 189	Chaudhary, R	70
Carrillo, M	109	Chagnes, A	49, 104	Chaudhary, V	7, 208
Carroll, J	107, 156, 171, 193	Chaitanya, V	149	Chaudhuri, S	146, 160
Carroll, L	254	Chai, W	181	Chauduri, S	155
Carroll, M	118, 141, 142, 163, 175, 236	Chai, Y	225	Chawla, H	164, 186
Carroll, R	163	Cha, J	68	Chawla, K	73
Carsley, J	61	Chak, K	141	Chawla, N	15, 21, 35, 40, 60, 67, 116, 146, 240
Carson, R	186, 248	Chakladar, S	258	Cheenady, A	38
Carter, B	101	Chakraborty, A	94, 167, 172, 244	Chellali, M	59
Carter, C	90	Chakraborty, P	203, 234	Chellali, R	35
Carter, F	132	Chakraborty, S	138, 243	Chemerisov, S	251
Carter, J	10, 21, 31, 32, 58, 87, 88, 113, 136, 137, 158, 159, 173, 174, 183, 218, 219, 220	Chakravarty, S	90, 258	Chen, A	74, 139, 152, 179, 205
Carter, R	154	Chamberlain, J	98	Chen, B	258
Carter, T	8, 163	Champagne, V	133, 147	Chen, C	47, 65, 70, 74, 101, 102, 116, 225, 229, 237, 238, 254, 255
Carter, W	108, 132	Champaney, V	210	Chen, D	195, 198, 205
Carvalho, J	197, 233	Chancey, M	129, 152	Chen, E	18, 52, 121
Carver, D	56	Chandra, L	261	Chen, F	223
Carver, K	207	Chandran, K	67	Chen, G	48, 162, 209, 232, 257
Carver, T	126, 176	Chandrasekaran, S	86, 108, 158	Cheng, B	177
Casalena, L	133	Chandrasekar, S	180	Cheng, C	238
Casari, D	139	Chandrashekar Dixith, A	90	Cheng, D	37, 177
Casas Luna, M	48	Chandross, M	100	Cheng, H	253
Casati, R	212, 218	Chang, C	49, 190, 211	Cheng, I	264
Casem, D	186	Chang, D	86	Cheng, J	33, 63, 167, 194, 236, 243
Castagnola, E	68	Chang, F	238	Cheng, L	51
Castañeda Montoya, M	216	Chang, H	220	Cheng, P	166
Castano, C	103, 127, 204	Chang, J	96, 120	Cheng, S	99, 252
Castilho, E	232, 233	Chang, K	40, 102, 200, 246	Cheng, T	94, 141, 216
Castillo, A	90	Chang, L	220	Cheng, X	205
Castro Baldivieso, S	24, 146	Chang, S	200, 219, 229	Cheng, Y	29, 81
Castro, F	262	Chang, Y	47, 222	Cheng, Z	266
Caswell, T	190	Chan, H	82, 129, 181, 218	Chen, H	24, 89, 158, 200, 224, 226, 249, 255, 261
Catalino, P	26	Chan, K	217, 262	Chen, J	86, 128, 143, 205, 232, 236, 256
Catania, R	249	Chankitmunkong, S	91	Chen, K	225
Cathcart, C	215	Chao, C	75	Chen, L	6, 57, 83, 133, 223, 225, 234
Catledge, K	119, 120	Chao, P	9, 47, 203	Chen, M	45, 116, 264
Caton, M	40, 67, 240	Chaouadi, R	202	Chen, N	200, 255, 256, 266
Cavanagh, K	168	Cha, P	162	Chen, P	62, 91, 116, 139, 141, 158, 196, 215, 218, 220, 228, 229, 230, 259, 265
Cavin, J	58	Chapman, M	210	Chen, Q	15, 27, 51, 79, 105, 129, 190, 200, 264
Cawley, J	131	Chaput, K	210	Chen, R	100
Cecchin, D	233	Charak, A	73	Chen, S	12, 58, 60, 115, 183, 206, 218, 219, 224, 225, 226, 255, 259
Ceder, G	42	Charatsidou, E	30, 110	Chen, T	200
Cefaratti, M	119	Charbonnier, A	161		
Cejpek, P	266	Charit, I	5, 53, 108, 192, 193, 208, 209, 252		
Celebi, O	22, 67	Charitos, A	151		
Celikin, M	154, 247	Charkaluk, E	17		
Çelik, O	34, 184	Charlebois, A	26		
		Charpagne, M	64, 113, 114, 162		
		Charrett, T	210		
		Chartrand, P	261		

- Chen, W.10, 19, 32, 42, 54, 69, 79,
89, 97, 98, 99, 113, 137, 148, 173,
213, 228, 229, 242, 244, 249, 256, 263
- Chen-Wiegart, K27
- Chen-Wiegart, Y. . .20, 27, 44, 49, 51, 79,
105, 129, 144, 182, 190, 241, 264
- Chen, X 59, 123, 147, 198, 202, 206,
209, 226
- Chen, Y 55, 93, 108, 109, 123, 134,
139, 189, 218, 219, 220, 228,
234, 240, 255
- Chen, Z177
- Cherkhev, A41
- Chernenko, V157, 173, 225
- Chernyshov, D157
- Chesser, I145, 243, 244
- Chiang, P210
- Chiba, A211, 212, 222, 243, 257
- Chica, E232
- Chidambaram, D20, 98
- Chien, S224, 238
- Chikushi, S225
- Chilukuri, A33, 221
- Chino, Y246
- Chintalapalle, R4, 28, 86, 111, 135,
157, 181, 182, 206, 214
- Chinwego, C24
- Chirinos-Collantes, H262
- Chirwa, W242
- Chi, S225, 234
- Chisholm, M254
- Chistyakov, D226
- Chiu, E15
- Chiu, G140
- Chiu, W . .12, 60, 115, 183, 224, 225, 226
- Chiu, Y47, 118, 180, 255
- Chi, Y34, 82
- Chmielus, M7, 55, 83, 107, 109, 131,
133, 154, 171, 191, 193, 207, 211
- Cho, c184
- Chodankar, S251
- Cho, H239
- Choi, C261
- Choi, D28, 157, 185, 216, 242
- Choi, H227
- Choi, I188
- Choi, J9, 30, 57, 86, 112, 136, 158,
182, 215, 216
- Choi, K22, 195, 251
- Choi, P36, 193, 203, 224
- Choi, S201, 215, 227, 253
- Choi, W147, 248
- Choi, Y244
- Cho, J28, 106, 121
- Cho, K46, 181, 184, 189
- Chokshi, A266
- Cholet, J126
- Chong, Y121
- Choo, H55
- Choong, Y253
- Chorney, J205
- Chorney, M205
- Cho, S14, 39
- Chote, A200
- Choubey, P261, 262
- Chou, C101
- Choudhari, V189
- Choudhary, C201
- Choudhary, K12, 63, 223
- Choudhuri, D243, 256
- Choudhury, S252
- Chou, K147, 171, 212
- Chou, Y10, 32, 113
- Cho, W173
- Chowdhury, S28
- Ch., R63
- Chraska, T48
- Christensen, S233
- Christ, H67
- Christian, K186
- Christian, M247, 248
- Christiansen-Salameh, J238
- Christien, F240
- Christodoulou, P124
- Christofidou, K64
- Christöfl, P181
- Chrzan, D137
- Chuang, A6, 27, 51, 55, 83, 87, 108,
132, 136, 155, 210
- Chubukov, B20
- Chudoba, T207
- Chu, K224
- Chulist, R189, 199
- Chumlyakov, Y13, 102
- Chung, C34, 144, 182, 190
- Chung, K261, 262
- Chung, R218
- Chung, T47
- Chun, J212
- Churaman, W76
- Chu, Y133, 206, 241
- Cianciosa, M99
- Cibula, M37
- Cieslak, G259
- Ciliveri, S10, 125, 193
- Cillessen, D154
- Cinbiz, M72
- Cink, S21
- Cipollone, D49
- Cisse, C102
- Cisse, F39
- Ciston, J69, 129
- Ciston, S46
- Ciucani, U260
- Claisse, A72, 243, 251
- Clare, A117, 212
- Clark, B . . .26, 51, 78, 105, 118, 128, 141,
142, 152, 163, 169, 175, 236, 263
- Clark, C16
- Clarke, A29, 47, 55, 59, 89, 97, 130,
137, 146, 156, 172, 176, 177, 192, 200
- Clarke, K46, 47, 89, 97, 130, 156,
172, 176, 177, 200
- Clark, G6
- Clark, S55, 93, 108, 134, 211
- Clatterbaugh, J238
- Clausen, B8, 126, 176, 194, 236
- Clausius, B122
- Cleary, W5
- Cleek, C192
- Clemens, H25, 222, 255, 260
- Clement, A95
- Clement, C99, 252
- Clérac, R157
- Clerc, F50
- Clifford, A120
- Clifton, P13
- Clouet, E222
- Clough, E117
- Clowers, L147
- Coakley, J73, 137, 203
- Cobb, C241
- Cobos-Becerra, L77
- Cobos-Murcia, J196, 221
- Cochran, A214
- Cochran, R156, 193
- Cockburn, E167
- Cockcroft, S226, 231
- Coduri, M218
- Coenen, J250
- Coffman, T29, 194
- Cohen, M33, 180
- Cohn, R114
- Cola, G243
- Colak, H245
- Colbert, J63
- Cole, K83
- Coleman, J207, 224, 248
- Colijn, H239
- Colin, J30
- Collado Cardenas, E199
- Collins, D134, 172, 235, 236, 253
- Collins, G142
- Collins, P137, 159
- Collins, S254
- Colmenares, A35
- Colombo, G53, 162
- Colon-Mercado, H93
- Colorado, H9, 163, 185, 216, 232,
261, 262
- Colton, S192
- Colton, T7
- Comandini, G106
- Comby-Dassonneville, S52
- Compton, B146
- Conkel, C214

- Connelly, J.35
 Conner, B.154
 Connolley, T.172
 Connolly, J.35
 Connolly, M.120, 189
 Conradi, M.192
 Conry, B.181
 Considine, K.156, 193
 Conversano, R.107
 Cook, P.214
 Coons, T.22
 Cooper, E.180
 Cooper, M.22, 29, 85, 251
 Copeland-Johnson, T.43
 Copenhagen, K.76
 Copley, J.89, 97, 172
 Coppo, F.213
 Cora', F.183
 Cordero, Z.15, 52, 64, 82, 118, 235
 Cordes, N.71
 Cordill, M.5, 29, 118, 130, 141, 142, 163, 167, 175, 207, 236
 Cordle, B.167, 180, 181, 193
 Cordonier, G.103
 Cormier, J.14, 16, 17, 38, 64, 73, 94, 118, 137, 141, 162, 186, 235
 Cornish, L.50
 Corona, S.175
 Corr, C.250
 Correa, D.228, 229
 Corrie, D.262
 Corrion, A.40
 Corsi, J.141
 Cortez, J.45, 88, 165
 Costa, E.26
 Costa, M.201
 Costigan, T.53
 Cote, D.23, 53, 115, 195, 211, 248, 257, 260
 Côté, J.161, 237
 Cote, P.65
 Cotto-Figueroa, D.232
 Couet, A.45, 70, 71, 106, 146, 148, 153, 155, 160, 194, 201, 219, 248, 251, 252
 Coughlin, D.153
 Coulais, C.106
 Coury, F.127, 172
 Cousinie, J.149
 Couturier, A.74, 75
 Couturier, L.240
 Couzinie, J.88, 127
 Couzinié, J.222, 256
 Cox, B.53
 Cox, M.110
 C. Park, S.193
 Craft, A.56
 Crandall, D.77, 162
 Crane, N.7
 Craparo, J.50
 Crawford, G.180
 Crepin, J.80
 Cresko, J.50, 77
 Creus, J.30
 Creuziger, A.47, 137
 Crevelt, L.251
 Crick, C.116
 Crimp, M.105
 Cronin, S.233
 Crook, C.89
 Cross, G.153, 170
 Cross, W.180
 Crouse, J.185
 Cruz, A.233
 Cruzado, A.34
 Cruz, L.96
 Cruz, N.229
 Crystal, I.168
 Cueva Sola, A.258
 Cueva-Sola, A.188
 Cui, B.16, 26, 39, 43, 51, 59, 66, 78, 95, 105, 119, 123, 128, 143, 152, 164, 165, 169, 173, 186, 187, 239, 240, 263
 Cui, J.43, 50, 128, 157, 164
 Cui, L.205
 Cui, Y.195, 212
 Cullen, J.218, 243
 Cunha, J.197
 Cunningham, C.123
 Cunningham, K.118, 141, 142, 163, 175, 236
 Cunningham, R.210
 Cunningham, W.52, 99, 123, 133, 147, 167
 Cureton, W.265
 Curreli, D.99
 Curry, J.100
 Curtarolo, S.69
 Curtin, W.28, 32, 218, 252
 Cusentino, M.60, 250
 Cygan, R.187
 Czaja, P.189, 199
 Czettel, C.260
 Czibula, C.181, 207
D
 D'Abreu, J.262
 Dabney, T.251, 252
 da Costa Garcia Filho, F.196, 197, 198
 Dacus, B.200
 Dada, M.127
 Dadfarnia, M.26
 Dadheech, G.9
 Daehn, G.77, 101, 108
 Daehn, K.77
 Daemen, L.225
 Dagel, D.58
 Dahmen, K.153, 230
 Dahotre, N.46, 109, 209, 228, 237, 239, 256
 Dai, S.27, 44
 Dai, W.246
 Dai, Y.198
 Dalaker, H.26, 104
 Dalin, C.232
 Dallmann, J.256
 da Luz, F.185, 197
 Daly, M.22, 45, 72, 100, 113, 124, 148, 167, 174, 190, 252, 253
 Daly, S.19, 82
 Damani, N.199
 Danaie, M.33
 Dang, K.126, 236
 Daniels, C.224
 Daniels, E.78
 Danielson, C.115
 Daniewicz, S.53, 81, 107, 131, 154, 171, 192, 208
 Daniš, S.173
 Danjuma, I.182
 Danković, R.61
 Dannemann, W.132
 Daphalapurkar, N.119
 Daraio, C.27, 74, 79, 191
 Daramola, A.224
 Dareh Baghi, A.171
 Darius, J.222, 247
 Darling, K.59, 69, 72, 148, 192, 242
 Darnbrough, E.170
 Daroonpravar, M.221
 Da Rosa, G.24
 Darsell, J.46, 167, 245, 248
 Darvishi Kamachali, R.93
 Darvish Motevali, A.171
 Darwish, A.33
 Das, A.36, 230
 Dasari, S.7, 33, 73, 88, 101, 113, 126, 208, 237, 256
 Das, C.199
 Das, D.86, 215
 Das, G.197
 Dasgupta, D.99, 123
 Das Gupta, T.51, 136
 Das, H.72, 189, 231, 245, 246, 248, 256
 Dash, B.90
 Dasika, P.35
 da Silva, M.195
 da Silva, R.264
 da Silva, T.197
 Da Silva, T.197, 198
 Da Silveira, P.197, 198
 Daskalakis, E.249
 Das, P.113
 Das, S.18, 72, 73, 161, 244
 Dass, A.6

Dato, A.	180	de Kloe, R.	8	De Souza-Ciacco, P.	7
Datye, A.	88	Delacroix, T.	48	Detlefs, C.	30, 36, 134, 166, 172, 214, 231
Daubenmier, N.	6, 146	Deland, E.	241	Detor, A.	14, 64, 221
Dau, E.	39, 95, 239	Delannoy, S.	89, 222	Detroit, M.	235
Daugela, A.	207	Delaqua, G.	197	Detsi, E.	74, 79, 141
Daugela, J.	207	De la Rocha, A.	63	Devadig, R.	4
Davariashiyani, A.	44	DeLellis, D.	59	Devanathan, R.	159, 251
da Veiga Junior, V.	197	De Leon Nope, G.	66	Devaraj, A.	24, 45, 47, 72, 105, 133, 159, 168, 211, 212, 235, 237, 240, 253, 255, 256, 265, 266
Davenport, K.	116	Del Guercio, G.	84, 117	Devarapalli, R.	28, 242
Davenport, N.	15	De Lorenzis, L.	79	Devoto, A.	104
Davey, T.	234	Delphine, B.	214	Devraj, A.	139
David, R.	146	Delplanque, J.	99	Dewitt, S.	189
Davidson, D.	180	DelRio, F.	53, 100, 173	DeWitt, S.	19, 43, 150, 210, 224, 244
Davidson, K.	208	Demange, G.	150	Dey, A.	28
Davidson, R.	182, 190	Demchenko, P.	190	Dezerald, L.	250
Davies, M.	177	Demetriou, M.	62	Dhal, A.	134
Davis, A.	132, 186, 256	Demille, K.	138	Dharmaiah, P.	225
Davis, D.	180	Demir, G.	184	Dheeradhada, V.	209
Davis, J.	45	Demirkiran, T.	184	Dhers, J.	219, 243
Dawson, J.	62	Demkowicz, M.	8, 42, 52, 65, 105, 119, 148, 149, 160, 169, 187, 237	Dhiman, A.	176, 236, 237
Dawson, P.	114	De Moor, E.	97	Dhokey, N.	23
Dawuk, D.	117	DeMoor, E.	97	Diaa, A.	89
Day, G.	106	Demosthenes, L.	200	Dial, L.	131, 209
de Aguiar, M.	183	Denes, T.	158	Diallo, M.	61
Deal, A.	83, 155	Deng, H.	211	Diamond, J.	126
de Almeida, K.	183	Deng, L.	66	Dias, W.	200
De Anda, E.	180	Deng, P.	198, 225, 226	Diaz, L.	262
de Araújo, R.	195	Deng, S.	235	Diaz, N.	146
Dear, F.	72, 120	Deng, X.	51	Diaz Vallejo, N.	82
de Assis, F.	185	Deng, Y.	32	DiCiano, M.	139
de Avillez, R.	262	Deng, Z.	228, 259	Dickel, D.	16, 198, 224, 247
De Backer, A.	169	Denissen, N.	65	Dickerson, M.	88
de Boer, M.	83, 134	Denizli, F.	36	Dicus, A.	53
de Brito, E.	185	Dennett, C.	8, 9, 110, 213, 217	DiDomizio, R.	14, 64
de Brito, J.	233	Dennis, K.	157	Diehl, M.	111
DebRoy, T.	6, 200	Denonno, O.	146	Dieng, A.	72
Décamps, B.	74, 75, 231	DeNonno, O.	136	Diep, T.	90
de Castro, D.	255	Dentinger, B.	13	Dieudonné, Y.	170
Dechent, M.	35	Denton, G.	105	Diewald, E.	107
Deck, C.	22, 44, 71, 99, 124, 148, 177, 202, 251, 252	Deo, C.	124, 178	Diewwanit, O.	91
Decker, P.	34, 91	Depond, P.	83	DiGiovanni, A.	224
Decolvenaere, E.	19	DePond, P.	6	Dike, Z.	4
DeCost, B.	223	Depree, N.	228	Dilemma, F.	114
Deemyad, S.	112	De Pretto, A.	96	Dillard, T.	236, 237
Degano, M.	208	Derby, B.	152	Dillon, R.	107, 175
Degel, R.	104	Derimow, N.	53, 55, 102	Dillon, S.	8, 73, 81, 97, 264
De Geuser, F.	222	Derlet, P.	35, 62, 92, 116, 161, 175, 184, 229, 230	DiMarco, C.	15, 94, 126, 184, 237
Degiampietro, M.	226	Dervishi-Whetham, E.	16	Dimiduk, D.	11, 33, 59, 90, 114, 138, 160, 174, 195, 223
De Graef, M.	105, 156, 197	Desai, S.	160	Dinda, G.	84
Dehghan-Niri, E.	108	De Saro, R.	50	Dinghao, L.	232
Dehm, G.	10, 148, 207	Desbiolles, J.	116	Ding, J.	28, 56, 92, 132, 209
Dehoff, R.	67, 207, 208, 209, 211, 254	Deshmukh, P.	156, 215	Ding, K.	206, 243
DeHosson, J.	141	Deshmukh, V.	219	Ding, L.	167
Dehua, W.	258	Deshpande, A.	104	Ding, Q.	111, 143
Dehury, R.	243	Deskins, W.	30	Ding, R.	100, 124
Deillon, L.	134, 212	Desmeules, J.	231		
deJong, M.	202	de Sousa, T.	92, 228		
de Jong, W.	63				

Dingreville, R . . .	13, 18, 52, 54, 121, 124, 138, 159, 160, 178, 237
Dingrevillie, R	27
Ding, W	257
Ding, Z	160
Dinkar, O	261, 262
Din, R	23
Dinter, A	241
Dion, L	227
Dispinar, D	140, 254
Disselhoff, T	231
Disser, C	188
Ditzler, B	257
Dixith, A	123
Dixon, C	247, 248
Dizdar, K	140
Djambazov, G	37, 63, 64, 147
Dlamini, T	127
Dlouhý, A	30
Dmowski, W	230
Doan, D	79, 105
Dobley, A	90, 101
Dodaran, M	131
Doddamani, M	100
Doddapaneni, V	211
Dodrill, B	136
Dogan, Ö	216, 240
Dogdibegovic, E	9
Doherty, K	143
Do, J	203
Doll, D	6
Dolley, E	251
Dolmetsch, T	84, 87
Dolocan, A	87
Domain, C	169, 224, 250
Domenech, B	150
Domenico, J	34
Domínguez, G	31, 155
Dommann, A	116
Dommati, S	219
Do, N	228
Donahue, R	14
Donaldson, O	88
Donchev, A	11, 19
Donegan, S	159
Dong, A	20, 99
Dongare, A	15, 38, 65, 90, 94, 101, 118, 142, 164, 176, 186, 236, 237
Dong, B	70
Dong, F	11, 32, 59, 88, 183, 220, 221
Dong, H	207
Dong, Q	230
Dong, W	209
Dong, X	61
Dong, Z	249
Doniger, W	70, 71, 201, 248
Donik, C	82, 192
Donkor, B	73
Donnelly, S	218
Dooryhee, E	133
Doppermann, S	25
Dorantes-Rosales, H	256
Dorari, E	168
Dornig, C	263
dos Santos, J	47, 168
Doude, H	75, 143
Douglas, L	182
Douglas, O	41, 187
Douguet, P	24
Douin, J	161, 184
Dou, Z	263
Dovgaliuk, I	157
Dowling, D	154
Downey, C	209
Downey, J	28, 130, 179, 205, 206
Doyer, G	263
Doyle, R	53
Drabold, D	248
Drach, B	149
Draelos, L	109
Drake, R	125
Draney, K	196
Draper, A	259
Dreano, A	240
Dreelan, D	198
Dregia, S	145
Dreisinger, D	24, 262
Dresselhaus-Marais, L	166
Drexler, M	21
Drey, D	265
Dreyer, M	211
Drillet, J	24
Drobny, J	99
Drumond, P	197
Dryepondt, S	16, 39, 66, 133, 238, 239
D'Souza, N	73, 236
D. Sparks, T	34
Duan, C	189
Duan, H	195, 198
Duarte Correa, M	207
Duarte, M	148
Dubey, M	76, 99, 147, 252, 265
Du, C	258
Duca, Z	93
Duchesne, C	39, 237
Duchet-Rumeau, J	264
Duck, A	226
Duckering, J	99
Dudarev, S	99, 195, 250
Duemmler, K	98
Duerrschnabel, M	250
Duffy, T	236
Du Frane, W	11, 108, 186, 234
Dufresne, E	230
Dugger, M	100
Duhamel, C	80
Duh, J	15
Du, J	13, 35, 61, 91, 115, 139, 196, 228, 234
Dumas, O	33, 137
Dumont, M	214
Dumont, R	231
Dunand, D	208
Dündar, K	184
Dunn, A	81, 172
Dunne, F	67, 72, 120, 235, 253
Dunne, T	166
Duong, T	8, 52, 119, 146, 160
Dupuis, M	4, 61, 91
Dupuy, A	31, 45, 59, 88, 133, 157, 165
Dupuy, L	202
Duque, A	176
Du, R	197
Durán, A	220
Durand, L	126
Duran, P	74, 75
Durga, A	6
Durmaz, A	43, 138, 174
Durodola, J	61, 150
Durst, K	29, 97, 126, 170
Dussault, D	70, 147
Du Toit, J	68
Dutta, A	8
Dutta, M	244
Du, Y	225, 226, 262
Duygulu, Ö	62
Du, Z	179
Dybalska, A	37
Dye, D	16, 33, 47, 72, 81, 120, 199, 222, 253
Dykes, H	242
Dyro, K	49
Dyussekenov, N	242
Dzisah, P	25
Dzугan, J	53
Džugan, J	109
E	
E. Allison, J	67, 82, 177
Earthman, J	44, 58, 139
Eastman, T	83
Easton, M	247
Ebendorff-Heidepriem, H	171
Eberl, C	43, 131, 138
Ebner, A	52, 207
Echeverria, M	236
Echeverry, L	258
Echeverry-Rendón, M	31, 155
Echlin, M	19, 36, 114, 137
Echols, J	202, 250, 251, 260
Eckel, Z	32
Ecker, L	251
Eckert, J	184, 218, 229, 230, 266
Eckert, R	241
Eckert, S	37, 64

- Eckhart, B213
 Ede, S86
 Edge, C105
 Edmondson, P80, 106, 129, 152,
 169, 204, 265
 Edmunson, J75
 Edrisy, A215
 Edwards, B73
 Edwards, D52, 167
 Edwards, J166
 Edwards, L39
 Edwards, R16
 Efe, M24, 72, 245
 Eftink, B26, 44, 51, 72, 73, 78, 105,
 128, 152, 169, 263
 Egami, T88, 92, 230
 Egan, A14, 24, 30, 64, 69, 102
 Egbu, J136
 Eggeler, G36, 37, 141, 170, 256
 Eggeler, Y98
 Eggert, J119
 Eggert, M242
 Ehrhardt, B244
 Eidem, P127
 Eidt, W81
 Einarsrud, K35, 42, 91, 96, 152, 161,
 188, 227
 Eisenberg, E174
 Eisenlohr, P105, 149, 156
 Eizadinia, M192
 Ekebafé, O246
 Elahinia, M131
 Elahi, P112
 Elahi, S90
 Elangeswaran, C154
 El Atwani, O53
 El-Atwani, O44, 50, 88, 99, 148, 177
 El Awady, J160
 El-Awady, J67, 90, 110, 125, 138,
 172, 256
 El-Azab, A30, 34, 134, 138, 162,
 169, 252, 264
 El-Azab, S109
 Elbadry, S214
 Elbakhshwan, M70
 Eldabah, N259
 Elder, K27, 32, 187
 Eldrup, N104
 El-Garaihy Nasr, W247
 El Ghzaoui, C179
 El-Guebaly, L250
 Eliaz, N56, 100, 171
 Elizarova, I171
 El Kadiri, H97
 Elkhateeb, M208
 Ellingsen, K103, 260
 Ellison, V114
 Ell, J17, 264
 Ellyson, B59, 89, 97, 172
 El Mahalawy, N89
 El-Mahallawi, I243
 Elmelegy, T38
 Elmustafa, A29, 66, 185, 187, 201
 Elsadek, M235
 Elverud, M56, 193
 Elwany, A26, 193, 208, 212
 El-Wardany, T211
 Elwasif, W99
 Emamy, H241
 Emdadi, A32
 Emerson, D35
 Emery, B115
 Emery, J138, 156, 172
 Emery, R217
 Emling, B128
 Endler, D50
 Ene, N188
 Engel, D23
 Engle, J146
 Enikeev, N80, 229
 En Naciri, A157
 Enoki, M223
 Enzinger, R266
 Epler, M53
 Epting, W216
 Erdal, E197
 Erdeniz, D17, 126
 Eres Castellanos, A255
 Erickson, G139
 Erickson, J161
 Erlebacher, J27, 51, 144, 151, 203
 Ernam, O140
 Esan, T31
 Escano, L57, 83
 Escarcega Herrera, K66
 Escobar Atehortua, J47, 255
 Escobar, J147, 168, 224
 Escobedo-Diaz, J13, 36, 63, 92, 117,
 161, 196, 231, 232
 Eskin, D4, 28, 34, 35, 36, 39, 61, 62,
 63, 65, 91, 95, 100, 116, 139, 140, 150,
 161, 184, 226, 227, 231, 237, 253
 Esmaeely, S119, 120
 Esparragoza, M170
 Espinosa, G26, 70, 147, 189
 Espinosa, H164
 Espinoza-Nava, L127
 Esposito, G188
 Esquivel-Lorenzo, S262
 Estournès, C126
 Estrada, D4, 25, 49, 76, 103, 190,
 208, 258, 259
 Estrada Hernandez, S228
 Estrada, J128
 Eswarappa Prameela, S19, 156, 237,
 244, 256
 Etienne Einarsrud, K103
 Euh, K227
 Euser, V65
 Eusterholz, M50
 Evans, A251
 Evans, H174
 Evans, J37
 Evans, K102
 Evans, P63
 Evans, R81
 Evehart, W57
 Evers, T36
 Evitts, L72, 136, 251
 Evlashin, S74, 75, 153, 170, 191, 266
 Ewing, B229
 Ewing, R81
 Exime, A23
 Eyidi, D14
- ## F
- Faal, S141
 Faber, K61, 88
 Fabregue, D222
 Fabrègue, D211
 Facchini, L237
 Fagerstrom, E166
 Fahrmann, M101, 162, 163
 Fairman, A11
 Faisal, A22
 Fait, J51
 Falconer, C70, 146, 201
 Falentin-Daudre, C214
 Falentin-Daudré, C214
 Falk, M19, 256
 Falkowski, A90
 Falzone, G152
 Fan, C169, 251
 Fancher, C54, 107, 207
 Fancher, R13
 Fang, F87, 137
 Fang, Q219
 Fang, X51, 126, 266
 Fan, S251
 Fan, X37, 54, 58, 123, 158, 218
 Fan, Y18, 27, 42, 63, 69, 97, 121, 145,
 165, 187, 188, 225, 242, 243
 Fan, Z185
 Farahani, M39
 Farhan, J126
 Farkas, D32, 58, 128, 152
 Farkoosh, A133
 Fasiku, J77
 Fattahpour, S162
 Fattebert, J90, 224
 Faubert, P263
 Fawaz, S154
 Fawcett, R251
 Feaugas, X143, 239
 Fedder, G193
 Fedorov, M250

Fehri, F.	129	Fitzpatrick, M.	55, 109	Fraser, H.	33, 85, 101, 109, 114, 127, 149, 220, 222
Feigelson, B.	45	Fjær, H.	231	Fraser, K.	167, 227
Feiler, C.	166	Flanagan, R.	94	Fratoni, M.	169
Feit, C.	58	Flaschel, M.	79	Fratto, E.	144
Feizpour, D.	192	Flater, P.	15	Frawley, K.	237
Feldhausen, T.	54, 210, 211, 235	Fleming, N.	187	Frayssines, P.	219
Felling, F.	122	Fleming, T.	123, 211	Frazer, D.	8, 29, 56, 71, 72, 85, 110, 134, 194, 213, 251
Fellner, S.	255	Fletcher, L.	39	Frazier, W.	22, 147, 195, 224, 248
Felts, J.	26	Fleurialt, C.	26, 50, 76, 77, 103, 104, 128, 151, 152, 260, 261, 262, 263	Free, B.	119
Feng, B.	21, 27, 191, 201	Flint, M.	165	Freedman, D.	48
Feng, G.	125, 150, 153	Flitz, E.	180	Free, M.	24
Feng, L.	14, 24, 30, 69, 145	Flock, D.	218	Freitas, M.	232
Feng, N.	257	Flores Guerrero, M.	197, 198	Freitas, S.	122
Feng, R.	32, 113, 218	Flores, K.	22, 35, 58, 62, 92, 113, 116, 161, 175, 184, 229, 230	Frenkel, A.	201
Feng, S.	79	Flores, M.	117	Frenzel, J.	36, 37
Feng, Z.	60, 111, 145, 150, 221	Flores, R.	78	Frey, C.	82, 113, 162, 174
Fensin, S.	10, 15, 19, 38, 45, 53, 65, 88, 94, 113, 118, 124, 137, 142, 164, 175, 176, 186, 236, 237	Floro, J.	27, 151, 155	Friedrich, B.	104
Ferblantier, G.	4, 28, 86, 111, 135, 157, 181, 182, 206, 214	Fokin, D.	34, 91	Frincu, B.	74, 75
Ferguson, J.	31	Fokwa, B.	188, 189, 199	Frint, P.	63
Fernández-Arteaga, J.	228	Foley, D.	113, 188, 256	Frishkoff, J.	200
Fernandez Martin, E.	173	Fomichev, E.	226	Frith, M.	256
Fernández-Sánchez, D.	203	Fonda, R.	121	Fritzsch, R.	62, 231
Fernandez-Zelaia, P.	133, 210	Fontes Vieira, C.	197	Fröhling, M.	77
Fernandez-Zelai, P.	209, 210, 223	Foradora, J.	25	Frolov, T.	78, 93, 121
Fernquist, J.	35, 59, 196	Foray, G.	264	Fronza, J.	208, 213
Ferraro, C.	51	Forberg, S.	227	Fu, C.	198
Ferreira-Palma, C.	256	Forbey, J.	4	Fuchs, N.	235
Ferreirós, P.	50, 202	Forer, J.	194	Fudger, S.	59, 69
Ferrigno, J.	29, 110	Forien, J.	55, 135, 155, 158	Fu, E.	199
Feyrer, M.	111	Forna Kreutzer, P.	264	Fuger, C.	221
Fezi, K.	14, 37, 64, 93, 185, 235	Forrest, R.	230	Fu, H.	196, 255
Fezzaa, K.	47, 55, 57, 83, 89, 97, 105, 172, 210, 211	Forsberg, K.	24, 49, 104, 258, 262	Fu, J.	79
Field, D.	97, 118, 121, 129, 130, 143, 193	Forse, A.	92	Fujieda, T.	212
Field, K.	42, 71, 99, 123, 147, 167, 177, 202, 250	Forsik, S.	53, 211	Fujii, H.	226
Fields, B.	84	Fortunier, R.	38	Fujimoto, K.	208, 261
Fields, S.	181	Fossum, M.	86	Fujimoto, S.	225
Figueiredo, A.	197	Foster, I.	9	Fujioka, K.	93
Figueroa Bengoa, A.	56	Foster, K.	182, 248	Fukuto, M.	190
Filleter, T.	68	Foster, M.	224	Fukuzawa, M.	259
Filzwieser, A.	70	Fotovvati, B.	212	Fullarton, M.	251
Findley, K.	36, 121	Fowler, H.	188	Fullenwider, B.	69
Finfrock, C.	89, 97, 121, 176	Fox, C.	179	Fuller, J.	83
Fink, C.	44, 168, 192	Fox, E.	75	Fullwood, D.	12, 21, 111, 139, 156, 165
Finšgar, M.	226	Fox, K.	72, 130	Fultz, B.	62, 63, 98, 175, 198, 203
Fiocchi, J.	89, 218	Fracchia, E.	231	Fumpa, N.	231
Fiory, A.	157	Frackiewicz, A.	219, 220, 224, 231, 243	Fung, L.	175
Firdosy, S.	107, 109	Fradet, C.	237	Funkenbusch, P.	61
Firlus, A.	62	Frame, L.	201	Furukawa, T.	216
Fischer, R.	83, 155, 195	Frampton, C.	240	Futterer, T.	68
Fischer, T.	111	Francis, C.	4, 161	Fu, w.	256
Fisher, L.	59	Francis, T.	156	Fu, W.	24
Fite, J.	156	Frankel, D.	7, 16, 21, 44, 71, 99, 121, 123, 146, 166, 201, 248, 249	Fu, X.	78
Fitz-Gerald, J.	27, 151, 155	Frankel, G.	218, 238, 239	Fu, Y.	22, 179, 195, 239
		Frankel, P.	213, 214		
		Franklin, A.	17		
		Frantsev, Y.	237		

- G**
- Gaba, A228
- Gabardi, T18
- Gabb, T102
- Gaboury, S227
- Gabriel, A72
- Gabriel, J234
- Gabryel, C227
- Gadaud, P232
- Gaddam, S183, 184
- Gadhamshetty, V4, 89
- Gadioli, M183, 197
- Gaertner, H65, 152
- Gagné, J65
- Gagneur, V203
- Gagnon, A237
- Gagnon, D237
- Gagnon, M161
- Gagnon, S146
- Gahkar, R98
- Gaikwad, H228
- Gaisin, R250
- Gakhar, R20, 43, 44, 201, 247, 248
- Galeano, D103, 127, 204
- Galetz, M11, 66, 76, 164, 260
- Galitskiy, S236, 237
- Gallagher, C204
- Gallagher, R122
- Gallegos-Patterson, D115
- Gallegos-Pérez, A203
- Gallino, I218, 229
- Gallivan, R110, 155
- Galodé, A115
- Galvin, C22, 29, 124
- Galy, C161, 184
- Galyon Dorman, S119, 154
- Gama, F232
- Gambaro, S89
- Gamble, K251
- Gambone, J83
- Gammer, C222, 255, 266
- Gandha, K70, 157
- Gandin, C123, 168
- Gandu, S130
- Gandy, D99, 252
- Ganggang, Y232
- Gangil, N111
- Gang, O79, 241
- Gangopadhyay, A33
- Ganguli, S31
- Ganguly, S244
- Gan, J31, 251
- Ganju, E21
- Gao, B257
- Gao, F124
- Gao, H73, 150
- Gao, J89, 97, 216
- Gao, L255
- Gao, M10, 31, 32, 58, 87, 88, 98, 113, 121, 135, 136, 137, 158, 159, 173, 174, 183, 214, 218, 219, 220
- Gao, N121
- Gao, P165, 212
- Gao, S62, 155, 193, 266
- Gao, W22, 45, 72, 100, 124, 144, 148, 167, 190, 252, 253, 258
- Gao, X170
- Gao, Y5, 36, 40, 132, 143, 145, 255
- Garandet, J48
- Garboczi, E105, 108
- Garbrecht, K138
- Garcia-Arribas, A173
- Garcia-Barriocanal, J100
- Garcia, C7
- Garcia, D133, 189, 231, 246, 256
- Garcia Filho, F197
- Garcia-Jimenez, A118
- Garcia Taormina, A191
- Gardner, H129, 130, 204
- Gardner, L210
- Garfinkel, D217
- Garfinkle, D158
- Garibay, E107
- Garikipati, K223, 244
- Garkida, A32, 130, 232
- Garmroudi, F12, 60
- Garner, F178
- Garnica-González, P203, 256
- Garrido Torres, J160, 174
- Garrison, L25, 50, 76, 118, 141, 142, 163, 175, 202, 236, 250, 251, 260
- Garud, P15
- Garvie, L232
- Garza, K177
- Gasafi, E226
- Gascoin, F12, 60, 115, 183, 224, 226
- Gaskey, B15, 51
- Gasparyan, Y250
- Gathright, M77
- Gaudez, S108, 132
- Gaulding, A233
- Gault, B222, 231, 234, 235, 236, 243, 264
- Gauthier, P37, 63
- Gautier, D194
- Gauvin, M214
- Gavini, V244
- Gazza, J71, 251
- Gebauer, J50
- Gehrich, M221
- Geiger, I145
- Geith, M262
- Gelbstein, Y225
- Ge, M20, 27, 44, 49
- Genau, A81
- Gengor, G22
- Geng, X48
- Gennett, T233
- Gentry, S46
- Geoly, B66
- Georgarakis, K127, 161, 230
- George, E17, 30, 37, 158, 255
- George, J225
- Gepreel, M259
- Gerard, A32, 119
- Gerard, C72
- Gerard, S227
- Gerczak, T134, 200, 213
- Gergaud, P214
- Germain-Careau, S48
- Germain, L74, 75
- German, R126
- Gerold, E249, 260
- Gertner, R225
- Geslin, P27, 51, 79, 105, 129, 190, 219, 264
- Gess, J53
- Getley, A183
- Gey, N74, 75
- Ghaednia, H33
- Ghaffarian, H124, 168
- Ghaffari, B235
- Ghahreman, A258
- Gharakhanyan, V160, 174
- Ghasemi, M200
- Ghassemi-Armaki, H145, 244
- Ghauri, H189
- Ghayoor, M53
- Ghazisaeidi, M14, 17, 30, 37, 69, 78, 88, 175
- Ghaznavi, T248
- Gheysen, J55, 167
- Ghiaasiaan, R118
- Ghimire, A228
- Ghodki, N35
- Ghomashchi, R171
- Ghorbani, H96, 192
- Ghose, S190
- Ghosh, D11, 32, 59, 88, 183, 220, 221
- Ghosh, P191
- Ghosh, S11, 12, 21, 164, 197, 265
- Ghoussoub, J56
- Giam, A223
- Giancola, E24
- Gianelle, M218
- Giannoudis, P228
- Gianola, D8, 23, 130, 162
- Gianotti, V104
- Gibbins, D15
- Gibbons, S193
- Gibeling, J82, 136
- Gibson, J90, 174
- Gibson, K199
- Gieg, L241
- Gienger, E34
- Gierlotka, S230

Gietl, H.	250	Goldenstein, H.	199	Granberg, F.	169
Gigax, J.	45, 94	Goldman, A.	83	Grande, H.	30
Gilani, N.	109	Gole, M.	41	Grandfield, J.	4, 231, 242
Gilardi, F.	210	Golubev, M.	237	Grandidier, J.	72
Gilat, A.	94	Golubev, V.	226	Grandini, C.	91, 195, 228, 229
Gilbert, A.	237	Golumbskie, W.	39	Grant, G.	167, 189, 227, 231, 246, 248, 256
Gilbert, D.	58, 137, 158, 174, 217	Gomez-Marroquin, M.	9, 262	Gratz, E.	104
Gilbert, M.	250	Gómez-Ovalle, Á.	35	Grau, L.	72
Giles, S.	32, 87	Gomez, S.	63	Graydon, K.	146, 173, 248
Gill, A.	177	Gonah, C.	130, 232	Gray, G.	15, 38, 53, 65, 94, 118, 142, 152, 164, 176, 186, 236, 237
Gill, S.	201, 251	Gonçalves, D.	202	Gray, S.	46
Gilmer, D.	211	Gonderman, S.	71, 251	Greaney, A.	92
Gingrich, E.	176	Gong, J.	7, 12, 56, 84, 90, 109, 131, 133, 155, 193, 211, 212	Greaney, P.	86
Girault, G.	61	Gong, M.	69	Greaves, G.	218
Giri, A.	59, 69	Gong, W.	266	Greeley, D.	57, 122
Girigisu, S.	77	Gong, Z.	235	Green, D.	99
Giroud, T.	137, 195	Gonzales, C.	210	Greenidge, G.	151, 203
Giuntini, D.	150, 170	Gonzales, M.	122	Green, J.	165
Gladstein, A.	125	González, C.	31	Green-Warren, R.	153, 199
Glass, J.	25	Gonzalez, J.	117, 192, 255	Greenwood, M.	234
Glass, T.	77	Gonzalez-Julian, J.	250	Greer, A.	230
Glatzel, U.	76	González, K.	117	Greer, J.	73, 74, 110, 150, 155
Glaubenslee, C.	78	Gonzalez, M.	122, 201	Greer, L.	35, 62, 92, 116, 161, 175, 184, 229, 230
Glaubitz, E.	81	Gonzalez Morales, D.	231	Gregory, D.	233
Glazoff, M.	85, 135, 156, 214	González-Pérez, B.	35	Gregurek, D.	18, 28, 41, 68, 96, 130, 179, 205, 206, 242
Gilbert, M.	99	Goodelman, D.	153, 183	Grejtak, T.	139
Gleason, M.	211, 248	Goodwin, C.	239	Greve, D.	136
Glechner, T.	11, 221	Goodwin, L.	115	Griebel, A.	229, 247
Gleeson, B.	66, 164	Goosen, W.	256	Griesbach, C.	130, 134, 178
Glover, A.	97, 121	Gopalakrishnan, S.	118	Griesemer, S.	69
Glover, C.	23	Gopalan, S.	9, 30, 136, 140	Griffiths, R.	75, 83, 133
Gneiger, S.	70, 87, 122	Gopon, P.	130	Griffiths, W.	37
Gobber, F.	231	Gordon, R.	201	Grimes, R.	22, 124
Gobert, C.	83, 107, 134	Gorey, T.	16	Grimm, J.	228
Gockel, J.	6, 55, 81, 83, 84, 108, 132, 155, 172, 210	Gorham, J.	102	Grinishin, M.	237
Godart, P.	158, 187	Gorr, B.	119, 143, 164, 186, 239	Grobert, N.	4, 28
Goddard, D.	72, 136, 177	Gorsse, S.	73	Groden, C.	48, 83
Goddard, W.	175	Gorti, S.	256	Grogan, J.	151
Godec, M.	82, 192	Gorzowski, E.	45	Gröger, R.	30
Godet, S.	33, 137	Goski, D.	216	Grohol, C.	209
Godfrey, D.	81	Gosselin, A.	227	Groome, C.	165
Godínez, G.	117	Goswami, R.	24, 47, 73, 74, 75, 102, 126, 150, 168, 203, 255, 256	Gros, N.	237
Goebel, M.	19, 199	Gotawala, N.	211, 246	Gross, A.	245
Goettsch, J.	125	Gould, B.	6, 108, 192	Großalber, A.	87
Goetz, A.	174	Gourlay, C.	238	Gross, B.	56
Gofryk, K.	217	Govil, T.	180	Gross, J.	123
Gogusetti, R.	56	Gracheva, A.	193	Gross, S.	86
Goh, B.	71, 146, 160	Gradinger, R.	84	Grubbs, J.	211, 248, 257
Gohl, J.	175	Gradl, P.	118, 133	Gruber, M.	63
Goins, P.	224	Gradoboev, A.	139	Gruber, P.	126
Go, J.	266	Graef, M.	160	Gruen, G.	62
Gökelman, M.	26, 35, 36, 50, 61, 62, 76, 77, 91, 103, 104, 116, 128, 140, 151, 161, 227, 228, 231, 260, 261, 262, 263	Graening, T.	250, 252	Grydin, O.	231
Göken, M.	220, 235	Graeve, O.	11, 62	Grzelak, K.	189
Gokuldoss, P.	211	Graff, D.	227	Grzenda, M.	27, 135, 188
Gokuli, M.	18	Graff, J.	260	Grzesiak, D.	5
Golden, P.	40, 131	Graf, G.	255		
		Graham-Brady, L.	186		

- Guan, D246
 Guan, S37
 Gubicza, J55, 266
 Guc, G130
 Gudbrandsen, H127
 Gudmundsson, S116
 Gueguen, M30, 85, 137
 Guerard, S227
 Guérard, S227
 Guérin, J263
 Guest, J74
 Guilherme, G45
 Guillemet, R126
 Guillemot, G123, 168
 Guillen, D26, 77, 99, 208, 252, 261
 Guillonnet, G29, 52
 Guillot, I222
 Guillou, R222
 Guilmeau, E225
 Guimond, L227
 Guirguis, D134
 Guizard, M91
 Gu, J123
 Gulshan, F206
 Gulsoy, E244
 Gumaste, A184
 Gumbsch, P43, 51
 Gu, N66
 Guner, M34, 184
 Gunes, I188
 Gunzburger, M165
 Guo, G249
 Guo, H31
 Guo, J248
 Guo, L123
 Guo, M28, 205, 217, 221
 Guo, Q6, 57, 83, 133, 183
 Guo, S160
 Guoshan, D258
 Guo, W195, 198
 Guo, X158, 238, 239
 Guo, Y79, 205, 206, 232, 246
 Guo, Z177, 198, 201
 Gupta, A12, 179, 192, 217, 227
 Gupta, M100, 253
 Gupta, R11, 33, 89, 183, 190, 221
 Gupta, S9, 11, 17, 30, 41, 57, 68, 86,
 93, 96, 112, 120, 136, 144, 158, 165,
 176, 182, 184, 187, 215, 216, 217,
 241, 242, 264
 Gupta, T41
 Gupta, V21, 209
 Gu, Q238
 Gurao, N245
 Gurniak, E186
 Gurrola, R90
 Gürsoy, Ö140
 Guruswamy, S215, 256
 Gu, S117
 Gussev, I265
 Gussev, M45, 250
 Guss, G83, 210
 Gustafson, S30, 111, 118
 Gu, T203, 238
 Guthrie, R231
 Gutierrez, E9, 163
 Guttman, G225
 Guvenc, O46
 Güvenç, O145
 Guven, T245
 Gu, W35, 45, 79, 105, 120, 124
 Gu, X230
 Gu, Y7, 67, 92, 110, 138, 141
 Gu, Z144
 Guziewski, M224
 Guzman, A227, 231
 Guzman, P175, 203
 Guzzetti, D138
 Gwalani, B7, 24, 33, 47, 73, 101,
 147, 149, 159, 168, 224, 235,
 237, 248, 253, 254, 255, 256
 Gylver, S227
 Gyuchul, P213
- ## H
- H, A111, 135
 Haag IV, J250
 Haarberg, G161, 227, 258
 Haber, R186
 Habib, S208
 Hachet, G239
 Hachiuma, H225
 Hackett, B29, 119, 181, 186
 Hackett, G216
 Hackney, S207
 Hadad, G194
 Hadadzadeh, A54, 212
 Haddad, M108
 Hadley, G204
 Haefelfinger, R251
 Haegeli Lohaus, S62
 Haemmerle, A226
 Hagen, L54, 192
 Haghayeghi, R140
 Haghshenas, M84, 110, 134, 156, 159,
 171, 172, 193, 212, 213
 Hagusawa, T257
 Hague, R109, 208, 222
 Hahn, E94
 Hahn, H35, 59, 157
 Hahn, R11, 214, 215, 221
 Haimi, T77
 Haines, C127
 Haines, M207
 Hakimian, A21
 Håkonsen, A231
 Halada, G133, 182
 Hale, C247
 Hale, L60
 Halet, J225
 Haley, J152, 210
 Halin, D238
 Hall, A11, 82
 Hallai, J95
 Hall, D16
 Halliday, H95
 Halliday, S83
 Halloran, J220
 Halstenberg, P27, 44, 201
 Hamasaki, S225
 Hameed, A157
 Hamilton, B175, 176
 Ham, K210
 Hammersmith, G63
 Hammons, J132, 210
 Hanbury, R80
 Han, C46
 Handwerker, C47, 77, 188
 Hanel, M70
 Hanemann, T211
 Han, G117, 140, 185, 198, 261, 262
 Han, H239, 249, 258
 Han, J32, 74, 75, 129, 153, 170, 191,
 219, 266
 Hanke, G262
 Hanna, L234
 Hannard, F55, 167
 Han, S241
 Hansen, D174
 Hansen, L170
 Hansen, T155
 Hanson, K53, 76
 Hanson, R21
 Hansson, C81, 207
 Hanus, R225
 Han, X92, 234
 Han, Z205
 Hao, J263
 Hao, L141, 197
 Hao, Q238
 Hao, T196
 Haq Mir, A113
 Haque, M165, 179
 Haque, N262
 Hara, R231
 Hara, Y231
 Harcuba, P196
 Hardie, C25, 207
 Harding, T40, 67, 240
 Hardin, J7
 Hardin, N234
 Hardin, T230
 Hardy, M14, 38, 64, 94, 118, 141,
 162, 186, 235, 236
 Hareland, C123

Hargather, C	58	Hawelek, L	107, 189	Hennig, R	12, 90, 174
Hargrave, C	179	Hawkins, L	44, 66, 134, 146	Henry, J	147
Hari, A	236	Hawk, J	94, 214, 235, 240	Hensel, R	150
Haridas, R	33, 54, 181, 184, 193	Haxhimali, T	236	Hensley, D	166
Hariharan, K	238	Hayashi, M	225	Heon, E	180
Hari, R	236	Hayes, G	247	Heo, S	182
Hari, V	246	Hayes, R	14, 44, 64, 169	Heo, T	172, 222
Harlin, P	127	Hay, J	52, 53	He, P	238
Harlow, D	139	Hayne, M	113	He, Q	219, 259
Harmer, M	69	Haynes, A	67, 176, 254	Herbert, E	5, 29, 52, 81, 130, 153, 170, 181, 206, 207
Harp, J	56, 213	Haynes, J	235	Herbig, M	255
Harrington, G	255	Hazeli, K	110	Herderick, E	6, 54, 82, 209, 210
Harrington, M	159	Headley, C	60, 151, 154	Hériprié, E	132, 133
Harrison, K	148	Healy, J	70	Herling, D	189, 226, 227, 246
Harrison, R	213, 214	Hearn, W	133	Herman, M	92, 176
Harris, R	15	Heath, G	78	Hermann, R	225
Harris, Z	26, 95, 118, 186	Hebert, R	126	Hernandez, A	114, 159
Harroun, P	180	Heckman, N	8, 52, 172	Hernandez-Arriaga, H	41
Hart, D	158, 187	Hector Jr., L	162	Hernández-Ferruzca, I	35
Hart, G	19, 166	Hector, L	97, 121, 133, 145, 166, 176, 243, 244, 257	Hernandez Garcia, L	185
Hartig, J	236	Heczal, A	55	Hernández-Lara, J	232
Hartmaier, A	206	Heczko, M	14, 17, 30, 78, 88	Hernandez, M	35
Hartnett, T	119	Hedberg, M	30	Hernández Negrete, O	220
Hartsfield, T	164	Hedstrom, P	135	Hernandez Paredes, J	220
Hartvigsen, P	8	Hedström, P	135	Hernández-Ramírez, A	232
Hartwig, K	52	Heelan, J	20	Hernandez, S	244
Harush, S	225	He, F	10, 136, 156, 191	Hernandez-Santiago, F	256
Harvey, C	44	Hegedues, Z	214	Herrera del Valle, R	154
Harvill, G	195	Hegedüs, Z	30, 170	Herrera, G	254
Ha, S	226	He, H	50, 78	Herrera, M	62
Hasan, M	23, 27, 58, 59, 144, 174, 234	Heiden, M	66	Herrmann, J	74, 75
Hasan, N	106	Heighes, M	239	Herrnring, J	47, 168
Hasan, T	224	Heilmaier, M	50, 211	Hersam, M	17
Hasebe, Y	257	Heine, M	175	Herstein, B	235
Haseeb, A	47, 74, 101, 254, 255	Heiner, A	196	Hertel, T	260
Hasenbusch, Z	155	Heinke, F	237	He, S	183, 187
Hashemi, R	171	Hein, M	222	Hespeler, S	108
Hashemi-Sadraei, L	238	Heinz, H	62, 91, 116, 139, 196, 229	Heuer, J	80
Hasib, A	76	He, J	97	Heuser, B	251
Hassani, M	44	Hektor, J	255	He, X	7, 147, 248
Hassan, M	54, 164	He, L	20, 27, 43, 44, 66, 134, 142, 146	He, Y	134, 215, 216, 228
Hassan, N	146	Heldt, R	55	Heyne, B	241
Hassan, S	199	Helfer, T	111	Hickel, T	97, 121, 145, 166, 176, 234, 243, 244
Hassan, Z	201	Helfritsch, D	147	Hickey, F	95
Hatem, T	212, 214, 235, 243, 261, 263	Helgeland, J	245	Hickman, D	48
Hato, N	223	Hellman, O	63, 175	Hidalgo, I	180
Hattar, K	8, 13, 23, 24, 26, 27, 46, 51, 52, 66, 74, 75, 78, 80, 81, 105, 123, 128, 148, 152, 167, 169, 173, 178, 187, 202, 203, 263	Hellmich, C	229	Higashida, K	263
Hattendorf, H	66	Helmholz, H	246	Higgins, W	119, 153, 181, 186
Hattrick-Simpers, J	43, 146, 155, 160, 223	Helmreich, G	213	Higuchi, M	249
Haugstad, G	100	Hemery, S	16, 85, 137, 149, 195	Hilário, A	233
Hausch, G	220	Hémery, S	64	Hildenbrand, K	180
Hausmann, D	220	Hemker, K	110, 125, 131	Hildreth, O	108
Haus, S	226	Hemmendinger, K	190	Hill, C	259
Hautier, G	37, 115	Henager Jr., C	250	Hill, L	13
Hawary, M	178	Henderson, H	37, 84, 132, 173, 187	Hill, M	82
		Henderson, S	122	Hilpert, B	166
		Henein, H	227, 239, 260	Hiltmann, F	257
		Hennessey, M	142		

- Hilvers, F 232
Hinojos, A 24, 131, 203, 256
Hintsala, E 52
Hirales, A 11
Hirata, A 116
Hirata, Y 255
Hirle, A 221
Hirn, U 207
Hirst, C 169
Hitchcock, D 245
Hite, N 208
Hixson, W 137
Hjelle, V 65
Hmeidat, N 146
Hoagland, R 175
Hoang, C 250
Hoang, M 94
Ho, C 238
Hochbaum, A 144
Höche, D 166
Hochhalter, J 79, 138
Hochrainer, T 252
Hocine, S 55
Hockaday, S 105
Hock, R 256
Hodge, A 11, 79, 153, 167, 171, 183, 190, 191
Hodges, D 112, 215
Hodges, E 59, 133
Hodyss, R 73
Hoe, A 26
Hoeber, L 123, 258
Hoelzer, D 44, 214, 251
Hofbauer, T 123
Hoff, B 180
Hoffelner, F 235
Hoffman, A 16, 20, 21, 39, 66, 221, 238, 239, 251
Hoffman, E 171
Hoffman, J 87
Hoffmann, A 260
Hoffmann Eegholm, T 160
Hoffman, R 108
Hofmann, D 175
Hofmann, F 71, 129, 161
Høgåsen, S 103
Hogg, B 68, 262
Hohenwarter, A 260
Ho, I 102
Ho, J 220
Hojjatzadeh, S 57, 83
Holcombe, E 39
Holdeman, C 196
Holec, D 207, 255
Holladay, S 174
Holländer Pettersson, N 6, 234
Hollenweger, Y 256
Holliday, A 53
Holm, E 60, 95, 102, 114, 121, 156, 160, 243
Holmes, C 21
Holm, L 109
Holschuh, T 208
Holt, N 127
Holtzapfel, A 263
Holwell, A 13, 36, 46, 92
Ho, M 225
Homer, E 12, 18, 42, 69, 97, 121, 145, 165, 166, 187, 242, 243
Hone, L 208
Hong, D 24, 170, 203, 256
Hong, J 162
Hong, K 209, 225
Hong, M 181
Hongpo, W 205
Hong, Q 44
Hong, S 12, 225, 235, 239, 249
Hong, W 15, 65, 237, 238
Honkimaki, V 55, 108
Hono, K 237
Honse, E 82
Hood, R 228
Hooks, D 16
Hooper, P 134
Hooshmand, M 30, 121
Hooshmand, N 17, 18, 41, 68, 96, 120, 144, 165, 176, 187, 241, 242
Hoover, H 18
Hop, J 65
Hopkins, E 13, 42, 52, 187
Hopkins, N 15
Hopkins, P 164
Horita, Z 92, 129
Horiya, T 246
Horlyck, J 151
Hornbuckle, B 59, 69, 72
Horner, J 215
Horn, T 202
Horowitz, S 180
Hort, N 122, 246
Horwath, J 144
Horwitz, J 119
Hosemann, P 8, 20, 29, 45, 53, 56, 60, 80, 81, 85, 99, 106, 110, 129, 134, 152, 169, 181, 186, 194, 200, 204, 213, 251, 265
Hosoda, H 225
Hossain, M 244
Hossain, S 157
Hosseini, A 86
Hosseini, Z 26
Hotar, A 173
Hou, C 117
Houghton, O 230
Houmada, K 24
Houser, N 119
House, S 7, 26, 51, 78, 105, 128, 152, 169, 263
Hou, Z 57
Ho, V 86
Howard, A 212
Howard, C 251
Howard, Y 119
Howarter, J 104, 262
Howe, L 86
Howland, W 194
Hoyer, K 208, 211, 222
Hoyt, N 20, 43, 70, 98, 122, 146, 201, 247, 248
Hrabe, N 53, 55, 81, 102, 107, 131, 154, 171, 192, 208
Hryha, E 127, 133
Hsiao, H 88, 124
Hsieh, K 255
Hsieh, Y 255
Hsu, C 265
Hsu, P 255
Hsu, Y 219
Htet, T 205
Hu, A 187
Hua, C 225
Huang, A 190
Huang, B 255
Huang, C 113, 243, 266
Huang, D 155, 205
Huang, E 10, 31, 32, 58, 87, 88, 113, 136, 137, 158, 159, 173, 174, 183, 218, 219, 220
Huang, H 238
Huang, J 124
Huang, K 82
Huang, L 40
Huang, M 139, 266
Huang, R 206
Huang, S 53, 109
Huang, T 185, 228
Huang, W 92, 196, 238
Huang, X 27, 52, 80, 81, 93, 106, 129, 153, 170, 191, 241, 246, 265, 266
Huang, Y 55, 93, 117, 123, 140, 144, 150, 185, 198, 211, 261, 262
Huang, Z 78
Huan, X 223
Huape, E 182
Huarcaya-Nina, J 262
Hua, Z 110, 213
Hubáľková, J 231
Huber, D 239
Hu, C 4, 25, 28, 52, 62, 93, 103, 121, 138
Hudak, B 31
Hudak, O 215, 221
Huddleston, B 16
Huet, A 137, 149

Hufnagel, T125, 236
Huggins Gonzalez, A39, 143
Hughes, D266
Hughes, K188
Hu, H205, 206
Hu, J21, 158, 228
Hu, L205
Humbert, M179
Humblot, V214
Humphreys, M115
Hung, C86, 126, 187
Hung, H238
Hunn, J213
Hunold, O11, 221
Hunter, A19, 45, 47, 119, 124, 167, 224, 243
Hunt, M39
Hunt, T139
Hunyadi Murph, S17, 23, 41, 46, 68, 73, 93, 96, 100, 120, 125, 140, 144, 162, 165, 176, 185, 187, 233, 236, 241, 242, 253
Huo, W87
Hupa, L190, 261
Hupa, M261
Hu, Q206, 232
Hurley, D8, 110, 213
Hurst, K233
Hurst, M132, 137
Hu, s256
Hu, S213, 266
Husain, S23
Husko, C76
Hussein, O109
Hutabalian, Y224, 225, 226
Hu, X236, 250, 254
Hu, Y19, 42, 44, 69, 88, 92, 98, 137, 243, 244, 252, 253
Huynh, N238
Huynh, T99, 146, 173
Hu, Z224, 226
Hwang, J13, 28, 36, 63, 92, 116, 117, 130, 161, 179, 196, 205, 206, 230, 231, 232, 238
Hwang, S41, 188, 214
Hwa, Y241
Hyer, H99
Hyers, R59, 93, 133

I

Iadicola, M87
Iantaffi, C79, 109
Ibe, E238
Ibekwe, C31
Ibrahim, A77
Ichimaru, S65
Idell, Y80
Idrissi, H167

Ifijen, I182, 242
Ijiri, Y70, 173
Ikeda, K227
Ikeda, M57, 127, 159, 259
Ikeda, Y244
Ikhmayies, S13, 36, 63, 92, 117, 161, 196, 231, 232
Ikhuoria, E242
Ilavsky, J203, 256
Ilevbare, G163
Iliopoulos, A110, 134, 203
Iliukha, N59
Illgen, C63
Iloeje, C26, 50, 77, 104, 151, 261, 263
Ilyas, S261
Imai, Y235
Imandoust, A54
Imasato, K225
Im, S24, 116, 146, 230
Ince, E254
Indurkar, P244
Inel, C36
Ingraci, R59
Inkley, C7
Inman, S32, 119, 149
Inoue, A230
Inoue, J223
Instone, S36, 62, 103, 116, 140, 231, 260
Inui, H218, 259
Ioannidou, C6
Ipek, E184
Ipek, K254
Iqbal, N228
Iroc, K50, 177
Irvine, J13
Isaac, N218
Isaacs, M171
Isac, M231
Isakov, E49
Isaksen, M127
Isano, H230
Isasti, N145
Isensee, T90, 117
Isgor, O39
Ishikawa, T246
Ishmurzin, A96
Islam, M41, 70, 173, 262
Islam, Z104
Isotahdon, E241
Iten, J198
Ito, T256
Ivankovic, A198
Ivanoff, T58, 172
Ivanov, I230
Ivanov, Y230
Iyen, C117
Iyen, I117
Izet Escano, L133

Izquierdo, J264

J

Jabed, A87
Jablonski, P214, 235
Jaca, E173
Jackson, A207
Jackson, J122
Jackson, M64, 104, 201, 245
Jacobsen, G251
Jacobs, H218
Jacobson, P121, 170
Jacobs, R42
Jacobs, T100, 124
Jacquemetton, L83, 95
Jacquier, V82
Jagatramka, R72, 174
Jagetia, A73, 101
Jagtap, P238
Jahan, S62, 103
Jahed, H122
Jahrsengene, G39, 65
Jai Likith, S59
Jain, A223, 244
Jain, J222
Jain, M87, 139
Jain, N238
Jakata, K55, 109
Jakes, J170
Jaklich, J70
Jakob, S25, 260
Jalan, V134
Jamal, M130
James, J9
James, R35, 196
Jamshidinina, M208
Jana, S202, 231
Janbaz, S106
Janecek, M48, 109, 196, 266
Jang, B203
Jang, C200
Jang, D22, 45, 72, 91, 124, 125, 149, 168, 203, 253
Jang, G80, 247
Jang, H244
Jangid, D19
Jang, J113, 170, 230, 259
Jang, K36, 203
Jang, S236
Janish, M152
Jankowski, P188
Janssens, K253
Jansto, S244
Jäntschi, U250
Jaques, B76
Jared, B58
Jarfors, A64
Jarman, J32

- Jarosinski, W.56
 Jarrett, M.51
 Jasien, C.47, 55
 Jasiuk, I.13
 Jasra, P.94
 Jasra, Y.94, 118
 Jassim, A.35, 95
 Jasthi, B.4, 11, 33, 89, 183, 221
 Jasuja, H.228, 229, 241
 Jaswandkar, S.228, 229
 Javaid, A.247
 Javidani, M.37
 Javier, C.236
 Jawaharram, G.73
 Jaya, B.8, 212, 214, 244, 265
 Jayachandran, J.136
 Jayaganthan, R.252
 Jayanand, K.206, 255
 Jayaraman, T.224, 259
 Jayasekera, V.154
 J, D.135
 Jeelani, S.86, 183
 Jennett, N.5, 29, 52, 81, 130, 153, 170, 181, 206, 207
 Jennion, A.118, 186
 Jensch, F.212
 Jensen, C.93
 Jensen, J.220
 Jensen, K.21
 Jensen, R.104
 Jeon, B.85
 Jeong, H.10
 Jeong, J.212, 266
 Jeong, K.68
 Jeong, W.235
 Jeong, Y.85
 Jeon, H.252, 253, 262, 264
 Jeon, I.141
 Jeon, J.188, 212, 244, 258
 Jeoung, H.258
 Jerred, N.252
 Jesika, P.232
 Jessop, C.231
 Jewell, J.194
 Jewett, T.76
 Jeyapalina, S.61
 Jha, A.227, 228
 Jha, M.261, 262
 Jha, P.23
 Jha, S.35, 40, 113, 131, 245
 Jiang, C.31
 Jiang, J.87
 Jiang, L.113, 169, 218
 Jiang, M.44, 97
 Jiang, R.37, 126, 192, 210
 Jiang, S.56, 100, 109, 155, 171
 Jiang, T.28, 130, 179, 205, 206, 249
 Jiang, W.57, 71, 85, 134, 178, 250, 251, 252
 Jiang, Y.189
 Jiang, Z.79
 Jian, W.237, 251
 Jiao, Y.141
 Jiao, Z.44, 147, 266
 Jia, X.146
 Jie, X.258
 Jihong, M.257
 Ji, K.168
 Jimenez, J.255
 Jiménez, J.97
 Jindal Fensin, S.186
 Jin, H.135, 179, 227
 Jin, K.93
 Jin, L.247
 Jin, M.20
 Jinschek, J.55, 168, 192
 Jin, Y.9, 31, 135, 157, 173, 194, 215, 237
 Jironvil, J.24
 Ji, S.61, 205
 Jitianu, A.188
 Ji, W.201
 Ji, Y.234
 Jochum, T.130
 Johannes, J.254
 Johannes, M.121
 Johansen, S.227
 John, M.221
 John, R.40
 Johnson, C.89, 97, 107
 Johnson, D.13, 16, 50, 128, 159, 164, 173, 174, 239
 Johnson, F.20
 Johnson, J.180
 Johnson, K.16, 30, 107, 131, 154, 171, 172, 191, 207, 251
 Johnson, N.40, 149
 Johnson, O.12, 18, 165, 166, 174
 Johnson, P.42
 Johnson, S.139, 184, 185
 Johnson, W.62, 175
 John, Y.13
 Johson, K.107
 Jokisaari, A.8, 57, 194
 Jolly, M.14, 37, 64, 78, 93, 127, 140, 161, 185, 235
 Jo, M.239
 Jomard, F.80, 106
 Jomboh, K.32
 Jones, C.19, 64, 136, 158
 Jones, D.15, 38, 53, 65, 94
 Jones, E.228
 Jones, H.77
 Jones, J.31, 171
 Jones, K.95
 Jones, M.55, 99, 100, 108, 173
 Jones, N.64, 222
 Jones, R.213
 Joo, G.227
 Joo, M.85
 Joo, S.259, 264
 Jordan, B.54
 Jordan, J.186
 Jordan, L.89
 Jordon, B.5, 83, 180
 Jordon, J.15, 46, 83, 133, 159, 167, 181, 184, 190, 192, 193
 Joress, H.223
 Jorgensen, C.137, 158
 Jorgensen, E.64
 Jo, S.12, 225
 Joseph, S.72, 253
 Joshi, H.97
 Joshi, P.25, 49, 76, 103, 190, 215, 217, 258, 259
 Joshi, R.23
 Joshi, S.22, 45, 72, 125, 149, 168, 203, 209, 237, 253
 Joshi, V.22, 46, 89, 122, 166, 189, 195, 246, 247, 248, 251
 Joshua, R.79
 Jossou, E.251
 Jost, E.21
 Joubert, H.18, 41, 68, 96, 242
 Joulain, A.14
 Jo, Y.10, 92
 Jozwik, B.107
 J Rowenhorst, D.82
 Juárez-Moreno, K.62
 Juárez Tapia, J.197, 198, 221
 Juárez-Tapia, J.232
 Juárez T., J.196
 Jublot, M.106
 Judge, C.239, 251
 Juhani, K.211
 Juhasz, M.7, 108, 199
 Juillet, C.143
 Julian, N.13, 34
 Jullien, M.184
 Jund, P.12, 60, 115, 183, 224, 226
 Jung, C.36, 224
 Jung, I.154, 219
 Jung, J.227, 235
 Jungjohann, K.66, 81, 148
 Jung, Y.41, 188, 252
 Jun, H.36, 203
 Junio, R.197
 Jun, J.221, 247, 250
 Jürgen, J.211
 Jussey, D.126
 Juul Jensen, D.264
 Jyanand, K.259
 Jyothi, R.188, 258

K

- Kacher, J 18, 19, 22, 26, 39, 45, 51, 66, 72, 78, 105, 110, 125, 128, 149, 152, 168, 169, 203, 236, 243, 253, 263
- Kadirvel, K. 101, 145, 149, 158, 220
- Kadkhodaei, S. 13, 37, 44, 63, 93, 117, 141, 162, 175, 198, 234
- Kafka, O. 16, 40, 53, 67, 81, 95, 120, 131, 240
- Kagay, B. 26
- Kageyama, Y. 249
- Kahl, G. 229
- Kahraman, R. 135
- Kain, C. 82
- Kainer, K. 246
- Kainuma, R. 255, 256
- Kakar, A. 49
- Kakhidze, N. 34
- Kakur, N. 196
- Kalamegham, P. 261
- Kalay, E. 177
- Kalay, I. 117, 184, 197
- Kalay, Y. 13, 36, 43, 63, 92, 117, 161, 184, 196, 197, 231, 232
- Kale, A. 105
- Kalia, R. 186
- Kalidindi, P. 35
- Kalidindi, S. 34, 90, 107, 114, 156, 160, 211, 252
- Kalliauer, J. 229
- Kalsar, R. 46, 189, 247
- Kaluba, G. 231
- Kalyanaraman, V. 182
- Kamatthewatta, N. 140
- Kamath, R. 55
- Kamboj, A. 265
- Kammerman, D. 71, 251
- Kamimura, G. 262
- Kanagaraj, A. 216
- Kandadai, V. 89
- Kandalam, A. 151
- Kandasamy, K. 167, 184
- Kane, J. 71, 114
- Kane, S. 171
- Kaneshita, T. 223
- Kang, H. 188
- Kang, J. 46, 71, 97, 166, 245, 249, 258, 261
- Kang, K. 123
- Kang, M. 239
- Kang, N. 101
- Kang, S. 119, 143, 164, 186, 228, 239, 266
- Kanjilal, A. 15
- Kannan, R. 7, 54, 133, 211
- Kan, S. 65, 130
- Kantharaj, R. 47
- Kantzios, C. 210
- Kao, A. 14, 37, 64, 93, 123, 147, 185, 235
- Kao, C. 238
- Kaoumi, D. 80, 106, 129, 152, 169, 202, 204, 265
- Kapoor, M. 61
- Kapoor, R. 191
- Kappagantula, K. 33, 46, 147, 224, 248
- Kappes, B. 198
- Kapp, M. 266
- Karabin, M. 60
- Karaca, H. 131
- Karagadde, S. 235
- Karakaya, N. 201
- Karakoc, O. 72
- Karaman, I. 13, 56, 102, 173, 189, 193, 208, 212, 220, 234
- Karamchad, P. 253
- Karamched, P. 33, 72, 236
- Karamitros, V. 67, 235
- Karanth, Y. 11, 72, 148
- Karas, E. 16, 66, 95, 188
- Karayagiz, K. 111, 141, 143
- Kardoulaki, E. 22, 44, 59, 71, 99, 124, 148, 177, 202, 251, 252
- Karim, M. 100, 227, 253
- Kariya, K. 255
- Karki, D. 171
- Karloopia, J. 23, 73
- Karlson, K. 135
- Karlsson, C. 192
- Karlsson, T. 98, 247
- Karma, A. 47, 51, 79, 168, 190
- Karna, S. 245
- Karolidis, E. 21
- Karpe, S. 100
- Karpstein, N. 235
- Karra, A. 83, 134
- Karumuri, S. 159
- Kasemer, M. 105
- Kashiwar, A. 167
- Kasianowicz, J. 120
- Kaspar, T. 152, 265
- Kassner, M. 171
- Kathaperumal, M. 180, 199
- Kato, H. 259, 264
- Katoh, Y. 72, 147, 250, 251
- Kato, N. 252
- Katona, R. 95
- Kato, Y. 210, 250
- Katsura, Y. 12, 223
- Katti, D. 228, 229, 241
- Katti, K. 62, 91, 116, 139, 196, 228, 229, 241
- Kattner, U. 98
- Kattoura, M. 39
- Kauffmann, A. 50
- Kaul, A. 206, 215, 217, 241, 255, 259
- Kaushik, H. 212
- Kaussen, F. 104
- Kautz, E. 45, 159, 265
- Kauwe, K. 34
- Kavousi, S. 14, 114
- Kawamoto, N. 225
- Kawamura, Y. 246
- Kawanaka, H. 193
- Kawanishi, S. 216, 217
- Kawano, J. 216
- Kawasaki, M. 24, 47, 74, 75, 102, 126, 150, 153, 168, 170, 191, 203, 255, 256, 266
- Kayang, K. 11
- Kaymak Aksu, E. 184
- Kazantsev, Y. 161
- Kazemzadeh, A. 115, 160
- Kebbede, A. 221
- Kecskes, L. 15, 126, 184
- kedarinath, k. 179
- Kedir, N. 89, 97
- Kedzierski, Z. 180
- Keilbart, N. 222
- Keiser, D. 213
- Kekana, T. 105
- Kellar, J. 180
- Kelleher, B. 146
- Keller, J. 155
- Kelley, D. 9, 35, 61, 194
- Kellock, T. 48
- Kellogg, R. 154
- Kelly, D. 83
- Kelly, R. 95
- Kelly, S. 50, 104
- Kemp, R. 169
- Kendall, C. 194
- Kenesei, P. 40, 78, 111
- Kenezovic, M. 111
- Kengkla, N. 91
- Kennedy, F. 158
- Kennedy, G. 236
- Kennedy, R. 194
- Kenney, D. 222, 247
- Kenney, M. 137
- Kenny, B. 25
- Keppens, V. 113
- Kercher, A. 213
- Kerfrieden, P. 174
- Kermouche, G. 29, 52
- Kerst, P. 263
- Keshavarz, S. 175, 234
- Keskinkilic, E. 28, 130, 179, 205, 206
- Kesler, M. 247
- Kessler, J. 239
- Ketteridge, M. 199
- Kettimuthu, R. 15
- Keum, J. 97, 221
- Kevorkian, V. 226
- Khachatryan, A. 150
- Khademi, V. 57
- Khafagy, K. 232

- Khafizov, M 29, 110, 152
 Khairallah, S 55, 83, 172, 210
 Khakurel, H 159
 Khalaghi, B 258
 Khalid, E 122
 Khalid, H 187
 Khalifa, Y 218
 Khan, A 19, 144
 Khanchandani, H 243, 264
 Khanikar, P 265
 Khan, M 186
 Khan, M 23, 33, 171, 183, 190
 Khanolkar, A 53, 110
 Khan, S 212, 228
 Khan, Z 210
 Kharangarh, P 206
 Khaykovich, B 248
 Khiari, L 263
 Khledi, H 192
 Khmelevskyi, S 12
 Khosla, N 4
 Khosravani, A 114
 Khosravian, N 180
 Khrustalyov, A 34
 Kianfar, S 221
 Kiani, M 35, 124
 Kibartas, D 226
 Kido, F 246
 Kiener, D 25, 52, 153, 222, 253, 266
 Kihm, K 68
 Kikuchi, S 247
 Kim, B 24, 47, 74, 75, 102, 126, 150, 168, 203, 212, 255, 256
 Kim, C 15, 188, 235, 261, 262
 Kim, D 63, 85, 173, 188, 214
 Kim, E 212
 Kim, G 10, 54, 137
 Kim, H 24, 49, 56, 70, 80, 82, 87, 106, 146, 154, 178, 180, 182, 200, 212, 248, 252, 253, 254, 258, 261, 262, 265, 266
 Kim, J 16, 31, 41, 68, 80, 91, 96, 99, 143, 152, 154, 169, 176, 182, 183, 188, 195, 200, 212, 219, 222, 228, 232, 235, 246, 252, 253, 254, 258, 263, 264, 266
 Kim, K 5, 25, 189, 228, 261
 Kim, M 171, 227, 238, 246
 Kim, R 261, 262
 Kim, S 36, 41, 70, 164, 184, 185, 188, 189, 226, 227, 234, 244, 258, 262
 Kim, T 91, 106, 153, 154, 194, 251
 Kimura, K 12
 Kimura, Y 12, 60, 115, 183, 224, 225, 226
 Kim, W 188
 Kim, Y 15, 184, 188, 196, 222, 247, 258
 Kinaci, A 34
 King, D 50
 King, G 11, 186, 234
 King, P 37
 King, W 210
 Kin, M 213
 Kinser, R 167, 184, 190, 192, 193
 Kinsler-Fedon, C 113
 Kirchheim, R 16, 27
 Kirchlechner, C 126
 Kirka, M 5, 53, 108, 192, 208, 209, 210, 223
 Kirk, C 89, 97
 Kirk, M 263
 Kirk, T 56, 135, 220
 Kirmani, M 15
 Kirnbauer, A 214, 215
 Kirsch, D 60, 154
 Kirsten, T 67
 Kirtley, T 141
 Kisailus, D 35, 86, 92, 96, 196
 Kishida, K 218, 259
 Kishore, S 176, 236
 Kiss, L 227
 Kisslinger, K 182
 Kitchaev, D 42
 KI, V 252
 Kjørholt, K 86
 Kjos, O 65
 Klaehn, J 262
 Kleem-Toole, J 97, 121, 145, 166, 176, 243, 244
 Klein, F 250
 Klein, T 84, 122
 Klemm-Toole, J 47, 54, 55, 73, 89, 97, 101, 132, 136, 146, 149, 172, 176, 192, 254
 Klepeis, J 19
 Klijnstra, J 241
 Klimenkov, M 250
 Klitzsch, M 262
 Klobcar, D 192
 Klocek, J 249
 Kloenne, Z 33, 59, 85, 89, 114, 127, 137, 149, 159, 195, 220, 222
 Klomp, A 129
 Klusemann, B 47, 168
 K, N 248
 Knabl, W 260
 Knapp, G 221, 224, 235, 248
 Knapp, T 15
 Knezevic, M 111, 139, 150, 160
 Knight, C 194
 Knipling, K 73, 101, 121, 149, 161, 254, 256
 Knopf, M 12
 Knowles, A 25, 50, 59, 76, 149, 202, 203, 235, 260
 Knowles, S 50
 Knyazev, A 226
 Kobayashi, K 225
 Kobayashi, S 200
 Kobayashi, Y 233
 Köbrich, M 220
 Kocaefe, D 237
 Kocaefe, Y 237
 Kocahakimoglu, C 184
 Kocovski, V 85
 Koch, A 40, 260
 Kochavi, E 195
 Koch, C 10
 Kochmann, D 253, 256
 Koch, R 137
 kocijan, a 192
 Koç, Ö 213, 214
 Koenig, G 220
 Koenig, T 170
 Koepf, M 77
 Koerbler, N 249
 Koerdt, A 241
 Kohnert, A 80, 106, 124, 129, 152, 169, 204, 265
 Ko, J 129
 Koju, R 145, 244
 Ko, K 235
 Kokalj, D 222
 Kolano-Burian, A 107, 189, 199
 Kolanthai, E 179
 Kolasinski, R 99
 Kole, M 181
 Kolitsky, E 48
 Kollo, L 211
 Kolonits, T 55
 Kolosov, V 31
 Kolozsvári, S 11, 215
 Komarasamy, M 189, 226, 227, 246, 256
 Komari, O 139
 Komarov, S 188
 Kombaiyah, B 239, 251
 Komoda, R 26
 Kompelli, G 255
 Komuro, M 215
 Konakoglou, K 127
 Koncik, L 68
 Koneru, S 101, 158, 220
 Kong, F 85
 Kong, Y 17, 25, 41, 49, 68, 76, 96, 103, 120, 144, 165, 176, 187, 190, 241, 242, 258, 259
 Kong, Z 128
 König, H 6
 König, T 260
 Kontis, P 14, 38, 64, 94, 118, 141, 162, 186, 235
 Kotsos, A 16, 40, 67, 83, 95, 120, 240
 Koo, J 215, 228
 Ko, P 219
 Kopechek, D 9
 Kopp, A 155
 Kordijazi, A 23
 Korey, M 76
 Korinko, P 53

Körmann, F	159	Kruzic, J	248	Kuzminova, Y	74, 75, 153, 170, 191, 266
Körner, C	256	Krynicky, J	15, 126	Kuznetsova, N	49
Kornfield, J	61	Krystalakos, O	210	Kvande, H	151
Koseniuk, K	18	K. Shargh, A	88, 112, 148	Kvande, R	104
Koshta, E	73	Ksiazek, M	18	Kvithyld, A	36, 103, 116
Koslowski, M	101	Kuang, W	128	Kwak, T	184
Kosmidou, M	178	Kuang, Y	233	Kwan, S	17
Kostka, A	235, 256	Kubacki, G	171	Kweon, K	222
Kosturek, R	189	Kuball, M	177	Kwok, T	145
Kothari, M	13, 36, 46, 92	Kubena, I	17	Kwon, O	188
Kotha, S	12	Kube, S	36, 88	Kwon, S	251
Kotula, P	66	Kublik, N	51, 146	Kyvelou, P	210
Kotzem, D	208	Kubo, K	257		
Koube, K	110, 236	Kubota, A	94		
Kouraytem, N	210	Kubota, M	26		
Koutna, N	207	Kuettner, L	13		
Koutny, D	122	Kuganathan, N	22, 124		
Kovacevic, S	156	Kugaswaran, L	116		
Kovarik, L	235	Kuila, S	28		
Kowalczyk, M	189, 199	Kuiper, J	21		
Koyama, T	224	Kulachenko, A	207		
Koyanagi, T	71, 72, 99, 123, 147, 167, 177, 202, 250, 251	Kulikowski, J	79, 105		
Koyn, Z	25	Kulkarni, J	54		
Kozakevich, J	34	Kulkarni, K	143		
Kozlik, J	48	Kulkarni, Y	72		
Kozmel, T	166, 170	Kulovits, A	37		
Kraft, B	50	Kumagai, M	213, 223		
Kraft, F	248	Kumagai, T	134, 162		
Krajewski, P	40, 67, 240	Kumar, A	248		
Krajnak, T	109	Kumar, B	200		
Krajník, T	266	Kumar, D	4, 217		
Kramer, A	50, 78	Kumar, G	87, 229		
Kramer, M	20, 43, 50, 70, 128, 247	Kumar, M	15, 38, 94, 124, 142, 148		
Krane, M	64	Kumar, N	167, 240, 244		
Krassnig, H	70	Kumar, P	15, 36, 53, 54, 94, 110, 118, 171, 189		
Krause, A	59, 181	Kumar, R	142		
Kraus, L	53	Kumar, S	54, 79, 96, 189, 193		
Kreller, C	152	Kumar, U	58, 179		
Krentz, T	245	Kumar, V	151, 261		
Kreyca, J	235	Kunanusont, N	258		
Krick, B	139	Kundu, A	218		
Krimer, Y	136	Kundu, T	28		
Krishnamoorthy, S	31	Kung, P	74, 75		
Krishnan, H	85	Kunka, C	23		
Krishnaraj, V	231	Kuntz, J	11, 108, 186, 234		
Krivec, T	249	Kunwar, A	217, 221, 255		
Krogstad, J	25, 67, 73, 74, 75, 76, 101, 142, 149, 254	Kuo, T	88		
Krokhin, A	139, 237	Kurniawan, C	12		
Krueger, A	195	Kurniawan, K	258		
Krueger, D	246	Kurosaki, K	213, 223		
Krüger, J	211	Kursun, E	253		
Krug, H	262	Kurzydowski, K	250, 259		
Krug, M	131	Kusdemir, H	104		
Kruhlov, I	215	Kushwaha, A	245		
Kruml, T	17	Kustas, A	54, 107, 131, 132, 154, 171, 173, 191, 207, 237		
Krushynska, A	265	Kutsal, M	214		
Kruska, K	265				

L

Labouta, H	17, 41, 68, 96, 120, 144, 165, 176, 187, 241, 242
Lach, T	218
Lacy, J	39
Ladani, L	112, 132, 155, 193
Ladonis, A	165
Lados, D	17, 90, 123
Ladygin, V	63, 93, 98
Laferriere, A	204
Lafferty, C	58
Laghzali, O	86, 89
Lago, J	173
Laheurte, P	89
Lai, J	264
Lai, K	218
Lai, L	51, 79, 190
Lai, T	255
Lai, W	208
Lai, Y	225, 228
Lajili, A	263
Lakshmanan, A	67, 78, 172, 177
Lakshman, S	151
Lalancette, F	227
La Lone, B	164, 186
LaLone, B	164
Lalpoor, M	226
Lambeets, S	45, 240, 265
Lamberson, L	38, 113, 142
Lambert, G	237
Lambert, M	216
Lambert, P	121
Lamb, J	36
Lamb, K	110, 236
Lambros, J	223, 264
Lam, M	21, 38, 53, 193, 214
Lammer, G	263
Lamm, M	76
la Monaca, A	236
Lamoureux, A	161
Lamprinakos, N	38, 108, 192
Lancaster, R	84, 110, 134, 156, 172, 193, 212, 213

- Lance, M 64, 133, 214, 238
 Landa, A 37
 Landeiro Dos Reis, M 143
 Lane, B 43
 Lan, F 230
 Lang, E 167
 Langlois, E 136
 Lang, M 7, 199, 265
 Lang, S 77
 Lan, P 206
 Lanzani, L 202
 Lapington, M 129
 Laplanche, G 177
 LaPlant, D 84, 132
 Laquidara, J 108
 Lara-Curzio, E 54, 214
 Larignon, C 161, 184
 Larimian, T 190
 Larkin, K 119
 Laroche, A 215, 256
 Larsen, J 40
 Larson, D 13
 Larson, E 56
 Larsson, H 57
 Lartigue-Korinek, S 235
 Lasa, A 99
 Laskowski, S 260
 Lass, E 6, 21, 24, 47, 54, 73, 74, 75,
 82, 101, 102, 126, 136, 149, 150, 158,
 167, 168, 180, 203, 210, 254, 255, 256
 Latypov, M 59, 60
 Laukkanen, A 135
 Laurençon, M 222
 Lauria, D 120, 189
 Lauria, S 210
 Lauridsen, E 30
 Laursen, C 156
 Lauzon-Gauthier, J 39, 237
 Lavenstein, S 256
 Lavernia, E 10, 27, 52, 56, 71, 80, 100,
 103, 106, 109, 121, 125, 129, 136, 149,
 153, 154, 155, 157, 170, 171, 191, 203,
 265, 266
 Lavery, N 218, 243
 Lavoie, J 263
 Lawrence, C 21
 Lawrence, S 5, 29, 36, 52, 81, 130,
 153, 170, 181, 206, 207
 Lawson, J 102
 Lazarus, B 13, 196, 198
 Lazou, A 77, 104
 Leal-Quiros, E 112
 Lear, C 53, 94
 Leary, A 135, 157, 173, 215
 Lebas, L 264
 Lebeau, J 10
 Lebensohn, R 94, 124, 138, 141,
 214, 236
 Lebepe, T 242
 Leblanc, S 60
 LeBlanc, S 60, 154
 Le Bourlot, C 264
 Lechner, P 63
 Ledford, C 210
 Lee, A 45, 237
 Lee, B 123
 Lee, c 137
 Lee, C 10, 32, 80, 100, 101, 113, 137,
 158, 215, 225, 235, 238
 Lee, D 45, 251, 258, 266
 Lee, E 188
 Lee, G 109, 126
 Lee, H 80, 182, 188, 214, 215, 228,
 255, 261
 Lee, I 191
 Lee, J 30, 35, 41, 47, 74, 101,
 123, 132, 147, 148, 153, 184, 185, 188,
 190, 199, 203, 208, 210, 218, 239, 249,
 254, 255, 258, 262
 Lee, K 5, 99, 171, 211
 Lee, M 70, 225, 235
 Lee, N 16
 Leen, S 150
 Lee, P 14, 23, 37, 48, 55, 64, 79, 93,
 108, 109, 123, 134, 171, 185,
 204, 211, 235, 238
 Lee, S 10, 36, 45, 91, 168, 203, 207,
 218, 227, 248
 Lee, T 15, 65, 80, 222, 237, 238,
 245, 258, 261
 Lee, W 17, 20, 27, 41, 44, 68, 72,
 96, 120, 136, 144, 165, 176, 187,
 212, 222, 241, 242, 243, 251
 Lee, Y 54, 82, 108, 132, 139,
 179, 192, 209, 210, 212, 219,
 225, 238, 252, 264, 266
 Lefebvre, F 133
 Lefebvre, R 122
 Lefebvre, W 167
 Leff, A 208
 Le Gall, N 23
 Leggett, J 46
 le Graverend, J 94
 Legros, M 30
 Lehman, B 136
 Lei, B 60
 Leicht, A 208
 Leick, N 233
 Leide, A 44, 71, 177
 Lei, L 153, 258
 Leineweber, A 256
 Leitner, M 260
 Lei, Y 216
 Le, J 108
 Lemson, G 43
 Le, N 34
 Lenahan, S 86
 Lennon, A 34
 Lenthe, W 8
 Lenz, M 235
 Leonard, A 125, 134
 Leonard, D 64, 111, 143, 209, 210, 214,
 221, 235, 256
 Leonard, H 126
 Leong, A 70
 León Simanca, P 163
 Leosson, K 116
 Le Pape, Y 202
 Le, Q 200
 Leser, P 82
 Lesjak, I 226
 Lesko, C 172
 Lester, B 138
 LeSure, S 141
 Le, T 48, 193, 204, 208, 213
 Letchford, M 68
 Lete Segura, N 173
 Letichevsky, S 262
 Letonquesse, S 115
 Letzig, D 246
 Leu, B 57
 Leuchtenmueller, M 235
 Leung, C 48, 55, 79, 93, 171, 183, 211
 Leu, P 78
 Levi, C 66, 98
 Levin, E 19
 Levine, L 43, 171, 248
 Levine, S 147
 Levin, Z 52, 55
 Levkulich, N 59
 Levy, A 213
 Lewandowski, J 53, 81, 107, 131,
 132, 154, 155, 171, 192, 208, 240
 Lewis, A 23
 Lewis, D 132, 137
 Lewis, N 236, 237
 Lhermitte, C 245
 Li, A 58
 Liang, A 183
 Liang, G 179
 Liang, Q 140
 Liang, S 198
 Liang, X 198
 Lian, J 44, 239, 266
 Liao, C 224
 Liao, X 27, 52, 80, 106, 129, 153,
 170, 191, 265, 266
 Liao, Y 159, 195, 230, 259
 Liao, Z 236
 Liaw, P 10, 31, 32, 35, 54, 58, 62, 87, 88,
 92, 113, 116, 127, 136, 137, 158,
 159, 161, 173, 174, 175, 183, 184,
 218, 219, 220, 229, 230, 259
 Li, B 11, 13, 32, 36, 46, 47, 59, 63,
 84, 87, 88, 92, 94, 102, 117, 153,
 161, 183, 196, 205, 220, 221, 231, 232
 Li, C 162, 176, 179, 189, 205, 235, 240

Lichtenstein, T	24	Lin, T	238, 255	Löffler, J	62, 175, 230
Li, D	48, 59, 73, 89, 126, 159, 181, 195	Lin, W	109	Logan, J	76
Liechty, K	179	Lin, Y	33, 98, 128, 147, 218	Lograsso, T	20
Lienert, T	53, 54, 82, 200	Lin, Z	139, 164	Lohaus, S	175, 203
Lienert, U	30, 170	Li, P	185	Loh, H	49, 76, 206
Lienhard, J	164	Lipkin, E	237	Loh, K	238
Liese, M	82	Li, Q	13, 45, 79, 105, 169, 249	Lohoefer, G	93
Lies, N	191	Li, R	205	Lokhande, A	157
Lightstone, J	21	Li, S	33, 137, 212, 222, 224, 230, 240, 253, 262	Lombardo, S	248
Li, J	9, 11, 13, 32, 36, 59, 63, 88, 89, 92, 95, 101, 108, 117, 129, 143, 158, 161, 165, 169, 183, 196, 197, 205, 206, 216, 219, 220, 221, 231, 232	Lissandrello, F	206	Lomello, F	48
Li, K	49, 211	Liss, K	74, 75, 153, 170, 191, 256, 266	London, A	250
Li, L	22, 24, 44, 86, 89, 90, 92, 116, 117, 128, 139, 182, 195, 198, 199, 212, 218, 219, 228, 237, 251, 253, 256, 264	Lister, T	262	Londoño, J	230
Lilensten, L	89, 222, 235	List, F	49, 207	Long, A	56, 194, 230
Lilleodden, E	27, 51, 79, 105, 126, 129, 150, 190, 207, 246, 264	Li, T	68, 95, 240	Long, D	148
Lillo, T	257	Litnovsky, A	250	Long, M	195, 198
Li, M	22, 58, 87, 113, 126, 148, 155, 169, 197, 205, 235, 263	Liu, B	117, 140, 185, 198, 205, 244, 262	Long, T	105
Lima, R	243	Liu, C	58, 97, 101, 168, 183	Loomba, V	42, 96
Lima, T	232, 233	Liu, D	22, 44, 71, 99, 124, 125, 148, 152, 177, 198, 202, 213, 251, 252, 264	Loose, J	8
Lim, B	261	Liu, E	42	Lopes Dias, N	222
Lim, J	169, 222, 250	Liu, F	205, 230, 231	Lopes, M	233
Lim, K	261	Liu, G	100, 227, 249, 253	Lopez-Hirata, V	256
Lim, M	11, 33, 89, 183, 221	Liu, H	113, 144, 166, 174, 206, 209, 258	Lopez, J	46, 56
Limmaneevichitr, C	91	Liu, J	10, 24, 31, 133, 139, 211, 239, 255	López-Martínez, E	256
Limmer, K	16, 97, 118, 121, 143	Liu, K	58, 244	Lopez Morales, A	152
Lim, R	6, 40, 72, 85, 120	Liu, L	74, 76, 119, 164, 168	Lordi, V	37
Lim, Y	221	Liu, M	34, 169, 190	Loretto, M	85, 114
Li, N	8, 10, 24, 45, 113, 124, 137, 152, 153, 203, 205	Liu, N	112, 206	Lorich, A	260
Lin, A	153	Liu, Q	9, 205, 217, 248	Losev, V	161
Linares, H	77	Liu, T	42, 211, 237, 240, 256	Loubet, J	5, 29, 52
Lin, C	49	Liu, W	106, 238, 266	Lou, J	100, 165
Lin, D	158, 205	Liu, X	20, 27, 43, 44, 66, 71, 74, 75, 85, 153, 157, 178, 182, 185, 191, 215, 247, 251, 256, 266	Loukachenko, N	74, 75
Lindberg, D	190, 261	Liu, Y	27, 47, 74, 101, 123, 158, 201, 205, 206, 226, 232, 235, 240, 254, 255	Lourenço, M	91
Lindemann, G	9, 47, 203	Liu, Z	13, 47, 74, 93, 101, 185, 198, 230, 234, 244, 248, 254, 255	Lou, X	5, 16, 39, 44, 53, 61, 66, 108, 134, 146, 192, 208, 209, 238, 239
Lindgren, K	133	Li, W	58, 119	Louzuine, D	230
Lindholm, D	231	Li, X	34, 37, 48, 58, 82, 84, 104, 136, 139, 147, 166, 173, 198, 226, 239, 248	Love, B	21
Lind, J	94, 142, 164, 186	Li, Y	24, 55, 63, 71, 92, 146, 147, 158, 161, 166, 168, 197, 202, 230, 231, 232, 254, 256	Lowery, A	231
Lindsay, S	151	Li, Z	52, 87, 128, 167, 168, 182, 192, 205, 206, 208, 243, 251	Lowe, T	62, 91, 106, 116, 139, 196, 229
Lindstad, L	96	Lizarazo, C	180	Low, T	109
Lindwall, G	6, 98, 234	Llorca, J	8, 31, 97, 155, 198	Lo, Y	200, 255
Linga, H	39	Lloyd, J	97, 118	Loyer-Prost, M	231, 256
Ling, H	28	Lloyd, M	250	L. Solbakk, G	103
Lingua, G	104	L. McDowell, D	67, 82	Luan, B	198
Linhares Júnior, J	232	Loaiza, A	102	Luan, X	187
Lin, J	166	Loaiza Lopera, Y	45	Lu, B	217
Linne, M	135, 155, 256	Locke, J	16, 39, 66, 95, 119, 120, 143, 165, 187, 238, 239, 240	Lu, C	42
Lin, P	243	Lødeng, R	151	Luckenbaugh, T	59
Lin, S	47, 74, 101, 180, 232, 238, 254, 255	Loeffler, T	234	Lucon, E	154
Linsley, C	139			Luczyniec, D	93
Linsmeier, C	250			Ludwig, K	213
				Ludwig, T	103
				Ludwig, W	30, 134, 264
				Luebbe, M	44
				Luettich, M	229
				Lugo, M	222, 247
				Lu, H	228
				Luidold, S	96, 249, 260
				Lu, J	264

- Lu, K. 11, 32, 44, 48, 59, 75, 88, 96,
102, 106, 126, 150, 182, 183,
204, 220, 221, 257, 265
- Lukic, B. 55, 109
- Luktuke, A. 15, 60, 116
- Lu, L. 113, 266
- Lu, M. 190
- Lund, E. 184
- Lundin, C. 158
- Lunt, A. 53
- Luo, A. 19, 50, 93, 122
- Luo, D. 179
- Luo, G. 232
- Luo, H. 216, 239
- Luo, J. 93, 102, 158, 165
- Luo, K. 142
- Luong, D. 188
- Luong, J. 183
- Luo, S. 28
- Luo, Y. 205
- Luo, Z. 208
- Lu, P. 18, 20, 173, 218
- Lupini, A. 49
- Lupo Pasini, M. 224, 244
- Lu, Q. 193, 208, 213
- Lu, S. 205, 232, 243
- Luscher, D. 45, 119, 124, 142, 224,
236, 243
- Luther, E. 112, 126
- Lutz, D. 251
- Luu, R. 13
- Lu, W. 61, 222
- Lu, X. 144, 258, 260, 262
- Lux, T. 104
- Lu, Y. 59, 66, 77, 99, 143, 147, 162, 252
- Lu, Z. 116
- Lv, C. 206
- Lv, R. 206
- Lv, X. 147, 206
- Lynch, J. 190
- Lynn, J. 234
- Lyu, G. 226
- Lyu, Y. 189
- M**
- Maass, R. 35, 36, 62, 92, 116, 161,
175, 184, 229, 230
- Maaß, R. 62, 230, 244
- MacAllister, N. 153
- MacDonald, B. 84, 100, 103, 136,
149, 155, 157
- Mach, A. 188
- Macha, J. 137
- Mach, R. 77
- Macías-Ávila, E. 35
- Macias, D. 186, 204
- Maciejewska, B. 28
- Mackay, G. 184
- Mackay, K. 119
- Mackey, B. 118, 185
- Mackey, P. 18, 41, 68, 96, 242
- Mackin, T. 257
- Maclachlan, D. 235
- MacLachlan, D. 67
- MacRosty, R. 96
- Macziewski, C. 59
- Ma, D. 206, 232
- Madariaga, R. 18, 96
- Madavali, B. 12
- Madden, N. 25
- Madejski, G. 88
- Madiseti, D. 125, 160
- Madison, J. 54, 58, 115, 118, 135, 141,
142, 163, 175, 236
- Madrigal-Camacho, M. 84, 102
- Maeno, H. 237
- Maffettone, P. 190
- Maftouni, M. 128
- Magagnin, L. 206
- Magagnosc, D. 97, 118, 164
- Magazzeni, C. 130
- Magdysyuk, O. 172
- Maghoul, P. 144
- Magnussen, J. 235, 260
- Ma, H. 206
- Mahaffey, J. 55
- Mahajan, S. 121
- Mahapatra, M. 189
- Maharjan, N. 189
- Mahbooba, Z. 183
- Mahbuba, K. 194
- Mahbub, R. 86
- Mahdi, N. 227
- Maheshwari, S. 111
- Mahjabin, T. 259
- Mahmood, Y. 145
- Mahmoud, M. 28, 130, 179, 205, 206
- Mahmud, A. 82, 99, 146, 173
- Mahmud, H. 246
- Mahmud, S. 16
- Mahoney, L. 234
- Mahurin, S. 27, 44
- Maidaniuk, A. 133
- Maier, H. 189
- Maier-Kiener, V. 5, 25, 29, 52, 81, 130,
153, 170, 181, 206, 207, 260
- Maier, P. 19, 70, 122, 166, 177, 189,
246, 247
- Maijer, D. 226, 231
- Mailman, A. 157
- Maire, E. 167, 211, 264
- Maita, J. 45
- Maiwald, D. 237
- Ma, J. 60, 102, 109, 154, 193
- Majeti, S. 19
- Majkut, M. 55, 109
- Majoros, A. 48
- Majumdar, B. 212
- Majumdar, U. 10, 91
- Majumder, S. 100
- Ma, K. 59, 231, 237, 260
- Makarov, E. 93
- Makinde, A. 132
- Makineni, S. 191, 254
- Makurunje, P. 72
- Ma, L. 154
- Malaka, L. 105
- Malakkal, L. 30
- Malak, R. 56
- Male, J. 225
- Malej, S. 82, 192
- Malen, J. 134
- Malet, L. 33, 137
- Malfliet, A. 28, 188, 205
- Malhotra, P. 94
- Maliki, M. 182, 242
- Malik, M. 215, 217, 262
- Mallakpour, F. 207
- Mallek, J. 77
- Mallick, D. 15, 237
- Mallon, M. 93
- Mallouhi, V. 34
- Maloy, S. 44, 50, 53, 73, 81, 88, 99, 148,
164, 177, 200, 251
- Ma, M. 181
- Mamani Calcina, E. 199
- Mamivand, M. 115, 160
- Mammo, F. 237, 244
- Mamun, M. 66
- Manakari, V. 100
- Manaka, T. 239
- Manandhar, K. 190
- Mandal, D. 201
- Mandal, S. 192, 217
- Mandrus, D. 113
- Mangelinck, D. 214
- Mangolini, F. 87
- Mangolini, L. 86
- Mani, B. 215
- Manickavasagam, K. 253
- Maniere, C. 109, 126
- Manjunath, B. 19
- Mankame, N. 27
- Manley, M. 98, 225, 234
- Mann, A. 123
- Manna, S. 234
- Mann, J. 110, 180, 213
- Mann, T. 101, 163
- Mann, V. 139, 237
- Mansoor, B. 122, 187, 189
- Mansouri Arani, M. 227
- Mansouri, E. 124
- Mantri, S. 33, 46, 109, 208, 256
- Manuel, M. 29, 92, 180
- Manzi, J. 259
- Manzoni, A. 93

Manzoor, A	159	Martin, J	21, 60, 66, 84, 117, 132, 154	Maurya, H	211
Mao, B	221	Martin, M	26, 51, 78, 102, 105, 120, 128, 152, 169, 189, 263	Mavrikakis, N	214
Mao, H	57	Martin, O	161	Mavroudis, A	139
Mao, M	207	Martin, S	138, 256	Ma, X	24, 27, 46, 139, 167, 246, 256, 266
Mao, N	198, 201	Marupalli, B	200	Maximenko, A	133
Mao, S	45	Marussi, S	48, 55, 93, 108, 123, 211	Ma, Y	205
Mao, W	266	Maruyama, B	33	May, A	225
Mao, Y	108	Maruyama, T	259	Maynor, E	188
Mapar, A	139	Marvel, C	69	Mayorov, D	226
Mara, N	33, 52, 63, 78, 87, 100, 105, 153, 167, 243	Marvila, M	232, 233	Mayo, U	145
Marathee, S	171	Marzoli, L	34, 91	Mayrhofer, P	207, 214
Marathe, S	235	Masago, N	255	Mazanov, V	17, 78, 88
Marcelo, E	179	Mascarenhas, S	167	Mazánová, V	17, 30
Marchand, D	252	Masengale, S	22	Maziarz, W	189, 199
Marchhart, T	202	Maskaly, G	119, 164, 186	Mazumder, J	192
Marchi, B	92	Maskley, B	180	Mazumder, S	115, 134, 209, 228, 239
Marchi, C	206	Maskrot, H	48, 82, 154	Mazza, R	122, 201
Marconnet, A	47	Mason, C	15	Mbah, V	117
Marcos, P	193	Mason, J	18, 42, 60, 69, 97, 121, 145, 165, 187, 216, 242, 243	McAlister, A	122
Maresca, F	27, 28, 32, 159	Mason, P	23	McAllister, N	199
Marian, J	13, 34, 42, 80, 99, 106, 123, 152, 183, 187, 195	Massar, C	55, 211, 248	McAlpine, M	120
Marie-Anne, D	157	Masse, N	26, 189	McArthur, D	70, 147
Marinel, S	126	Massion, C	77, 162, 233	McAuliffe, T	72, 120, 199
Marin, G	48	Masson, P	86, 89	McBride, B	97, 130
Marioara, C	226	Mastorakos, I	137, 140, 162, 185, 233	McCabe, R	8, 56, 57, 153, 160
Mariyappan, A	214	Masuda, T	129	McCall, S	20, 37, 43, 70, 84, 132, 157, 173, 187, 247
Marki, R	160	Masuo, C	108	McCarthy, K	71
Markovsky, P	114	Ma, T	203	McCartney, D	84
Marks, L	239	Mata Ramirez, J	220	McCleary, D	41
Maroudas, D	123	Matejunas, A	113	McClellan, K	22, 59
Marquardt, A	34, 91	Mates, S	208, 236	McClenny, L	85
Marquardt, K	170	Mathaudhu, S	24, 47, 70, 84, 92, 102, 122, 129, 142, 166, 168, 170, 172, 253, 255, 256, 266	McClung, R	107
Marquez Guevara, A	199	Mathe, N	127	McClung, R	107
Marquez Rossy, A	210	Mathew, N	19, 45, 123, 224	McClure, Z	114, 174
Márquez Rossy, A	210, 223	Mathonière, C	157	McClure, Z	47, 159
Marquis, E	14, 30, 64, 222, 265	Matinde, E	105	McCue, I	27, 34, 51, 79, 105, 129, 131, 144, 167, 172, 190, 264
Marschall, D	242	Matlock, D	97	McCulley, D	37
Marschall, U	96	Matos, P	233	McDeavitt, S	29, 85, 194
Martens, R	75	Matson, T	69	McDonald, A	100, 162
Marthinsen, A	260	Matsumura, S	237	McDonald, N	215
Martin, A	55, 83, 92, 122, 132, 210	Matsunaga, H	26	McDonald, S	237, 238, 246
Martina, F	78	Matsunaga, S	101, 200	McDonnell, S	23, 242
Martín, D	155	Matsushita, S	193	McDowell, D	12, 67, 206, 264
Martin, E	93	Matsuura, H	225	Mcelfresh, C	195
Martinez, D	15, 38, 65, 94	Matsuura, Y	224	McElroy, K	34
Martinez, E	50, 145, 224, 250	Matthes, S	218	Mcenerney, B	107
Martinez, F	62	Matthews, A	246	McGrath, J	88
Martinez, M	88	Matthews, C	85	McGuire, M	49, 247
Martinez, R	38, 137, 221	Matthews, I	39	McHenry, M	136
Martinez Saez, E	12, 34, 60, 90, 115, 123, 138, 160, 195, 219, 223	Matthews, M	29, 55, 83, 132, 172, 210	McKay, B	100, 227, 253
Martínez-Soto, J	196	Matveeva, I	139	McKeown, D	247
Martin, F	80, 106	Matveev, S	34	McKeown, J	95, 256
Martin, H	7, 56, 84, 109, 133, 154, 155, 193, 211, 212	Maughan, M	5, 130, 162, 192, 193, 209	McKeown, J	37, 47, 187
Martini, A	100, 124	Maugis, P	24	McKibben, N	259
Martini, F	72	Maurer, J	17	McKinnell, J	171
				McKinney, C	187, 194

- McClean, B.80
 McMahan, M.39, 95, 239
 McMillan, K.265
 McMurray, J.122, 248
 McMurtrey, M.192, 208, 239
 McQueen, T.34, 256
 Mc Williams, B.46
 McWilliams, B.181, 184
 Means, C.21
 Mecklenburg, M.114
 Medal, H.137
 Medina, A.182
 Medlin, D.18, 24, 27, 52, 121
 Medvedeva, J.141
 Medved, J.226
 Meena, A.32
 Meena, K.73
 Meena, N.219
 Meermann, B.241
 Megahed, M.210
 Mehdi, M.215
 Mehdi pour, I.152
 Meher, A.189
 Meher, S.5, 53, 108, 192, 208, 209, 254, 257
 Mehraban, S.218
 Mehrabi, A.180
 Mehta, A.88, 99, 146, 173
 Mehta, R.215, 259
 Mehta, V.56, 214
 Mei, H.49
 Meijer, K.205
 Meirbekova, R.103, 116, 161, 227
 Meisnar, M.79, 109
 Meißner, J.222
 Meißner, R.166
 Mei, Z.22, 213
 Mele, P.224
 Melgarejo, Z.29
 Melia, M.16, 54, 57, 66, 173
 Meliande, N.185
 Mellor, R.222
 Melo, T.26
 Melzer, D.53
 Mendelev, M.12, 34, 60, 90, 115, 138, 150, 160, 195, 223
 Mendes, B.197
 Mendoza-Buenrostro, C.35
 Menezes, P.221, 245
 Meng, F.121, 183, 218
 Meng, H.70
 Mengis, L.164
 Meng, Y.24
 Menon, A.179
 Menon, V.18
 Mensink, K.84
 Menze, R.247
 Meraz, V.63
 Meredith, C.97, 118
 Merle, B.5, 29, 52, 81, 130, 153, 170, 181, 206, 207
 Merrill, L.148
 Merritt, B.8
 Mesarovic, S.156
 Meshot, E.68
 Meskers, C.76, 104, 151, 263
 Meslin, E.74, 75, 256
 Messina, L.250
 Messina, S.110
 M. Estakhri, N.17
 Metson, J.4
 Metzger, K.22
 Metz, P.165
 Meyer, H.214
 Meyer III, H.221
 Meyer, L.54, 108, 132
 Meyer, M.194
 Meyers, M.13, 15, 38, 65, 94, 118, 142, 164, 173, 176, 186, 236, 237
 Meza, A.88
 Meza, L.172
 Mezin, H.237
 M'hamdi, M.260
 Mian, M.193
 Miao, C.15, 94
 Miao, J.78, 116
 Miao, Y.22, 213
 Miao, Z.181
 Michael, F.6
 Michael, G.184
 Michaelis, A.81
 Micha, J.126
 Michalek, M.181
 Michalik, S.62, 172
 Michelson, A.241
 Michie, R.212
 Michi, R.67, 208, 209, 254
 Michler, J.45
 Michopoulos, J.110, 134, 203
 Michor, H.12
 Middleburgh, S.22, 44, 71, 72, 99, 124, 136, 148, 177, 202, 243, 251, 252
 Middlemas, S.169
 Middlemass, S.110
 Mielnik, S.257
 Mier, R.63, 212
 Mieza, J.202
 Mignanelli, P.64
 Migonney, V.214
 Mi, J.4, 28, 61, 87
 Milaage, D.208
 Milanese, J.64
 Mileski, S.61
 Miles, M.111, 139
 Milhet, X.30, 232
 Militzer, M.234
 Millan Espitia, N.90
 Miller, B.128, 213
 Miller, C.63, 153
 Miller, J.77
 Miller, M.40, 46, 105, 125, 137
 Miller, N.165
 Miller, V.19, 40, 67, 70, 71, 102, 122, 146, 166, 177, 189, 240, 246, 247, 256
 Millett, J.118
 Milligan, B.227, 254
 Mills, L.162
 Mills, M.14, 17, 24, 30, 64, 69, 74, 78, 88, 102, 131, 203, 256
 Mills, S.44, 169
 Millwater, H.265
 Milne, Z.27, 148
 Minárik, P.173, 266
 Minevich, B.241
 Mingo, B.246
 Mingsheng, H.197
 Minnert, C.29
 Minor, A.44, 69, 88, 121, 129, 137, 169
 Miracle, D.22, 31, 113
 Miraz, A.98
 Mireles, O.6, 54, 82, 184, 210
 Miroux, A.226
 Mirzababaei, S.211
 Mishchenko, Y.110
 Mishin, Y.145, 244
 Mishra, A.90, 142, 237
 Mishra, B.50, 54, 76, 77, 103, 111, 143, 179, 260
 Mishra, N.211, 236
 Mishra, R.22, 54, 58, 83, 101, 113, 134, 181, 183, 184, 193, 227
 Mishra, S.174, 196, 248
 Misiolek, W.75, 184
 Misra, A.27, 69, 78, 167, 170, 172, 186, 192, 257
 Misra, D.200
 Misra, M.221, 245
 Mistry, Y.35, 116
 Mixture, S.159, 165
 Mitchell, I.146
 Mitchell, J.54, 58
 Mitchell, S.241
 Mitchell, T.162
 Mitchell, U.21
 Mitchler, J.139
 Mitome, M.225
 Mitra, I.125, 193
 Mitra, N.89, 119, 186
 Mitra, R.8
 Miura, S.227
 Miyagawa, T.252
 Miyake, T.23
 Miyanaji, H.7
 Miyasaka, F.249
 Mi, Z.87
 Mizohata, K.71, 161
 Mizzell, G.70

Moatti, A	217	Moon, K	98	Mouton, I	74, 75
Mock, C	181	Moo, P	208	Moverare, J	208
Moelans, N	217, 221, 255	Mooraj, S	54, 79, 99	Mowat, M	177
Mofrad, A	247, 248	Moore, C	148	Mo, X	258
Mogeritsch, J	168	Moore, D	26, 156	Mozammil, S	23, 73
Mohamad, R	240	Moore, E	70, 84, 173	Mradula, M	196, 199
Mohamad Zaimi, N	238	Moorehead, M	146, 148, 155, 219	Mroz, M	35, 59
Mohammad, I	35, 61, 194	Moore, J	17	M'Saoubi, R	236
Mohammadi, A	123, 179	Moore, R	54	Mshar, A	264
Mohammadi Estakhri, N	17	Moosavi, R	36	Mubarok, A	11, 33, 89, 183, 221
Mohammadi, M	208	Moradi, M	52, 130	Mudryk, Y	90
Mohammed, A	67, 191, 243	Morales-Collazo, O	87	Mueller, J	97
Mohammed, S	22, 78	Morales, D	42	Mueller, T	244
Mohammed, Y	29	Morankar, S	35, 60, 116	Mufazzal, S	111
Mohammed, Z	183	Mora-Núñez, C	35	Muhammad, M	17, 95, 118, 131
Mohan, N	111	Moreland, J	128, 151	Mujahid, S	97, 143, 156, 193
Mohan, J	41	Moreno, J	94	Mukherjee, A	34
Mohan, S	90, 156, 198	More, T	212, 265	Mukherjee, P	9, 30, 57, 86, 112, 136, 158, 182, 215, 216
Mohanty, C	239	Morgan, B	119	Mukherjee, S	35, 39, 113, 255
Mohanty, T	114	Morgan, D	42, 106, 161, 219	Mukherjee, T	6, 53, 200
Mohapatra, M	49	Morgan, J	92	Mukhlis, R	231
Mohd Salleh, M	238	Morgan, T	250	Mukhopadhyay, J	14
Mohraz, A	86	Moriarty, D	163	Mukhopadhyay, N	23
Mo, K	22, 213	Moridi, A	6, 7, 21, 56, 84, 109, 118, 133, 141, 142, 155, 163, 175, 193, 199, 211, 212, 236	Mukhopadhyay, S	14, 64, 74
Mokhtari, M	264	Mori, H	246, 249	Mukono, T	41
Molavi-Zarandi, M	155	Mori, K	252	Mulholland, M	244
Molina-Aldareguia, J	29	Mori, M	243	Mullaney, K	210
Molina-Aldareguia, J	155	Morimoto, S	243	Mullen, R	222
Molina Higgins, M	189	Morin, J	261	Müller, A	202
Molin, J	126	Morisada, Y	226	Müller, M	174
Molkeri, A	8, 52	Mori, T	12, 60, 115, 183, 224, 225, 226	Muller, S	212
Molnar, K	121, 145	Morita, K	217, 249	Mullin, K	66
Molstad, E	50	Moroz, M	190, 261	Mullurkara, S	136
Mondal, K	110, 192, 266	Morris, J	13, 37, 63, 93, 117, 141, 162, 175, 198, 234	Mumm, D	55, 89, 156
Mondal, S	191	Morris, R	92	Munoz, E	88
Mondieig, D	157	Morris, S	83	Munoz, J	63
Moniruzzaman, M	54, 206	Morrow, B	15, 38, 65, 94, 118, 142, 164, 176, 186, 236, 237	Munro, T	8
Monnet, G	224	Morsdorf, L	255	Mun, S	16, 198
Monreal, M	122, 201, 245	Mortensen, D	231	Münstermann, S	43
Monson, T	107, 136, 154, 180	Morton, J	4	Muntaha, M	85
Montalbano, T	34	Moser, D	54, 181	Murakami, Y	215
Montanelli, L	128	Moser, N	53, 81, 105, 108	Muralidharan, G	15, 64, 65, 176, 235, 237, 248, 256
Monteiro, G	233	Mostaed, A	218	Murali, N	136
Monteiro, S	13, 36, 63, 92, 117, 161, 185, 196, 197, 198, 200, 231, 232, 233	Mostafaei, A	131, 192	Muramutsa, F	76
Montemor, M	135	Motallebzadeh, A	62, 184	Murata, S	92
Montes de Oca Zapiain, D	138	Motley, J	37	Murayama, M	86, 250
Montgomery, C	16, 212	Motta, A	85	Murph, S	73
Montiel, D	141, 150, 189	Mouche, P	213	Murphy, C	41
Montiel, G	119, 120	Moudgal, A	26	Murphy-Leonard, A	30, 84, 110, 118, 134, 141, 142, 156, 163, 172, 175, 193, 212, 213, 236
Monti, J	13, 27	Mougin, K	86, 111, 135, 157, 182, 214	Murray, A	158
Montoya, K	200	Mouillard, F	86, 89	Murray, D	20, 72, 114, 213, 219, 251
Montoya, T	66, 188	Moulin-Silva, W	96	Murray, J	212
Montroni, D	35, 96, 196	Moura, H	233	Murray, S	192, 211
Moodispaw, M	93	Mou, T	119	Murty, K	72, 178
Moody, L	114, 137			Murugan, S	239
Moody, M	129, 130				
Moon, G	261				
Moon, J	20, 98, 125, 182, 254				

- Mus, C231
 Musgrave, R157
 Musinski, W110
 Muskeri, S35, 113
 Muta, H232
 Muthu, N265
 Mu, W9, 57, 87, 112, 194, 216
 Muzakkir, S111
 Mwanza, T242
 Myers, J248
 M Y, R83
 Myrvold, E127
- N**
- Naab, B154
 Nachtigal, C135
 Nafisi, S171
 Nagao, A26
 Nagaraj, A111
 Nagarajan, R144
 Nagar, S11
 Nagasaka, T262
 Nagase, K225
 Nagata, K223
 Nagatani, K225
 Nag, S88, 126, 211, 218, 248
 Nahian, M248
 Nahmany, M194
 Nai, M218
 Nair, A169
 Nair, J256
 Nait-Ali, A30, 38, 137, 149
 Naït-Ali, A85
 Na, J175
 Najjar, F119, 164, 186, 236
 Nakagawa, T65
 Nakai, Y247
 Nakajima, A249
 Nakamura, S243
 Nakamura, T50, 249
 Nakano, A9, 57, 87, 112, 186, 194, 216
 Nakano, J9, 57, 87, 112, 194, 216
 Nakashima, K216
 Nakayama, H216
 Nalam, P86
 Naleway, S13, 35, 59, 61, 91, 115, 139, 196, 228
 Nalon, G233
 Nam, C125, 168
 Nam, K49, 144
 Nam, S68, 96, 179
 Nam, T212, 220, 222, 266
 Namur, R6
 Na, N96, 120
 Nandam, S35
 Nandipati, G251
 Nandwana, D173
 Nandwana, P7, 54, 55, 83, 109, 133, 193, 209, 210, 211
 Nandwana, R70
 Nan, N189
 Napolitano, R167
 Napollion, B25
 Naragani, D40, 78
 Narayanan, B82, 132, 209, 210
 Narayan, J4, 206, 215, 217
 Narayan, R36, 53, 109, 215, 217, 230, 241
 Narita, H258
 Narita, K155
 Narra, S6, 54, 55, 82, 83, 108, 131, 132, 155, 192, 209, 210
 Nartu, M7, 33, 46, 73, 109, 208
 Nascimento, L185, 197, 198
 Nasim, W245
 Nasiri, A54
 Naskar, A25
 Nastac, L155
 Nastar, M74, 75, 224, 256
 Nastasi, M123
 Natarajan, A19, 244
 Nathaniel, J18, 24, 27, 42, 52, 187
 Nath, S227
 Natkowski, E43
 Naunheim, Y48
 Nautiyal, P9, 57, 87, 112, 194, 216
 Navarro, J265
 Navidirad, M184
 Nawaz, M135
 Na, Y124, 168
 Nayak, G86
 Nazari Tiji, S156
 Ndiriza, S117
 Neal, C179
 Neamtu, R115, 195
 Nedeljkovic, D152
 Neding, B135
 Needleman, A34
 Neelameggham, N19, 24, 26, 49, 70, 77, 104, 122, 151, 166, 177, 189, 228, 246, 247, 258, 261, 263
 Neels, A116
 Neffati, D72
 Negrier, P157
 Negron Lopez, J199
 Nehil-Puleo, K156
 Nelaturu, P71, 104, 146, 155, 160, 219
 Nelms, M94, 186
 Nelson, A53, 201, 252
 Nelson, J254
 Nelson, K164
 Nelson, T110
 Nelson Weker, J136, 215
 Nemati, S160
 Nematollahi, M131
 Nemoto, N65
 Nenninger, T69
 Neogi, A237
 Neralla, S215
 Neto, R88
 Netto, N17
 Neuba, L197, 198
 Neuefeind, J126
 Neugebauer, J234, 244
 Neumeier, S220, 235
 Neuser, M231
 Neves Monteiro, S196, 197, 198
 Neves, P197, 198
 Neville, R265
 New, A34
 Newaz, G84
 Newell, P13, 248
 Newman, R248
 Newton, M71
 Nezhadfar, P17, 133
 Ng, K215
 Ngo, A107, 131, 154, 155
 Ngo, H165
 Ng, P257
 Nguyen, A41
 Nguyen, B250
 Nguyen-Manh, D60, 250, 259
 Nguyen, P60, 93, 164
 Nguyen, T96, 214
 Nguyen, V230
 Nianwen, P258
 Niazorau, S51, 146
 Nicholas, C27
 Nickerson, E256
 Nicol, S262
 Nicometo, E187
 Niebuhr, J119
 Nieh, T136
 Nielsen, M132, 210
 Nielsen, R13
 Niendorf, T208
 Nieto, A33
 Nieto-Valeiras, E8, 97
 Nie, Z220
 Niezgoda, S14, 138
 Nikitin, P161
 Nikitin, V15
 Nikolai, D67
 Nikolaidis, A255
 Nikolic, S262
 Nikolov, S234
 Nilssen, D104
 Nimbalkar, S77
 Nimmagadda, L213
 Ninglei, S258
 Nino, J166
 Nishida, M243
 Nishikawa, H47, 74, 101, 254, 255
 Nishimura, T238
 Nitol, M224, 247

Nittala, A 33, 147, 248
 Niu, T. 28, 72, 121
 Niu, X. 34
 Niverty, S. 15, 60, 116, 146
 Nizolek, T. 112, 126, 153
 Nlebedim, C. 43, 207, 215
 Nlebedim, I. 70, 157, 215, 247
 Nnaji, R. 162
 Noack, M. 190
 Noakes, M. 108, 209, 210
 Noebe, R. 135
 Noel-Hermes, N. 241
 Noell, P. 16, 57, 66, 156, 172
 Nogan, J. 23
 Nogita, K. 15, 65, 237, 238, 246
 Nolet, I. 68
 Noltensmeyer, J. 164
 Nomoto, A. 99
 Nomura, M. 224
 Noor E Sumaiya, S. 165
 Nordlund, K. 169
 Norkett, J. 240
 Norrish, C. 243
 Nosonovsky, M. 23, 100
 Nowak, B. 66
 Nowak, C. 224
 Nowell, M. 8
 Nozawa, T. 72, 147
 N P, R. 111
 Ntemou, E. 215
 N'Tsouaglo, K. 30
 Nuckols, L. 113
 Nuechterlein, J. 7
 Nuggehalli, R. 108
 Nunez, L. 209
 Nuñez, L. 209
 Nunez, S. 42
 Nworie, E. 246
 Nyarko-Appiah, J. 261
 Nyberg, E. 61, 83
 Nycz, A. 54, 82, 108, 132, 192, 209,
 210, 223
 Nygren, K. 26, 40, 51, 78, 105, 128,
 152, 169, 263
 Nykypanchuk, D. 251

O

Oaks, A. 22
 Obeng, Y. 187, 201
 Obiso, D. 147
 O'Brien, M. 36
 O'Brien, S. 174
 Ocegueda, E. 177
 O'Connor, A. 92
 Odagawa, K. 225
 Oddershede, J. 30, 36
 Odette, G. 152, 250, 265
 Odette, R. 81, 167

Odiachi, I. 182
 O'Donnell, K. 137
 Offenthaler, D. 96
 Ogata, M. 225
 Ogren, A. 27, 191
 Ogunseitán, O. 78
 Oh, C. 164
 O'Hern, C. 92
 Oh, H. 10, 44, 46, 70, 79, 97, 145
 Oh, I. 253
 Ohishi, Y. 213, 232
 Oh, J. 266
 Ohlhausen, J. 74, 75
 Ohm, S. 54
 Ohmura, T. 72
 Ohno, M. 235
 Ohodnicki, P. 9, 30, 57, 70, 86, 103,
 112, 136, 158, 171, 182, 215, 216
 Oh, S. 6, 10, 182
 Ohsaki, S. 257
 Oh, T. 165
 Ohta, M. 225
 Oikawa, K. 132
 Oishi, T. 262
 Oitabén, D. 161
 Ojeda Ledo, J. 104
 Ojeda-Mota, R. 36
 Ojha, A. 208
 Ojo, O. 249
 Okabe, T. 258, 262
 Okada, J. 230
 Okanigbe, D. 222, 234, 258, 261
 O'Kelly, P. 59
 Okosun, T. 151
 Okuda, H. 232, 246
 Okulov, I. 259, 264
 Okuniewski, M. 56, 213
 Okuno, Y. 223
 Okuyucu, C. 117, 184, 197
 Olaoluwa, D. 77
 Olaye, O. 249
 Olbinado, M. 93
 Old, A. 231
 Olds, D. 133, 190, 248
 O'Leary, D. 137
 Oleksak, R. 240
 Olevesky, E. 127
 Olevsky, E. 11, 32, 48, 59, 75, 88,
 102, 109, 126, 127, 133, 150,
 183, 204, 220, 221, 257
 Oleynik, I. 60
 Oliani, W. 196
 Oliveira Costa, U. 196, 197, 198
 Oliveira, J. 127, 132
 Oliveira, L. 232, 233
 Oliveira, M. 92, 185, 197
 Oliveira, T. 96
 Olivera Castillo, A. 232
 Oliver, C. 25

Oliver, W. 5, 24, 29, 52, 81, 119, 126,
 130, 186
 Olivetti, E. 50, 76, 77, 78, 103, 104,
 128, 151, 260, 262, 263
 Olivier, F. 214
 Olmsted, D. 121
 Olokun, A. 176
 Olsen, H. 61
 Olsen, J. 18, 41, 42, 96
 Olson, A. 146
 Olson, D. 93, 164
 Olson, G. 7, 21, 44, 71, 97, 99, 121,
 123, 131, 146, 166, 201, 248, 249
 Olsson, P. 30, 124
 Olsson, R. 86
 Olszta, M. 24, 129, 240, 253, 256
 Oltmanns, H. 222
 Olu, E. 182
 Olumor, I. 133
 Oluwafemi, S. 242
 Oluwasegun, K. 31
 Olvesky, E. 126
 Olynik, N. 167
 Omar, M. 172
 O'Masta, M. 32, 117
 Ombogo, J. 57, 89, 203
 Omonokhua, M. 117
 Omori, T. 255, 256
 Omorogbe, S. 182, 246
 Öner, I. 130
 Ong, J. 238
 Onovo, H. 162
 Onuguh, I. 182
 Onuki, Y. 74, 75, 153, 243, 266
 Onwukwe, U. 104
 Ophus, C. 33
 Opila, E. 119, 143, 164, 186, 239
 Opoku, E. 232
 Oppelstrup, T. 78, 93
 Oppenheimer, S. 64
 O'Quinn, E. 265
 Oraon, A. 197, 200
 O'Reilly, E. 206
 Oreski, G. 181
 Orikasa, K. 28, 87
 Orji, B. 162
 Orlov, A. 215
 Orlov, D. 30, 70, 166, 170
 Oros, T. 171
 Orozco-Caballero, A. 8, 97, 198
 Orr, J. 131
 Ortega Rojas, J. 210
 Ortiz, A. 227
 Ortiz, M. 34
 Osborn, C. 63
 Osborne, M. 6, 54, 82, 210
 Osbourne, M. 54
 Osetsky, Y. 218
 Osmanson, A. 15

- Ossa, A.35, 228
 Ossa Henao, E.86
 Ostashin, S.49
 Ostlind, A.69
 Ostormujof, T.74, 75
 Otabor, G.242
 Otis, R.37, 93, 175, 198
 Ott, C.36
 Ott, R.20, 43, 70, 84, 157, 247
 Ott, V.50
 Ouchi, T.24, 49, 104, 258, 262
 Oudriss, A.143, 239
 Ouisse, T.168
 Ou, J.226, 231
 Ouyang, F.238
 Ouyang, G.50, 128, 164
 Ouyang, M.133
 Overman, N.46, 248
 Ovri, H.207, 246, 264
 Owen, A.264
 Owen, L.64
 Owen, M.243, 251
 Owens, B.166
 Owens, C.16, 180
 Oyarzabal, I.157
 Oyatogun, G.31
 Oya, Y.250
 Øye, B.65
 Oyekeye, M.123
 Oyerinde, J.137
 Ozcan, B.155
 Ozcan, H.102
 Ozcan, S.49, 76
 Özçelik, G.184
 Özçetin, Y.36, 184
 Ozdogru, B.57
 Ozdogru, E.245
 Özen, Z.34, 184
 Ozerinc, S.62, 84, 172, 189
 Özerinç, S.184
 Ozkan, C.259
 Ozpineci, B.49
 Oztan, Y.60
 Ozturk, D.12
 Öztürk, D.265
- P**
- Pabarcus, L.73
 Paccou, E.167
 Pachauri, A.115, 199
 Pacheco, R.16, 212
 Pacquentin, W.82, 154
 Paddea, S.78
 Padilla Espinosa, I.100, 124
 Padilla, K.113
 Paesani, Z.149
- Pagan, D.6, 11, 33, 40, 57, 59, 72, 85,
 90, 105, 114, 120, 122, 132, 138,
 160, 174, 195, 223
 Page, D.12
 Pagone, E.78, 140
 Pakanati, A.231
 Palacios Beas, E.197, 198
 Pal, D.188
 Paldi, R.175, 264
 Palkowski, H.86, 89, 111, 135, 157,
 182, 214
 Pallai, R.209
 Palm, E.95
 Palmer, T.166
 Palm, F.212
 Pal, R.91
 Pal, U.26, 30, 98, 105, 140, 213
 Palumbo, A.20, 70
 Pambaguian, L.82, 192
 Panagiotopoulos, N.230
 Panagiotopoulou, V.228
 Panat, R.4, 25, 28, 49, 62, 76, 103,
 156, 190, 193, 258, 259
 Panchal, Y.99
 Panda, E.217
 Panda, R.261, 262
 Panda, S.222
 Pandey, P.91
 Pandey, A.9, 22, 30, 31, 45, 57, 58, 59,
 72, 86, 112, 125, 136, 149, 158, 168,
 182, 203, 215, 216, 217, 253
 Pandey, K.227, 266
 Pandey, N.197
 Pandoli, O.243
 Pang, E.94
 Pang, H.183, 226
 Pang, Q.24, 247, 256
 Panindre, A.218, 239
 Panov, A.49, 226
 Pan, Q.61, 113
 Pan, S.34, 84
 Pantawane, M.209, 228, 237, 239, 256
 Pantleon, W.8, 30, 56, 85, 108, 111,
 135, 156, 170, 172, 214, 260
 Pant, N.52
 Panton, B.101
 Panuganti, S.252
 Pan, W.206
 Panwisawas, C.210, 236
 Pan, Y.179
 Pan, Z.239
 Papanikolaou, M.140
 Papenberg, N.70, 122
 Papham, T.131, 136
 Parab, N.57, 89, 97, 210
 Paradise, P.82, 172
 Paradis, L.11
 Parai, R.220
 Parakh, A.35, 45
- Paramore, J.7, 48, 52, 55, 83, 109, 114,
 132, 133, 137, 188, 193, 211, 257
 Parande, G.100
 Paranjape, H.170
 Paranthaman, M.207
 Parashar, M.215, 255
 Paras, J.9, 203
 Pardhasaradhi, S.29, 186
 Paredis, C.114
 Pareige, P.99, 202
 Parent, L.136
 Parganiha, D.193
 Parida, S.90, 101
 Parikh, C.221
 Parish, C.167
 Parivendhan, G.198
 Park, A.237, 244
 Park, c.256
 Park, C.69, 92, 127, 237
 Park, D.252
 Park, E.116, 230
 Parker, C.25, 248
 Parker, D.157
 Parker, J.236
 Parker, S.56, 122, 201, 245
 Parkes, N.25
 Park, G.212
 Park, H.38, 65, 68, 94, 119, 188, 224
 Parkin, C.148
 Park, J.40, 78, 113, 120, 126, 182, 216,
 228, 266
 Park, K.182
 Park, M.266
 Park, N.219
 Park, S.5, 212, 219, 266
 Parks, D.97
 Parks, G.179
 Park, Y.182, 215, 253, 262
 Parmar, A.209
 Parnlasarn, N.91
 Parra, D.196
 Parry, M.251
 Parsa, A.141
 Parson, N.227
 Parsons, E.23
 Partanen, J.266
 Parween, R.261, 262
 Parzer, M.12, 60
 Pasco, C.256
 Pascual-González, C.31
 Pascuii, A.13
 Pasebani, S.53, 211
 Pasini, D.265
 Pastor, J.202
 Pataky, G.16, 40, 67, 95, 120, 156, 240
 Patel, S.14
 Patel, Y.27
 Patel, Z.172
 Pate, M.85

Pathak, D	262	Peralta García, Z	198	Philips, N	162
Pathak, S	44, 87, 139, 148, 167, 252	Perander, L	4	Philipson, H	103
Pathare, P	53	Perea, D	240, 265	Phillion, A	34, 61, 91, 139, 184, 226, 227
Patil, C	138	Pereira, A	197	Phillips, B	192
Patki, P	42, 242	Pereira, C	214	Phillips, N	161
Patra, A	123, 244	Perepezko, J	76, 128, 161, 164	Phillips, Z	74
Patriarca, L	218	Perera, D	139	Phukan, H	105
Patrick, J	74	Peres, P	194	Piash, K	103
Pattamatta, S	219	Pereviznyk, O	190	Piatko, C	34
Pattammattel, A	133	Perez-Badillo, E	256	Picak, S	13, 56
Patte, R	150	Perez, D	60, 123, 175	Picard, D	237
Patterson, B	13	Peréz-Labra, M	196	Picard, E	69
Paudel, B	109, 211	Pérez Labra, M	197, 198, 221	Pichler, C	263
Paudel, Y	97, 156, 193	Pérez-Labra, M	232	Piedmont, D	178
Paudyal, D	70, 157	Perhach, C	201	Pierce, D	97, 176, 177
Paul, B	190, 211	Pericleous, K	37, 61, 63, 64, 147	Pierron, O	19, 243
Paul, K	112	Perimenis, A	50	Pierson, T	180, 192
Paul, M	17	Perlepe, P	157	Piette, T	17
Paul, S	79	Pero, B	21	Piglione, A	254
Paulson, N	234	Perrière, L	256	Pikul, J	74, 79
Paul, T	23, 84, 87, 112	Perriman, A	106	Pilania, G	34
Paulus, R	237	Perrin, S	80	Pilchak, A	40, 47, 156, 208
Pauza, J	107, 210	Perriot, R	85	Pillai, R	243
Pavel, M	186	Perron, A	32, 37, 84, 132, 155, 187	Pilsniak, A	107, 189
Pavlov, T	8, 29, 56, 71, 85, 110, 134, 194, 213	Perry, J	221	Pimblott, S	20
Pawlikowski, G	75	Perry, M	133	Pineda, E	229
Payno, D	112, 157	Persson, K	19, 42	Pingin, V	127
Payton, E	24, 47, 59, 74, 75, 102, 126, 149, 150, 168, 203, 255, 256	Persson, M	68	Ping, Y	119
Payton, J	94	Perumal, V	83, 95	Pinheiro, V	196, 197
Paz y Puente, A	41	Pesci, R	214	Pinney, P	56
Paz Y Puente, A	73, 101, 149, 254	Pešicka, J	173	Pinomaa, T	135
Pecharsky, V	20	Peters, E	49	Pino Munoz, D	195
Pechimuthu, D	36	Peterson, A	14	Pino Muñoz, D	195
Pedersen, K	157	Peterson, E	177	Pint, B	209, 238, 248, 250
Pedersen, S	76	Peterson, N	126	Pinter, G	181
Pedersen, T	122	Pethica, J	5	Pinto, D	234
Pedroti, L	197, 233	Pethö, L	45	Pinto, J	247
Pegues, J	54, 107, 132, 173	Petrash, S	182	Pintsuk, G	250
Pei, G	147	Petrella, A	146	Pippan, R	260, 266
Pei, Z	121, 218	Petrie, C	251	Pires, M	75
Pekala, M	34	Petry, W	213	Pirling, T	155
Pek, E	110	Pettifor, N	66	Pirovano, R	231
Pelegri, A	153, 199	Pfefferkorn, F	5, 104, 239	Pistorius, P	6, 9, 68, 133
Pena, R	42	Pfeffer, M	257	Pitthan, E	215
Peng, F	48	Pfizenmaier, P	76	Pityana, S	127
Peng, H	24, 49, 104, 258, 262	Pham, H	216, 228	Pizzolato, N	39
Peng, J	30, 45, 219	Pham, M	22, 45, 72, 125, 149, 168, 203, 212, 253, 254	Plaisted, T	232
Peng, P	101	Phan, H	200	Plamthottam, R	256
Peng, R	208	Phani, P	126	Platunov, M	157
Peng, S	201	Phani Pardhasaradhi, S	119	Plikas, T	96
Peng, X	205, 224	Phan, N	17, 165	Plocinska, M	259
Peng, Y	249	Phan, T	6, 72, 171	Plotkowski, A	14, 37, 64, 67, 93, 185, 207, 208, 209, 212, 221, 224, 235, 248, 254
Peng, Z	13, 28, 36, 63, 92, 117, 130, 161, 179, 196, 205, 206, 231, 232	Pharr, G	5, 29, 119, 125, 153, 167, 170, 181, 186, 189, 237	Plumeri, J	184
Penick, C	35, 116	Pharr, M	81	Plummer, G	72, 142
Penn, R	105	Phatak, C	136	Plunkett, A	150, 170
Penso, J	145	Phatti - Satto, K	262	Pocquette, N	239
		Phelps, D	66		

- Podany, P.188
 Podder, P.24
 Podlousky, R.12
 Poerschke, D.33, 105
 Po, G.195
 Pogatscher, S.87, 255
 Pogue, E.34
 Poirier, S.161, 263
 Pokharel, R.59
 Polak, J.17
 Polák, J.17
 Polak, M.107, 189
 Polasik, A.46
 Polat, B.130
 Polatidis, E.28
 Polcik, P.214, 221
 Pole, M.24, 33, 39, 255
 Policandriotes, T.126
 Poling, W.40
 Pöllmann, H.81
 Pollock, T.19, 36, 40, 42, 47, 57, 64, 66,
 67, 69, 82, 94, 98, 113, 114, 137, 141,
 149, 162, 174, 192, 211, 240, 244, 254
 Polonsky, A.58, 114, 135
 Polovnikov, V.237
 Polsin, D.142
 Polsky, W.36
 Polycarpou, A.148
 Pomeroy, J.177
 Pommerenke, H.44
 Pomorski, T.5
 Pondick, J.68
 Ponge, D.222
 Ponnambalam, V.60, 154
 Pontikes, Y.260
 Poole, L.119, 237
 Poole, W.227
 Poon, J.31, 119, 149
 Poorganji, B.7, 56, 84, 109, 133, 155,
 193, 211, 212
 Popelar, C.95
 Poplawsky, J.32, 64, 88, 126, 135, 159,
 167, 208, 209, 211, 214, 243, 254, 256
 Popoola, A.261
 Popoola, O.261
 Popoola, P.127
 Popovich, A.193
 Popovich, V.193
 Popov, M.234
 Porfyarakis, K.4, 28
 Porro, J.173
 Porro, M.209
 Porter, D.13, 35, 59
 Porter, III, J.40
 Porter, K.32
 Potocnik, V.151
 Pottore, N.145
 Poudel, A.95, 118
 Poudel, N.217
 Poulain, R.222
 Poulsen, H.18, 166, 172, 214
 Pourfallah, H.42
 Pourroy, G.86, 89
 Povoden-Karadeniz, E.235
 Povstugar, I.250
 Powell, A.24, 26, 50, 70, 76, 98, 103,
 105, 111, 136, 141, 143, 147, 189,
 213, 260
 Powell, C.24, 47, 168, 253, 256
 Pownceby, M.262
 Prabhakaran, R.147, 250
 Prabhakaran, V.165, 189
 Prabhu, N.111, 219
 Pradeep, K.254
 Pradhan, S.91
 Prakash, V.164
 Prakas, V.164
 Prasad, A.240
 Prasad, K.108
 Prasanth, A.231
 Preisler, D.48, 109, 196, 222, 266
 Prendergast, D.233
 Prentice, D.152
 Prentice, P.4
 Presbitero, G.35
 Present, S.131
 Preston, A.261
 Preuss, M.213, 214
 Price, S.144, 203
 Prichard, P.7, 55, 83, 109, 133,
 193, 211
 Priedeman, J.69
 Prikhodko, S.114, 215
 Prima, F.33, 89, 137, 222, 231
 Prime, M.94
 Primetzhof, D.215
 Primig, S.254
 Prince, M.68, 242
 Pringle, R.45
 Prionto, F.203
 Prithivirajan, V.212, 236
 Prithiv, T.222
 Priyadarshi, A.61, 150
 Prochazka, R.188
 Prokhorenko, M.190
 Prorok, B.83, 155, 195
 Proschel, A.208
 Provatas, N.234
 Pruitt, L.17
 Pruyne, N.9
 Puchala, B.19, 43
 Puckett, R.54, 107, 173
 Puente, A.149
 Puente Orench, I.155
 Puentes, B.180
 Pugh, S.92
 Puide, M.251
 PU, J.198
 Pujari, A.41
 Puri, S.11, 22, 24, 31, 33, 45, 47,
 58, 59, 72, 74, 75, 90, 102, 114, 125,
 126, 138, 149, 150, 160, 168, 174, 182,
 195, 203, 217, 223, 253, 255, 256
 Pusceddu, F.196
 Pusch, K.82, 192, 211
 Pusko, M.125
 Pustogow, A.12
 Putman, J.199
 Pyka, G.55, 154, 167
- ## Q
- Qian, B.89
 Qian, D.240
 Qiang, Y.45
 Qian, M.48, 70, 257
 Qian, X.18, 42, 69, 97, 121, 145, 165,
 187, 242, 243
 Qian, Y.250
 Qiao, T.185
 Qi, J.119, 149
 Qi, L.10, 18, 42, 44, 69, 78, 97, 121,
 137, 145, 162, 165, 187, 242, 243, 257
 Qin, B.258
 Qing, G.205
 Qin, L.28, 61, 87
 Qin, M.257
 Qin, Q.203
 Qinxian, L.262
 Qin, Y.224
 Qiu, A.243
 Qiu, D.145
 Qiu, J.129
 Qiu, R.39
 Qiu, Z.205
 Qi, Z.39, 147, 202
 Qorbani, M.225
 Quadir, S.225
 Quammen, R.164, 203
 Quan, H.13
 Qu, D.246
 Queylat, B.106, 153, 219
 Que, Z.266
 Qu, H.66
 Quigley, L.137
 Quillin, K.251
 Quine, C.198
 Quinn, L.61, 88
 Quinn, T.154
 Quintana, M.137
 Quirarte, G.134
 Quiroga-Arias, J.35
 Quirós, D.202
 Quispe Cardenas, L.199
 Qu, J.33
 Qu, M.57, 83, 133
 Qu, R.230

Qureshi, A. 239
 Qu, X 48, 257

R

Raab, A. 266
 Raabe, D. 81, 97, 222, 243, 264
 Raab, G. 266
 Raab, S. 152
 Rabago, L. 227
 Rabbi, I. 54
 Rabbi, M. 232
 Rabiei, A. 253
 Rack, A. 55, 93, 108, 109
 Rack, P. 137, 158, 217, 218
 Rackwitz, J. 145
 Rader, K. 245
 Radhakrishnan, B. 211, 224, 243, 256
 Radhakrishnan, J. 110, 171
 Radhakrishnan, M. 54, 63
 Radhakrishnan, V. 107, 177
 Radiguet, B. 99, 202
 Radin, M. 42
 Radon, A. 107
 Radonjic, M. 77, 162, 233
 Radovic, M. 88, 168
 Rae, C. 64
 Raeker, E. 192, 211
 Rafailov, G. 132
 Rafferty, B. 198
 Ragan, R. 86, 144, 165
 Raghavan, K. 112, 215
 Raghavan, N. 209
 Raghavan, R. 141
 Raghupatruni, P. 209
 Rahbar, A. 35
 Rahman, M. 4, 187, 210
 Rahn, T. 56
 Raiman, S. 20, 43, 70, 80, 98, 106,
 122, 129, 146, 152, 169, 186,
 201, 204, 247, 248, 265
 Raisor, E. 221
 Raj, A. 155
 Raja, A. 197
 Rajagopalan, J. 22, 45, 72, 106, 125,
 149, 168, 203, 253
 Rajagopalan, R. 11
 Rajagopal, N. 180
 Rajala, P. 241
 Rajan, K. 32, 87, 104
 Rajan, T. 100
 Rajendran, R. 16, 180
 Rajgopal, V. 215
 Raji, M. 49
 Rajpoot, D. 36
 Raj, R. 196
 Raju, K. 248
 Raju Natarajan, A. 69
 Rakita Shlafstein, Y. 113

Rakoczy, L. 187
 Rakotondramanana, L. 227
 Ralf, D. 19
 Ralls, A. 221
 Ramakrishna, G. 238
 Ramamurthy, U. 7, 53, 110, 113, 171, 230
 Raman, A. 77
 Ramana, C. 215
 Ramanathan, A. 242, 247
 Ramanujan, R. 7, 208
 Ramasawmy, V. 251
 Ram, D. 220
 Rame, J. 14, 38, 64, 94, 118, 141, 162,
 186, 235
 Ramesh, K. 15, 94, 119, 126, 184, 186,
 236, 237
 Ramesh, R. 231
 Ramgopal, T. 82
 Ramirez, A. 6, 54, 82, 146, 210
 Ramirez-Chavez, I. 51
 Ramirez Grijalba, H. 48
 Ramli, M. 238
 Ramm, J. 11, 215
 Ramos, E. 92, 129, 170
 Ramos, K. 142
 Ramprasad, R. 237
 Rampyapedi, K. 41
 Ramstein, G. 220, 223, 243
 Ranaiefar, M. 212
 Randall, C. 11
 Randall, N. 168
 Rane, K. 23
 Rangari, V. 86, 183, 185
 Ranga, S. 134
 Rangel, E. 229
 Ranjan, S. 23
 Rao, A. 240
 Rao, H. 5, 192
 Rao, J. 148, 207
 Rao, M. 205
 Rao, P. 54, 83, 95
 Rao, S. 90
 Rao, V. 151
 Rao, Y. 69
 Rao Yarasi, S. 38, 108, 192
 Rappaz, M. 116
 Rappleye, D. 122
 Rashed, H. 203
 Rasti, B. 192
 Rateau, L. 243
 Rathod, H. 168
 Rat, L. 38
 Ratto, C. 34
 Raturi, A. 245
 Ratvik, A. 4, 127, 151, 257
 Rauch, H. 75, 83, 153
 Rausch, J. 154
 Ravaji, B. 244
 Ravel, B. 182

Ravi Chandran, K. 114
 Ravikumar, S. 73
 Ravindra, N. 4, 25, 28, 31, 49, 58, 76,
 86, 103, 111, 135, 157, 181, 182,
 190, 206, 214, 215, 217, 258, 259
 Ravindran, S. 244
 Ravi, P. 40
 Ravi, S. 243, 252
 Ravi, V. 20, 107, 119, 143, 164, 180,
 186, 239
 Rawlings, A. 134, 172, 203
 Raymond Herrera, O. 220
 Ray, P. 43, 58
 Razavi, M. 180
 Razmi, J. 132, 193
 Razumovskiy, V. 234
 Ready, W. 21
 Reali, L. 99
 Rebak, R. 16, 21, 39, 66, 95, 119, 143,
 165, 187, 221, 239, 240, 251
 Recnik, S. 226
 Reddy, R. 248, 249
 Redel, E. 201
 Redwing, J. 41
 Reece, C. 33
 Reed, P. 118
 Reed, R. 56, 134
 Reek, T. 228
 Rees, D. 48, 123
 Reese, C. 125
 Reeve, S. 12, 34, 60, 90, 115, 138, 160,
 195, 223, 224, 244, 248
 Regmi, A. 96, 120
 Rehman, I. 220
 Reich, S. 262
 Reid, A. 234
 Reid, N. 202, 251, 260
 Reina, C. 223
 Reinhard, D. 13
 Reinmüller, M. 151
 Reiser, W. 228
 Reis, L. 232
 Reis, R. 197
 Reiss, R. 229
 Rekha, M. 192
 Rementería, R. 255
 Remington, B. 38, 65, 94
 Ren, C. 216
 Rencheck, M. 76
 Ren, F. 52
 Ren, J. 32, 166
 Ren, K. 192
 Renk, O. 266
 Ren, Q. 135, 214, 243
 Rentería, C. 228
 Renuka Balakrishna, A. 57, 70, 86, 247
 Ren, W. 205, 233
 Ren, Y. 40, 205, 206, 216, 240, 249
 Ren, Z. 153, 192

- Reshetnyak, O.190
 Restrepo, D.13, 27, 35, 61, 91, 115,
 139, 196, 228, 265
 Reticcioli, M.12
 Reuban, A.250
 Reu, P.16
 Reusch, F.188
 Reuter, M.77, 104, 128, 147, 151
 Reverdy, M.151
 Reyes Cruz, V.221
 Reyes-Cruz, V.196, 232
 Reyes Domínguez, I.197, 198
 Reyes Pérez, M.197, 198, 221
 Reyes-Pérez, M.196, 232
 Reynaud, C.133
 Reynolds, Q.18, 41, 68, 96, 105, 242
 Reynolds, W.117
 Reza, A.161
 Reza-E-Rabby, M.139, 227
 Rezaie, A.188
 Reza, M.71
 Rezvan, A.184
 Rezwani, A.22, 57
 Rhamdhani, A.179
 Rhamdhani, M.231
 Rhee, H.75, 97, 143, 156, 193
 Rhein, R.171
 Rhodes, E.7
 Ribeiro, A.96
 Ribeiro da Cruz, J.89
 Ribeiro, J.233
 Ribeiro, M.197, 198
 Ricciardi, D.59, 102
 Riche, H.39
 Richer, T.227
 Richter, A.122, 147
 Richter, N.121, 175
 Rickman, J.10
 Rida, A.90, 219
 Ridley, M.164
 Riechers, B.230
 Riedemann, T.48, 167
 Riedl, H.11, 221
 Riedl-Tragenreif, H.215
 Riegler, S.218, 229
 Rielli, V.254
 Riemann, J.7, 108, 199
 Riensche, A.54, 83, 95
 Riesch, J.250
 Rietema, C.89, 97
 Rieth, M.250
 Rifat, M.156
 Riffaud, F.161
 Rigal, E.219
 Righi, G.38, 65
 Riley, P.215, 217
 Rincon, B.16
 Rincon Troconis, B.16, 39, 66, 238, 239
 Rinehart, S.36
 Ringdalen, E.77, 104
 Ringer, S.158
 Rinko, E.43, 107, 131, 154, 171,
 191, 207
 Rios, O.7, 43, 56, 84, 109, 133, 155,
 193, 211, 212
 Rippy, K.70, 201
 Riss, A.12, 60
 Rist, S.103
 Ritchie, R.13, 14, 17, 22, 26, 27, 44, 51,
 71, 79, 88, 99, 106, 124, 129, 148, 169,
 177, 191, 202, 230, 251, 252, 264, 265
 Ritchie, S.156
 Rivas-Lopez, D.256
 Rivera, M.200
 Rivera, R.96
 Rix, J.30, 140
 Rix, S.38
 Rizzo, F.243
 R., J.63
 Roach, C.72
 Robbes, A.194
 Robelin, C.261
 Robert, M.133
 Roberts, C.138
 Roberts, D.63
 Robertson, A.34, 160
 Robertson, I.128
 Robertson, K.11
 Robertson, S.98
 Roberts, S.136, 175, 215
 Robichaud, P.63
 Robincheck, J.40
 Robin, I.250
 Robino, C.74, 75
 Robinson, T.167, 190
 Robles, G.200
 Robson, J.256
 Rocha, D.232
 Rocha, L.229
 Rocha, S.232
 Rochet, N.214
 Rock, C.202
 Rodd, L.68
 Rodelas, J.66, 74, 75
 Rodgers, B.47
 Rodgers, T.54, 55, 181
 Rodney, D.121, 219
 Rodrigues, D.237
 Rodrigues-Lamas, R.214
 Rodriguez Aseguinolaza, I.173
 Rodriguez, B.157
 Rodriguez de Vecchis, P.131
 Rodriguez, E.202
 Rodriguez-Ibabe, J.145
 Rodriguez-Lamaz, R.134
 Rodriguez, S.54
 Roebuck, B.236
 Roehling, J.47
 Rogalev, A.157
 Rogers, S.47
 Roger, T.227
 Rohatgi, A.24, 245
 Rohatgi, P.23, 46, 73, 100, 125, 253
 Rohrer, G.166, 188
 Rohr, T.79, 109
 Roiban, L.264
 Rojas, J.189, 251
 Rokkam, S.16, 39, 66, 95, 119, 143,
 164, 165, 186, 187, 239, 240
 Rolchigo, M.224, 248
 Rollett, A.6, 11, 33, 38, 40, 59, 63,
 85, 90, 95, 102, 105, 107, 108, 114, 120,
 133, 138, 160, 174, 192, 195, 210, 223
 Romaner, L.25, 234, 266
 Romanovskaia, E.129, 181
 Romedenne, M.133, 238, 250
 Romero, I.90
 Romero, P.196
 Romero-Serrano, J.232
 Rommel, S.45, 126
 Romnes, C.53, 76, 139, 184
 Ronchi, M.143
 Rondinelli, J.119, 256
 Rong, Y.192
 Ronne, A.27
 Roosendaal, T.227, 231, 246, 256
 Root, J.234
 Roper, C.55, 66
 Rørvik, S.65, 127
 Rosales, J.22
 Rosa, M.79
 Roscioli, G.44, 66, 166
 Rose, D.34
 Rosefort, M.34, 91, 188
 Rosenberger, A.40
 Rosenberg, S.66
 Rosenkilde, C.91
 Rose, P.122
 Rose, T.90
 Rossi, E.81, 126, 130, 167
 Rossi, J.264
 Rossin, J.82
 Ross, J.135
 Ross, K.5, 39, 188, 239
 Rosso, M.231
 Rossy, A.54
 Rostamian, A.116
 Rota, A.211
 Rotella, J.78
 Roth, P.85, 99
 Roth, R.78
 Rottler, J.234
 Rottmann, P.107, 164, 172, 203
 Roue, V.17, 118
 Roumina, R.36, 125
 Rouzières, M.157
 Rovný, O.61

Rowenhorst, D30, 125
 Rowe, R15
 Roy, A31, 32, 159, 162, 174, 181, 207
 Royer, F82
 Roy, I32, 58
 Roy, S33, 54, 82, 132, 192, 201, 209, 210
 Rozak, G25
 Roze, J155
 Rozman, K235, 240
 R, R200
 Ruan, S258
 Ruban, A12, 266
 Rubenchik, A210
 Rubinson, K120
 Rubiolo, G202
 Ruckh, E55
 Rudawski, N46
 Rudd, R13, 38, 93, 236
 Rudra, K189
 Rudyk, B190
 Rueda, M29
 Ruel, L237
 Ruestes, C38, 65
 Ruffo, L35
 Rugg, D72, 120
 Runnels, B18, 27
 Rupert, J21
 Rupert, T88, 121, 124, 145, 242
 Rupp, M174
 Rusch, J17
 Rushing, T46
 Rushton, M29, 124, 136, 148, 243, 251
 Russell, K121
 Russell, T156
 Ruta, B229
 Rutherford, A48
 Rutherford, M70, 147, 189
 Ruth, R8
 Ruzzene, M79
 Ryabov, D139
 Ryan, A79
 Ryan, K36
 Ryel, B259
 Rygier, T259
 Ryland, K180
 Ryou, K193
 Ryter, J78
 Ryu, C230
 Ryu, Y222
 Rzepa, S53

S

Saal, J7, 19, 43, 56, 84, 109, 133, 155, 193, 211, 212, 244
 Sabau, A12, 34, 60, 90, 115, 123, 138, 147, 160, 190, 195, 209, 214, 223, 249
 Sabbah, A225

Sable, P15
 Sablosky, E49
 Sabolsky, E49
 Saboo, A7, 16, 131
 Saccone, M110, 155
 Sachan, R31, 58, 182, 192, 217
 Sack, H138
 Sadayappan, K61
 Sadeghilaridjani, M39, 155
 Sadeghi, O53
 Sadiq, R127
 Sadler, B35
 Sadler, E201
 Sadoh, A157
 Sadoway, D77
 Sadowski, J87
 Sadri, F258
 Saedi, S131
 Saeed, M68
 Sægrov-Sorte, B152
 Saeidi, A78
 Saeidi, S89
 Saengdeejing, A234
 Saevardottir, G151, 161, 227
 Sævardóttir, G18, 127
 Saffarian, S112
 Sagadin, C96
 Sagapuram, D164, 186
 Sagdiç, S184
 S A, H111
 Saharan, A17
 Sahariah, B265
 Sahin, H140
 Sahoo, K201
 Sahragard-Monfared, G23, 46, 136, 254
 Sahu, B8, 167
 Sahu, H237
 Sahu, P227
 Said, A162
 Saida, J230
 Saimoto, S227
 Saini, P230
 Saini, R165
 Sainju, R71
 Saito, J233
 Saito, N9, 57, 87, 112, 194, 216
 Saito, T211
 Saiz, E51, 171
 Sajjadpour, H179
 Sajl, S28
 Sakane, S235
 Sakano, M176
 Sala Casanovas, M105
 Salado, M112
 Salas, D102, 173
 Salas Mula, D56
 Šalata, K196

Salazar, D20, 135, 157, 173, 215
 Saldana, C21, 211
 Saleh, M62, 103, 253
 Saleh, T22, 44, 112, 126
 Salem, A208
 Salem, D180
 Salgado, M116
 Salloom, R33
 Salloum-Abou-Jaoude, G116
 Salloum-Abou-Joude, G150
 Salmi, M266
 Salonitis, K78, 140
 Salvador, H70
 Salvador, P188
 Salzbrenner, B154
 Samaha, S63
 Samajdar, I244
 Samanta, A37, 155, 231
 Samateh, A188
 Sameezadeh, M171
 Samin M V, A254
 Samolyuk, G37
 Sampath, S66, 89, 214, 221
 Samson, J161
 Samuel, A119
 Samuelsen, S78
 Samuha, S200, 225
 Samwer, K175, 229
 Sana, H140
 Sanchez, F215
 Sanchez, J86
 Sanders, C171
 Sandhage, K159
 Sandnes, E91
 Sangid, M30, 40, 78, 111, 118, 131, 185
 Sangster, A17
 Sani, R180
 Sankaranarayanan, S160, 234
 Sankaran, R256
 Sankar, J215, 247
 Sankar, K44, 71, 181
 San Marchi, C26, 66, 82
 San Martin, D255
 Sansoucie, M59
 Sansoz, F45, 69
 Sant'Ana, M183, 197
 Santangelo, D39, 65
 Santerre, R227
 Sant, G152, 202
 Santiago, P86, 144
 Santodonato, L32, 37
 Santos da Luz, F196, 198
 Santos Macias, J132, 135, 154
 Santos, P119
 Sanyal, O103
 Sanz-Matias, A233
 Sao Joao, S29
 Saptarshi, S202

Saputo, J.	66	Scarsella, A.	226	Schreiber, M.	146
Sarac, B.	184	Schaaf, P.	218	Schrieber, D.	60
Sarebanzadeh, M.	97, 198	Schaedler, T.	32	Schrier, J.	43
Sargeant, D.	111, 139	Schaeffer, B.	82, 209, 210	Schrock, D.	119
Sargent, N.	108	Schaffar, G.	52	Schrodj, G.	111
Sari, I.	34, 184	Schaffer, J.	203, 247	Schroer, L.	15
Sariturk, D.	117, 184, 197	Schaffer, S.	130	Schroers, J.	36, 88, 92, 175, 184, 229
Sarkar, A.	191, 207, 215	Schaller, R.	66, 95, 188	Schubert, H.	166
Sarkar, K.	4	Schanche, T.	231	Schubert, T.	168
Sarkar, M.	111	Schaper, D.	56	Schuessler, B.	248
Sarkar, S.	206, 216	Schaper, M.	208, 211, 222, 231	Schuette, C.	244
Sarkar, Z.	139	Scharf, T.	46	Schuh, C.	25, 48, 69, 94, 145, 152, 164, 168
Sarker, D.	109	Schäublin, R.	62	Schuler, T.	202, 224
Sarker, S.	88	Scheel, M.	132	Schulli, T.	214
Sarkis-Martins, M.	141	Scheiber, D.	234, 266	Schulte, M.	128
Sarntinoranont, M.	180	Scheiblehner, D.	96	Schultz, B.	75
Sarrasin, A.	82	Scheifers, J.	199	Schulz, M.	41
Sarswat, P.	24	Scheiner, S.	229	Schumacher, P.	81
Sasaki, T.	19, 237	Schell, N.	189, 199	Schunk, P.	254
Sasaki, Y.	262	Schenter, G.	212	Schuster, F.	48, 82, 154
Satapathy, D.	173, 197	Scheunis, L.	188	Schwab, F.	150
Satko, D.	208	Schindelholz, E.	57, 66, 238	Schwaebe, B.	78
Sato, E.	213	Schlatmann, R.	77	Schwaiger, R.	153
Sato, H.	225	Schleife, A.	12	Schwalbach, E.	43, 55, 210, 212, 248
Sato, M.	266	Schlereth, C.	66	Schwarting, M.	9
Sato, N.	226	Schley, R.	213	Schwen, D.	44, 134, 146
Sato, S.	243	Schluetter, R.	64	Schwiedrzik, J.	139
Sato, Y.	121	Schmalbach, K.	100, 105, 153	Scime, L.	134
Satyanarayana, N.	123	Schmid, E.	195	Sconyers, D.	17
Sauceda, D.	50	Schmid, F.	255	Scott, A.	45
Saucedo-Muñoz, M.	256	Schmid, K.	123	Scott, E.	233
Saucier, R.	56	Schmidl, J.	96	Scott, M.	202
Saud, N.	238	Schmidt, F.	129	Scott, S.	191
Sau, M.	52	Schmidt, J.	45	SC, S.	135
Saunders, A.	119, 164, 236	Schmied, F.	129	Scully, J.	23, 32, 119, 129, 149, 181, 218
Saunders, B.	48, 55, 108	Schmiedt-Kalenborn, A.	40	Scuseria, T.	166, 177
Saunders, C.	62, 63, 98, 175, 198	Schmitt, M.	100, 176	Sdrenka, S.	111
Sauni Camposano, Y.	218	Schmuck, K.	25, 222, 253, 266	Seal, S.	58, 179, 180
Saury, D.	232	Schnall, M.	84, 122	Sease, E.	170
Sauzay, M.	202	Schneider, A.	31, 35, 45, 161, 251	Sebastiani, M.	81, 126, 130, 167
Savage, D.	8, 100, 111	Schneider, E.	141	Sebastian, J.	16, 21
Saville, A.	47, 55, 137	Schneider, G.	150, 170	Sebeck, K.	121, 176
Savitzky, B.	33	Schneider, H.	250	Sediako, D.	34, 221
Savoy Polack, E.	202	Schneider, M.	8, 152, 177	Sedlar, T.	7
Savvakini, D.	114	Schneiderman, B.	87, 136	Seede, R.	193
Sawada, M.	245	Schneider, S.	93	Seeley, M.	21
Sawalkar, S.	266	Schnelle, J.	188	Seely, D.	16
Saxena, A.	82, 172	Schniepp, H.	13, 35, 61, 91, 115, 139, 196, 228	Seeterlin, J.	11
Saxena, P.	140	Schoell, R.	80, 106, 129, 152, 169, 202, 204, 265	Seetharaman, S.	198
Saxena, R.	94, 118	Schoenenung, J.	165	Seffens, R.	231
Sayeed, H.	34	Schoenung, J.	31, 32, 45, 50, 56, 59, 73, 77, 78, 88, 100, 109, 121, 125, 155, 157, 171, 197, 203	Seguin, M.	263
Scaiano, J.	241	Scholz, F.	36, 37	Segurado, J.	150
Scampone, G.	140	Schorne-Pinto, J.	248	Sehitoglu, H.	22, 67, 78, 243
Scannapieco, D.	107, 131	Schott, F.	247	Seibert, R.	213
Scarlat, R.	20, 42, 43, 44, 70, 80, 98, 106, 122, 129, 146, 152, 169, 201, 204, 247, 248, 265	Schreiber, D.	69, 129, 152, 265	Seidman, D.	133
Scarpa, F.	27, 51, 79, 106, 191, 265			Seidt, J.	94
Scarponi, J.	136			Seifi, M.	53, 81, 107, 131, 154, 171, 192, 208, 212

Seif, M	52	Shakhmatov, V	127	Shibata, H	9, 57, 87, 112, 194, 216, 217
Seiner, H	48	Shakoor, A	135	Shibutani, H	233
Seita, M	48, 155, 193, 208, 212, 213	Shamberger, P	26, 77, 173	Shibuta, Y	42
Sekban, T	140	Shamsaei, N	17, 53, 75, 81, 95, 107, 118, 131, 133, 154, 159, 171, 192, 208	Shie, K	238
Seker, E	129	Shamsolhodaei, A	101	Shield, J	43, 54, 86, 197
Seligmann, B	153	Sham, T	178	Shields, J	187
Selim, F	129	Shanbhag, S	165	Shifler, D	10
Selvamanickam, V	177	Shangchao, D	258	Shih, M	17, 78
Semenchenko, L	237	Shang, H	258	Shih, T	219
Semiati, L	27, 52, 59, 80, 106, 129, 153, 170, 191, 265, 266	Shang, S	198, 234, 248	Shi, J	213
Sen, A	213	Shang, W	205	Shi, K	261
Senanu, S	127, 151	Shang, Z	28, 56, 169, 251	Shi, M	262
Sen-Britain, S	39, 66, 80	Shankar, K	231	Shimada, M	250
Senck, S	122	Shankar, S	61	Shima, H	243
Sengupta, D	32, 87	Shank, J	102	Shimanskii, A	161
Senkov, O	31, 88, 113, 127	Shanks, K	30, 57, 122	Shimizu, K	246
Senninger, O	123	Shannon, D	21	Shim, J	228
Senol, K	236	Shao, L	72, 146, 147, 178, 251	Shimoyama, Y	258
Seno, R	226	Shao, M	55	Shin, D	254
Senor, D	251, 265	Shao, S	75, 95, 118, 131, 133, 159, 171	Shinde, M	51
Senthilnathan, A	223, 224, 234	Shao, Y	88	Shinde, P	249
Senyuta, A	226	Shapeev, A	93	Shinde, V	221
Seo, J	38, 108, 192	Shapovalov, K	251	Shin, H	188
Seol, J	212, 219, 235, 254, 266	Sharar, D	208	Shin, J	47, 200, 227
Seo, M	202	Sharief, P	12	Shinjo, J	210
Seo, S	182	Sharma, A	13, 33, 73, 113, 208, 226, 237, 256	Shinohara, M	155
Serafin, L	166	Sharma, H	111	Shinohara, T	132
Sergejev, F	211	Sharma, M	215, 241, 255	Shin, S	58, 68, 174, 212, 217, 244, 262
Serov, A	19, 57, 136, 158	Sharma, P	261	Shin, Y	123, 208, 209, 210
Seshadri, R	19	Sharma, R	51, 111, 139, 207	Shi, Q	86, 96, 107, 171, 246
Sessions, H	93	Sharma, S	72, 148, 192, 209, 220, 256	Shi, R	33, 39, 59, 89, 114, 137, 159, 172, 195, 222
Setyawan, W	167, 250, 266	Sharma, Y	152	Shirato, N	217
Seveno, D	217, 221	Sharpe, R	203	Shittu, J	39, 187
Severa, G	233	Sharpe, C	107, 131, 154, 155	Shivam, V	23
Severs, K	14	Sharstniou, A	51	Shivprasad, A	112, 126
Seyfert, C	211	Shattuck, M	92	Shi, Y	48
Sghuri, A	232	Shaw, D	19	Shi, Z	257
Shabana, M	189	Shayesteh, N	131	Shlafstein, Y	119
Shabani, M	73, 108	Sheets, C	139	Shniepp, H	91
Shabani Nezhad, P	17	Shekhar, R	261	Shoemaker, T	171
Shackelford, E	180	Shekhar, S	266	Short, M	20, 43, 69, 70, 80, 98, 106, 122, 129, 146, 152, 169, 200, 201, 204, 247, 248, 265
Shadangi, Y	23	Sheldon, B	42	Shower, P	221, 254
Shade, P	40, 78, 110	Shen, A	70	Shrestha, S	93, 212
Shadle, D	40	Shen, C	64	Shrivastava, A	211, 236, 246
Shaeffer, M	94, 186	Shen, J	139	Shrivastav, S	76
Shah, A	226	Shenogin, S	31	Shrotriya, P	215
Shahabi, M	26, 131	Shenouda, S	257	Shtefanyuk, Y	127
Shahani, A	9, 47, 125, 166, 203	Shen, P	113	Shukla, A	164, 176, 236
Shaha, S	122	Shen, T	176	Shukla, S	31, 64, 101, 196, 217, 248, 256
Shahbazian-Yassar, R	141, 176	Shen, Y	10, 98, 255	Shultz, A	215
Shah, J	248	Sherburne, M	46	Shunmugasamy, V	122
Shah, M	43, 210	Sheridan, L	131, 172	Shu, S	213
Shah, N	25	Sheth, K	182	Shyam, A	67, 208, 209, 212, 236, 254
Shahrani, S	150	Sheu, E	187	Sickle, J	153
Shahriar, M	10, 31	Shevchenko, N	37, 64	Siddiquee, A	111
Shah, S	48, 235	She, X	205, 232		
Shahzad, M	23	Shi, B	252		
Shaker, A	243				

Siegmund, T	185	Siopis, M	248	Sofronis, P	26
Siekhaus, W	80	Siqueiros, J	220	Sohn, I	9, 57, 87, 112, 194, 216
Sierros, K	25, 49, 76, 103, 190, 206, 258, 259	Sirrenberg, M	141	Sohn, J	262
Sigdel, P	4	Sisco, K	67, 208, 209, 254	Sohn, S	36, 88
Signor, L	30, 137, 232	Sisik, B	60	Sohn, Y	82, 99, 146, 173, 248
Silaen, A	151	Sisson, R	263	So, J	68
Sills, R	224	Sitefane, M	96	Sokalski, V	197
Sill, T	182	Sjogren, E	30, 170	Sokol, M	38
Silva, A	92	Skelton, J	27, 151, 155	Sokolowski, S	21
Silva, B	196	Sket, F	155, 198	Solanki, K	11, 69, 72, 89, 148, 166, 183, 192
Silva, C	218	Skitt, D	213	Solaymani, F	228
Silva, P	64	Skopic, B	115	Solem, C	36
Silva, T	197, 233	Skreiberg, Ø	65	Solheim, A	35, 127, 151, 227
Silverstein, J	24, 147, 224, 237, 248, 255	Skrotzki, B	93	Solheim, I	152
Silverstein, R	174	Skszek, T	111, 139	Soliak, L	190
Simar, A	17, 55, 154, 167	Skulborstad, A	135	Sologubenko, A	45
Simard, C	227	Skybakmoen, E	95	Solomon, C	253
Simard, M	263	Slifka, A	120, 189	Soltani, S	234
Sim, G	253	Slomski, H	229	Soltani-Tehrani, A	75, 159
Simmonds, P	4	Slone, C	17, 78	Soltys, C	96
Simonassi, N	197	Sloop, T	110	Soman, R	13, 36, 63, 92, 117, 161, 196, 231, 232
Simonds, B	55, 210	Slotwinski, J	156	Somekawa, H	246
Simonelli, M	84, 109, 117, 212, 222	Sluiter, M	244	Somerday, B	26
Simonetti, D	152	Small, K	172	Somerville, M	262
Simonova, N	161	Smeltzer, J	69	Somidin, F	207, 237
Simon, R	177	Smerdova, O	85	Sommai, P	238
Simpson, J	67	Smid, M	28	Sommerfeld, M	104
Simpson, M	71, 98, 122, 201	Smirnov, A	13, 128, 226	Sommerseth, C	127, 161
Simpson, W	44	Smith, B	17, 95	Song, E	252, 253, 264
Sims, H	82, 132	Smith, C	146, 213	Song, G	10, 12
Simson, C	70, 87	Smith, D	89, 97	Song, H	150
Sims, Z	37, 187	Smith, H	62, 63	Song, J	73
Simunovic, S	108, 132	Smith, J	94	Song, K	9, 161
Sinclair, C	234	Smith, L	86	Song, M	17, 24, 41, 44, 46, 66, 68, 73, 96, 120, 123, 144, 146, 158, 165, 176, 187, 205, 241, 242, 247
Sinclair, L	93	Smith, M	53	Song, R	165, 239
Sinfield, M	133	Smith, N	24, 36, 146, 248	Song, S	205, 230, 259
Singamaneni, S	217	Smith, R	236	Song, X	188
Singaravelu, A	21	Smith, S	82	Song, Y	58, 227
Singer, J	27, 76, 135, 153, 188, 199	Smith, T	23, 24, 30, 64, 102, 136	Son, H	227
Singh, A	189, 198, 246	Smoqi, Z	83	Soni, V	73, 101, 113
Singhal, S	118	Smudde, C	23, 46, 82, 254	Sonkusare, R	50
Singh, D	60	Snapp, P	68	Sonnweber-Ribic, P	43
Singh, G	63, 181, 252	Snead, L	177	Son, R	175
Singh Gaur, R	76	Snead, M	116	Son, S	266
Singh Gautam, A	243	Snitzer, J	66	Sooby, E	8, 141, 200
Singh, H	180	Snow, B	12, 97	Sopcisak, J	154
Singh, M	29, 134, 162, 194	Snyder, A	74	Sopu, D	92, 229
Singh, P	13, 16, 44, 50, 71, 90, 128, 173, 174, 180, 181, 198, 220	Snyder, G	225	Sorensen, I	21
Singh, R	215, 256	Snyder, J	264	Sorhuus, A	61
Singh, S	44, 106, 150, 189, 207, 222, 236	Snyder, K	224	Sorkin, S	12
Sing, S	109	Snyder, N	123	Sørum, M	61
Sinha, P	78	Soare, M	209	Soto Leytan, K	55, 156
Sinha, S	213	Soar, P	64	Sottovia, L	229
Sinnott, S	24	Sobalvarro, E	11	Soulami, A	22, 24, 195, 237, 251, 253, 256
Sinogeikin, S	237, 256	Sobieraj, D	250, 259		
		Sobotka, E	235		
		Sobotka, J	95, 107		
		Soderhjelm, C	103, 235		
		Sofinowski, K	212		

Soulen, C	13	Stach, E	144, 264	Stokes, M	210
Soundarapandiyan, G	48	Stallcup, E	186	Stonaha, P	234
Sousa, B	23, 53, 115, 195, 211, 248	Stan, C	38, 119	Stone, D	29, 66, 170
Souto, R	264	Stanciu, L	140	Stone, H	64, 73, 137, 222
Souza, A	197	Stanek, C	34, 85	Stone, K	210
Souza Oliveira, M	197	Stangebye, S	19, 243	Stonkevitch, E	32
Souza, V	197	Stangier, D	222	Stopka, K	67, 131
Sowards, J	6, 54, 82, 210	Stanke, S	171	Storck, S	131, 133
Spadotto, J	243	Stan, T	9, 168	Støre, A	65
Spaepen, F	230	Stapel, A	35	Storf, C	260
Spain, D	180	Stark, A	77	Stoudt, M	208
Spangenberger, A	17, 90, 123	Starkey, K	252, 264	Stover, J	66
Spanring, A	96	Stark, V	228	Stoyanov, M	224
Sparks, G	30, 64	Staron, P	47, 168	St-Pierre, R	65
Sparks, T	34, 90, 112, 114, 115, 251	Startt, J	159	Strachan, A	47, 102, 114, 159, 174, 176
Spataru, C	224	Staska, M	164, 186	Strain, J	180, 184
Spathis, D	139	Stasyuk, O	114	Strano, M	17
Spätig, P	253	Staublin, P	18, 34	Strantza, M	6, 55, 132, 149, 172
Spear, A	16, 40, 67, 95, 120, 138, 240	Stauffer, D	22, 45, 52, 72, 100, 124, 148, 167, 190, 252, 253	Strasky, J	48, 222
Spear, L	116	Stavila, V	233	Stráský, J	48, 109, 196
Spearot, D	10, 18, 142	Stawovy, M	25, 54	Straub, S	68
Speer, J	97	Stebner, A	15, 107, 109, 192, 198	Straub, T	131
Spencer, B	252	Steczkowska-Kempka, M	107, 189	Stringfellow, E	210
Spencer, P	91, 140	Steenkamp, J	18, 41, 68, 96, 105, 242	Stroh, J	34, 221
Spendlove, J	166	Stefanski, G	65	Stroud, R	31
Spiecker, E	235	Stegman, B	56, 155, 175	Stryjewski, W	210
Spieckermann, F	184	Stein, A	105	Stubbers, A	166
Spiegelman, J	41	Steiner, M	73, 101, 149, 165, 254	Stubbins, J	53, 178, 184
Splitter, D	236	Steingrimsson, B	158, 218	Stubblefield, G	15, 167
Spoerer, T	63	Steinlechner, S	123, 258	Stüber, M	50
Spoerk-Erdely, P	255	Stelter, M	151	Stubsgaard, A	122
Spolenak, R	45, 134	Stemper, L	255	Stuckner, J	223
Sprague, E	186	Stempien, J	213	Studecky, T	188
Sprengel, W	266	Stephens, G	72	Stukowski, A	10
Springer, H	142	Stephenson, L	231, 243, 264	Stull, J	16
Sprouster, D	133, 152, 167, 168, 177, 248, 250	Stepniowski, W	184	Stump, B	207, 224, 235
Spurgeon, S	265	Steppan, J	201	Sturtevant, B	186
Sratong-On, P	225	Stergiou, V	139	Suarez, F	11
Sreeramagiri, P	82, 173, 199	Steuben, J	134, 203	Subbaraman, H	259
Sridar, S	108, 141	Stevens, E	131	Subbarayan, G	188
Sridharan, K	5, 20, 39, 43, 53, 70, 71, 98, 108, 122, 134, 146, 148, 178, 192, 201, 208, 209, 239, 247, 248, 251, 252	Stevens, G	164, 186	Subedi, K	248
Sridharan, N	33	Stevenson, S	186	Subedi, U	255
Sridhar, N	39, 143	Stevens, T	154	Subeshan, B	210
Srikakulapu, K	255	Stewart, B	75	Subhash, G	38, 142
Srikanth, N	154	Stewart, C	121	Subramanian, A	168
Srinivasan, B	225	Stewart, J	138	Subramanian, G	261
Srinivasan, S	237	Steyn, E	231	Subroto, T	61, 63, 150
Sriram, H	14, 64, 74	Stiehler, M	127, 161	Suchkov, A	250
Sri Ranga Jai, L	172	Stiles, C	34, 125, 138, 160	Sudarshan, M	19, 136, 158, 176
Srivastava, A	8, 15, 31, 52, 58, 109, 114, 149, 168, 182, 217	Still, E	60	Sudbrack, C	54, 82, 132, 192, 209, 210, 245
Srivastava, R	261	Stimac, J	23, 46, 60, 254	Suddmans, M	172
Srivatsan, T	23, 46, 100, 125	Stinehart, J	192	Sudhakar, K	205
Srivilliputhur, S	33	Stinn, C	24, 63, 104	Sudharshan, P	5
Srolovitz, D	42, 152, 219	Stinville, J	14, 16, 38, 40, 57, 64, 67, 94, 95, 113, 114, 118, 120, 137, 141, 162, 186, 235, 240	Sudharshan Phani, P	130
S. Stopka, K	67, 82	Stitt, C	20	Sudmanns, M	110, 125
		Stoica, M	36, 62, 230	Suero, K	41
				Su, G	248
				Suganuma, K	65

- Sugimoto, M30, 105
 Sugimoto, S215
 Su, H.232
 Suhane, A.234
 Suh, J239
 Sukenaga, S57, 217
 Su, L205
 Sulejmanovic, D248
 Sullivan, E27, 151, 155
 Sullivan, T90
 Sumption, M.6
 Sun, B.123
 Sun, C.100, 153, 194, 251
 Sundar, A.162
 Sundaram, H.209
 Sundararaghavan, V.57, 67, 78, 122, 172, 177, 181
 Sundar, V.63
 Sunderland, J.161
 Sun, F.33, 59, 89, 114, 137, 159, 195, 222
 Sung, H154, 212, 219, 235, 254, 266
 Sun, H26, 177, 198
 Sun, J30, 36, 188, 258
 Sun, L125, 165
 Sun, Q.162, 266
 Sun, R.93
 Sun, S66, 247
 Sun, T.6, 28, 29, 47, 55, 56, 57, 72, 83, 89, 97, 105, 108, 121, 132, 155, 192, 210
 Sun, W60, 258
 Sun, X.205, 246
 Sun, Y.30, 35, 36, 62, 92, 116, 161, 175, 184, 217, 221, 229, 230, 232, 246
 Sun, Z.26, 77, 225, 261
 Supakul, S87, 167
 Su, R.72, 76, 128, 152, 164
 Surajarusarn, B111
 Surana, M68
 Sur, D32
 Suresh, S.19, 45
 Suri, S.25, 49
 Surup, G.18
 Su, S117, 140, 185, 198, 261, 262
 Susan, D.74, 75, 107, 154
 Sushko, P.24, 247, 256, 266
 Suss, A49
 Suter, R.6, 63
 Sutherland, J18, 155
 Sutton, B146
 Suturina, E.157
 Su, W201
 Suwas, S191
 Su, Y.103, 162, 248, 251
 Suzuki, A14, 38, 64, 67, 94, 118, 141, 162, 186, 235
 Suzuki, S.245
 Suzuki, Y225
 Svård, M.49
 Svensson, A39
 Svetlizky, D56, 100, 171
 Svoevskiy, A.127
 Swain, P73
 Swaminathan, M.180, 199
 Swartz, S.9
 Sweet, A51
 Swinburne, T.121
 Syed, K.183
 Synnott, F.64
 Syvertsen, M36, 103, 260
 Szachogluchowicz, I.189
 Szajewski, B.236
 Szczech, T187
 Szlezzynger, M199
 Szlufarska, I.42, 106, 152
T
 T A, A.256
 Tabata, T215
 Tabereaux, A.151, 227
 Tadarova, M198
 Tadj, K202
 Taguchi, M.246
 Tahara, M.225
 Taheri Andani, M.172
 Taheri, M.10, 18, 24, 39, 42, 45, 69, 97, 113, 118, 119, 121, 141, 142, 144, 145, 152, 154, 156, 163, 164, 165, 172, 175, 187, 236, 242, 243, 256
 Tahsin, S.185
 Tajedini, M15
 Takahashi, J.217
 Takahiro, M.92
 Takaki, T223, 235
 Takazaki, D26
 Takeda, O.9, 258, 260, 262
 Takekoh, R.216
 Takemasa, T65
 Takemoto, S.223
 Takeuchi, A216
 Takeuchi, I.43, 144, 190
 Takeuchi, Y217
 Takizawa, Y92
 Talaat, A.136
 Talaat, K.115, 164
 Talamini, B26
 Talapatra, A.33, 34
 Talebinezhad, H155, 195
 Taleff, E25, 50, 67, 76, 260
 Talignani, A.6
 Taller, S.251
 Talluri, S.4
 Tamakloe, S.182
 Tamerler, C9, 57, 62, 87, 91, 112, 116, 139, 140, 194, 196, 216, 229
 Tamraparni, A.26
 Tamura, S.215
 Tanaka, A.223
 Tanaka, M263
 Tanawansombat, T.91
 Tan, C.194
 Tancet, F.219, 220, 223, 240, 243
 Tandaiya, P36
 Tandoc, C.137
 Tandon, R20
 Taneike, M.53
 Tan, F219
 Tan, G.189
 Tang, G.70, 120, 210
 Tang, H.206
 Tang, J48
 Tang, M238
 Tang, N.137, 217
 Tang, Q.211
 Tangstad, M.18, 41, 77
 Tanguy, A.135
 Tang, W45, 157, 209
 Tang, Y.56, 61, 63, 134, 236
 Tan, J109
 Tanjil, M.41, 187
 Tan, L250
 Tan, Q.236
 Tansel, D193
 Tanvar, H.179
 Tan, X.65, 237, 238, 250
 Tao, J.33, 240
 Tao, Q.257
 Tao, W95
 Tarasankar, D53
 Tarcea, G43
 Tardio, J262
 Tari, V150
 Tarras Madsen, D.260
 Tarraste, M211
 Tarroja, B.78
 Tarzimoghadam, Z.184
 Tasan, C.8, 10, 16, 24, 30, 44, 45, 46, 56, 66, 85, 87, 97, 106, 111, 114, 121, 135, 143, 145, 156, 163, 166, 169, 172, 176, 214, 243, 244
 Tatam, R.210
 Tate, S.54
 Tatman, J39
 Taub, A.125
 Taufique, M159
 Taupin, V.138
 Tavakoli, R.90
 Tavares Gomes, N.196
 Tavares, S.92, 173, 197, 198
 Tavazza, F11, 33, 59, 90, 114, 138, 160, 174, 195, 223
 Tavenner, J.12
 Tawfick, S.68
 Taylor, B.22
 Taylor, C.112, 126, 218, 239, 248, 250
 Taylor, H107

Taylor, J	16, 66, 188	Thomas, B	14, 37, 64, 93, 185, 235	Toda Caraballo, I	255
Taylor, N	33, 180	Thomas, D	228	Toda-Caraballo, I	60
Taylor, S	15, 52, 265	Thomas, H	216	Toda, H	216
Taylor, W	68	Thomas, J	19, 56	Todd, I	93
Taylor, Z	74	Thomas, K	163	Todorova, M	13, 234
Taysom, B	139, 227	Thomas, M	7, 16	Toews, P	115, 228
Taysom, S	226	Thomas, R	214	Tofail, S	206
Teferra, K	135	Thomas, S	4, 69	Togaru, M	71
Teichert, C	181, 207	Thomas, V	229	Toijer, E	124
Teichert, G	244	Thome, P	36, 37	Tokutomi, K	200
Teigen, P	65	Thompson, A	26, 60, 93, 140, 185, 233, 234, 250	Tokzhigitov, T	68
Teixeira, A	197	Thompson, C	31	Toll, S	63
Tejado, E	202	Thompson, G	18, 46, 69, 93, 170, 244	Tolnai, D	122
Teja Ruiz, A	197, 198, 221	Thompson, M	250	Toloczko, M	44
Teja-Ruiz, A	196	Thompson, P	15	Tolomelli, F	243
Tekalur, S	171	Thompson, S	17	Toman, J	131
Tekawade, A	15	Thompson, Z	168	Tomaraei, G	41, 49, 144
Tekerek, E	83, 95	Thong, H	225	Tomar, V	19, 43, 136, 158, 176, 236, 237, 244
Tekinalp, H	76	Thorington-Jones, B	65	Tome, C	57, 85, 126
Telgerafchi, A	70, 147, 189	Thornton, K	27, 150, 189, 244	Tomé, C	56
Temes, S	172	Thrun, M	97, 176	Tomich, J	180
Temple, A	159	Thum, A	184	Tomko, K	164
Tence, Q	74, 75	Thune, Z	187	Tomsett, A	4
Tendolkar, S	153	Thurrow, B	83	Tomsia, A	51
Tenequer, A	83	Tiamiyu, A	94	Tondro, A	124
Tener, Z	247	Tian, B	49	Tong, C	37
Teng, F	20, 251	Tian, G	58	Tong, J	48
Tenkamp, J	40	Tian, H	33	Tong, M	150
Teprovich, J	93, 140, 185, 233, 234	Tian, S	78, 206	Tong, S	179
Terada, S	215	Tian, Y	125, 135, 198, 219	Tong, X	182
Terentyev, D	250	Tiarks, J	48	Tong, Y	218
Teresa Gómez-del Río	13	Tieu, A	39	Tonks, M	56, 57, 70, 85, 198
Ter-Isahakyan, A	136	Tiley, J	88, 126, 211, 248	Tonry, C	37, 147
Terrani, K	251	Tillmann, W	222	Topsakal, M	201
Terrazas Medina, J	197	Timelli, G	140	Torbati-Sarraf, H	15, 116
Terrones - Ramirez, A	262	Timmins, S	202	Torbet, C	82, 141, 192
Tesar, K	246	Tingaud, D	154	Torrento, J	228
Tesfaye, F	26, 77, 123, 147, 190, 249, 261	Tin, S	14, 64, 102, 132, 235	Torresani, E	126, 127
Tessier, J	4, 39	Tiparti, D	102, 132	Torres Lopez, J	138
Tess, M	176	Tiphéne, G	52	Torres, S	256
Tewes, S	231, 263	Tippey, K	216, 245	Torrez, M	22
Tew, J	167, 180, 193	Tirumalai, S	10, 23, 31, 32, 46, 58, 73, 87, 88, 100, 113, 125, 136, 137, 158, 159, 173, 174, 183, 218, 219, 220, 253	Torzewski, J	189
Tew, Z	15, 159	Tischler, J	156	Toscano, D	122
Texier, D	64	Titus, M	101, 102, 114, 159, 163, 200	Tossey, B	248
Thadhani, N	236, 237	Tiwale, N	168	Toth, K	128, 151
Than, Y	72	Tiwari, A	217	Tougas, B	48
Theisen, E	135, 136, 157, 173, 215	Tiwari, N	139	Tourret, D	13, 37, 47, 63, 90, 93, 117, 141, 150, 162, 175, 198, 234
Thevamaran, R	130, 134, 178	Tiwari, P	181, 243	Towolawi, E	162
Thiaudière, D	222	Tiwari, S	186	Trageser, J	54
Thibeault, P	227	Tiwary, C	245	Traisnel, C	143
Thie, C	162	Tjong, J	221	Tranchida, J	234
Thiriaux, R	133	To, A	54, 82, 132, 192, 208, 209, 210, 211	Tranell, G	36, 103, 104, 152, 188
Thiyagalingam, J	211	Toader, O	251	Tran, M	214
Thobadi, I	105	Tobiáš, J	17	Tran, N	220
Thodla, R	39, 143	Tobita, K	12	Tran, T	110
Thoma, D	15, 53, 71, 104, 132, 146, 155, 160, 161, 219			Traversier, M	219
Thomas, A	138, 174			Traxel, K	46, 48, 193

- Trehern, W220
Trejo Martínez, J.....197
Trelewicz, J52, 69, 71, 99, 123, 133,
147, 167, 177, 202, 250
Tremblay, D.....237
Tremsin, A.....56, 132
Trexler, M131
Trillo, E 16, 39, 66, 238, 239, 248
Trimarchi, G200
Trinh, H.....258
Trinkle, D.....98, 174
Tripathi, M4
Tripathi, N.....266
Tripathi, S102
Trobaugh, C.....221
Trofimov, A176
Tromas, C85
Trombley, M107
Trometer, N.....93
Trost, C.....130
Truchon, M227
Trujillo, C..... 15, 65, 186
Trumble, K.....180
Tsai, C..... 113, 219, 238
Tsai, F.....80
Tsai, P.....230, 259
Tsai, T.....47
Tsai, Y.....225, 226
Tsaknopoulos, K.....211, 248
Tsangarides, J109
T-Sarraf, H.....60
Tse Lop Kun, J.....48
Tseng, H.....238
Tseng, K.....58, 218
Tseng, M243
Tseng, S238
Tse, Y222
Tsiros, J.....139
Tsou, N.....255
Tsuchiya, K218
Tsuchiyama, T.....26
Tsuda, K.....223
Tsujii, N183, 226
Tsui, N... 27, 52, 80, 106, 129, 153, 170,
191, 259, 265, 266
Tsukada, Y.....224
Tubei, V216
Tubul, M 63, 193, 195
Tuchinda, N.....69
Tuck, C.....84
Tucker, C134
Tucker, D.....208
Tucker, G... 12, 18, 34, 42, 60, 69, 72, 90,
97, 113, 115, 121, 138, 142, 145, 160,
165, 167, 170, 187, 195, 223, 242, 243
Tucker, J39, 168
Tucker Roper, B83
Tucker, V200
Tugan, O140
Tuhser, T137
Tuissi, A.....89, 218
Tu, K.....255
Tuma, C.....154, 155
Tuncer, N... 7, 55, 83, 109, 133, 193, 211
Tunes, M 50, 88, 148, 218
Tung, C..... 219, 220, 228, 229, 265
Tung, D107
Tung, P.....255
Tunqui Labra, E199
Tupin, M106
Turan, A.....104
Turcksin, B.....210
Turfitt, R.....148
Turley, W164, 186
Turlo, V253
Turner, G133
Turner, J..... 65, 209, 224, 251
Turner, K45
Tveito, K.....231
Tyedmers, A191
Tyler, G.....178
Tyler, K.....254
Tzanakis, I 4, 28, 61, 63, 150
U
Uahengo, F.....231
Uberuaga, B... 34, 42, 129, 152, 169, 265
Ucar, H..... 135, 157, 173, 215
Uchida, S225
Ucsnik, S84
Udartsev, S.....250
Udaykumar, H.....60
Uddin, M210
Uddin, S.....134
Ueda, M.....127, 259
Ueda, S.....217
Uesugi, M.....216
Uggowitz, P255
Uhl, D.....88
Ukeje, C.....182
Ulfig, R.....13, 194
Ulloa, A140
Ulrich, A76, 260
Ulrich, J163
Ulucan, T.....184
Ulus, A.....36, 184
Umana, A42
Umbaugh, D35
Umezawa, O246
Umretiya, R.....21, 251
Unal, C.....164
Underhill, R.....243
Underwood Jackson, O... 8, 30, 56, 85,
111, 135, 156, 163, 172, 214
Ungarish, Z 63, 193, 195
Ungar, T.....32
Ungár, T.....213, 214
Unocic, K... 7, 16, 39, 66, 133, 238, 239
Unocic, R.....88, 211
Unruh, T208
Unterreiter, G68, 96
Upadhyay, M...108, 111, 132, 133, 135,
138, 156
Upadhyay, P..... 72, 111, 143, 245
Upadrasta, R36
Upreti, T.....187
Uranga, P.....145
Urban, A160, 174
Urbano-Reyes, G196
Urones Garrote, E.....255
Ury, N..... 107, 109, 180
Utada, S38
Utt, D10, 58
Uyên, M.....215
Uzer-Yilmaz, B228
V
Vachani, S139
Vachaparambil, K.....227
Vachhani, S124, 252
Václav, V61
Vahidi, H88, 165
Vakhromov, R.....34, 139
Valchuk, S91
Valdes, J182
Valdevit, L... 55, 56, 79, 84, 89, 100, 105,
109, 133, 155, 156, 171, 203
Valdez, J 22, 88, 137, 152, 200
Valencia, R164
Valente, R195
Valentino, G131
Valenza, T222
Valery, R.....77
Valiev, R..... 80, 170, 229
Valizadeh, M108
Vallejo Olivares, A103
Valle, V64, 162
Valloton, J227
Valtierra Rodriguez, S234
Vamsi, K..... 94, 98, 149
van Boggelen, J.....104
Van Camp, M76
van Dam, J.....241
Van Der Eijk, C.....104
Van Der Merwe, S.....222
Van der Ven, A 19, 42, 47, 69, 244
Van der Woude, C96
Van De Sande, J.....260
Vandever, M83
Van Handel, N.....82, 172
Van Hooreweder, B154
Van Iderstine, D97
Van Pelt, R.....53

Van Petegem, S6
 Van Renterghem, W250
 van Rooyen, I110, 209
 Van Rooyen, I5, 6, 48, 53, 54, 75,
 82, 102, 108, 126, 150, 192, 204,
 208, 209, 210, 257
 van Rooyen, N193
 Van Swygenhoven, H28
 Van Weereld, F162
 Varahabhatla, S208
 Varela, K12
 Vargas, M137
 Vargas, P12
 Vargas, S103, 127, 204
 Vargas Viveros, E220
 Varga, T227, 237
 Varghese, T259
 Varma, S139
 Varney, C107, 172, 203
 Varshney, P167, 240
 Vaseghi, M171
 Vashishta, P186
 Vasudevan, V5, 73
 Vaughan, D132
 Vaughan, G230
 Vaughan, M189, 193
 Vavřík, J109
 Vayron, R214
 Vazquez-Duhalt, R11
 Vazquez, G90
 Vázquez-Gómez, O203, 256
 Vazquez Tovar, G90
 Vecchio, K38
 Vedani, M212, 218
 Vedanti, P208
 Vee, I65
 Vela, B220
 Velasco-Hogan, A13
 Velasco, L157
 Velasquez, J265
 Velay, M27
 Velenturf, A78
 Velraj, A115
 Vera Garcia, O257
 Verdu, P161
 Verduzco Gastelum, J175
 Vergara-Hernández, H203, 256
 Vergari, L169
 Verghese, N182
 Verhulst, D26, 77, 261
 Verma, A262
 Vermaak, N146
 Verma, P233
 Verma, R63, 83, 252
 Vermaut, P89
 Verquin, B133
 Versino, D119
 Vesely, J266
 Vesper, G100

Vetrano, J264
 Veverková, A48
 Veyssat, D9, 57, 87, 112, 164, 194, 216
 Vicente-Vazquez, J7
 Vidal, F183
 Vidal, J70, 201
 Vieira, C115, 197, 232, 233
 Vieira, R223
 Vijayan, S55, 168, 192
 Villanova, J55, 167
 Villarroel, I92
 Villechaise, P14, 16, 17, 38, 118,
 137, 195
 Villegas-Cardenas, J256
 Villeneuve, C263
 Vincent, M210
 Vinh, N86
 Vishnubhotla, S100
 Vishnugopi, B158, 216
 Vissa, V77, 162
 Viswanathan, B239
 Viswanathan, G14, 64, 85, 114,
 127, 149
 Vivek, A101, 108
 Vizoso, D124, 178
 Vladimirov, P250
 Vo, A16
 Vogel, S8, 47, 56, 63, 100, 122, 137,
 160, 176, 194
 Vogt, S199
 Vo, H50
 Voigt, C62, 231
 Voisin, T37, 39, 66, 135, 155
 Volkenandt, T168
 Volkert, C230
 Volkov, A11, 210
 Volk, W63
 Voller, N263
 Vollhüter, J235
 Voloshko, S215
 Volz, N235
 Vo, N90
 von Kaenel, L257
 Vonk, D182
 Voorhees, P9, 18, 27, 34, 102, 123,
 144, 168, 244
 Vorozhtsov, A34, 161
 Vo, S92
 Voyles, P161
 V Prasad, K135
 Vrellou, M99
 Vrethed, P64
 Vrettou, A253
 Vukovic, G96
 Vulimiri, P208
 Vullum, P36
 Vuorinen, V47, 74, 101, 254, 255
 Vyatskikh, A109, 157, 203

W

Wachowski, M189
 Wada, K26
 Wada, T230, 259, 264
 Wadsworth, A26
 Wadsworth, J6
 Wagih, M69, 145
 Wagner, A126, 252
 Wagner, H24
 Wagner, M63, 134
 Wagner, T253
 Wagoner, R156
 Wagstaff, B242
 Wagstaff, F36
 Wagstaff, R36, 116
 Wagstaff, S36, 62, 116, 123, 140, 147,
 190, 231, 242, 249
 Wainwright, J132
 Walbrühl, M21
 Walker, C29, 119, 181, 186, 237
 Walker, S116
 Wallace, A9
 Wallace, G205
 Wallace, L26, 189
 Wallace, W156
 Walla, N151
 Wallemacq, V23
 Wallin, M41, 103, 104
 Wall, J100
 Walsh, F14
 Walter, T97, 118
 Walther, F40, 208, 260
 Walzl, A82
 Wanchoo, P176
 Wan, D200
 Wang, A218
 Wang, B9, 177, 194, 201
 Wang, C32, 47, 51, 74, 100, 101,
 153, 174, 198, 205, 217, 238, 240,
 253, 254, 255, 258, 259
 Wang, D74, 266
 Wang, F15, 59, 64, 113, 123, 143,
 173, 198, 249, 262
 Wang, G10, 31, 32, 58, 66, 87,
 88, 113, 122, 136, 137, 158, 159, 173,
 174, 183, 192, 205, 218, 219, 220
 Wang, H28, 38, 56, 72, 108, 117, 120,
 121, 170, 176, 225, 246, 251, 256, 264
 Wang, J5, 28, 45, 52, 55, 58, 61, 69,
 72, 95, 117, 121, 140, 147, 149, 153,
 157, 167, 170, 179, 193, 198, 205,
 231, 232, 239, 249, 250, 255
 Wang, K21, 33, 37, 86, 115, 119, 120,
 177, 184, 202, 225, 226, 263
 Wang, L14, 65, 74, 93, 117, 128, 147,
 202, 205, 218, 248, 256
 Wang, M17, 35, 41, 66, 68, 87, 96, 120,
 124, 144, 165, 176, 187, 241, 242

- Wang, N. 179
- Wang, P. 7, 48, 53, 79, 80, 168, 179, 206, 207, 257
- Wang, Q. 67, 139, 201
- Wang, R. 11, 32, 48, 59, 61, 75, 88, 102, 126, 136, 150, 183, 198, 204, 220, 221, 257
- Wang, S. 26, 49, 51, 78, 105, 128, 129, 137, 152, 169, 205, 206, 242, 258, 263
- Wang, T. 35, 37, 53, 63, 71, 92, 117, 196, 227
- Wang, W. 57, 80, 86, 143, 182, 185, 205, 216, 257, 262
- Wang, X. 31, 32, 42, 44, 45, 48, 50, 59, 100, 121, 125, 159, 161, 203, 205, 208, 213, 227, 257
- Wang, Y. 6, 8, 13, 14, 20, 22, 24, 30, 33, 39, 44, 63, 64, 69, 70, 71, 72, 74, 80, 84, 101, 116, 117, 119, 124, 129, 135, 140, 145, 146, 149, 150, 152, 155, 158, 160, 175, 183, 198, 203, 206, 209, 210, 213, 220, 230, 232, 234, 248, 249, 251, 256, 260, 265, 266
- Wang, Z. 7, 95, 105, 123, 191, 198, 223, 231, 257
- Wan, H. 182
- Wan, Z. 219
- Wardini, J. 255
- Ward, L. 22, 69, 223
- Ward, P. 17, 18, 41, 68, 93, 96, 120, 140, 144, 165, 176, 185, 187, 233, 234, 241, 242
- Ware, L. 159, 235
- Warner, D. 120
- Warren, G. 231
- Warren, J. 11, 18, 19, 34, 43, 244
- Warren, P. 256
- Warren, R. 17
- Warski, T. 189
- Warwick, M. 33
- Waryoba, D. 11
- Was, G. 80, 99, 128, 147, 251
- Waske, A. 36
- Wat, A. 11, 27, 51, 79, 106, 108, 191, 265
- Watanabe, K. 260
- Watanabe, M. 75, 184, 225
- Watanabe, T. 225
- Waters, M. 119, 256
- Watkins, E. 92, 126, 194
- Watson, T. 126
- Watts, J. 32
- Weaver, J. 84, 110, 134, 156, 172, 193, 212, 213
- Weaver, M. 119, 143, 164, 186, 193, 239
- Weaver, S. 221
- Webb, A. 133
- Weber, P. 66
- Weber, W. 87, 113, 218
- Webler, B. 9, 57, 83, 87, 112, 134, 148, 194, 216
- Webster, S. 105, 108
- Weeks, J. 141
- Weeks, N. 48
- Weeks, P. 92
- Weems, A. 9, 140, 146
- Wehrenberg, C. 65, 94
- Wei, B. 5, 52, 69, 162, 170
- Wei, C. 231
- Weidner, A. 50
- Wei, H. 144
- Weihs, T. 15, 19, 126, 156, 237, 244, 256
- Wei, L. 200
- Weinberger, C. 22, 72, 113, 119, 143, 164, 186, 239
- Weinstein, M. 70, 201
- Wei, P. 12, 60, 115, 183, 224, 225, 226, 261
- Wei, Q. 70
- Wei, R. 248
- Wei, S. 7, 10, 24, 46, 87, 97, 114, 163
- Weiss, D. 34, 84
- Weissenboeck, T. 260
- Weiss, M. 11
- Weiss, P. 18
- Wei, Z. 11, 150, 258
- Welborn, S. 141
- Welch, B. 151
- Welch, R. 60
- Welk, B. 33, 109, 127, 149
- Wells, D. 208
- Wells, S. 64
- Wen, D. 101
- Wendorf, J. 114, 137
- Weng, Y. 68
- Weng, Z. 258
- Wen, H. 20, 44, 134, 160
- Wen, J. 51, 164, 254, 258
- Wen, L. 205
- Wentlent, L. 15, 65, 237
- Wen, X. 91, 244
- Wen, Y. 94, 121, 141, 216
- Wenzl, C. 68, 96, 263
- Werden, J. 213
- Weritz, J. 50
- Werkhoven, R. 247
- Wertz, K. 14
- Wessman, A. 14, 38, 64, 94, 118, 141, 162, 186, 192, 235
- Westraadt, J. 256
- Whalen, B. 102
- Whalen, K. 33
- Whalen, S. 139, 226, 227
- Wharry, J. 66, 99, 213, 242, 252, 256
- Wheeler, J. 45, 52, 134
- Wheeler, R. 22, 45, 72, 125, 149, 168, 203, 253
- Whelan, G. 11, 12, 131
- Whetten, S. 54, 107, 132
- White, D. 167
- White, E. 66, 107, 131, 154, 164, 171, 173, 191, 202, 207
- White, J. 8, 22, 28, 99, 104, 110, 130, 148, 151, 179, 200, 205, 206, 228, 263
- White, M. 208, 212
- Whiteman, G. 65, 118
- White, R. 102, 158
- Whitney, B. 90, 123
- Wicke, M. 67
- Wicker, R. 107
- Wicks, J. 236
- Widener, C. 147
- Widgeon Paisner, S. 22
- Widom, M. 32, 113, 218
- Wiegart, L. 49
- Wiese, B. 246
- Wigger, T. 235
- Wilde, G. 219, 229
- Wilhelm, F. 157
- Wilkinson, A. 129, 170
- Willard, M. 70, 173
- Willey, T. 132, 210
- Willhard, T. 215, 256
- Williams, C. 15, 38, 65, 94, 118, 142, 164, 176, 186, 236, 237
- Williams, E. 199
- Williams, H. 42, 44
- Williams, J. 199
- Williams, K. 201
- Williams, M. 5, 15, 46, 180, 184, 190, 193
- Williamson, C. 5, 83, 133, 159, 184, 190, 193
- Williamson, J. 180, 181
- Williamson, M. 159
- Williams, S. 132, 209, 210
- Williams, W. 143
- Willing, E. 251, 252
- Willumeit-Romer, R. 246
- Willumeit-Römer, R. 166
- Wilmers, J. 264
- Wilson, A. 208
- Wilson, D. 155
- Wilson, J. 136, 148
- Wilson, M. 107
- Wilt, J. 146
- Wimmer, A. 226
- Winch, N. 49
- Windl, W. 238
- Winfrey, L. 202
- Winner, N. 42
- Winter, I. 93
- Winther, G. 166, 172
- Wirth, B. 85, 99, 123, 124, 152

- Wirth, M240
 Wischhusen, M.119, 149
 Wishart, J. 20, 27, 201
 Wisner, B.16, 40, 67, 95, 120, 140, 162, 185, 233, 240
 Witharamage, C33
 Withers, P134
 Witteman, L.70, 201
 Wittig, J97
 Wittwer, M.212
 Wohlberg, B.56
 Wojcik, A.189
 Wójcik, A.199
 wojcik, T215
 Wojcik, T11, 235
 Wójck, A189
 Wolfe, C.247
 Wolff, S.105, 108
 Woller, K129, 200
 Wollmershauser, J.45
 Woloshun, K164
 Wolverton, C.69
 Wong, B.12, 34, 60, 90, 115, 138, 160, 195, 223
 Wong, C.147
 Wong, D.228
 Wong, X.230
 Wood, B. 39, 66, 222
 Wood, J76
 Wood, M. 60, 159, 234, 236, 250
 Woods, M. 20, 43, 44, 98, 201, 247
 Woodward, C.11, 33, 59, 90, 114, 138, 160, 174, 195, 223
 Woo, J. 82, 99, 146, 248
 Woo, S247
 Worsley, M. 11, 108, 158
 Worth, R251
 Wright, A.118, 141, 142, 163, 175, 236
 Wright, J.230
 Wright, K.56
 Wright, S8
 Wright, W. 125, 150, 153, 230
 Wrobel, J250, 259
 Wróbel, J60, 250
 Wróblewski, R.199
 Wu, A. 15, 65, 225, 237, 238, 256
 Wu, B.139, 198
 Wu, C. 198, 201, 255
 Wu, D.9, 185
 Wu, G.197
 Wu, H. 12, 60, 115, 183, 184, 198, 216, 224, 225, 226, 266
 Wu, J. 15, 195, 198, 208
 Wu, M. 9, 135, 155, 255
 Wu, P238
 Wu, R.165
 Würger, T.166
 Wurmshuber, M.25
 Wurster, S.25
 Wu, S225, 226
 Wu, W 49, 52, 69, 170
 Wu, X 80, 82, 189, 198
 Wu, Y 47, 136, 147, 238, 242
 Wu, Z 15, 38, 108, 192, 210, 219
 Wyrobek, D187
- ## X
- Xakalashe, B105
 Xavier, G232, 233
 Xia, G30
 Xiang, J.147
 Xiangyuan, Z.57
 Xian, M114
 Xiao, H.48, 206
 Xiaoqing, Z205
 XiaoQing, Z.205
 Xiao, S45
 Xiao, X20, 27, 44
 Xiao, Y223
 Xiaoyan, L258
 Xia, R197
 Xia, X74
 Xia, Y249
 Xia, Z129
 Xie, A25
 Xie, B219
 Xie, D 28, 40, 45, 72
 Xie, J.255
 Xie, K.8, 57, 63, 105, 133, 148, 161, 188
 Xie, S.174
 Xie, X.10, 31, 32, 58, 87, 88, 113, 136, 137, 158, 159, 173, 174, 183, 218, 219, 220
 Xie, Y45, 221, 251
 Xie, Z87
 Xi, J.42, 106, 152
 Xijun, Z232
 Xing, B.174
 Xing, L35
 Xing, Y10
 Xin, H.119
 Xintao, S.232
 Xiong, L.57, 72, 214, 243
 Xiong, W.7, 21, 44, 71, 73, 99, 108, 123, 141, 146, 166, 201, 211, 248, 249
 Xiong, Y.233
 Xi, Z257
 Xu, A253
 Xu, B.241, 249
 Xu, C.9, 10, 14, 31, 72, 194
 Xue, C.193
 Xue, F.14, 30, 64, 94
 Xue, Q205, 232
 Xue, R.74
 Xue, Y179
 Xu, F114
 Xu, H9, 10, 31, 32, 213
- Xu, M 10, 91, 149
 Xu, N30
 Xu, P. 22, 44, 71, 99, 110, 124, 148, 177, 202, 239, 251, 252
 Xu, R.105, 161
 Xu, S.68, 167, 237, 243, 251, 255, 259
 Xu, W.59, 144, 227
 Xu, X.256
 Xu, Y.54, 72, 120, 253
 Xu, Z.22, 126, 195, 247
- ## Y
- Yaacoub, J68
 Yablinsky, C.65, 118, 141, 142, 163, 175, 236
 Yacout, A22, 213
 Yadavalli, V91
 Yadav, D.105, 148, 212, 214, 221, 265
 Yadav, G.123
 Yadav, S.164, 183, 186
 Yager, K190, 241
 Yaghoobi, M.57, 67, 82, 122, 177
 Yakovlev, V237
 Yamada, R230
 Yamaguchi, K200
 Yamamoto, T.167, 188
 Yamamoto, Y.135, 209, 210, 214, 235
 Yamamura, A235
 Yamanaka, K.211, 212, 222, 243, 257
 Yamanaka, N.235
 Yamasaki, M246
 Yamase, K227
 Yan, C.170, 266
 Yanchuk, V215
 Yan, D.15, 48, 65, 237, 257
 Yan, F21, 90, 92
 Yang, A.200
 Yang, B.11, 56, 198
 Yang, C.78, 255, 257
 Yang, D.262
 Yang, F41
 Yang, H.61, 160
 Yang, J.5, 44, 66, 108, 134, 146
 Yang, K.239, 243
 Yang, L.147, 205, 206
 Yang, P.122
 Yang, Q.20, 88, 108, 124, 186
 Yang, R.102
 Yang, S.13, 198, 233, 238
 Yang, T.47, 74, 101, 237, 254, 255
 Yang, W.35, 51, 92, 249
 Yang, X.40, 150
 Yang, Y.20, 37, 39, 40, 69, 87, 88, 100, 129, 145, 158, 169, 208, 216, 219, 235, 250, 255
 Yang, Z.140, 191, 248
 Yan, H.16, 105, 133, 143, 168, 169, 213, 241

- Yan, J. 21
 Yankey, J. 201
 Yano, K. 265
 Yan, W. 117, 205, 223, 248
 Yan, X. 123, 143, 173
 Yan, Z. 205
 Yao, B. 158
 Yao, D. 52
 Yao, T. 114
 Yao, Y. 90
 Yapo, J. 188
 Yarasi, S. 102
 Yar, M. 243
 Yarmolenko, S. 215, 247
 Yasin, M. 159
 Yasin, S. 95
 Yasinskiy, A. 161
 Yasinsky, A. 91
 Yassir, S. 236
 Yasuda, H. 235, 238, 259
 Yasuda, Y. 193
 Yavari, R. 83
 Yazbeck, M. 152
 Yeager, J. 13, 92, 100, 176
 Ye, B. 213
 Ye, C. 11
 Yedra, L. 133
 Yee, D. 155
 Yee, K. 85
 Yeh, A. 102
 Yeh, J. 58, 113, 218
 Yehuda, T. 63, 193
 Ye, J. 6, 193
 Yen, D. 49
 Yen, H. 113, 218, 243
 Yen, W. 225, 226
 Yen, Y. 47, 254, 259
 Yeo, L. 201
 Yeom, H. 5, 39, 239, 251, 252
 Yeom, J. 9
 Yeong, W. 53, 109
 Ye, Q. 140
 Yerokhin, A. 246
 Ye, Y. 158
 Ye, Z. 223
 Yi, J. 218
 Yi, K. 258
 Yildirim, C. 36, 134, 166, 172, 214, 231
 Yildizbakan, L. 228
 Yin, A. 61
 Yin, B. 218
 Yin, C. 205
 Yin, D. 192
 Yingling, J. 247, 248
 Yin, H. 5, 108
 Yin, J. 9, 31, 194
 Yin, L. 246
 Yin, P. 225
 Yin, S. 69, 88, 129, 169
 Yin, T. 35, 59
 Yin, Y. 28
 Yin, Z. 41, 187, 203
 Yi, P. 19, 256
 Yi, S. 246
 Yocupicio-Gaxiola, R. 220
 Yokoo, N. 225
 Yonezu, A. 252
 Yoo, B. 193
 Yoo, G. 116, 230
 Yoo, J. 228
 Yoon, C. 188
 Yoon, H. 261, 262
 Yoon, J. 182
 Yoon, Y. 226
 Yoo, S. 47, 56, 74, 82, 101, 234, 252, 254, 255
 Yoo, Y. 18, 143, 172
 Yoshida, H. 247
 Yoshida, K. 243
 Yoshida, R. 262
 Yoshida, S. 259
 Yoshikawa, T. 216, 217, 230
 You, B. 247
 You, J. 202
 Young, D. 172
 Young, G. 20
 Young, J. 127
 Young, S. 13
 Young, Z. 83
 Younkin, T. 99
 Yousefi, E. 217, 221
 You, X. 232
 You, Z. 206, 232
 Yquel, M. 157
 Yu, A. 24, 70, 255
 Yuan, B. 4, 25, 28, 62, 103
 Yuan, J. 34
 Yuan, L. 14, 37, 48, 64, 90, 93, 185, 209, 235, 245
 Yuan, R. 244
 Yuan, S. 80, 190
 Yuan, W. 193
 Yuan, X. 179, 229
 Yu, B. 191
 Yu, C. 47, 165, 180, 208, 226, 228, 229
 Yüce, E. 184
 Yücel, O. 28, 104, 130, 179, 205, 206
 Yu, D. 51
 Yue, W. 166
 Yu, F. 66
 Yu, H. 48, 71, 75, 83, 102, 126, 133, 150, 153, 161, 204, 257, 262
 Yu, J. 36, 135
 Yu, K. 121
 Yu, L. 27, 161
 Yun, D. 76
 Yunfeng, F. 258
 Yungang, B. 257
 Yun, J. 182
 Yu, P. 205
 Yu, Q. 17, 69, 88, 129, 169, 189, 246
 Yurchio, A. 253
 Yurek, Q. 166
 Yurko, J. 80
 Yu, T. 203, 256
 Yu, W. 261
 Yu, X. 44, 71, 99, 119, 143, 164, 186, 239
 Yuya, P. 137
 Yu, Z. 45, 54, 85, 87, 136, 146, 158, 192, 219
 Yvinec, T. 137
- ## Z
- Zabava, K. 201
 Zackiewicz, P. 107, 189
 Zaeem, M. 124, 198
 Zaefferer, S. 243, 264
 Zahiri, A. 57, 89, 203
 Zahm, N. 5
 Zakar, E. 76
 Zakirov, A. 202
 Zak, S. 130
 Zálezák, T. 30
 Zamora, J. 138
 Zanelato, E. 232, 233
 Zapolsky, H. 150
 Zappulla, M. 121
 Zarandi, F. 6, 54, 82, 210
 Zare, A. 15, 186
 Zargaran, A. 149
 Zarkadoula, E. 13, 37, 63, 93, 117, 141, 162, 175, 198, 234, 255
 Zarkevich, N. 102
 Zarzar, L. 96
 Zauner, L. 221
 Zavattieri, P. 27, 35
 Zebarjadi, M. 224
 Zecevic, M. 138
 Zedel, H. 231
 Zeh, J. 116
 Zeinalabedini, H. 189
 Zelaya, E. 202
 Zelenika, A. 172
 Zelenka, F. 82
 Zeleznik, N. 131
 Zeller, M. 253
 Zeller, P. 82
 Zeller-Plumhoff, B. 246
 Zendegani, A. 244
 Zeng, Q. 230
 Zeng, X. 246
 Zeng, Y. 95, 139
 Zeng, Z. 16
 Zenk, C. 14, 64, 235
 Zepeda-Alarcon, E. 132

Zerbin, I.	34	Zhao, Z.	90, 105, 205, 206	Zhu, Z.	218
Zevalkink, A.	12, 60, 115, 159, 183, 224, 225, 226	Zheludkevich, M.	166	Zibiao, W.	232
Zgheib, C.	179	Zheng, B.	56, 100, 125, 136, 154, 155, 171	Zibrov, M.	123
Zhang, B.	140, 209, 249, 262, 266	Zheng, G.	70, 248	Ziegmann, G.	111
Zhang, C. . .	10, 23, 26, 58, 66, 71, 84, 87, 109, 122, 149, 198, 208, 218	Zheng, R.	266	Ziehmer, M.	27
Zhang, D.	71, 86, 99, 107, 123, 131, 147, 154, 167, 171, 177, 191, 201, 202, 207, 211, 248, 250, 265	Zheng, S.	6	Zienert, T.	50
Zhang, F. .	6, 24, 53, 55, 62, 83, 108, 114, 132, 155, 205, 208, 210, 248, 249	Zheng, T.	34, 84	Zikry, M.	224
Zhang, H. . .	42, 45, 51, 73, 95, 123, 152, 164, 173, 194, 198, 201, 205, 247	Zheng, X.	27, 44, 51, 79, 106, 114, 191, 265	Zillinger, J.	252
Zhang, J.	18, 20, 28, 43, 70, 93, 98, 122, 146, 179, 198, 201, 205, 206, 247, 248, 249, 258, 262	Zheng, Y.	33, 59, 89, 114, 126, 137, 159, 181, 195, 222	Zimmermann, M.	67
Zhang, K.	68, 179	Zherdev, A.	127	Zinkle, S.	128, 147, 177, 202
Zhang, I.	113	Zhi, W.	198	Žist, S.	226
Zhang, L.	26, 36, 37, 42, 47, 48, 71, 74, 77, 101, 140, 205, 206, 216, 233, 243, 249, 254, 255, 261	Zhiyi, Z.	212	Zok, F.	119, 237
Zhang, M.	13, 23, 26, 36, 46, 63, 77, 92, 97, 117, 129, 161, 162, 196, 231, 232, 254, 261, 263	Zhong, D.	147	Zollinger, J.	82
Zhang, N.	13, 35, 61, 91, 115, 139, 196, 228	Zhong, H.	190	Zolotoyabko, E.	256
Zhang, P.	179, 224, 244	Zhong, L.	73, 212	Zometa Panigua, D.	122
Zhang, Q.	106, 162, 183, 217	Zhong, M.	51, 190	Zou, H.	11
Zhang, R.	88, 121, 149, 169	Zhong, S.	17, 41, 68, 96, 120, 144, 165, 176, 187, 241, 242	Zou, L.	210
Zhang, S.	57, 142, 176, 205, 232, 233	Zhong, W.	19, 110, 162	Zou, M.	70
Zhang, T.	48, 205, 226, 235, 245, 263	Zhong, Y.	13, 26, 98, 136, 198, 253, 258	Zrodowski, L.	199
Zhang, W.	73, 158, 170, 225, 251, 265	Zhongyu, Z.	258	Zuanetti, B.	142
Zhang, X. . .	28, 45, 56, 72, 73, 121, 150, 155, 159, 169, 173, 185, 195, 205, 246, 251	Zhou, B.	21, 37, 119, 177, 198	Zulkifli, N.	238
Zhang, Y. . .	8, 19, 22, 27, 31, 39, 44, 45, 63, 80, 82, 87, 98, 99, 113, 121, 130, 134, 140, 146, 153, 173, 189, 195, 206, 210, 218, 219, 226, 231, 235, 242, 243, 248, 249, 251, 252, 255, 258, 264, 266	Zhou, C.	27, 52, 80, 106, 128, 129, 151, 153, 170, 191, 265, 266	Zuo, H.	188, 205
Zhang, Z. . .	9, 22, 31, 57, 58, 61, 87, 96, 112, 113, 119, 194, 216, 230	Zhou, D.	47, 153	Zuo, J.	74, 75, 88, 124, 185, 244
Zhan, J.	211	Zhou, F.	168	Zurob, H.	191
Zhao, B.	28, 130, 179, 205, 206	Zhou, G.	156, 205	Zvenigorodsky, S.	25
Zhaobo, L.	258	Zhou, H.	80, 198, 232, 266		
Zhao, C.	57, 144, 190, 210	Zhou, J.	238		
Zhao, D.	8, 105	Zhou, K.	46, 154		
Zhao, H.	41, 187	Zhou, L.	82, 99, 123, 192, 216		
Zhao, J.	19, 82, 110, 162, 188, 198, 206, 232	Zhou, N.	53, 162, 211		
Zhao, L.	17, 154, 166, 167, 232	Zhou, Q.	205, 206		
Zhao, M.	120, 140	Zhou, S.	255		
Zhao, P.	116, 145, 230	Zhou, T.	214, 215		
Zhao, S.	40, 94, 170, 183	Zhou, W.	20, 69, 129		
Zhao, W.	37, 59, 89, 126, 159, 195	Zhou, X.	30, 183, 224		
Zhao, X.	38, 76, 142, 226	Zhou, Y. . .	25, 56, 61, 100, 101, 154, 171		
Zhao, Y.	7, 113, 147, 202, 205, 252	Zhu, C.	156		
		Zhu, G.	205		
		Zhu, H.	60, 258, 260, 262		
		Zhu, J.	205, 249		
		Zhu, K.	243		
		Zhukov, I.	34, 161		
		Zhu, L.	231		
		Zhu, M.	238		
		Zhu, N.	128, 167		
		Zhu, P.	205		
		Zhu, Q.	44, 119, 143		
		Zhu, S.	247		
		Zhu, T.	16, 19, 27, 82, 206, 239, 242, 243, 252, 266		
		Zhu, Y. . .	27, 39, 41, 52, 71, 80, 99, 106, 123, 129, 147, 153, 167, 170, 177, 191, 202, 250, 265, 266		