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TMS 2023

152nd Annual Meeting & Exhibition

MARCH 19–23, 2023

SAN DIEGO CONVENTION CENTER & HILTON SAN DIEGO BAYFRONT

SAN DIEGO, CALIFORNIA, USA

MOBILE-FRIENDLY

FINAL TECHNICAL PROGRAM

THE CONTENT IN THIS FINAL TECHNICAL PROGRAM WAS GENERATED ON MARCH 6, 2023.

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 Daylight Time (UTC-7:00).

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Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM
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Accelerated Discovery and Insertion of Next Generation Structural Materials	Sapphire M							•	•		
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AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification	Cobalt 520	•	•		•	•	•	•	•	•	•
Algorithm Development in Materials Science and Engineering	Aqua 310A					•	•				
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LIGHT METALS

2023 Light Metals Keynote Session — Research and Process Optimization through Computer Modelling and Digitalization

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

Program Organizer: Dmitry Eskin, Brunel University

Monday AM | March 20, 2023
20A | SDCC

Session Chair: Dmitry Eskin, Brunel University

8:30 AM Introductory Comments

8:35 AM Keynote
Data Analytics for Advanced Process Monitoring and Control in Primary Aluminum Smelting: *Carl Duchesne*[1]; [1]Laval University

9:00 AM Keynote
Numerical Modeling Tools for the Assessment of High-Amperage DC Busbars: *Andre-Felipe Schneider*[1]; Daniel Richard[1]; Olivier Charette[1]; [1]Hatch Ltd.

9:25 AM Keynote
Hydro Aluminium - Smelter Improvements Through Modelling and Digitalization: *Nancy Holt*[1]; [1]Hydro Aluminium AS

9:50 AM Keynote
Importance of Transparent Data and Standardised Data Analysis for Decarbonisation of the Aluminium Sector: *Marlen Bertram*[1]; L. Wu[1]; [1]International Aluminium Institute

10:15 AM Break

10:30 AM Keynote
Issues in Macroscopic Modeling of Aluminum Direct Chill Casting: *Matthew Krane*[1]; [1]Purdue University

10:55 AM Keynote
Microstructure Simulation as a Basis for Material Property and Casting Defect Predictions: *Markus Apel*[1]; [1]Access RWTH-Aachen

11:20 AM Keynote
Improving Safety and Performance of DC Casting Lines by Applying Digital Twins, Process Models and Vision Systems: *Arild Hakonsen*[1]; [1]Hycast AS

11:45 AM Keynote
Data Driven Methods to Increase Aluminum Recycling: *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

12:10 PM Panel Discussion

ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Carbon Related Materials - Processing, Properties & Applications I

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

Committee

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

Monday AM | March 20, 2023
Aqua AB | Hilton

Session Chairs: Madan Dubey, Army Research Laboratory, Sensors and Electron Devices Directorate; Nuggehalli Ravindra, New Jersey Institute of Technology

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8:30 AM Introductory Comments

8:35 AM Invited
Group IV-V Based Lamellar Thin Films: A Path Toward Novel 2D Materials: *Mathieu Stoffel*[1]; Alix Valdenaire[1]; Sébastien Geiskopf[1]; Xavier Devaux[1]; Erwan André[1]; Cédric Carteret[1]; Alexandre Bouché[1]; Michel Vergnat[1]; Hervé Rinnert[1]; [1]Universite De Lorraine

9:00 AM Invited
Laser Photothermal Production of 3D Graphene with Polymers for Multifunctionality: *Pilgyu Kang*[1]; Byoung Gak Kim[2]; Minsu Kim[2]; Seung Min Lee[1]; Shirin Movaghgharnezhad[1]; [1]George Mason University; [2]Korea Research Institute of Chemical Technology

9:25 AM Invited
Mapping the Local and Global Vibrational Properties of Hetero-strained Twisted Bilayer Graphene: *Hesam Askari*[1]; Aditya Dey[1]; Shoieb Chowdhury[1]; [1]University of Rochester

9:50 AM Keynote
Laser Processing of Novel 2D and 3D Diamond Related Materials: *Jagdish Narayan*[1]; [1]North Carolina State University

10:20 AM Break

10:35 AM
Preparation and Electromagnetic Shielding Effectiveness (EMI SE) of Cobalt Nanowires/Carbon Nanotubes Composites: *Syed Sajl*[1]; Rajakumar Devarapalli[1]; [1]Khalifa University

10:55 AM Invited
2D Amorphous Carbon Dielectric for Nanoelectronics: *Congjun Wang*[1]; [1]National Energy Technology Laboratory

11:20 AM Keynote
Graphene and Metal Oxides Based Functional Materials for High Performance Perovskite Solar Cells and Multicomponent-Detecting Sensors: *Yoon-Bong Hahn*[1]; [1]Jeonbuk National University

11:50 AM Invited
Defect Modulation in Laser Induced Graphene Oxide for Advanced Electrochemical Sensing: *Pratik Joshi*[1]; Jagdish Narayan[1]; Roger Narayan[1]; [1]NC State University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session I

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

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

Monday AM | March 20, 2023
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Session Chair: Nik Hrabe, National Institute of Standards and Technology

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8:30 AM Invited
Fracture and Adhesion of Cold Sprayed HY80 Steel: *Luke Brewer*[1]; Christopher Roper[1]; Anita Heczel[1]; [1]University of Alabama

9:00 AM
Fatigue Behavior of Fastener Holes in High-strength Aluminum Plates Repaired by Additive Friction Stir Deposition: *Ismael Hidalgo*[1]; Paul Allison[1]; Brian Jordon[1]; Malcolm Williams[1]; Jacob Williamson[2]; Jacob Strain[2]; [1]Baylor University; [2]The University of Alabama

9:20 AM
The Influence of Powder Reuse on the Mechanical Properties of Laser Powder Bed Fused Stainless Steel 316L: *Rory Douglas*[1]; Robert Lancaster[1]; Thomas Jones[2]; [1]Swansea University; [2]Rolls-Royce

9:40 AM
An Acoustic Emission Monitoring Method during LPBF Processing for Detection of Microdefects: *Kaita Ito*[1]; Rinako Kokaji[2]; Masahiro Kusano[1]; Makoto Watanabe[1]; Takayuki Shiraiwa[2]; Manabu Enoki[2]; [1]National Institute for Materials Science; [2]The University of Tokyo

10:00 AM Break

10:20 AM Invited
Nondestructive Inspection for Structural Cold Spray Repairs: *Brandi Briggs*[1]; Mackenzie Perry[2]; Dustin Avery[2]; Jay Waterman[2]; Bobbie Diedrich[1]; [1]Naval Air Systems Command Aircraft Division; [2]Naval Surface Warfare Center Carderock Division

10:50 AM
Comparison of Hydrogen-Metal Interactions in Additively Manufactured and Wrought 17-4PH via Thermal Desorption Spectroscopy Methods: *Zachary Harris*[1]; Alfredo Zafra[2]; Lauren Singer[3]; Emilio Martinez-Paneda[2]; John Scully[3]; James Burns[3]; [1]University of Pittsburgh; [2]Imperial College London; [3]University of Virginia

11:10 AM Invited
Defect-sensitive Fatigue Design in Additive Manufacturing: Flaw Size Effects in Ultrasonic Fatigue of Laser Powder Bed Fabricated Al-10Si-Mg Alloys: *Anthony Spangenberger*[1]; Timothy Piette[1]; Bernd Schönbauer[2]; Diana Lados[1]; [1]Worcester Polytechnic Institute; [2]University of Natural Resources and Life Sciences, Institute of Physics and Materials Science

11:40 AM
Mechanical Properties of Binder Jet Printed 17 – 4 Precipitation Hardened Martensitic Stainless Steel: *Jayaraj Radhakrishnan*[1]; Punit Kumar[2]; Alexis Bryl[3]; Jim Mckinnell[3]; Upadrasta Ramamurty[1]; [1]Nanyang Technological University; [2]Lawrence Berkeley National Laboratory; [3]HP Inc.

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Special Session for MURI Program

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

Monday AM | March 20, 2023
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Session Chairs: Alex Plotkowski, Oak Ridge National Laboratory; Wenda Tan, University of Michigan

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8:30 AM Keynote
Rationalization of Interphase Instabilities during Thermo-Mechanical Gyrations Typical to Metal Additive Manufacturing: *Jennifer Wolk*[1]; Zoran Sterjovski[2]; Simon Ringer[3]; Sudarsanam Babu[4]; [1]Office of Naval Research; [2]Defence Science and Technology Group; [3]The University of Sydney; [4]University of Tennessee, Knoxville

8:50 AM
Decomposition of a CrMnFeCoNi High-entropy Alloy Manufactured via Laser Powder Bed Fusion: *Hansheng Chen*[1]; Hao Wang[1]; Zibin Chen[2]; Bryan Lim[1]; Hongwei Liu[1]; Zhiguang Zhu[3]; Andrew Breen[1]; Rongkun Zheng[1]; Sharon Mui Ling Nai[3]; Sophie Primig[4]; Xiaozhou Liao[1]; Simon Ringer[1]; [1]The University of Sydney; [2]The Hong Kong Polytechnic University; [3]Singapore Institute of Manufacturing Technology; [4]UNSW Sydney

9:10 AM
Estimation of Transient Melt-pool Temperature Distributions Using In-situ X-ray Radiography Images: *Rakesh Kamath*[1]; Sudarsanam Suresh Babu[1]; Hahn Choo[1]; [1]University of Tennessee Knoxville

9:30 AM
In Situ Melt Pool Measurements for Laser Powder Bed Fusion using Multi Sensing and Correlation Analysis: *Rongxuan Wang*[1]; David Garcia[1]; Rakesh Kamath[2]; Chaoran Dou[1]; Xiaohan Ma[1]; Bo Shen[1]; Choo Hahn[2]; Kamel Fezzaa[3]; Hang Z. Yu[1]; Zhenyu Kong[1]; [1]Virginia Tech; [2]University of Tennessee Knoxville; [3]X-ray Science Division, Advanced Photon Source, Argonne National Laboratory

9:50 AM
Numerical Simulation of the Phase Transformation Dynamics of during Electron Beam Powder Bed Fusion of IN738 Ni-based Superalloy: *Nana Adomako*[1]; Nima Haghdadi[1]; James Dingle[2]; Xiaozhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; [1]UNSW Sydney; [2]The University of Sydney

10:10 AM Break

10:25 AM
In Situ TEM Observations of Thermally Activated Phenomena under Additive Manufacturing Process Conditions: *Sriram Vijayan*[1]; Avantika Gupta[1]; Carolin Fink[1]; Joerg Jinschek[1]; [1]The Ohio State University

10:45 AM
3D Characterization of Microstructure Anisotropy along the Build Direction of PBF SB-CoNi-10: *James Lamb*[1]; Andrew Polonsky[2]; Kira Pusch[1]; Evan Raeker[1]; Tresa Pollock[1]; [1]University of California Santa Barbara; [2]Sandia National Labs

11:05 AM
Spatially Tailoring Chemistry and Property Variations in Electron Beam Additive Manufacturing Builds through Process Control of Unicomposition Powder: Katie O'Donnell[1]; Maria Quintana[1]; Thomas Ales[1]; Michael Kirka[2]; Christopher Ledford[2]; Siddhartha Pathak[1]; *Peter Collins*[1]; [1]Iowa State University; [2]Oak Ridge National Laboratory

11:25 AM
Validation and Prediction with ECP ExaAM Simulations and MURI Additive Experiments: *Sam Reeve*[1]; Rakesh Kamath[2]; Steven Gagniere[3]; Raymond Wysmierski[2]; Garrett Fields[2]; David Hyde[4]; Yu Fang[3]; Yuxing Qiu[3]; John Coleman[1]; Gerry Knapp[1]; Kwitae Chong[1]; Austin Isner[1]; Stuart Slattery[1]; Duan Zhang[5]; Joseph Teran[6]; Chenfanfu Jiang[3]; Hahn Choo[2]; Jim Belak[7]; [1]Oak Ridge National Laboratory; [2]University of Tennesse, Knoxville; [3]University of California, Los Angeles; [4]Vanderbilt University; [5]Los Alamos National Laboratory; [6]University of California, Davis; [7]Lawrence Livermore National Laboratory

11:45 AM
Solidification Mapping of Refractory Alloys during Additive Manufacturing: *Megan Le Corre*[1]; Jonah Klemm-Toole[1]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond on the Beam IV — Characterization

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

Program Organizers: James Paramore, US Army Research Laboratory; Daniel Lewis, Texas A&M University; Kyle Tsaknopoulos, Worcester Polytechnic Institute; Paul Prichard, Kennametal Inc.

Monday AM | March 20, 2023
24A | SDCC

Session Chairs: James Paramore, United States Army Research Laboratory; Daniel Lewis, Texas A&M University; Paul Prichard, Kennametal Inc.

8:30 AM Invited
Shape and Microstructural Characterization of Commercially Pure Titanium Feedstock Powders for Cold Spray Additive Manufacturing: *Newell Moser*[1]; Nicholas Derimow[1]; Edward Garboczi[1]; Ozan Ozdemir[2]; Sinan Muftu[2]; Carlos Pfeiff[2]; Shawn Moylan[1]; [1]National Institute of Standards and Technology; [2]Northeastern University

8:50 AM
Capturing the Thermo-mechanical History of Additive Friction Stir Deposited Al6061 Using a Three-dimensional CFD Based Numerical Model: *Nikhil Gotawala*[1]; Hang Yu[1]; [1]Virginia Tech

9:10 AM
Additive Friction Stir Deposition of IN625-316L Bimetal: *Shreyash Patil*[1]; Sameehan Joshi[1]; Mani Krishna Karri[1]; Madhavan Radhakrishnan[1]; Shashank Sharma[1]; Narendra Dahotre[1]; [1]University of North Texas, Denton

9:30 AM
Evolution of Precipitate Structure in AA7050 Produced by Additive Friction Stir Deposition: *Jacob Strain*[1]; Rekha Rao[1]; Zachary Tew[1]; Ismael Hidalgo[1]; Paul Allison[2]; Brian Jordon[2]; Luke Brewer[1]; [1]University of Alabama; [2]Baylor University

9:50 AM
Friction Stir Additive Manufacturing of Al-5083: *David Garcia*[1]; Tianhao Wang[1]; Sarvesha Rajashekara[2]; Richard Eberheim[3]; Arvind Agarwal[2]; Tanaji Paul[2]; Kenneth Ross[1]; [1]Pacific Northwest National Laboratory; [2]Florida International University; [3]Solvus Global

10:10 AM Break

10:25 AM
Effect of Additive Friction Stir Deposition Tool Geometry on Material Mixing and Microstructure Gradient of Al Alloys: *Mackenzie Perry*[1]; Hang Yu[2]; [1]NSWCCD; [2]Virginia Tech

10:45 AM
Physical Trends Unraveled by Integrated In Situ Monitoring in Additive Friction Stir Deposition-Enabled Repair: *Kendall Knight*[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute and State University

11:05 AM
A Novel Solid-stir Continuous Extrusion of an AlMgSc Alloy: *Aishani Sharma*[1]; Abhijeet Dhal[1]; Anurag Gumaste[1]; Supreeth Gaddam[1]; Rajiv Mishra[1]; [1]University of North Texas

11:25 AM
Quantification of Defects in Binder-jet Printed Steel Parts Using Confocal Imaging and Machine Learning: *Pooja Maurya*[1]; P Pistorius[1]; [1]Carnegie Mellon University

11:45 AM
A High-throughput Process for Mechanical Characterization of Ceramic Materials Produced by Direct Ink Writing: *Raphael Thiraux*[1]; Lorenzo Valdevit[1]; Alexander Dupuy[1]; [1]University of California Irvine

12:05 PM
Characterization of an Additively-manufacturable Ammonium Perchlorate Composite Rocket Propellant: *Dylan Purcell*[1]; Michael Hargather[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Small Scale Mechanical Testing/Microstructural Features I

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew

Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

Monday AM | March 20, 2023
23B | SDCC

Session Chair: Meysam Haghshenas, University of Toledo

8:30 AM Introductory Comments

8:35 AM Invited
Estimating Bulk Uniaxial Mechanical Properties of AM Alloys with Instrumented Indentation: Berkovich Hardness, Spherical Stress-Strain Curves, and Small Punch Testing: *Jordan Weaver*[1]; [1]National Institute of Standards and Technology

8:55 AM
An Indentation Study of Mechanical Properties of Laser Powder-Bed-Fusion Fabricated Stainless Steels: *Yu-Keng Lin*[1]; Alberico Talignani[1]; Raj Sanjaykumar Patel[2]; Roger Qiu[3]; Kelvin Xie[2]; Jenn-Ming Yang[1]; Yinmin (Morris) Wang[1]; [1]University of California, Los Angeles; [2]Texas A&M University; [3]Lawrence Livermore National Laboratory

9:15 AM Invited
Nanomechanical and Microstructural Characterization of Additively Manufactured Parts Fabricated via High-velocity Laser Accelerated Deposition: *Keivan Davami*[1]; Nicholas Brooks[1]; [1]University of Alabama

9:35 AM
Nanoindentation Assisted Measurements of Hierarchical Mechanical Properties in Additively Manufactured Martensitic Steel: *Ankita Roy*[1]; Abhijeet Dhal[1]; BA McWilliams[1]; Kyu C Cho[1]; Clara M Mock[1]; Rajiv Mishra[1]; [1]University of North Texas

9:55 AM Invited
Nanoindentation Response of Wire-arc Additive Manufactured and Friction Stir Modified Cu-Al-Ni Alloy: *Farzad Khodabakhshi*[1]; Adrian P. Gerlich[1]; Mohsen Mohammadi[2]; [1]University of Waterloo; [2]University of New Brunswick

10:15 AM Break

10:35 AM Invited
The Effect of Nano-scale Porosity on the SCC Behavior of AM 17-4PH in the Peak- and Over-aged Condition: *James Burns*[1]; Trevor Shoemaker[1]; Zach Harris[1]; [1]University of Virginia

10:55 AM
Length Scale Effects of Nanoindentation on Additively Manufactured Stainless Steel: *Kunqing Ding*[1]; Yin Zhang[1]; Andrew Birnbaum[2]; John Michopoulos[2]; David McDowell[1]; Ting Zhu[1]; [1]Georgia Institute of Technology; [2]US Naval Research Laboratory

11:15 AM Invited
Micromechanical Testing of Additively Manufactured Materials and Structures: Opportunities for a Better Understanding of the Structure-Property Relationships: *Sezer Ozerinc*[1]; [1]Middle East Technical University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — Design Fundamentals

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

Program Organizers: Behrang Poorganji, University of Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

Monday AM | March 20, 2023
24C | SDCC

Session Chairs: Behrang Poorganji, Morf3D; James Saal, Citrine Informatics

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8:30 AM Introductory Comments Behrang Poorganji. Morf3D

8:35 AM Invited
In-Situ Alloying As An Approach for Alloy Development: Does It Work?: *Moataz Attallah*[1]; [1]University of Birmingham

9:05 AM Invited
Algorithmic Design of Functionally Graded Alloys: *Raymundo Arroyave*[1]; Marshall Allen[1]; Tanner Kirk[2]; Richard Malak[1]; [1]Texas A&M University; [2]Questek

9:35 AM Invited
Grain Refinement in Fusion Based Additive Manufacturing: *Mark Easton*[1]; Duyao Zhang[1]; Dong Qiu[1]; [1]RMIT University

10:05 AM Break

10:20 AM Invited
ICME-guided Design of Ni-based Superalloy Coatings for High-temperature Industrial Applications: *Ida Berglund*[1]; Savya Sachi[1]; David Linder[1]; Fuyao Yan[1]; [1]Questek Europe AB

10:50 AM Invited
Additive Manufacturing of Inconel 718 by Meltpool and Grain Boundary Engineering: Frank Abdi[1]; *Vasyl Harik*[1]; Mallikharjun Marrey[1]; Amir Eftekharian[1]; Rashid Miraj[1]; [2]; [1]Alphastar Technology Solutions LLC; [2]Imperial College London

11:20 AM
Grain Boundary Engineering of New Additive Manufactured Polycrystalline Alloys: *Abhishek Kumar*[1]; Mallikharjun Marrey[2]; Veera Sundararaghavan[3]; Frank Abdi[2]; [1]Wentworth Institute of Technology; [2]AlphaStar Corporation; [3]University of Michigan

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MATERIALS PROCESSING

Advanced Characterization of High-temperature Alloys: Phase Evolution during Manufacturing and Service-induced Deformation — Deformation Assisted Microstructural Control of High Temperature Alloys During Manufacturing Processes

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

Program Organizers: Katerina Christofidou, University of Sheffield; Benjamin Adam, Oregon State University; Stoichko Antonov, Max-Planck Institut für Eisenforschung GmbH; James Coakley, University of Miami; Martin Detrois,

National Energy Technology Laboratory; Paraskevas Kontis, Norwegian University of Science and Technology; Stella Pedrazzini, Imperial College London; Sophie Primig, University of New South Wales

Monday AM | March 20, 2023
29D | SDCC

Session Chairs: Katerina Christofidou, The University of Sheffield; Sophie Primig, University of New South Wales

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8:30 AM Introductory Comments

8:35 AM Invited
A New Paradigm for Wrought Superalloys with Superior Fatigue Strength: *Marie Charpagne*[1]; JC Stinville[2]; [1]University of Illinois at Urbana-Champaign; [2]University of Illinois

9:05 AM Invited
Grain Boundary Microstructure Optimization in Ni-Co-based Wrought Superalloys: *Akane Suzuki*[1]; Steve Buresh[1]; Richard DiDomizio[1]; Scott Oppenheimer[1]; Ian Spinelli[1]; [1]GE Research

9:35 AM
Accelerating Alloy Development for Additive Manufacturing: *Elisabeth Kammermeier*[1]; Carolin Körner[1]; Christopher Zenk[1]; [1]FAU Erlangen-Nuernberg, WTM

9:55 AM
Influence of Local Thermal History during Laser Powder Bed Fusion Additive Manufacturing on Solidified Microstructure and Phase Transformations during Subsequent Heat Treatment: Andrew Wessman[1]; *Yi Zhang*[1]; [1]University of Arizona

10:15 AM Break

10:35 AM Invited
Segregation-assisted Yield Strength Anomalies in Superalloys: *Steffen Neumeier*[1]; Andreas Bezold[1]; Mathias Goeken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

11:05 AM
Effect of Machining Processes on the Perceived Mechanical Properties of Tantalum Refractory Alloys: *Christopher Finfrock*[1]; Zahra Ghanbari[1]; Rachel White[1]; Charles Robino[1]; Christina Profazi[1]; Jay Carroll[1]; Stephen Spiak[1]; Bonnie Antoun[1]; [1]Sandia National Laboratories

11:25 AM
Effects of Heat-Treatment on the High-Temperature Wear Behaviors of Additively Manufactured Inconel 718: *Zhengyu Zhang*[1]; Wenjun Cai[1]; [1]Virginia Polytechnic Institute and State University

11:45 AM
Surface Integrity and Microstructural Characterization of Additively Manufactured Inconel 625 subjected to Shot Peening and Laser Peening: *Manisha Tripathy*[1]; LLoyd Hackel[2]; Keivan Davami[3]; Ali Beheshti[1]; [1]George Mason University; [2]Curtiss Wright Surface Technologies; [3]The University of Alabama

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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 Jackson, Sandia National Laboratories

Monday AM | March 20, 2023
Aqua 311A | Hilton

Session Chairs: Dierk Raabe, Max-Planck Institute; Gregory Rohrer, Carnegie Mellon University

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8:30 AM Invited
Quantifying Microstructural Evolution in Polycrystals: *Gregory Rohrer*[1]; Robert Suter[1]; Zipeng Xu[1]; Aditi Bhattacharya[1]; [1]Carnegie Mellon University

9:00 AM
Multiscale Characterization of Deformation and Defect Structures during Continuous Bending under Tension: *David Fullwood*[1]; Nathan Miller[1]; Addison McClure[1]; Michael Miles[1]; Marko Knezevic[2]; Brad Kinsey[2]; [1]Brigham Young University; [2]University of New Hampshire

9:20 AM
Three-dimensional Assessment of Strain Localization at the Sub-grain Level of a Ni-based Superalloy at Low and High Temperature Using Laser Scanning Confocal Microscopy: *Damien Texier*[1]; Malo Jullien[1]; Ali Rouwane[1]; Julien Genée[1]; Jean-Charles Stinville[2]; Marc Legros[3]; Jean-Charles Passieux[1]; [1]CNRS - Institut Clément Ader; [2]University of Illinois, Urbana-Champaign; [3]CEMES - UPR CNRS 8011

9:40 AM
The Effect of Hydrogen on Strain Gradient Hardening of Ni: *Lai Jiang*[1]; Michael Demkowicz[1]; [1]Texas A&M University

10:00 AM Break

10:20 AM Invited
Mesoscale Simulation of Material Properties and Processing under Consideration of Microstructure, Chemistry and Damage Using DAMASK: *Dierk Raabe*[1]; [1]Max-Planck Institute

10:50 AM
Towards Data-driven In-Situ Materials Testing in SEM: *Fang Zhou*[1]; [1]Carl Zeiss Microscopy

11:10 AM
Structure-property Correlations in Molecular Crystals Determined via Nanoindentation and Molecular Mechanics Modeling: *Sushmita Majumder*[1]; Gerrit Vreeman[1]; Javier Garcia Barriocanal[1]; Greg Haugstad[1]; Changquan Calvin Sun[1]; Nathan Mara[1]; [1]University of Minnesota-Twin Cities

11:30 AM
Integration of X-Ray Microscopy and Finite Elements into a Digital Twin: *Mustafa Elsherkisi*[1]; Theo Huyghe[1]; Maadhav Kothari[2]; Fabian Duarte Martinez[1]; Simon Gray[1]; Gustavo Castelluccio[1]; [1]Cranfield University; [2]Carl Zeiss Microscopy Limited

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ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session — Honorary Palkowski Session I

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

Program Organizers: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology

Monday AM | March 20, 2023
Aqua E | Hilton

Session Chairs: Ravindra Nuggehalli, New Jersey Institute of Technology; Gérald Ferblantier, University of Strasbourg, ICube Laboratory, CNRS; Adele Carrado, University of Strasbourg, IPCMS, CNRS

8:30 AM Introductory Comments

8:45 AM Invited
Thermal Fatigue of Spheroidal Graphite Cast Iron: *Primoz Mrvar*[1]; Mitja Petric[1]; Milan Tercelj[1]; [1]University of Ljubljana

9:15 AM
Reduction of Friction and Adhesion in Copper and Brass Extrusion by Application of Boron Containing Surface Modifications: *Stefan Lechner*[1]; Alexander Thewes[2]; Soeren Mueller[1]; [1]Extrusion Research and Development Center FZS, TU Berlin; [2]Institute for Surface Technology, TU Braunschweig

9:35 AM Invited
In-Situ Alloy Formation during Selective Laser Melting with CuSn10 and Aluminum Powders: *Farzad Foadian*[1]; Robert Kremer[1]; [1]Dortmund University of Applied Sciences and Arts

10:05 AM Break

10:20 AM Invited
Prediction of Grain Size Evolution during Hot Rolling of HSLA Steels Considering Precipitation: *Goran Kugler*[1]; Jan Foder[2]; Boštjan Bradaškja[2]; David Bomba[1]; [1]University of Ljubljana; [2]SIJ Acroni d.o.o.

MATERIALS PROCESSING

Advanced Joining Technologies for Automotive Lightweight Structures — Novel Joining Processes

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

Program Organizers: Yan Huang, Brunel University London; Carla Barbatti, Constellium

Monday AM | March 20, 2023
29C | SDCC

Session Chair: Shouxun Ji, Brunel University London

8:30 AM Invited
Enabling Multimaterial Joining in Lightweight Automotive Structures Using Novel High Velocity Riveting Process: *Benjamin Schuessler*[1]; Daniel Ramirez-Tamayo[1]; Lei Li[1]; Ayoub Soulami[1]; Sridhar Niverty[1]; Xiaolong Ma[1]; Darrel Herling[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

9:00 AM Invited
Impact Welding of an Automotive Component with Vaporizing Foil Actuator: Yu Mao[1]; Brian Thurston[1]; *Anupam Vivek*[1]; Glenn Daehn[1]; [1]The Ohio State University

9:30 AM
Adhesive Bonding of Lightweight Multi-materials with Surface Modifications: Yong Chae Lim[1]; Nihal Kanbargi[1]; Zeyang Yu[1]; Bradley Lokitz[1]; *Jiheon Jun*[1]; Yi Feng Su[1]; Amit Naskar[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

9:55 AM Break

10:10 AM
Joint Strength Optimization of Single-lap Al 5052-H36 Adhesively Bonded for Off-road Vehicle Chassis Components: Marzieh Nodeh[1]; Ahmed Maslouhi[1]; *Alain Desrochers*[1]; [1]Universite de Sherbrooke

10:35 AM
Ultrasonically Assisted Resistance Spot Welding of Multiple Thin Al Foil Stacks for Battery Cell Joining: *Ho Kwon*[1]; Xun Liu[1]; [1]The Ohio State University

11:00 AM
Investigation of Metal Mixing in Laser Keyhole Welding of Dissimilar Metals: *Wenkang Huang*[1]; Wenda Tan[1]; [1]The University of Michigan

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ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — 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; Amit Pandey, Lockheed Martin Space; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Eric Detsi, University of Pennsylvania

Monday AM | March 20, 2023
32B | SDCC

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

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8:30 AM Keynote
Analysis of Degradation of (Ni-YSZ) Fuel Electrode during SOEC Operation: *Uday Pal*[1]; John-In Lee[1]; Jillian Mulligan[1]; Ayesha Akter[1]; Soumendra Basu[1]; Srikanth Gopalan[1]; [1]Boston University

9:00 AM Invited
Corrosion Resistant SiOCN Coatings on Steel with Repair Capability: *Kathy Lu*[1]; Hyeon Joon Choi[1]; [1]Virginia Polytechnic Institute and State University

9:25 AM Keynote
SolidPAC: A Design Tool for Solid-state Batteries: *Ilias Belharouak*[1]; [1]Oak Ridge National Laboratory; University of Tennessee, Knoxville

9:55 AM Break

10:15 AM Invited
Dielectrics, Solid Electrolytes, and Ferroelectrics: What Makes a Good Insulator Layer in Energy Harvesting and Storage Cells Good?: *Maria Helena Braga*[1]; [1]University of Porto

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ENERGY & ENVIRONMENT

Advances in Magnetic Materials — Soft Magnetic Materials

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

Program Organizers: Jose Maria Porro, Bcmaterials; Huseyin Ucar, California Polytechnic University,Pomona; Patrick Shamberger, Texas A&M University; Min Zou, Lab Magnetics, A Quadrant Company; Gaoyuan Ouyang, Ames Laboratory; Alex Leary, NASA Glenn Research Center

Monday AM | March 20, 2023
33A | SDCC

Session Chair: Alex Leary, NASA Glenn Research Center

8:30 AM Invited
Market Trends and Supply Chain Constraints for Soft Magnetic Materials: *Eric Theisen*[1]; [1]Metglas Inc.

9:00 AM
Computer-aided Optimization of Packing Behavior of Soft-magnetic Amorphous Powder: *Jungjoon Kim*[1]; Junhyub Jeon[2]; Seok-Jae Lee[2]; Youngkyun Kim[3]; Hwi-Jun Kim[4]; Youngjin Kim[5]; Hyunjoo Choi[1]; [1]Kookmin University; [2]Jeonbuk National University; [3]Institute of Advanced Engineering; [4]Korea Institute of Industrial Technology; [5]Korea Institute of Materials Science

9:20 AM
Effect of Nitrogen Martensite Formation on Magnetostriction in Fe-Co Alloy: *Tomohiro Tabata*[1]; Matahiro Komuro[1]; Yusuke Asari[1]; Masafumi Noujima[1]; Shohei Terada[1]; [1]Hitachi, Ltd.

9:40 AM
High-Temperature Stability of Induced Anisotropy and Permeability in Co-Rich Nanocrystalline Soft Magnetic Alloys: *Tyler Paplham*[1]; Yuankang Wang[1]; Paul Ohodnicki[1]; [1]University of Pittsburgh

10:00 AM Break

10:15 AM Invited
Tunable Magnetics: Materials, Manufacturing, and Component Designs: *Paul Ohodnicki*[1]; Tyler Paplham[1]; Richard Beddingfield[2]; Mark Nations[2]; Subhashish Bhattacharya[2]; [1]University of Pittsburgh; [2]North Carolina State University

10:45 AM
Effect of Thermodynamic and Sintering Atmosphere Parameters on Magnetic Properties of Mn-Zn Ferrites: *Suraj Mullurkara*[1]; Alexander Pierce[1]; Christopher

Bracken[1]; Paul Ohodnicki[1]; [1]University of Pittsburgh

11:05 AM
Low Magnetostrictive Materials Produced by Severe Plastic Deformation: *Alexander Paulischin*[1]; Michael Zawodzki[1]; Stefan Wurster[1]; Heinz Krenn[2]; Reinhard Pippan[1]; Andrea Bachmaier[1]; [1]Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences; [2]Institute of Physics, University of Graz

11:25 AM
Crystallization Kinetics and Magnetic Properties of Co-Fe2.3Mn2.3Nb4Si2B14 Nanocomposite Ribbon: *Yuankang Wang*[1]; Alex Leary[2]; Paul Ohodnicki[1]; [1]University of Pittsburgh; [2]NASA

ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Alloy Development and Application I

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Monday AM | March 20, 2023
Aqua D | Hilton

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

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8:30 AM Keynote
Nanostructured Multi-principal Ellement Alloys: A Review: *Carl Koch*[1]; [1]North Carolina State University

9:00 AM Keynote
Exceptional Fracture Toughness of CrCoNi-based Alloys Close to Liquid Helium Temperatures: Robert Ritchie[1]; Dong Liu[2]; Qin Yu[3]; Saurabh Kabra[4]; Madelyn Payne[5]; Ruopeng Zhang[5]; Flynn Walsh[5]; Bernd Gludovatz[6]; Mark Asta[5]; Andrew Minor[5]; Easo George[7]; *Punit Kumar*[8]; [1]University of California, Berkeley; [2]Bristol University; [3]Lawrence Berkeley Natonal Laboratory; [4]Rutherford Appleton Laboratory; [5]University of California, Berkeley; [6]University of New South Wales; [7]Oak Ridge National Laboratory; [8]Lawrence Berkeley National Laboratory

9:30 AM Invited
High Throughput Design and Synthesis of MPEAs: Unexpected Discoveries: *Mitra Taheri*[1]; [1]Johns Hopkins University

9:50 AM Invited
High Entropy Alloys and NSF: *Jonathan Madison*[1]; [1]National Science Foundation

10:10 AM Break

10:30 AM Invited
Design and Development of Refractory High-entropy Alloys via An Experimentally Driven High-throughput Approach: *Chanho Lee*[1]; Dongyue Xie[1]; Benjamin Derby[1]; Jon Baldwin[1]; Christopher Tandoc[2]; Osman Atwani[1]; Yong-Jie Hu[2]; Nan Li[1]; Saryu

Fensin[1]; [1]Los Alamos National Laboratory; [2]Drexel University

10:50 AM Invited
Accelerated Design of Cost-Competitive FCC High Entropy Alloys Superior to IN625: Kenneth Smith[1]; John Sharon[1]; Ryan Deacon[1]; Soumalya Sarkar[1]; Shunli Shang[2]; Zongrui Pei[3]; *Michael Gao*[3]; [1]Raytheon Technologies Research Center; [2]Pennsylvania State University; [3]National Energy Technology Laboratory

11:10 AM Invited
High-Throughput Design of Refractory Multi-Principal Element Alloys: Katharine Padilla[1]; Zhaohan Zhang[1]; Rohan Mishra[1]; *Katharine Flores*[1]; [1]Washington University in St. Louis

11:30 AM Invited
Additive Manufacturing of Compositionally Complex Metal Alloys with Engineered Microstructures: *Wen Chen*[1]; [1]University of Massachusetts-Amherst

11:50 AM Invited
Tailoring Microstructure of Refractory High Entropy Superalloys through Semi-quantitative Miscibility Gap: Sangjun Kim[1]; Jiyoung Kim[1]; Jae Kwon Kim[1]; Kook Noh Yoon[1]; Hyun Seok Oh[2]; *Eun Soo Park*[1]; [1]Seoul National University; [2]Massachusetts Institute of Technology

12:10 PM Invited
Designing Immiscible Medium-entropy Alloys: *Hyoung Seop Kim*[1]; Jongun Moon[1]; [1]Pohang University of Science and Technology

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MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — High Entropy Ceramics I

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Monday AM | March 20, 2023
30A | SDCC

Session Chairs: Alexander Dupuy, University of California Irvine; Bowen Li, Michigan Tech

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8:30 AM Introductory Comments

8:50 AM Keynote
Microstructure Engineering Using Entropic Phase Transformations: *Julie Schoenung*[1]; [1]University of California, Irvine

9:20 AM Invited
Compositionally Complex Oxide Ceramics: Synthesis, Structure and Properties: *Horst Hahn*[1]; [1]Karlsruhe Institute of Technology

9:40 AM Invited
Compositionally Complex Oxides: Synthesis, Characterization, Challenges, and Opportunities: *Veerle Keppens*[1]; [1]University of Tennessee

10:00 AM Break

10:20 AM
Design of High Entropy Ceramics with IGZO-based Compounds for Electroceramics Applications: Zaid Alejandro Luzanilla Meléndrez[1]; Alejandro Durán[2]; Francisco Brown[1]; Ofelia Hernández Negrete[1]; Javier Hernández Paredes[1]; *Victor Emmanuel Alvarez Montano*[1]; [1]Universidad De Sonora; [2]Universidad Nacional Autónoma de México

10:40 AM Invited
Applying the High Entropy Concept in Single-atom Catalysts and Ceramic Battery Cathode Active Materials: *Huolin Xin*[1]; Rui Zhang[1]; Chunyang Wang[1]; Lili Han[1]; [1]University of California - Irvine

11:00 AM
Grain size Confinement of Secondary Phases in Entropy Stabilized Oxides: *Alexander Dupuy*[1]; Julie Schoenung[1]; [1]University of California, Irvine

11:20 AM
Electrical Behavior of Multi-phase Entropy-stabilized Oxides: *Arturo Meza*[1]; Alina Vizcaya[1]; Alexander Dupuy[1]; Julie Schoenung[1]; [1]University of California Irvine

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MATERIALS PROCESSING

Advances in Pyrometallurgy: Developing Low Carbon Pathways — Biocarbon and Alternative Reduction Methods

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

Program Organizers: Camille Fleuriault, Eramet Norway; Joalet Steenkamp, XPS Glencore; Dean Gregurek, RHI Magnesita; Jesse White, KTH Royal Institute of Technology; Quinn Reynolds, Mintek; Phillip Mackey, P.J. Mackey Technology, Inc.; Lina Hockaday, Curtin University, WASM

Monday AM | March 20, 2023
29B | SDCC

Session Chairs: Dean Gregurek, RHI Magnesita; Camille Fleuriault, Eramet Norway

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8:30 AM Invited
Ferroalloy Production without Use of Fossil Carbon - Some Alternatives: *Eli Ringdalen*[1]; [1]SINTEF

9:00 AM Invited
The Path to Zero Carbon Dioxide Emissions in Silicon Production: *Gudrun Saevarsdottir*[1]; Thordur Magnusson[2]; Halvor Kvande[3]; [1]Reykjavik University; [2]Normi; [3]Previously NTNU

9:30 AM Invited
Towards Bio-Carbon Substitutes in the Manufacture of Electrodes and Refractories for the Metallurgical Industries: A Science and Technology Review: *Jesse White*[1]; Natalia Skorodumova[1]; Björn Glaser[1]; [1]KTH Royal Institute of Technology

10:00 AM Break

10:20 AM
A Pilot Trial Investigation of Using Hydrochar Derived from Biomass Residues for EAF Process: *Chuan Wang*[1]; Yu-Chiao Lu[2]; Liviu Brabie[1]; Guangwei Wang[3]; [1]Swerim AB; [2]KTH Royal Institute of Technology; [3]University of Science and Technology Beijing

10:40 AM
Biocarbon Materials in Metallurgical Processes – Investigation of Critical Properties: Nicholas Smith-Hanssen[1]; *Gøril Jahrsengene*[1]; Eli Ringdalen[1]; [1]SINTEF

11:00 AM
Characterizing Bio-carbon for Metallurgical Processes Using Micro X-ray Computed Tomography with High Temperature Experiments: *Stein Rørvik*[1]; Nicholas Smith-Hanssen[1]; Sethulakshmy Jayakumari[1]; Liang Wang[1]; [1]Sintef Industry

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MATERIALS DESIGN

Advances in Titanium Technology — Session 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, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Monday AM | March 20, 2023
Cobalt 500 | Hilton

Session Chair: Yufeng Zheng, University of Nevada Reno

8:30 AM Invited
Interface and Colony Boundary Sliding as a Deformation Mechanism in Titanium Alloys: Zachary Kloenne[1]; Gopal Viswanathan[1]; *Hamish Fraser*[1]; [1]Ohio State University

9:00 AM Invited
New Insights into Oxygen-rich Alpha Titanium Alloys for Structural Applications: Fabienne Amann[1]; Régis Poulain[2]; Stéphanie Delannoy[1]; Ivan Guillot[2]; Zachary Kloenne[3]; Guillou Raphaëlle[4]; Couzinié Jean-Philippe[2]; Dominique Thiaudière[5]; Jean-Luc Béchade[4]; Lartigue Sylvie[2]; Emmanuel Clouet[4]; Hamish Fraser[3]; *Frederic Prima*[1]; [1]Chimie ParisTech; [2]Université Paris Est Créteil; [3]The Ohio State University; [4]Université Paris-Saclay; [5]Synchrotron SOLEIL

9:30 AM Invited
Pathways to Engineer High Strength Coupled with High Strain Hardenability and Ductility in Metastable -Titanium Alloys: Abhishek Sharma[1]; Srinivas Aditya Mantri[1]; Nartu Mohan Sai Kiran[1]; Sriswaroop Dasari[1]; Ravisankar Haridas[1]; Riyadh Salloom[1]; Fan Sun[2]; Frederic Prima[2]; Hamish Fraser[3]; Srinivasan Srivilliputhur[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]CNRS - PSL Research University; [3]The Ohio State University

10:00 AM Break

10:20 AM
Adiabatic Heating and Phase Transformation in Serrated Chips of Ti-6Al-4V during Turning: Jiawei Lu[1]; *Thomas Bieler*[1]; Ryan Khawarizmi[1]; Patrick Kwon[1]; [1]Michigan State University

10:40 AM
Investigation of Grain Boundary Precipitation in Titanium Alloys using 3D Computational Simulation and Experimental Characterization: Dian Li[1]; Rongpei Shi[2]; *Yufeng Zheng*[1]; [1]University of Nevada-Reno; [2]Harbin Institute of Technology (Shenzhen)

11:00 AM
Exploring the Potential of Ti-Fe-X Systems for Design of Novel Titanium-based Superalloys: *Rosie Mellor*[1]; Nicholas Jones[1]; Howard Stone[1]; [1]University of Cambridge

11:20 AM
Grand Canonical Optimization of Grain Boundary Structure in Hexagonal Close-packed Titanium: *Enze Chen*[1]; Timofey Frolov[2]; Mark Asta[1]; Tae Wook Heo[2]; Brandon Wood[2]; [1]University of California, Berkeley; [2]Lawrence Livermore National Laboratory

11:40 AM
Understanding the Role of Dual-phase Interface on the Alpha Precipitation in Metastable Beta Titanium Alloy: *Dian Li*[1]; Yufeng Zheng[1]; [1]University of Nevada, Reno

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MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Monday AM | March 20, 2023
Cobalt 520 | Hilton

Session Chair: Darren Pagan, Pennsylvania State University

8:30 AM Keynote
RVE, SERVE and Digital Material Volumes for Design and Engineering: *Dennis Dimiduk*[1]; Somnath Ghosh[2]; David Furrer[3]; [1]BlueQuartz Software LLC; [2]Johns Hopkins University; [3]Pratt & Whitney

9:00 AM
A Framework to Solve the Inverse "Process-Structure" Problem of Identifying Process Parameters to Produce a Target Microstructure: *Dung-Yi Wu*[1]; Todd Hufnagel[1]; [1]Johns Hopkins University

9:20 AM
A Hybrid Gaussian Random Field – Deep Learning Model for Statistically Controllable Synthetic Microstructure Generation: *Andreas Robertson*[1]; Surya Kalidindi[1]; [1]Georgia Institute of Technology

9:40 AM
Data-driven Surrogate Models for Predicting Microstructural Evolution: *Peichen Wu*[1]; Kumar Ankit[1]; Ashif Lquebal[1]; [1]Arizona State University

10:00 AM
Predicting Grain Boundary Properties Using Strain Functional Descriptors and Supervised Machine Learning: *Avanish Mishra*[1]; Sumit Suresh[1]; Khanh Dang[1]; Saryu Fensin[1]; Edward Kober[1]; Nithin Mathew[1]; [1]Los Alamos National Laboratory

10:20 AM Break

10:35 AM
Statistical Generation of Three-Dimensional Dislocation Microstructures with Graph Neural Networks: *Dylan Madisetti*[1]; Jafaar El-Awady[1]; Christopher Stiles[2]; [1]Johns Hopkins University; [2]Johns Hopkins Applied Physics Laboratory

10:55 AM
Comparing Microstructure Representations for Machine Learning Models Predicting Material Properties: *Akhil Thomas*[1]; Ali Durmaz[1]; Harald Sack[2]; Chris Eberl[3]; [1]Fraunhofer IWM; [2]FIZ Karlsruhe / KIT Karlsruhe; [3]University of Freiburg

11:15 AM
Inferring Topological Transitions in Pattern-forming Processes via Self-supervised Learning: Marcin Abram[1]; Keith Burghardt[1]; Greg Ver Steeg[1]; *Remi Dingreville*[2]; [1]University of Southerm California; [2]Sandia National Laboratories

11:35 AM
What Does a Computer Vision Model Trained to Classify Material Microstructure Images Actually Understand?: Colby Wight[1]; Henry Kvinge[1]; *Davis Brown*[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

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MATERIALS DESIGN

Alloy Behavior and Design Across Length-Scales: An SMD Symposium Honoring Easo George — Perspectives and Behavior at Extremes

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

Program Organizers: Michael Mills, Ohio State University; George Pharr, Texas A&M University; Robert Ritchie, University of California, Berkeley; Muralidharan Govindarajan, Oak Ridge National Laboratory

Monday AM | March 20, 2023
Cobalt 502B | Hilton

Session Chair: Michael Mills, The Ohio State University

8:30 AM Introductory Comments

8:40 AM Invited
Physical Metallurgy and Mechanical Properties of Iridium and Platinum Alloys Used in Power and Heat Sources Onboard Interplanetary Spacecraft: *Easo George*[1]; [1]Oak Ridge National Laboratory

9:10 AM Invited
Easo George - Recollections of His Youth: *David Pope*[1]; [1]University of Pennsylvania

9:40 AM Invited
From Superplasticity in Steels to the Great Pyramid of Giza: *Jeffrey Wadsworth*[1]; [1]former CEO, Battelle

10:10 AM Break

10:30 AM Invited
Future Prospects of MoSiBTiC Alloys as Ultra-High Temperature Materials: *Kyosuke Yoshimi*[1]; [1]Tohoku University

11:00 AM Invited
Challenges in the Design of Refractory Multi-principal Element Alloys: Carolina Frey[1]; Leah Mills[1]; Sebastian Kube[1]; *Tresa Pollock*[1]; [1]University of California, Santa Barbara

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MATERIALS DESIGN

Alloy Development for Energy Technologies: ICME Gap Analysis — ICME Tools, Data, and Materials Design

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

Program Organizers: Ram Devanathan, Pacific Northwest National Laboratory; Raymundo Arroyave, Texas A & M University; Carelyn Campbell, National Institute of Standards and Technology; James Saal, Citrine Informatics

Monday AM | March 20, 2023
Sapphire I | Hilton

Session Chairs: Ram Devanathan, Pacific Northwest National Laboratory; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology; Raymundo Arroyave, Texas A & M University

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8:30 AM Invited
Materials-by-Design Utilizing ICME Tools and Crucial Next-generation Needs: *Amit Behera*[1]; Yu Lin[1]; Noriaki Arai[1]; Greg Olson[1]; [1]QuesTek Innovations LLC

9:00 AM Invited
Theory-guided Design of High-strength, Ductile Multi-principal-element Alloys with Validation for High-temperature Energy Technologies: *Duane Johnson*[1]; Prashant Singh[2]; Andrey Smirnov[2]; [1]Iowa State University; [2]Ames Laboratory

9:30 AM
Phase Field Dislocation Dynamics Modeling of Shearing Modes in Ni_2(Cr,Mo,W)-containing HAYNES® 244® Superalloy: *Thomas Mann*[1]; Michael Fahrmann[2]; Marisol Koslowski[1]; Michael Titus[1]; [1]Purdue University; [2]Haynes Intl.

9:50 AM
Phase-field Modeling of Aluminum Foam Based on Molecular Dynamics Simulations: *Chaimae Jouhari*[1]; Yucheng Liu[1]; Doyl Dickel[2]; [1]South Dakota State University; [2]Mississippi State University

10:10 AM Break

10:30 AM Invited
Filling Data Gaps with ICME Tools and Identifying Data Gaps in ICME Tools: A Case Study in Precipitation Kinetics: *Paul Mason*[1]; Taiwu Yu[1]; Carl-Magnus Lancelot[2]; Thomas Barkar[2]; [1]Thermo-Calc Software Inc.; [2]Thermo-Calc Software AB

11:00 AM Invited
Electronic NIST/TRC Resource for Thermophysical Property Data of Metal Systems: *Boris Wilthan*[1]; [1]NIST

11:30 AM
Towards FAIR Simulation Workflows: nanoHUB's Sim2Ls and ResultsDB: *Juan Verduzco*[1]; Daniel Mejia[1]; Steven Clark[2]; David Farache[1]; Alejandro Strachan[1]; [1]Purdue University; [2]University of California San Diego

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ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications XI — Session I

Sponsored by: TMS Functional Materials Division, TMS Structural 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; Wan-Ting Chiu, Tokyo Institute of Technology; Chenguang Fu, Zhejiang University

Monday AM | March 20, 2023
Sapphire A | Hilton

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

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8:30 AM Introductory Comments

8:35 AM Invited
Interface and Grain Boundary Effects on Thermal and Electrical Transport: *G. Jeffrey Snyder*[1]; [1]Northwestern University

8:55 AM Invited
Novel Mechanisms to Lower Thermal Conductivity and Enhance ZT: *Takao Mori*[1]; [1]National Institute For Materials Science

9:15 AM Invited
Crystal Structure, Phase Stability, and Thermoelectric Properties of Medium-Temperature IV-VI Thermoelectric Materials: *Hsin-Jay Wu*[1]; Szu-Chien Wu[1]; [1]National Yang Ming Chiao Tung University

9:35 AM
Shapes of Phase Boundaries in Isothermal Phase Diagrams: *Adetoye Adekoya*[1]; G. Jeffrey Snyder[1]; [1]Northwestern University

9:55 AM
Redissolution of Ge precipitates Boosts Thermoelectric Performance and Self-tunes the Carrier Concentration in Homogenous GeTe materials: *Yi-Fen Tsai*[1]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University

10:15 AM Break

10:35 AM Invited
Unexpected Reactions Observed in Ni/SnSe2 Couples: *Sinn-wen Chen*[1]; Chao-hong Wang[2]; Jia–Ruei Chang[1]; He-Cheng Yang[2]; [1]National Tsing Hua University; [2]National Chung Cheng University

10:55 AM
Phase Diagrams of the Ag-Cu-Se-Te Quaternary System: *Yohanes Hutabalian*[1]; Sinn-wen Chen[1]; [1]National Tsing Hua University

11:15 AM
Concluding Maximum Solubility Using Impurity Phase Stoichiometry: *Shashwat Anand*[1]; Chris Wolverton[2]; Jeff Snyder[2]; [1]Lawrence Berkeley National Laboratory; [2]Northwestern University

11:35 AM
Enhanced Thermoelectric Performance by Compositional Modulation in $AgSbTe_2$: *Chen Bo-Chia*[1]; Hsin-Jay Wu[1]; [1]National Yang-Ming Chiao Tung University

11:55 AM
Phase Diagram of Ternary Zn-Sb-Cu System and Thermoelectric Properties of Copper Doped Zn_4Sb_3: *I-Lun Jen*[1]; You-Kai Su[2]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University; [2]National Sun Yat-Sen University

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SPECIAL TOPICS

Beyond Apprenticeship: Navigating the Stages of Academia — The Path to Academia

Sponsored by: TMS: Education Committee

Program Organizers: Alexis Lewis, National Science Foundation; Suveen Mathaudhu, Colorado School of Mines; Michael Groeber, The Ohio State University

Monday AM | March 20, 2023
23A | SDCC

Session Chairs: Michael Groeber, The Ohio State University; Alexis Lewis, National Science Foundation

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8:30 AM Invited
Comparing Leadership Perspectives at a National Laboratory and a University: Transition to Academia: *Dan Thoma*[1]; [1]University of Wisconsin-Madison

9:00 AM Invited
A Field Guide for Becoming an Assistant Professor: *Victoria Miller*[1]; [1]University of Florida

9:30 AM Invited
The Early Days of Faculty Life: Balancing the Tripod: *Danielle Cote*[1]; [1]Worcester Polytechnic Institute

10:00 AM Break

10:20 AM Invited
Additive Manufacturing across Organizations: A perspective on Academia, Companies, and Research Institutes: *Ed Herderick*[1]; [1]The Ohio State University

10:50 AM Invited
Navigating Academia from Industry and a National Laboratory: *Bradley Jared*[1]; [1]University of Tennessee, Knoxville

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BIOMATERIALS

Bio-Nano Interfaces and Engineering Applications — Session I

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

Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hannes Schniepp, William & Mary; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Monday AM | March 20, 2023
Sapphire 400A | Hilton

Session Chairs: Hannes Schmidt, William & Mary; Candan Tamerler, University of Kansas

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8:30 AM Invited
An Insight into Cellular Protein Mechanics during Cancer Progression: *Dinesh Katti*[1]; Sharad Jaswandkar[1]; Hanmant Gaikwad[1]; Kalpana Katti[1]; [1]North Dakota State University

9:05 AM
From Molecular Interactions to Macroscopic Properties: Studying Protein-based Structural Materials Across the Scales: *Hannes Schniepp*[1]; [1]William & Mary

9:35 AM
Antimicrobial Peptide-polymer Hybrids Towards Next Generation Dental Adhesives: *Kalea Chu*[1]; Kyle Boone[1]; Aya Cloyd[1]; Qiang Ye[1]; Paulette Spencer[1]; Candan Tamerler[1]; [1]University of Kansas

9:55 AM Break

10:10 AM Invited
Nanostructural Bone Remodeling at the Interface to Mg Implants: *Helga Lichtenegger*[1]; Thomas Bretschneider[1]; Annelie Weinberg[2]; Nicole Sommer[2]; Omer Suljevic[2]; Christian Hellmich[3]; Lukas Pircher[3]; Nicole Zechmann[3]; Tilman Gruenewald[4]; Irene Rodriguez[5]; Andreas Menzel[5]; [1]University of Natural Resources and Life Sciences (BOKU); [2]Medical University of Graz; [3]Technical University of Vienna; [4]Institut Fresnel, Marseille; [5]Paul Scherrer Institute

10:45 AM
Influence of Nanoscale Hydration on the Micro-structural Properties of Human Cortical Bone: *Elizabeth Montagnino*[1]; Glynn Gallaway[1]; Thomas Siegmund[1]; John Howarter[1]; [1]Purdue University

11:05 AM
Dental Application of Nano-Zirconia: *Joy Iyamu*[1]; Ikhazuagbe Ifijen[2]; Obehi Ogudu[2]; Aiyevbekpen C. Ehigie[1]; Osahon K. Ogbeide[1]; [1]University of Benin, Benin City, Edo State, Nigeria; [2]Rubber Research Institute of Nigeria

11:25 AM
Multi-functional Peptide-mediated Intrafibrillar Remineralization for Dental Tissue Repair: *Aya Cloyd*[1]; Kye Boone[1]; Qiang Ye[1]; Paulette Spencer[1]; Candan Tamerler[1]; [1]University of Kansas

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BIOMATERIALS

Biological Materials Science — Biological Materials Science I

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

Monday AM | March 20, 2023
Sapphire 402 | Hilton

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

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8:30 AM Invited
The Mechanics of Living Organisms: Some Observations: *Marc Meyers*[1]; Tarah Sullivan[1]; Andrei Pissarenko[1]; Haocheng Quan[2]; Eduard Arzt[2]; [1]University of California-San Diego; [2]Leibniz Institute for New Materials

9:00 AM
Hierarchical, Progressive Collapsibility in the Impact Resistant Jackfruit: *Benjamin Lazarus*[1]; Rachel Luu[1]; Victor Leung[1]; Matthew Wong[1]; Samuel Ruiz-Pérez[2]; Willams Barbosa[3]; Ryan Fancher[1]; Diego Carneiro[3]; Wendell Almeida Bezerra[4]; Marc Meyers[1]; Josiane Barbosa[3]; [1]University of California San Diego; [2]Universidad Nacional Autónoma de México; [3]SENAI CIMATEC; [4]Instituto Militar de Engenharia (IME)

9:20 AM
Bio-inspired 3-phase Composites for Improved Impact Resistance: *Shahbaz Khan*[1]; Ling Li[1]; [1]Virginia Tech

9:40 AM Invited
Structure-mechanics-performance of Fish-fins as Inspiration for Robotic Materials: *Francois Barthelat*[1]; Saurabh Das[1]; Florent Hannard[2]; [1]University of Colorado Boulder; [2]Université Catholique de Louvain

10:10 AM Break

10:30 AM
Protecto-flexible Bioinspired Design: *Alex Ossa*[1]; Susana Estrada[1]; Dwayne Arola[2]; [1]Universidad Eafit; [2]University of Washington

10:50 AM
Prestressing Bioceramics: On the Structural Origins and Mechanical Significance of Residual Stresses in Sea Urchin Spines: *Zhifei Deng*[1]; Zian Jia[1]; Hyunchae Loh[2]; Admir Masic[2]; Emily Peterman[3]; Ling Li[1]; [1]Virginia Polytechnic Institute and State University; [2]Massachusetts Institute of Technology; [3]Bowdoin College

11:10 AM
Sclerites from the Gorgonian Octocoral, Lophogorgia Chilensis: A Biological Mechanotunable System Based on Granular Jamming: *Chenhao Hu*[1]; Zian Jia[1]; Ravi Tutika[1]; Michael Bartlett[1]; Xianghui Xiao[2]; Daniel Baum[3]; James Weaver[4]; Ling Li[1]; [1]Virginia Tech; [2]Brookhaven National Laboratory; [3]Zuse Institute Berlin; [4]Harvard University

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — 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 of Materials Research and Testing (BAM); Peter Derlet, Paul Scherrer Institut; Katharine Flores, Washington University in St. Louis; Yonghao Sun, The Chinese Academy of Sciences; Lindsay Greer, University of Cambridge; Peter Liaw, University of Tennessee

Monday AM | March 20, 2023
Aqua C | Hilton

Session Chair: Sebastian Kube, University of California Santa Barbara

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8:30 AM Introductory Comments

8:40 AM Invited
Studying Phase Transitions in Slow Motion via Fast Differential Scanning Calorimetry: *Jörg Löffler*[1]; [1]ETH Zurich

9:00 AM
Uncovering the Structural Evolution of Metallic Liquids during Vitrification: *Konstantinos Georgarakis*[1]; [1]Cranfield University

9:20 AM
The Physics of Elemental Ag and Binary Cu-Ag Glasses: First Order Glass Transition: *Qi An*[1]; William Johnson[1]; Konrad Samwer[1]; Sydney Corona[1]; William Goddard[1]; [1]Iowa State University

9:40 AM Invited
Compositional Dependence of the Fragility in Metallic Glass Forming Liquids: *Sebastian Kube*[1]; Sungwoo Sohn[1]; Rodrigo Ojeda Mota[1]; Theo Evers[1]; William Polsky[1]; Naijia Liu[1]; Kevin Ryan[1]; Sean Rinehart[1]; Yong Sun[1]; Jan Schroers[1]; [1]Yale University

10:00 AM Break

10:20 AM
Measurements from the Gap: Viscosity and Wave Speed Measurements in the Supercooled Liquid Region: Robert Conner[1]; Stefan Lohaus[2]; *Rebecca Stevens*[1]; Joseph Serrano[1]; [1]California State University Northridge; [2]California Institute of Technology

10:40 AM
Thermodynamic Connections to the Fragility of Pt-based BMGs: *Hillary Smith*[1]; Colby Stoddard[1]; Jong Na[2]; Marios Demetriou[2]; [1]Swarthmore College; [2]Glassimetal

11:00 AM
In-situ XRD Studies of Crystallization and Phase Transformations in Metallic Glasses upon Ultrafast Heating: *Ivan Kaban*[1]; [1]IFW Dresden

11:20 AM
Imaging Crystallization of a Au-based Bulk Metallic Glass: Influence of the Initial Glassy State: *Owain Houghton*[1]; A. Greer[1]; Yurii Ivanov[1]; [1]University of Cambridge

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CHARACTERIZATION

Characterization of Materials through High Resolution Coherent Imaging — High Resolution Characterization of Materials with Coherent Diffraction Imaging

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

TMS: Materials Characterization Committee

Program Organizers: Richard Sandberg, Brigham Young University; Ross Harder, Argonne National Laboratory; Xianghui Xiao, Brookhaven National Laboratory; Brian Abbey, La Trobe University; Saryu Fensin, Los Alamos National Laboratory; Ana Diaz, Paul Scherrer Institute; Mathew Cherukara, Argonne National Laboratory

Monday AM | March 20, 2023
Aqua 310A | Hilton

Session Chair: Ana Diaz, Swiss Light Source, Paul Scherrer Institute

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8:30 AM Invited
Structural Evolution of Nanoparticles Under Realistic Conditions Observed with Bragg Coherent X-ray Imaging: *Marie-Ingrid Richard*[1]; Maxime Dupraz[1]; Corentin Chatelier[1]; Clément Atlan[1]; Sarah Yehya[2]; David Simonne[2]; Stéphane Labat[3]; Steven Leake[4]; Ewen Bellec[4]; Tobias Schulli[4]; Olivier Thomas[3]; Joel Eymery[1]; Eugen Rabkin[5]; [1]CEA Grenoble; [2]Synchrotron SOLEIL; [3]IM2NP-CNRS; [4]ESRF; [5]Technion

9:00 AM
Nanoscale Imaging of Electrochemically-induced Strain Dynamics in a Locally Polarized Pt Grain: *Dina Sheyfer*[1]; Ruperto Mariano[2]; Tomoya Kawaguchi[3]; Wonsuk Cha[1]; Ross Harder[1]; Mathew Kanan[4]; Stephan Hruszkewycz[1]; Hoydoo You[1]; Matthew Highland[1]; [1]Argonne National Laboratory; [2]Massachusetts Institute of Technology; [3]Tohoku University; [4]Stanford University

9:20 AM
In Situ and Operando 3D Imaging of Pt and Pd Electrocatalytic Nanocrystals: *Clement Atlan*[1]; Corentin Chatelier[1]; Arnaud Viola[2]; Maxime Dupraz[3]; Isaac Martens[4]; Joël Eymery[1]; Frédéric Maillard[2]; Marie-Ingrid Richard[1]; [1]French Alternative Energies and Atomic Energy Commission; [2]Laboratory of Electrochemistry and Physical-Chemistry of Materials and Interfaces; [3]French National Centre for Scientific Research; [4]European Synchrotron Radiation Facility

9:40 AM
Exploring the Formation of Superlattice in Metal Nanocrystals using Bragg Coherent X-ray Diffraction Imaging: *Ericmoore Jossou*[1]; Ana Suzana[1]; Longlong Wu[1]; Jiecheng Diao[2]; Tadesse Assefa[3]; Steven Leake[4]; Adam Gabriel[5]; Anton Schneider[6]; Kim Kisslinger[1]; Lin Shao[5]; Yongfeng Zhang[6]; Lynne Ecker[1]; Jian Gan[7]; Ian Robinson[1]; Simerjeet Gill[1]; [1]Brookhaven National Laboratory; [2]University College London; [3]SLAC National Accelerator Laboratory; [4]The European Synchrotron Facility; [5]Texas A&M University; [6]University of Wisconsin; [7]Idaho National Laboratory

10:00 AM Break

10:20 AM Invited
Searching for Crystals, Twins, Peaks and Dislocations with BCDI: *Anthony Rollett*[1]; Yueheng Zhang[1]; Matthew Wilkin[1]; Robert Suter[1]; Nicholas Porter[2]; Richard Sandberg[2]; Wonsuk Cha[3]; Ross Harder[3]; Siddharth Maddali[3]; Stephan Hruszkewycz[3]; [1]Carnegie Mellon University; [2]Brigham Young University; [3]Argonne National Lab

10:50 AM Invited
High-speed Free-run Ptychography at the Australian Synchrotron: *Cameron Kewish*[1]; [1]Australian Nuclear Science and Technology Organization

11:20 AM
Catalytic Properties at the Nanoscale Probed by Coherent Diffraction Imaging: *David Simonne*[1]; Andrea Resta[1]; Alessandro Coati; Alina Vlad[1]; Benjamin Voisin[1]; Yves Garreau[1]; Corentin Chatelier[2]; Maxime Dupraz[3]; Marie-Ingrid Richard[2]; [1]Synchrotron

SOLEIL; [2]CEA Grenoble; [3]ESRF

11:40 AM
In Situ Bragg Coherent X-ray Diffraction Imaging Studies: *David Yang*[1]; Nicholas Phillips[2]; Kay Song[1]; Guanze He[1]; Clara Barker[1]; Wonsuk Cha[3]; Ross Harder[3]; Wenjun Liu[3]; Dina Sheyfer[3]; Felix Hofmann[1]; [1]University of Oxford; [2]Paul Scherrer Institute; [3]Argonne National Laboratory

12:00 PM
Internal Strain Changes of Pt Nanoparticles in Response to the High Pressure in Diamond-anvil Cell: *Stephane Labat*[1]; Sarah Yehya[1]; Marie-Ingrid Richard[2]; Felisa Berenguer[3]; Pierre Fertey[3]; Steven Leake[4]; Bjorn Wehinger[4]; Mor Levi[5]; Eugen Rabkin[5]; Mohamed Mezouar[4]; [1]AMU-CNRS; [2]CEA; [3]SOLEIL; [4]ESRF; [5]TECHNION

12:20 PM
Rationalization of CO2 Adsorption on Ni nanocrystals using Bragg Coherent X-ray Imaging: *Corentin Chatelier*[1]; Clément Atlan[1]; David Simonne[2]; Joël Eymery[1]; Marie-Ingrid Richard[1]; [1]CEA Grenoble; [2]Synchrotron SOLEIL

CHARACTERIZATION

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

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Monday AM | March 20, 2023
Aqua 313 | Hilton

Session Chairs: Jian Li, CanmetMATERIALS; Yunus Kalay, Middle East Technical University

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8:30 AM
Non-local Means Denoising of EDS Spectra for Rapid Mapping of Composition in Nickel Aluminum Bronze: *Patrick Callahan*[1]; Dillon Watring[1]; David Rowenhorst[1]; [1]US Naval Research Laboratory

8:50 AM
Analytical Polarized-light Microscopy: Specifications and Applications: *Brian Hoover*[1]; Cesar Ornelas-Rascon[1]; [1]Advanced Optical Technologies, Inc.

9:10 AM
Characterization of the Speed of Sound for Molten Metals at High Pressures: *Elizabeth Rasmussen*[1]; Mark McLinden[1]; [1]National Institute of Standards and Technology

9:30 AM
Critical Analysis of Intermetallic Phases in Cu-Sn Alloys by EBSD: *Stefan Martin*[1]; Andreas Leineweber[1]; [1]Tu Bergakademie Freiberg

9:50 AM
Thermal Conductivity Measurements of Battery Components using the Flash Method: *Heng Wang*[1]; Peter Ralbovsky[1]; Guiquan Pan[1]; Marc-Antoine Thermitus[1]; [1]Netzsch Instruments North America, LLC

10:10 AM Break

10:25 AM
Characterization of Lunar and Martian Meteorites using Scanning Electronic Microscope (SEM): *Hussain Al Halwachi*[1]; [1]Bahrain Society of Chemists

10:45 AM
Characterization of Pearls using EDXF and Omnian Standard Less Application: *Hussain Al Halwachi*[1]; [1]Aluminium Bahrain (Alba)

11:05 AM
X-ray Tomography as a 3D Metrology Technique: *Brian Patterson*[1]; Bryan Hunter[1]; Steven Young[1]; Theresa Quintana[1]; Thomas Day[1]; Derek Schmidt[1]; Adam Wachtor[1]; [1]Los Alamos National Laboratory

11:25 AM
Online Electron Microscope for 3D Microstructure Data: *Zachary Varley*[1]; Allison Weller[1]; Gregory Rohrer[1]; Marc De Graef[1]; [1]Carnegie Mellon University

11:45 AM
Unveiling Effect of Alloying Elements on Recrystallization Behavior of Platinum Alloys: *Gaeun Song*[1]; So-Yeon Lee[2]; In-Suk Choi[1]; [1]Seoul National University; [2]Kumoh National Institute of Technology

12:05 PM
The Power and Limitation of Ion Beam Imaging in Focused Ion Beam Microscopes: *Pei Liu*[1]; [1]CanmetMATERIALS

NUCLEAR MATERIALS

Composite Materials for Nuclear Applications II — SiC/SiC for Fission and Fusion

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

Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Commonwealth Fusion Systems; Peng Xu, Idaho National Laboratory; Johann Riesch, Max-Planck-Insitut Fuer Plasmaphysik

Monday AM | March 20, 2023
24B | SDCC

Session Chairs: Anne Campbell, Oak Ridge National Laboratory; Peng Xu, Idaho National Laboratory

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8:30 AM Invited
Status Update on Framatome PROtect ATF Solutions: Cr-coated $M5_{Framatome}$ and SiC_f/SiC Cladding Designs: *Matthieu Aumand*[1]; Kiran Nimishakavi[1]; Elmar Schweitzer[1]; Karl Buchanan[1]; Claire Verdon[1]; Thorsten Marlaud[1]; [1]Framatome

9:00 AM
Characterization of Defects Generated from Thermal Stresses in SiC/SiC Composites: *Jose Arregui-Mena*[1]; Takaaki Koyanagi[1]; Yutai Katoh[1]; [1]Oak Ridge National Laboratory

9:20 AM
Advanced Modeling for use in Accelerate Fuel Qualification of Silicon Carbide Composite Cladding: *Joel Kosmatka*[1]; Nicholas Truong[1]; Herb Shatoff[1]; George Jacobsen[1]; [1]General Atomics

9:40 AM
Development of SiCf/SiC Composite Materials for Fusion Applications: *Alexander Leide*[1]; Max Rigby-Bell[1]; Slava Kuksenko[1]; James Wade-Zhu[1]; David Bowden[1]; [1]United Kingdom Atomic Energy Authority

10:00 AM Break

10:20 AM Invited
Next-generation Nuclear Grade Composite Components: *Sean Gonderman*[1]; George Jacobsen[1]; Ivan Ivanov[1]; Lucas Borowski[1]; Rolf Haefelfinger[1]; Christian Deck[1]; Jack Gazza[1]; [1]General Atomics

10:50 AM
Development and Evaluation of Dual-purpose Coating to SiC/SiC Composite Accident-tolerant Fuel Cladding for Light Water Reactors: *Yutai Katoh*[1]; Takaaki Koyanagi[1]; Peter Mouche[1]; [1]Oak Ridge National Laboratory

11:10 AM
Mechanistic Understanding of Hydrothermal Corrosion of SiC Under Irradiation: *Peng Wang*[1]; Gary Was[1]; [1]University of Michigan

11:30 AM
Stress Rupture of SiC/SiC Composite Tubes Under High-temperature Steam: Implications for Resistance to Light Water Reactor Accident: *Takaaki Koyanagi*[1]; Omer Karakoc[1]; Charles Hawkins[1]; Edgar Lara-Curzio[1]; Yutai Katoh[1]; [1]Oak Ridge National Laboratory

11:50 AM
Microstructure and Mechanical Behavior of Cr Coatings for Mitigating Hydrothermal Corrosion of SiC-SiC$_f$ Fuel Cladding: *Kyle Quillin*[1]; Hwasung Yeom[1]; Tyler Dabney[1]; Evan Willing[1]; David Frazer[2]; Lingfeng He[2]; Laura Jamison[3]; Kumar Sridharan[1]; [1]University of Wisconsin-Madison; [2]Idaho National Laboratory; [3]Argonne National Laboratory

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MATERIALS DESIGN

Computational Discovery and Design of Materials — Session I

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

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha Vermaak, Lehigh University

Monday AM | March 20, 2023
Cobalt 502A | Hilton

Session Chairs: Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory

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8:30 AM Invited
Ultra-fast Interpretable Machine-learning Potentials for Accelerated Structure Prediction of Materials: *Richard Hennig*[1]; Stephen Xie[2]; Pawan Prakash[1]; Ajinkya Hire[1]; Robert Schmid[3]; Hendrik Kraß[3]; Matthias Rupp[3]; [1]University of Florida; [2]KBR, NASA Ames Research Center; [3]University of Konstanz

9:00 AM Invited
Computational Reconnoiter for the Design of Amorphous Transition Metal Oxides for Surface Transfer Doping of Diamond: *Peter Greaney*[1]; Cameron Chevalier[1]; Harsha Antony[1]; Pegah Mirabedini[1]; Sarah Allec[2]; Mahesh Neupane[3]; [1]University of California, Riverside; [2]Pacific Northwest National Laboratory; [3]Army Research Laboratory

9:30 AM Invited
Modeling of Local Lattice Distortion Effects on Vacancy Migrations in Multicomponent FCC Alloys: Zhucong Xi[1]; Louis Hector, Jr[2]; Amit Misra[1]; *Liang Qi*[1]; [1]University of Michigan; [2]GM Global Technical Center, General Motors Company

10:00 AM Break

10:20 AM Invited
Computation Discovery of Materials for Solid-state Batteries: *Yifei Mo*[1]; [1]University of Maryland, College Park

10:50 AM
Machine-learning-boosted Searching and Optimization of Emergent Quantum Materials: *Mingda Li*[1]; [1]Massachusetts Institute of Technology

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PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Kinetics and Transport

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Monday AM | March 20, 2023
26A | SDCC

Session Chairs: Theresa Davey, Tohoku University; Eva Zarkadoula, Oak Ridge National Laboratory

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8:30 AM Invited
Interplay between Thermodynamics and Kinetics in Solid-state Synthesis: *Katsuyo Thornton*[1]; [1]University of Michigan

9:00 AM
Characterization of Grain Boundary Phase Transformations: *Ian Winter*[1]; Robert Rudd[2]; Tomas Oppelstrup[2]; Timofey Frolov[2]; [1]Sandia National Laboratories; [2]Lawrence Livermore National Laboratory

9:20 AM
Kinetic Monte Carlo Simulations of BCC Crystal Surfaces with Applications to Chromium, Titanium, and Nitinol: *Pheobe Appel*[1]; Divya Sharma[1]; Paulette Clancy[1]; Jonah Erlebacher[1]; [1]Johns Hopkins University

9:40 AM
Accelerating Off-lattice Kinetic Monte Carlo Simulations to Predict Hydrogen Vacancy-cluster Interactions in –Fe: *Conor Williams*[1]; Enrique Galindo-Nava[2]; [1]University of Cambridge; [2]University College London

10:00 AM Break

10:20 AM
Microscopic View of Heat Capacity of Matter: *Jaeyun Moon*[1]; Takeshi Egami[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee, Knoxville

10:40 AM
Semi-empirical Approach for Analyzing the Microstructure-aware Effective Thermal Conductivity of Polycrystalline Materials: *Younggil Song*[1]; N. C. Du[1]; D.-X. Qu[1]; T. W. Heo[1]; [1]Lawrence Livermore National Laboratory

11:00 AM
A Phase Field Approach to Study Precipitate Migration under Temperature Gradient: *Sandip Guin*[1]; Soumya Bandyopadhyay[2]; Saswata Bhattacharya[3]; Rajdip Mukherjee[4]; [1]Indian Institute of Technology, Kanpur/National Yang Ming Chiao Tung University; [2]Indian Institute of Technology, Kanpur/Kookmin University; [3]Indian Institute of Technology, Hyderabad; [4]Indian Institute of Technology, Kanpur

11:20 AM
First-principles Investigation of Alloying Element Migration and Intermetallic Phase Formation in a Cr-alloy Coated Zr-alloy Accident Tolerant Nuclear Fuel System: *Theresa Davey*[1]; Ying Chen[1]; [1]Tohoku University

11:40 AM Invited
Understanding the Effect of Crystal Anisotropy on Grain Growth, Texturing, and Transport via the Orthorhombic Alpha-uranium System: *Andrea Jokisaari*[1]; Benjamin Beeler[2]; Khadija Mahbuba[2]; Yuhao Wang[3]; [1]Idaho National Laboratory; [2]North Carolina State University; [3]University of Michigan

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Deformation Mechanisms I

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Monday AM | March 20, 2023
Aqua 300AB | Hilton

Session Chairs: Timothy Rupert, University of California, Irvine; Christoph

Kirchlechner, KIT

8:30 AM Invited
The Role of Amorphous Shear Bands in Deformation of Crystalline Materials: *Izabela Szlufarska*[1]; [1]University of Wisconsin-Madison

9:00 AM
Submicron Intermetallic Particle Heterogeneity Controls Shear Localization in High-strength Nanostructured Al Alloys: *Tianjiao Lei*[1]; Esther Hessong[1]; Jungho Shin[2]; Daniel Gianola[2]; Timothy Rupert[1]; [1]University of California Irvine; [2]University of California Santa Barbara

9:20 AM
Rejuvenation of Plasticity via Deformation Graining in Submicron Magnesium: Boyu Liu[1]; Zhen Zhang[2]; Fei Liu[1]; *Bin Li*[3]; Zhiwei Shan[1]; [1]Xi'an Jiaotong University; [2]Hefei University of Technology; [3]University of Nevada, Reno

9:40 AM
The Heterogeneous Nature of Mechanically Accelerated Grain Growth: Elton Chen[1]; Brad Boyce[1]; *Remi Dingreville*[1]; [1]Sandia National Laboratories

10:00 AM Break

10:20 AM Invited
Thermal Stability and Mechanical Behavior in Segregation-Engineered Nanocrystalline Ternary Al Alloys: Jungho Shin[1]; Fulin Wang[2]; Glenn Balbus[3]; Tianjiao Lei[4]; William Cunningham[1]; Ravit Silverstein[1]; Timothy Rupert[4]; *Daniel Gianola*[1]; [1]University of California-Santa Barbara; [2]Shanghai Jiao Tong University; [3]Air Force Research Laboratory; [4]University of California Irvine

10:50 AM
Deformation Behavior and Microstructural Characterization of Pure Mg Deformed by Nanoindentation: *Yi-Cheng Lai*[1]; Yuwei Zhang[1]; George Pharr[1]; Kelvin Xie[1]; [1]Texas A&M University

11:10 AM Invited
Dislocation Twin Boundary Interactions: Slip Transfer and Dislocation Nucleation: *Christoph Kirchlechner*[1]; [1]Karlsruhe Institute of Technology

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ELECTRONIC MATERIALS

Electronic Packaging and Interconnection — Quality and Reliability of Advanced Microelectronic Packaging

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

Program Organizers: Kazuhiro Nogita, University of Queensland; Mohd Arif Mohd Salleh, Universiti Malaysia Perlis; Dan Li, Beijing University of Technology; David Yan, San Jose State University; Fan-Yi Ouyang, National Tsing Hua University; Patrick Shamberger, Texas A&M University; Tae-Kyu Lee, Cisco Systems; Christopher Gourlay, Imperial College London; Albert T. Wu, National Central University

Monday AM | March 20, 2023
Sapphire D | Hilton

Session Chairs: Tae-Kyu Lee, Cisco Systems; Kazuhiro Nogita, The University of Queensland

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8:30 AM Introductory Comments

8:40 AM Invited
Power Cycling Reliability with Temperature Deviation of Pressureless Silver Sinter Joint for Silicon Carbide Power Module: *Won Sik Hong*[1]; Mi Song Kim[1]; [1]Korea Electronics Technology Institute

9:05 AM
Investigation of Corrosion for Ni-based Surface Finish: *Jui-Lin Chao*[1]; Si-Wei Lin[1]; Jing-Chie Lin[1]; Yi-Hung Liu[1]; Chih-Yuan Hsiao[2]; Freeze Wang[2]; Nico Li[2]; Alber T Wu[1]; [1]National Central University; [2]Taiwan Uyemura Co Ltd., 337 Taiwan

9:25 AM
Mitigation of Tin Whiskers Growth by Co-electroplating Sb: *Lei Zhang*[1]; Xia Wang[1]; Hongwei Qu[1]; [1]Oakland University

9:45 AM Break

10:05 AM
Low Melting Temperature Solder Interconnect Thermo-mechanical Performance Enhancement Using Elemental Tuning: *Tae-Kyu Lee*[1]; Nilesh Badwe[2]; Greg Baty[3]; Raiyo Aspandiar[4]; Young-Woo Lee[5]; [1]Cisco Systems; [2]IIT Kanpur; [3]Portland State University; [4]Intel; [5]MK Electron

10:25 AM
Probing Defect Formation and Reliability of Solder Interconnects Produced through Quasi-ambient Bonding: *Wajira Mirihanage*[1]; Saranarayanan Ramachandran[1]; Zhaoxia Zhou[2]; Zhe Cai[1]; Fan Wu[1]; Canyu Liu[2]; Han Jiang[2]; Christoforos Panteli[3]; Stuart Robertson[2]; Andrew Holmes[3]; Sarah Haigh[1]; Changqing Liu[2]; [1]The University of Manchester; [2]Loughborough University; [3]Imperial College London

10:45 AM
The Effect of Grain Boundary Type on Void Formation in a Through Silicon Via (TSV): *Armin Shashaani*[1]; Panthea Sepehrband[1]; [1]Santa Clara University

11:05 AM
Phase-field Modeling of Electromigration-mediated Void Migration and Coalescence under Mechanical Compression: William Farmer[1]; *Kumar Ankit*[1]; [1]Arizona State University

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ENERGY & ENVIRONMENT

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: Shafiq Alam, University of Saskatchewan; Donna Guillen, Idaho National Laboratory; Fiseha Tesfaye, Metso Outotec Finland Oy; Lei Zhang, University of Alaska Fairbanks; Lina Hockaday, Curtin University, WASM; Neale Neelameggham, IND LLC; Hong (Marco) Peng, University of Queensland; Nawshad Haque, Commonwealth Scientific and Industrial Research Organization; Liu Yan, Northestern University

Monday AM | March 20, 2023
33B | SDCC

Session Chairs: Donna Guillen, Idaho National Laboratory; Lina Hockaday, Curtin

University, WASM

9:35 AM Introductory Comments

9:40 AM
Analysis of Environmental Impact of Vertical Axis Wind Turbine using Circular Economy Approach: Satyendra Dayalu[1]; Shalini Verma[1]; Akshoy Ranjan Paul[1]; *Nawshad Haque*[2]; [1]Motilal Nehru National Institute of Technology Allahabad; [2]Commonwealth Scientific and Industrial Research Organization

10:00 AM
Corrosion and Erosion Protection to Accelerate Deployment of Sustainable Biomass: *Patrick Shower*[1]; Voramon Dheeradhada[1]; Scott Weaver[1]; Bruce Pint[2]; Michael Pagan[3]; Suresh Babu[3]; Aida Amroussia[1]; Martin Morra[1]; Gilad Zorn[1]; Anteneh Kebbede[1]; [1]GE Research; [2]Oak Ridge National Laboratory; [3]University of Tennessee, Knoxville

10:20 AM Break

10:40 AM
Development of Indium-tin Oxide Thin Films on PAMAM Dendrimer Layers for Perovskite Solar Cells Application: *Firdos Ali*[1]; Alecsander Mshar[1]; Ka Ming Law[1]; Xiao Li[1]; A. Hauser[1]; Shanlin Pan[1]; Dawen Li[1]; Subhadra Gupta[1]; [1]University of Alabama

11:00 AM
DFT Study of CuS-ZnS Heterostructures: *Louis Oppong-Antwi*[1]; Judy Hart[1]; [1]University of New South Wales

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CORROSION

Environmental Degradation of Multiple Principal Component Materials — High Temperature Corrosion I

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

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; XiaoXiang Yu, Novelis Global Research Center; 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); Gerald Frankel, Ohio State University; ShinYoung Kang, Lawrence Livermore National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Monday AM | March 20, 2023
Sapphire 410A | Hilton

Session Chairs: Bronislava Gorr, Karlsruhe Institut für Technologie; Mark Weaver, The University of Alabama

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8:30 AM Invited
Conditions for Exclusive External Scale Formation in the High Temperature Oxidation of Alloys: *Karl Sieradzki*[1]; William Blades[1]; Elizabeth Opilia[2]; [1]Arizona State University; [2]University of Virginia

8:50 AM
Effect of the Chemical Composition on the Formation of Compact (Cr,Ta,Ti) O_2 Scales on Refractory High-entropy Alloys (RHEAs) within the Ta-Mo-Cr-Ti-

Al System: *Steven Schellert*[1]; Hans-Jürgen Christ[1]; Stephan Laube[2]; Alexander Kauffmann[2]; Martin Heilmaier[2]; Bronislava Gorr[3]; [1]Universität Siegen; [2]Karlsruher Institut für Technologie (KIT IAM-WK); [3]Karlsruher Institut für Technologie (KIT IAM-AWP)

9:10 AM
Flow and Steam Enhanced Degradation of Once Through Steam Generation Piping Steels: Kevin Hodder[1]; Omnath Ekambaram[1]; Saeid Dehghani[1]; *John Nychka*[1]; Basil Perdicakis[2]; R. Sean Sanders[1]; [1]University of Alberta; [2]Suncor Energy

9:30 AM
High Temperature Oxidation of CoNiFeMnCr High Entropy Alloys Reinforced by MC-carbides: *Patrice Berthod*[1]; [1]University of Lorraine

9:50 AM Break

10:05 AM
Investigation of Spinel Phase Formation on Ni-doped FeCrAl Alloy in Multiple Environments: *Rajnikant Umretiya*[1]; Andrew Hoffman[1]; Richard Blair[1]; Robert Motly[1]; Timothy Jurewicz[1]; Raul Rebak[1]; [1]GE Research

10:25 AM Invited
Elemental Effects on Oxidation Kinetics of Refractory High Entropy Alloys: *Hideyuki Murakami*[1]; Moreau Louis[1]; Wei-Chih Lin[2]; Kai-chi Lo[2]; Stephane Gorsse[3]; An-chou Yeh[2]; [1]National Insititute for Materials Science; [2]National Tsing Hua University; [3]CNRS, Univ. Bordeaux

10:45 AM
Role of Surface Deformation on the High-Temperature Oxidation Response of FeNiCr-based HEAs: *Kate Moo*[1]; Daniele Fatto Offidani[1]; Emmanuelle Marquis[1]; [1]University of Michigan

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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 AM | March 20, 2023
Sapphire 410B | Hilton

Session Chairs: Gary Was, University of Michigan; John Scully, University of Virginia

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8:30 AM Invited
Mechanistic Understanding of Irradiation Assisted Stress Corrosion Cracking: *Gary Was*[1]; [1]University of Michigan

9:00 AM
Cold Spray Deposition for Mitigation and Repair of Stress Corrosion Cracking in Used Nuclear Fuel Storage Stainless Steel Canisters: *Hwasung Yeom*[1]; Nicholas Pocquette[1]; Jonathan Tatman[2]; Frank Pfefferkorn[1]; Kumar Sridharan[1]; [1]University of Wisconsin Madison; [2]Electric Power Research Institute

9:20 AM
Peening Technologies to Mitigate Initiation and Resurgence of Stress Corrosion Cracking in Dry Cask Storage Stainless Steel Canisters: *John Lacy*[1]; Hwasung Yeom[1]; Kumar Sridharan[1]; Stan Bovid[2]; Andrew Tieu[3]; Jon Tatman[4]; Willie[3]; Kenneth Ross[5]; [1]University of Wisconsin-Madison; [2]LSP Technologies ; [3]VLN Technologies; [4]Electric Power and Research Institute; [5]Pacific Northwest nation Laboratory

9:40 AM
Coupled Analysis of Stress and Deformation Behavior in Transgranular Stress Corrosion Crack Tip Plasticity in Austenitic Stainless Steel: *Haozheng Qu*[1]; Rebecca Schaller[2]; Eric Schindelholz[3]; Janelle Wharry[1]; [1]Purdue University; [2]Sandia National Laboratories; [3]Ohio State University

10:00 AM Break

10:20 AM Invited
Hydrogen Interactions and Transport in Additively Manufactured Structural Alloys: Implications for Stress Corrosion Cracking and Hydrogen Embrittlement: *John Scully*[1]; James Burns[1]; Lauren Singer[1]; Zachary Harris[1]; [1]University of Virginia

10:50 AM
Improving Stress Corrosion Cracking of Type 304 Stainless Steel through Grain Boundary Engineering: *Osama Alyousif*[1]; [1]Kuwait University

11:10 AM
A Mechanistic Study on Dealloyed-induced Stress Corrosion Cracking Initiation of Alloy 800: Hooman Gholamzadeh[1]; Adil Shaik[1]; Kevin Daub[1]; Matt Topping[1]; Mark Daymond[1]; *Suraj Persaud*[1]; [1]Queen's University

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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: Mechanical Behavior of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Additive Manufacturing 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, National Institute of Standards and Technology

Monday AM | March 20, 2023
Sapphire H | Hilton

Session Chair: Brian Wisner, Ohio University

8:30 AM Invited
On the Low Temperature Fatigue Crack Growth Behavior of AA7075-T651 in Ultra-high Vacuum Environments: *Zachary Harris*[1]; Adam Thompson[2]; James Burns[2]; [1]University of Pittsburgh; [2]University of Virginia

8:55 AM
Hydrogen Impact on Cyclic Behavior of Titanium Alloys Questioned in Term of Dislocation Pattern and Internal Stresses: Some Consequences on Damage:

Larissa Moreira[1]; Abdelali Oudriss[2]; Guillaume Lotte[3]; Stéphane Cohendoz[2]; Simon Frappart[4]; Aude Mathis[4]; Thierry Millot[4]; Jamaa Bouhattate[2]; *Feaugas Xavier*[3]; [1]LaSIE - NavalGroup; [2]Lasie Cnrs Umr73; [3]LaSIE UMR CNRS; [4]Naval Group CESMAN

9:15 AM
Very-high Cycle Fatigue Lives of High-temperature Materials Tested by Ultrasonic Fatigue: *Alexander Schmiedel*[1]; Anja Weidner[1]; Horst Biermann[1]; [1]TU Bergakademie Freiberg

9:35 AM
Sensitivity of Fatigue Crack Growth Lives to Sustained Thermal Gradients: *James Sobotka*[1]; Robert McClung[1]; Michael Enright[1]; [1]Southwest Research Institute

9:55 AM
Contributions of Oxidation and Creep to High Temperature Fatigue Crack Susceptibility in Waspaloy: *Alex Jennion*[1]; Zachary Harris[1]; James Burns[1]; [1]University of Virginia

10:15 AM Break

10:30 AM
Mechanism of Microstructural Decay from a Detailed Characterization of 52100 Bearing Steel after Rolling Contact Fatigue: *Tania Loaiza*[1]; Prasath Babu Revathy Rajan[1]; Steve Ooi[2]; Peter Hedström[1]; [1]KTH (Royal Institute of Technology); [2]Ovako/ Maxwell Centre, University of Cambridge,

10:50 AM Invited
Critical Effect of Volumetric Defects in High Cycle Fatigue of Additively Manufactured Ti-6Al-4V: *Shuai Shao*[1]; Nima Shamsaei[1]; [1]Auburn University

11:15 AM
Influence of Build Orientation on High Temperature Fatigue Crack Growth Mechanisms in Inconel 718 Fabricated by Laser Powder Bed Fusion: Effects of Temperature and Hold Time: Diego Martinez de Luca[1]; Philippa Reed[1]; *Andrew Hamilton*[1]; [1]University of Southampton

11:35 AM
Fatigue Crack Propagation in Plasticity Mismatched Bi-material Steels Fabricated by Laser Powder Bed Fusion: Anqi Liang[1]; Sandeep Sahu[1]; Xiao Zhao[1]; Tomas Polcar[1]; *Andrew Hamilton*[1]; [1]University of Southampton

11:55 AM
The Role of Cellular Microstructures on the Fatigue Behavior of Additively Manufactured Al Alloys: *Emine Tekerek*[1]; Lars Jacquemetton[2]; Darren Beckett[2]; Scott Halliday[3]; Jorg M. K. Wiezorek[4]; Antonios Kontsos[1]; [1]Drexel University; [2]Sigma Additive Inc; [3]Navajo Technical University; [4]University of Pittsburg

12:15 PM
High Cycle Fatigue of a Novel Additively Manufactured Al-Ni-Ti-Zr Alloy with a Heterogeneous Microstructure: *Ravi Sankar Haridas*[1]; Saket Thapliyal[1]; Priyanka Agrawal[1]; Priyanshi Agrawal[1]; Rajiv Mishra[1]; [1]University of North Texas

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MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Additive Friction Stir Deposition

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory;

Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Monday AM | March 20, 2023
29A | SDCC

Session Chairs: Hang Yu, Virginia Polytechnic Institute And State University; Mandana Hendrickson, MELD Manufacturing

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8:30 AM Invited
Recent Progress in Additive Friction Stir Deposition: from Process Fundamentals to Niche Applications: *Hang Yu*[1]; [1]Virginia Polytechnic Institute and State University

8:50 AM Invited
Repair of Railroad Rail via Additive Friction Stir Deposition: *Michael Eff*[1]; Kathleen Chou[2]; Chase Cox[3]; Connor Saukas[2]; Jason Carroll[2]; Ryan Henderson[3]; [1]EWI; [2]Eaton; [3]MELD Manufacturing Corporation

9:10 AM
Microstructure and Hardness of Al2050 Parts Made by Additive Friction Stir Deposition: Hamed Ghadimi[1]; Mojtaba Talachian[1]; Congyuan Zeng[1]; Huan Ding[1]; Selami Emanet[1]; Uttam Bhandari[1]; Chase Cox[2]; Michael Eller[3]; *Shengmin Guo*[1]; [1]Louisiana State Univ; [2]MELD Manufacturing Corporation; [3]Lockheed Martin Space

9:30 AM
Closed-loop PID Temperature Control of Additive Friction Stir Deposition: *Jason Glenn*[1]; Luk Dean[1]; Arnold Wright[2]; Yuri Hovanski[1]; [1]Home; [2]Bond Technologies

9:50 AM Break

10:10 AM Invited
Advancement of US Navy Sustainment Capabilities Through Solid-State Additive Manufacturing (FSW/FSAM): *Stephen Cox*[1]; [1]US Navy

10:30 AM
A Feasibility Study on Friction Screw Extrusion Additive Manufacturing of AA6060: *Ton Bor*[1]; Sharon Strik[1]; Saed Sayyad Rezaeinejad[1]; Nick Helthuis[1]; Bert Vos[1]; Martin Luckabauer[1]; Remko Akkerman[1]; [1]University of Twente

10:50 AM
Fundamental Study of Material Properties of Aluminum Additively Manufactured via Multi-layer Friction Surfacing: Zina Kallien[1]; Lars Rath[1]; Arne Roos[1]; *Benjamin Klusemann*[1]; [1]Helmholtz-Zentrum Hereon

11:10 AM Invited
Neutron/X-ray Testing on Al6061 Prepared by Solid-state Friction Stir Additive Manufacturing: Saber Nemati[1]; Les Butler[1]; Gerry Knapp[2]; Kyungmin Ham[1]; Selami Emanet[1]; Hamed Ghadimi[1]; Congyuan Zeng[1]; *Shengmin Guo*[1]; [1]Louisiana State University; [2]Oak Ridge National Laboratory

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MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — Dendritic Growth & Rapid Solidification

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS:

Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials Institute

Monday AM | March 20, 2023
28E | SDCC

Session Chairs: Andre Phillion, McMaster University; Michel Rappaz, EPFL; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials

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8:30 AM Introductory Comments

8:50 AM Invited
In-situ Measurements of Dendrite Tip Shape Selection in a Metallic Alloy: *Christoph Beckermann*[1]; Hieram Neumann-Heyme[2]; Natalia Shevchenko[2]; Joerg Grenzer[2]; Kerstin Eckert[2]; Sven Eckert[2]; [1]University of Iowa; [2]Helmholtz-Zentrum Dresden-Rossendorf (HZDR)

9:20 AM Invited
Growth Orientations and the Morphology of Dendrites: *Maike Becker*[1]; [1]German Aerospace Center (DLR)

9:50 AM Break

10:10 AM Invited
Bridging between Glass-Crystal Growth in Organics and Rapid Solidification Effects in Metals: *A. Lindsay Greer*[1]; Yurii Ivanov[2]; Dmitri Louzguine-Luzgin[3]; [1]University of Cambridge; [2]Istituto Italiano di Tecnologia (IIT); [3]Tohoku University

10:40 AM Invited
Quantitative Phase-field Modeling of Alloy Solidification Far from Equilibrium: New Insights into Absolute Stability and Banded Microstructures: *Alain Karma*[1]; Kaihua Ji[1]; Elaheh Dorari[1]; Amy Clarke[1]; [1]Northeastern University

11:10 AM Invited
Kinetics Phase Diagram for Dendrite Tip Kinetics: Gildas Guillemot[1]; Christopher Hareland[2]; Peter Voorhees[2]; *Charles-Andre Gandin*[1]; [1]PSL University; [2]Northwestern University

11:40 AM
Phase-field Model for Non-equilibrium Solidification: *Arnab Mukherjee*[1]; James Warren[2]; Peter Voorhees[1]; [1]Northwestern University; [2]National Institute of Standards and Technology

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NANOSTRUCTURED MATERIALS

Functional Nanomaterials 2023 — Session I

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

Program Organizers: Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Mostafa Bedewy, University of Pittsburgh; Woochul Lee, University of Hawaii at Mnoa; Changhong Cao, McGill University; Kiyo Fujimoto, Idaho National Laboratory; Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

Monday AM | March 20, 2023

Aqua 305 | Hilton

Session Chairs: Surojit Gupta, University of North Dakota; Woochul Lee, University of Hawaii at Manoa; Yong Lin Kong, University of Utah

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8:30 AM
Design and Characterization of Novel Lignin Based Nanoparticles: *Surojit Gupta*[1]; Negin Ziamahmoodi[1]; Sabah Javaid[1]; [1]University of North Dakota

8:50 AM
Fabrication of Hexagonal Diamond by Aqueous Solution-based Electrochemistry: *Rajakumar Sidharada Devarapalli*[1]; Daniel Choi[1]; [1]Khalifa University

9:10 AM Invited
Multi-principal Element Nanostructures via Nanosecond Laser-induced Dewetting: Ritesh Sachan[1]; Ashish Gupta[1]; *Soumya Mandal*[1]; Andrea Konečná[2]; Nozomi Shirato[3]; Jordan Hachtel[4]; [1]Oklahoma State University; [2]Brno University of Technology; [3]Argonne National Laboratory; [4]Oak Ridge National Laboratory

9:40 AM Invited
Multiscale and In Situ X-ray Interrogation of Functional Carbon Nanotube Materials and Devices: *Eric Meshot*[1]; [1]Lawrence Livermore National Laboratory

10:10 AM Break

10:30 AM
3D Printed Nanomaterials-based Functional Architecture with Metamaterials-inspired Electromagnetic Structures: Samuel Hales[1]; Jared Anklam[1]; Yang Xin[2]; John Ho[2]; *Yong Lin Kong*[1]; [1]University of Utah; [2]National University of Singapore

10:50 AM
Heteroatom-Doped Laser-Induced Graphene for Flexible Biosensors of Neurotransmitters with Nanomolar Sensitivity: *Mostafa Bedewy*[1]; Ki-Ho Nam[1]; Moataz Abdulhafez[1]; Elisa Castagnola[1]; Golnaz Najaf Tomaraei[1]; Xinyan Tracy Cui[1]; [1]University of Pittsburgh

11:10 AM
Energetics of Nanoscale Films Consisting of Vertically-aligned Oxide-metal Pillars In Nitride Matrix: *Sreekar Rayaprolu*[1]; Ahmad Ahmad[1]; Haiyan Wang[1]; Anter El-Azab[1]; [1]Purdue University

11:30 AM
Bottom Up, Scalable Synthesis of Anatase-based Carbo-oxide Nanofilaments and Two-dimensional Sheets, Their Properties, and Potential Applications: *Hussein Badr*[1]; Michel Barsoum[1]; [1]Drexel University

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CHARACTERIZATION

Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties — Heterostructured Materials I: Fundamentals

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

Program Organizers: Yuntian Zhu, City University of Hong Kong; Kei Ameyama, Ritsumeikan University; Irene Beyerlein, University of California, Santa Barbara; Yuri Estrin, Monash University; Huajian Gao, Nanyang Technological University; Ke Lu, Institute of Metal Research; Suveen Mathaudhu, Colorado School of

Mines; Xiaolei Wu, State Institute of Mechanics, Chinese Academy of Sciences

Monday AM | March 20, 2023
Aqua 314 | Hilton

Session Chairs: Amit Misra, University of Michigan; Xinghang Zhang, Purdue University

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8:30 AM Invited
Deformation Mechanisms in Laser Processed Nano-eutectics: *Amit Misra*[1]; Jian Wang[2]; [1]University of Michigan; [2]University of Nebraska-Lincoln

9:00 AM
Mechanical Anisotropy Effects on Strength and Deformability in Nanolaminates Containing 3D Interfaces: *Justin Cheng*[1]; Shuozhi Xu[2]; Jon Baldwin[3]; Mauricio De Leo[1]; Irene Beyerlein[4]; Nathan Mara[1]; [1]University of Minnesota Twin Cities; [2]University of Oklahoma; [3]Los Alamos National Laboratory; [4]University of California Santa Barbara

9:20 AM Invited
Designing Materials with Heterogeneous Microstructure via Additive Manufacturing: *Matteo Seita*[1]; Karl Sofinowski[2]; Shubo Gao[2]; Crystal Feng Ji[2]; [1]University of Cambridge; [2]Nanyang Technological University

9:50 AM
Progress in Heterostructured Materials: *Yuntian Zhu*[1]; [1]City University of Hong Kong

10:10 AM Break

10:30 AM Invited
Mechanics of Extremely Heterogeneous Materials: *Ting Zhu*[1]; [1]Georgia Institute of Technology

11:00 AM Invited
Constitutive Model and Finite Element Analysis of Heterostructured Materials: *Hyoung Seop Kim*[1]; Yongju Kim[1]; [1]Pohang University of Science and Technology

11:30 AM Invited
Work Hardening and Radiation Response of Gradient Alloys: Tianyi Sun[1]; Zhongxia Shang[1]; *Xinghang Zhang*[1]; [1]Purdue University

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ADVANCED MATERIALS

High Performance Steels — High Performance Steels for Defense Applications

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

Monday AM | March 20, 2023
Aqua F | Hilton

Session Chairs: Krista Limmer, Army Research Laboratory; Richard Fonda, Naval Research Laboratory

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8:30 AM Invited
Designing the Precipitation Sequence in Triple Nano-precipitate Strengthened Austenitic Steel: *Colin Stewart*[1]; Richard Fonda[1]; Keith Knipling[1]; Patrick Callahan[1]; Paul Lambert[2]; [1]US Naval Research Laboratory; [2]US Naval Surface Warfare Center, Carderock Division

9:00 AM
Atomistic Modeling of a Nano-precipitate Strengthened Alloy: *Edwin Antillon*[1]; Colin Stewart[1]; Noam Bernstein[1]; Michelle Johannes[1]; Richard Fonda[1]; Keith Knipling[1]; Patrick Callahan[1]; [1]Naval Research Laboratory

9:20 AM
Contribution of Two Different Microstructural Morphologies on the Mechanical Responses in Medium-Mn Steels: *Jeongho Han*[1]; [1]Hanyang University

9:40 AM
High-fidelity Crystal Plasticity Finite Element Modeling of Multi-phase Medium-Mn TWIP-TRIP Steel: Considerations In Microstructure Reconstruction and Meshing for Capturing the Influences of Phase Constituents: *Pengfei Shen*[1]; Yang Liu[2]; Jake Benzing[3]; Xiang Zhang[1]; [1]University of Wyoming; [2]Imperial College London; [3]National Institute of Standards and Technology

10:00 AM Break

10:20 AM
Ultra-high Strength Steel for Defense Applications: *Katelyn Adkison*[1]; Stephane Forsik[1]; Daniel Roup[1]; Colleen Tomasello[1]; [1]Carpenter Technology

10:40 AM
Advancing AF96: Next Generation Strong/Tough Steels: *Michael Rupinen*[1]; Amy Clarke[1]; John Speer[1]; [1]Colorado School of Mines

11:00 AM
Extreme Strengthening of Ausformed M54 through Ambient Temperature Rolling: *Joshua Edwards*[1]; Nicholas Derimow[2]; Jake Benzing[2]; Thomas Kozmel[3]; Jeffrey Lin[3]; Suveen Mathaudhu[1]; [1]Colorado School of Mines; [2]National Institute of Standards and Technology; [3]QuesTek Innovations LLC

11:20 AM
Improving the Low-temperature Toughness of Ni-Cr-Mo Low-Alloy Steel Castings via Short Intercritical Heat Treatments: *Matt Frichtl*[1]; Sreeramamurthy Ankem[1]; [1]University of Maryland

11:40 AM
The Effect of Varying Carbon Equivalents on Temper Embrittlement Mechanisms in Nickel-Chromium-Molybdenum Steels: *Aphrodite Strifas*[1]; Matthew Draper[2]; Sreeramamurthy Ankem[1]; [1]University of Maryland; [2]Naval Surface Warfare Center - Carderock

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MECHANICS & STRUCTURAL RELIABILITY

High Temperature Creep Properties of Advanced Structural Materials — Creep Behavior of Superalloys

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

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Lab; Jeffery Gibeling,

University of California, Davis

Monday AM | March 20, 2023
Sapphire P | Hilton

Session Chairs: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Laboratory; Jeffery Gibeling, University of California, Davis

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8:30 AM Introductory Comments

8:35 AM Invited
A Microstructure Sensitive Model to Account for the Non-isothermal Creep Behavior of Ni-based Single Crystal Superalloys: *Jonathan Cormier*[1]; [1]ENSMA - Institut Pprime - UPR CNRS 3346

9:05 AM
Creep and Creep-ratcheting Behaviour of Selective Laser Melted (SLM) Additively Manufactured (AM) Inconel 718: Vincent Masse-Denicourt[1]; Hosea Watson[1]; *Milo Kral*[1]; [1]University of Canterbury

9:25 AM
Creep and Tensile Properties of Five Novel, Computationally Designed Ni-based SX Superalloys: *Abel Rapetti*[1]; Cervellon Alice[1]; Menou Edern[2]; Rame Jérémy[3]; Cormier Jonathan[1]; [1]Institut Pprime UPR CNRS 3346; [2]Safran Tech; [3]Safran Aircraft Engines

9:45 AM
On the High Temperature Strength of Single Crystal Ni-base Superalloys: *Marc Sirrenberg*[1]; David Bürger[1]; Alireza Parsa[1]; Stefan Guth[2]; Gunther Eggeler[1]; [1]Ruhr-University Bochum; [2]Karlsruher Institut für Technologie (KIT)

10:05 AM Break

10:20 AM Invited
The Elevated Temperature Creep, Fatigue, and Fracture Behavior of Nickel-based Superalloys Manufactured by Direct Metal Laser Sintering: *Michael Kassner*[1]; Theophil Oros[1]; Kwangtae Son[2]; Lyle Levine[3]; Thien Phan[4]; [1]University of Southern California; [2]Oregon State University; [3]National Institute of Standards and Technology; [4]Lawrence Livermore National Laboratory

10:50 AM
Creep Behavior at Elevated Temperatures of Several Polycristalline Ni-based Superalloys Strengthened by MC-carbides: *Patrice Berthod*[1]; Safa Tlili[1]; Dame Assane Kane[1]; [1]University of Lorraine

11:10 AM
Effect of the Casting Process on the Microstructure and Creep Properties of a Cast Ni-Based Alloy: *Govindarajan Muralidharan*[1]; Jiten Shah[2]; Ram Krishnamurthy[3]; James Myers[4]; [1]Oak Ridge National Laboratory; [2]PDA LLC; [3]Haynes International; [4]MetalTek International

11:30 AM
Threshold Creep Behaviour of Ni-based Superalloy IN740H: Chandan Kumar[1]; Pavan A.H.V.[2]; *Praveen Kumar*[3]; [1]Interdisciplinary Centre for Energy Research, Indian Institute of Science, Bangalore; [2]BHEL Corporate R&D Division, Hyderabad; [3]Indian Institute of Science, Bangalore

11:50 AM
Induction of Alternative Shearing Pathways during Creep Deformation of Nickel Based Superalloys via Local Phase Transformation Strengthening: *Ashton Egan*[1];

Fei Xue[2]; Emmanuelle Marquis[2]; Michael Mills[1]; [1]Ohio State University; [2]University of Michigan

MATERIALS PROCESSING

High Temperature Electrochemistry V — Session I

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

Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Monday AM | March 20, 2023
28B | SDCC

Session Chair: Guy Fredrickson, Idaho National Laboratory

8:30 AM Introductory Comments

8:35 AM Invited
Optimisation of the Anodic and Cathodic Current Densities during Nd Electrowinning Process: *Mathieu Gibilaro*[1]; Christophe Remazeilles[1]; Laurent Massot[1]; Pierre Chamelot[1]; [1]University of Toulouse

9:15 AM
Thermodynamic Properties of Nd-Fe Alloys via EMF Measurements in Molten Salts: *Sanghyeok Im*[1]; Hojong Kim[1]; [1]Pennsylvania State University

9:35 AM
On the Separation of Niobium and Tantalum Metals via Molten Sulfide Electrolysis: *Charles Boury*[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

9:55 AM
Formation of Carbon Layer on Ni and Mo Through Electrochemical Reduction of Carbonate Ions in Molten LiCl: *Chongrui Zhuang*[1]; Xin Lu[1]; Osamu Takeda[1]; Hongmin Zhu[1]; [1]Tohoku University

10:15 AM Break

10:35 AM
Chloro-aluminate Species Distribution Correlation with Electrical Conductivity of 1-ethyl-3-methyl Imidazolium Chloride (EMIC)-Aluminum Chloride (AlCl3) System: *Aninda Nafis Ahmed*[1]; Md Khalid Nahian[1]; Ramana Reddy[1]; [1]University of Alabama Tuscaloosa

10:55 AM
A Revised High Temperature Synthesis of UCl3 via Reaction of U with FeCl2: *Jacob Yankey*[1]; Jarom Chamberlain[1]; Marisa Monreal[2]; Matt Jackson[2]; Michael Simpson[1]; [1]University of Utah; [2]Los Alamos National Laboratory

11:15 AM
Blind Identification and Quantification of Analytes in Molten LiCl-KCl Eutectic: *Tyler Williams*[1]; Greg Chipman[1]; Ranon Fuller[1]; Mark Schvaneveldt[1]; Jason Torrie[1]; Devin Rappleye[1]; [1]Brigham Young University

11:35 AM
Study of Potentiometry for Monitoring Activity of GdCl3 in Molten LiCl-KCl Salt: *Guoping Cao*[1]; Steven Herrmann[1]; Guy Fredrickson[1]; Robert Hoover[1]; [1]Idaho National Laboratory

MATERIALS DESIGN

Hume-Rothery Symposium on First-Principles Materials Design — Interface First-principle Method with Thermodynamics and Kinetics

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

Program Organizers: Bin Ouyang, Florida State University; Mark Asta, University of California, Berkeley; Geoffroy Hautier, Dartmouth College; Wei Xiong, University of Pittsburgh; Anton Van der Ven, University of California, Santa Barbara

Monday AM | March 20, 2023
Cobalt 501C | Hilton

Session Chair: Mark Asta, University of California Berkey

8:30 AM Keynote
William Hume-Rothery Award Lecture: Ab initio Thermodynamics and Kinetics from Alloys to Complex Oxides: *Gerbrand Ceder*[1]; [1]University of California, Berkeley

9:10 AM Invited
Double Descent, Linear Regression, and Fundamental Questions in Alloy Model Building: *Gus Hart*[1]; [1]Brigham Young University

9:40 AM Invited
Linking Phenomenological Theories of Materials to Electronic Structure: *Anton Van der Ven*[1]; Brian Puchala[2]; Derick Ober[1]; [1]University of California, Santa Barbara; [2]University of Michigan

10:10 AM Break

10:30 AM Invited
Holistic Integration of Experimental and Computational Data and Simple Empirical Models for Diffusion Coefficients of Metallic Solid Solutions: Wei Zhong[1]; *Ji-Cheng Zhao*[1]; [1]University of Maryland

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CORROSION

Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion — Session I

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

Program Organizers: Penghui Cao, University of California, Irvine; Yang Yang, Pennsylvania State University; Fadi Abdeljawad, Clemson University; Irene Beyerlein, University of California, Santa Barbara; Enrique Lavernia, University of California, Irvine; Robert Ritchie, University of California, Berkeley

Monday AM | March 20, 2023
Sapphire 411A | Hilton

Session Chairs: Penghui Cao, University of California, Irvine; Robert Ritchie,

University of California, Berkeley; Yang Yang, The Pennsylvania State University

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8:30 AM Invited
Short Range Order and the Evolution of Deformation Mechanisms in Both High and Low Entropy Alloys: *Andrew Minor*[1]; [1]University of California-Berkeley

9:00 AM
Assessing Local Order in Alloys Using Total Scattering, Pair Distribution Functions and Reverse Monte Carlo Simulations: *Lewis Owen*[1]; [1]University of Sheffield

9:20 AM Invited
Ordering in Ti-V-Nb-Hf Refractory High-Entropy Alloys with Al Alloying: *C. Tasan*[1]; Shaolou Wei[1]; Michael Xu[1]; James Lebeau[1]; [1]Massachusetts Institute of Technology

9:50 AM
Comparing Short-range Ordering Behavior in Novel Austenitic Steels via Fluctuation Electron Microscopy Techniques: Po-Cheng Kung[1]; Jian-Min Zuo[1]; Toshihiro Tsuchiyama[2]; Brian Somerday[1]; Petros Sofronis[1]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign; [2]Kyushu University

10:10 AM Break

10:25 AM Invited
Solute-strengthening in Alloys with Short-range Order: *William Curtin*[1]; Shankha Nag[2]; Xin Liu[1]; [1]Epfl Sti Igm Lammm; [2]TU Darmstadt

10:55 AM
Dislocation Motions in Refractory High-entropy Alloys and Effects of Chemical Order and Disorder: *Xinyi Wang*[1]; Francesco Maresca[2]; Penghui Cao[1]; [1]University of California, Irvine; [2]Engineering and Technology Institute Groningen, Faculty of Science and Engineering, University of Groningen

11:15 AM Invited
Neural-network Based Atomistic Simulation on Chemical Order Formation Kinetics in Medium Entropy Alloys: *Shigenobu Ogata*[1]; Jun-ping Du[1]; [1]Osaka University

11:45 AM
Structural Transitioning in Near Boundary Segregation Zones due to Chemical Ordering in NbMoTaW: *Doruk Aksoy*[1]; Megan McCarthy[2]; Ian Geiger[1]; Timothy Rupert[1]; [1]University of California, Irvine; [2]Sandia National Laboratories

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LIGHT METALS

Magnesium Technology 2023 — Keynote Session

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

Program Organizers: Steven Barela, Terves, Inc; Aeriel Murphy-Leonard, Ohio State University; Petra Maier, University of Applied Sciences Stralsund; Neale Neelameggham, IND LLC; Suveen Mathaudhu, Colorado School of Mines; Victoria Miller, University of Florida

Monday AM | March 20, 2023
30C | SDCC

Session Chairs: Steven Barela, Terves, Inc.; Petra Maier, Stralsund University of Applied Sciences; Aeriel Leonard, The Ohio State University

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8:30 AM Keynote
Sustainable Domestic Manufacturing and Protecting IP in a Post-AIA World: *Andrew Sherman*[1]; [1]Terves LLC

9:15 AM Keynote
Reductant Consideration in Thermal Pathways to Primary Magnesium Metal Production: *Aaron Palumbo*[1]; [1]Big Blue Technologies

10:00 AM Presentation of Magnesium Technology Awards

10:15 AM Break

10:35 AM Keynote
Metastable – stable: *Norbert Hort*[1]; [1]Helmholtz-Zentrum Hereon

11:20 AM Keynote
Engineered Bioabsorption for Implant Applications: Jacob Edick[1]; *Carolyn Woldring*[1]; Joshua Caris[2]; Nicholas Farkas[2]; Anuvi Gupta[2]; Andrew Sherman[2]; [1]Magsorbeo Biomedical; [2]Terves Inc.

CHARACTERIZATION

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

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

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

Monday AM | March 20, 2023
Aqua 309 | Hilton

Session Chairs: Daniel Coughlin, United States Steel Corporation; Cody Miller, Los Alamos National Laboratory

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8:30 AM Invited
Comparison of Plasticity and Fracture Behaviors of Conventional and 3rd Gen. AHSS: *Sriram Sadagopan*[1]; Hong Zhu[1]; Gang Huang[1]; Brian Lin[1]; [1]ArcelorMittal Global R&D

9:00 AM Invited
A Practical Edge Fracture Limit for the Advanced High Strength Steels: *Hua-Chu Shih*[1]; [1]United States Steel

9:30 AM Invited
Characterization and Modeling of Anisotropic Fracture of Advanced High Strength Steels: *Jun Hu*[1]; [1]Cleveland-Cliffs Steel

10:00 AM Break

10:20 AM
Examining Temperature, Strain Rate, and Strain State on TRIP-assisted Steel Forming Behavior: Christopher Finfrock[1]; Nathan Smith[2]; Melissa Thrun[1]; Amy Clarke[1]; *Kester Clarke*[1]; [1]Colorado School of Mines; [2]Colorado School of Mines/ Montana Tech

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NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Corrosion, Wear and Corrosion Products

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

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

Monday AM | March 20, 2023
27A | SDCC

Session Chair: Stephen Raiman, University of Michigan

8:30 AM
In-situ Corrosion Monitoring of 316 SS L Natural Convection Loop by Radioactive Isotope Tracking: *Yafei Wang*[1]; Cody Falconer[1]; Aeli Olson[1]; Ivan Mitchell[1]; Brian Kelleher[1]; Jonathan Engle[1]; Kumar Sridharan[1]; Adrien[1]; [1]University of Wisconsin-Madison

8:50 AM
Long-Term Corrosion Behavior of 316SS and Alloy 601 in Elevated Temperature Molten Nitrate Salt: *Andrew Dong*[1]; Camilla Stitt[2]; Peter Hosemann[1]; George Young[2]; [1]University of California Berkeley; [2]Kairos Power

9:10 AM
Salt Impurities: Measuring Them, Getting Them Out, and Learning to Live with Them: *Stephen Raiman*[1]; Kyle Williams[2]; [1]The University of Michigan; [2]Texas A&M University

9:30 AM
Diffusion Dynamics of Molten FLiNaK Quantified with Quasi-elastic Neutron Scattering: *Brent Heuser*[1]; Golam Rakib[1]; Yang Zhang[1]; Shao-Chun Lee[1]; [1]University of Illinois

9:50 AM
Effects of Impurities on Corrosion of 316H Stainless-Steel in Molten FLiNaK Salt: *Dino Sulejmanovic*[1]; Timothy Hall[2]; Holly Garich[2]; Bruce Pint[1]; [1]Oak Ridge National Laboratory; [2]Faraday Technology

10:10 AM Break

10:30 AM
Chromium Solution in Molten Uranium-Sodium Chloride Salts Investigated by Ab Initio Molecular Dynamics Simulations: *David Andersson*[1]; Gaoxue Wang[1]; Bo Li[1]; Ping Yang[1]; [1]Los Alamos National Laboratory

10:50 AM
Determination of Instantaneous Corrosion Current Densities of Materials in Molten FLiNaK Salts: *Elena Romanovskaia*[1]; Ho Lun Chan[1]; Francisco Garfias[1]; Sara Mastromarino[2]; Raluca Scarlat[2]; John Scully[1]; [1]University of Virginia; [2]University of California, Berkeley

11:10 AM
Friction and Wear Measurements of Candidate Metal Alloys for Fluoride Salt Pump Bearing and Shaft Materials: *Michael Borrello*[1]; Lorenzo Vergari[1]; Raluca

Scarlat[1]; Lewis Handy-Cardena[2]; Mark Anderson[2]; [1]UC Berkeley; [2]University of Wisconsin, Madison

11:30 AM
Speciation of Metal Ion Solutes in Molten Salt Matrices for Reactor Applications using Advanced Spectroscopy Techniques: *Ruchi Gakhar*[1]; Kaustubh Bawane[1]; William Phillips[1]; Michael Woods[1]; [1]Idaho National Laboratory

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MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — Overview

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

Monday AM | March 20, 2023
Sapphire L | Hilton

Session Chair: Yu Zhong, Worcester Polytechnic Institute

8:30 AM Invited
Zentropy: *Zi-Kui Liu*[1]; [1]Pennsylvania State University

9:00 AM Invited
The Materials Genome and Cross Effects in Transport Phenomena: *John Agren*[1]; [1]Royal Institute of Technology

9:30 AM Invited
Genomic Materials Design: The Concurrency Frontier: *Gregory Olson*[1]; [1]Massachusetts Institute of Technology; QuesTek Innovations LLC

10:00 AM Break

10:20 AM Invited
Magnesium & Mentoring - 15 Years of Science and Friendship with Prof. Liu.: *Suveen Mathaudhu*[1]; [1]Colorado School of Mines

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Ferritic Alloys I

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel

Kaoumi, North Carolina State University

Monday AM | March 20, 2023
28D | SDCC

Session Chairs: Kayla Yano, PNNL; Eda Aydogan, METU

8:30 AM Invited
Microstructure-aware Predictions of the Creep Response of Metals Subjected to Nuclear Environments: *Laurent Capolungo*[1]; Arul Kumar[1]; Aritra chakraborty[1]; Aaron Kohnert[1]; Andrea Rovinelli[1]; Ricardo Lebensohn[1]; [1]Los Alamos National Laboratory

9:00 AM
Examining Microstructures and Mechanical Properties of Neutron and Ion Irradiated T91, HT9 and 800H Alloys: *Pengcheng Zhu*[1]; Shradha Agarwal[1]; Steven Zinkle[1]; [1]University of Tennessee, Knoxville

9:20 AM
Irradiation and Nanomechanical Performance of Additively Manufactured, In Situ Tempered Grade 91 Steel: *Calvin Lear*[1]; Emily Proehl[2]; Todd Steckley[1]; Matthew Chancey[1]; Hyosim Kim[1]; Yongqiang Wang[1]; Tuhin Mukherjee[3]; Jeff Bickel[4]; Tarasankar DebRoy[3]; Peter Hosemann[4]; Thomas Lienert[5]; Stuart Maloy[6]; [1]Los Alamos National Laboratory; [2]University of Tennessee, Knoxville; [3]Pennsylvania State University; [4]University of California, Berkeley; [5]Optomec, Inc; [6]Pacific Northwest National Laboratory

9:40 AM
Fracture Toughness of Highly Irradiated RPV Steels: *Mikhail Sokolov*[1]; Xian Chen[1]; Takuya Yamamoto[2]; Robert Odette[2]; Randy Nanstad[3]; [1]ORNL; [2]UCSB; [3]R&S Consulting

10:00 AM Break

10:20 AM
Microstructure and Mechanical Properties of Neutron Irradiated Tantalum-alloyed Ferritic Martensitic Steels: *Weicheng Zhong*[1]; Lizhen Tan[1]; Thak Sang Byun[1]; Ying Yang[1]; [1]Oak Ridge National Laboratory

10:40 AM
Impact of Electrolytic Hydrogen Charging on Fatigue Crack Propagation in Reactor Steels: *Melissa Weihrauch*[1]; Maulik Patel[1]; Eann Patterson[1]; [1]University of Liverpool

11:00 AM
Estimating the Strengthening Parameters for Irradiated Alloys using Atomic Scale: *Osetsky Yury*[1]; German Samolyuk[1]; [1]Oak Ridge National Laboratory

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BIOMATERIALS

Mechanics and Physiological Adaptation of Hard and Soft Biomaterials and Biological Tissues — Soft Materials & Adaptation

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

Program Organizers: Bernd Gludovatz, UNSW Sydney; Elizabeth Zimmermann, McGill University; Steven Naleway, University of Utah

Monday AM | March 20, 2023

Sapphire 400B | Hilton

Session Chairs: Elizabeth Zimmermann, McGill University; Bernd Gludovatz, UNSW Sydney

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8:30 AM Introductory Comments

8:35 AM Keynote
Materials for Mechanochemistry and Mechanobiology: Pavithra Jayathilaka[1]; Thomas Molley[1]; Yuwan Huang[1]; Meredith Silberstein[2]; Jay Kruzic[1]; *Kristopher Kilian*[1]; [1]UNSW Sydney; [2]Cornell University

9:15 AM Keynote
Mechanics and Applications of Bioinspired Bioadhesives for Tissue Repair: *Jianyu Li*[1]; [1]McGill University

9:55 AM Break

10:15 AM Invited
Bone Adaptation as a Response to Mechanical Loading in Zebrafish: *Bjorn Busse*[1]; [1]University Medical Center Hamburg

10:45 AM Invited
Bone's Adaptation to Hyperglycemia in Diabetes: *Claire Acevedo*[1]; [1]University of Utah

11:15 AM
Adaptation of Hard and Soft Tissues Structures to Physiological Loading Patterns: *Elizabeth Zimmermann*[1]; [1]McGill University

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NUCLEAR MATERIALS

Methods, Techniques, and Materials Discovery of Irradiation Effect Using In-situ Microscopy — In-situ Microscopy under Irradiation

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

Program Organizers: Wei-Ying Chen, Argonne National Laboratory; Xuan Zhang, Argonne National Laboratory; Kevin Field, University of Michigan; Donald Brown, Los Alamos National Laboratory; Aida Amroussia, GE Global Research

Monday AM | March 20, 2023
25A | SDCC

Session Chair: Wei-Ying Chen, Argonne National Laboratory

8:30 AM Invited
High Throughput Assessment of Advanced Nuclear Materials via In-situ TEM: *Osman El-Atwani*[1]; Enrique Martinez[2]; Andrew Alvarado[1]; Meimei Li[3]; [1]Los Alamos National Laboratory; [2]Clemson University; [3]Argonne National Laboratory

9:00 AM
Effect of Stacking Fault Energy on Microstructural Evolution of Compositionally Complex Alloys under In situ Dual-beam Heavy-ion Irradiation: *Calvin Parkin*[1]; Boris Maioriv[2]; Kumar Sridharan[1]; Wei-Ying Chen[3]; Meimei Li[3]; Adrien Couet[1]; [1]University of Wisconsin-Madison; [2]Los Alamos National Laboratory; [3]Argonne National Laboratory

9:20 AM
Observations of 'Far from Equilibrium' Phenomena under in Reactor Thermal Conditions Using In Situ TEM: *Sriram Vijayan*[1]; Kaustubh Bawane[2]; Lingfeng He[2]; Fidelma Di Lemma[2]; Joerg Jinschek[3]; [1]The Ohio State University; [2]Idaho National Laboratory; [3]Technical University of Denmark (DTU)

9:40 AM
Discovering the Mechanisms of Helium Channel Evolution Via In-situ Annealing and Observation in TEM: *Digvijay Yadav*[1]; Ryan Schoell[2]; Eric Lang[2]; Benjamin Derby[3]; Jon Kevin Baldwin[3]; Nan Li[3]; Khalid Hattar[2]; Michael Demkowicz[1]; Kelvin Xie[1]; [1]Texas A&M University; [2]Sandia National Laboratory; [3]Los Alamos National Laboratory

10:00 AM Break

10:20 AM Invited
Rare-earth Titanates Ln2TiO5 Crystal Chemistry and Radiation Response. A Review.:*RobAughterson*[1]; [1]AustralianNuclearScienceandTechnologyOrganisation

10:50 AM
Radiation Tolerance of Amorphous Alumina Cladding Coatings for Heavy Liquid Metal Cooled Fast Reactors: Temperature and Dose Effect.: *Davide Loiacono*[1]; Mattia Cabrioli[1]; Wei Ying Chen[2]; Meimei Li[2]; Fabio Di Fonzo[3]; [1]Politecnico di MIlano; [2]Argonne national Laboratory; [3]IIT

11:10 AM
Understanding the Amorphization Limit in Irradiated Ceramics via Repeated In situ Recrystallization Experiments: Nathan Madden[1]; Matthew Janish[2]; Wei-Ying Cheng[3]; Meimei Li[3]; Blas Uberuaga[2]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign; [2]Los Alamos National Laboratory; [3]Argonne National Laboratory

11:30 AM
Helium Effects on Defect Evolution of In-situ Irradiated Additive-manufactured Grade 91 Steel: *Yan-Ru Lin*[1]; Arunodaya Bhattacharya[1]; Wei-Ying Chen[2]; Steven Zinkle[3]; [1]Oak Ridge National Laboratory; [2]Argonne National Laboratory; [3]University of Tennessee

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NUCLEAR MATERIALS

Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-cladding Interface — Uranium Dioxide Fuels I

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

Program Organizers: Yi Xie, Purdue University; Miaomiao Jin, Pennsylvania State University; Jason Harp, Oak Ridge National Laboratory; Fabiola Cappia, Idaho National Laboratory; Jennifer Watkins, Idaho National Laboratory; Michael Tonks, University of Florida

Monday AM | March 20, 2023
26B | SDCC

Session Chair: Yi Xie, Purdue University

8:30 AM Introductory Comments

8:35 AM
Characterization of the Radial Microstructural Evolution in Commercial LWR UO_2 with Different Power Histories: *Casey McKinney*[1]; Nathan Capps[1]; Jason Harp[1]; Tyler Gerczak[1]; [1]Oak Ridge National Laboratory

8:55 AM Invited
Spark Plasma Sintering – Innovative Approaches for High Temperature Creep Testing and Transient Behavior of Nuclear Fuels: *Jie Lian*[1]; [1]Rensselaer Polytechnic Institute

9:20 AM
Observations from Microscopy on High Burnup Light Water Reactor Fuel Before and After LOCA Testing: *Jason Harp*[1]; Rachel Seibert[1]; Jesse Werden[1]; Chad Parish[1]; Tyler Gerczak[1]; Nathan Capps[1]; [1]Oak Ridge National Laboratory

9:45 AM
Improved Model of Microcracking Behavior in High Burnup UO2 Fuel: *Walter Brinkley*[1]; Oliver Baldwin[1]; Jonathan Norman[1]; Nathan Capps[2]; Brian Wirth[1]; [1]UTK; [2]ORNL

10:05 AM Break

10:20 AM
Cr-doped UO_2 Studied Using XAS and Neutron Scattering: *Arjen van Veelen*[1]; Adrien Terricabras[1]; Scarlett Widgeon Paisner[1]; Tarik Saleh[1]; Joshua White[1]; [1]Los Alamos National Laboratory

10:40 AM
Small-scale Mechanics Quantification of UO2 Fracture Toughness: *Brent Heuser*[1]; Shen Dillon[1]; Andrew Nelson[2]; Sarah Finkeldei[2]; [1]University of Illinois; [2]ORNL

11:00 AM
Fracturing and Fragmentation of Cr2O3-doped UO2 Pellets with Controlled Microstructure Under Prototypic LOCA and RIA Thermal Transients: *Dong Zhao*[1]; Kun Yang[1]; Andre Broussard[1]; Heng Ban[2]; Jie Lian[1]; [1]Rensselaer Polytechnic Institute; [2]University of Pittsburgh

11:20 AM
Performance of FeCrAl Alloys Under Long-term Graphite Exposure: *Maria Kosmidou*[1]; Hyosim Kim[1]; Nan Li[1]; Mehadi Hassan[1]; Erofili Kardoulaki[1]; [1]Los Alamos National Laboratory

11:40 AM
Interconnectivity Quantification and Corrosion Mechanisms in Zr Alloys:*Hongliang Zhang*[1]; William Howland[2]; Adrien Couet[1]; [1]University of Wisconsin Madison; [2]Naval Nuclear Laboratory

12:00 PM
In Situ EBSD Studies of Blocky Grain Growth in Welded Zircaloy-4: *Thomas Britton*[1]; Ruth Birch[2]; [1]University of British Columbia; [2]Imperial College London

12:20 PM
Determination of the Hydrogen Heat of Transport in Zircaloy-4: *Soyoung Kang*[1]; Pei-Hsun Huang[2]; Victor Petrov[2]; Annalisa Manera[2]; Taehwan Ahn[2]; Arthur Motta[1]; [1]Pennsylvania State University; [2]University of Michigan-Ann Arobor

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NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Metals

in Irradiation Environments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Monday AM | March 20, 2023
Aqua 303 | Hilton

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

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8:30 AM Introductory Comments

8:35 AM Invited
Nanostructured Ferritic Alloys for Advanced Nuclear Reactors: *Stuart Maloy*[1]; David Hoelzer[2]; Eda Aydogan[3]; G.R. Odette[4]; [1]Pacific Northwest National Laboratory; [2]ORNL; [3]METU; [4]UCSB

9:00 AM Invited
Role of Electronic Energy Loss on Interface Stability of Nanostructured High-Entropy Alloys: *Yanwen Zhang*[1]; Chinthaka Silva[2]; Timothy Lach[1]; Matheus Tunes[3]; Philip Rack[4]; Stephen Donnelly[5]; William Weber[4]; [1]Oak Ridge National Laboratory; [2]Lawrence Livermore National Laboratory; [3]Los Alamos National Laboratory; [4]University of Tennessee; [5]University of Huddersfield

9:25 AM Invited
Global Compositional Patterning and Self-organization in Irradiated Alloys: Gabriel Bouobda Moladje[1]; Sourav Das[1]; Amit Verma[1]; Robert Averback[1]; *Pascal Bellon*[1]; [1]University of Illinois at Urbana-Champaign

9:50 AM
Microstructural Evolution in Dilute Nanocrystalline Al Alloys During Ion-irradiation: *Sourav Das*[1]; Sung Eun Kim[1]; Pascal Bellon[1]; Robert Averback[1]; [1]University of Illinois, Urbana-Champaign

10:10 AM Break

10:30 AM Invited
Nanostructured Mechanical Martensites in Ni Alloys: Defects and Ordering Effects: *Janelle Wharry*[1]; Caleb Clement[1]; Chao Yang[1]; Daniel Hong[2]; Yu Lu[3]; Sheng Cheng[3]; Peter Anderson[2]; Donna Guillen[4]; David Gandy[5]; [1]Purdue University; [2]The Ohio State University; [3]Boise State University; [4]Idaho National Laboratory; [5]Electric Power Research Institute

10:55 AM Invited
Nanostructured BCC Materials for Applications in Extreme Environments: *Osman El-Atwani*[1]; Enrique Martinez[2]; Saryu Fensin[1]; Stuart Maloy[3]; Jonathan Gigax[1]; Hyosim Kim[1]; [1]Los Alamos National Laboratory; [2]Clemson University; [3]Pacific Northwest National Laboratory

11:20 AM
Study of the Microstructural Evolution of Ultrafine-grained Austenitic Stainless Steel Irradiated by Neutrons by Atom Probe Tomography and Transmission Electron Microscopy: *Frederic Habiyaremye*[1]; Bertrand Radiguet[1]; Auriane Etienne[1]; Solène Rouland[1]; Xavier Sauvage[1]; Benoit Tanguy[2]; Joël Malaplate[2]; Christophe Domain[3]; Remy Bonzom[3]; Nariman Enikeev[4]; Marina Abramova[5]; [1]Université et INSA de Rouen; [2]Université Paris-Saclay; [3]EDF Lab; [4]Ufa State Aviation Technical University; [5]Saint Petersburg State University

11:40 AM
Irradiation Response of Nanostructured HEAs: *Matthew Luebbe*[1]; Haiming Wen[1]; Khalid Hattar[2]; [1]Missouri University of Science and Technology; [2]Sandia National Laboratory

12:00 PM
Review of Irradiation-induced Grain Growth in Nanocrystalline FCC Metals: *Marie Thomas*[1]; Eric Lang[2]; Trevor Clark[2]; Heather Salvador[3]; Khalid Hattar[2]; Suveen Mathaudhu[3]; [1]Colorado School of Mines; [2]Sandia National Laboratories; [3]University of California, Riverside

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CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Atomic Dynamics in Crystalline Materials

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

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

Monday AM | March 20, 2023
Aqua 311B | Hilton

Session Chair: Hillary Smith, Swarthmore College

8:30 AM Invited
Inelastic Neutron Scattering Studies of New Spectral Features from Nonlinear Phonon Interactions: *Brent Fultz*[1]; Vladimir Ladygin[1]; Camille Bernal-Choban[1]; Claire Saunders[1]; Yang Shen[1]; [1]California Institute of Technology

9:00 AM Invited
Atomic Tunneling in Crystalline Materials: *Raphael Hermann*[1]; [1]Oak Ridge National Laboratory

9:30 AM Invited
Understanding the Origin of Kohn Anomalies in Alpha-Uranium: *Dipanshu Bansal*[1]; Aditya Roy[1]; Naini Bajaj[1]; Ranjan Mittal[2]; P D Babu[2]; [1]IIT Bombay; [2]BARC

10:00 AM Break

10:15 AM Invited
Modification of Phonon Group Velocity in Doped Sapphire: Shuonan Chen[1]; Javier Garay[2]; Fariborz Kargar[1]; Tao Hong[3]; Alexander Balandin[1]; *Chen Li*[1]; [1]University of California-Riverside; [2]University of California, San Diego; [3]Oak Ridge National Laboratory

10:45 AM Invited
Lattice Dynamics of Incommensurate Crystals: *Michael Manley*[1]; Andrew May[1]; Barry Winn[1]; Douglas Abernathy[1]; Raffi Sahul[2]; Raphael Hermann[1]; [1]Oak Ridge National Laboratory; [2]Amphenol Corporation

11:15 AM
Temperature Dependence of Anharmonic Effects in NaBr by Inelastic Neutron Scattering and Interatomic Potentials from Machine Learning: *Vladimir Ladygin*[1]; Claire Sounders[1]; Camille Bernal-Choban[1]; Douglas Abernathy[2]; Michael Manley[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Oak Ridge National Laboratory

11:35 AM
Validating First-principles Phonon Lifetimes via Inelastic Neutron Scattering: *Hao Ma*[1]; Enda Xiao[2]; Chris Marianetti[2]; Michael Manley[1]; [1]ORNL; [2]Columbia University

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ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Keynote Session

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Monday AM | March 20, 2023
33C | SDCC

Session Chairs: Thomas Battle; Merete Tangstad, Norwegian University of Science and Technology

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8:30 AM Introductory Comments: Ramana Reddy for the introduction of Patrick Taylor Symposium

8:40 AM Introductory Comments: Chrisinta Meskers to introduce EPD Award Lecture

8:45 AM Keynote
EPD Distinguished Award Lecture: New Directions for Biotechnology Practices in Metals Extraction: *Corale Brierley*[1]; [1]Brierley Consultancy LLC

9:25 AM Keynote
New Directions in Decarbonization of Metals Production: *Ramana Reddy*[1]; [1]University of Alabama

10:05 AM Break

10:25 AM Keynote
Development of Ironmaking Technology by the Direct Gaseous Reduction of Iron Concentrate: *Hong Yong Sohn*[1]; [1]University of Utah

11:05 AM Keynote
Domestic Strategic & Critical Metal & Material Production With NSC & ASL Hydrometallurgical Technologies.: *Corby Anderson*[1]; [1]Colorado School of Mines

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NUCLEAR MATERIALS

Phase Stability in Extreme Environments — Phase Stability in Nuclear Environments I

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Andrew Hoffman, GE Research; Kinga Unocic, Oak Ridge National Laboratory; Janelle Wharry, Purdue University; Kaila Bertsch, Lawrence Livermore National Laboratory; Raul Rebak, GE Global Research

Monday AM | March 20, 2023
28C | SDCC

Session Chairs: Pin Lu, Questek Innovations Llc; Djamel Kaoumi, North Carolina State University

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8:30 AM Invited
Advanced Additively Manufactured Materials for Fission and Fusion Nuclear Applications: *Pin Lu*[1]; Tanner Kirk[1]; [1]QuesTek Innovations LLC

9:00 AM
Dynamic Sink Strength Effects of Irradiation-induced Precipitates in Advanced Steels for Fusion Reactor Applications: T.M. Kelsy Green[1]; *Tim Graening*[2]; Weicheng Zhong[2]; Ying Yang[2]; Kevin Field[1]; [1]University of Michigan Ann Arbor; [2]Oak Ridge National Laboratory

9:20 AM
Influence of Crystal Structure on Helium-induced Nano-tendril Formation in a Multiphase, Multicomponent Alloy: *Amy Gandy*[1]; Svenja Lohmann[2]; Gregor Hlawacek[2]; Rene Hübner[2]; Le Ma[1]; Russell Goodall[1]; [1]University of Sheffield; [2]Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf

9:40 AM Invited
Phase Transformations Driven by Non-Equilibrium Lattice Point Defects: Fe-based Alloys under Irradiation: *Maylise Nastar*[1]; Quentin Tencé[1]; Lisa Belkacemi[1]; Estelle Meslin[1]; Marie Loyer-Prost[1]; [1]C.E.A

10:10 AM Break

10:30 AM
Examining the Contribution of Solute Nano-clustering in MA957 to Neutron Irradiation Induced Hardening and Embrittlement: *Samara Levine*[1]; Steven Zinkle[1]; Jonathan Poplawsky[2]; David Hoelzer[2]; Arunodaya Bhattacharya[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

10:50 AM
Reversible Disorder Transformation of Fe3O4 under Ion Irradiation Evidence by In-situ TEM: Angelica Lopez Morales[1]; *Djamel Kaoumi*[1]; [1]North Carolina State University

11:10 AM
Exploring Temperature and Radiation Damage Induced Phase Transformations in Ta-V-Ti (W,Cr,Fe) Multicomponent Alloys: *Amy Gandy*[1]; Christina Hofer[2]; Paul Bagot[2]; Michael Moody[2]; Dhinisaben Patel[1]; Hamed Shahmir[1]; David Armstrong[2]; Junliang Liu[2]; Alexander Carruthers[3]; Ed Pickering[3]; Russell Goodall[1]; Shavkat Akhmadaliev[4]; [1]University of Sheffield; [2]University of Oxford; [3]University of Manchester; [4]Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf

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ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXII — Advanced Electronic Materials

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Chung University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, Bangladesh University of Engineering and Technology (BUET); Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Monday AM | March 20, 2023
Sapphire E | Hilton

Session Chairs: Jae-Ho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University

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8:30 AM Keynote
Alternative Metal with Lower Resistivity than Cu: A First-principles Study: Tae Gon Ha[1]; Youngmin Lee[2]; Jungwoo Choi[2]; *Hyuck Mo Lee*[2]; [1]Samsung; [2]KAIST

9:00 AM
Cu Sintering Process Modified by Adding a Low Temperature Liquid Sintering Step: *Bo Rong Huang*[1]; [1]National Central University

9:20 AM
Thermal Stability of Highly (111)-oriented Nanotwinned Ag Thin Film during Annealing Process: *Wei-Cheng Chang*[1]; Leh-Ping Chang[1]; Fan-Yi Ouyang[1]; [1]National Ching Hua University

9:40 AM
Multistep Electroplating for the Uniform Composition of Invar Electroplating: Na-Young Kang[1]; *Jaeho Lee*[1]; [1]Hongik University

10:00 AM Break

10:20 AM
Employment of Diamond-like Carbon and Chromium Carbide Coatings as Diffusion Barrier Layers against Ga-based Thermal Interface Materials (TIMs): Efficacy and Impact on Heat Transfer: *Yifan Wu*[1]; Amy Marconnet[1]; Carol Handwerker[1]; [1]Purdue University

10:40 AM
Mechanism of Microstructure Evolution between Bi-Sn Layer Deposition and Substrate Elements: *Ching Yu Yeh*[1]; [1]National Central University

11:00 AM
Flip-chip Encapsulation with Hybrid Organic Inorganic Passivation of Perovskite Solar Cells: *Tse-Lin Lai*[1]; [1]National Central University

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Ferrous Alloys I

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Monday AM | March 20, 2023
25C | SDCC

Session Chair: Eric Lass, University of Tennessee-Knoxville

8:30 AM
Microstructural Evolution of Pressure Vessel Carbon Steel Plate during Hydrogen Creep Testing: *Jenna Krynicki*[1]; Brandon Rollins[2]; Kenneth Bagnoli[3]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]DNV GL USA, Inc.; [3]Engineering Mechanics Corporation

8:50 AM
A Comprehensive Investigation on the Sintering Behavior of CaO-SiO2-CaF2-Al2O3 Slags System: *Liang Yu*[1]; Shaopeng Gu[2]; Guanghua Wen[1]; Chunhua Ran[3]; Funian Han[1]; Zhe Wang[1]; [1]Chongqing University; [2]North China University of Science and Technology; [3]Teacher's College for Vocational Studies of JiuLongPo District

9:10 AM
Can We Make an Electron Beam Weld 'Disappear'?: *Kirstie Bruce*[1]; Mark Taylor[1]; Jonathan Fellowes[1]; Luke Burling[2]; John Francis[1]; Ed Pickering[1]; [1]University of Manchester; [2]Rolls-Royce plc

9:30 AM
Chemical Heterogeneity and Quench Rate Considerations for Quench and Partition Processing: *Douglas Smith*[1]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines

9:50 AM Break

10:10 AM
Surrogate Model to Predict Microstructure and Mechanical Properties in Stainless Steel Cladding under Reactor Operating Conditions: *William Frazier*[1]; Yucheng Fu[1]; Lei Li[1]; Ram Devanathan[1]; [1]Pacific Northwest National Laboratory

10:30 AM
In-situ SEM Study of Hydrogen-dislocation Interactions in Ferritic Stainless-steel: *Kyung-Shik Kim*[1]; Cem Tasan[1]; [1]Massachusetts Institute of Technology

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Session I

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

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

Monday AM | March 20, 2023
Sapphire 411B | Hilton

Session Chairs: Paul Ohodnicki, University of Pittsburgh; Masoud Mahjouri-Samani, Auburn University; Christine Fisher, City University of New York

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8:30 AM Invited
Functional Sensing Material Enabled Fiber Optic Sensors for Electric Grid Assets: *Paul Ohodnicki*[1]; Yang-Duan Su[1]; Dolendra Karki[1]; [1]University of Pittsburgh

8:55 AM Invited
Multimaterial Dry Printing and Additive Nanomanufacturing of Flexible Hybrid Electronics and Sensors: *Masoud Mahjouri-Samani*; Zabihollah Ahmadi[1]; Aarsh Patel[1]; Seungjong Lee[1]; Nima Shamsaei[1]; Raymond Unocic[2]; [1]Auburn University; [2]Oak Ridge National Laboratory

9:20 AM
3D Printing of Customized Embedded Sensors for Soft Robotic Applications: Akshay Kakar[1]; Derrick Banerjee[1]; Evan Helgeson[1]; Konstantinos Sierros[1]; Edward Sablosky[1]; *Emrah Demirkal*[1]; [1]West Virginia University

9:40 AM
Analysis of Coaxial Direct Ink Writing for Embedded Sensors in Soft Robotic Applications: *John Burke*[1]; Derrick Banerjee[1]; Craig Joiner[1]; Domenic Cipollone[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; [1]West Virginia University

10:00 AM Break

10:20 AM Invited
Closing the Loop on Aerosol Jet Printing: Optical Process Monitoring to Support Reliable Fabrication of Electronics: *Ethan Secor*[1]; [1]Iowa State University

10:45 AM Invited
In-situ Sensors Enabling and Enabled by Additive Electronics: *Benjamin LaRiviere*[1]; M. Ericson[1]; [1]Oak Ridge National Laboratory

11:10 AM
Aerosol-Jet Printed Sensors for Environmental, Safety, and Health Monitoring: *Christine Fisher*[1]; Lydia Skolrood[1]; Kai Li[1]; Pooran Joshi[1]; Tolga Aytug[1]; [1]Oak Ridge National Laboratory

11:30 AM
Ball Milling Assisted Liquid Exfoliation and Aerosol Jet Printing of Ternary Transition Metal Dichalcogenides: *Fereshteh Rajabi Kouchi*[1]; Alireza Ahmadiparidari[2]; Amin Salehi-Khojin[2]; David Estrada[1]; [1]Boise State University; [2]University of Illinois at Chicago

MATERIALS PROCESSING

Rare Metal Extraction & Processing — Processing for Rare Earth

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

Program Organizers: Takanari Ouchi, University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Gisele Azimi, University of Toronto; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Hojong Kim, Pennsylvania State University; Alafara Baba, University of Ilorin; Hong (Marco) Peng, University of Queensland; Athanasios Karamalidis, Pennsylvania State University; Shijie Wang, Coeur Mining, Inc

Monday AM | March 20, 2023
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Session Chairs: Gisele Azimi, University of Toronto; Neale Neelameggham, IND LLC

9:35 AM Introductory Comments

9:40 AM
Rare Earth Elements Extraction from an Ionic Clay from South America: *Gisele Azimi*[1]; [1]University of Toronto

10:00 AM
Leaching of Neodymium from Recycled NdFeB Magnet Powders Using Citric Acid: *Srujan Rokkam*[1]; Quang Truong[1]; Jonas Baltrusaitis[2]; Manoj Silva[2]; [1]Advanced Cooling Technologies, Inc.; [2]Lehigh University

10:20 AM Break

10:40 AM Introductory Comments

10:45 AM
Separation of Rare Earth Elements from Monazite via Sulfidation: *Caspar Stinn*[1]; Zachary Adams[1]; Vasu Kaker[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

11:05 AM
Experimental Investigation of Liquid Metal Leaching for Rare Earth Magnet Recycling: *Chinenye Chinwego*[1]; Adam Powell[1]; [1]Worcester Polytechnic Institute

11:25 AM
Recycling of Rare Earth Elements (REEs) from Scrap Nd-Fe-B Magnets: *Nityanand Singh*[1]; Pankaj Kumar Choubey[1]; Rekha Panda[1]; Rajesh Kumar Jyothi[2]; Manis Kumar Jha[1]; [1]CSIR-National Metallurgical Laboratory; [2]Korea Institute of Geoscience & Mineral Resources (KIGAM)

NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Separations/Forensics

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

Committee

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Monday AM | March 20, 2023
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Session Chairs: Rory Kennedy, INL; Don Wood, Idaho National Laboratory

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8:30 AM Introductory Comments

8:35 AM Invited
Next Steps for Actinide Separations & Reprocessing: *Jenifer Shafer*[1]; [1]Colorado School of Mines

9:05 AM Invited
Actinide Electrochemistry at Metal Oxide Electrodes: *Christopher Dares*[1]; Jeffrey McLachlan[1]; Xiangyang Hou[1]; Evan Jones[1]; Gabriela Ortega[1]; Travis Grimes[2]; [1]Florida International University; [2]Idaho National Laboratory

9:35 AM
Methodology and Density of $PuCl_3$-NaCl Mixtures: *Michael Woods*[1]; Toni Karlsson[1]; Ruchi Gakhar[1]; [1]Idaho National Laboratory

9:55 AM
Melting Temperature Method for Determining the Concentration of Pu-metal in PuCl3 Salt: *Toni Karlsson*[1]; Cynthia Adkins[1]; [1]Idaho National Laboratory

10:15 AM Break

10:35 AM Invited
Actinide Science for Post Detonation Nuclear Forensic Analyses: *Mathew Snow*[1]; David Chichester[1]; James Johnson[1]; Tommy Holschuh[1]; Jessica Meiers[1]; Jacob Brookhart[1]; [1]Idaho National Laboratory

11:05 AM Invited
Local Structure and Distribution of Impurities in Plutonium Materials for Nuclear Forensics: *Sarah Hickam*[1]; Kasey Hanson[1]; Harry Jang[1]; Arjen van Veelen[1]; Daniel Olive[1]; Nicholas Edwards[2]; Alison Pugmire[1]; [1]Los Alamos National Laboratory; [2]SLAC National Accelerator Laboratory

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MATERIALS DESIGN

Thermodynamics and Kinetics of Alloys — Session I

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

Program Organizers: Ji-Cheng Zhao, University of Maryland; Wei Xiong, University of Pittsburgh; Chuan Zhang, CompuTherm LLC; Shuanglin Chen, CompuTherm LLC

Monday AM | March 20, 2023
Sapphire M | Hilton

Session Chairs: Ji-Cheng Zhao, University of Maryland; Kil-Won Moon, National Institute of Standards and Technology; Yijia Gu, Missouri University of Science &

8:30 AM Invited
Thermodynamic Assessments and Experimental Validation of Iron "Impurity" in Cast Aluminum Alloys: *Alan Luo*[1]; Siva Balasubramani[1]; Michael Moodispaw[1]; Jianyue Zhang[1]; Gabriel Garcia[1]; [1]The Ohio State University

8:50 AM Invited
First-principles Based Calculation of Thermodynamic and Kinetic Properties in Non-Dilute Mg Alloys Using CASM: *Brian Puchala*[1]; Anton Van der Ven[2]; [1]University of Michigan; [2]University of California, Santa Barbara

9:10 AM
A First-principles Analysis of the Phase Stability of B2/BCC High Entropy Alloys: *Julian Brodie*[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

9:30 AM
Twin Nucleation from Stacking Fault Networks in Magnesium: *Kehang Yu*[1]; Xin Wang[1]; Subhash Mahajan[2]; Irene Beyerlein[3]; Penghui Cao[1]; Timothy Rupert[1]; Julie Schoenung[1]; Enrique Lavernia[1]; [1]University of California, Irvine; [2]University of California, Davis; [3]University of California, Santa Barbara

9:50 AM
On the Effect of Different Elements on the Phase Stability of Bulk Alloys, Which Compositions Were Derived from Co-base Superalloys: *Maik Rajkowski*[1]; Mike Schneider[1]; Aleksander Kostka[1]; Christoph Somsen[1]; Guillaume Laplanche[1]; [1]Ruhr-Universität Bochum

10:10 AM Break

10:30 AM Invited
Interfacial and Volumetric Melting Regimes of Sn Nanoparticles: Lucas Robinson[1]; John Blendell[1]; Carol Handwerker[1]; *Edwin Garcia*[1]; [1]Purdue University

10:50 AM
Evaluation and Assessment of Interdiffusion Coefficients and Atomic Mobility in FCC Al-Cu-V: *Yang Yang*[1]; David Christianson[1]; Michele Manuel[1]; [1]University of Florida

11:10 AM
Low Temperature Phase Equilibria Investigation and Phase Identification in the Cu-In-Sn System: *Fu-Ling Chang*[1]; Han-Tang Hung[1]; I-Chieh Fang[1]; Yu-Hsin Lin[1]; C.Robert Kao[1]; [1]National Taiwan University

11:30 AM
Experimental Investigation and Thermodynamic Assessment of the Cr-Si Binary System: *Kazushige Ioroi*[1]; Yuki Aono[1]; Xiao Xu[1]; Toshihiro Omori[1]; Ryosuke Kainuma[1]; [1]Tohoku University

11:50 AM
Thermodynamic Assessment of the V-Ti-B System: *Mustafa Yazlak*[1]; Hans-Jürgen Christ[1]; Weiguang Yang[2]; Georg Hasemann[3]; Manja Krüger[3]; Bronislava Gorr[4]; [1]Universität Siegen; [2]Forschungszentrum Jülich; [3]Otto-von-Guericke Universität Magdeburg; [4]Karlsruher Institut für Technologie

NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Facilities, Characterization & Experimental Validation

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

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Session Chairs: Grace Burke, Oak Ridge National Laboratory; Philip Edmondson, University of Manchester

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8:30 AM Invited
Irradiation Spectrum, Transmutation, and Supporting Materials Use Next Generation Fusion Systems: *Lance Snead*[1]; David Sprouster[2]; Steven Zinkle[3]; Brian Wirth[3]; Yutai Katoh[4]; Ethan Peterson[5]; [1]Stony Brook University; Massachusetts Institute of Technology; [2]Stony Brook University; [3]University of Tennessee; [4]Oak Ridge National Laboratory; [5]Massachusetts Institute of Technology

9:10 AM
The University of Birmingham Accelerator Driven Neutron Facility: *Martin Freer*[1]; [1]University of Birmingham

9:30 AM
Advanced Synchrotron Characterization Techniques for Fusion Materials Science: *David Sprouster*[1]; J Trelewicz[1]; T Koyanagi[2]; W Zhong[2]; Y Katoh[2]; L Snead[1]; [1]Stony Brook University; [2]Oak Ridge National Laboratory

9:50 AM
Tracking Neutron-irradiation Induced Transmutation Using Atom Probe Tomography and Neutron Inventory Calculations: *Philip Edmondson*[1]; Mark Gilbert[2]; [1]The University of Manchester; [2]UKAEA

ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Carbon Related Materials - Processing, Properties & Applications II

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

Monday PM | March 20, 2023
Aqua AB | Hilton

Session Chairs: Hesam Askari, University of Rochester; Sufian Abedrabbo, Khalifa University

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2:00 PM Introductory Comments

2:05 PM Invited
Processing Approaches for the Efficient Liquid Exfoliation of Graphene Transport Enhancement between Subsequent Flakes: *Konstantinos Sierros*[1]; Harrison Loh[1]; [1]West Virginia University

2:30 PM
Q-Carbon Nanoballs and Diamond Nanodots: *Nayna Khosla*[1]; Jagdish Narayan[1]; [1]North Carolina State University

2:50 PM
SynthesisandImplicationsofAntibacterialGrapheneCoatingonNickelSubstrates using Pulsed Laser Deposition: *Ramesh Devadig*[1]; Venkata A.S. Kandadai[1]; Bharat Jasthi[1]; Venkataramana Gadhamshetty[1]; [1]South Dakota School of Mines and Tech

3:10 PM Invited
Ultra-long Carbon Nano Tube Changing the World of Materials: *Shuki Yeshurun*[1]; [1]Tortech Nano Fibers

3:35 PM Break

3:50 PM Invited
“Temperature”, a Key Parameter for Graphene Exfoliation In Water: *Iakovos Tzanakis*[1]; Amanpreet Kaur[1]; Dmitry Eskin[1]; [1]Oxford Brookes University

4:15 PM
An Overview of Graphene-based Nanomaterials in Electronic Skin Biosensing
: Raphael Ekun[1]; Eribe Jonathan[2]; Okeke Emmanuel[3]; Best Atoe[4]; *Ikhazuagbe Ifijen*[5]; [1] Cyprus International University; [2]Benson Idahosa University; [3]University of Benin; [4]Worldwide Healthcare, Nigeria; [5]Rubber Research Institute of Nigeria

4:35 PM
Utilizations of Graphene-based Nanomaterials for the Detection and Treatment of Mycobacterium Tuberculosis: Nyaknno U. Udokpoh[1]; *Jacob Jacob*[2]; Ukeme Archibong[2]; Gregory Onaiwu[3]; Ikhazuagbe Ifijen[1]; [1]Rubber Research Institute of Nigeria; [2]University of Benin; [3]Department of Chemistry, Benson Idahosa University

4:55 PM
Heterostraining and Moiré Reconstruction in Bilayer Graphene: *Aditya Dey*[1]; Shoieb Chowdhury[1]; Hesam Askari[1]; [1]University of Rochester

5:15 PM
NovelApproachtoProduceThickCNTBaseduckypaperforShieldingApplications: *Syed Sajl*[1]; [1]Khalifa University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing Keynote Session — Additive Manufacturing Keynote Session

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizer: Eric Lass, University of Tennessee-Knoxville

Monday PM | March 20, 2023
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Session Chair: Eric Lass, University of Tennessee-Knoxville

2:00 PM Keynote
Putting More Refractory Metals in Additive Manufacturing: *Moataz Attallah*[1]; [1]University of Birmingham

2:35 PM Question and Answer Period

2:40 PM Keynote
Novel Applications with Directed Energy Deposition (DED): *Melanie Lang*[1]; [1]Formalloy

3:15 PM Question and Answer Period

3:20 PM Break

3:40 PM Keynote
Overview of Research to Standardization Efforts In Support of Additive Manufacturing Qualification and Certification: *Mohsen Seifi*[1]; [1]ASTM International; Case Western Reserve University

4:15 PM Question and Answer Period

4:20 PM Keynote
TMS Young Innovator in the Materials Science of Additive Manufacturing Award: Microstructure Design Freedom in Metal AM: A LEGO Analogy: *Matteo Seita*[1]; [1]University of Cambridge

4:55 PM Question and Answer Period

MATERIALS PROCESSING

Advanced Characterization of High-temperature Alloys: Phase Evolution during Manufacturing and Service-induced Deformation — Advanced Characterisation of Deformation Mechanisms: Microscopy

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

Program Organizers: Katerina Christofidou, University of Sheffield; Benjamin Adam, Oregon State University; Stoichko Antonov, Max-Planck Institut für Eisenforschung GmbH; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Paraskevas Kontis, Norwegian University of Science and Technology; Stella Pedrazzini, Imperial College London; Sophie Primig, University of New South Wales

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Session Chairs: Stoichko Antonov, National Energy Technology Laboratory; Cynthia Rodenkirchen, Imperial College London

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2:00 PM Invited
High-resolution Characterization of Grain Boundary Precipitates and Their Interfaces in Ni-based Superalloys with B and C Additions: *Felix Theska*[1]; Richard Buerstmayr[1]; Michael Lison-Pick[2]; Steven Street[2]; Sophie Primig[1]; [1]UNSW Sydney; [2]Western Australian Specialty Alloys (WASA)

2:30 PM Invited
STEM/SEM Study on the Microstructural Evolution and Deformation Mechanisms of Fe-25Cr-20Ni-1.4Nb-0.2C Steel Fabricated by Laser Powder-bed Fusion: *Kinga Unocic*[1]; Rangasayee Kannan[1]; Lisa Debeer-Schmitt[1]; Ken Littrell[1]; Peeyush

Nandwana[1]; Sebastien Dryepondt[1]; [1]Oak Ridge National Laboratory

3:00 PM
Advanced Characterization of Centrifugally Cast HP40 Reformer Tubes: Thibaut Dessolier[1]; Thomas McAuliffe[1]; Chrétien Hermse[2]; Wouter Hamer[3]; *Thomas Britton*[4]; [1]Imperial College London; [2]Shell Nederland Chemie B.V.; [3]Shell Global Solutions International; [4]University of British Columbia

3:20 PM
Microstructure Evolution and Mechanical Properties of \945\8242/\945\8243-Strengthened Ferritic Superalloys: *Christopher Zenk*[1]; Andreas Bezold[1]; Andreas Förner[1]; Steffen Neumeier[1]; Carolin Körner[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

3:40 PM Break

4:00 PM Invited
Characterization of Deformed Structures in Containing Superalloys: Akshat Godha[1]; Karthick Sundar[1]; Shashidhar Gangavarapu[1]; Nithin Baler[1]; *Surendra Kumar Makineni*[1]; [1]Indian Institute of Science Bangalore

4:30 PM
An In-Situ Elevated Temperature Investigation of Plasticity and Damage Evolution in a Ni-based Superalloy: *Prafull Pandey*[1]; Shaolou Wei[1]; Cemal Tasan[1]; [1]MIT

4:50 PM
TEM Characterization of Tensile Behavior of Advanced Ni-based Single-crystal Superalloys: *Benoît Mansoz*[1]; Jonathan Cormier[2]; Pierre Caron[3]; Florence Pettinari-Sturmel[1]; [1]CEMES-CNRS; [2]Institut Pprime; [3]ONERA

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 Jackson, Sandia National Laboratories

Monday PM | March 20, 2023
Aqua 311A | Hilton

Session Chairs: Jaafar El-Awady, Johns Hopkins University; Ricardo Lebensohn, Los Alamos National Laboratory

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2:00 PM Invited
Full Integration of FFT-based Methods for Optimization and Modelling of Micromechanical Data Obtained by Advanced Characterization Techniques: *Ricardo Lebensohn*[1]; [1]Los Alamos National Laboratory

2:30 PM
Surface Roughness in Polycrystalline Copper under Cyclic Thermal Loading: FFT-based Thermomechanical Modelling with Experimental Verification for Accelerator Applications: *Zhangxi Feng*[1]; Miroslav Zecevic[2]; Rodney McCabe[2]; Daniel Hooks[2]; Marko Knezevic[1]; Ricardo Lebensohn[2]; [1]University of New Hampshire;

[2]Los Alamos National Laboratory

2:50 PM
Investigating the Influence of Precipitates on Strengthening Mechanisms in Mg Alloys Using Phase-field Simulations: *Darshan Bamney*[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

3:10 PM
Spatial Quantification of Deformation by Combining Data Collected from Digital Image Correlation and EBSD: Alex Forsey[1]; Ehsan Afshin[1]; Suzanne Cheney[1]; Salih Gungor[1]; *Richard Moat*[1]; [1]The Open University

3:30 PM Break

3:50 PM
Three-dimensional Surface Morphology Reconstruction for In-situ Scanning Electron Microscope Experiments: An Alternative to Digital Image Correlation (DIC): Khalid El-Awady[1]; Steven Lavenstein[1]; *Jaafar El-Awady*[1]; [1]Johns Hopkins University

4:10 PM
Crystallographic Slip System Activity Fields Identified Automatically from DIC Data for Intersecting, Diffuse and Cross Slip: *Tijmen Vermeij*[1]; Ron Peerlings[1]; Marc Geers[1]; Johan Hoefnagels[1]; [1]Eindhoven University Of Technology

4:30 PM
Using the Digital Image Correlation Techniques in Unique Ways: *Carl Cady*[1]; Cheng Liu[1]; [1]Los Alamos National Laboratory

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ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session — Honorary Palkowski Session II

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

Program Organizers: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology

Monday PM | March 20, 2023
Aqua E | Hilton

Session Chairs: Ravindra Nuggehalli, New Jersey Institute of Technology; Karine Mougin, IS2M CNRS; Adele Carrado, University of Strasbourg, IPCMS, CNRS

2:00 PM Introductory Comments

2:05 PM Keynote
Dry coatings: Modulating the Releasing of Plasma-grafted Biologically Active Molecules from Medical Devices to Impact the Biological Response: *Diego Mantovani*[1]; Pascale Chevallier[1]; Andranik Sarkissian[2]; [1]Laval University; [2]Plasmionique Inc.

2:45 PM Invited
A Carbon Fiber Cloth / Calcium-deficient Hydroxyapatite Biomaterial as a Promising Patch for Bone Repair: F. Olivier[1]; N. Rochet[2]; *Sylvie Bonnamy*[1]; [1]CNRS,

Univ. Orléans, ICMN; [2]CNRS, INSERM, Univ. Côte d'Azur

3:15 PM Invited
Global Engagement – Taking the Example of the Institute of Metallurgy at Clausthal University of Technology: *Astrid Abel*[1]; [1]Clausthal University of Technology

3:35 PM Break

3:55 PM Keynote
Development of Sandwich Materials from Automotive to Biomedical Applications: *Adele Carrado*[1]; [1]University of Strasbourg - IUT LP / IPCMS - CNRS

4:35 PM Invited
Towards the Biomedical Applicability of Sandwich Materials Processed by Incremental Sheet Forming: *Mohamed Harhash*[1]; Heinz Palkowski[1]; [1]Clausthal University of Technology (TU Clausthal)

5:05 PM Invited
Thermal Stability and Residual Stresses in Nanolamellar CVD TiAlN Coatings Investigated by In Situ Synchrotron Diffraction: *Kristine Bakken*[1]; Olof Bäcke[1]; Mats Halvarsson[1]; Magnus Hörnqvist Colliander[1]; [1]Chalmers University of Technology

5:25 PM Concluding Comments

MATERIALS PROCESSING

Advanced Joining Technologies for Automotive Lightweight Structures — Fundamental Investigations

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

Program Organizers: Yan Huang, Brunel University London; Carla Barbatti, Constellium

Monday PM | March 20, 2023
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Session Chair: Shouxun Ji, Brunel University London

2:00 PM
A Novel Approach for In-process Monitoring of Dissimilar Ultrasonic Welds of Multi-strand Aluminum Wires and Copper Terminals Utilizing the Seebeck Effect: *Andreas Gester*[1]; Toni Sprigode[1]; Guntram Wagner[1]; [1]Chemnitz University of Technology

2:25 PM
Microstructure and Mechanical Properties of Electron Beam Welded AA2024 to AA6061 Dissimilar Joints: *Jyotirmaya Kar*[1]; [1]Malaviya National Institute of Technology Jaipur

2:50 PM
Numerical Analysis of High-Velocity Riveted (HVR) Joints through Finite Element Modeling Supported by Experimental Data: Daniel Ramirez Tamayo[1]; *Lei Li*[1]; Benjamin Schuessler[1]; Vineet Joshi[1]; Ayoub Soulami[1]; [1]Pacific Northwest National Laboratories

3:15 PM
Recent Advances in the Transformative Non-fusion Weld-brazing Process Used to Join Thin-gauge Alloys Used in the Automotive Industry: *M. Shehryar Khan*[1];

Yong Hwan Cho[1]; Frank Goodwin[2]; Y. Norman Zhou[1]; [1]University of Waterloo; [2]International Zinc Association

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Energy Conversion with SOC

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

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

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Session Chairs: Uday Pal, Boston University; Prabhakar Singh, University of Connecticut

2:00 PM Keynote
Electrochemical Systems for Global Net-Zero and Zero Carbon Electricity Infrastructure: *Prabhakar Singh*[1]; Amit Pandey[2]; [1]UConn, University of Connecticut; [2]Lockheed Martin Space

2:30 PM
Bioinspired Hydrogen Electrolyzer: Laura Carmona-Saldarriaga[1]; *Alex Ossa*[1]; [1]Universidad Eafit

2:50 PM
In-situ Mitigation of Chromium Poisoning in SOFC Air Electrodes: Michelle Sugimoto[1]; Zhikuan Zhu[2]; Srikanth Gopalan[2]; Soumendra Basu[2]; *Uday Pal*[2]; [1]Saint-Gobain; [2]Boston University

3:10 PM Invited
Protective Coatings on Porous Interconnects for SOFC Applications: *Soumendra Basu*[1]; Zhikuan Zhu[1]; Srikanth Gopalan[1]; Uday Pal[1]; [1]Boston University

3:35 PM Break

3:50 PM
Correlating Microstructural Evolution in Reversible Solid Oxide Electrochemical Cells to their Performance: *Jillian Mulligan*[1]; Ayesha Akter[1]; John-In Lee[1]; Uday Pal[1]; Srikanth Gopalan[1]; Soumendra Basu[1]; [1]Boston University

4:10 PM Invited
High Performance Reversible Solid Oxide Fuel Cells (RSOCs) Based on Ruddlesden-Popper Oxygen Electrodes for Grid Scale Energy Storage: Ayesha Akter[1]; Hector Grande[1]; Uday Pal[1]; Soumendra Basu[1]; *Srikanth Gopalan*[1]; [1]Boston University

4:35 PM
Sulfur and Chromium Poisoning Mechanism of Lanthanum Nickelate Cathode Material: A Thermodynamic and Experimental Study: Rui Wang[1]; Lucas Parent[2]; Srikanth Gopalan[3]; *Yu Zhong*[1]; [1]Worcester Polytechnic Institute; [2]University of Connecticut; [3]Boston University

4:55 PM
New Family of Interstitial Oxygen Ion Conductor Discovered by High-Throughput Computational Screening: *Jun Meng*[1]; MD Sariful Sheikh[1]; Ryan Jacobs[1]; Dane Morgan[1]; [1]University of Wisconsin-Madison

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CHARACTERIZATION

Advanced Real Time Imaging — Joint Session: Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling

Sponsored by: TMS Functional Materials Division, 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 Engergy 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, Sourthern 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

Monday PM | March 20, 2023
Aqua 310B | Hilton

Session Chairs: Tanaji Paul, Florida International University; Robert Wheeler, Microtesting Solutions LLC

2:00 PM
Energy Absorption Properties of Open-Cell Rhombic Dodecahedron Cellular Lattice Structures Under Shock Compression: *Cyril Williams*[1]; [1]US Army Research Laboratory

2:20 PM
Estimation of Interfacial Strain Response for a Bi-material Strip in Tensile and Shear Loading Using THz-TDS: *Sushrut Karmarkar*[1]; Vikas Tomar[1]; [1]Purdue University - School of Aeronautics and Astronautics

2:40 PM
Study of Fracture Behaviors of Epoxy-Alumina Composite Using Mechanical Testing Coupled with Micro-CT: *Yichun Tang*[1]; Yuetong Hao[1]; Jing Du[1]; [1]Penn State University

3:00 PM
Three-dimensional Assessment of Strain Localization at the Sub-grain Level of a Ni-based Superalloy at Low and High Temperature Using Laser Scanning Confocal Microscopy: *Damien Texier*[1]; Malo Jullien[1]; Ali Rouwane[1]; Julien Genée[1]; Jean-Charles Stinville[2]; Marc Legros[3]; Jean-Charles Passieux[1]; [1]CNRS - Institut Clément Ader; [2]University of Illinois, Urbana-Champaign; [3]CEMES - UPR CNRS 8011

3:20 PM Break

3:40 PM Invited
Thermal Stability of fcc-bcc Nanolaminates Containing 3D Interfaces: *Justin Cheng*[1]; Zezhou Li[2]; Shuozhi Xu[3]; Jon Baldwin[4]; Mauricio De Leo[1]; Irene Beyerlein[5]; Khalid Hattar[6]; Nathan Mara[1]; [1]University of Minnesota Twin Cities; [2]Beijing Institute of Technology; [3]University of Oklahoma; [4]Los Alamos National Laboratory;

[5]University of California Santa Barbara; [6]Sandia National Laboratories

4:00 PM
4D Microstructural Evolution of Bismuth (Bi) Phase during Solidification of Sn-58Bi Solder: *Amey Luktuke*[1]; Hamid Torbati-Sarraf[1]; Sridhar Niverty[2]; Alan Kastengren[3]; Viktor Nikitin[3]; Aniket Tekawade[3]; Rajkumar Kettimuthu[3]; Nikhilesh Chawla[1]; [1]Purdue University; [2]Pacific Northwest National Laboratory; [3]Argonne National Laboratory

4:20 PM
In-situ TEM Study of Rapidly Solidifed AlCuLi Based Alloys: *Rostislav Králík*[1]; Lucia Bajtošová[1]; Barbora Křivská[1]; Miroslav Cieslar[1]; [1]Charles University

4:40 PM Invited
The Influence of Temperature on Strength: Are Concentrated BCC Alloys Different than Elements and Dilute Alloys?: *Daniel Miracle*[1]; Satish Rao[2]; Oleg Senkov[2]; Carolina Frey[3]; Tresa Pollock[3]; [1]Air Force Research Laboratory; [2]Air Force Research Laboratory; MRL Materials Resources LLC; [3]University of California, Santa Barbara

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ENERGY & ENVIRONMENT

Advances in Magnetic Materials — Magnetoelastic and Magnetocaloric Materials

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

Program Organizers: Jose Maria Porro, Bcmaterials; Huseyin Ucar, California Polytechnic University,Pomona; Patrick Shamberger, Texas A&M University; Min Zou, Lab Magnetics, A Quadrant Company; Gaoyuan Ouyang, Ames Laboratory; Alex Leary, NASA Glenn Research Center

Monday PM | March 20, 2023
33A | SDCC

Session Chair: Jose Maria Porro, BCMaterials & Ikerbasque

2:00 PM Invited
Magnetovolume Effects in Metamagnetic Shape Memory Heusler Compounds: *Patricia Lazpita*[1]; Victor L'vov[2]; Jesús Rodríguez Fernández[3]; Jose Manuel Barandiarán[1]; Volodymyr Chernenko[4]; [1]University of Basque Country; [2]Taras Shevchenko National University; [3]University of Cantabria; [4]Ikerbasque, Basque Foundation for Science

2:30 PM
Fe-doping Influence on the Magnetostrictive Behaviour of Ni–Mn–Ga–Co–In–Fe Magnetic Shape Memory Alloys: *Natalia Río-López*[1]; Patricia Lázpita[2]; Fernando Plazaola[2]; Volodymyr Chernenko[3]; Jose María Porro[1]; [1]BCMaterials; [2]University of the Basque Country; [3]Ikerbasque

2:50 PM Invited
The Search in the Vast High-entropy Alloy Space for Competitive Magnetocaloric Properties: *Jia Yan Law*[1]; Álvaro Díaz-García[1]; Luis M. Moreno-Ramírez[1]; Victorino Franco[1]; [1]Sevilla University

3:20 PM
Mechanochemical Synthesis of Magnetostrictive Materials: Ce-doped Galfenol and Alfenol: *Alexander Baker*[1]; Alfred Amon[1]; Jibril Shittu[1]; Hunter Henderson[1]; Emily Moore[1]; Scott McCall[1]; [1]Lawrence Livermore National Laboratory

3:40 PM Break

3:55 PM Invited
Magnetoelastic Resonance Sensors: The Importance of Their Geometry on the Most Recent Applications: Paula G.Saiz[1]; Roberto Fernández-de-Luis[1]; Andoni Lasheras[2]; José M. Porro[1]; José Luis Vilas-Vilela[2]; *Ana Catarina Lopes*[2]; [1]BCMaterials; [2]University of Basque Country

4:25 PM
Rhombic Magnetoelastic Sensors with MOF Active Layers: A Potential Tool for Wireless VOCs Detection: *Paula Gonzalez*[1]; Roberto Fernandez[2]; Maria Isabel Arriortua[2]; Ana Catarina Lopes[3]; [1]Knight Campus; [2]BCMaterials; [3]UPV/EHU

4:45 PM Invited
Development of Magnetic Refrigeration Materials for Cryogenic Applications: Hossein Sepehri Amin[1]; *Xin Tang*[1]; J. Lai[1]; Anton Bolyachkin[1]; Tadakatsu Ohkubo[1]; Kazuhiro Hono[1]; [1]National Institute for Materials Science

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Alloy Development and Application II

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Monday PM | March 20, 2023
Aqua D | Hilton

Session Chairs: Joseph Poon, University of Virginia; Jennifer Carter, Case Western Reserve University

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2:00 PM Invited
The Challenges of High-Entropy Intermetallic Alloys: *Joseph Poon*[1]; Jie Qi[1]; [1]University of Virginia

2:20 PM Invited
Charged Particles: Unique Tools to Study Irradiation Resistance of High-entropy Alloys: *Yanwen Zhang*[1]; Lumin Wang[2]; William Weber[3]; [1]Oak Ridge National Laboratory; [2]University of Michigan; [3]The University of Tennessee

2:40 PM Invited
Developing TRansformation-Induced-Plasticity (TRIP) TiZrHf(VNbTa)x High-entropy Alloys via Bo-Md Diagram: *Gian Song*[1]; Yunjong Jung[1]; Kangjin Lee[1]; Jiwoon Lee[1]; Junhee Han[2]; Ke An[3]; Chanho Lee[4]; Peter Liaw[5]; [1]Kongju National University; [2]Korea Institute for Rare Metals, Korea Institute of Industrial Technology (KITECH); [3]Oak Ridge National Laboratory; [4]Los Alamos National Laboratory; [5]The University of Tennessee

3:00 PM Invited
Ion-beam Modification of High-entropy Oxides: *William Weber*[1]; Candice Kinsler-Fedon[1]; Lauren Nuckols[1]; Anamul Mir[2]; Brianna Musico[1]; Ashish Gupta[3]; Ritesh Sachan[3]; Christopher Nelson[4]; David Mandrus[1]; Yanwen Zhang[4]; Veerle Keppens[1];

[1]University of Tennessee; [2]University of Huddersfield; [3]Oklahoma State University; [4]Oak Ridge National Laboratory

3:20 PM Invited
High Entropy Alloy Metamaterials: *Dustin Gilbert*[1]; Corisa Kons[1]; Cameron Jorgensen[1]; [1]University of Tennessee

3:40 PM Break

4:00 PM Invited
Combined Machine Learning – Graph Theory Based Framework for the Design of New High Entropy Alloy Chemistries: *Scott Broderick*[1]; Krishna Rajan[1]; [1]University at Buffalo

4:20 PM Invited
Compositionally Complex Ceramics (CCCs): Recent Discoveries of Long- and Short-Range Ordering and Order-Disorder Transitions: *Jian Luo*[1]; [1]University of California, San Diego

4:40 PM
Development of Coherent Ru-based BCC + B2 Alloys with High Thermal Stability: *Carolina Frey*[1]; Haojun You[1]; Sebastian Kube[1]; Kaitlyn Mullin[1]; Andrew Detor[2]; Scott Oppenheimer[2]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]GE Research

5:00 PM Invited
Deformation Behavior of CoCrFeMnNi High Entropy Alloy Highly Strained by Torsion at Elevated Temperatures: *Nobuhiro Tsuji*[1]; Reza Gholizadeh[1]; Shuhei Yoshida[1]; Yu Bai[2]; Shu Kurokawa[1]; Akinobu Shibata[3]; [1]Kyoto University; [2]Dalian University of Technology; [3]National Institute for Materials Science (NIMS)

5:20 PM Invited
Simulations and Modelling of the High Temperature Yield Behavior of Compositionally Complex Concentrated BCC Alloy: *Satish Rao*[1]; Brahim Akdim[2]; Oleg Senkov[1]; Glenn Balbus[3]; Eric Payton[3]; [1]MRL Materials Resources LLC; [2]UES Inc.; [3]Air Force Research Laboratory

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MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — High Entropy Ceramics II

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Monday PM | March 20, 2023
30A | SDCC

Session Chairs: William Bowman, University of California Irvine; Stefano Curtarolo, Duke University

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2:00 PM Introductory Comments

2:05 PM Invited
Multifunctional High-entropy Ceramics: *Stefano Curtarolo*[1]; Corey Oses[1]; Cormac Toher[2]; Arrigo Calzolari[3]; Marco Esters[1]; [1]Duke University; [2]U. Texas Dallas; [3]CNR

2:25 PM
Dislocation-based Room Temperature Plasticity in High Entropy Oxides: *Xin Wang*[1]; Justin Cortez[1]; Alexander Dupuy[1]; William Bowman[2]; Julie Schoenung[1]; [1]University of California Irvine; [2]University of California Irvine; Irvine Materials Research Institute

2:45 PM
Mechanical Behavior of Multiphase Entropy Stabilized Oxides: *Salma El-Azab*[1]; Luz Gomez[1]; Alexander Dupuy[1]; Julie Schoenung[1]; [1]University of California Irvine

3:05 PM
Enhanced Li-ion Conductivity in Compositionally Complex Perovskite Oxides: *Shu-Ting Ko*[1]; Dawei Zhang[1]; Tom Lee[2]; Ji Qi[1]; Shyue Ping Ong[1]; Xiaoqing Pan[2]; Jian Luo[1]; [1]University of California, San Diego; [2]University of California, Irvine

3:25 PM
Dual Cubic Perovskite Phases in Macro-Equimolar High Entropy Oxides: *Imrongnaro Longkumer*[1]; Ashutosh Gandhi[1]; [1]IIT Bombay

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MATERIALS PROCESSING

Advances in Pyrometallurgy: Developing Low Carbon Pathways — Keynote

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

Program Organizers: Camille Fleuriault, Eramet Norway; Joalet Steenkamp, XPS Glencore; Dean Gregurek, RHI Magnesita; Jesse White, KTH Royal Institute of Technology; Quinn Reynolds, Mintek; Phillip Mackey, P.J. Mackey Technology, Inc.; Lina Hockaday, Curtin University, WASM

Monday PM | March 20, 2023
29B | SDCC

Session Chairs: Phillip Mackey, P.J. Mackey Technologies Inc.; Joalet Steenkamp, XPS Glencore

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2:00 PM Introductory Comments

2:10 PM Keynote
The HYBRIT Demonstration of a Fossil-free Iron- and Steelmaking Value Chain: *Amanda Ohman*[1]; [1]Hybrit Development AB

2:35 PM Keynote
Decarbonisation of High-temperature Processes in the Australian Context: *G.J. 'Gus' Nathan*[1]; [1]University of Adelaide

3:00 PM Keynote
The Pathway to CO2-Reduction in the Refractory Industry: *Thomas Drnek*[1]; [1]RHI Magnesita GmbH

3:25 PM Break

3:45 PM Keynote
Electrification to Decrease the Carbon Footprint of Iron and Steelmaking: *Petrus Pistorius*[1]; [1]Carnegie Mellon University

4:10 PM Keynote
Roadmap for Reduction of Fossil CO2 Emissions in Eramet Mn Alloys: *Benjamin Ravary*[1]; Pierre Gueudet[2]; [1]Eramet Norway AS; [2]Eramet SA

4:35 PM Keynote
Towards Net Zero PyroMetallurgical Processing with the ISASMELT™ and ISACYCLE™: Stuart Nicol[1]; *Stanko Nikolic*[1]; Ben Hogg[1]; [1]Glencore Technology

5:00 PM Panel Discussion

MATERIALS DESIGN

Advances in Titanium Technology — Session 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, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Monday PM | March 20, 2023
Cobalt 500 | Hilton

Session Chair: Fan Sun, CNRS - PSL Research University

2:00 PM Invited
Design of Compositionally Modulated Ti-Alloys for Novel Microstructures and Exceptional Properties: *Yunzhi Wang*[1]; [1]Ohio State University

2:30 PM Invited
The Effects of Fe and Al Additions on the Microstructure and Mechanical Property Evolution of Ti-11at.%Cr Alloys: JoAnn Ballor[1]; Ashiq Shawon[1]; Alex Zevalkink[1]; Scott Misture[2]; Jonathan Poplawsky[3]; *Carl Boehlert*[1]; [1]Michigan State University; [2]Alfred University; [3]Oak Ridge National Laboratory

3:00 PM
In-situ Observation of Twinning Pathways in TRIP/TWIP Ti-12Mo Alloy: *Fan Sun*[1]; Bingnan Qian[2]; Lola Lilensten[1]; Philippe Vermaut[1]; Frédéric Prima[1]; [1]CNRS - PSL Research University; [2]Southern University of Science and Technology

3:20 PM Break

3:40 PM
High Strain Rate Deformation in Metastable -Titanium Alloys: A Case Study of Ti-1023: *Abhishek Sharma*[1]; Mohan Sai Kiran Nartu[1]; Ravisankar Haridas[1]; Sriswaroop Dasari[1]; Srinivas Aditya Mantri[1]; Jeffrey T Lloyd[2]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]DEVCOM Army Research Laboratory

4:00 PM
Stress Induced Martensitic Transformation and Twinning in Beta Titanium Alloys with Increased Oxygen Content: *Mariano Casas Luna*[1]; Jií Kozlík[1]; Dalibor Preisler[1]; Hanuš Seiner[1]; Tomáš Chráska[1]; Josef Strasky[1]; [1]Charles University

MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Monday PM | March 20, 2023
Cobalt 520 | Hilton

Session Chairs: Saaketh Desai, Sandia National Laboratories; Amit Verma, LLNL

2:00 PM
Addressing Semantic Challenges towards Data Mining using Natural Language Processing: *Amit Verma*[1]; Zhisong Zhang[2]; Benjamin Glaser[2]; Robin Kuo[2]; Jason Zhang[2]; Nicholas David[2]; Emma Strubell[2]; Anthony Rollett[2]; [1]LLNL; [2]Carnegie Mellon University

2:20 PM
A Data Facilitation Platform for Materials Science Literature Mining: *Vipul Gupta*[1]; Florian Pyczak[1]; Ingo Schmitt[2]; [1]Helmholtz-Zentrum Hereon; [2]BTU Cottbus-Senftenberg

2:40 PM
Compactness Matters: Improving Bayesian Optimization Efficiency of Materials Formulations through Invariant Search Spaces: *Sterling Baird*[1]; Jason Hall[2]; Taylor Sparks[1]; [1]University of Utah; [2]Northrop Grumman Innovation Systems

3:00 PM
Using Categorical Structures in Model Analysis & Development: *Kalan Kucera*[1]; John Nychka[1]; Glenn Hibbard[2]; [1]University of Alberta; [2]University of Toronto

3:20 PM
Intrinsic Dimensionality Estimates for Microstructural Data: *Megna Shah*[1]; Veera Sundararaghavan[2]; Jeff Simmons[1]; [1]Air Force Research Laboratory; [2]University of Michigan

3:40 PM Break

4:00 PM
XenonPy: An Open Source Platform for Data-driven Materials Design with Small Data: *Stephen Wu*[1]; Chang Liu[1]; Ryo Yoshida[1]; [1]The Institute of Statistical Mathematics

4:20 PM
Uncertainty and Domain Quantification in Machine Learning Regression Models for Materials Properties: *Dane Morgan*[1]; Glenn Palmer[2]; Lane Schultz[1]; Yiqi Wang[1]; Ryan Jacobs[1]; [1]University of Wisconsin-Madison; [2]Duke University

4:40 PM
A Quantitative Approach to Explainable AI in DIW AM: *Jennifer Ruddock*[1]; Robert Weeks[2]; Ezra Ameperosa[1]; James Hardin[1]; Jennifer Lewis[2]; [1]Air Force Research

Lab; [2]Harvard University

5:00 PM
The interp5DOF Matlab Toolbox: Grain Boundary Energy Models and Uncertainty Quantification: *Oliver Johnson*[1]; Sterling Baird[2]; Eric Homer[1]; David Fullwood[1]; Gus Hart[1]; [1]Brigham Young University; [2]University of Utah

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MATERIALS DESIGN

Alloy Behavior and Design Across Length-Scales: An SMD Symposium Honoring Easo George — Point Defects and High Temperature Materials

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

Program Organizers: Michael Mills, Ohio State University; George Pharr, Texas A&M University; Robert Ritchie, University of California, Berkeley
; Muralidharan Govindarajan, Oak Ridge National Laboratory

Monday PM | March 20, 2023
Cobalt 502B | Hilton

Session Chair: Govindarajan Muralidharan, Oak Ridge National Laboratory

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2:00 PM Invited
Strong Effects of Tiny Compositional Changes on Structural and Functional Material Properties: *Gunther Eggeler*[1]; [1]Ruhr-Universität Bochum

2:30 PM Invited
Some Unusual Aspects of the Deformation Behavior of FeAl: *Ian Baker*[1]; [1]Dartmouth College

3:00 PM Invited
Solid Solution Hardening Effects on Thermal Stability and Mechanical Properties of Nanostructured Ni-enriched CrMnFeCoNi High Entropy Alloys: Tom Keil[1]; Enrico Bruder[1]; *Karsten Durst*[1]; [1]Technical University Darmstadt

3:30 PM Break

3:50 PM Invited
Deformation Mechanisms in Compositionally Complex Polycrystalline CoNiCr-based Superalloys: *Steffen Neumeier*[1]; Andreas Bezold[1]; Mathias Goeken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

4:20 PM Invited
Heat-Resistant Cr-Alloys, Microstructure, Oxidation and Creep: *Uwe Glatzel*[1]; Mathias Galetz[2]; Anke Silvia Ulrich[1]; [1]University Bayreuth; [2]DECHEMA Forschungsinstitut

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MATERIALS DESIGN

Alloy Development for Energy Technologies: ICME Gap Analysis — Machine Learning and Deformation Modeling

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

Program Organizers: Ram Devanathan, Pacific Northwest National Laboratory; Raymundo Arroyave, Texas A & M University; Carelyn Campbell, National

Institute of Standards and Technology; James Saal, Citrine Informatics

Monday PM | March 20, 2023
Sapphire I | Hilton

Session Chairs: Raymundo Arroyave, Texas A&M University; Carelyn Campbell, National Institute of Standards and Technology; James Saal, Citrine Informatics; Ram Devanathan, Pacific Northwest National Laboratory

2:00 PM Invited
Voxelized Representations of Atomic Systems for Machine Learning Applications: *Surya Kalidindi*[1]; Matthew Barry[1]; Pranoy Ray[1]; [1]Georgia Institute of Technology

2:30 PM
Unsupervised Techniques for Outlier Identification in Alloy Datasets: *Madison Wenzlick*[1];Osman Mamun[2];M.F.N. Taufique[2];Ram Devanathan[2];Keerti Kappagantula[2]; Kelly Rose[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory; [2]Pacific Northwest National Laboratory

2:50 PM
VPSC's New Clothes: Developing a Modern MATLAB API for Automating High-throughput VPSC Experiments: *Benjamin Begley*[1]; Victoria Miller[1]; [1]University of Florida

3:10 PM Invited
ExtremeMat: towards Microstructure and Composition Sensitive Models for the Creep Deformation of Engineering Steels: *Laurent Capolungo*[1]; Arul Kumar[1]; Ricardo Lebensohn[1]; Michael Glazoff[2]; Michael Gao[3]; Yuki Yamamoto[4]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory; [3]National Energy Technology Laboratory; [4]Oak Ridge National Laboratory

3:40 PM Break

4:10 PM
Data Quality Evaluation and Influence on the Predictability of Data-Driven Alloy Design: *Sunyong Kwon*[1]; Yukinori Yamamoto[1]; Jian Peng[1]; Michael Brady[1]; Dongwon Shin[1]; [1]Oak Ridge National Laboratory

4:30 PM
Design of Creep-resistant Additively Manufactured Stainless Steels for Nuclear Reactors: *Pedro Rivera-Diaz-Del-Castillo*[1]; Wei Wen[1]; Weiling Wang[1]; Hossein Eskandari Sabzi[1]; [1]Lancaster University

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ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications XI — Session II

Sponsored by: TMS Functional Materials Division, TMS Structural 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; Wan-Ting Chiu, Tokyo Institute of Technology; Chenguang Fu, Zhejiang University

Monday PM | March 20, 2023
Sapphire A | Hilton

Session Chairs: Yoshisato Kimura, Tokyo Institute of Technology; Hsin-Jay Wu, National Chiao Tung University

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2:00 PM Invited
Mg2Sn Epitaxial Thin Film for Thermoelectric Application: *Takeaki Sakurai*[1]; Mariana Lima[1]; Takashi Aizawa[2]; Isao Ohkubo[2]; Takao Mori[2]; [1]University of Tsukuba; [2]National Institute for Materials Science

2:20 PM
A Robust Thermoelectric Module Based on MgAgSb/Mg3(Sb,Bi)2 with a Conversion Efficiency of 8.5% and a Maximum Cooling of 72 K: *Pingjun Ying*[1]; Lennart Wilkens[1]; Heiko Reith[1]; Nicolas Rodriguez[1]; Xiaochen Hong[1]; Qiongqiong Lu[1]; Christian Hess[1]; Kornelius Nielsch[1]; Ran He[1]; [1]Leibniz Institute of Solid State and Materials Science

2:40 PM Invited
Effects of Doping Element Addition on Phase Equilibria and Mg_2Si–Mg_2Sn Two-phase Microstructure Formation in Thermoelectric $Mg_2(Si, Sn)$-based Alloys: *Yoshisato Kimura*[1]; Naoki Ueda[1]; Yaw Wang Chai[1]; Manabu Watanabe[1]; Yonghoon Lee[1]; [1]Tokyo Institute of Technology

3:00 PM Invited
Thermoelectric Modules Based on Thin Films for Localized Heat Harvesting: Paolo Mele[1]; Giovanna Latronico[1]; Marco Fronzi[1]; *Hiroki Shigemune*[1]; Motoki Maeda[1]; Kimiyoshi Usami[1]; Cedric Bourges[2]; Takao Mori[2]; [1]Shibaura Institute of Technology; [2]NIMS

3:20 PM Break

3:40 PM Invited
Full-Heusler Compounds: Unconfined Prospects for Tuning Thermoelectricity: *Ernst Bauer*[1]; Alexander Riss[1]; Michael Parzer[1]; Fabian Garmroudi[1]; Takao Mori[2]; [1]Technische Universität Wien; [2]NIMS Tsukuba

4:00 PM
Modulating Doping Concentration via Thermodynamic Approach for High-Performance p-type Bi_2Te_3 Thermoelectrics: *Hung-Wei Chen*[1]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University

4:20 PM
Mixing Amorphous and Crystalline Structures for High Performance n-type Bi_2Te_3 Thermoelectrics: *Wan-Ting Yen*[1]; Hsin-jay Wu[1]; Kuang-Kuo Wang[2]; [1]National Yang Ming Chiao Tung University; [2]National Sun Yat-sen University

4:40 PM
Effect of Interfacial Stability of Bi2Te3 Thin Film Modules on Thermoelectric Property: *Kai-Wen Cheng*[1]; Albert T. Wu[1]; [1]National Central University

5:00 PM Invited
Thermoelectric Effect Under Photon Excitation: A Connector between Thermoelectrics and Photovoltaics: *Heng Wang*[1]; [1]Illinois Institute of Technology

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LIGHT METALS

Alumina & Bauxite — Session I

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

Program Organizers: Errol Jaeger, The Business Consultants FZ-LLC; Stephan

Broek, Kensington Technology Inc.

Monday PM | March 20, 2023
31B | SDCC

Session Chairs: Errol Jaeger, The Business Consultants FZ-LLC; Roberto Seno, Cba

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2:00 PM
Process Simulation with Tertiary Cyclone for Kaolinite Removal from Amazonian Bauxite Reduction in Mineral Processing: *Allan Reis*[1]; Geraldo Magela Duarte[1]; Eslyn Neves[1]; Geovan Oliveira[1]; Thiago Jatobá[2]; [1]Hydro Mineração Paragominas; [2]Mineral Processing Solutions

2:25 PM
Granulometry Impact on Digestion Efficiency and Cost-economics in Alumina Refinery for East Coast Bauxite (INDIA): *Suchita Rai*[1]; M.J. Chaddha[1]; Prachiprava Pradhan[1]; K. J. Kulkarni[1]; M. Panchal[1]; A. Agnihotri[1]; [1]Jawaharlal Nehru Aluminium Research Development and Design Centre

2:50 PM
Effect of Thermal Activation Temperature on Pre-desilication of Low-grade Bauxite: Chaojun Fang[1]; *Tianrui Cai*[1]; Bo Lv[1]; Xiaowei Deng[1]; Jinming Zhang[1]; Zeya Zhao[1]; Bobing Dong[1]; [1]Henan Polytechnic University

3:15 PM
Study of Repeatability and Reproducibility in Analyzes of Available Alumina and Reactive Silica in Bauxites: *Paula Lima*[1]; Danielle Matos[1]; Walter Santana[1]; Jaqueline Pinho[1]; Janyne Ramos[1]; [1]Hydro

3:40 PM Break

3:55 PM
Zero Waste Alumina Production: *Casper Van Der Eijk*[1]; Camilla Sommerseth[1]; [1]SINTEF

4:20 PM
Statistical Modelling of Operating Parameters on Bauxite Slurry Hyperbaric Filtration: *Clara Souza*[1]; Eduardo Moreira[1]; Enio Laubyer[1]; Fabricia Ferreira[1]; Antonio Silva[1]; Raimundo Neto[1]; [1]Hydro Alunorte

4:45 PM
Reduction of GHG Emissions and Increase Operational Reliability using Immersed Electrode Boiler in an Alumina Refinery: Rodrigo Neves[1]; Fernando Melo[1]; Everton Mendonça[1]; *Erinaldo Filho*[1]; Jeferson Carneiro[1]; [1]Norsk Hydro

5:10 PM
Steam Grid Stability using Advanced Process Control and Real Time Optimization in an Alumina Refinery: Rodrigo Neves[1]; *Fernando Melo*[1]; Danilo Arcodaci[1]; Daniella Costa[1]; João Freitas[1]; Ediciano Junior[1]; Juvenal Sousa[1]; [1]Norsk Hydro

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LIGHT METALS

Aluminum Alloys, Characterization and Processing — Processing and Heat Treatment I

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek,

Kensington Technology Inc.

Monday PM | March 20, 2023
32A | SDCC

Session Chair: Mihaiela Isac, McGill Metals Processing Centre

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2:00 PM
Comparison of TiB2 and TiC Grain Refiners' Impact on Surface Quality, Edge Cracking, and Rolling Performance of AA5182 DC-Cast Ingot: *Joshua Lawalin*[1]; Pascal Gauthier[2]; Tao Wang[2]; [1]Commonwealth Rolled Products; [2]Rio Tinto Aluminum

2:25 PM
The Influence of Crystallographic Texture Gradients on the Deformation Response of Aluminum Extrusions: *Warren Poole*[1]; Andrew Zang[1]; Yu Wang[1]; Mary Wells[1]; Nick Parson[1]; [1]University of British Columbia

2:50 PM
Mechanical Properties and Microstructures of Cold Rolling Sheets of a Low-cost Continuous Cast Al-1.5Cu Alloy with Potential Application in Auto Sheets: *Xiyu Wen*[1]; Yan Jin[1]; Wei Li[1]; [1]University of Kentucky

3:15 PM
Challenges in the Production of 5754 Automotive Alloy Sheet via Twin Roll Casting Route: *Dionysios Spathis*[1]; John Tsiros[1]; Andreas Mavroudis[1]; [1]ELVAL SA

3:40 PM Break

3:55 PM
Fabrication of Bright-rolled Aluminum Suitable for Design Elements in the Automotive Industry: *Anita Gruendlinger*[1]; Peter Uggowitzer[2]; Josef Berneder[1]; [1]AMAG rolling GmbH; [2]ETH Zürich

4:20 PM
Effects of Aging Conditions on Fracture Characteristics of Al-Mg-Si Alloys: *Zeynep Tutku Ozen*[1]; Ilyas Artunc Sari[1]; Anil Umut Ozdemir[1]; Gorkem Ozcelik[1]; Abdullah Kagan Kinaci[1]; Alptug Tanses[1]; Emre Cankaya[1]; [1]Asas Aluminyum As

4:45 PM
Evaluation of EN AW 3003 Aluminium Alloy Homogenization with Specific Electrical Resistivity Measurement: *Maja Voncina*[1]; Mitja Petrič[1]; Sebastjan Kastelic[1]; Tilen Balaško[1]; Stanislav Kores[2]; Jožef Medved[1]; [1]University of Ljubljana; [2]Talum d.d.

SPECIAL TOPICS

Beyond Apprenticeship: Navigating the Stages of Academia — Navigating an Academic Career

Sponsored by: TMS: Education Committee

Program Organizers: Alexis Lewis, National Science Foundation; Suveen Mathaudhu, Colorado School of Mines; Michael Groeber, The Ohio State University

Monday PM | March 20, 2023
23A | SDCC

Session Chairs: Suveen Mathaudhu, Colorado School of Mines; Alexis Lewis,

National Science Foundation

2:00 PM Invited
Navigating the Proposal Process at the National Science Foundation: *Jonathan Madison*[1]; [1]National Science Foundation

2:30 PM
Research Integrity Investigations at the NSF Office of Inspector General: *Beth Masimore*[1]; [1]National Science Foundation

2:50 PM
Beyond Apprenticeship: Transforming Your Academic Jargon into Plain Language: *Marlit Hayslett, Phd*[1]; [1]Hayslett Consulting, LLC

3:10 PM
Beyond Apprenticeship: How to "Know" Your Audience: *Marlit Hayslett, Phd*[1]; [1]Hayslett Consulting, LLC

3:30 PM Break

3:50 PM
Mental Health of a Diverse and Inclusive Academic Community: *Arezoo Zare*[1]; [1]Johns Hopkins University

4:10 PM
Engagement with DoD Program Managers: *Michael Bakas*[1]; [1]Army Research Office

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BIOMATERIALS

Bio-Nano Interfaces and Engineering Applications — Session II

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

Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hannes Schniepp, William & Mary; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Monday PM | March 20, 2023
Sapphire 400A | Hilton

Session Chairs: Kalpana Katti, North Dakota State University; Terry Lowe, Colorado School of Mines

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2:00 PM Invited
DNA-templated Dye Aggregate Design for Excitonic Applications: *Lan Li*[1]; [1]Boise State University

2:35 PM
Hierarchical Surface Restructuring for Next Generation Implantable Neural Interfacing Applications: *Shahram Amini*[1]; [1]Pulse Technologies Inc.

2:55 PM
Sisal-inspired Multilevel Structure for Fog Collection Fabricated by Additive Manufacturing and Surface Modification: *Yan-Jie Huang*[1]; Haw-Kai Chang[1]; Phuong Uyen Mai[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

3:15 PM
Influence of Fluid Flow on Inducing Bone Metastasis through use of a Novel Bioreactor with In Vitro Cancer Models: *Kalpana Katti*[1]; Haneesh Jssuja[1]; Sharad Jaswandkar[1]; Dinesh Katti[1]; [1]North Dakota State University

3:45 PM Break

4:05 PM
Self-assembled Flavoprotein Putrescine Oxidase System Offers Enhanced Thermal Stability: *Taylor Bader*[1]; Emina Derakovic[1]; Nilan Kamathewatta[1]; Chris Johnson[1]; Cindy Berrie[1]; Candan Tamerler[1]; [1]University of Kansas

4:25 PM
Chemical, Thermal and Bio-responsive Polystyrene Based-photonic Crystals: A Concise Review: *Doreen Omorogbe*[1]; Stanley Omorogbe[2]; Ikhazuagbe Ifijen[2]; [1]F.C.T Universial Basic Education Board, Abuja; [2]Rubber Research Institute of Nigeria

4:45 PM Invited
Enzymatic Mechanism of Self-healing in Concrete and Carbon-negative Construction Material: *Nima Rahbar*[1]; [1]Worcester Polytechnic Institute

5:20 PM
A Carbon-negative Self-healing Construction Materials: *Shuai Wang*[1]; Suzanne Scarlata[1]; Nima Rahbar[1]; [1]Worcester Polytechnic Institute

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BIOMATERIALS

Biological Materials Science — Biological Materials Science II

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

Monday PM | March 20, 2023
Sapphire 402 | Hilton

Session Chairs: Ning Zhang, University of Alabama; Du Jing, Pennsylvania State University

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2:00 PM Invited
Ultrasonic Characterization of Wave Propagation in Biomineralized Materials: *Horacio Espinosa*[1]; Nicolas Alderete[1]; Maroun Abi Ghanem[2]; [1]Northwestern University; [2]Institut Lumière Matière - Université Claude Bernard Lyon 1

2:30 PM
Sensitivity Analysis of Bio-inspired Phononic Materials Using the Hypercomplex Taylor Series Expansion Method: *Juan C. Velasquez-Gonzalez*[1]; Juan David Navarro[1]; William Beck[1]; David Restrepo[1]; [1]The University of Texas at San Antonio

2:50 PM
Bioinspired Materials Inspired by Biological Structural Design Elements: *Steven Naleway*[1]; Debora Lyn Porter[1]; Tony Yin[1]; Josh Fernquist[1]; Maddie Schmitz[1]; Elise Hotz[1]; [1]University of Utah

3:10 PM Invited
Biological Designs that Prevent Catastrophic Damage: Jung-Eun Lee[1]; Jack Connolly[2]; Devis Montroni[3]; Wei Huang[4]; Taifeng Wang[1]; Phani Saketh Dasika[2]; Pablo Zavattieri[2]; *David Kisailus*[1]; [1]University of California-Irvine; [2]Purdue University;

[3]University of Bologna; [4]Hong Kong University of Science and Technology

3:40 PM Break

4:00 PM Invited
Exploring the Mechanics of Force Transduction in the Tooth-stylus-radula System of Chitons: John (Jack) Connolly[1]; Phani Saketh Dasika[1]; Jungeun Lee[2]; Taifeng Wang[2]; David Kisailus[2]; *Pablo Zavattieri*[1]; [1]Purdue University; [2]University of California, Irvine

4:30 PM
Bio-Inspired Composites and Metamaterials from High-aspect Ratio Ribbons: *Hannes Schniepp*[1]; Ben Skopic[1]; [1]William & Mary

4:50 PM
Mechanical Behavior and Response of the Horse Hoof Wall's Internal Architecture using In-situ MicroCT: *Benjamin Lazarus*[1]; Rachel Luu[1]; Samuel Ruiz-Pérez[2]; Victor Leung[1]; Matthew Wong[1]; Iwona Jasiuk[3]; Marc Meyers[1]; [1]University of California San Diego; [2]Universidad Nacional Autónoma de México; [3]University of Illinois Urbana-Champaign

5:10 PM
Biomineralized Architected Microlattice in Starfish Ossicles: Structure, Mechanics, Morphogenesis, and Bio-Inspired Design: *Ling Li*[1]; [1]Virginia Polytechnic Institute

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Novel Alloys, Processing or Manufacturing Methods

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

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

Monday PM | March 20, 2023
Aqua C | Hilton

Session Chair: Katharine Flores, Washington University in St. Louis

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2:00 PM Invited
Thermal Drawing of Bulk Metallic Glasses within Polymer Fibers: Challenges and Opportunities: *Fabien Sorin*[1]; [1]Ecole Polytechnique Fédérale de Lausanne

2:20 PM
Employment of Joule Heating and Simple Mechanical Loading to Stretch Bulk Metallic Glass Rod into Wire: Fiachra Robinson[1]; Philip Meagher[1]; *David Browne*[1]; [1]University College Dublin

2:40 PM
Rejuvenation of the Supercooled Liquid State by Straining during Cooling: *Ethen Lund*[1]; Rodrigo Mota[1]; Sungwoo Sohn[1]; David Browne[2]; Jan Schroers[1]; [1]Yale University; [2]University College Dublin

3:00 PM
Development and Properties of Marginal Zr-based Bulk Glassy Alloys: *Akihisa Inoue*[1]; F.L. Kong[1]; S.L. Zhu[2]; A.L. Greer[3]; [1]Josai International University; [2]Tianjin

University; [3]University of Cambridge

3:20 PM Break

3:40 PM
Tuning Microstructure and Enhancing Mechanical Properties of Co-Ni-V and Co-Ni-V-Al Medium Entropy Alloy Thin Films via Deposition Power: *Qingping Cao*[1]; [1]Zhejiang University

4:00 PM
Processability of Cu-Ti-based Metallic Glasses via Laser Powder Bed Fusion: Erika Soares Barreto[1]; *Erika Soares Barreto*[2]; Maximilian Frey[3]; Jan Wegner[4]; Stefan Kleszczynski[4]; Ralf Busch[3]; Lutz Mädler[1]; Lutz Mädler[2]; Nils Ellendt[1]; Nils Ellendt[2]; [1]Leibniz Institute for Materials Engineering—IWT; [2]University of Bremen; [3]Saarland University; [4]University of Duisburg-Essen

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LIGHT METALS

Cast Shop Technology — Molten Metal Cleanliness and Analysis

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

Program Organizers: Halldor Gudmundsson, Century - Nordural; Stephan Broek, Kensington Technology Inc.

Monday PM | March 20, 2023
31C | SDCC

Session Chair: Volker Ohm, HOESCH Metallurgie GmbH

2:00 PM Introductory Comments Mr. Halldor Gudmundsson

2:05 PM
Electromagnetic Priming of Filtration Systems: Pyrotek EM-DF: *Robert Fritzsch*[1]; Joseph Whitworth[1]; Paul Bosworth[1]; Jason Midgley[1]; [1]Pyrotek

2:30 PM
Automated Metal Cleanliness Analyzer (AMCA): Digital Image Analysis Phase Differentiation and Benchmarking Against PoDFA-derived Cleanliness Data: *Hannes Zedel*[1]; Robert Fritzsch[1]; Ragnhild Aune[2]; Shahid Akhtar[3]; [1]Metallurgical Insight and Quality; [2]Norwegian University of Science and Technology; [3]Norsk Hydro

2:55 PM
Automated Image Analysis of Metallurgical Grade Samples Reinforced with Machine Learning: *Anish Nayak*[1]; Hannes Zedel[2]; Shahid Akhtar[3]; Robert Fritzsch[2]; Ragnhild Aune[2]; [1]Norwegian University of Science and Technology (NTNU); Institute of Chemical Technology Mumbai (IndianOil Odisha Campus); [2]Norwegian University of Science and Technology (NTNU); [3]Norsk Hydro, Karmøy Primary Production

3:20 PM Break

3:35 PM
Characterization of Low- and High Mg-containing Aluminum White Dross Using Deterministic Image Analysis of EPMA Scans: *Cathrine Solem*[1]; Hannes Zedel[1]; Ragnhild Aune[1]; [1]Norwegian University of Science and Technology (NTNU)

4:00 PM
Assessment of Separation and Agglomeration Tendency of Non-metallic Inclusions in an Electromagnetically Stirred Aluminum Melt: *Cong Li*[1]; Thien Dang[2]; Mertol Gokelma[3]; Sebastian Zimmermann[4]; Jonas Mitterecker[4]; Bernd Friedrich[1]; [1]IME - Process Metallurgy and Metal Recycling Institute, RWTH Aachen University; [2]TRIMET Aluminium SE; [3]Izmir Institute of Technology; [4]Former Student of IME Process Metallurgy and Metal Recycling, RWTH Aachen University

4:25 PM
Microalloying of Liquid Al-Mg Alloy Studied In-situ by Laser-induced Breakdown Spectroscopy: *Kristjan Leosson*[1]; Sveinn Gudmundsson[1]; Arne Ratvik[2]; Anne Kvithyld[2]; [1]DTE ehf.; [2]SINTEF

CHARACTERIZATION

Characterization of Materials through High Resolution Coherent Imaging — Algorithms for High Resolution Coherent Imaging of Materials

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

Program Organizers: Richard Sandberg, Brigham Young University; Ross Harder, Argonne National Laboratory; Xianghui Xiao, Brookhaven National Laboratory; Brian Abbey, La Trobe University; Saryu Fensin, Los Alamos National Laboratory; Ana Diaz, Paul Scherrer Institute; Mathew Cherukara, Argonne National Laboratory

Monday PM | March 20, 2023
Aqua 310A | Hilton

Session Chair: Ross Harder, Advanced Photon Source, Argonne National Laboratory

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2:00 PM Invited
3D Nanoscale Crystalline Microscopy: The Interest of 3D Bragg Ptychography for Material Science: *Virginie Chamard*[1]; [1]Institut Fresnel

2:30 PM
Using Automatic Differentiation to Solve the Phase Problem in X-ray Bragg Ptychography: *Tao Zhou*[1]; Mathew Cherukara[1]; Stephan Hruszkewyzcz[1]; Saugat kandel[1]; Martin Holt[1]; [1]Argonne National Laboratory

2:50 PM
Near Atomic Resolution BCDI through Materials Modeling: *Jason Meziere*[1]; Ross Harder[2]; Anastasios Pateras[3]; Richard Sandberg[1]; [1]Brigham Young University; [2]Argonne National Laboratory; [3]Deutsches Elektronen-Synchrotron DESY

3:10 PM
The Application of Advanced Coherent Imaging Technique and Element Analysis on a Self-organized Loop Structure: *Yao Li*[1]; Arunodaya Bhattacharya[2]; Yajie Zhao[1]; Jean Henry[3]; Steven Zinkle[1]; [1]University Of Tennessee Knoxville; [2]Oak Ridge National Laboratory; [3]Commissariat à l'Energie Atomique

3:30 PM Break

3:50 PM
Fluctuation Analysis of Coherent Electron Diffuse Scattering for Diffractive Imaging: *Jian Min Zuo*[1]; Saran Pidaparthy[1]; Haoyang Ni[1]; Robert Busch[1]; hanyu Hou[1]; [1]University of Illinois

4:10 PM Invited
Method Developments for High-efficient X-ray Coherent Diffraction Imaging: *Yudong Yao*[1]; Junjing Deng[1]; Henry Chan[1]; Jeffrey Klug[1]; Yi Jiang[1]; Barbara Frosik[1]; Zhonghou Cai[1]; Ross Harder[1]; Barry Lai[1]; Mathew Cherukara[1]; [1]Argonne National Laboratory

4:40 PM
"Similarity Mapping" Using Precession Electron Diffraction Data: *Marcus Hansen*[1]; Ainiu Wang[1]; Jiaqi Dong[1]; Kelvin Xie[1]; [1]Texas A&M University

5:00 PM
Advances in Phase Retrieval for *In Situ* Observation of Dislocation Dynamics in Gold Microcrystals: *Jason Porter*[1]; Ross Harder[2]; Wonsuk Cha[2]; Siddharth Maddali[2]; Yueheng Zhang[3]; Matthew Wilkin[3]; Anastasios Pateras[4]; Landon Schnebly[1]; Joshua Miller[1]; Robert Suter[3]; Anthony Rollett[3]; Richard Sandberg[1]; [1]Brigham Young University; [2]Argonne National Laboratory; [3]Carnegie-Mellon University; [4]Deutsches Elektronen-Synchrotron

5:20 PM
Characterisation of Material Defects via Plasmon-enhanced Phase Imaging: *Brian Abbey*[1]; [1]La Trobe University

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CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Advanced Characterization Methods II

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Monday PM | March 20, 2023
Aqua 313 | Hilton

Session Chairs: Bowen Li, Michigan Technological University; Rajiv Soman, Eurofins EAG Materials Science LLC

2:00 PM
On the Feasibility of Back-scattered or Ion-induced Secondary Electron Imaging to Determine Grain Orientations: *Marc De Graef*[1]; [1]Carnegie Mellon University

2:20 PM
Structure and Interfaces of MBE Grown Fe Thin Films on GaAs: *Ramasis Goswami*[1]; [1]Naval Research Laboratory

2:40 PM
Development of Bearing Temperature Monitoring Technology in Railway Vehicle: *Jeongguk Kim*[1]; [1]Korea Railroad Research Institute

3:00 PM
Enhancing the Reliability of Reconstruction for Small Grains Using Novel Laboratory Diffraction Contrast Tomography (Lab DCT) Acquisition and

Reconstruction Approaches: *Eshan Ganju*[1]; Eugenia Nieto-Valeiras[2]; Javier LLorca[2]; Nikhilesh Chawla[1]; [1]Purdue University; [2]IMDEA Materials Institute

3:20 PM
Film Structure of Polymerized Synthetic Dopamine by Neutron Reflectometry: *Matthew Herman*[1]; Erik Watkins[1]; John Yeager[1]; [1]Los Alamos National Laboratory

3:40 PM Break

3:55 PM
Material Characterization by Neutron Imaging and Neutron Grating Interferometry: *Yuxuan Zhang*[1]; Leslie Butler[2]; Hassina Bilheux[1]; Kyungmin Ham[2]; Jean Bilheux[1]; Erik Stringfellow[1]; Wieslaw Stryjewski[2]; Michael Vincent[2]; [1]Oak Ridge National Laboratory; [2]Louisiana State University

4:15 PM
Quantitative 3D Imaging of Multi-type Chemical Short-range Order in a Medium-entropy Alloy: *Yue Li*[1]; Zhangwei Wang[2]; Baptiste Gault[1]; [1]Max-Planck-Institut Fur Eisenforschung; [2]Central South University

4:35 PM
Structure and Substructure Characterization of Ni50.3Ti29.7Hf20 High-temperature Shape Memory Alloy: *Jiaqi Dong*[1]; Umale Tejas[1]; Benjamin Young[1]; Dexin Zhao[1]; Ibrahim Karaman[1]; Kelvin Xie[1]; [1]Texas A&M University

4:55 PM
Nano-scale Spatially Resolved Analysis of Hydrogen in Stainless Steels: *Dallin Barton*[1]; Mark Wirth[1]; Dan Nguyen[1]; Mengkong Tong[1]; Tingkun Liu[1]; Zihua Zhu[1]; Daniel Perea[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

5:15 PM
Curing Behavior of Plasmonic Spiky Gold Nanoparticles Integrated in an Epoxy System: *Cynthia Sangang*[1]; [1]Texas Tech University

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NUCLEAR MATERIALS

Composite Materials for Nuclear Applications II — Tungsten Composites and TRISO Fuel

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

Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Commonwealth Fusion Systems; Peng Xu, Idaho National Laboratory; Johann Riesch, Max-Planck-Insitut Fuer Plasmaphysik

Monday PM | March 20, 2023
24B | SDCC

Session Chairs: Johann Riesch, Max-Planck-Institut für Plasmaphysik; Dong Liu, University of Bristol

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2:00 PM Invited
Progress in the Development of Tungsten Fibre-reinforced Copper Composites for Heat Sink Applications in Plasma-facing Components: *Alexander Von Mueller*[1]; Maximilian Fuhr[1]; Katja Hunger[1]; Patrick Junghanns[1]; Rudolf Neu[1]; Johann Riesch[1]; Jeong-Ha You[1]; Markus Milwich[2]; Lena Müller[2]; Michael Decius[3]; Selanna

Roccella[4]; [1]Max-Planck-Institut fuer Plasmaphysik; [2]Deutsche Institute für Textil- und Faserforschung Denkendorf (DITF); [3]TEC-KNIT CreativCenter für technische Textilien GmbH; [4]ENEA Frascati Research Center

2:30 PM
Recent Progress in the Development of Tungsten Fibre-reinforced Tungsten Composite: *Johann Riesch*[1]; Jan Coenen[2]; Alexander Feichtmayer[1]; Maximilian Fuhr[1]; Lauren Garrison[3]; Henri Greuner[1]; Till Höschen[1]; Alexander Lau[2]; Robert Lürbke[1]; Yiran Mao[2]; Wolfgang Pantleon[4]; Daniel Schwalenberg[2]; Thomas Schwarz-Selinger[1]; Rudolf Neu[1]; [1]Max-Planck-Insitut Fuer Plasmaphysik; [2]Forschungszentrum Jülich; [3]Oak Ridge National Laboratory; [4] Technical University of Denmark

2:50 PM
Is there Residual Stress in Tungsten Fiber Reinforced Tungsten Composites: *Hanns Gietl*[1]; Johann Riesch[2]; T. Höschen[2]; S. Schönen[3]; Ch. Le Bourlot[4]; J-Y. Buffière[4]; Wolfgang Pantleon[5]; J.W. Coenen[6]; [1]Idaho National Laboratory; [2]Max-Planck-Insitut Fuer Plasmaphysik; [3]Forschungszentrum Jülich GmbH, Institut für Energie und Klimaforschung, Partner of the Trilateral Euregio Cluster (TEC),; [4]Laboratoire de Mécanique des Contact et des Solides, INSA de Lyon; [5]Technical University of Denmark; [6]Forschungszentrum Jülich GmbH, Institut für Energie und Klimaforschung, Partner of the Trilateral Euregio Cluster (TEC)

3:10 PM
Effect of Hot Rolling and High Temperature Annealing on the Microstructure and Mechanical Properties of Hot-rolled 90W7Ni3Fe WHA: *Md Ershadul Alam*[1]; Charles Henager Jr.[2]; Jing Wang[2]; Wahyu Setyawan[2]; G.R. Odette[1]; [1]University of California, Santa Barbara; [2]Pacific Northwest National Laboratory, Richland

3:30 PM Break

3:50 PM Invited
W_2C-reinforced Tungsten: A Promising Candidate for EU DEMO Divertor Material: Petra Jenus[1]; *Aljaž Iveković*[1]; Matej Kocen[1]; Anže Abram[1]; Andreja Šestan Zavašnik[1]; Sabina Markelj[1]; Andrei Galatanu[2]; Magdalena Galatanu[3]; Elena Tejado[4]; Jose Ygnacio Pastor[4]; Marius Wirtz[5]; Saša Novak[1]; Gerald Pintsuk[5]; [1]Jožef Stefan Institute; [2]National Institute of Materials Physics, Magurele, Romania ; [3]National Institute of Materials Physics, Magurele, Romania; [4]Dpto. de Ciencia de Materiales-CIME. Universidad Politécnica de Madrid, Spain; [5]Institute for Energy and Climate Reseach, Forschungszentrum Juelich GmbH

4:20 PM
Thermal Properties of Dispersoid-strengthened Tungsten Alloys for Fusion Applications: *Chase Hargrove*[1]; Trevor Marchhart[1]; Nathan Reid[2]; Xing Wang[1]; Jean Paul Allain[1]; [1]Pennsylvania State University; [2]Oak Ridge National Laboratory

4:40 PM
Oxidation Response of Irradiated and Unirradiated TRISO Fuel: *Tyler Gerczak*[1]; Darren Skitt[1]; Rachel Seibert[1]; John Hunn[1]; [1]Oak Ridge National Laboratory

5:00 PM
Correlating Heterogeneous Pore Distribution with Stochastic Fracture in the Pyrocarbon Buffer Layer in TRISO Fuel Particles: *Yongfeng Zhang*[1]; Aashique Rezwan[1]; Claire Griesbach[1]; Ramathasan Thevamaran[1]; Wen Jiang[2]; Tyler Gerczak[3]; Karim Ahmed[4]; [1]University of Wisconsin; [2]Idaho National Laboratory ; [3]Oak Ridge National Laboratory ; [4]Texas University A&M

MATERIALS DESIGN

Computational Discovery and Design of Materials — Session II

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

Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha Vermaak, Lehigh University

Monday PM | March 20, 2023
Cobalt 502A | Hilton

Session Chairs: Ismaila Dabo, Penn State University; Arunima Singh, Arizona State University

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2:00 PM
Designing Ohmic and Schottky Interfaces for Oxide Electronics: *Valentino Cooper*[1]; Matthew Brahlek[1]; [1]Oak Ridge National Laboratory

2:30 PM Invited
Searching for New "Quantum Defects" through High-throughput Computational Screening: *Geoffroy Hautier*[1]; [1]Dartmouth College

3:00 PM
Electronic and Structural Properties of Ab-initio Predicted $B_xAl_{1-x}N$ Alloy Structures: *Cody Milne*[1]; Arunima Singh[1]; Tathagata Biswas[1]; [1]Arizona State University

3:20 PM
Crystal to PNG (xtal2png): A Screening Tool to Accelerate Domain Transfer from State-of-the-art Image-processing Models to Materials Informatics and a Case Study on Denoising Diffusion Probabilistic Models: *Sterling Baird*[1]; Kevin Jablonka[2]; Michael Alverson[3]; Hasan Sayeed[1]; Faris Khan[1]; Colton Seegmiller[4]; Berend Smit[2]; Taylor Sparks[1]; [1]University of Utah; [2]École Polytechnique Fédérale de Lausanne; [3]University of Southern California; [4]Utah Valley University

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PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Defects and GBs I

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Monday PM | March 20, 2023
26A | SDCC

Session Chairs: Danny Perez, Los Alamos National Laboratory; Timofey Frolov, Lawrence Livermore National Laboratory

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2:00 PM Invited
Strong Entropic Contributions to Thermally-activated Kinetics: A Case-study in Dislocation Nucleation: Soumendu Bagchi[1]; *Danny Perez*[1]; [1]Los Alamos National Laboratory

2:30 PM
Expanding Insights into Disconnections: *Spencer Thomas*[1]; Jason Trelewicz[1]; [1]Stony Brook University

2:50 PM
Universal Transition in Segregation Structures near Twin-boundary Disconnections: *Chongze Hu*[1]; Stéphane Berbenni[2]; Douglas Medlin[1]; Remi Dingreville[1]; [1]Sandia National Laboratories; [2]Université de Lorraine, CNRS, Arts et Métiers ParisTech

3:10 PM
A Lattice Monte Carlo Approach to Spectral Grain Boundary Segregation: *Thomas Matson*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

3:30 PM Break

3:50 PM
On the Variability of Grain Boundary Motion from a Diffusion Standpoint: *Anqi Qiu*[1]; Ian Chesser[2]; Elizabeth Holm[1]; [1]Carnegie Mellon University; [2]George Mason University

4:10 PM
Propagation and Quantification of Microstructural Uncertainty in Molecular Dynamic Simulations of Polycrystalline Nickel: *Meizhong Lyu*[1]; Anqi Qiu[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

4:30 PM Invited
Modeling Grain Boundary Mediated Plasticity with Massively Parallel Atomistic Simulations: *Timofey Frolov*[1]; Nicolas Bertin[1]; Alexander Chernov[1]; Tomas Oppelstrup[1]; [1]Lawrence Livermore National Laboratory

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Size Effects

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Monday PM | March 20, 2023
Aqua 300AB | Hilton

Session Chairs: Eugen Rabkin, Technion; Anuj Bisht, Technion

2:00 PM Invited
Nanoparticles under High Pressure: Assembly and Formation of Active Nanostructures: *Hongyou Fan*[1]; [1]Sandia National Laboratories

2:30 PM
The Effect of Ion Irradiation on Strength of Ni Nanoparticles: Anuj Bisht[1]; Yuanshen Qi[2]; *Eugen Rabkin*[1]; [1]Technion; [2]GTIIT

2:50 PM
Atomistic Modeling of Peierls Barriers to Dislocation Glide in Metals: *Yipin Si*[1]; David L. McDowell[1]; Ting Zhu[1]; [1]Georgia Institute of Technology

3:10 PM
In-situ Investigation of Tension-compression Anisotropic Behaviour of Ni-SiOC Nanocomposites: *Bingqiang Wei*[1]; Wenqian Wu[1]; Jian Wang[1]; [1]University of Nebraska-Lincoln

3:30 PM Break

3:50 PM Invited
How are Natural Structural Materials Toughened from the Nanoscale?: *Ottman Tertuliano*[1]; [1]University of Pennsylvania

4:20 PM
Multi-stage Superelasticity in $SrNi_2P_2$ Intermetallic Compound via Lattice Collapse and Expansion and the Influence of Cryogenic Temperature: *Shuyang Xiao*[1]; Vladislav Borisov[2]; Adrian Valadani[2]; Guilherme Gorgen-Lesseux[3]; Roser Valentí[2]; Paul Canfield[3]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]Goethe University; [3]Iowa State University

4:40 PM
Grain Size Refinement Altering Yielding Mechanism in an Ultrafine-grained High-Mn Austenitic Steel: *Chang-Yu Hung*[1]; Yu Bai[2]; Tomotsugu Shimokawa[3]; Ya-Peng Yu[1]; Nobuhiro Tsuji[2]; Mitsuhiro Murayama[1]; [1]Virginia Tech; [2]Kyoto University; [3]Kanazawa University

5:00 PM
Mechanical and Microstructural Analysis of a Nanocrystalline Supersaturated Solid Solution Cr-Cu Coatings: *Michael Burtscher*[1]; Markus Alfreider[1]; Christina Kainz[1]; Daniel Kiener[1]; [1]Montanuniversitaet Leoben

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LIGHT METALS

Electrode Technology for Aluminum Production — Anode Raw Materials

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

Program Organizers: Roy Cahill, Rio Tinto; Stephan Broek, Kensington Technology Inc.

Monday PM | March 20, 2023
31A | SDCC

Session Chair: Barbara Cramer, BP

2:00 PM
Partial Replacement of Coke with Biocoke: Effect of Biocoke Production Temperature on Anode Quality: *Belkacem Amara*[1]; Duygu Kocaefe[1]; Yasar Kocaefe[1]; Jules Côté[2]; André Gilbert[3]; [1]University of Quebec at Chicoutimi; [2]Aluminerie Alouette; [3]Boisaco Inc.

2:25 PM
Method for Calcined Petroleum Coke Evaluation to Improve the Anode Quality: *Sheetal Gupta*[1]; Suwarna Mahajan[1]; Amit Gupta[1]; Vilas Tathavadkar[1]; [1]Aditya Birla

Science & Technology Company, Ltd

2:50 PM
Influence of Crusher Type and Particle Shape on the Bulk Density of Blended Shaft and Hearth Calcined Anode Grade Petroleum Coke: *Howard Childs*[1]; Barry Sadler[2]; Mike Davidson[1]; [1]BP; [2]Net Carbon Consulting Pty Ltd

3:15 PM
Managing Green Petroleum Coke Properties Variations on Prebaked Anodes Quality in Aluminium Bahrain "Alba": *Hesham Hassan Buhazza*[1]; Vasantha Kumar Rangasamy[1]; Nabeel Ebrahim Mohd Al Jallabi[1]; Taleb Al Ansari[1]; Abdulmohsin Hasan Radhi[1]; Francois Morales[2]; Abdulla Habib Ahmed Ali[1]; [1]Aluminium Bahrain B.S.C. (Alba); [2]SCCR Consultant

3:40 PM Break

3:55 PM
New Methods to Determine PAH Emission Dynamics during Electrode Mass Processing: *Ole Kjos*[1]; Thor Aarhaug[1]; Heiko Gaertner[1]; Bente Håland[2]; Jens Christian Fjelldal[2]; Katarina Jakovljevic[3]; Oscar Espeland[4]; Ida Kero[1]; [1]Sintef As; [2]Elkem Carbon; [3]Norwegian university of science and technology (NTNU); [4]Nemko Norlab

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ELECTRONIC MATERIALS

Electronic Packaging and Interconnection — Pb Free Solder Alloys I

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

Program Organizers: Kazuhiro Nogita, University of Queensland; Mohd Arif Mohd Salleh, Universiti Malaysia Perlis; Dan Li, Beijing University of Technology; David Yan, San Jose State University; Fan-Yi Ouyang, National Tsing Hua University; Patrick Shamberger, Texas A&M University; Tae-Kyu Lee, Cisco Systems; Christopher Gourlay, Imperial College London; Albert T. Wu, National Central University

Monday PM | March 20, 2023
Sapphire D | Hilton

Session Chairs: Chris Gourlay, Imperial College London; Arif Salleh, Universiti Malaysia Perlis

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2:00 PM Introductory Comments

2:05 PM
Effects of Anisotropic Indium Solder on Cu Diffusion under a Temperature Gradient: *Pei Ni Jiang*[1]; [1]National Tsing Hua University

2:25 PM
Characterising the Thermal Expansion Behaviour in In-Sn Superconducting Solder Joints by In-situ Synchrotron Powder X-ray Diffraction: *Jiye Zhou*[1]; Xin Fu Tan[1]; Qinfen Gu[2]; Stuart McDonald[1]; Kazuhiro Nogita[1]; [1]The University of Queensland; [2]Australian Synchrotron

2:45 PM
Microalloying Effects of Sb and Ag on the Strain-Rate Sensitivity and Microstructural Evolution of Eutectic SnBi Alloys: *Hannah Fowler*[1]; Sukshitha Achar Puttur Lakshminarayana[1]; Sui Xiong Tay[1]; Ganesh Subbarayan[1]; John Blendell[1]; Carol Handwerker[1]; [1]Purdue University

3:05 PM
The Effects of Sb on the Properties of Hypo-eutectic Sn-Bi Alloys: Xin Tan[1]; Qichao Hao[1]; Qinfen Gu[2]; Stuart McDonald[1]; Keith Sweatman[3]; Michael Bermingham[1]; *Kazuhiro Nogita*[1]; [1]University of Queensland; [2]ANSTO; [3]Nihon Superior Co., Ltd

3:25 PM Break

3:45 PM Invited
Kinetics of the Accumulation of Bismuth at the Anode of a Sn-Bi Based Solder Joint during Current Stressing: *Eric Cotts*[1]; Faramarz Hadian[1]; Javier Flores[1]; Sitaram Panta[1]; Mohammed Genanu[1]; [1]Binghamton University

4:10 PM
Surface Precipitation and Growth of Bismuth Particles in Sn-Bi Solder Alloys: *John Wu*[1]; Amey Luktuke[1]; Nikhilesh Chawla[1]; [1]Purdue University

4:30 PM
Study of Sn-Bi-In Ternary Solders with Compositions of Lines between Binary Eutectic Points to Ternary Eutectic Points: *Hoon Choi*[1]; Hoo-Jeong Lee[1]; [1]Sungkyunkwan University

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ENERGY & ENVIRONMENT

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: Shafiq Alam, University of Saskatchewan; Donna Guillen, Idaho National Laboratory; Fiseha Tesfaye, Metso Outotec Finland Oy; Lei Zhang, University of Alaska Fairbanks; Lina Hockaday, Curtin University, WASM; Neale Neelameggham, IND LLC; Hong (Marco) Peng, University of Queensland; Nawshad Haque, Commonwealth Scientific and Industrial Research Organization; Liu Yan, Northestern University

Monday PM | March 20, 2023
33B | SDCC

Session Chairs: Shafiq Alam, University of Saskatchewan; Hong (Marco) Peng, University of Queensland; Liu Yan, Northestern University

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2:00 PM Invited
CO2 Mineralization and Critical Battery Metals Recovery from Olivine and Nickel Laterites: *Fei Wang*[1]; David Dreisinger[1]; [1]The University of British Columbia

2:20 PM Invited
Decarbonization Pathways for an Aluminum Rolling Mill and Downstream Processes: *Alexander Wimmer*[1]; [1]Constantia Teich

2:40 PM
Rethinking the Decomposition of Refractory Lithium Aluminosilicates: Opportunities for Energy-efficient Li Recovery from LCT Pegmatites: *Joanne Gamage McEvoy*[1]; Yves Thibault[1]; Nail Zagrtdenov[1]; Dominique Duguay[1]; [1]Natural Resources Canada, CanmetMINING

3:00 PM Break

3:20 PM Invited
Energy-saving Green Technologies in the Mining and Mineral Processing Industry: *Shafiq Alam*[1]; [1]University of Saskatchewan

3:40 PM Invited
Extraction of Valuables Metals from Luanshya Copper Smelting Slag with Minimal Waste Generation: *Namiluko Yaki*[1]; Yotamu Hara[1]; Nachikonde Fumpa[1]; Agabu Shane[1]; Rainford Hara[1]; Makwenda Ngomba[1]; Ireen Musukwa[1]; Stephen Parirenyatwa[1]; Ronald Hara[1]; [1]Copperbelt University

4:00 PM
Carbon Footprint Assessment of Waste PCB Recycling Process through Black Copper Smelting Route in Australia: *Aulia Qisthi Mairizal*[1]; Agung Yoga Sembada[1]; Kwong Ming Tse[1]; Nawshad Haque[2]; M. Akbar Rhamdhani[1]; [1]Swinburne University of Technology; [2]CSIRO

4:20 PM
Screening High Entropy Alloys for Carbon Dioxide Reduction Reaction using Alchemical Perturbation Density Functional Theory: *Mohamed Hendy*[1]; Okan Orhan[1]; Homin Shin[2]; Ali Malek[3]; Mauricio Ponga[1]; [1]The University of British Columbia; [2]Security and Disruptive Technologies Research Centre, National Research Council Canada; [3]Energy, Mining and Environment Research, National Research Council Canada

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CORROSION

Environmental Degradation of Multiple Principal Component Materials — High Temperature Corrosion II

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

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; XiaoXiang Yu, Novelis Global Research Center; 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); Gerald Frankel, Ohio State University; ShinYoung Kang, Lawrence Livermore National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Monday PM | March 20, 2023
Sapphire 410A | Hilton

Session Chairs: Xiaoxiang Yu, Novelis Global Research Center; Bronislava Gorr, Karlsruhe Institut für Technologie

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2:00 PM Invited
High Temperature Oxidation of NbTiZr and HfNbTaTiZr RMPEAs: *Charlotte Brandenburg*[1]; David Beaudry[2]; Elaf Anber[2]; Jean-Philippe Couzinie[3]; Loic Perriere[3]; Mitra Taheri[2]; Elizabeth Opila[1]; [1]University of Virginia; [2]Johns Hopkins University; [3]ICMPE - Institut de Chimie et des Matériaux Paris-Est

2:20 PM
Hot Corrosion of TP347H in Coal Ash – an Electrochemical Noise Investigation: *Shanshan Hu*[1]; Xingbo Liu[1]; [1]West Virginia University

2:40 PM
Intermediate and High-Temperature Oxidation Behavior of an Equiatomic CrTaTi Alloy from 800°C to 1400°C: *Noah Welch*[1]; Maria Quintana[1]; Todd Butler[2]; Peter Collins[1]; [1]Iowa State University; [2]Air Force Research Laboratory, WPAFB

3:00 PM Invited
Limitations of Equiatomic Refractory High Entropy Alloys: Role of Reactive Elements in Al-containing HfNbTaTiZr: *Elaf Anber*[1]; David Beaudry[1]; Daniel Foley[1]; Lavina Backman[2]; Michael Waters[3]; Jean Phillippe Couzinie[4]; James Rondinelli[3]; Elizabeth Opila[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]university of virginia; [3]Northwestern University; [4]University Paris-Est Créteil (UPEC) - IUT

3:20 PM Break

3:35 PM Invited
Novel Refractory Metal-based High Entropy Silicide-Borides and their Oxidation at 1100°C: *Mathias Galetz*[1]; Anke Ulrich[1]; Georg Hasemann[2]; Manja Krüger[2]; [1]DECHEMA-Forschungsinstitut; [2]Universität Magdeburg

3:55 PM
On the High-temperature Oxidation of Complex Concentrated Alloys FeAlCrNi$_x$V$_y$: *Eliska Jaca*[1]; Peter Minarik[1]; Stanislav Daniš[1]; Jozef Veselý[1]; [1]Charles University

4:15 PM
Tailoring Oxidation Behavior of MPEAs Through Microstructural Modification: *Michael Pavel*[1]; Mark Weaver[1]; [1]University of Alabama Tuscaloosa

4:35 PM
Tuning of Hierarchical Oxide Evolution in NbTiZr-based RMPEAs: *David Beaudry*[1]; Michael Waters[2]; Charlotte Brandenburg[3]; Daniel Foley[1]; Elaf Anber[1]; Jean-Philippe Couzinie[4]; Loic Perriere[4]; Keith Knipling[5]; Benjamin Redemann[1]; Tyrel McQueen[1]; Elizabeth Opila[3]; James Rondinelli[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]Northwestern University; [3]University of Virginia; [4]Univ Paris Est Creteil, CNRS, ICMPE; [5]U.S. Naval Research Laboratory

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CORROSION

Environmentally Assisted Cracking: Theory and Practice — Hydrogen Embrittlement I

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

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies, Inc.; Jenifer Locke, Ohio State University

Monday PM | March 20, 2023
Sapphire 410B | Hilton

Session Chairs: Reiner Kirchheim, University of Goettingen; Dierk Raabe, Max-Planck Institute

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2:00 PM Invited
Hydrogen Affecting Defect Density and Mobility in Metals and Vice Versa: *Reiner Kirchheim*[1]; [1]University of Goettingen

2:30 PM
Some Recent Advances on Hydrogen Embrittlement in Martensitic Steels: From Diffusion and Trapping of Hydrogen to Mechanisms of Damage: *Abdelali Oudriss*[1];

Xavier Feaugas[1]; [1]Lasie Cnrs Umr 7356

2:50 PM
Effect of Hydrogen on the Yield Stress of Austenitic Stainless Steels: A Stress Orientation Dependent Contribution: *Fernando Leon-Cazares*[1]; Samuel Parry[1]; Brian Kagay[2]; Xiaowang Zhou[1]; Coleman Alleman[1]; Joseph Ronevich[1]; Chris San Marchi[1]; [1]Sandia National Laboratories; [2]MPA University of Stuttgart

3:10 PM
Understanding Hydrogen Embrittlement Effects on the Deformation Mechanisms in Developmental Austenitic Steels: *Quinten Yurek*[1]; Po-Cheng Kung[1]; Hoon Lee[2]; James Stubbins[3]; Brian Somerday[4]; Petros Sofronis[4]; Tsuchiyama Toshihiro[5]; Jessica Krogstad[1]; [1]Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign; [2]Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana-Champaign ; [3]Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana-Champaign; [4]Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign; [5]Department of Materials Science and Engineering, Kyushu University

3:30 PM Break

3:50 PM Invited
Atomic-scale Analysis of Hydrogen Embrittlement in High-strength Al Alloys: *Dierk Raabe*[1]; Huan Zhao[1]; Batiste Gault[1]; Tilmann Hickel[1]; Dirk Ponge[1]; Binhan Sun[1]; [1]Max-Planck Institute

4:20 PM
Mechanical Behavior of Wrought Aluminum in Hydrogen Environments: *Adam Freund*[1]; Kester Clarke[1]; Amy Clarke[1]; Suveen Mathaudhu[1]; [1]Colorado School of Mines

4:40 PM
The Impacts of Hydrogen on the Elasticity, Plasticity and Damage Mechanisms of Pure Nickel: *Abdelali Oudriss*[1]; Siva Pasad Murugan[1]; Yasmine Ben Jedidia[1]; Nadjib Iskounen[1]; Marie Landeiro Dos Reis[1]; Jamaa Bouhattate[1]; Xavier Feaugas[1]; [1]Lasie Cnrs Umr 7356

5:00 PM
A Combined Micromechanics/Materials Science Approach to Understanding High Temperature Hydrogen Attack: *Kshitij Vijayvargia*[1]; Mohsen Dadfarnia[2]; Petros Sofronis[1]; Masanobu Kubota[3]; Aleksandar Staykov[3]; Kentarou Wada[3]; John Pugh[4]; Tom Eason[5]; [1]University of Illinois Urbana-Champaign; [2]Seattle University; [3]International Institute for Carbon Neutral Energy Research; [4]Other; [5]BP Products North America

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MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Applications of Machine Learning and Data Science to Fatigue Studies

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

Monday PM | March 20, 2023
Sapphire H | Hilton

Session Chairs: Ashley Spear, University of Utah; Orion L. Kafka, National Institute of Standards and Technology

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2:00 PM Invited
Capturing Spatial Fields of Deformation ahead of Fatigue Cracks in Alloys Using Dictionary-based Data Reduction Strategies on In Situ High-energy X-ray Diffraction Data: *Kelly Nygren*[1]; Daniel Banco[2]; Akihide Nagao[3]; Shuai Wang[4]; Matthew Miller[1]; Eric Miller[2]; Darren Pagan[5]; [1]Cornell University; [2]Tufts University; [3]Air Liquide; [4]Southern University of Science and Technology; [5]Pennsylvania State University

2:30 PM
Using Computer Vision to Identify Crack Initiation and Link to Fatigue Life: *Katelyn Jones*[1]; Paul Shade[2]; Reji John[2]; William Musinski[2]; Elizabeth Holm[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Air Force Research Laboratory

2:50 PM
A Machine Learning Model to Predict Fatigue Progression Using 3D Topology Data of Materials Obtained from X-ray Microscope: *Gunjick Lee*[1]; Leslie Tiong[2]; Donghun Kim[2]; Seok Su Sohn[1]; [1]Korea University; [2]Korea Institute of Science and Technology

3:10 PM
Intelligent Data-guided Process Design for Fatigue-resistant Steel Components with Bainitic Microstructure (iBain): *Ingo Steinbach*[1]; [1]Ruhr-University Bochum

3:30 PM
Machine Learning Segmentation Methods for Fatigue Fracture Surface Defect Analyses: *Austin Ngo*[1]; David Scannapieco[1]; Oluwatumininu Adeeko[1]; Shuheng Zhang[1]; Shuyue Bian[1]; Collin Sharpe[1]; John Lewandowski[1]; [1]Case Western Reserve University

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MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Friction Stir Processing

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Monday PM | March 20, 2023
29A | SDCC

Session Chairs: Nilesh Kumar, University of Alabama, Tuscaloosa; Hrishikesh Das, Pacific Northwest National Laboratory

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2:00 PM
Enhanced Tensile and Tear Toughness Properties of Thin-wall Vacuum-assisted High-pressure Die-cast Aural-5 Alloy by Friction Stir Processing: *Avik Samanta*[1];

Hrishikesh Das[1]; Glenn Grant[1]; Saumyadeep Jana[1]; [1]Pacific Northwest National Laboratory

2:20 PM
Effect of Friction Stir Processing on the Microstructure and Mechanical Properties of Thick Al-6061 Alloy: *Amlan Kar*[1]; Eric Pickron[1]; Todd Curtis[1]; Bharat Jasthi[1]; Grant Crawford[1]; [1]Arbegast Materials Processing and Joining Laboratory (AMP),

2:40 PM
Effect of Microstructure on Mechanical Properties of Friction Stir Processed Al Alloy: *Rajashekara Sarvesha*[1]; David Garcia[2]; Richard Eberheim[3]; Kenneth Ross[2]; Arvind Agarwal[1]; Tanaji Paul[1]; [1]FIU College of Engineering and Computing; [2]Pacific Northwest National Laboratory; [3]Solvus Global

3:00 PM
Surface Alloying Due to WC Tool Wear during FSP and Its Effects on the Microstructure and Mechanical Properties of Topmost Steel Layer: *Hajime Yamamoto*[1]; Yudai Imagawa[1]; Yuji Yamamoto[1]; Kazuhiro Ito[1]; [1]Joining and Welding Research Institute, Osaka University

3:20 PM Break

3:40 PM
Graphite-Reinforced 6201 Aluminum Alloy Fabricated by In-situ Friction Stir Processing: Process, Microstructure and Mechanical/Electrical Properties: *Yijun Liu*[1]; Gaoqiang Chen[1]; Fangzheng Shi[1]; Mengran Zhou[1]; Shuai Zhang[1]; Gong Zhang[1]; Qingyu Shi[1]; [1]Tsinghua University

4:00 PM
Fabrication and Characterization of Mono and Hybrid Composites Using Friction Stir Processing with Soda-lime Glass and Polymer Reinforcements: Ankita Mohanty[1]; Nishkarsh Srivastava[1]; Mo Rizwan Qureshi[1]; *Amit Arora*[1]; [1]Indian Institute of Technology Gandhinagar

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MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — Peritectics & Eutectics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials Institute

Monday PM | March 20, 2023
28E | SDCC

Session Chairs: Julien Zollinger, University of Lorraine - IJL; Hani Henein, University of Alberta

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2:00 PM Invited
Phase-field Simulations of Peritectic Coupled Growth: *Mathis Plapp*[1]; [1]Ecole Polytechnique

2:30 PM Invited
About the Complexity of Using a 'Simple' Transparent Model Alloy to Study Peritectic Couple Growth in Microgravity: *Andreas Ludwig*[1]; Johann Mogeritsch[1]; [1]Montanuniversitaet Leoben

3:00 PM
Microstructure Evolution during Solidification of Fe-C-Mn-Si Peritectic Steels: *Olajide Akintayo*[1]; Muhammad Nabeel[1]; André Phillion[1]; [1]McMaster University

3:20 PM Break

3:40 PM Invited
Formation of Locked-lamellar Grains in a Slightly Hypereutectic Al-Al2Cu Alloy during Thin-sample Directional Solidification: *Sabine Bottin-Rousseau*[1]; Silvère Akamatsu[1]; Mehdi Medjkoune[2]; [1]Sorbonne University; [2]IM2NP

4:10 PM
Eutectic Growth Dynamics during Directional Solidification with Velocity Ramps: In-situ Investigations in Microgravity: Victor Witusiewicz[1]; Ulrike Hecht[1]; Sabine Bottin-Rousseau[2]; *Silvere Akamatsu*[3]; [1]Access e.V.; [2]Sorbonne University; [3]Cnrs

4:30 PM
Tomographic Analysis of Microstructure Evolution in Ternary Al-Cu-Ag Eutectic: *Amber Genau*[1]; Jessica Friess[1]; Philipp Rayling[1]; [1]University of Alabama at Birmingham

4:50 PM
Nanoscopic View of Irregular Eutectic Solidification: *Shanmukha Kiran Aramanda*[1]; Paul Chao[1]; Ashwin Shahani[1]; [1]University of Michigan

5:10 PM
Microstructural Evaluation of Containerless Solidification of Al-Ce Alloys: *Jonas Valloton*[1]; Akankshya Sahoo[1]; Marcelino da Silva Dias Filho[1]; Sven Vogel[2]; Hani Henein[1]; [1]University of Alberta; [2]Los Alamos National Laboratory

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NANOSTRUCTURED MATERIALS

Functional Nanomaterials 2023 — Session II

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

Program Organizers: Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Mostafa Bedewy, University of Pittsburgh; Woochul Lee, University of Hawaii at Mnoa; Changhong Cao, McGill University; Kiyo Fujimoto, Idaho National Laboratory; Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

Monday PM | March 20, 2023
Aqua 305 | Hilton

Session Chairs: Changhong Cao, McGill University; Michael Cai Wang, University of South Florida; Mostafa Bedewy, University of Pittsburgh

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2:00 PM Keynote
Mechanical Reliability of 2D Materials: *Tobin Filleter*[1]; [1]University of Toronto

2:40 PM Invited
Synthesis, Characterization and Molecular Simulation of Polymers Enhanced with Halloysite Nanotubes: *Ronald Miller*[1]; Rafaela Aguiar[2]; Oren Petel[1]; [1]Carleton University; [2]University of Toronto

3:10 PM Invited
Exploring Lubrication Mechanisms One Layer of Atoms at a Time: *Philip Egberts*[1]; Chaochen Xu[1]; Peng Gong[1]; Zahra Abooalizadeh[1]; Nicholas Chan[1]; [1]University of Calgary

3:40 PM Break

4:00 PM Keynote
Morphological Stability of Micro- and Nano-structures: *Carl Thompson*[1]; [1]Massachusetts Institute of Technology

5:00 PM Invited
Mechanical Insights into 2D Metal Halide Perovskite Structures: From Bulk Crystals to Molecular Sheets: *Qing Tu*[1]; [1]Texas A&M University

4:40 PM
Epitaxial Growth of Single Crystal Nanostructure Arrays through Thermomechanical Nanomolding: *Guannan Liu*[1]; Sungwoo Sohn[1]; Naijia Liu[1]; Arindam Raj[1]; Udo Schwarz[1]; Jan Schroers[1]; [1]Yale University

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CHARACTERIZATION

Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties — Heterostructured Materials II: Structure Design

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

Program Organizers: Yuntian Zhu, City University of Hong Kong; Kei Ameyama, Ritsumeikan University; Irene Beyerlein, University of California, Santa Barbara; Yuri Estrin, Monash University; Huajian Gao, Nanyang Technological University; Ke Lu, Institute of Metal Research; Suveen Mathaudhu, Colorado School of Mines; Xiaolei Wu, State Institute of Mechanics, Chinese Academy of Sciences

Monday PM | March 20, 2023
Aqua 314 | Hilton

Session Chairs: Kei Ameyama, Ritsumeikan University; Andrea Hodge, University of Southern California

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2:00 PM Invited
Design of Heterostructured High Entropy Alloys for Superior Mechanical Properties at Cryogenic-to-ambient Temperatures: Cheng Zhang[1]; *Enrique Lavernia*[1]; [1]University of California Irvine

2:30 PM Invited
Deformation Domains in Heterogeneous Nanostructured Inconel: *Andrea Hodge*[1]; [1]University of Southern California

3:00 PM
Application of Harmonic Structure Design to a CrMnFeCoNi High Entropy Alloy: *Kei Ameyama*[1]; Hiroshi Fujiwara[1]; [1]Ritsumeikan University

3:20 PM Break

3:40 PM
Multiscale and Hierarchical Laminated Steel Structures with Superior Strength-ductility Synergy via Additive Manufacturing: *Xipeng Tan*[1]; Shubham Chandra[2]; [1]National University of Singapore; [2]Nanyang Technological University

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ADVANCED MATERIALS

High Performance Steels — Novel Steels and Extreme Environments

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

Monday PM | March 20, 2023
Aqua F | Hilton

Session Chairs: Kester Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology

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2:00 PM Invited
Influence of N and Mn on Performance of Advanced Austenitic Stainless Steels: *Guocai Chai*[1]; [1]Alleima

2:30 PM
Nano-engineering of High Performance Steels: *Wenwen Song*[1]; [1]RWTH Aachen

2:50 PM
Low-density, Medium-Mn Steels: Influence of Al Content on Microstructure Related Properties: *Tomas Scuseria*[1]; Kelcey Garza[2]; Dean Pierce[3]; Jerry Arnold[2]; Amy Clarke[1]; Kester Clarke[1]; [1]Colorado School of Mines; [2]Cleveland-Cliffs; [3]Oak Ridge National Laboratory

3:10 PM
On the Development of High-strength High-damping Steels: A CALPHAD Assisted Alloy Design Study: *Julian Rackwitz*[1]; Cemal Tasan[1]; Gregory Olson[1]; [1]Massachusetts Institute of Technology

3:30 PM Break

3:50 PM
Very Strong High-entropy Steel Strengthened by Multiphase of Multiscale: *Yi-Hsuan Sun*[1]; Zen-Hao Lai[1]; Jui-Fan Tu[2]; Yu-Jen Tseng[1]; Hung-Wei Yen[1]; [1]National Taiwan University; [2]China Steel Corporation

4:10 PM
B2 Precipitation Strengthened Medium Mn Steel Processed by Intercitical Annealing and Aging: Jinyoung Kim[1]; *Jinkyung Kim*[1]; [1]Hanyang University

4:30 PM
Carbide Precipitation Strengthening Behaviour in an Additively Manufactured High-speed Steel with Unprecedented Strength: *Huayue Zhang*[1]; Hui Peng[2]; Hongbo Guo[2]; Stuart Robertson[3]; Paul Bagot[4]; Michael Moody[4]; Bo Chen[1]; [1]University of Leicester; [2]Beihang University; [3]Loughborough University; [4]University of Oxford

4:50 PM
Analysing the Corrosion of T91 in Liquid Lead-bismuth-Eutectic: *Minyi Zhang*[1]; Guanze He[1]; Mark Lapington[1]; Weiyue Zhou[2]; Michael Short[2]; Paul Bagot[1]; Felix Hofmann[1]; Michael Moody[1]; [1]University of Oxford; [2]Massachusetts Institute of Technology

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MECHANICS & STRUCTURAL RELIABILITY

High Temperature Creep Properties of Advanced Structural Materials — Creep Behavior of Steels and Multi-Principal Element Alloys

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

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Lab; Jeffery Gibeling, University of California, Davis

Monday PM | March 20, 2023
Sapphire P | Hilton

Session Chairs: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Laboratory; Jeffery Gibeling, University of California, Davis

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2:00 PM Introductory Comments

2:05 PM
Role of Cr Content on Creep-rupture Performance in Alumina-forming Austenitic Alloys: *Yukinori Yamamoto*[1]; Qing-Qiang Ren[1]; Michael Brady[1]; [1]Oak Ridge National Laboratory

2:25 PM
Creep Ratcheting of a HP+NbW (MA) Steam Methane Reformer Tube Alloy: *Mackenzie Caughey*[1]; Milo Kral[1]; [1]University of Canterbury

2:45 PM Invited
Creep Behaviors of High-entropy Alloys: Lia Amalia[1]; Di Xie[1]; Shuying Chen[1]; Weidong Li[1]; Dongyue Li[2]; Yong Zhang[2]; Chelsey Hargather[3]; Yanfei Gao[1]; *Peter Liaw*[1]; [1]University of Tennessee; [2]University of Science and Technology Beijing; [3]New Mexico Institute of Mining and Technology

3:15 PM
Mechanisms of Creep in Additively Manufactured NiCoCr and ODS-NiCoCr Multi-principal Element Alloys: *Gianmarco Sahragard-Monfared*[1]; Mingwei Zhang[2]; Timothy Smith[3]; Easo George[4]; Jeffery Gibeling[1]; [1]University of California, Davis; [2]Lawrence Berkeley National Laboratory; [3]NASA Glenn Research Center; [4]The University of Tennessee, Knoxville

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MATERIALS PROCESSING

High Temperature Electrochemistry V — Session II

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

Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National

Laboratory); Guy Fredrickson, Idaho National Laboratory

Monday PM | March 20, 2023
28B | SDCC

Session Chair: Hojong Kim, Pennsylvania State University

2:00 PM Introductory Comments

2:05 PM Invited
Relative Performance of Platinum, Iridium, and Ruthenium as Oxygen-Evolving Anodes during the Electrolytic Reduction of Uranium Oxide in Molten LiCl-Li2O: *Steven Herrmann*[1]; Prabhat Tripathy[1]; James King[1]; Guoping Cao[1]; Kevin Tolman[1]; [1]Idaho National Laboratory

2:45 PM
Evaluating the Electrochemical Recovery of Gd Using a Reactive Liquid Bi Electrode: *Stephanie Castro Baldivieso*[1]; Sanghyeok Im[1]; Nathan Smith[1]; Hojong Kim[1]; [1]Pennsylvania State University

3:05 PM
Cyclic Voltammetry for Real-time Oxide Ion Concentration Measurements of a Molten CaCl2: *Forest Felling*[1]; Olivia Dale[1]; Mario Gonzalez[1]; Michael Simpson[1]; [1]University of Utah

3:25 PM
Electrochemical Behavior of Bismuth in molten LiCl-KCl-CaCl2: *Greg Chipman*[1]; Bryant Johnson[1]; Devin Rappleye[1]; [1]Brigham Young University

3:45 PM Break

4:05 PM
Electrochemical Properties of Ca-Sb Metal Battery with a Molten Chloride Electrolyte: *Peyman Asghari-Rad*[1]; Sanghyeok Im[1]; Kelly Elizabeth Varnell[1]; Hojong Kim[1]; [1]Pennsylvania State University

4:25 PM
Numerical Modelling and Phase Field Modelling of Silicon Electrodeposition for Solar Cells at High Temperatures using Molten Salts: *Aditya Moudgal*[1]; Tyler Melo[1]; Alexander Alonzo[1]; Andrew Charlebois[1]; Evan Costa[1]; Peter Catalino[1]; Adam Powell[1]; Yu Zhong[1]; Uday Pal[2]; [1]Worcester Polytechnic Institute; [2]Boston University

4:45 PM
Evaluating the Effects of Mixed Cation Molten Salt Electrolytes within the Li-Sb-Sn Liquid Metal Battery System: *Kelly Varnell*[1]; Sanghyeok Im[1]; Peyman Asghari-Rad[1]; Hojong Kim[1]; [1]Pennsylvania State University

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MATERIALS DESIGN

Hume-Rothery Symposium on First-Principles Materials Design — Interface First-principle Method with the Discovery of Energy Materials

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

Program Organizers: Bin Ouyang, Florida State University; Mark Asta, University of California, Berkeley; Geoffroy Hautier, Dartmouth College; Wei Xiong, University of Pittsburgh; Anton Van der Ven, University of California, Santa

Barbara

Monday PM | March 20, 2023
Cobalt 501C | Hilton

Session Chairs: Pieremanuele Canepa, National University of Singapore; Bin Ouyang, Florida State University

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2:00 PM Invited
Disorder and Degradation in Rock-salt-type Lithium-ion Battery Cathodes: *Alexander Urban*[1]; [1]Columbia University

2:30 PM Invited
First Principle Design of High Entropy Materials for Energy Storage and Conversion: *Bin Ouyang*[1]; Gerbrand Ceder[2]; [1]Florida State University; [2]University of California Berkeley

3:00 PM Invited
Computational Materials Design and Discovery for Next-generation Solid-state Batteries: *Yan Wang*[1]; [1]Samsung Semiconductor, Inc.

3:30 PM Break

3:50 PM Invited
Millisecond-ion Transport in Mixed Polyanion in Energy Materials: Zeyu Deng[1]; Tara Mishra[1]; Eunike Mahayoni[2]; Jean-Noel Chotard[2]; Vincent Seznec[2]; Christian Masquelier[2]; Gopalakrishnan Sai Gautam[3]; *Pieremanuele Canepa*[1]; [1]National University of Singapore; [2]Laboratoire de Réactivité et de Chimie des Solides; [3]Indian Institute of Science

4:20 PM Invited
Understanding Complex Materials and Interfaces through Molecular Dynamics Simulations: *Yifei Mo*[1]; [1]University of Maryland, College Park

4:50 PM Invited
Matterverse.ai - A Graph Deep Learning Database of Materials Properties: *Shyue Ping Ong*[1]; Chi Chen[1]; [1]University of California-San Diego

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LIGHT METALS

Light Metals Subject Awards Presentation — Light Metals Subject Awards Presentation

Sponsored by: TMS: Aluminum Committee

Program Organizer: Stephan Broek, Kensington Technology Inc.

Monday PM | March 20, 2023
30E | SDCC

1:45 PM Awards Presentation: Please join us as we recognize the award recipients of the TMS Light Metals Subject Best Papers from TMS2022.

CORROSION

Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion — Session II

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

Program Organizers: Penghui Cao, University of California, Irvine; Yang Yang, Pennsylvania State University; Fadi Abdeljawad, Clemson University; Irene Beyerlein, University of California, Santa Barbara; Enrique Lavernia, University of California, Irvine; Robert Ritchie, University of California, Berkeley

Monday PM | March 20, 2023
Sapphire 411A | Hilton

Session Chairs: Irene Beyerlein, University of California, Santa Barbara; Yang Yang, The Pennsylvania State University; Robert Ritchie, University of California, Berkeley; Penghui Cao, University of California, Irvine

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2:00 PM Invited
Multi-scale Investigation of Chemical Short-range Order and Dislocation Glide in the MoNbTi and TaNbTi Refractory Multi-principal Element Alloys: *Shyue Ping Ong*[1]; Hui Zheng[1]; Lauren Fey[2]; Xiang-Guo Li[1]; Yong-Jie Hu[3]; Liang Qi[4]; Shuozhi Xu[2]; Irene Beyerlein[2]; [1]University of California, San Diego; [2]University of California, Santa Barbara; [3]Drexel University; [4]University of Michigan, Ann Arbor

2:30 PM
Symmetry Considerations for Ordering in High-entropy Alloys
: *Flynn Walsh*[1]; Robert Ritchie[1]; Mark Asta[1]; [1]Lawrence Berkeley National Laboratory

2:50 PM
Short Range Order Prediction in High Throughput from First Principles: A Descriptor-based Screening Process: *Nathan Smith*[1]; Chris Wolverton[1]; [1]Northwestern University

3:10 PM Invited
Strengthening Mechanisms In Refractory High Entropy Alloys Based on Athermal Atomic-sized Dislocation Imperfections: *Jaime Marian*[1]; [1]University of California, Los Angeles

3:40 PM Break

3:55 PM Invited
Local and Short-range Chemical Order in High/Medium Entropy Alloys: *Evan Ma*[1]; [1]Xi'an Jiaotong University, China

4:25 PM
Computational and Characterization Methods to Quantify Chemical Ordering in Compositionally Complex Alloys: *Annie Barnett*[1]; Daniel Foley[1]; Elaf Anber[1]; Yevgeny Shlafstein[1]; Alejandro Perez[2]; Partha Das[2]; Douglas Spearot[3]; Irene Beyerlein[4]; Michael Falk[1]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]NanoMEGAS SPRL; [3]University of Florida; [4]University of California Santa Barbara

4:45 PM
Observation of Fe and Mn Chemical Ordering in High Mn Steels by Neutron Diffraction: *Lawrence Cho*[1]; Pawan Kathayat[1]; Yuran Kong[1]; John Speer[1]; Kip Findley[1]; Donald Brown[2]; Bjorn Clausen[2]; Sven Vogel[2]; Samantha Lawrence[2]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory

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LIGHT METALS

Magnesium Technology 2023 — Microstructure Evolution

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

Program Organizers: Steven Barela, Terves, Inc; Aeriel Murphy-Leonard, Ohio State University; Petra Maier, University of Applied Sciences Stralsund; Neale Neelameggham, IND LLC; Suveen Mathaudhu, Colorado School of Mines; Victoria Miller, University of Florida

Monday PM | March 20, 2023
30C | SDCC

Session Chairs: Benjamin Anthony, University of Florida; Kiran Solanki, Arizona State University

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2:00 PM
Effects of Ca and Zn Additions on the Static Recrystallization Kinetics and Texture Evolution in Wrought Magnesium Alloys: *Tracy Berman*[1]; John Allison[1]; [1]University of Michigan

2:20 PM
A Theoretical Model for Predicting Stacking Fault Energies of Ternary Magnesium Alloys Based on High-throughput Calculation and Machine Learning: *Qiwen Qiu*[1]; Jun Song[1]; [1]McGill University

2:40 PM
Precipitation Behavior in Low-alloyed Mg-Ca-Zn Alloys: *Zehao Li*[1]; Taisuke Sasaki[1]; Du Cheng[2]; Kang Wang[2]; Bi-cheng Zhou[2]; Akira Uedono[3]; Tadakatsu Ohkubo[1]; Kazuhiro Hono[1]; [1]National Institute for Materials Science; [2]University of Virginia; [3]University of Tsukuba

3:00 PM
Multiscale, Multimodal Characterization of Recrystallized and Non-recrystallized Grains during Recrystallization in a Hot-compressed Mg-3.2Zn-0.1Ca wt.% Alloy: *Sangwon Lee*[1]; Ashley Bucsek[1]; Tracy Berman[1]; Can Yildirim[2]; Carsten Detlefs[2]; John Allison[1]; [1]University of Michigan; [2]European Synchrotron Radiation Facility

3:20 PM Break

3:40 PM Invited
Combined Effect of Alloying and Grain Size on the Deformation Behavior of Magnesium Alloys: *Mariyappan Arul Kumar*[1]; [1]Los Alamos National Laboratory

4:00 PM
Quantifying the Role of Coarse Intermetallic Particles on Twinning Behavior: *Benjamin Anthony*[1]; Victoria Miller[1]; [1]University of Florida

4:20 PM
Optimization of the Microstructure and Performance of Aluminum Alloy Cold Spray Coatings on Magnesium Alloys: *Sridhar Niverty*[1]; Rajib Kalsar[1]; Anthony Naccarelli[2]; Timothy Eden[2]; Glenn Grant[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory; [2]Pennsylvania State University

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CHARACTERIZATION

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

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

Shaping and Forming Committee

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

Monday PM | March 20, 2023
Aqua 309 | Hilton

Session Chairs: Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory

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2:00 PM Invited
Predicting Strength and Ductility of Multi-directionally Deformed Steel Plate: a Coupled Distortional Hardening and Continuum Damage Mechanics: *Myoung-Gyu Lee*[1]; Seonghwan Choi[1]; Soo-Chang Kang[2]; [1]Seoul National University; [2]POSCO

2:30 PM Invited
Simplifying Complex Loading for Training Advanced Constitutive Models: Treating Sheet Metal Like It's Not 2D
: *Zachary Brunson*[1]; Aaron Stebner[1]; [1]Georgia Institute of Technology

3:00 PM
A Novel Anisotropic Continuum Damage Evolution Model Coupled with Anisotropic Hardening under Non-proportional Deformation Paths: *Seonghwan Choi*[1]; Soo-Chang Kang[2]; Myoung-Gyu Lee[1]; [1]Seoul National University; [2]Steel Solution Research Lab, POSCO

3:20 PM
Determination of Optimum Tension-compression Loops/Cycles for Estimating Yoshida-Uemori Constitutive Model Parameters for Advanced Lightweighting Materials: *Dilip Banerjee*[1]; William Luecke[1]; Mark Iadicola[1]; Evan Rust[1]; [1]National Institute of Standards and Technology

3:40 PM Break

4:00 PM Invited
Characterization of Commercially Pure Titanium Twinning under Proportional Loading Paths: *Jinjin Ha*[1]; Abrar Ebrahim[1]; Jinjae Kim[1]; Brad Kinsey[1]; [1]University of New Hampshire

4:30 PM
Anisotropic Behaviour and Deformation Mechanism of Ti407 Sheets with Reduced Al Content: *Saeed Tamimi*[1]; Giri Sivaswamy[1]; Tabassam Yasmeen[1]; Salah Rahimi[1]; [1]AFRC- University of Strathclyde

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NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Corrosion and Speciation

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

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

Monday PM | March 20, 2023

27A | SDCC

Session Chair: Nathaniel Hoyt, Argonne National Laboratory

2:00 PM Invited
Flibe Chemistry Control for Fluoride Salt-Cooled High-Temperature Reactors: *Francesco Carotti*[1]; Augustus Merwin[1]; Kaitlin Johnson[1]; Sam Mossadeghian[1]; Jacob McMurray[1]; Michael Hanson[1]; Alan Kruizenga[1]; [1]Kairos Power

2:30 PM
Fundamental Aspects of Chromium Corrosion in Molten Fluoride Salts: *Ho Lun Chan*[1]; Elena Romanovskaia[1]; Minsung Hong[2]; Valentin Romanovski[1]; Peter Hosemann[2]; John Scully[1]; [1]University of Virginia; [2]University of California Berkeley

2:50 PM
Thermodynamics and Kinetics of Extrinsic Corrosion Impurities in Molten Salts: *Jicheng Guo*[1]; Amber Polke[1]; Timothy Lichtenstein[1]; Sumit Bhattacharya[1]; Nathaniel Hoyt[1]; [1]Argonne National Laboratory

3:10 PM
Modeling the Evolution of Structural Alloy Microstructure Due to Molten Salt Corrosion: *Chaitanya Bhave*[1]; Michael Tonks[1]; Kumar Sridharan[2]; Adrien Couet[2]; [1]University of Florida; [2]University of Wisconsin-Madison

3:30 PM Break

3:50 PM
Exploring the Effect of Radiation and Temperature on the Local Structure of Metal Ions in Molten Salt Environments using X-ray Absorption Spectroscopy: *Nirmalendu Patra*[1]; Kazuhiro Iwamatsu[1]; Mehmet Topsakal[1]; Alejandro Ballesteros[2]; Ruchi Gakhar[3]; Michael Woods[3]; Simon Pimblott[3]; Jay LaVerne[2]; James Wishart[1]; Anatoly Frenkel[4]; Simerjeet Gill[1]; [1]Brookhaven National Laboratory; [2]University of Notre Dame; [3]Idaho National Laboratory; [4]Stony Brook University

4:10 PM
High Temperature X-ray Scattering and MD Simulation of Molten Fluoride Salts: *Anubhav Wadehra*[1]; Yifan Zhang[2]; Haoxuan Yan[1]; Alexander Levy[1]; Jicheng Guo[3]; Daniel Olds[4]; Karl Ludwig[1]; Uday Pal[1]; Yu Zhong[2]; Adam Powell[2]; [1]Boston University; [2]Worcester Polytechnic Institute; [3]Argonne National Laboratory; [4]Brookhaven National Laboratory

4:30 PM
Operando Synchrotron X-ray Nano-tomography and Multimodal Studies on the Evolution of Metals in Molten Chloride Salts: *Yu-chen Karen Chen-Wiegart*[1]; [1]Stony Brook University / Brookhaven National Laboratory

4:50 PM
Evaluation of the Lanthanide Electrolytic Extraction on Li-Bi Liquid in Molten Fluorides: *Pierre Chamelot*[1]; Mathieu Gibilaro[1]; Laurent Massot[1]; [1]Laboratoire de Génie Chimique UMR5503

5:10 PM
Keep It Lewis-Basic: Stability of NaSICON Separators in $AlCl_3$-NaI Catholytes for Molten Sodium Batteries: *Adam Maraschky*[1]; Melissa Meyerson[1]; Stephen Percival[1]; Amanda Peretti[1]; Erik Spoerke[1]; Leo Small[1]; [1]Sandia National Laboratories

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MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — CALPHAD

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

Monday PM | March 20, 2023
Sapphire L | Hilton

Session Chair: Richard Otis, NASA Jet Propulsion Laboratory

2:00 PM Invited
Computational Design of Engineering Materials: Tools and Applications: *Rainer Schmid-Fetzer*[1]; Yong Du[2]; Jincheng Wang[3]; Shuhong Liu[2]; Jianchuan Wang[2]; [1]Clausthal University of Technology; [2]Central South University; [3]Northwestern Polytechnic University

2:30 PM Invited
Rapidly Generating Calphad Databases with High-throughput First-principles Calculations: *Brandon Bocklund*[1]; Aurélien Perron[1]; [1]Lawrence Livermore National Laboratory

3:00 PM Invited
CALPHAD Supported by Advanced Materials Analytics: *Hans Seifert*[1]; [1]Karlsruhe Institute of Technology

3:30 PM Break

3:50 PM Invited
A New Modeling Approach for Co-base Superalloys: *Ursula Kattner*[1]; Júlio Pereira dos Santos[2]; Chuan Liu[2]; Sean Griesemer[3]; Peisheng Wang[4]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology; [2]CHiMaD; [3]Northwestern University; [4]Central South University

4:20 PM Invited
Thermochemical and Thermophysical Properties of Metal Diborides (MB2 | M = Ti, Zr, Nb, Hf, Ta) up to 3150 C: *Scott Mccormack*[1]; Stuart Ness[1]; Fox Thrope[1]; Elizabeth Sobalvarro[2]; James Cahil[2]; Gabrella King[2]; Wyatt Du Frane[2]; Joshua Kuntz[2]; [1]University of California, Davis; [2]Lawrence Livermore National Laboratory

4:50PM Invited
Applications of the CALPHAD Approach to Nuclear Materials Design: *Chao Jiang*[1]; [1]Idaho National Laboratory

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MATERIALS PROCESSING

Materials Processing Fundamentals — Process Optimization

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus Consulting; Alexandra

Anderson, Gopher Resource; Adrian Sabau, Oak Ridge National Laboratory

Monday PM | March 20, 2023
25B | SDCC

Session Chair: Samuel Wagstaff, Oculatus Consulting

2:00 PM Introductory Comments

2:05 PM
Magnetohydrodynamics Computational Framework for Submerged Arc Furnace: A Review: *Yonatan Afework Tesfahunegn*[1]; Pascal Bayrasy[2]; Hákon Haraldsson[1]; Thordur Magnusson[3]; Merete Tangstad[4]; Gudrun Saevarsdottir[1]; [1]Reykjavik University; [2]Fraunhofer Institute for Algorithms and Scientific Computing SCAI; [3]Stakksberg ehf; [4]Norwegian University of Science and Technology

2:25 PM
Modeling of Macro-scale Reaction Effects in a Secondary Lead Reverberatory Furnace: *Nicholas Walla*[1]; Emily Higley[1]; Armin Silaen[1]; Alexandra Anderson[2]; Joseph Grogan[2]; Chenn Zhou[1]; [1]Purdue University Northwest; [2]Gopher Resource

2:45 PM
A Study on Behavior of Post Combustion in 2-Ton Converter Simulator: *Jia Lee*[1]; Jeong Whan Han[1]; [1]Inha University

3:05 PM
PostProcessingApproachtoModelMicrosilicaFormation:*KurianJ.Vachaparambil*[1]; Kristian Etienne Einarsrud[2]; Stefan Andersson[1]; Halvor Dalaker[1]; [1]SINTEF Industry; [2]Norwegian University of Science and Technology (NTNU)

3:25 PM Break

3:45 PM
Comparative Statistical Analysis of Gold Processing Plant Recovery Data: Martin Beyuo[1]; *Eric Agorhom*[1]; Ishmael Quaicoe[1]; Clement Owusu[1]; [1]University of Mines and Technology

4:05 PM
Correlation Between Edge Failure and Edge Geometry of Advanced High-Strength Steels Using the Image Processing: *Kyucheol Jeong*[1]; Yuhyeong Jeong[1]; Gisuk Chung[2]; Jaewook Lee[2]; Jonghun Yoon[1]; [1]Hanyang University; [2]POSCO Global R&D Center

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Ferritic Alloys II

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

Monday PM | March 20, 2023
28D | SDCC

Session Chairs: Clarissa Yablinsky, LANL; Osman Anderoglu, University of New Mexico

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2:00 PM Invited
Evaluating ATF Cladding Mechanical Behavior: *Benjamin Eftink*[1]; Peter Beck[1]; Nan Li[1]; Cheng Liu[1]; Mathew Hayne[1]; Hyosim Kim[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

2:30 PM
Mechanical and Microstructural Characterization of Neutron Irradiated HT-9 Heats at LWR and Fast Reactor Relevant Temperatures: *Ramprashad Prabhakaran*[1]; Indrajit Charit[2]; Dan Edwards[1]; Mychailo Toloczko[1]; Stuart Maloy[1]; Kumar Sridharan[3]; [1]Pacific Northwest National Laboratory; [2]University of Idaho; [3]University of Wisconsin-Madison

2:50 PM
The Origin of Superior IASCC Resistance of Additively Manufactured 316L Stainless Steel after Hot Isostatic Pressing in Oxygenated BWR Water: *Jingfan Yang*[1]; Laura Hawkins[2]; Lingfeng He[2]; Miao Song[3]; Yu Lu[4]; Gary Was[3]; Xiaoyuan Lou[1]; [1]Purdue University; [2]Idaho National Laboratory; [3]University of Michigan—Ann Arbor; [4]Boise State University

3:10 PM
Musings on Advanced Cladding Qualification: *Tarik Saleh*[1]; [1]Los Alamos National Laboratory

3:30 PM Break

3:50 PM
High Throughput Nanoindentation Creep Testing in Nuclear Reactor Steels: *Moujhuri Sau*[1]; Eric Hintsala[2]; Douglas Stauffer[2]; Laurent Capolungo[3]; Nathan Mara[1]; [1]University of Minnesota; [2]Bruker Nano Inc.; [3]Los Alamos National Laboratory

4:10 PM
Deformation Characteristics of Additively Manufactured 316L Stainless Steels after Neutron Irradiation: *Thak Sang Byun*[1]; Maxim Gussev[1]; Timothy Lach[1]; Annabelle Le Coq[1]; Kory Linton[1]; [1]Oak Ridge National Laboratory

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BIOMATERIALS

Mechanics and Physiological Adaptation of Hard and Soft Biomaterials and Biological Tissues — Bone Mineralization & Hard Tissue Mechanics

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

Program Organizers: Bernd Gludovatz, UNSW Sydney; Elizabeth Zimmermann, McGill University; Steven Naleway, University of Utah

Monday PM | March 20, 2023
Sapphire 400B | Hilton

Session Chairs: Bernd Gludovatz, UNSW Sydney; Elizabeth Zimmermann, McGill University

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2:00 PM Invited
Bone Quality and Mineralization from Vibrational Spectroscopy: *Eve Donnelly*[1]; [1]Cornell University

2:30 PM Invited
Multi-scale Characterization of Ear Bone Mechanics: *Alessandra Carriero*[1]; [1]The City College of New York

3:00 PM Invited
Mineral Ellipsoids and Nanochannel Structures in Bone: *Tengteng (Toni) Tang*[1]; Alyssa Williams[1]; Chiara Micheletti[1]; Mike Phaneuf[2]; Nabil Bassim[1]; Aurelien Gourrier[3]; Kathryn Grandfield[1]; [1]McMaster University; [2]Fibics Inc.; [3]Université Grenoble Alpes

3:30 PM Break

3:50 PM Keynote
Learning from Nature - How Biological Hard Tissues Cope with Stress: *Rizhi Wang*[1]; [1]University of British Columbia

4:30 PM
Impact of Test Environment on the Fracture Resistance of Cortical Bone: *Bernd Gludovatz*[1]; Mihee Shin[1]; Min Zhang[1]; Annika vom Scheidt[2]; Matthew Pelletier[1]; William Walsh[1]; Penny Martens[1]; Jamie Kruzic[1]; Björn Busse[2]; [1]UNSW Sydney; [2]University Medical Center Hamburg

4:50 PM
Mimicking the Structure and Properties of Bone with Freeze Casting: *Steven Naleway*[1]; Tony Yin[1]; Josh Fernquist[1]; Debora Lyn Porter[1]; Maddie Schmitz[1]; Elise Hotz[1]; [1]University of Utah

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NUCLEAR MATERIALS

Methods, Techniques, and Materials Discovery of Irradiation Effect Using In-situ Microscopy — In-situ Observation of Material Response under Extreme Environments

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

Program Organizers: Wei-Ying Chen, Argonne National Laboratory; Xuan Zhang, Argonne National Laboratory; Kevin Field, University of Michigan; Donald Brown, Los Alamos National Laboratory; Aida Amroussia, GE Global Research

Monday PM | March 20, 2023
25A | SDCC

Session Chair: Donald Brown, LANL

2:00 PM Invited
Evolution of Vacancy/Interstitial Dislocation Loops in Pure Zr and Ti at Elevated Temperatures Observed by In-situ TEM Annealing: *Fei Long*[1]; Matthew Topping[1]; Zhongwen Yao[1]; Malcolm Griffiths[1]; Mark Daymond[1]; [1]Queens University

2:30 PM Invited
Industrial Nuclear Materials Applications for In-situ Microscopy: *Andrew Hoffman*[1]; Rajnikant Umretiya[1]; Nathan Almirall[1]; Raul Rebak[1]; [1]GE Research

3:00 PM
Transient Grating Spectroscopy of Defect Annealing Kinetics and Microstructural Evolution in Self-ion Implanted Tungsten with In-situ Annealing: *Mohamed Abdallah Reza*[1]; Kenichiro Mizohata[2]; Cody Dennett[3]; Guanze He[1]; Hongbing Yu[4]; Felix Hofmann[1]; [1]University Of Oxford; [2]University of Helsinki; [3]Massachusetts Institute of Technology; [4]Canadian Nuclear Laboratories

3:20 PM Break

3:40 PM Invited
Simultaneous Proton Irradiation Changes Molten Fluoride Salt Corrosion Rates and Mechanisms: *Weiyue Zhou*[1]; Nouf AlMousa[2]; Yang Yang[3]; Kevin Woller[1]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Princess Nourah Bint Abdulrahman University; [3]Pennsylvania State University

4:10 PM Invited
Is a TEM Foil "Bulk Enough" to Study the Parabolic Air-ingress Oxidation of W PFM in In-situ Environmental TEM?: Bharath Krupa Mekala[1]; Rajat Sainju[1]; Lichun Zhang[1]; *Yuanyuan Zhu*[1]; [1]University of Connecticut

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NUCLEAR MATERIALS

Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-cladding Interface — Uranium Dioxide Fuels II

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

Program Organizers: Yi Xie, Purdue University; Miaomiao Jin, Pennsylvania State University; Jason Harp, Oak Ridge National Laboratory; Fabiola Cappia, Idaho National Laboratory; Jennifer Watkins, Idaho National Laboratory; Michael Tonks, University of Florida

Monday PM | March 20, 2023
26B | SDCC

Session Chair: Mia Jin, Pennsylvania State University

2:00 PM Introductory Comments

2:05 PM Invited
Multiphysics Modeling of Nuclear Fuels at the Mesoscale: *Karim Ahmed*[1]; [1]Texas A&M University

2:30 PM
Comparing the Impact of Thermal Stresses and Bubble Pressure on Intergranular Fracture in UO2 Using 2D Phase Field Fracture Simulations: Shuaifang Zhang[1]; Wen Jiang[2]; Kyle Gamble[2]; *Michael Tonks*[3]; [1]Oak Ridge National Laboratory; [2]Idaho National Laboratory; [3]University of Florida

2:50 PM
Extended Defect Coalescence in Kr Irradiated UO2 During High Temperature Annealing: *Joshua Ferrigno*[1]; Chang-Yu Hung[2]; Lingfeng He[3]; Marat Khafizov[1]; [1]The Ohio State University; [2]Johns Hopkins University; [3]Idaho National Laboratory

3:10 PM
Modeling Stoichiometry Controlled Defect Dependent Densification in $UO_{2\pm x}$: *Brandon Battas*[1]; Michael Cooper[2]; Michael Tonks[1]; [1]University of Florida; [2]Los Alamos National Laboratory

3:30 PM Break

3:45 PM
Modeling Fission Gas Release Behavior from Microcracking and Thermal Diffusion at High Burnup in UO2 Fuel in BISON: *Oliver Baldwin*[1]; Walter Brinkley[1];

Jonathan Norman[1]; Nathan Capps[2]; Brian Wirth[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

4:05 PM
Uncertainty Quantification of Thermal Performance of UO2 Fuel Pellets: *Robert Annewandter*[1]; [1]Nuclear Futures Institute

4:25 PM
Atomistically-informed Cluster Dynamics Modelling of Defect Evolution in Irradiated ThO2: *Sanjoy Mazumder*[1]; Maniesha Singh[1]; Tomohisa Kumagai[1]; Anter El-Azab[1]; [1]Purdue University

4:45 PM
Modeling Low-temperature Hydrided Zircaloy Cladding Failure Under a Reactivity-initiated Accident: Katheren Nantes[1]; *Miaomiao Jin*[1]; Arthur Motta[1]; [1]Pennsylvania State University

5:05 PM
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]; Ji-Cheng Zhao[1]; [1]University of Maryland

5:25 PM
Molecular Dynamics Study of the Anisotropic Elastic Response of Defects in Alpha-Uranium: *Yuhao Wang*[1]; Benjamin Beeler[2]; Andrea Jokisaari[3]; [1]University of Michigan; [2]North Carolina State University; [3]Idaho National Laboratory

NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Metals in High Temperature Environments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Monday PM | March 20, 2023
Aqua 303 | Hilton

Session Chair: Nan Li, Los Alamos National Laboratory

2:00 PM Invited
Interface Mediated Strain at High Temperatures: *Shen Dillon*[1]; [1]University of California, Irvine

2:25 PM Invited
Can Engineered Nanostructures Enhance the Performance of Tungsten for Extreme Environments?: *Jason Trelewicz*[1]; [1]Stony Brook University

2:50 PM
Uncovering the Transition from Helium Clustering to Bimodal Cavity Distributions in Tungsten: *Cormac Killeen*[1]; Yang Zhang[1]; David Sprouster[1]; Jason Trelewicz[1]; [1]Stony Brook University

3:10 PM
Microstructural Evolution of Refractory-based Nanomultilayers at Elevated Temperatures: *Kyle Russell*[1]; Andrea Hodge[1]; [1]University of Southern California

3:30 PM Break

3:50 PM Invited
Nanostructured Metals with Dispersed Nanoparticles: Xiaochun Li[1]; *Enrique Lavernia*[2]; Diran Apelian[2]; Julie Schoenung[2]; [1]University of California, Los Angeles; [2]University of California, Irvine

4:15 PM Invited
Nb Solubility in Cu Grain Boundaries: *Emmeline Sheu*[1]; Jon Baldwin[2]; Darrick Williams[2]; Michael Demkowicz[1]; [1]Texas A&M University; [2]Los Alamos National Laboratory

4:40 PM
High-temperature Evolution of Nano-structured High-entropy Alloys and Stainless Steel as Studied by In-situ Neutron and Synchrotron X-ray Diffraction: *Klaus-Dieter Liss*[1]; Xiaojing Liu[1]; Jae-Kyung Han[2]; Yusuke Onuki[3]; Malte Blankenburg[4]; Megumi Kawasaki[2]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT); [2]Oregon State University; [3]Ibaraki University; [4]Deutsches Elektronen-Synchrotron (DESY)

5:00 PM
Multicomponent Nanostructured Al-based High-performance Alloys for Elevated Temperature Structural Applications: *Gourav Mundhra*[1]; Hsin-Chieh Chao[2]; Ya-Jing Lee[3]; Jien-Wei Yeh[3]; B. S. Murty[4]; [1]Indian Institute of Technology, National Tsing Hua University; [2]MSS Corps. Co. LTD.; [3]National Tsing Hua University; [4]Indian Institute of Technology

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CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Amorphous and Magnetic Materials

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

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

Monday PM | March 20, 2023
Aqua 311B | Hilton

Session Chair: Michael Manley, Oak Ridge National Laboratory

2:00 PM Invited
High-frequency Transverse Phonons in Metallic Glasses: Xiyang Li[1]; Huaping Zhang[2]; Si Lan[3]; Doug Abernathy[4]; Maozhi Li[2]; *Xun-li Wang*[1]; [1]City University of Hong Kong; [2]Remin University; [3]Nanjing University of Science and Technology; [4]Oak Ridge National Laboratory

2:30 PM Invited
In Situ Inelastic Neutron Scattering Measurements of Glassy Liquids: *Hillary Smith*[1]; Marios Demetriou[2]; Brent Fultz[3]; [1]Swarthmore College; [2]Glassimetal; [3]Caltech

3:00 PM
Inelastic Neutron Scattering Across the Melt: the Role of Vibrational Entropy in Latent Heat: *Camille Bernal-Choban*[1]; Claire Saunders[1]; Yang Shen[1]; Stefan Haegeli Lohaus[1]; Vladimir Ladygin[1]; Shiva Mudide[1]; Douglas Abernathy[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Oak Ridge National Laboratory

3:20 PM
X-ray Free-electron Laser Heating of Water at Picosecond Time Scale: *Eva Zarkadoula*[1]; Yuya Shinohara[1]; Takeshi Egami[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee / Oak Ridge National Laboratory

3:40 PM Break

3:55 PM
Use of Neutron and X-ray Total Scattering to Map Short-range Order and Improve Nucleation Modelling in Engineering Materials: *Monika Rolinska*[1]; Joakim Odqvist[1]; Peter Hedström[1]; [1]KTH

4:15 PM
Dynamic Imaging of Twin Formation in NiMnGa Based Magnetic Shape Memory Alloys under Cyclic Magnetic Field.: *Saurabh Kabra*[1]; Anton Tremsin[2]; Winfried Kockelmann[1]; [1]Science & Technology Facilities Council; [2]University of California Berkley

4:35 PM
Frustration-induced Diffusive Scattering Anomaly and Dimension Change in $FeGe_2$: *Yaokun Su*[1]; Hillary Smith[2]; Matthew Stone[3]; Douglas Abernathy[3]; Mark Lumsden[3]; Carl Adams[4]; Chen Li[1]; [1]University of California, Riverside; [2]Swarthmore College; [3]Oak Ridge National Laboratory; [4]St. Francis Xavier University

4:55 PM
Intriguing Magnetism of Topological Kagome Material TbMn6Sn6: *Charles Mielke*[1]; Zurab Guguchia[1]; [1]Paul Scherrer Institut

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ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Pyrometallurgy

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Monday PM | March 20, 2023
33C | SDCC

Session Chairs: Muhammad Akbar Rhamdhani, Swinburne University of Technology; Divakar Mantha, Collins Aerospace (a Raytheon Technologies

company)

2:00 PM Invited
A Multi-scale View of Scalability Challenges in Hydrogen-Based Ironmaking: *Leora Dresselhaus-Marais*[1]; [1]Stanford University

2:30 PM
Carbon Formation in MIDREX Hot Briquetted Iron: *Emmanuel De Moor*[1]; Michelle Herrera[1]; Christopher Harris[1]; [1]Advanced Steel Processing and Products Research Center, Colorado School of Mines

2:50 PM
Application of Fiber Optics in Metallurgical Processes Temperature Monitoring of Metallurgical Furnace with Distributed Temperature Sensing (DTS): *Luis Gonzalez*[1]; Luis Chambi[1]; Stefany Huanca Choque[1]; Carlos Javier Acho Quispe[1]; [1]Universidad Mayor de San Andres

3:10 PM
Lead Bleed-off from Dust of Copper Smelter: *Kifu Matsuura*[1]; Satoshi Shibata[1]; Kifu Matsuura[1]; Fumito Tanaka[1]; [1]Mitsubishi Materials Corporation

3:30 PM Break

3:50 PM
Ga, In and Ge Extraction from Zinc Plant Residues by Chlorine Metallurgy: *Santiago Iriarte Aguirre*[1]; Patrick Taylor[1]; Stephen James[1]; [1]Colorado School of Mines

4:10 PM
Alternatives to Pyrometallurgical Recovery of Copper and Gold from Waste Printed Wiring Boards: Process Flow and Environmental Impacts Assessment: Eric Schwartz[1]; *Haoyang He*[1]; Oladele Ogunseitan[1]; Julie Schoenung[1]; [1]University of California, Irvine

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NUCLEAR MATERIALS

Phase Stability in Extreme Environments — Phase Stability in Nuclear Environments II

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Andrew Hoffman, GE Research; Kinga Unocic, Oak Ridge National Laboratory; Janelle Wharry, Purdue University; Kaila Bertsch, Lawrence Livermore National Laboratory; Raul Rebak, GE Global Research

Monday PM | March 20, 2023
28C | SDCC

Session Chairs: Andrew Hoffman, GE Research; Jia-Hong Ke, Idaho National Laboratory

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2:00 PM Introductory Comments

2:10 PM Invited
Effect of α` Chromium-rich Precipitates on the Tensile Properties of Commercial FeCrAl Alloy: *Hamdy Abouelella*[1]; Andrew Hoffman[2]; Rajnikant Umretiya[2]; Nathan Almirall[2]; Benjamin Beeler[1]; Raul Rebak[2]; [1]North Carolina State University; [2]Ge Research

2:40 PM
Reduced Alpa-prime Precipitation during Thermal Annealing and Irradiation in Ultrafine-grained or Nanocrystalline FeCrAl Alloys: *Haiming Wen*[1]; Maalavan Arivu[1]; Rinat Islamgaliev[2]; [1]Missouri University of Science and Technology; [2]Ufa State Aviation Technical University

3:00 PM
Aging-Induced α' Precipitates in FeCrAl Alloys and Its Effects on Corrosion Behavior: *Rupesh Rajendran*[1]; Rajnikant Umretiya[2]; Andrew Hoffman[2]; Richard Blair[2]; Christopher Perlee[2]; Raul Rebak[2]; [1]Georgia Institute of Technology; [2]GE Global Research

3:20 PM Break

3:50 PM Invited
Effects of Aluminum Addition and Point Defects on Cr-rich α' Phase Stability in FeCrAl Alloys: *Jia-Hong Ke*[1]; Andrea Jokisaari[1]; [1]Idaho National Laboratory

4:20 PM
Atom Probe Characterization of Al/Mo Effects on α' Precipitation in FeCrAl Cladding Alloys: *Nathan Almirall*[1]; Andrew Hoffman[1]; Rajnikant Umretiya[1]; Michael Worku[1]; Christopher Perlee[1]; Raul Rebak[1]; Hamdy Abouelella[1]; [1]GE Research

4:40 PM
Determining the Phase Boundary between and α+α' at Low-temperatures with Proton Irradiations and APT: *Yajie Zhao*[1]; Pengcheng Zhu[1]; Jonathan Poplawsky[2]; Arunodaya Bhattacharya[2]; Jean Henry[3]; Steven Zinkle[4]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory; [3]CEA, DEN, Service de Recherches Métallurgiques Appliquées, Laboratoire d'Analyse Microstructurale des Matériaux, Université Paris-Saclay; [4]University of Tennessee, Knoxville; Oak Ridge National Laboratory

5:00 PM
Phase-field Modeling of Laves Phase Precipitate in Accident Tolerant Cladding: Jeonghwan Lee[1]; *Kunok Chang*[1]; [1]Kyung Hee University

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ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXII — Phase Stability of Electronic Materials

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Chung University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, Bangladesh University of Engineering and Technology (BUET); Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Monday PM | March 20, 2023
Sapphire E | Hilton

Session Chairs: Yee-Wen Yen, National Taiwan University of Science and Technology; Yu-chen Liu, National Cheng Kung University

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2:00 PM Invited
SAC-In,Bi(Sb) Solder Joints with Multiphase Microstructures and Their Mechanical Properties Guided by CALPHAD Design: *Xiaojing Wang*[1]; Shanshan Cai[2]; *Yuhang Wang*[1]; [1]Jiangsu University of Science and Technology; [2]Yunnan Tin Group (Holding) Co. Ltd

2:25 PM
Composition Design of Coherent Precipitate-strengthening Multi-principal Element Alloys by High-throughput CALPHAD-type Calculation: *Shao-Yu Yen*[1]; Hao-che Wang[1]; Hideyuki Murakami[2]; Shih-kang Lin[1]; [1]National Cheng-Kung University; [2]National Institute for Materials Science

2:45 PM
Use of Molecular Dynamics Simulations to Examine Crystal Growth from the Melt in Pure Sn Systems: *Andrea Papaleo*[1]; Bruce White[1]; Stephen Whitelam[2]; Eric Cotts[1]; [1]Binghamton University; [2]Lawrence Berkeley National Laboratory

3:05 PM
Ab Initio Exploration of Alloying Elements for Stabilizing ' Nanoprecipitates in Al-Zn-Mg Alloys: *Yu-ning Chiu*[1]; Shao-yu Yen[1]; Chung-yi Yu[2]; Shih-kang Lin[1]; [1]National Cheng Kung University; [2]China Steel Corp, Aluminum Prod R&D Sect

3:25 PM Break

3:45 PM
Ag and Cu Whisker Formation: *Sinn-wen Chen*[1]; Pin- Shuo Huang[1]; Yohanes Hutabalian[1]; [1]National Tsing Hua University

4:05 PM
3d-transition Metal-tin Compounds: *Andreas Leineweber*[1]; Stefan Martin[1]; [1]Tu Bergakademie Freiberg

4:25 PM
Thermal and Mechanical Evaluation of Anisotropic Cu-Solder Composite Joint on High Temperature Storage: *Hiroaki Tatsumi*[1]; Hiroshi Nishikawa[1]; [1]Osaka University

4:45 PM
3D Electromagnetic Simulation and Experimental Measurements of Performance of Antenna at mm-wave Frequencies: Surface Finish Effect: *Ying-Chih Chiang*[1]; Pei-Chia Hsu[1]; Chun-Jou Yu[1]; Cheng-Hsien Chou[2]; Cheng-En Ho[1]; [1]Yuan Ze University; [2]Unitech Printed Circuit Board Corp.

5:05 PM
Study of Interfacial Stability for Medium-temperature GeTe-based Thermoelectric Modules: *Cheng-Hao Kung*[1]; Albert T. Wu[1]; [1]National Central University

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Ferrous Alloys II

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou,

Marquette University

Monday PM | March 20, 2023
25C | SDCC

Session Chair: Megumi Kawasaki, Oregon State University

2:00 PM
Study of the Martensitic Transformation by Deformation of Traction in the Steels AISI 304 Through Electrical Resistivity: *Edgar Apaza Huallpa*[1]; Hélio Goldenstein[2]; Esequiel Nicolas Collado Cardenas[1]; Elmer Antonio Mamani Calcina[1]; Juan Carlos Negron Lopez[1]; Lino Reynaldo Quispe Cardenas[1]; Alejandro Boris Marquez Guevara[1]; Erick Omar Tunqui Labra[1]; [1]Universidad Nacional de San Agustin de Arequipa, Perú; [2]Universidade de São Paulo

2:20 PM
Effect of High Temperatures on the Delamination Susceptibility of Chromium Carbide Overlays: *Alejandro Alvarez*[1]; Lingyun Wei[1]; Jonas Svantesson[1]; Jan-Erik Hedin[1]; Petter Eklof[1]; [1]SSAB

2:40 PM
Monte Carlo Simulations for Synthetic Microstructure Generation of M23C6 Precipitation in 347H Stainless Steels: *William Frazier*[1]; Arun Sathanur[1]; Ram Devanathan[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

3:00 PM
Development of a Phase Field Model of Microstructural Evolution in Fe-C Steels during Induction Coupled Thermomagnetic Processing: Christopher Lovenduski[1]; *Michael Tonks*[1]; [1]The University of Florida

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Session II

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

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

Monday PM | March 20, 2023
Sapphire 411B | Hilton

Session Chairs: David Estrada , Boise State University; Pooran Joshi, Oak Ridge National Laboratory; Anming Hu, The University of Tennessee

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2:00 PM Invited
Printed Electronics for Space-based Applications: *Emily Heckman*[1]; [1]AFRL/RYDI

2:25 PM Invited
3D-printed Sensors Optimized for Remote Monitoring of Declared Hazardous and Nuclear Containers: *Stylianos Chatzidakis*[1]; [1]Purdue University

2:50 PM Invited
Additive Manufacturing for Passive In-pile Sensors: *Kiyo Fujimoto*[1]; David Estrada[2]; Tommy Holschuh[1]; Lance Hone[1]; Nicholas Der Garabedian[3]; Troy Unruh[1]; Michael McMurtrey[1]; [1]Idaho National Laboratory; [2]Boise State University; [3]Villanova University

3:15 PM
Printed High Temperature Irradiation Resistant Thermocouples for Real-time Monitoring of Nuclear Reactor Components: *Josh Eixenberger*[1]; David Estrada[1]; Katelyn Wada[1]; Nicholas McKibben[1]; Richard Fink[2]; [1]Boise State University; [2]Applied Nanotech, Inc.

3:35 PM Break

3:55 PM
Recent Progresses of Nanojoining: Fundamentals and Applications for Single-wire Devices: *Anming Hu*[1]; [1]University of Tennessee

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MATERIALS PROCESSING

Rare Metal Extraction & Processing — Processing for Precious Metals and Rare Metals / Electrochemical Processing for Rare Metals

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

Program Organizers: Takanari Ouchi, University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Gisele Azimi, University of Toronto; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Hojong Kim, Pennsylvania State University; Alafara Baba, University of Ilorin; Hong (Marco) Peng, University of Queensland; Athanasios Karamalidis, Pennsylvania State University; Shijie Wang, Coeur Mining, Inc

Monday PM | March 20, 2023
30B | SDCC

Session Chairs: Athanasios Karamalidis, Pennsylvania State University; Shijie Wang, Coeur Mining, Inc; Hojong Kim, Pennsylvania State University; Takanari Ouchi, The University of Tokyo

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2:00 PM Invited
An Innovated Hydrometallurgical Process for Recoveries of Critical and Rare Metals from Copper Anode Slimes: *Shijie Wang*[1]; [1]Coeur Mining, Inc

2:30 PM
Eutectic Freeze Crystallization for Recovery of Cobalt Sulfate in the Recycling of Li-ion Batteries: Yiqian Ma[1]; Amanda Sjögren[1]; Michael Svärd[1]; Xiong Xiao[1]; James Gardner[1]; Richard Olsson[1]; *Kerstin Forsberg*[1]; [1]KTH Royal Institute of Technology

2:50 PM
Studies on the Hydrometallurgical Recovery of Metals from Used and End of Life PCBs: *Om Dinkar*[1]; Rekha Panda[1]; Pankaj Choubey[1]; Manis Jha[1]; Balram Ambade[1]; [1]CSIR-National Metallurgical Laboratory

3:10 PM
Extraction of Tungsten, Yttrium and Uranium from Tantalum – Niobium Ore from Muchinga Province in Zambia: *Douglas Musowoya*[1]; Yotamu Hara[1]; Fredrick Chilese[1]; Janet Mundundu[1]; Stephen Parirenyatwa[1]; [1]Copperbelt University

3:30 PM Break

3:50 PM
Production of High-purity Mg Metal from Various MgO Resources through a Novel Electrolytic Process Using a Cu Cathode and Vacuum Distillation: *Hyeong-Jun Jeoung*[1]; Tae-Hyuk Lee[1]; Youngjae Kim[1]; Jin-Young Lee[1]; Young Min Kim[2]; Toru H. Okabe[3]; Kyung-Woo Yi[4]; Jungshin Kang[1]; [1]Korea Institute of Geoscience and Mineral Resources; [2]Korea Institute of Materials Science; [3]The University of Tokyo; [4]Seoul National University

4:10 PM
Recovery of Copper Metal from Discarded Printed Circuit Boards (PCBs) by Hydro and Electro Metallurgical Processes: Om Shankar Dinkar[1]; *Rukshana Parween*[1]; Rekha Panda[1]; Pankaj Kumar Choubey[1]; Balram Ambade[2]; Manis Kumar Jha[1]; [1]CSIR-National Metallurgical Laboratory; [2]National Institute of Technology

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LIGHT METALS

Scandium Extraction and Use in Aluminum Alloys — Scandium - Extraction/ Mining and Master Alloy Production

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

Program Organizers: Timothy Langan, Sunrise Energy Metals; Samuel Wagstaff, Oculatus Consulting; Phil Chataigneau, PDU Consulting; Efthymios Balomenos, Mytilineos S.A., Metallurgy Bu; Thomas Dorin, Deakin University; Muhammad Akbar Rhamdhani, Swinburne University of Technology; Dimitrios Filippou, Rio Tinto Iron & Titanium; Henk van der Laan, V.I.C. Van der Laan International Consultancy BV; Frank Palm, Airbus Defence and Space GmbH

Monday PM | March 20, 2023
30D | SDCC

Session Chair: Henk van der Laan, V.I.C. Van der Laan International Consultancy BV

2:00 PM Introductory Comments

2:05 PM
Investigations into Optimized Industrial Pilot Scale BR Leaching for Sc Extraction: *Efthymios Balomenos*[1]; Panagiotis Davris[1]; Alexandra Apostolopoulou[1]; Danai Marinos[2]; Elena Mikeli[2]; Aikaterini Toli[2]; Dimitris Kotsanis[2]; Grigoris Paschalis[1]; Dimitrios Panias[2]; [1]Mytilineos S.A., Metallurgy Bu; [2]NTUA

2:30 PM
Solvent Extraction of Scandium from Titanium Process Solutions: Dimitrios Filippou[1]; Michel Paquin[1]; Yves Pépin[1]; *Mike Johnson*[2]; Niels Verbaan[2]; [1]Rio Tinto Iron & Titanium; [2]SGS Canada Inc.

2:55 PM
State of the Art Technologies for Scandium Recovery, Purification, and Aluminum-Scandium Alloy Production: Anne Marie Reyes[1]; Gomer Abrenica[1]; *Ghazaleh Nazari*[1]; [1]Coherent

3:20 PM
FEA Materials - AlSc Master Alloy Production Technology: Eugene Prahin[1]; Rick Salvucci[1]; *Brian Hunt*[1]; [1]FEA Materials LLC

3:45 PM Break

4:00 PM Invited
Scandium Master Alloy Production via Sulfidation and Vacuum Aluminothermic Reduction: *Caspar Stinn*[1]; Ethan Benderly-Kremen[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

4:25 PM Invited
European Scandium for a Lighter and Greener Future: *Henk van der Laan*[1]; Beate Orberger[2]; [1]V.I.C. Van der Laan International Consultancy BV; [2]CATURA Geoprojects

4:35 PM Panel Discussion Scandium Supply

NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Panel/Actinide Physics

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Monday PM | March 20, 2023
28A | SDCC

Session Chair: Krzysztof Gofryk, Idaho National Laboratory

2:00 PM Panel Discussion

3:30 PM Break

3:50 PM Invited
The Central Role of f-electron Correlations in the Spin Triplet Superconductor UTe2: *Nicholas Butch*[1]; [1]University of Maryland

4:20 PM Invited
DFT+U in Uranium Dioxide: Occupation Matrix Control and Phonons: *Shuxiang Zhou*[1]; Hao Ma[2]; Enda Xiao[3]; Krzysztof Gofryk[1]; Chao Jiang[1]; Michael Manley[2]; David Hurley[1]; Chris Marianetti[3]; [1]Idaho National Laboratory; [2]Oak Ridge National Laboratory; [3]Columbia University

4:50 PM
Synthesis, Characterization, and Magnetic Property Measurements of Some A2M4U6S17 (A = K, Rb, Cs; M = Pd, Pt) and Ba3MUQ6 (M = transition metal; Q = S, Se) Compounds: *Logan Breton*[1]; [1]University of South Carolina

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MATERIALS DESIGN

Thermodynamics and Kinetics of Alloys — Session II

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

Program Organizers: Ji-Cheng Zhao, University of Maryland; Wei Xiong, University of Pittsburgh; Chuan Zhang, CompuTherm LLC; Shuanglin Chen,

CompuTherm LLC

Monday PM | March 20, 2023
Sapphire M | Hilton

Session Chairs: Bi-Cheng Zhou, University of Virginia; Shalini Roy Koneru, The Ohio State University

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2:00 PM Invited
Effect of N and/or B Additions on the Precipitation Kinetics in Isothermally Aged and Creep Ruptured 347H Stainless Steels: *Qing-Qiang Ren*[1]; Yukinori Yamamoto[1]; Michael Brady[1]; Jonathan Poplawsky[1]; Martin Detrois[2]; Paul Jablonski[2]; Jeffrey Hawk[2]; [1]Oak Ridge National Laboratory; [2]National Energy Technology Laboratory

2:20 PM
Accelerated CALPHAD-based Design of a 7xxx High Strength Aluminum Plate Alloy: *Maria-Ioanna Tzini*[1]; Gregory Olson[1]; [1]Massachusetts Institute of Technology

2:40 PM
Al-Ce Alloy Development Using Computational Thermodynamics: *Emily Moore*[1]; Hunter Henderson[1]; David Weiss[2]; Scott McCall[1]; Orlando Rios[3]; Aurélien Perron[1]; [1]Lawrence Livermore National Laboratory; [2]Eck Industries Inc.; [3]University of Tennessee, Knoxville

3:00 PM
CALPHAD and Data-driven Approach for Phase Prediction Model in Refractory High-entropy Alloys: *Jiwon Park*[1]; Chang-Seok Oh[1]; [1]Korea Institute of Materials Science

3:20 PM Break

3:40 PM Invited
Tunable Heterogeneous Microstructures in a High Throughput Architecture: *Markus Short*[1]; [1]Karlsruhe Institute for Technology

4:00 PM Invited
Impact of Magnetic Excitation and Transition on Atomic Diffusion in Fe Alloys: *Chu-Chun Fu*[1]; Anton Schneider[1]; Kangming Li[1]; [1]Université Paris-Saclay, CEA, Service de Recherches de Métallurgie Physique

4:20 PM
Effect of Ti on the Diffusional Growth of A15 Nb_3Sn: *Sang-Ho Oh*[1]; Yang-Jin Jeong[2]; Sin-Hye Na[2]; Iksang Shin[2]; Jiman Kim[2]; Byeong-Joo Lee[1]; [1]Pohang University of Science and Technology; [2]Kiswire Advanced Technology Ltd.

4:40 PM
The Selection of Solidification Pathway in Rapid Solidification Processes: *Nima Najafizadeh*[1]; Yijia Gu[1]; [1]Missouri University of Science and Technology

5:00 PM
Study on Densification Kinetics of the Binder Jetted Fine 316L SS Powder: *Mohammad Jamalkhani*[1]; Maciej Dorula[1]; Elijah Roberts[1]; Julia Deguia[1]; Amir Mostafaei[1]; [1]Illinois Institute of Technology

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NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Experiments & Multiscale Modeling of Solid-state Transmutation

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

Committee

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Monday PM | March 20, 2023
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Session Chairs: David Sprouster, Stony Brook University; Sergei Dudarev, UK Atomic Energy Authority

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2:00 PM Invited
The Effect of Chemical Element Inventory Evolution on Recoil Production and Its Effect on Defect Cluster Evolution in Tungsten: *Jaime Marian*[1]; Mark Gilbert[2]; [1]University of California, Los Angeles; [2]UKAEA

2:40 PM
Analytical TEM Examination of Re and Os Segregation in Neutron Irradiated Tungsten: *Michael Klimenkov*[1]; Ute Jäntsch[1]; Michael Dürrschnabel[1]; Michael Rieth[1]; Dmitry Terentyev[2]; Wouter Van Renterghem[2]; [1]Karlsruhe Institute of Technology; [2]Belgian Nuclear Research Centre

3:00 PM
Co-Segregation of Transmuted Re and Os in Neutron Irradiated Tungsten: First-principles Prediction and Experimental Validation: *Duc Nguyen-Manh*[1]; Matthew Lloyds[2]; Jan Wrobel[3]; Michael Klimenkov[4]; Luca Messina[5]; Enrique Martinez[6]; Mark Gilbert[1]; [1]UK Atomic Energy Authority; [2]Singapore University of Technology and Design; [3]Warsaw University of Technology; [4]Karsruhe Institute of Technology; [5]CEA; [6]Clemson University

3:20 PM
Ab Initio Study of Tungsten-based Alloys Under Fusion Power-plant Conditions: Yichen Qian[1]; *Mark Gilbert*[2]; Lucile Dezerald[3]; Duc Nguyen-Manh[2]; David Cereceda[1]; [1]Villanova University; [2]Culham Centre For fusion Energy; [3]Universite de Lorraine

3:40 PM Break

4:00 PM Invited
Experimental Validation of Simulated Transmutation Predictions for Fusion Materials: *Mark Gilbert*[1]; Arunodaya Bhattacharya[2]; Philip Edmondson[3]; Jean-Christophe Sublet[4]; [1]Ukaea; [2]ORNL; [3]University of Manchester; [4]IAEA

4:40 PM
Ab Initio and Classical Molecular Dynamics Study of Re Transport in W: *Osetsky Yury*[1]; German Samolyuk[1]; [1]Oak Ridge National Laboratory

5:00 PM
Modelling of Re/Os Transmutation Product Segregation in Irradiated W Using Atomistic Kinetic Monte Carlo: *Matthew Lloyd*[1]; Robert Simpson[1]; Enrique Martinez[2]; Duc Nguyen-Manh[3]; [1]Singapore University of Technology and Design; [2]Clemson University; [3]United Kingdom Atomic Energy Authority

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ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Processing, Characterization & Applications I

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

Tuesday AM | March 21, 2023
Aqua AB | Hilton

Session Chairs: Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS

8:00 AM Introductory Comments

8:05 AM
Investigation of Defects Produced by H and O Ion Irradiations in MoS2: *Aaron Rabin*[1]; Assel Aitkaliyeva[1]; Zhihan Hu[2]; Lin Shao[2]; [1]University of Florida; [2]Texas A&M University

8:25 AM Invited
Synthesis of Transition Metal Dichalcogenides on Oxide Surfaces: Maria Gabriela Sales[1]; Peter Litwin[1]; *Stephen McDonnell*[1]; [1]University of Virginia

8:50 AM Invited
Stimuli Responsive Multi-functional 2D and 3D Nanoporous Materials in Condensed Phases: *Mohammad R. Momeni*[1]; [1]University of Missouri - Kansas City

9:15 AM Invited
2-dimensional and Layered Nanomaterial Inks for Additive Electronic Manufacturing: *Dave Estrada*[1]; [1]Boise State University

9:40 AM Break

10:00 AM Invited
Dual-frequency Ultrasound-assisted Exfoliation of Graphene: Mechanisms and Implementation: *Dmitry Eskin*[1]; Anastasia Tyurnina[1]; Justin Morton[2]; Amanpreet Kaur[2]; Nicole Grobert[3]; Kyriakos Porfyrakis[4]; Jiawei Mi[5]; Iakovos Tzanakis[2]; [1]Brunel University; [2]Oxford Brookes University; [3]University of Oxford; [4]University of Greenwich; [5]University of Hull

10:25 AM Invited
Transferrable Computational Framework based on Density Functional Theory for Study and Design of 2D Materials: From Battery to Sensing Applications: *Mohsen Asle Zaeem*[1]; [1]Colorado School of Mines

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LIGHT METALS

60 Years of Taking Aluminum Smelting Research and Development from New Zealand to the World: An LMD Symposium in Honor of Barry J. Welch — Barry Welch Honorary Symposium

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

Program Organizers: Mark Dorreen, CSIRO; Alan Tomsett, Rio Tinto Pacific

Operations; David Wong, Atmolite Consulting Pty Ltd; Linus Perander, Yara International; Barry Sadler, Net Carbon Consulting Pty Ltd; Stephan Broek, Kensington Technology Inc.

Tuesday AM | March 21, 2023
30E | SDCC

Session Chair: James Metson, University of Auckland

8:00 AM Introductory Comments

8:10 AM Keynote
Barry Welch's Honorary Keynote: *Svein Brandtzaeg*[1]; [1]Brandtzaeg

8:35 AM Invited
Barry Welch - A Mentor Driving Improvement in Industry Through Leadership and Technology: *Jennifer Purdie*[1]; [1]BHP

9:00 AM Invited
Highlights of Aluminium Smelting Research Inspired by Barry Welch at UNSW from 1985 to Present: *Maria Skyllas-Kazacos*[1]; [1]University of New South Wales

9:25 AM Invited
What Makes TMS Special? Let Us Consider a Case Study in Volunteer Excellence: Barry J. Welch: *James Robinson*[1]; [1]The Minerals, Metals & Materials Society

9:50 AM Break

10:05 AM Invited
Meeting the Requirements of Potline Customers – the Largely Unmet Challenges Set by Barry Welch to Carbon Anode Producers: *Barry Sadler*[1]; Alan Tomsett[2]; [1]Net Carbon Consulting Pty Ltd; [2]Rio Tinto Pacific Operations

10:30 AM Invited
Barry Welch, Professor and Mentor for the Aluminium Industry: *Martin Iffert*[1]; [1]Martin Iffert Consulting GmbH

10:55 AM
Contribution of Professor Barry Welch to the Development of EGA's Reduction Technologies: Nadia Ahli[1]; Sergey Akhmetov[1]; *Abdalla Alzarooni*[1]; [1]Emirates Global Aluminium

11:20 AM Concluding Comments with an opportunity for any former students of Barry to say a few words

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Shape Memory Alloys and Steels I

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

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas, Sandia National Laboratories; Iver Anderson, Iowa State University Ames

Laboratory

Tuesday AM | March 21, 2023
23C | SDCC

Session Chair: Andrew Kustas, Sandia National Laboratories

8:00 AM Invited
Additive Manufacturing of Cu-based Shape Memory Alloys: Challenges and Perspectives: *Jose San Juan*[1]; Mikel Pérez-Cerrato[1]; Lucía Del-Río[1]; Ernesto Urionabarrenetxea[2]; Josu Leunda[3]; Iban González[4]; Iban Quintana[3]; Fernando Carreño[5]; Nerea Burgos[2]; María Nó[1]; [1]Universidad del Pais Vasco; [2]CEIT-Basque Research and Technology Alliance (BRTA); [3]TEKNIKER, Basque Research and Technology Alliance (BRTA); [4]LEITAT; [5]CENIM-CSIC

8:30 AM
Improving Tensile Strengths of Laser-Direct Energy Deposited (L-DED) NiTiHf Alloys by Printing Dislocation Structures: *Soumya Mohan*[1]; Aaron Stebner[1]; [1]Georgia Institute of Technology

8:50 AM
Controlling Martensitic Transformation Characteristics in Defect-free NiTi Shape Memory Alloys Fabricated Using Laser Powder Bed Fusion: *Ibrahim Karaman*[1]; L. Xue[1]; Kadri Atli[1]; Chen Zhang[1]; Alaa Elwany[1]; Raymundo Arroyave[1]; [1]Texas A&M University

9:10 AM
Electron Beam Powder Bed Fusion of Binary Ni-Ti Shape Memory Alloys – On the Impact of TiC on the Functional Properties: *Philipp Krooss*[1]; Christian Lauhoff[1]; Tobias Gustmann[2]; Julia Hufenbach[2]; Thomas Niendorf[1]; [1]Institute of Materials Engineering, University of Kassel; [2]Leibniz Institute for Solid State and Materials Research Dresden

9:30 AM
Additive Manufacturing of NiTi Shape Memory Alloy via Laser Metal Deposition and Laser Powder Bed Fusion: *Haopeng Shen*[1]; Kun Yang[1]; Daniel East[1]; Daniel Liang[1]; Anthony Murphy[1]; Ma Qian[2]; Ryan Watkins[3]; Douglas Hofmann[3]; [1]CSIRO; [2]RMIT; [3]Jet Propulsion Laboratory

9:50 AM Break

10:05 AM Invited
Opportunities and Challenges for Fabrication of Electrical Machine Components by Additive Manufacturing: *Marco Simonelli*[1]; Ian Ashcroft[1]; Nesma Aboulkhair[1]; Michele Garibaldi[1]; Leonidas Gargalis[1]; Cassidy Silbernagel[1]; Julan Wu[1]; Richard Hague[1]; [1]University of Nottingham

10:35 AM
Consequences of Powder Reuse on Microstructure Evolution during Laser Powder Bed Fusion of 316L Stainless Steel: *Madelyn Madrigal-Camacho*[1]; Mitchell Keeler[1]; Joy Gockel[1]; Suveen Mathaudhu[1]; [1]Colorado School of Mines

10:55 AM
Directed Energy Deposition of a Martensitic Steel – Microstructure Evolution and Mechanical Response: *Shubham Chandra*[1]; Mehmet Cagirici[1]; Upadrasta Ramamurty[1]; [1]Nanyang Technological University

11:15 AM
Fabrication of HSLA Steel Si-Bronze Aluminum Functionally Graded Material Using Wire Arc Additive Manufacturing: *Hanadi Salem*[1]; Marwan El-Husseiny[2]; Ehab El-Danaf[2]; [1]American University in Cairo; [2]Cairo University

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session II

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

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

Tuesday AM | March 21, 2023
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Session Chair: Nima Shamsaei, Auburn University

8:00 AM Invited
Effects of Process Conditions and Flaws/Surface Roughness on Fracture and Fatigue of AM-processed Alloys: *John Lewandowski*[1]; [1]Case Western Reserve University

8:30 AM
Effects of Scan Strategy Induced Microstructural Differences on Thin-Wall SLM IN718 Fatigue Performance: *Connor Varney*[1]; Imran Noor[1]; Paul Rottmann[1]; [1]University of Kentucky

8:50 AM
Effect of Defect Variability in Aluminum Alloys on Ultrasonic Fatigue Performance Across Additive Manufacturing Platforms: *Harsha Phukan*[1]; Rob Rhein[1]; Niloofar Sanaei[1]; Eric Johnson[1]; Jason Carroll[1]; [1]Eaton Corporation

9:10 AM Invited
The Influence of Surface Finish and Build Orientation on the Low Cycle Fatigue Behaviour of Laser Powder Bed Fused Stainless Steel 316L: *Robert Lancaster*[1]; William Beard[2]; Thomas Jones[2]; Nicholas Barnard[1]; [1]Swansea University; [2]Rolls-Royce

9:40 AM Break

10:00 AM
Isolated Influence of Upward and Downward Facing Surface Roughness on the Fatigue Life of Laser Powder Bed Fusion Ti-6Al-4V: *Jason Rogers*[1]; Martin Leary[1]; Ma Qian[1]; Chris Wallbrink[2]; Joe Elambasseril[1]; [1]RMIT University; [2]Defence Science Technology

10:20 AM
Effect of Microstructure and Surface Roughness on Fatigue Behavior of PBF-LB 316L Stainless Steel: Garrison Hommer[1]; *Jorge Ramirez*[1]; Simon Richardsen[1]; Jonah Klemm-Toole[1]; Joy Gockel[1]; [1]Colorado School of Mines

10:40 AM
Post-Processing Surface Finishing of Additively Manufactured Aluminum and Titanium Alloys for Optimal Mechanical and Corrosion-Resistance Performance: *Joshua Boykin*[1]; Agustin Diaz[1]; Patrick McFadden[1]; Justin Michaud[1]; [1]REM Surface Engineering

11:00 AM
Effect of a Build Stop on the Fatigue Behavior of Laser Powder Bed Fusion 316L Stainless Steel with As-printed Surfaces: Simon Richardsen[1]; Jorge Ramirez[1]; Charles Smith[1]; Garrison Hommer[1]; Jonah Klemm-Toole[1]; *Joy Gockel*[1]; [1]Colorado School of Mines

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ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications V — Properties, Performance Testing and Modeling I

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

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

Tuesday AM | March 21, 2023
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Session Chair: Kumar Sridharan, University of Wisconsin-Madison

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8:00 AM Introductory Comments

8:05 AM Invited
Irradiation Response and Mechanical Property Changes of Conventionally and Additively Manufactured 316L Stainless Steels: *Lin Shao*[1]; [1]Texas A&M University

8:40 AM
Creep Behavior of an Additively Manufactured Al-Ce-Ni-Mn-Zr Alloy: *Sumit Bahl*[1]; Richard Michi[1]; Jonathan Poplawsky[1]; Lawrence Allard[1]; Kevin Sisco[2]; Ryan Dehoff[1]; Alex Plotkowski[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee-Knoxville

9:00 AM
Creep of Wire Arc Additive Manufactured Stainless Steels for Power Generation Applications: *Juan Gonzalez*[1]; Luc Hagen[1]; Stephen Tate[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines

9:20 AM
Creep Properties of Additively Manufactured 316L Stainless Steel: Performance and Microstructure: *Xuan Zhang*[1]; Wei-Ying Chen[1]; Chris Carter[1]; Jun-Sang Park[1]; Peter Kenesei[1]; Aniket Tekawade[1]; Yashas Satapathy[1]; Meimei Li[1]; [1]Argonne National Laboratory

9:40 AM Break

9:55 AM
Creep Resistance and Microstructure of Binary Al-Ce Alloy Produced by Casting and Laser Powder Bed Fusion: *Jillian Stinehart*[1]; Le Zhou[1]; [1]Marquette University

10:15 AM Invited
The Key Role of High-Temperature Testing & Post-Test Characterization to Qualify Advanced Manufacturing Methods and Materials for Energy Applications: *John Shingledecker*[1]; David Gandy[1]; Alex Bridges[1]; [1]EPRI

10:50 AM
High Temperature Tribology of AM Ni-based Alloys 699XA and 400: *Emma White*[1]; Beyza Oeztuerk[1]; Mathias Galetz[1]; [1]DECHEMA Forschungsinstitut

11:10 AM
Nanomechanical Properties of Heat-Treated High Entropy Alloys: *Modupeola Dada*[1]; Patricia Popoola[1]; Evlly Mtileni[1]; Lindokuhle Ntanzi[1]; [1]Tshwane University of Technology

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Physics-based and Data-based Modeling I

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

Tuesday AM | March 21, 2023
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Session Chairs: Wenda Tan, University of Michigan; Lang Yuan, University of South Carolina

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8:00 AM
Challenges in Wire-Arc Additive Manufacturing of Fe-Based Shape Memory Alloy: *Soumyajit Koley*[1]; Kuladeep Rajamudili[1]; Supriyo Ganguly[1]; [1]Cranfield University

8:20 AM
A Machine Learning Approach to Fast Microstructure Predictions in Laser Powder Bed Fusion: *Mason Jones*[1]; Jean-Pierre Delplanque[1]; Theron Rodgers[2]; Daniel Moser[2]; [1]University of California Davis; [2]Sandia National Laboratories

8:40 AM
Assessment of Phase Evolution in Titanium-Niobium based Alloys During Rapid-Solidification: *Theo Mossop*[1]; David Heard[2]; Mert Celikin[1]; [1]University College Dublin; [2]Stryker

9:00 AM
Bayesian Optimization of an Exponentially Modified Gaussian Heat Source Model for Laser-Based Additive Manufacturing: *John Coleman*[1]; Gerry Knapp[1]; Matt Rolchigo[1]; Benjamin Stump[1]; Alex Plotkowski[1]; [1]ORNL

9:20 AM
Effect of Laser Dwell Time on Pore Elimination in Selective Laser Melting of Metal Matrix Composites: Experimentally Validated Modeling: *Ifeanyichukwu Olumor*[1]; Andrii Maximenko[1]; Eugene Olevsky[1]; [1]San Diego State University

9:40 AM Break

9:55 AM
In-situ Alloying of High Entropy Alloys by Laser Powder Bed Fusion: Insights from Molecular Dynamics Simulations: *Yulia Klunnikova*[1]; Arne J. Klomp[1]; Karsten Albe[1]; [1]TU Darmstadt

10:15 AM
Microstructure Evolution in an As-Built IN625 Thin-wall Fabricated Via Laser Powder Bed Fusion: Pardis Mohammadpour[1]; *Andre Phillion*[1]; Hui Yuan[1]; [1]McMaster University

10:35 AM
Modeling Microstructural Evolution during Laser Processing of Metallic Powders using a Hybrid Mesoscale-Continuum Approach: *Ching Chen*[1]; Sergey Galitskiy[1]; Dmitry Ivanov[2]; Ranadip Acharya[3]; Vijay Jagdale[3]; Avinash Dongare[1]; [1]University of Connecticut; [2]Lebedev Physical Institute; [3]Collins Aerospace

10:55 AM
Modeling Non-Equilibrium Partitioning in Concentrated Cu-Fe Alloys Manufactured by Laser Powder-fed Directed Energy Deposition: *Daniel Yin*[1]; Amit Misra[1]; [1]University of Michigan

11:15 AM
Modeling the Hot Crack Susceptibility of Nickel-Based Superalloys by Laser Powder Bed Fusion.: *Marcus Lam*[1]; [1]Monash University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond on the Beam IV — Process Development and Optimization

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

Program Organizers: James Paramore, US Army Research Laboratory; Daniel Lewis, Texas A&M University; Kyle Tsaknopoulos, Worcester Polytechnic Institute; Paul Prichard, Kennametal Inc.

Tuesday AM | March 21, 2023
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Session Chairs: Kyle Tsaknopoulos, Worcester Polytechnic Institute; Paul Prichard, Kennametal Inc.; Daniel Lewis, Texas A&M University

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8:00 AM Invited
Engineering Powder Characteristics of WC-Co for Binderjet Processing: *Paul Prichard*[1]; Zhuqing Wang[1]; Hadi Miyanaji[1]; [1]Kennametal Inc.

8:20 AM
Electroplating Powder for Cold Spray Applications: *Elizabeth Hodges*[1]; Gilbeom Seo[1]; Victor Champagne[2]; Robert Hyers[1]; [1]University of Massachusetts-Amherst; [2]Cold Spray Innovations International

8:40 AM
A New Approach to the Manufacturing of Metallic Lattice Parts by Combining Polymer Additive Manufacturing and Electroplating: Roozbeh Neshani[1]; Olgun Yılmazer[1]; Atalay Balta[1]; Davis McGregor[2]; Sameh Tawfick[2]; William King[2]; İshak Karakaya[1]; *Sezer Ozerinc*[1]; [1]Middle East Technical University; [2]University of Illinois at Urbana-Champaign

9:00 AM
Optimization of Mechanical Performance of Cold Sprayed Niobium: *Brady Butler*[1]; Van Pham[2]; Bradley Robinson[2]; Charles Ribardo[2]; Ion Powell[2]; Zachary Nolan[2]; Isaac Nault[1]; James Paramore[1]; [1]DEVCOM-ARL; [2]Texas A&M University

9:20 AM
Through-Process Experimental Approach for Optimization of Powder Feedstock for Cold Spray Additive Manufacturing: Kyle Tsaknopoulos[1]; *Bryer Sousa*[1]; Jack Grubbs[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

9:40 AM Break

9:55 AM
Liquid Metal Jetting Based Additive Manufacturing of Cu-Al-Fe Bronze Alloy: *Kellen Traxel*[1]; Chinthaka Silva[1]; Eric Elton[1]; Viktor Sukhotskiy[1]; Luke Thornley[1]; Andrew Pascall[1]; Jason Jeffries[1]; [1]Lawrence Livermore National Laboratory

10:15 AM
Recycled Ti-6Al-4V Powder Processed by Fusion Deposition Modelling (FDM): Marcus Rackel[1]; Stephan Schulze[1]; Kai Steinberg[1]; Henrik Lüneburg[1]; *Florian Pyczak*[1]; Wolfgang Limberg[1]; Thomas Ebel[1]; [1]Helmholtz-Zentrum Hereon

10:35 AM
Solid State Additive Manufacturing of Oxide Dispersion Strengthened FeCrAl Alloy through Metal Extrusion Method: *Saumyadeep Jana*[1]; Zachary Kennedy[1]; Amrita Lall[1]; Michelle Fenn[1]; [1]Pacific Northwest National Laboratory

10:55 AM
Solid State Additive Manufacturing of Magnesium via Friction Stir Deposition: *Sameehan Joshi*[1]; Shreyash Patil[1]; Shashank Sharma[1]; Sangram Mazumder[1]; Daniel Riley[1]; Shelden Dowden[1]; Rajarshi Banerjee[1]; Narendra Dahotre[1]; [1]University of North Texas

11:15 AM
Teaching Printers How to Print: From G-Code to Integrating AI and Cloud Computing into Additive Manufacture: *James Hardin*[1]; Erick Braham[1]; Jennifer Ruddock[1]; Nicholas Arn[1]; [1]Air Force Research Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Microstructural Features II

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

Tuesday AM | March 21, 2023
23B | SDCC

Session Chairs: Keivan Davami, The University of Alabama; Vikas Tomar, Purdue University

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8:00 AM
Toward Developing Processing-Microstructure-Property Prediction to Enable Digital Twins of Additive Manufacturing Process: *Mohsen Taheri Andani*[1]; Veera Sundararaghavan[1]; Amit Misra[1]; [1]University of Michigan

8:20 AM
Kinetically-Driven Microstructure and Mechanical Properties of 3D Micro-architected Metal Alloys formed via Hydrogel Infusion Additive Manufacturing (HIAM): *Thomas Tran*[1]; Rebecca Gallivan[1]; Julia Greer[1]; [1]California Institute of

Technology

8:40 AM
A Novel Continuous-wave Laser and SEM Coupling: Application to Engineer an Additively Manufactured Microstructure: *Juan Guillermo Santos Macias*[1]; Alexandre Tanguy[1]; Manas Upadhyay[1]; [1]Ecole Polytechnique

9:00 AM
A Multiscale Study of the Interconnection between Unit Cell Design, Processing Conditions, Microstructure, and Mechanical Properties of Additively Manufactured Titanium Metamaterials: *Massimiliano Casata*[1]; Conrado Garrido[1]; Toby Wilkinson[1]; Enrique Alabort[2]; Daniel Barba[1]; [1]Universidad Politécnica de Madrid; [2]Alloyed

9:20 AM
Effect of Grain Microstructure on the Deformation Behaviour of Inconel 718 Fabricated by Laser Powder-bed Fusion: An In-situ Study: Jalal Al-Lami[1]; Thibaut Dessolier[1]; Talha Pirzada[2]; *Minh-Son Pham*[1]; [1]Imperial College London; [2]University of Oxford

9:40 AM Break

10:00 AM
Local Control of Strain, Microstructure, and Properties in Ti-5553 Lattice Materials: *Caleb Andrews*[1]; Jenny Wang[2]; Maria Strantza[2]; Manyalibo Matthews[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]Lawrence Livermore National Laboratory

10:20 AM
Impact of Nanoscale Intermetallic Dispersions in Al-Ce Alloys for Selective Laser Melting: *Hunter Henderson*[1]; Alfred Amon[1]; Alexander Wilson-Heid[1]; Zachary Sims[1]; Orlando Rios[2]; Ryan Ott[3]; Scott McCall[1]; [1]Lawrence Livermore National Laboratory; [2]University of Tennessee-Knoxville; [3]Ames Laboratory

10:40 AM
Enhanced Tensile Ductility of an Additively Manufactured AlSi10Mg Alloy by Reducing the Density of Melt Pool Boundaries: *Haoxiu Chen*[1]; Yu Zou[1]; [1]University of Toronto

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — Aluminum Alloys I

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

Program Organizers: Behrang Poorganji, University of Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

Tuesday AM | March 21, 2023
24C | SDCC

Session Chair: Hunter Martin, HRL

8:00 AM Invited
Al-Ce Alloys for Additive Manufacturing: *Ryan Ott*[1]; Seungjin Nam[1]; Nicolas Argibay[1]; Hunter Henderson[2]; Orlando Rios[3]; Scott McCall[2]; [1]Ames National Laboratory (USDOE); [2]Lawrence Livermore National Laboratory; [3]University of Tennessee

Knoxville

8:30 AM
Design of an Aluminum Alloy Based on Stable Nanoparticles for Eliminating Process Instability in Laser Metal Additive Manufacturing: *Minglei Qu*[1]; Qilin Guo[1]; Luis Izet Escano[1]; Ali Nabaa[1]; S. Mohammad H. Hojjatzadeh[1]; Lianyi Chen[1]; [1]University of Wisconsin-Madison

8:50 AM
Finding "Printing" Alloys: A New Category of Aluminum(-Cerium) Alloys in an Untapped Composition Space: *Alfred Amon*[1]; Seungjin Nam[2]; Emily Moore[1]; Hunter Henderson[1]; Orlando Rios[3]; Ryan Ott[2]; Scott McCall[1]; [1]Lawrence Livermore National Laboratory; [2]Ames Laboratory; [3]University of Tennessee Knoxville

9:10 AM
Laser Powder Bed Fusion of Al-Ce Alloys: *Holden Hyer*[1]; Abhishek Mehta[1]; Le Zhou[2]; Brandon McWilliams[3]; Kyu Cho[3]; Yongho Sohn[1]; [1]University of Central Florida; [2]Marquette University; [3]DEVCOM Army Research Laboratory

9:30 AM Break

9:50 AM
Impact of Starting Particle Content and Laser Powder Bed Fusion Processing on Microstructure and Material Properties in A6061-RAM Alloys: *Chloe Johnson*[1]; Michael Kaufman[2]; Adam Polizzi[1]; Jeremy Iten[1]; Amy Clarke[2]; [1]Elementum 3D; [2]Colorado School of Mines

10:10 AM
Designing High-Strength Aluminum and Superalloys for Laser Powder Bed Fusion: Analyzing Cases of Success and Failure: *Marcus Lam*[1]; [1]Monash University

10:30 AM
Using ' Interfaces as Templates for Planar L12 Precipitation in Additively Manufactured AlCuMnZr Alloys: *Jonathan Poplawsky*[1]; Richard Michi[1]; Lawrence Allard[1]; Sumit Bahl[1]; Dongwon Shin[1]; Alex Plotkowski[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

10:50 AM
Additive Manufacturing of Highly-reinforced Metal Matrix Composites: *Ethan Parsons*[1]; [1]MIT Lincoln Laboratory

11:10 AM
New Feedstock Design for Additive Manufacturing Using a Commercial Alloy Powder Mixture: *Daozheng Li*[1]; Wei Xiong[1]; [1]University of Pittsburgh

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MATERIALS PROCESSING

Advanced Characterization of High-temperature Alloys: Phase Evolution during Manufacturing and Service-induced Deformation — Deformation Determined In-service Performance

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

Program Organizers: Katerina Christofidou, University of Sheffield; Benjamin Adam, Oregon State University; Stoichko Antonov, Max-Planck Institut für Eisenforschung GmbH; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Paraskevas Kontis, Norwegian University of Science and Technology; Stella Pedrazzini, Imperial College

London; Sophie Primig, University of New South Wales

Tuesday AM | March 21, 2023
29D | SDCC

Session Chairs: Martin Detrois, National Energy Technology Laboratory; Katerina Christofidou, The University of Sheffield

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8:00 AM Invited
Monotonic Mechanical Behavior of a Nickel-based Single Crystal Superalloy with a Bimodal Precipitation: Jérémy Rame[1]; Dominique Eyidi[2]; Anne Joulain[2]; *Jonathan Cormier*[3]; [1]Safran Aircraft Engines; [2]Institut Pprime - University of Poitiers; [3]ENSMA - Institut Pprime - UPR CNRS 3346

8:30 AM Invited
A Microscopy Investigation on the Nucleation and Propagation of Superlattice Stacking Faults in Nickel-based Superalloys: *Fernando Leon-Cazares*[1]; Regina Schluetter[2]; Francesco Monni[2]; Mark Hardy[3]; Catherine Rae[2]; [1]University of Cambridge and Sandia National Laboratories; [2]University of Cambridge; [3]Rolls-Royce Plc

9:00 AM
The Role of Ru on the Deformation Mechanism of a Single Crystal Superalloy during Thermomechanical Fatigue: *Paraskevas Kontis*[1]; Zhicheng Ge[2]; Guang Xie[2]; Di Wan[1]; Jinghao Xu[3]; Mikael Segersäll[3]; Viktor Norman[3]; Johan Moverare[3]; Jian Zhang[2]; [1]Norwegian University of Science and Technology; [2]Institute of Metal Research; [3]Linköping University

9:20 AM
Variations in Formers and Refractory Elements for Enhanced Creep Resistance and Phase Stability of Alloy 282: *Martin Detrois*[1]; Stoichko Antonov[1]; Chantal Sudbrack[1]; Jonathan Poplawsky[2]; Paul Jablonski[1]; [1]National Energy Technology Laboratory; [2]Oak Ridge National Laboratory

9:40 AM Break

10:00 AM Invited
Comparison of Laboratory-generated and Ex-service Fractography for a 4th Generation Single Crystal Ni-based Superalloy: *Jane Woolrich*[1]; Simon Gray[2]; Ian Edmonds[1]; Edward Saunders[1]; Catherine Rae[3]; [1]Rolls-Royce; [2]Cranfield University; [3]University of Cambridge

10:30 AM
Creep Assisted Phase Transformation Deformation Mechanisms in Polycrystalline Ni-based Superalloys and Their Impact on the Creep Performance: *Daniel Barba*[1]; Ashton Egan[2]; Satoshi Utada[1]; Yilun Gong[3]; Yuanbo Tang[1]; Veronika Mazanova[2]; Michael Mills[2]; Roger Reed[1]; [1]University of Oxford; [2]The Ohio State University; [3]Max-Planck-Institut für Eisenforschung GmbH

10:50 AM
Superalloys by Computational Optimization: Phase Evolution and Creep Properties: *Tobias Gaag*[1]; Julius Weidinger[1]; Jakob Bandorf[1]; Christopher Zenk[1]; Carolin Körner[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

11:10 AM
High Temperature Creep Properties along Concentration Gradients in Superalloys: *Lukas Haussmann*[1]; Steffen Neumeier[1]; Mathias Göken[1]; [1]FAU Erlangen

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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. Tasan, Massachusetts Institute of Technology; Olivia Jackson, Sandia National Laboratories

Tuesday AM | March 21, 2023
Aqua 311A | Hilton

Session Chairs: Dalton Shadle, Cornell University; Ramamurty Upadrasta, Nanyang Technological University

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8:00 AM Invited
Size Effects and Failure Regimes in Notched Micro-cantilever Beam Fracture: Devashish Rajpoot[1]; Parag Tandaiya[1]; R Lakshmi Narayan[2]; *Ramamurty Upadrasta*[3]; [1]IIT-Bombay; [2]IIT-Delhi; [3]Nanyang Technological University

8:30 AM
Kink Band Formation in Nano Metallic Laminates: *Yifan Zhang*[1]; Rodney McCabe[1]; Miroslav Zecevic[1]; Thomas Nizolek[1]; Nan Li[1]; Ricardo Lebensohn[1]; John Carpenter[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

8:50 AM
Understanding Deformation Behavior in an Al Alloy via Multimodal 3D Characterization: *Andrew Polonsky*[1]; Philip Noell[1]; Julia Deitz[1]; Hojun Lim[1]; John Emery[1]; Kyle Johnson[1]; [1]Sandia National Laboratories

9:10 AM
In Situ Thermomechanical Loading of Nanocrystalline Alloys: Thomas Koenig[1]; Hongyu Wang[2]; Yong Zhu[2]; Ankit Gupta[3]; Alicia Koenig[1]; Garritt Tucker[3]; *Gregory Thompson*[1]; [1]University of Alabama; [2]North Carolina State University; [3]Colorado School of Mines

9:30 AM Break

9:50 AM
Characterization of the Impact of Grain-Neighborhoods on Cyclic Twinning in Magnesium Alloys Using High Energy X-Ray Diffraction: *Duncan Greeley*[1]; Mohammadreza Yaghoobi[1]; Katherine Shanks[2]; Darren Pagan[2]; Veera Sundararaghavan[1]; John Allison[1]; [1]University of Michigan; [2]Cornell High Energy Synchrotron Source

10:10 AM
Effect of Strain Rate on Slip Activation in a Mg-Al alloy by In-situ 3DXRD: *Gaoming Zhu*[1]; Anatoly Shabalin[1]; Ulrich Lienert[1]; Leyun Wang[2]; [1]Deutsches Elektronen-Synchrotron (DESY); [2]Shanghai Jiao Tong University

10:30 AM
Measurement and Modeling of Grain Scale Tensorial Stresses in Notched Zirconium Specimens: 3D-XRD vs CPFE: *Karim Louca*[1]; Katherine Shanks[2]; Darren Pagan[2]; Hamidreza Abdolvand[2]; [1]University of Western Ontario; [2]Cornell High Energy Synchrotron Source (CHESS)

10:50 AM Invited
Extending High Energy Diffraction Microscopy to Track Localized Deformation with an Intragranular Signature during Cyclic Loading: *Dalton Shadle*[1]; Kelly Nygren[2]; Matthew Miller[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron Source

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ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session — Thin Films and Nanostructures for Optoelectronics I

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

Program Organizers: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology

Tuesday AM | March 21, 2023
Aqua E | Hilton

Session Chairs: Gerald Ferblantier, University of Strasbourg, ICube Laboratory, CNRS; Ramana Chintalapalle, University of Texas at El Paso

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8:00 AM Introductory Comments

8:05 AM
Optical Properties of Silicon in the Infrared: *Allyson Tarifa*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

8:25 AM Keynote
Infrared Plasmonics Based on Doped Silicon Nanostructures: *Caroline Bonafos*[1]; Jean-Marie Poumirol[1]; Meiling Zhang[1]; Nicolas Chery[1]; Clément Majorel[2]; Arnaud Arbouet[2]; Hervé Rinnert[3]; Etienne Talbot[4]; Peter Wiecha[5]; Rémi Demoulin[5]; Fuccio Cristiano[5]; G Larrieu[5]; S Kerdiles[6]; P. Acosta-Alba[6]; A Royet[6]; Fabrice Gourbilleau[7]; VincentPaillard[7];[1]CEMES-CNRS;[2]CEMES-CNRS,UniversitédeToulouse;[3]Université de Lorraine, CNRS; [4]GPM-CNRS, Université de Rouen Normandie; [5]LAAS-CNRS, Université de Toulouse; [6]LETI; [7]CIMAP, Normandie Université

9:05 AM
Fabrication and Structure-Optical Property Optimization of Wide Band Gap Oxide Thin Films Made by Pulsed Laser Deposition: *Ramana Chintalapalle*[1]; [1]University of Texas at El Paso

9:25 AM Break

9:40 AM Invited
New Eco-friendly « Chameleon » Inks: *Karine Mougin*[1]; Feriel Ghellal[2]; Guillaume Caffier[3]; Arnaud Spangenberg[1]; [1]CNRS, IS2M; [2]CNRS, IS2M ; Bic Ecriture 2000; [3]Bic Ecriture 2000

10:10 AM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Energy Storage with Battery I

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

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

Tuesday AM | March 21, 2023
32B | SDCC

Session Chairs: Partha Mukherjee, Purdue University; Leon Shaw, Illinois Institute of Technology

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8:00 AM Keynote
Understanding Reactive Metals for Future Batteries - Lithium vs. Sodium: *Shirley Meng*[1]; [1]The University of Chicago

8:30 AM Invited
3D Detailed Modeling Framework of Electrochemo-mechanics Behavior in SiO/Gr Composite Anode for High Energy Density Lithium-ion Battery: Xiang Gao[1]; *Jun Xu*[1]; [1]UNC Charlotte

8:55 AM
Advanced Na-metal Halide Batteries for Long Duration Energy Storage Applications: *Guosheng Li*[1]; [1]Pacific Northwest National Laboratory

9:15 AM
Apparent Microstructurally Induced Phase Separation in Porous LiNiMnCoO2 Cathodes: Abhas Deva[1]; *Edwin Garcia*[1]; [1]Purdue University

9:35 AM Break

9:55 AM
Application of Electrodeposited Zinc Thin Film to Anode of Zn-Ni Secondary Battery for Thousands of Charge-Discharge Cycles: *Masatsugu Morimitsu*[1]; Yusuke Tachida[1]; Mayu Yasuda[1]; Takuya Kuruma[2]; Kyohei Yamaguchi[2]; Hiroki Sawamoto[2]; [1]Doshisha University; [2]Mitsui Mining & Smelting Co., Ltd.

10:15 AM Keynote
Challenges of ASSB development for Future Electric Vehicle Application: Toshikazu Kotaka[1]; Koichiro Aotani[1]; Yuichi Aihara[1]; *Balachandran Radhakrishnan*[2]; Shigemasa Kuwata[2]; [1]Nissan Motor Co., Ltd.; [2]Alliance Innovation Lab in Silicon Valley, Nissan North America Inc.

10:45 AM Invited
Elucidating the Governing Forces Behind Chemo-Mechanical Instabilities in Electrodes for Alkali Metal-ion Batteries: *Omer Ozgur Capraz*[1]; [1]Oklahoma State University

11:10 AM Invited
Enabling High-energy-density Cathodes by Coupling Electrochemistry and Mechanics across Length Scales: *Scott Roberts*[1]; Jeffrey Horner[1]; [1]Sandia National Laboratories

11:35 AM Invited
Multiphysics Models for Understanding and Enhancing Cycle and Calendar Life of Silicon-rich Lithium-ion Batteries: *Ankit Verma*[1]; Peter Weddle[1]; Andrew Colclasure[1]; [1]National Renewable Energy Laboratory

BIOMATERIALS

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

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

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

Tuesday AM | March 21, 2023
Sapphire 400B | Hilton

Session Chair: Md Shahriar, Texas Tech University

8:00 AM Invited
Electrohydrodynamic 3D Printing of Aqueous Solutions: *Ander Reizabal*[1]; [1]BCMaterials - Basque Center for Materials, Applications and Nanostructures

8:30 AM
Development of Propolis Modified Scaffolds for Tissue Engineering: *Alex Ossa*[1]; Alejandro Pelaez[2]; Claudia Garcia[3]; [1]Universidad Eafit; [2]Universidad Cooperativa de Colombia; [3]Universidad Nacional de Colombia

8:50 AM
Effects of Corona Treatment on Cellular Attachment and Morphology on Polydimethylsiloxane Micropillar Substrates: *Md Shahriar*[1]; Eduardo Pena[1]; Jiachen Liu[1]; Zhengyi Zhang[2]; Changxue Xu[1]; [1]Texas Tech University; [2]Huazhong University of Science and Technology

9:10 AM
Fabrication of Hierarchically Porous 316L Stainless Steel Scaffolds by Freeze Casting and 3D-printed Sacrificial Templating Techniques: *Cheng Tsai*[1]; Kuan-Cheng Lai[1]; Haw-Kai Chang[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

9:30 AM Break

9:50 AM
High Speed and High-Resolution 3D Printing of Self-healing and Ion-conductive Hydrogels via μCLIP: *Wenbo Wang*[1]; Siying Liu[1]; Luyang Liu[1]; Xiangfan Chen[1]; [1]Arizona State University

10:10 AM
Inkjet Bioprinting of Cell-laden Biomaterials for Constructing 3D Multicell and Multimaterial Scaffolds: *Dengke Zhao*[1]; Jun Yin[1]; [1]Zhejiang University

10:30 AM
Cell-Laden Bioink Circulation-Assisted Inkjet-Based Bioprinting to Mitigate Cell Sedimentation and Cell Aggregation: *Jiachen Liu*[1]; Md Shahriar[1]; Changxue Xu[1]; [1]Texas Tech University

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ENERGY & ENVIRONMENT

Advances in Magnetic Materials — Rare-earth Lean Permanent Magnets

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

Committee

Program Organizers: Jose Maria Porro, Bcmaterials; Huseyin Ucar, California Polytechnic University,Pomona; Patrick Shamberger, Texas A&M University; Min Zou, Lab Magnetics, A Quadrant Company; Gaoyuan Ouyang, Ames Laboratory; Alex Leary, NASA Glenn Research Center

Tuesday AM | March 21, 2023
33A | SDCC

Session Chair: Huseyin Ucar, California Polytechnic University, Pomona

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8:00 AM Invited
Enhanced Powder-Processed Alnico Magnets by Novel Solid-State Engineering of the Microstructure and Nanostructure: *Iver Anderson*[1]; Emily Rinko[1]; Wei Tang[1]; Matthew Kramer[1]; Nicolas Argibay[1]; [1]Iowa State University Ames Laboratory

8:30 AM
Denitrogenation Process in ThMn12 Nitride by In Situ Neutron Powder Diffraction: *Jose Maria Porro*[1]; Alex Aubert[2]; Ines Puente-Orench[3]; Sorana Luca[4]; Jose Javier S. Garitaonandia[5]; Jose Manuel Barandiaran[5]; George C. Hadjipanayis[6]; [1]BCMaterials & Ikerbasque; [2]TU Darmstadt; [3]Institut Laue Langevin; [4]Univ. Grenoble Alpes, CEA LITEN; [5]University of the Basque Country (UPV/EHU); [6]University of Delaware

8:50 AM
Enhancing Stability and Magnetism of ThMn12-type Cerium-iron Intermetallics by Site Substitution: Churna Bhandari[1]; *Durga Paudyal*[1]; [1]Ames Laboratory

9:10 AM
Development of the Sintered (NdMM)-(FeCo)-B Based Magnets Substituted Nd by Less Critical Rare Earth (MM= La, Ce): *Wei Tang*[1]; Harshida Parmar[1]; Jing Wang[1]; Xubo Liu[1]; Ikenna Nlebedim[1]; Ryan Ott[1]; Scott McCall[2]; David Parker[3]; Jun Cui[1]; [1]Ames National Laboratory; [2]Lawrence Livermore National Laboratory; [3]Oak Ridge National Laboratory

9:30 AM Break

9:50 AM Invited
Grain Boundary Engineering for High Performance Heavy Rare-Earth Free Permanent Magnets: *Matthew Kramer*[1]; Wei Tang[1]; Gaoyuan Ouyang[1]; Jun Cui[1]; Iver Anderson[1]; [1]Ames Laboratory

10:20 AM
Towards One-step Castable Cerium-based Gap Magnet: *Andriy Palasyuk*[1]; Arne Swanson[1]; Matthew Besser[1]; [1]Ames Laboratory

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Structures and Characterization

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao

Wang, Globus Medical

Tuesday AM | March 21, 2023
Aqua D | Hilton

Session Chairs: Tirumalai Srivatsan, The University of Akron; Mitra Taheri, Johns Hopkins University

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8:00 AM Invited
Chemical Short-range Order in Multi-principal Element Alloys: *Takeshi Egami*[1]; [1]University of Tennessee

8:20 AM Invited
Role of Local Chemical Order on Phase Stability and Passivation in High Entropy Alloys: *Elaf Anber*[1]; Debashish Sur[2]; Daniel Foley[1]; Diana Farkas[3]; Peter Liaw[4]; John Scully[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]University of Virginia; [3]Virginia Tech; [4] university of tennessee

8:40 AM Invited
Uncovering Unique Multi-Principal Element Alloy Properties Using Atom Probe Tomography: *Jonathan Poplawsky*[1]; Ying Yang[1]; Xing Wang[2]; Rui Feng[1]; [1]Oak Ridge National Laboratory; [2]Penn State University

9:00 AM Invited
Study of Microstructural Evolution of Two Magnesium-based Multi-element High Entropy Alloys: *Srivatsan Tirumalai*[1]; Khin Tun[1]; Manoj Gupta[1]; [1]The University of Akron

9:20 AM Invited
Microstructural Evolution and Deformation Mechanisms in Compositionally Complex Alloys: Zachary Kloenne[1]; Jean-Philippe Couzinié[2]; Gopal Viswanathan[1]; William Clark[1]; Yunzhi Wang[1]; *Hamish Fraser*[1]; [1]Ohio State University; [2]Univ. Paris Est Creteil, CNRS

9:40 AM Break

10:00 AM Invited
Structure-induced Local Lattice Distortions in a Refractory High-entropy Alloy: *Jian Min Zuo*[1]; Haw-Wen Hsiao[1]; [1]University of Illinois

10:20 AM Invited
Powder Properties Characterization of Al0.1CoCrFeNi High-Entropy Alloy Fabricated by Gas Atomization Process: Sung-Jae Jo[1]; Min-Woo Shin[1]; Ji-Woon Lee[1]; Kwangtae Son[2]; Andy Fan[2]; Baldur Steingrimsson[3]; Peter Liaw[4]; *Soon-Jik Hong*[1]; [1]Kongju National University(CAMP2); [2]Oregon State University; [3]Imagars LLC, ; [4]University of Tennessee

10:40 AM Invited
Defect Detection and Characterization of Additively Manufactured Al0.1CoCrFeNi High Entropy Alloy: *Kwangtae Son*[1]; Andy Fan[1]; Baldur Steingrimsson[2]; Peter Liaw[3]; Soon-Jik Hong[4]; Ji-Woon Lee[4]; [1]Oregon State University; [2]Imagars LLC; [3]University of Tennessee, Knoxville; [4]Kongju National University

11:00 AM
Characterizing Deformation Mechanisms in BCC/B2 Refractory Multi-principal Element Alloys via a Model BCC/B2 Alloy in the Fe-Al-Ni System: *Bryan Crossman*[1]; Milan Heczko[1]; Veronika Mazanova[1]; Junxin Wang[1]; Julian Brodie[1]; Loic Perriere[2]; Jean-Philippe Couzinie[2]; Michael Mills[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University; [2]Institute of Chemistry and Materials Science (ICMPE)

11:20 AM Invited
Lattice Distortion and Phase Transitions in AlxCoCrFeNi HEAs under Pressure: *Qiaoshi Zeng*[1]; [1]Hpstar

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MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Advances in Ceramic Materials and Processes I

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Tuesday AM | March 21, 2023
30A | SDCC

Session Chair: Bowen Li, Michigan Technological University

8:00 AM Introductory Comments

8:05 AM
Development of High Voltage Multilayer Ceramic Capacitor: *Hyungsuk Kim*[1]; [1]Hyundai Motors

8:25 AM
Magnetron Sputtering of Ti3AlC2 MAX Phase Coating on Carbon Nanofiber and Its Electrochemical Performance: *Shuang Song*; Xiang Wang[1]; Xunrui Wang[2]; Jinhong Li[2]; [1]State Key Laboratory of Multiphase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences; [2]School of Materials Science and Technology, China University of Geosciences

8:45 AM
CeO2-x Nanorods as Effective Cathode Host Materials in Li-S Batteries: *Zhen Wei*[1]; Sakibul Azam[1]; Randeja Warren[1]; Dariya Jones[1]; Zephyr Barlow[1]; Ruigang Wang[1]; [1]University of Alabama

9:05 AM
Ceramic Additive Manufacturing: Applications in High-Temperature Electronics: Bhargavi Mummareddy[1]; *Pedro Cortes*[1]; [1]Youngstown State University

9:25 AM Break

9:45 AM
Development of an Experimentally Derived Model for Molybdenum Carbide (Mo2C) Synthesis in a Fluidized-bed Reactor: *Maureen Chorney*[1]; Jerome Downey[1]; K. V. Sudhakar[1]; [1]Montana Technological University

10:05 AM
Effects of Temperature on Domain Wall Mobility in Single Crystal BaTiO3: *Quinten Yurek*[1]; Jessica Krogstad[1]; [1]University of Illinois at Urbana-Champaign

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MATERIALS PROCESSING

Advances in Pyrometallurgy: Developing Low Carbon Pathways — Hydrogen

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

Program Organizers: Camille Fleuriault, Eramet Norway; Joalet Steenkamp, XPS Glencore; Dean Gregurek, RHI Magnesita; Jesse White, KTH Royal Institute of Technology; Quinn Reynolds, Mintek; Phillip Mackey, P.J. Mackey Technology, Inc.; Lina Hockaday, Curtin University, WASM

Tuesday AM | March 21, 2023
29B | SDCC

Session Chairs: Quinn Reynolds, MINTEK; Jesse White, KTH Royal Institute of Technology

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8:00 AM Invited
Hydrogen, a Promising Carbon Substitute in Metallurgy?: *Juergen Antrekowitsch*[1]; [1]University of Leoben

8:30 AM Invited
Use of H2 in Mn-ferroalloy Production: *Merete Tangstad*[1]; Trygve Schanche[1]; Faan Du Preez[2]; [1]Norwegian University of Science and Technology; [2]North West University

9:00 AM Invited
Development of Fossil Free Technologies for the Metallurgical Industry – Swerim Pilot and Industrial Experiences: *Guozhu Ye*[1]; Ida Heintz[1]; Elsayed Mousa[1]; [1]Swerim

9:30 AM Break

9:50 AM
Investigation of High-H2 Reducing Gas Delivery through Shaft-level Tuyeres with Computational Fluid Dynamics: *Tyamo Okosun*[1]; Samuel Nielson[1]; Orlando Ugarte[1]; Chenn Zhou[1]; [1]Purdue University Northwest

10:10 AM
Hydrogen Plasma Reduction of Iron Oxides: *Dierk Raabe*[1]; Hauke Springer[1]; Isnaldi Souza Filho[1]; Yan Ma[1]; [1]Max-Planck Institute

10:30 AM
Hydrogen Plasma Reduction of Metal Oxides: *Halvor Dalaker*[1]; Even Hovig[1]; [1]Sintef

10:50 AM
Hydrogen-based Direct Reduction of Iron Oxides: *Dierk Raabe*[1]; Hauke Springer[1]; Yan Ma[1]; Isnaldi Souza Filho[1]; [1]Max-Planck Institute

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MATERIALS DESIGN

Advances in Titanium Technology — Session III

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Tuesday AM | March 21, 2023

Cobalt 500 | Hilton

Session Chair: Stoichko Antonov, National Energy Technology Laboratory

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8:00 AM Invited
Tuning the Reversibility of Stress-induced Martensitic Transformation in β-metastable Titanium Alloys by Low Temperature Heat Treatment: *Philippe Castany*[1]; Gaëtan Cabon[1]; Doïna Gordin[1]; Thierry Gloriant[1]; [1]INSA Rennes

8:30 AM Invited
Caracterisation of the Microstructure and the Plastic Deformation in Ti-6al-4v Produced via Directed Energy Deposition: Silvia Lopez-Castaño[1]; *Florence Pettinari-Sturmel*[2]; Samuel Hemery[3]; Patrick Villechaise[3]; Philippe Emile[4]; Claude Archambeau[4]; Joël Douin[2]; [1]AIRBUS; [2]CEMES - Université de Toulouse; [3]Pprime Institut, ENSMA - CNRS; [4]AIRBUS Operation S.A.S.

9:00 AM
Mechanisms of Grain Boundary Precipitation in the Metastable -Titanium Ti-5Al-5Mo-5V-3Cr: *Stoichko Antonov*[1]; T.S. Prithiv[2]; Zachary Kloenne[3]; Yufeng Zheng[4]; Rongpei Shi[5]; Hamish Fraser[3]; Baptiste Gault[2]; [1]National Energy Technology Laboratory; [2]Max-Planck-Institut fur Eisenforschung GmbH; [3]The Ohio State University; [4]University of Nevada Reno; [5]Harbin Institute of Technology (Shenzhen)

9:20 AM Break

9:40 AM
Suppression of -phase Formation in Prototypical Metastable -Ti Alloys: *Martin Luckabauer*[1]; Florian Brumbauer[2]; Wolfgang Sprengel[2]; Norihiko L Okamoto[3]; Tetsu Ichitsubo[3]; [1]University of Twente; [2]Graz University of Technology; [3]Institute for Materials Research, Tohoku University

10:00 AM
Effect of Loading Rate and Applied Potential on the Environment-assisted Cracking Behavior of ST/A Beta-C Titanium Exposed to Marine Environments: *Zachary Harris*[1]; James Burns[2]; [1]University of Pittsburgh; [2]University of Virginia

10:20 AM
Investigation of Fine-scaled Alpha Microstructure in Metastable Beta Titanium Alloys: *Deepak Pillai*[1]; Ahsan Habib Munna[1]; Cameron Tucker[1]; Dian Li[1]; Yufeng Zheng[1]; [1]University of Nevada Reno

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MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Tuesday AM | March 21, 2023
Cobalt 520 | Hilton

Session Chair: Ashley Spear, University of Utah

8:00 AM
Adversarial Hierarchical Variational Autoencoder: A Novel Autoencoder Architecture for Microstructure Synthesis and Feature Extraction: *Simon Mason*[1]; Mengfei Yuan[2]; Ashley Lenau[1]; Octavian Donca[1]; Dennis Dimiduk[3]; Steve Niezgoda[1]; [1]Ohio State University; [2]Ping An Insurance; [3]BlueQuartz Software LLC

8:20 AM
Automated Classification of Powder X-ray Diffraction Data Using Deep Learning: *Jerardo Salgado*[1]; Zhaotong Du[1]; Samuel Lerman[1]; Chenliang Xu[1]; Niaz Abdolrahim[1]; [1]University of Rochester

8:40 AM
Comparison of U-Net and Mask R-CNN Neural Network for Detection of Helium Bubbles and Voids in Nuclear Reactor Materials: *Shradha Agarwal*[1]; Sydney Copp[2]; July Reyes[2]; Steven Zinkle[1]; [1]University of Tennessee and Oak Ridge National Laboratory; [2]University of Tennessee

9:00 AM
Computer Vision Assisted Automated Grain Segmentation and High-Throughput Composition Analysis with Scanning Electron Transmission Microscopy: *Doruk Aksoy*[1]; Jenna Wardini[1]; Timothy Rupert[1]; William Bowman[1]; [1]University of California, Irvine

9:20 AM
Weakly-Supervised Segmentation of Microstructure Images with Deep Convolutional Neural Networks: *Bo Lei*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

9:40 AM Break

10:00 AM
Utilizing and Understanding Deep Learning for 3D Microstructure Synthesis: *Neal Brodnik*[1]; Devendra Jangid[1]; McLean Echlin[1]; B. S. Manjunath[1]; Samantha Daly[1]; Tresa Pollock[1]; [1]University of California Santa Barbara

10:20 AM
Physics-Based Deep Learning Methods for Enforcing Stress Equilibrium in GAN Generated Stress Fields: *Ashley Lenau*[1]; Dennis Dimiduk[2]; Stephen Niezgoda[1]; [1]Ohio State University; [2]BlueQuartz Software LLC

10:40 AM
Generation of 3D Synthetic Polycrystalline Microstructures using Gaussian Random Fields and Two Point Spatial Correlations: *Michael Buzzy*; Andreas Robertson[1]; Surya Kalidindi[1]; [1]Georgia Institute of Technology

11:00 AM
Synthetic Data Development towards Automated Defect Detection of Irradiated Materials: *Matt Lynch*[1]; Priyam Patki[1]; Ryan Jacobs[2]; Steven Chen[1]; Gabriella Bruno[1]; Dane Morgan[2]; Kevin Field[1]; [1]University of Michigan - Ann Arbor; [2]University of Wisconsin - Madison

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MATERIALS DESIGN

Alloy Behavior and Design Across Length-Scales: An SMD Symposium Honoring Easo George — Small-Scale Mechanical Behavior and Alloy Modeling

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

Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Michael Mills, Ohio State University; George Pharr, Texas A&M University; Robert Ritchie, University of California, Berkeley; Muralidharan Govindarajan, Oak Ridge National Laboratory

Tuesday AM | March 21, 2023
Cobalt 502B | Hilton

Session Chair: George Pharr, Texas A&M University

8:00 AM Invited
Easo George – Advancing Understanding of Mechanical Behavior through Test Material Preparation: *William Nix*[1]; [1]Stanford University

8:30 AM Invited
Ambient-temperature Plasticity of Brittle Intermetallics at Micron-meter Size Scales: *Haruyuki Inui*[1]; Kyosuke Kishida[1]; [1]Kyoto University

9:00 AM Invited
Theory-guided Design of High-strength, Ductile, Single-phase BCC High Entropy Alloys: *William Curtin*[1]; You Rao[1]; Carolina Baruffi[1]; Anthony De Luca[2]; Christian Leinenbach[2]; [1]Epfl Sti Igm Lammm; [2]EMPA

9:30 AM Break

9:50 AM Invited
The Interplay between Phase Transformation and Mechanical Properties in High Entropy Alloys: *Maryam Ghazisaeidi*[1]; [1]The Ohio State University

10:20 AM Invited
Deformation Twinning in HCP Ti: The Role of Interfacial Complexions and Interstitial Solutes: Mohammad Hooshmand[1]; Buyu Zhang[2]; Enze Chen[2]; Timofey Frolov[3]; Ruopeng Zhang[4]; Yan Chong[4]; Andrew Minor[2]; *Mark Asta*[2]; [1]University of California, Berkeley; [2]University of California, Berkeley; Lawrence Berkeley National Laboratory; [3]Lawrence Livermore National Laboratory; [4]Lawrence Berkeley National Laboratory

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ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications XI — Session III

Sponsored by: TMS Functional Materials Division, TMS Structural 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; Wan-Ting Chiu, Tokyo Institute of Technology; Chenguang Fu, Zhejiang University

Tuesday AM | March 21, 2023
Sapphire A | Hilton

Session Chairs: Yi-Fen Tsai, National Yang Ming Chiao Tung University; I-Lun Jen, National Yang Ming Chiao Tung University

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8:00 AM Invited
Bi2Te3 Based Compounds Made via Mechanical Alloying: Defect Chemistry and Phase Diagram: *Franck Gascoin*[1]; Amélie Galodé[1]; [1]Cnrs Crismat Unicaen

8:20 AM Invited
Enhancement of Phonon Scattering in Thermoelectric Half-Heusler Compounds by Non-equilibrium Synthesis: *Ran He*[1]; [1]IFW-Dresden

8:40 AM
Influence of Connectivities and Length Scales of Eutectic Alloys on Thermoelectric Properties: Panithi Sireesha[1]; Shriparna Mukherjee[1]; *Shanmukha Kiran Aramanda*[1]; Kamanio Chattopadhyay[1]; [1]Indian Institute of Science

9:00 AM Invited
Young Leaders International Scholar – JIM: Discovery of Triple Half-Heusler with Low Thermal Conductivity: *Kazuki Imasato*[1]; Philipp Sauerschinig[1]; Shashwat Anand[2]; Takao Ishida[1]; Atsushi Yamamoto[1]; Michihiro Ohta[1]; [1]National Institute of Advanced Industrial Science and Technology; [2]Lawrence Berkeley National Laboratory

9:30 AM Break

9:50 AM Invited
Doping as a Tuning Mechanism for Magneto-thermoelectric Effects to Improve zT in Weyl Semimetals: *Sarah Watzman*[1]; [1]University of Cincinnati

10:10 AM Invited
Carrier Concentration Adjustment and Texturation Processing on Thermoelectric Silicide: *David Berthebaud*[1]; [1]French National Center for Scientific Research

10:30 AM
Order-disorder Transitions in Zr-doped NbCoSn Heusler Alloys Enable Tunable n-p Transitions: *Nathan Johnson*[1]; [1]Stanford University

10:50 AM
In-situ Creep Deformation Electrical Conductivity Measurement of I-doped PbTe: *Muath Almalki*[1]; Yukun Liu[1]; James Male[1]; Vinayak Dravid[1]; David Dunand[1]; G. Jeffrey Snyder[1]; [1]Northwestern University

11:10 AM
Enhanced Mechanical Properties of Ti-rich Medium Entropy Alloys via Phase Diagram Engineering: *Wen-Chi Yang*[1]; Ping-Yuan Deng[1]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University

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LIGHT METALS

Aluminum Alloys, Characterization and Processing — Processing and Heat Treatment II

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek, Kensington Technology Inc.

Tuesday AM | March 21, 2023
32A | SDCC

Session Chair: Warren Poole, University of British Columbia

8:00 AM
The Effect of Octagonal Ingot Shape on AA6xxx Hot Rolling Performance: *Joshua Lawalin*[1]; Pascal Gauthier[2]; Tao Wang[2]; [1]Commonwealth Rolled Products; [2]Rio Tinto Aluminum

8:25 AM
The Low-carbon Production of Wrought Aluminum Alloys based on Post-consumer Scrap: Varuzan Kevorkijan[1]; Sandi Žist[1]; *Matjaz Godec*[2]; [1]Impol R in R d.o.o.; [2]Institute of Metals and Technology

8:50 AM
Reducing the Inclusion Levels in Aluminum: *Bader Almuhana*[1]; Abdullah Alqarni; [1]Ma'aden Aluminum

9:15 AM
Effect of Iron and Manganese Content on Microstructure and Mechanical Properties of AlSi11 Alloy in Wheels Produced by LPDC-process: *Sergey Matveev*[1]; Dmitry Moiseev[1]; Tatyana Bogdanova[2]; Roman Vakhromov[1]; Aleksandr Krokhin[3]; [1]Light Materials and Technologies Institute UC RUSAL; [2]LMZ SCAD LLC; [3]JSC RUSAL Management

9:40 AM Break

9:55 AM
Shear Assisted Processing and Extrusion of Unhomogenized Aluminum Alloy 6063 Castings with High Iron Content: Scott Whalen[1]; Nicole Overman[1]; *Brandon Taysom*[1]; Md. Reza-E-Rabby[1]; Timothy Skszek[1]; Massimo DiCiano[2]; [1]Pacific Northwest National Laboratory; [2]Magna International, Inc.

10:20 AM
Solutionization via Severe Plastic Deformation: Effect on Natural Aging in an Al-Mg-Si-(Mn) Alloy: *Brian Milligan*[1]; B. Scott Taysom[1]; Xiaolong Ma[1]; Scott Whalen[1]; [1]Pacific Northwest National Laboratory

10:45 AM
Manufacture of Nano-to-Micron-scale Tic Particulate Reinforced Aluminium Composites By Ultrasound-assisted Stir Casting: *Guangyu Liu*[1]; Abdallah Abu Amara[1]; Dmitry Eskin[1]; Brian McKay[1]; [1]Brunel University London

11:10 AM
Effect of Mn Content on Quench Sensitivity on 6082 Alloys: Emrah Ozdogru[1]; Aleyna Gümüsoy[1]; Hilal Colak[1]; *Isik Kaya*[1]; [1]TRI Metalurji A.S.

LIGHT METALS

Aluminum Waste Management and Utilization — Aluminum Waste Management and Utilization

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

Program Organizers: Pernelle Nunez, International Aluminium Institute; Lavinya Kugaswaran, International Aluminium Institute

Tuesday AM | March 21, 2023
31A | SDCC

Session Chair: Miles Prosser, International Aluminium Institute

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8:55 AM Introductory Comments

9:05 AM
Recovery of Value Added Products from Bauxite Residue: *Himanshu Tanvar*[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

9:30 AM Invited
Current Status and Proposed Economic Incentives for Higher Utilization of Bauxite Residue to Enhance Sustainability of the Aluminum Industry: *Subodh Das*[1]; Muntasir Shahabuddin[2]; [1]Phinix LLC; [2]Worcester Polytechnic Institute

9:55 AM Invited
Aluminium Bahrain (Alba) SPL Sustainable Solution from Landfill to Valuable Feedstock "HiCal30": *Nabeel Aljallabi*[1]; Khalid Ahmed Shareef[1]; Bernie Cooper[2]; Mohsen Qaidi Ghulam[1]; Fuad A. Hussain Alasfor[1]; Vijay Rajendran[1]; [1]Aluminium Bahrain Bsc; [2]Regain Technologies

10:20 AM Break

10:35 AM
Valorization of Treated Spent Potlining in Cement Industry: *Laurent Birry*[1]; Jean Lavoie[1]; Victor Brial[2]; Claudiane Ouellet-Plamondon[2]; Hang Tran[3]; Luca Sorelli[3]; David Conciatori[3]; [1]Rio Tinto Aluminium; [2]Ecole de Technologie Superieure, Montreal; [3]Universite Laval, Quebec

11:00 AM
Aluminum Recycling and Recovery of Other Components from Waste Tetra Pak Aseptic Packages: Ilgm Baltaci[1]; *Selcuk Kan*[1]; Ahmet Turan[2]; Onuralp Yücel[1]; [1]Istanbul Technical University; [2]Yeditepe University

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BIOMATERIALS

Biological Materials Science — Biological Materials Science III

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

Tuesday AM | March 21, 2023
Sapphire 402 | Hilton

Session Chairs: Li Ling, Virginia Polytechnic Institute; Claire Acevedo, University of Utah

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8:00 AM
Mechanics of Bioinspired Hierarchical Tape-springs: Kristiaan Hector[1]; Phani Saketh Dasika[1]; Adwait Trikanada[1]; Nilesh Mankame[2]; Wei Huang[3]; Jesus Rivera[3]; David Restrepo[4]; David Kisailus[3]; *Pablo Zavattieri*[1]; [1]Purdue University; [2]General Motors Research and Development; [3]University of California, Irvine; [4]Purdue University/University of Texas

8:20 AM
Real-time Investigations of Tensile and Fracture Behavior of Fibers from the Venus Flower Basket (*Euplectella Aspergillum***)**: *Swapnil Morankar*[1]; Yash Mistry[2]; Dhruv Bhate[2]; Clint Penick[3]; Nikhilesh Chawla[1]; [1]Purdue University; [2]Arizona State University; [3]Kennesaw State University

8:40 AM
Relationship between Structure, Material Property and Function in Locust Cuticle: *Chuchu Li*[1]; Hamed Rajabi[2]; Stanislav Gorb[1]; [1]Functional Morphology and Biomechanics, Institute of Zoology, Kiel University; [2]Division of Mechanical Engineering & Design, School of Engineering, London South Bank University, London, UK

9:00 AM Invited
Unraveling the Mystery of Mammalian Enamel Microstructure: Carli Marsico[1]; Cameron Renteria[1]; Jack Grimm[1]; Donna Guillen[1]; Susana Estrada[1]; Julians Fernández-Arteaga[1]; E. Alex Ossa[1]; *Dwayne Arola*[1]; [1]University of Washington

9:30 AM Break

9:50 AM
Finite Element Analyses of Cracks in Lateral Incisors under Quantitative Percussion Conditions: *Omid Komari*[1]; Jie Shen[1]; Cherilyn Sheets[2]; James Earthman[1]; [1]University of California, Irvine; [2]Newport Coast Oral Facial Institute

10:10 AM
Notched 3D Printed Replica Teeth for In Vitro Characterization of Dental Cracks with Quantitative Percussion Diagnostics: *Jie Shen*[1]; Haocheng Yang[1]; Cherilyn Sheets[2]; James Earthman[1]; [1]University of California Irvine; [2]Newport Coast Oral Facial Institute

10:30 AM
Micromechanical Investigations of the Remarkable Damage Tolerance in Tooth-enamel of Hadrosaurid Dinosaurs: *Soumya Varma*[1]; Sid Pathak[1]; Gregory Erickson[2]; Brandon Krick[2]; Jakob Schwiedrzik[3]; Johann Michler[3]; Arun Devaraj[4]; Michael Thompson[5]; [1]Iowa State University; [2]Florida State University; [3]EMPA; [4]Pacific Northwest National Laboratory; [5]Los Alamos National Laboratory

10:50 AM
A Novel Glass-based Material for Vital Pulp Therapy: Biocompatibility and Physiochemical Properties: *Jerry Howard*[1]; Krista Carlson[1]; John Colombo[2]; [1]University of Nevada, Reno; [2]University of Nevada, Las Vegas

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SPECIAL TOPICS

Bladesmithing 2023 — Bladesmithing I

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

Program Organizers: Samuel Wagstaff, Oculatus Consulting; David Sapiro, USNC-Tech

Tuesday AM | March 21, 2023
Sapphire I | Hilton

Session Chairs: Samuel Wagstaff, Oculatus Consulting; David Sapiro, Ultra Safe Nuclear

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8:00 AM Introductory Comments

8:05 AM Keynote
Reverse Engineering of Historical Swords: *David Sapiro*[1]; [1]Schonpiro Materials

8:45 AM
Aggie Frontier Knife: *Berkeley Rhoads*[1]; Charles Schmidt[1]; [1]Texas A&M

9:05 AM
The Pegasus: *Arjav Singh*[1]; Nandagopal P[1]; [1]IIT Madras

9:25 AM Break

9:45 AM
Material Characterization of Medieval Dagger: *Kira Martin*[1]; Abby Sreden[1]; Adam Slafsky[1]; Bailey Wooldridge[1]; [1]University of Illinois Urbana-Champaign

10:05 AM
The Zhànshi Jian: *Jin Kim*[1]; [1]University of North Texas

10:25 AM
Bladesmithing from a Modern Standpoint with Historical Regards: *Hans Pommerenke*[1]; Jeremiah Cohn[1]; Logyn Siders[1]; Michael Fritzmaurice[1]; [1]Missouri University of Science and Technology

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Structural Dynamics and Local Strains

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

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

Tuesday AM | March 21, 2023
Aqua C | Hilton

Session Chair: Robert Maass, Federal Institute of Materials Research and Testing (BAM)

8:00 AM Invited
A Spatially Resolved View on Heterogeneous Dynamics in Metallic Glasses: *Gerhard Wilde*[1]; [1]University of Muenster

8:20 AM Invited
Pressure Dependence of the Collective Motion in Metallic Glasses Studied with Coherent X-rays: *Beatrice Ruta*[1]; Antoine Cornet[1]; [1]Univ Lyon 1 and CNRS

8:40 AM
Long-time Structural Evolution of Metallic Glasses: *Robert Maass*[1]; Birte Riechers[2]; Amlan Das[3]; Zengquan Wang[2]; Eric Dufresne[4]; Peter Derlet[5]; [1]Federal Institute of Materials Research and Testing (BAM), University of Illinois at Urbana-Champaign; [2]Federal Institute of Materials Research and Testing (BAM); [3]Cornell High Energy Synchrotron Source; [4]Advanced Photon Source, Argonne National Laboratory; [5]Condensed Matter Theory Group, Paul Scherrer Institut

9:00 AM
Low-temperature Relaxation and Crystallization Processes in Metallic Glasses: *Dmitri Louzguine*[1]; [1]WPI-AIMR, Tohoku University

9:20 AM
Origin of -relaxation in Metallic Liquids: *Chae Woo Ryu*[1]; Takeshi Egami[1]; [1]University of Tennessee

9:40 AM Break

10:00 AM Invited
Non-affine Strains in Glassy Solids: *Wojciech Dmowski*[1]; Chae Woo Ryu[1]; Hui Wang[1]; Takeshi Egami[1]; [1]University of Tennessee

10:20 AM
Stress-strain Measurements on Cyclically Sheared Colloidal Glasses: *J. Zsolt Terdik*[1]; David Weitz[1]; Frans Spaepen[1]; [1]Harvard University

10:40 AM
Local Strain Analysis by 4D-STEM on Zr50Cu40Al10 Subjected to High Pressure Torsion: *Katsuaki Nakazawa*[1]; Sangmin Lee[1]; Kazutaka Mitsuishi[1]; Shinji Kohara[1]; Koichi Tsuchiya[1]; [1]National Institute for Materials Science

11:00 AM
Structural Symmetry of Medium Range Ordering in Metallic Glasses Revealed by Angular Correlation Analysis of 4D-STEM Nanodiffraction: Gabriel Calderon[1]; Jiyoung Kim[2]; Geun-Hee Yoo[2]; Chaoyi Liu[3]; Soohyun Im[4]; Minhazul Islam[1]; Yue Fan[3]; Eun Soo Park[2]; *Jinwoo Hwang*[1]; [1]Ohio State University; [2]Seoul National University; [3]University of Michigan; [4]University of Wisconsin Madison

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LIGHT METALS

Cast Shop Technology — Furnace Operations and Recycling

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

Program Organizers: Halldor Gudmundsson, Century - Nordural; Stephan Broek, Kensington Technology Inc.

Tuesday AM | March 21, 2023
31C | SDCC

Session Chair: Luke Mackenzie, HATCH

8:00 AM
Hydrogen Absorption of Aluminum-magnesium Melts from Humid Atmospheres: *Stefan Tichy*[1]; Philip Pucher[2]; Bernd Prillhofer[2]; Stefan Wibner[1]; Helmut Antrekowitsch[1]; [1]University of Leoben; [2]AMAG casting GmbH

8:25 AM
Influence of Cryolite Content on the Thermal Properties and Coalescence Efficiency of NaCl-KCl Salt Flux: Veronica Milani[1]; *Alicia Vallejo Olivares*[2]; Gabriella Tranell[2]; Giulio Timelli[1]; [1]University of Padova; [2]Norwegian University of Science and Technology

8:50 AM
Oxidation Study of Al-Mg Alloys in Furnace Atmospheres Using Hydrogen and Methane as Fuel: *Martin Syvertsen*[1]; Anders Johansson[2]; Johannes Lodin[3]; Are Bergin[4]; Mari Ommedal[5]; Yngve Langsrud[6]; Ray Peterson[7]; [1]SINTEF Industry; [2]Siemens Energy AB; [3]Linde Gas AB; [4]Hydro Aluminium ANS; [5]Alcoa Norway ANS; [6]Benteler Aluminium systems Norway AS; [7]Real Alloy Recycling INC

9:15 AM
Towards the Efficient Recycling of Used Beverage Cans: Numerical Study and Experimental Validation: *Nikolaos Chamakos*[1]; Malamatenia Koklioti[1]; Theofani Tzevelekou[1]; Athanasia Flampouri[1]; Ioannis Contopoulos[1]; Alexandros Anestis[2]; Grigorios Galeros[2]; Epameinondas Xenos[2]; Andreas Mavroudis[2]; [1]ELKEME SA; [2]ElvalHalcor SA

9:40 AM Break

9:55 AM
A Novel Green Melt Technology for Aluminum Alloys: *Kaborson Ke*[1]; Xiyu Wen[2]; Dongjie Ke[1]; [1]Fuzhou Metal-new High Temperature Technology Incorporation Limited; [2]University of Kentucky

10:20 AM
MagPump: *Oscar Perez*[1]; Eishin Takahashi[2]; Steve Iijima[1]; [1]TST INC; [2]TST Inc.

10:45 AM
Recycling of Aluminium from Aluminium Food Tubes: *Sarina Bao*[1]; Anne Kvithyld[2]; Gry Aletta Bjørlykke[3]; Kurt Sandaunet[1]; [1]SINTEF; [2]SINTEF ; [3]Kavli AS

CHARACTERIZATION

Characterization of Materials through High Resolution Coherent Imaging — High Resolution Characterization of Materials with Phase Contrast Imaging

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

Program Organizers: Richard Sandberg, Brigham Young University; Ross Harder, Argonne National Laboratory; Xianghui Xiao, Brookhaven National Laboratory; Brian Abbey, La Trobe University; Saryu Fensin, Los Alamos National Laboratory; Ana Diaz, Paul Scherrer Institute; Mathew Cherukara, Argonne National Laboratory

Tuesday AM | March 21, 2023
Aqua 310A | Hilton

Session Chair: Richard Sandberg, Brigham Young University

8:00 AM Invited
Imaging Intact Human Organs across the Scales using Hierarchical Phase-contrast Tomography: *Peter Lee*[1]; Claire Walsh[1]; Paul Tafforeau[2]; Christopher Werlein[3]; Danny Jonigk[3]; Maximilian Ackermann[4]; [1]University College London; [2]ESRF; [3]Hannover Medical School; [4]Johannes Gutenberg University Mainz

8:30 AM
Resolving the Morphology of a Polyphase Solidification Pattern via In-situ Nanotomography: *Paul Chao*[1]; Aramanda Kiran[1]; Ashwin Shahani[1]; [1]University of Michigan

8:50 AM
Imaging Laser Shockwave Dynamics in Defect-bearing Ablator Materials: *Daniel Hodge*[1]; Silvia Pandolfi[2]; Andrew Leong[3]; David Montgomery[3]; Arianna Gleason[2]; Richard Sandberg[1]; [1]Brigham Young University; [2]SLAC National Laboratory; [3]Los Alamos National Laboratory

9:10 AM
Precise Registration Algorithm for High-resolution Imaging Applications: *Xianghui Xiao*[1]; Zhengrui Xu[2]; Dong Hou[2]; Zhijie Yang[2]; Feng Lin[2]; [1]Brookhaven National Laboratory; [2]Virginia Tech

9:30 AM Break

9:50 AM
Solving Complex Structures with Electron Ptychography: *Yu-Tsun Shao*[1]; Zhen Chen[1]; Yi Jiang[1]; Chenyu Zhang[1]; Harikrishnan K.P.[1]; David Muller[1]; [1]Cornell University

10:10 AM Invited
MHz Microscopy at European XFEL: *Patrik Vagovic*[1]; Pablo Villanueva Perez[2]; Tokushi Sato[3]; Valerio Bellucci[3]; Sarlota Birsteinova[3]; Henry Kirkwood[3]; Richard Bean[3]; Romain Letrun[3]; Jayanath Koliyadu[3]; Rita Graceffa[3]; Antonio Bonucci[3]; Adrian Mancuso[3]; Alke Meents[1]; Henry Chapman[1]; [1]Center for Free Electron Laser Science, DESY; [2]Lund University; [3]European XFEL

10:40 AM
Ultrafast Dark-field X-ray Microscopy – A New Tool for Multiscale Analysis: *Leora Dresselhaus-Marais*[1]; [1]Stanford University

11:00 AM
Coherent Surface Scattering Imaging with Nanometer Resolution for 3D Mesoscale Structures at Surfaces and Interfaces: *Zhang Jiang*[1]; Peco Myint[1]; Ashish Tripathi[1]; Miaoqi Chu[1]; Mathew Cherukara[1]; Suresh Narayanan[1]; Nicholas Schwarz[1]; Jin Wang[1]; [1]Argonne National Lab

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CHARACTERIZATION

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

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Tuesday AM | March 21, 2023
Aqua 313 | Hilton

Session Chairs: John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University

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8:00 AM
Microstructural Effects on the Shock Hugoniot: *David Jones*[1]; Daniel Martinez[1]; Jesse Callanan[1]; Darby Luscher[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

8:20 AM
Quantitative Microstructural Characterization of Precipitates and their Distributions in Nickel Alloys: Chris Bilsland[1]; *Thomas Britton*[2]; [1]Imperial College London; [2]University of British Columbia

8:40 AM
Correlative Microscopy Characterization of Afterburner Thermal Barrier Coating: *Bartlomiej Winiarski*[1]; [1]Thermo Fisher Scientific

9:00 AM
Electron Transport Properties in Metal Nanowhiskers: *Gunther Richter*[1]; Olga Iaroslavtseva[1]; [1]Mpi For Intelligent Systems

9:20 AM
Evaluation And Construction of Microstructural Property Distributions For Advanced Material Characterization: *Noah Wade*[1]; Lori Graham-Brady[1]; [1]Johns Hopkins University

9:40 AM Break

9:55 AM
Effect of Single Crystal Growth Techniques on Dendritic Microstructures and Small Orientation Defects in Ni-based Superalloys: *Felicitas Werner*[1]; Felicitas Scholz[1]; Paul Git[2]; Alexander Richter[1]; Pascal Thome[1]; Carolin Körner[2]; Gunther Eggeler[1]; Jan Frenzel[1]; [1]Ruhr-University Bochum; [2]Friedrich-Alexander-University Erlangen-Nürnberg

10:15 AM
Optical Parameters of ZnO Thin Films: *Shadia Ikhmayies*[1]; [1]Jabal El-Hussain

10:35 AM
Correlative Microscopy Materials Characterization Using fs-laser Plasma FIB-SEM: *Bartlomiej Winiarski*[1]; Remco Geurts[1]; [1]Thermo Fisher Scientific

10:55 AM
Optical Properties of Iridium at High Temperatures: *Minsu Oh*[1]; John McElearney[1]; Kevin Grossklaus[1]; Thomas Vandervelde[1]; [1]Tufts University

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NUCLEAR MATERIALS

Composite Materials for Nuclear Applications II — Composite Metallic Systems

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

Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Commonwealth Fusion Systems; Peng Xu, Idaho National Laboratory; Johann Riesch, Max-Planck-Insitut Fuer Plasmaphysik

Tuesday AM | March 21, 2023
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Session Chairs: Johann Riesch, Max-Planck-Institut für Plasmaphysik; Anne Campbell, Oak Ridge National Laboratory

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8:00 AM Invited
An Innovative Additive Manufacturing Route for Metal Matrix Composites for Nuclear Applications: Taegyu Lee[1]; Wonjong Jeong[1]; SeunhHyeok Chung[1]; *Ho Jin Ryu*[1]; [1]KAIST

8:30 AM
EffectofInterfacialFeaturesontheStrengtheningBehaviorofB4C/AlComposites: *Juyeon Han*[1]; Hansol Son[1]; Yoonjung Won[1]; Kisub Cho[1]; Hyunjoo Choi[1]; [1]Kookmin university

8:50 AM
Development and Additive Manufacturing of ODS IN-718 Alloys for Nuclear Applications: *Eda Aydogan*[1]; Yesim Yalcin[1]; Bora Derin[2]; Bahattin Koc[3]; [1]Middle East Technical University; [2]Istanbul Technical University; [3]Sabanci University

9:10 AM
Ion Beam Synthesis of Nano-Oxides in FeCr: Towards an Understanding of Precipitation in Oxide Dispersion Strengthened Steels: *Stephanie Jublot-Leclerc*[1]; Martin Owusu-Mensah[2]; Aurélie Gentils[1]; [1]Université Paris-Saclay, CNRS/IN2P3, IJCLab; [2]Kwame Nkrumah University of Science and Technology

9:30 AM Break

9:50 AM
Characterization of the Effects of Intermediate Temperature Neutron Irradiation on Model Fe-Cr Alloys: *Dhriti Bhattacharyya*[1]; Alan Xu[1]; Takuya Yamamoto[2]; G. Robert Odette[2]; [1]Australian Nuclear Science and Technology Organization; [2]UCSB

10:10 AM
Effect of Copper Fiber in RAFM Steel Composite on Improving the Thermal Conductivity: *Yong Hwan Cho*[1]; Hyun Joon Yang[1]; Chang-Hoon Lee[2]; Woong-Ryeol Yu[1]; Heung Nam Han[1]; [1]Seoul National Univ; [2]Korea Institute of Material Science

10:30 AM
Microstructure and Thermophysical Property Characterization of U-ZrHx Fuel Fabricated by Powder Metallurgy: *Tyler Smith*[1]; Caitlin Taylor[1]; Michael Hahn[1]; Erik Luther[1]; Thomas Nizolek[1]; Aditya Shivprasad[1]; [1]Los Alamos National Laboratory

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MATERIALS DESIGN

Computational Discovery and Design of Materials — Session III

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

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha Vermaak, Lehigh University

Tuesday AM | March 21, 2023
Cobalt 502A | Hilton

Session Chairs: Yang Jiao, Arizona State University; Duyu Chen, University of California, Santa Barbara; Houlong Zhuang, Arizona State University

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8:00 AM Invited
Adaptive Discovery and Mixed-variable Bayesian Optimization of Next Generation Synthesizable Microelectronic Materials: Wei Chen[1]; *Hengrui Zhang*[1]; [1]Northwestern University

8:30 AM Invited
Computer Vision Problems in Transmission Electron Microscopy: *Huolin Xin*[1]; [1]University of California - Irvine

9:00 AM
Developing an *Ab Initio*-Kinetic Passivation Model for High-throughput Screening of Material Stability: *Rachel Gorelik*[1]; Arunima Singh[1]; [1]Arizona State University

9:20 AM Break

9:40 AM Invited
Data- and Physics-driven Approaches to Discovering the Governing Equations for Complex Phenomena in Heterogeneous Materials: *Muhammad Sahimi*[1]; [1]University of Southern California

10:10 AM
An Inverse Materials Design Route Based on Structure-property Linkages Leveraging 3D Convolutional Neural Network and Bayesian Optimization: *Xiao Shang*[1]; Yu Zou[1]; [1]University of Toronto

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PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Defects and GBs II

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Tuesday AM | March 21, 2023
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Session Chairs: Steven Kenny, Loughborough University Ziyong Hou, Chongqing University

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8:00 AM Invited
Phase Field Modeling of Microstructures in Titanium Alloys: *Benoit Appolaire*[1]; Yann Le Bouar[2]; Alphonse Finel[2]; [1]Universite de Lorraine; [2]LEM CNRS-ONERA

8:30 AM
An Atomistic Approach of the Impact of Hydrogen on the Formation of Vacancy Clusters in Fcc Metals: *Marie Landeiro Dos Reis*[1]; Abdelali Oudriss[1]; Xavier Feaugas[1]; [1]Lasie Cnrs Umr73

8:50 AM
Robustness, Sensitivity and Expressivity of Simple Many-body Potentials: Application to -Zr: Alessandra Del Masto[1]; *Céline Varvenne*[1]; Jean Baccou[2]; Guy Tréglia[1]; Fabienne Ribeiro[2]; [1]CNRS, CINaM; [2]IRSN

9:10 AM
A Statistical Perspective on Embrittling Potency for Intergranular Fracture: *Miguel Fernandez*[1]; Remi Dingreville[2]; Douglas Spearot[1]; [1]University of Florida; [2]Sandia National Laboratories

9:30 AM Break

9:50 AM
Rationalizing the Impact of Experimental Preparation Routes on Impurity Content Using Ab-initio Phase Diagrams: *Mira Todorova*[1]; Su-Hyun Yoo[1]; Poulami Chakraborty[1]; Tilmann Hickel[1]; Se-Ho Kim[1]; Baptiste Gault[1]; Joerg Neugebauer[1]; [1]Max-Planck-Insitut Fuer Eisenforschung

10:10 AM
Handling Conditional Convergence in Point Defect Calculations: *Celine Varvenne*[1]; Emmanuel Clouet[2]; Thomas Jourdan[2]; [1]CINaM, CNRS, Aix-Marseille Univ.; [2]Université Paris-Saclay, CEA

10:30 AM Invited
Atomistic Modelling of Thin Film Growth: *Steven Kenny*[1]; [1]Loughborough University

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MATERIALS PROCESSING

Deformation-induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies — Deformation Induced Microstructural Evolution I

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

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign; Suhas Eswarappa Prameela, Massachusetts Institute of Technology; Mostafa Hassani, Cornell University

Tuesday AM | March 21, 2023
29C | SDCC

Session Chair: Arun Devaraj, Pacific Northwest National Laboratory

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8:00 AM Introductory Comments

8:05 AM Invited
Crystal Rotation Kinematics and the Activation of Different Twinning Systems due to Tribological Loading: *Christian Greiner*[1]; [1]KIT

8:35 AM
Shear Deformation of Fe-Mn Alloys by High-speed Rotational Diamond Anvil Cell (HS-RDAC): *Tingkun Liu*[1]; Julian D Escobar Atehortua[1]; Changyong Park[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

8:55 AM
Robotic Blacksmithing: Towards the Autonomous Control of Geometry and Microstructure Via Iterative, Open-Die Forming: *Michael Groeber*[1]; Steve Niezgoda[1]; Glenn Daehn[1]; Tobias Mahan[1]; [1]The Ohio State University

9:15 AM Break

9:30 AM Invited
Chemistry and Phase Formation at Lattice Defects: Equilibrium Cases and Kinetics: *Dierk Raabe*[1]; [1]Max-Planck Institute

10:00 AM
Continuous Metal Processing of Ultrafine-grained Copper Sheets through Cold Angular Rolling Process: *Isshu Lee*[1]; Jae-Kyung Han[1]; Yun-Hsuan Wu[1]; Lukas Daut[1];

Brain Bay[1]; Melissa Santala[1]; Roberto Figueiredo[2]; Megumi Kawasaki[1]; [1]Oregon State University; [2]Universidade Federal de Minas Gerais

10:20 AM
Development of Solid-state Processing of Electrical Steels for Cost-efficient Electric Motors: *Shivakant Shukla*[1]; Hrishikesh Das[1]; Piyush Upadhyay[1]; [1]Pacific Northwest National Laboratory

10:40 AM
Studies on Defect- and Chemical Diffusion Driven Rapid Consolidation of New Ni Alloys: *Yannick Naunheim*[1]; Christopher A Schuh[1]; [1]Massachusetts Institute of Technology

11:00 AM
Ultrafine-grained Bonding Interface of 316L Stainless Sheets Processed by Ultrasonic Spot Welding: *Jheyu Lin*[1]; Hue-En Chu[1]; [1]National Taipei University of Technology

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Phase Transformation Plasticity

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Tuesday AM | March 21, 2023
Aqua 300AB | Hilton

Session Chairs: Niaz Abdolrahim, University of Rochester; Matthew Daly, UIC

8:00 AM Invited
First Principles Study of Local Phase Transformation in Ni Base Superalloys: *Maryam Ghazisaeidi*[1]; Naga Sri Harsha Gunda[1]; Michael Mills[1]; [1]Ohio State University

8:30 AM
Measurement of Transformation Stress in Metastable HEAs by Nanoindentation: *Yingjie Lu*[1]; Junaid Ahmed[1]; Matthew Daly[1]; [1]University of Illinois at Chicago

8:50 AM
In-situ TEM Annealing Reveals Oxide-metal Interface is Initiation Site for Phase Transformation in TiO2 Nanotubes: *Jerry Howard*[1]; Hammad Malik[1]; Brian Van Devener[2]; Swomitra Mohanty[2]; Krista Carlson[1]; [1]University of Nevada, Reno; [2]University of Utah

9:10 AM Invited
About the Plasticity of Metals upon Phase Transformation – A High Temperature Nanoindentation Study: *Verena Maier-Kiener*[1]; Lea Lumper[1]; [1]Montanuniversitaet Leoben

9:40 AM Break

10:00 AM
Size Effects on the Stress-induced Martensitic Transformation in Cu-based Shape Memory Alloys: Jose Gómez-Cortés[1]; María Nó[1]; Mikel Pérez-Cerrato[1]; Isabel Ruiz-

Larrea[1]; Tomasz Breczewski[1]; *Jose San Juan*[1]; [1]Universidad del Pais Vasco

10:20 AM
Stress-assisted Structural Phase Transformation in Molybdenum-based Composites: Lijie He[1]; Linh Vu[1]; Zheming Guo[1]; Ali Shargh[1]; *Niaz Abdolrahim*[1]; [1]University of Rochester

10:40 AM
Characterization of Dislocations in Shape Memory Alloy Using Large Scale MD Simulation: *David Farache*[1]; Shivam Tripathi[2]; Alejandro Strachan[1]; [1]Purdue; [2]Istituto Italiano di Tecnologia

11:00 AM
Probing the Plasticity and Microstructure Evolution of an Icosahedral Quasicrystal i-Al-Pd-Mn at Small Scales: *Yu Zou*[1]; [1]University of Toronto

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ELECTRONIC MATERIALS

Electronic Packaging and Interconnection — Emerging Interconnection Technology

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

Program Organizers: Kazuhiro Nogita, University of Queensland; Mohd Arif Mohd Salleh, Universiti Malaysia Perlis; Dan Li, Beijing University of Technology; David Yan, San Jose State University; Fan-Yi Ouyang, National Tsing Hua University; Patrick Shamberger, Texas A&M University; Tae-Kyu Lee, Cisco Systems; Christopher Gourlay, Imperial College London; Albert T. Wu, National Central University

Tuesday AM | March 21, 2023
Sapphire D | Hilton

Session Chairs: Patrick Shamberger, Texas A&M University; Dan Li, Beijing University of Technology

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8:00 AM Introductory Comments

8:05 AM Invited
Flexible Packaging by Microwave Bonding for Flexible Electronics: *Tae-Ik Lee*[1]; Minjeong Sohn[1]; Min-Su Kim[1]; Dongyurl Yu[1]; So Jeong Lee[1]; [1]Korea Institute of Industrial Technology

8:30 AM
Effect of Synthesized Variables on Characteristics for Cu Nanoparticle: *Ping-Hsuan Chen*[1]; Albert T. Wu[1]; [1]National Central University

8:50 AM
Low Temperature Direct Bonding in Atmosphere by Nanocrystalline Ag: *Cheng Jie Yang*[1]; Fan-Yi OuYang[1]; [1]National Tsing Hua University

9:10 AM
Pad Connectivity Induced Capacitance Effect in Electroless Copper Plating Interconnection: *Yu-Chun Lin*[1]; Po-Shao Shih[1]; Jeng-Hau Huang[1]; Simon Johannes Gräfner[1]; Chang-Hsien Shen[1]; C. Robert Kao[1]; [1]National Taiwan University

9:30 AM Break

9:50 AM
Impact of Non-linear Phase Change Processes on Thermal Impedance of an Electronics Package: *Patrick Shamberger*[1]; Alison Hoe[1]; Juan Carlos Lago[1]; Colton Brietzke[1]; Veronica Gonzalez[1]; [1]Texas A&M University

10:10 AM
Sintered Ag-In Alloy Paste as Die-attach Material for Power Electronic Packaging: *Chin-Hao Tsai*[1]; Wei-Chen Huang[1]; C. R. Kao[1]; [1]National Taiwan University

10:30 AM
Microstructural Effect of Cu Substrate on Join Properties for Cu-to-Cu Direct Bonding: *Hung Wang*[1]; Albert T. Wu[1]; [1]National Central University

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ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management — Thermal Management, Environmental and Energy Technologies

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

Program Organizers: Shafiq Alam, University of Saskatchewan; Donna Guillen, Idaho National Laboratory; Fiseha Tesfaye, Metso Outotec Finland Oy; Lei Zhang, University of Alaska Fairbanks; Lina Hockaday, Curtin University, WASM; Neale Neelameggham, IND LLC; Hong (Marco) Peng, University of Queensland; Nawshad Haque, Commonwealth Scientific and Industrial Research Organization; Liu Yan, Northestern University

Tuesday AM | March 21, 2023
33B | SDCC

Session Chairs: Nawshad Haque, Commonwealth Scientific and Industrial Research Organization; Joseph Hamuyuni, Metso Outotec

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8:30 AM
Novel Thermal Conductivity Measurement Technique Utilizing a Transient Multilayer Analytical Model of a Line Heat Source Probe for Extreme Environments: *Katelyn Wada*[1]; Austin Fleming[2]; David Estrada[1]; [1]Boise State University; [2]Idaho National Laboratory

8:50 AM
The Effect of Reduced Flue Gas Suctioning on Superstructure and Gas Temperatures: *Brandon Velasquez*[1]; Sarah DiBenedetto[1]; Yonatan Tesfahunegn[1]; María Gudjonsdottir[1]; Gudrun Saevarsdottir[1]; [1]Reykjavik University

9:10 AM
Environmental Life Cycle Assessment of Gold Production in Nevada: *Ehsan Vahidi*[1]; Saeede Kadivar[1]; [1]University of Nevada-Reno

9:30 AM
Polymeric Composite Dense Membranes Applied for the Flue Gas Treatment: *Dragutin Nedeljkovic*[1]; [1]American University of the Middle East

9:50 AM Break

10:10 AM
Molten Salt Mg-air Battery Improvement and Recharging: *Mahya Shahabi*[1]; Nicholas Masse[1]; Amanda Lota[1]; Lucien Wallace[1]; Heath Bastow[1]; Adam Powell[1];

[1]Worcester Polytechnic Institute

10:30 AM Invited
Superconductor Busbar Systems in the Light of Increased Energy Costs: *Wolfgang Reiser*[1]; Till Reek[2]; Claus Hanebeck[1]; Peter Abrell[1]; [1]Vision Electric Super Conductors Gmbh; [2]Consultant Engineer

10:50 AM
Critical Metals for Clean Energy: Extraction of Rare Earth Elements from Coal Ash: *Sara Penney*[1]; Shafiq Alam[1]; [1]University of Saskatchewan

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CORROSION

Environmental Degradation of Additively Manufactured Alloys — Environmental Degradation of Additively Manufactured Materials at High Temperatures and Radiation Environments

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

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

Tuesday AM | March 21, 2023
Sapphire 400A | Hilton

Session Chairs: Kinga Unocic, Oak Ridge National Laboratory; Sebastien Dryepondt, Oak Ridge National Laboratory

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8:00 AM Invited
The Process-Structure-Performance Correlations of Additively Manufactured Steels Exposed to High Dose Neutron Irradiations: *Kevin Field*[1]; Pengyuan Xiu[2]; Niyanth Sridharan[3]; [1]University of Michigan; [2]University of Michigan; Now at: Intel Corporation; [3]Lincoln Electric - India

8:30 AM
Thermal response of Additive Manufactured Alloys Submitted to Transient High Heat Flux Testing: John Saputo[1]; Felipe Caliari[1]; *Sanjay Sampath*[1]; [1]Stony Brook University

8:50 AM Invited
Enhanced High-temperature Oxidation of Additively Manufactured Ni-base Alloy IN625: Microstructure or Chemical Composition?: *Anton Chyrkin*[1]; Kerem Gunduz[2]; Irina Fedorova[1]; Wojciech Nowak[3]; Mohammad Sattari[1]; Mats Halvarsson[1]; Jan Froitzheim[1]; Krystyna Stiller[1]; [1]Chalmers University of Technology; [2]Chalmers University of Technology; Gebze Technical University; [3]Rzeszow University of Technology

9:20 AM Break

9:40 AM
High-temperature Oxidation Behavior of Additively Manufactured Haynes 282 Samples in Direct-fired Supercritical CO_2 Power Cycle Environments: *Casey Carney*[1]; Nicholas Lamprinakos[2]; Richard Oleksak[3]; Omer Doğan[3]; Anthony Rollett[2]; [1]LRST; [2]Carnegie Mellon University; [3]National Energy Technology Laboratory

10:00 AM
Impact of the Gas Composition on Oxide Scales formed on Ni-based Alloys in Metal Dusting Conditions: *Clara Schlereth*[1]; Martin Weiser[2]; Emma White[1]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut; [2]FAU Erlangen-Nürnberg

10:20 AM
Metal Dusting and Surface Treatment of Additively Manufactured Ni-Cu Alloys and Alloy 699XA: *Till König*[1]; Ceyhun Oskay[1]; Clara Schlereth[1]; Emma White[1]; Lukas Reiff[2]; Katrin Jahns[2]; Anke Silvia Ulrich[1]; Ulrich Krupp[2]; Mathias Galetz[1]; [1]DECHEMA Research Institute; [2]IEHK, RWTH Aachen

CORROSION

Environmental Degradation of Multiple Principal Component Materials — Aqueous Corrosion and Embrittlement I

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

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; XiaoXiang Yu, Novelis Global Research Center; 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); Gerald Frankel, Ohio State University; ShinYoung Kang, Lawrence Livermore National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Tuesday AM | March 21, 2023
Sapphire 410A | Hilton

Session Chairs: Wenjun Cai, Virginia Tech; Xiaoxiang Yu, Novelis Global Research Center

8:00 AM
A High, Medium to Low Throughput Study of Aqueous Passivation in FeCoNi–(Crx–Aly) Alloys across Classical Cr Threshold Concentration: *Debashish Sur*[1]; William Blades[2]; Emily Holcombe[3]; Elaf Anber[3]; Lauren Walters[4]; Ben Redeman[3]; Brian DeCost[5]; Jean-Philippe Couzinie[6]; Howie Joress[5]; James Rondinelli[4]; Tyler McQueen[3]; Karl Sieradzki[2]; Mitra Taheri[3]; John Scully[1]; [1]University of Virginia; [2]Arizona State University; [3]Johns Hopkins University; [4]Northwestern University; [5]National Institute of Standards and Technology; [6]CNRS-UPEC

8:20 AM
Cold Working Enhanced Thermal Stability of Native Oxide Solar Absorbers on FeMnNiAlCr High Entropy Alloys for Concentrated Solar Power System: *Xiaoxue Gao*[1]; Edwin Jiang[1]; Andrew Pike[1]; Ian Baker[1]; Geoffroy Hautier[1]; Jifeng Liu[1]; [1]Dartmouth College

8:40 AM Invited
Corrosion and Mechanical Behavior of High-Entropy Alloys: *Michael Gao*[1]; Alvaro Rodriguez[1]; Zongrui Pei[1]; Joseph Tylczak[1]; Paul Jablonski[1]; Martin Detrois[1]; Margaret Ziomek-Moroz[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

9:00 AM Invited
Corrosion Behavior of High-Entropy Alloys: Lia Amalia[1]; Yunzhu Shi[2]; Rui Feng[1]; Yanfei Gao[1]; *Peter Liaw*[1]; [1]University of Tennessee; [2]University of Science and Technology Beijing

9:20 AM Break

9:35 AM
Determining Elemental Distributions across Thin Corrosion Films on Multi-principal Element Alloys via Atom Probe Tomography: *Elizabeth Kautz*[1]; Angela Gerard[2]; Sten Lambeets[1]; Daniel Perea[1]; John Scully[2]; Daniel Schreiber[1]; [1]Pacific Northwest National Laboratory; [2]University of Virginia

9:55 AM
Influence of Hydrogen on the Low Cycle Fatigue Behavior of the Equiatomic CrMnFeCoNi High Entropy Alloy: *Dayane Marques Oliveira*[1]; Christopher San Marchi[2]; Easo George[3]; Jeffery Gibeling[1]; [1]University of California, Davis; [2]Sandia National Laboratories, Livermore; [3]Oak Ridge National Laboratory

10:15 AM
Understanding Elemental Effects on the Accelerated Corrosion of FeCrAl Alloy System in Steam Environments: *Atharva Chikhalikar*[1]; Indranil Roy[1]; Hamdy Abouelella[1]; Rajnikant Umretiya[1]; Andrew Hoffman[1]; Raul Rebak[1]; [1]GE Research Center

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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 21, 2023
Sapphire 410B | Hilton

Session Chairs: Khalid Hattar, Univerisity of Tennessee Knoxville; Yongfeng Lu, University Of Nebraska - Lincoln

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8:00 AM Invited
In-situ Electron Microscopy Degradation in Extreme Environments: Eric Lang[1]; Kathryn Small[1]; Ryan Schoell[1]; Nathan Madden[1]; Nan Li[2]; Benjamin Derby[2]; *Khalid Hattar*[1]; [1]Sandia National Laboratories; [2]Los Alamos National Lab

8:30 AM
Creep Degradation of Austenitic Steels in CO2 Environment: *Kyle Rozman*[1]; Richard Oleksak[2]; Ömer Doan[2]; [1]Site Support Contractor; [2]National Energy Technology Laboratory

8:50 AM
Investigation of Mechanical Properties of Corrosion Products in AA7075-T651 Using In Situ Nanoindentation: *Ankit Kumar*[1]; Amey Luktuke[1]; Hamidreza Torbati-Sarraf[1]; Daniel Sinclair[1]; Nikhilesh Chawla[1]; [1]Purdue University

9:10 AM
Environmentally Assisted Cracking of Nickel-Based Alloys in Molten Salts Containing Tellurium: *Mohammad Umar Farooq Khan*[1]; Lesley Frame[2]; Stephen Raiman[3]; [1]University of MIchigan; [2]University of Connecticut; [3]University of Michigan

9:30 AM Break

9:50 AM Invited
A Portable Solution to Corrosion Remediation of Sea Ships to Desensitize Severely Sensitized Aluminum Alloys Using Lasers: *Yongfeng Lu*[1]; Leimin Deng[1]; Bai Cui[1]; [1]University of Nebraska - Lincoln

10:20 AM
Site Specific Multimodal In-situ Study of Early-Stage Corrosion of Model Fe-Cr-Ni Alloys Using Electrochemical Atomic Force Microscopy: *Tingkun Liu*[1]; Cheng-Han Li[1]; Matthew Olszta[1]; Jinhui Tao[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

10:40 AM
Exploring Environmentally-Assisted Cracking in Liquid Metal and Molten Salt Advanced Reactor Coolant Environments: *Samuel Briggs*[1]; Dustin Mangus[1]; Jake Quincey; Xavier Quintana[1]; Guillaume Mignot[1]; Julie Tucker[1]; [1]Oregon State University

11:00 AM
Liquid Metal Embrittlement Behavior of Dual-Phase Steels: The Influence of Microstructure and Strain Rate.: *Pallavi Pant*[1]; Benjamin Hilpert[2]; Holger Shubert[2]; Luke Brewer[1]; [1]The University of Alabama; [2]Mercedes Benz AG

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: Mechanical Behavior of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Additive Manufacturing 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, National Institute of Standards and Technology

Tuesday AM | March 21, 2023
Sapphire H | Hilton

Session Chair: Garrett Pataky, Clemson University

8:00 AM Invited
Characterising Fatigue Crack Tip Deformation States in Nickel Base Superalloys: Slip Character, Strain Accumulation and Oxidation Effects: Philippa Reed[1]; *Andrew Hamilton*[2]; [1]University of Southampton; [2]University of Southhampton

8:30 AM Invited
Monitoring of Fatigue Evolution by In-Situ Measurement Methods and Micromagnetic Analysis: Ramin Hajavifard[1]; Lukas Lücker[1]; Julian Rozo Vasquez[1]; Yashar Sarafraz[1]; Simon Strodick[1]; Nikolas Baak[1]; *Frank Walther*[1]; [1]TU Dortmund University

8:50 AM
Fatigue Damage Evolution in Duplex Steel Investigated by µLaue Diffraction Using a 3D Energy-dispersive Detector: *Carolin Leidigkeit*[1]; Ullrich Pietsch[2]; Hans-Jürgen Christ[1]; [1]Universität Siegen - Institut für Werkstofftechnik; [2]Universität Siegen - Festkörperphysik

9:10 AM
Build Orientation and Stress Ratio Effects on the Fatigue Crack Growth Properties of Laser Powder Bed Fused Ti-6Al-4V: *Mikyle Paul*[1]; Shuai Shao[1]; Nima Shamsaei[1]; [1]Auburn University

9:30 AM Break

9:50 AM
High-throughput Characterization of Small Crack Growth Behavior in Ti-6-4: *Michelle Harr*[1]; Bradley Rucker[2]; Ayman Salem[3]; Adam Pilchak[3]; T. Broderick[4]; S.I. Rao[3]; [1]Wright Patterson Air Force Laboratories; MRL Materials Resources LLC ; [2]MRL Materials Resources LLC; [3]Wright Patterson Air Force Laboratories; MRL Materials Resources LLC; [4]Wright Patterson Air Force Laboratories

10:10 AM
High Resolution Microcrack Growth Analysis in Thermomechanical Fatigue Loading: *Nicolas Leost*[1]; Djamel Missoum-Benziane[1]; Laurent Cameriano[2]; François Comte[2]; Vincent Maurel[1]; [1]Le Centre des Matériaux de MINES PARIS - PSL University; [2]Safran Aircraft Engines

10:30 AM
Ultrasonic Fatigue Investigations for High and Very-High Cycle Fatigue Applications of A356 Cast Aluminum Alloys: *Hayden Furcolo*[1]; Anthony Spangenberger[1]; Qigui Wang[2]; Diana Lados[1]; [1]Worcester Polytechnic Institute; [2]General Motors

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MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Modeling & Validation

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Tuesday AM | March 21, 2023
29A | SDCC

Session Chairs: Ayoub Soulami, Pacific Northwest National Laboratory; Dwight Burford, University of North Texas

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8:00 AM Invited
Smoothed Particle Hydrodynamics Model for Friction Stir Processing of 316 L Stainless Steel: Process Modeling and Microstructure Evolution Analysis: *Ayoub Soulami*[1]; Lei Li[1]; Neil Henson[1]; Erin Barker[1]; Eric Smith[1]; [1]Pacific Northwest National Laboratory

8:20 AM
Validation of Models for Predicting Bonding Behavior in Friction Stir Welding Processes: *Christian Kocak*[1]; Yanfei Gao[1]; Hyojin Park[1]; Hahn Choo[1]; Martin McDonnell[2]; Zhili Feng[3]; [1]University of Tennessee; [2]Ground Vehicle Systems Center; [3]Oak Ridge

National Laboratory

8:40 AM Invited
Analysis of Torque Data from Friction Stir Welds in Aluminum Alloys: *Kevin Colligan*[1]; [1]Concurrent Technologies Corporation

9:00 AM Invited
The Influence of Flow Stress Data and Friction Models on 2D and 3D Simulations of Friction Stir Welding in AA 2219-T76: Kennen Brooks[1]; Bryan Ramos[1]; *Michael Miles*[1]; Tracy Nelson[1]; [1]Brigham Young University

9:20 AM
Temperature Matching of Friction Stir Welding: 3D Simulation: *Ryan Melander*[1]; Matthew Goodson[1]; Michael Miles[1]; Troy Munro[1]; [1]Brigham Young University

9:40 AM Break

10:00 AM
A Coupled SPH-FEM Framework to Predict Residual Stresses during Friction Stir Processing: Ayoub Soulami[1]; Lei Li[1]; *Kranthi Balusu*[1]; Choi Kyoo Sil[1]; [1]Pacific Northwest National Laboratory

10:20 AM
3D Modeling and Experimental Validation of Linear Friction Welding Process: *Srujan Rokkam*[1]; Quang Truong[1]; Michael Eff[2]; Don Weaver[3]; [1]Advanced Cooling Technologies, Inc.; [2]Edison Welding Institute; [3]Air Force Research Laboratory

MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — X-ray In Situ Investigations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials Institute

Tuesday AM | March 21, 2023
28E | SDCC

Session Chairs: Sabine Bottin-Rousseau, Sorbonne University; Peter Lee, University College London

8:00 AM Invited
Measuring Key Phenomena in Solidification Using X-ray Imaging: Insung Han[1]; Shikang Feng[1]; Enzo Liotti[1]; *Patrick Grant*[1]; [1]University of Oxford

8:30 AM Invited
In Situ X-ray Synchrotron Imaging Investigation of Solidification: *Nathalie Mangelinck-Noel*[1]; Guillaume Reinhart[1]; Gabrielle Regula[1]; Henri Nguyen-Thi[1]; [1]IM2NP CNRS AMU UMR 7334

9:00 AM Invited
Observation of Growing Dendrites by Time-resolved Tomography and Image Processing Using a Phase-field Model: *Hideyuki Yasuda*[1]; Arisa Nishiguchi; Ryoji

Katsube[1]; Taka Narumi[1]; Tomohiro Takaki[2]; [1]Kyoto University; [2]Kyoto Institute of Technology

9:30 AM Break

9:50 AM
In Situ Synchrotron X-ray Diffraction Resolves the Transition from Ferritic to Metastable Austenitic Solidification in Fe-Ni-Cr Alloys: *Joseph Aroh*[1]; Seunghee Oh[1]; S. Thomas Britt[1]; Emma Barake[1]; Andrew Chuang[2]; P. Chris Pistorius[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory

10:10 AM
In Situ X-ray Tomographic Investigations of Dendritic Patterns in a Co-base Alloy during Solidification: *Mohammed Azeem*[1]; Tim Wigger[2]; Andrew Kao[3]; Nghia Vo[4]; Robert Atwood[4]; Peter Lee[2]; [1]University of Leicester; [2]University College London; [3]University of Greenwich; [4]Diamond Light Source Ltd

10:30 AM
In situ Synchrotron Radiography Investigation of Graphite Nodule Evolution during Solidification in Ductile Cast Iron: *Xiangmei Ding*[1]; Tim Wigger[2]; Niels Tiedje[3]; Yasuda Hideyuki[4]; Narumi Taka[4]; Jenny Shepherd[1]; Peter Lee[2]; Mohammed Azeem[5]; [1]University of Leicester; [2]University College London, Harwell Campus; [3]Technical University of Denmark; [4]Kyoto University; [5]University of Leicester, Harwell Campus

10:50 AM
The Impact of Melt Flow on Solidification Patterns in a Ternary Ga-In-Bi Alloy: Natalia Shevchenko[1]; *Olga Budenkova*[2]; Guy Chichignoud[2]; Sven Eckert[1]; [1]Helmholtz-Zentrum Dresden-Rossendorf; [2]Univ. Grenoble Alpes, CNRS

11:10 AM
Machine Learning Enhanced Operando Study of the Nucleation and Evolution of Complex Intermetallic Phases in Solidification: *Kang Xiang*[1]; Jiawei Mi[1]; [1]University of Hull

11:30 AM
In Situ Synchrotron X-ray Radio- and Tomography Analysis of Grain Boundary Formation during Directional Solidification of a Mg Alloy: Maral Sarebanzadeh[1]; Alberto Orozco-Caballero[2]; Federico Sket[3]; *Damien Tourret*[3]; Javier LLorca[1]; [1]IMDEA Materials & Universidad Politécnica de Madrid; [2]Universidad Politécnica de Madrid; [3]IMDEA Materials Institute

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NANOSTRUCTURED MATERIALS

Functional Nanomaterials 2023 — Session III

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

Program Organizers: Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Mostafa Bedewy, University of Pittsburgh; Woochul Lee, University of Hawaii at Mnoa; Changhong Cao, McGill University; Kiyo Fujimoto, Idaho National Laboratory; Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

Tuesday AM | March 21, 2023
Aqua 305 | Hilton

Session Chairs: Woochul Lee, University of Hawaii at Manoa; Ying Zhong, University of South Florida; Kiyo Fujimoto, Idaho National Laboratory; Mostafa Bedewy, University of Pittsburgh

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8:00 AM Invited
One-dimensional Nano-carbon Additives for Flexible Lithium Rechargeable Battery: *Yoon Hwa*[1]; [1]Arizona State University

8:30 AM Invited
Synthesis and Ion Transport Study for the Development of Graphene Aerogel Electrodes: Multiscale Computations: *Seungha Shin*[1]; Yu-Kai Weng[1]; Md Abdullah Al Hasan[1]; Kenneth Kihm[1]; Douglas Aaron[1]; [1]University of Tennessee

9:00 AM Keynote
Nanoscale Phenomena in Advanced Batteries - From Thin Film Battery Platform to Practical Batteries: *Shirley Meng*[1]; [1]The University of Chicago

9:40 AM Break

10:00 AM
Coupling of Electric Field Driven Ion Transport with Convective Flow in Graphene Nanochannels: *Md Abdullah Al Hasan*[1]; Yu-Kai Weng[1]; Seungha Shin[1]; Kenneth Kihm[1]; Doug Aaron[1]; [1]University of Tennessee

10:20 AM
Application of 2D Materials as Additives In Hybrid Perovskite Solar Cells for Improved Performance and Stability: *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory

10:40 AM Invited
Covellite Enveloped Spherical Carbon Nanoparticles Decorated Polyurethane Foam as Solar Evaporator for Efficient Interfacial Water Evaporation: *Suman Chhetri*[1]; Anh Nguyen[1]; Woochul Lee[1]; [1]University of Hawaii at Manoa

11:00 AM Invited
Feature Classification of Evaporation-driven Multi-scale 3D Printing: *Samannoy Ghosh*[1]; Marshall Johnson[2]; Rajan Neupane[1]; James Hardin[3]; John Berrigan[3]; Surya Kalidindi[3]; Yong Lin Kong[1];
[1]University of Utah; [2]Georgia Institute of Technology; [3]Air Force Research Laboratory

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CHARACTERIZATION

Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties — Processing and Properties

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

Program Organizers: Yuntian Zhu, City University of Hong Kong; Kei Ameyama, Ritsumeikan University; Irene Beyerlein, University of California, Santa Barbara; Yuri Estrin, Monash University; Huajian Gao, Nanyang Technological University; Ke Lu, Institute of Metal Research; Suveen Mathaudhu, Colorado School of Mines; Xiaolei Wu, State Institute of Mechanics, Chinese Academy of Sciences

Tuesday AM | March 21, 2023
Aqua 314 | Hilton

Session Chairs: Nobuhiro Tsuji, Kyoto University; Rajiv Mishra, University of Northern Texas

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8:00 AM Invited
Heterogeneous Microstructure Driven Strength-ductility Synergy in Laser Powder Bed Additively Manufactured Alloys: *Rajiv Mishra*[1]; [1]University of North Texas

8:30 AM
Effect of Grain Refinement on Plastic Deformation and Fracture in a Si-added High-Mn Austenitic Steel: *Sukyoung Hwang*[1]; Yu Bai[2]; Si Gao[1]; Akinobu Shibata[3]; Nobuhiro Tsuji[1]; [1]Kyoto University; [2]Dalian University of Technology; [3]National Institute for Materials Science (NIMS)

8:50 AM
High Strength and Ductility in a Heterostructured Nanotwinned Ni Film: Rohit Berlia[1]; *Jagannathan Rajagopalan*[1]; [1]Arizona State University

9:10 AM
Improving Local Fracture Properties of W-CuZn Nanocomposites by Microstructure Tailoring: *Daniel Kiener*[1]; Klemens Schmuck[1]; Markus Alfreider[1]; Michael Burtscher[1]; Michael Wurmshuber[1]; [1]University of Leoben

9:30 AM Break

9:50 AM
Modeling of Back Stresses in Additively Manufactured Stainless Steel: *Kunqing Ding*[1]; Yin Zhang[1]; David McDowell[1]; Ting Zhu[1]; [1]Georgia Institute of Technology

10:10 AM
Quasi-static and Dynamic Mechanical Behavior of Metal Composites with Co-continuous Phase Distributions: *Lauren Poole*[1]; Avery Samuel[1]; Ashley Hilmas[2]; Frank Zok[1]; [1]University of California Santa Barbara; [2]Air Force Research Laboratory

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ADVANCED MATERIALS

High Performance Steels — Microstructure Development and Advanced Characterization I

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

Tuesday AM | March 21, 2023
Aqua F | Hilton

Session Chairs: Amit Behera, Questek Innovations; Benjamin Adam, Oregon State University

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8:00 AM Invited
Metastability of Martensite and Bainitic Ferrite as Carbon Super-saturated Structures: *Francisca Caballero*[1]; Jonathan Poplawsky[2]; Esteban Urones-Garrote[3]; [1]National Centre for Metallurgical Research (CENIM-CSIC); [2]ORNL; [3]Spanish National Centre for Electron Microscopy (CNME-UCM)

8:30 AM
In Situ & Post Mortem Investigations of Carbide-free Bainitic Transformations during Continuous Cooling: Cécile Rampelberg[1]; Guillaume Geandier[1]; Florimonde Lebel[1]; *Sebastien Allain*[1]; Julien Teixeira[1]; Thomas Sourmail[2]; [1]Institut Jean Lamour;

[2]Ascometal

8:50 AM
Tempering of Low Carbon Martensite, Experimental Results and Model Development: *Juan Macchi*[1]; Julien Teixeira[1]; Guillaume Geandier[1]; Sabine Denis[1]; Frédéric Bonnet[2]; Sébastien Allain[1]; [1]Institut Jean Lamour Ijl (Cnrs Umr7198); [2]ArcelorMittal Research SA

9:10 AM
A Modified Model for Predicting Retained Austenite Using Informed Compositional Modeling: *Melissa Thrun*[1]; Amy Clarke[1]; Kester Clarke[1]; [1]Colorado School of Mines

9:30 AM Break

9:50 AM
A New Approach for Optimizing Heat Treatment Parameters in Q&P Steel: *Casey Gilliams*[1]; Kip Findley[1]; John Speer[1]; [1]Colorado School Of Mines

10:10 AM
Semi In-situ Observation of Micro-crack Formation in Dual-phase Steels: Hung-Wei Yen[1]; *Ming-Yu Tseng*[1]; Yi-Fan Hu[1]; Kuo-Cheng Yang[2]; Kangying Zhu[3]; [1]National Taiwan University; [2]China Steel Corporation; [3]ArcelorMittal Maizières

10:30 AM
Nucleation during Static Recrystallization of Austenite - A Combined Experimental and Modeling Approach: *Pablo Garcia Chao*[1]; Vitesh Shah[2]; Jonathan Joe Eipe[1]; Jesus Galan-Lopez[1]; Monika Krugla[3]; Winfried Kranendonk[3]; Jilt Sietsma[1]; Cornelis Bos[3]; Sven Erik Offerman[1]; [1]Delft University of Technology; [2]Max-Planck-Institut für Eisenforschung; [3]Tata Steel, Research & Development

10:50 AM
Numerical Investigations of Interface-controlled Phase Transformations during Intercritical Annealing of DP Steels: *Clelia Couchet*[1]; Julien Teixeira[1]; Sébastien Allain[1]; Guillaume Geandier[1]; Frédéric Bonnet[2]; [1]Institut Jean Lamour-Ijl (Cnrs Umr 7198); [2]ArcelorMittal Maizières Research

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MECHANICS & STRUCTURAL RELIABILITY

High Temperature Creep Properties of Advanced Structural Materials — Modeling and Simulation of Creep in Advanced Structural Alloys

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

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Lab; Jeffery Gibeling, University of California, Davis

Tuesday AM | March 21, 2023
Sapphire P | Hilton

Session Chairs: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Laboratory; Jeffery Gibeling, University of California, Davis

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8:00 AM Introductory Comments

8:05 AM Invited
CALPHAD Alloy Design for Diffusion-mediated Plasticity-Induced Phase Transformations for Creep Resistant Multicomponent Principal Elemental Alloy:

Jennifer Carter[1]; Sipei Li[1]; [1]Case Western Reserve University

8:35 AM
Crystal Plasticity Creep Modeling in Cobalt Based Superalloys: *Shahriyar Keshavarz*[1]; Carelyn Campbell[1]; Andrew Reid[1]; [1]NIST

8:55 AM
Effect of Alloying Additions on Twinning in Ni-based Superalloys: *Valery Borovikov*[1]; Mikhail Mendelev[1]; Timothy Smith[1]; John Lawson[1]; [1]NASA

9:15 AM Break

9:35 AM Invited
Creep Simulations of Refractory High Entropy Alloys: Xin Chen[1]; Saro San[2]; Fei Wang[1]; Bai Cui[1]; Dongsheng Li[3]; Shanshan Hu[4]; Xingbo Liu[4]; David Alman[2]; *Michael Gao*[2]; [1]University of Nebraska Lincoln; [2]National Energy Technology Laboratory; [3]Advanced Manufacturing LLC; [4]West Virginia University

10:05 AM
Thermal Creep Models Derived from a Comprehensive Multiple Heat 9Cr Tempered Martensitic Steels Database: *Md Ershadul Alam*[1]; Takuya Yamamoto[1]; G.R. Odette[1]; [1]University of California, Santa Barbara

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MATERIALS PROCESSING

High Temperature Electrochemistry V — Session III

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

Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Tuesday AM | March 21, 2023
28B | SDCC

Session Chair: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory)

8:00 AM Introductory Comments

8:05 AM Invited
The Impact of Moisture on the Electrochemical Behavior of Molten Calcium Chloride: Marah Fuller[1]; *Devin Rappleye*[1]; [1]Brigham Young University

8:45 AM
Electrochemical Reduction of Nd2O3+Fe2O3 Mixed Oxide Precursors in Calcium Chloride Melt: *Kunal Mondal*[1]; Prabhat Tripathy[1]; [1]Idaho National Laboratory

9:05 AM
Oxide Ion Ceramic Sensor in Molten CaCl2 for Real Time Monitoring of the Direct Oxide Reduction Process: *Olivia Dale*[1]; Forest Felling[1]; Michael Simpson[1]; [1]University of Utah

9:25 AM
The Demonstration and Optimization of Thin-cell Electrochemical Measurements in Molten LiCl-KCl Eutectic: *Cameron Vann*[1]; Tyler Williams[1]; Devin Rappleye[1]; [1]Brigham Young University

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MATERIALS DESIGN

Hume-Rothery Symposium on First-Principles Materials Design — Interface First-principle Method with the Discovery of Complex Materials

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

Program Organizers: Bin Ouyang, Florida State University; Mark Asta, University of California, Berkeley; Geoffroy Hautier, Dartmouth College; Wei Xiong, University of Pittsburgh; Anton Van der Ven, University of California, Santa Barbara

Tuesday AM | March 21, 2023
Cobalt 501C | Hilton

Session Chairs: Jeffrey Hoyt, McMaster University; Wenhao Sun, University of Michigan, Ann Arbor

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8:00 AM Invited
The Stewardship of a Materials Genome: *Kristin Persson*[1]; [1]University of California, Berkeley

8:30 AM Invited
Computational Design of Multicomponent Nanoparticle Morphologies: *Christopher Wolverton*[1]; [1]Northwestern University

9:00 AM Invited
Plasmonic High-entropy Carbides: *Stefano Curtarolo*[1]; Arrigo Calzolari[2]; [1]Duke University; [2]CNR-NANO Research Center S3

9:30 AM Break

9:50 AM Invited
Computational Discovery of Materials with Fast Oxygen Kinetics: *Dane Morgan*[1]; Ryan Jacobs[1]; Jun Meng[1]; Md Sariful Sheikh[1]; Jian Liu[2]; [1]University of Wisconsin-Madison; [2]DOE National Energy Technology Laboratory

10:20 AM Invited
From Atom to System - How to Build Better Batteries: *Shirley Meng*[1]; [1]The University of Chicago

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CORROSION

Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion — Session III

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

Program Organizers: Penghui Cao, University of California, Irvine; Yang Yang, Pennsylvania State University; Fadi Abdeljawad, Clemson University; Irene Beyerlein, University of California, Santa Barbara; Enrique Lavernia, University of California, Irvine; Robert Ritchie, University of California, Berkeley

Tuesday AM | March 21, 2023
Sapphire 411A | Hilton

Session Chairs: Robert Ritchie, University of California, Berkeley; Penghui Cao, University of California, Irvine; Yang Yang, The Pennsylvania State University; Irene Beyerlein, University of California, Santa Barbara

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8:00 AM Invited
Different Scales of Chemical and Structural Ordering in Advanced High Strength Steels: *Dierk Raabe*[1]; Dirk Ponge[1]; Binhan Sun[1]; [1]Max-Planck Institute

8:30 AM
In-situ TEM Study of the Role of Short-range-order in the Deformation of Medium Entropy Alloy: *Yang Yang*[1]; Ying Han[1]; Yongwen Sun[1]; Mark Asta[2]; Robert Ritchie[2]; Andrew Minor[2]; [1]The Pennsylvania State University; [2]Lawrence Berkeley National Laboratory

8:50 AM Invited
Short-range Order Effects on Dislocation Mobilities in High-entropy Alloys from Atomistic Simulations: Sheng Yin[1]; Anas Abu-Odeh[2]; David Olmsted[2]; Jun Ding[3]; Wenqing Wang[2]; Flynn Walsh[2]; Robert Ritchie[1]; *Mark Asta*[2]; [1]Lawrence Berkeley National Laboraory; [2]University of California, Berkeley; [3]Xi'an Jiaotong University

9:20 AM Break

9:40 AM Invited
Local Phase Transformations Associated with Extended Defects in Ni-base Superalloys: *Michael Mills*[1]; Ashton Egan[1]; Semanti Mukhopadhyay[1]; Steven Niezgoda[1]; Maryam Ghazisaeidi[1]; Emmanuelle Marquis[2]; Fei Xue[2]; Yunzhi Wang[1]; Tim Smith[3]; [1]Ohio State University; [2]University of Michigan; [3]NASA Glenn Research Center

10:10 AM
Diffusion Kinetics and Formation of Chemical Short-range Order in Alloys: *Bin Xing*[1]; Penghui Cao[1]; [1]University of California, Irvine

10:30 AM Invited
Integrating In Situ Experiment and Atomistic Modeling to Decipher Grain Boundary Deformation Mechanisms: *Ting Zhu*[1]; [1]Georgia Institute of Technology

11:00 AM
Mean-field Prediction of Short-range Ordering/Clustering Kinetics in Binary FCC Solid Solution Alloys: *Anas Abu-Odeh*[1]; Blas Uberuaga[2]; Mark Asta[1]; [1]University of California Berkeley; [2]Los Alamos National Laboratory

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LIGHT METALS

Magnesium Technology 2023 — Corrosion and Coatings

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

Program Organizers: Steven Barela, Terves, Inc; Aeriel Murphy-Leonard, Ohio State University; Petra Maier, University of Applied Sciences Stralsund; Neale Neelameggham, IND LLC; Suveen Mathaudhu, Colorado School of Mines; Victoria Miller, University of Florida

Tuesday AM | March 21, 2023
30C | SDCC

Session Chairs: Petra Maier, Stralsund University of Applied Sciences; Josh Caris, Terves, Inc.

8:00 AM
Open-air Plasma Assisted Si-O-C Layer Deposition on AZ91D Mg Alloy for Corrosion Mitigation: *Jiheon Jun*[1]; Yong Chae Lim[1]; Yi-Feng Su[1]; Daphne Pappas[2]; Andrew Sy[2]; Ryan Robinson[2]; [1]Oak Ridge National Laboratory; [2]Plasmatreat USA

8:20 AM
Integrating Multimodal Corrosion with Correlative Microscopy Across Multiple Length Scales: *Sridhar Niverty*[1]; Rajib Kalsar[1]; Lyndi Strange[1]; Venkateshkumar Prabhakaran[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

8:40 AM
Protective Micro-arc Oxidation Surface Coating on AZ80 Forged Magnesium Alloy: *Xin Pang*[1]; Yuna Xue[2]; Hamid Jahed[3]; [1]CanmetMATERIALS, Natural Resources Canada; [2]Xi'an Shiyou University; [3]University of Waterloo

9:00 AM
Effect of Deformation Speed on Stress Corrosion and Fracture Toughness of Extruded Mg10Dy and Mg10Dy1Nd using C-ring Tests: *Petra Maier*[1]; Benjamin Clausius[1]; Norbert Hort[2]; [1]University of Applied Sciences Stralsund; [2]Helmholtz-Zentrum Hereon

9:20 AM Break

9:35 AM
A Comparative Study about Hydroxyapatite Coated AZ31 and AZ91 Mg Alloys: Serkan Baslayici[1]; Mehmet Bugdayci[2]; *Kagan Benzesik*[3]; Ozan Coban[4]; Onuralp Yucel[3]; Ercan Acma[3]; [1]Istanbul Medipol University; [2]Yalova University; [3]stanbul Technical University; [4]Istanbul Gedik University

9:55 AM
In Situ Study of the Degradation Behaviour Under Load of Mg1.8Y0.6Zn(1Ag) Using Synchrotron Tomography: *Domonkos Tolnai*[1]; Birte Hindenlang[1]; Jan Bohlen[2]; Joao Pereira da Silva[1]; Jianan Gu[1]; Anais Louapre[1]; Florian Wieland[1]; Fabian Wilde[3]; [1]Institute of Metallic Biomaterials, Helmholtz-Zentrum Hereon; [2]Institute of Material and Process Design, Helmholtz-Zentrum Hereon; [3]Institute of Materials Physics, Helmholtz-Zentrum Hereon

10:15 AM
In Vitro Degradation Assessment of Magnesium Wire in Sternal-closure-like Conditions: *Adam Griebel*[1]; Natalie Romick[1]; [1]Fort Wayne Metals

10:35 AM
Influence of Corrosion Extent on Residual Tensile Strength and Corrosion Fatigue Properties of an Mg-Y-Nd Alloy Characterized by µCT: Benjamin Clausius[1]; Nils Wegner[2]; Sharmajeya Jeyavalan[1]; Hendrik Hartweg[2]; Frank Walther[2]; *Petra Maier*[1]; [1]University of Applied Sciences Stralsund; [2]TU Dortmund University

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NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Novel Materials and Properties

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

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

Laboratory

Tuesday AM | March 21, 2023
27A | SDCC

Session Chair: Kumar Sridharan, University of Wisconsin

8:00 AM
Microstructural Evolution and Hardness Changes in Ion irradiated Ni-based Superalloys: *Qinyun Chen*[1]; Ryan Thier[1]; Yan-Ru Lin[2]; Wang Ling[3]; Steven Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]SLAC National Accelerator Laboratory

8:20 AM
Interest of Nickel Based Alloys Additive Manufacturing for Molten Salt Reactors: First Elements of Behavior under Ion Irradiation.: *Martin Madelain*[1]; Pascal Aubry[1]; Alexandre Legris[2]; Yann de Carlan[1]; [1]Université Paris-Saclay, CEA; [2]UMET, Polytech Lille

8:40 AM
Residual Stress in Cobalt Free Cladding Systems for Molten Salt Reactors: Behrooz Tafazzolimoghaddam[1]; *Richard Moat*[1]; [1]The Open University

9:00 AM
ICME Development of a Cold Spray Enabled Corrosion Resistant Bimetallic Structure for Nuclear Reactors: *Pin Lu*[1]; Joseph Heelan[2]; Vilupanur Ravi[3]; [1]QuesTek Innovations LLC; [2]Solvus Global; [3]Cal Poly Pomona

9:20 AM
Corrosion Behavior of Compositionally Gradient Additively Manufactured 316L Stainless Steel Doped with Hafnium in Eutectic NaCl-MgCl2 Molten Salt at 700 °C: *Laura Hawkins*[1]; Jingfan Yang[2]; Michael Woods[3]; Trishelle Copeland-Johnson[3]; Ruchi Gakhar[3]; Lin Shao[1]; Xiaoyuan Lou[2]; Daniel Murray[3]; Lingfeng He[3]; [1]Texas A&M University; [2]Purdue University; [3]Idaho National Laboratory

9:40 AM Break

9:55 AM
Investigate on Dechromization in Converter during Vanadium Extraction and Semi-steel Steelmaking Processes Based on the Ion and Molecule Coexistence Theory: *Wang Zhou*[1]; Zhao Chen[1]; Xiaoxi Chen[1]; Bailin Luo[1]; Changfa Zhou[1]; Gai Fu[1]; Xiaowen Yu[1]; [1]Chongqing CEPREI Industiral Technology Research Institute Co., Ltd.

10:15 AM
Thermal Conductivity Measurements of FLiNaK, FMgNaK, and LiCl-KCl: *Troy Munro*[1]; Brian Merritt[1]; Benjamin Wright[1]; Noah Cahill[1]; Noah Cahill[1]; [1]Brigham Young University

10:35 AM
Cover Gas Selection for Molten Salts: *Adam Burak*[1]; Minghui Chen[2]; [1]University of Michigan; [2]University of New Mexico

10:55 AM
Uncertainty Quantification and Propagation for Thermodynamic Models of Molten Salts: *Jorge Paz Soldan Palma*[1]; Jacob Yingling[1]; Juliano Schorne-Pinto[1]; Johnathon Ard[1]; Mina Aziziha[1]; Clara Dixon[1]; Ronald Booth[1]; Amir Mofrad[1]; Theodore Besmann[1]; [1]University of South Carolina

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MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — Materials Genome

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

Tuesday AM | March 21, 2023
Sapphire L | Hilton

Session Chair: James Saal, Citrine Informatics

8:00 AM Invited
The Materials Genome Initiative: *James Warren*[1]; [1]NIST

8:30 AM Invited
Alloy Design Based on Automated CALPHAD Composition Search and Machine Learning: *Alan Luo*[1]; [1]The Ohio State University

9:00 AM Invited
Design of Compositional Pathways for Functionally Graded Materials in Additive Manufacturing: *Allison Beese*[1]; [1]Pennsylvania State University

9:30 AM Break

9:50 AM Invited
CALPHAD-based ICME Design for Additive Manufacturing of Functionally Graded Alloys: *Wei Xiong*[1]; [1]University of Pittsburgh

10:20 AM Invited
Thermodynamics of Iodine Terminated MXenes from First-principles Calculations and CALPHAD Modeling: *Yong-Jie Hu*[1]; Ervin Rems[1]; David Bugallo Ferron[1]; Yury Gogotsi[1]; [1]Drexel University

10:50 AM Invited
Big Data-Assisted Digital Twins for the Smart Design and Manufacturing of Advanced Materials: From Atoms to Products: *William Yi Wang*[1]; Jinshan Li[1]; Xingyu Gao[2]; Feng Sun[3]; Qinggong Jia[3]; Bin Tang[1]; Xi-Dong Hui[4]; Haifeng Song[2]; Zi-Kui Liu[5]; [1]Northwestern Polytechnical University; [2]Institute of Applied Physics and Computational Mathematics; [3]Western Superconducting Technologies Co., Ltd; [4]University of Science and Technology Beijing; [5]The Pennsylvania State University

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Ferritic Alloys III

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest

National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

Tuesday AM | March 21, 2023
28D | SDCC

Session Chairs: Caleb Massey, Oak Ridge National Laboratory; Eda Aydogan, METU

8:00 AM Invited
A New Microcrack Healing Mechanism in an Annealed 14YWT Nanostructured Ferritic Alloy: *Md Ershadul Alam*[1]; Soupitak Pal[1]; Nicholas Cunningham[1]; G. R. Odette[1]; [1]University of California, Santa Barbara

8:30 AM
Preliminary Studies on Creep Behavior of Commercial FeCrAl Alloy (APMT): *Hamdy Abouelella*[1]; Benjamin Beeler[1]; Jacob Eapen[1]; Korukonda Murty[1]; [1]North Carolina State University

8:50 AM
Investigating Environmentally-Assisted Cracking in 316 Stainless Steel U-Bend Specimens Exposed to Liquid Sodium: *Dustin Mangus*[1]; Xavier Quintana[1]; Guillaume Mignot[1]; Wade Marcum[1]; Julie Tucker[1]; Samuel Briggs[1]; [1]Oregon State University

9:10 AM
Effect of Irradiation on the Tensile Strength of Select Layers and Layer Interfaces of TRISO-coated Nuclear Fuel Particles: *Tanner Mauseth*[1]; Mary Lou Dunzik-Gougar[1]; Fei Teng[2]; Subhashish Meher[3]; [1]Idaho State University; [2]Idaho National Laboratory ; [3]Idaho National Laboratory

9:30 AM Break

9:50 AM
Fatigue Assessment of Metastable Austenitic AISI 347 Pipe Components for Nuclear Engineering: *Kai Donnerbauer*[1]; Tobias Bill[2]; Peter Starke[2]; Ruth Acosta[3]; Christian Boller[3]; Jens Arndt[4]; Klaus Heckmann[4]; Jürgen Sievers[4]; Tim Schopf[5]; Frank Walther[1]; [1]TU Dortmund, Chair of Materials Test Engineering (WPT); [2]University of Applied Sciences Kaiserslautern, Department of Materials Science and Materials Testing (WWHK); [3]Saarland University, Chair of Nondestructive Testing and Quality Assurance (LZfPQ); [4]Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH; [5]University of Stuttgart, Materials Testing Institute (MPA)

10:10 AM
ODS Cu Materials for Fusion Application Produced by Mechanical Alloying: *Carsten Bonnekoh*[1]; Andrei Galatanu[2]; David Bürger[3]; Thomas Gietzelt[1]; Michael Rieth[1]; [1]Karlsruhe Institute of Technology; [2]National Institute of Materials Physics; [3]Ruhr-University Bochum

10:30 AM
Additively Manufactured Digital Image Correlation for Nuclear Materials: *Kaelee Novich*[1]; Timothy Phero[1]; Sarah Cole[1]; Michael McMurtrey[2]; David Estrada[1]; Brian Jaques[1]; [1]Boise State University; [2]Idaho National Laboratory

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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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

Tuesday AM | March 21, 2023
Aqua 310B | Hilton

Session Chairs: Josh Kacher, Georgia Institute of Technology; Ashley Bucsek, University of Michigan

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8:00 AM Invited
Effect of Defect Spatial Distribution on Ductile Failure in Additively Manufactured 316L: *David Rowenhorst*[1]; Aeriel Leonard[2]; [1]Naval Research Laboratory; [2]Ohio State University

8:30 AM
Direct Measurement of the Effective Mechanical Properties of Additively Manufacturing Octet Truss Lattices using High Energy X-ray Diffraction: *Nathan Johnson*[1]; [1]Stanford University

8:50 AM
Load Transfer in Ni-CrC Composites Studied by Synchrotron X-ray Diffraction and X-ray Microtomography: Lewei He[1]; Eshan Ganju[2]; Nikhilesh Chawla[2]; *Mostafa Hassani*[1]; [1]Cornell University; [2]Purdue University

9:10 AM
Transmission X-Ray Microscopy Reveals Role of Secondary Cracks in Hydrogen Embrittlement: *Andrew Lee*[1]; Abhinav Parakh[1]; Wendy Gu[1]; [1]Stanford University

9:30 AM Break

9:50 AM Invited
Three-dimensional In-situ Measurements of Martensitic Phase Transformation Across Length Scales using X-ray Topotomography and Dark-field X-ray Microscopy: *Ashley Bucsek*[1]; [1]University of Michigan

10:20 AM
Damage Evolution in Al Alloys Assessed via X-ray Computed Tomography and Crystallographic Orientation Data: *Philip Noell*[1]; Raiyan Seede[2]; Kyle Johnson[1]; [1]Sandia National Laboratories; [2]Lawrence Livermore National Laboratory

10:40 AM
Assessment of Phase-field Fracture Simulations of Brittle Fracture in Polycrystalline Materials: *Mythreyi Ramesh*[1]; Sara Gorske[2]; Jean-Michel Scherer[2]; Blaise Bourdin[3]; Kaushik Bhattacharya[2]; Katherine Faber[2]; Peter Voorhees[1]; [1]Northwestern University; [2]California Institute of Technology; [3]McMaster University

11:00 AM
On the Deformation Mechanisms of Ductility Enhanced Mg-X-Ca Alloys at Elevated Temperatures: *Mohammed Said*[1]; David Collins[1]; [1]University of Birmingham

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NUCLEAR MATERIALS

Methods, Techniques, and Materials Discovery of Irradiation Effect Using In-

situ Microscopy — Advances in Microstructure Characterization and Data Analysis

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

Program Organizers: Wei-Ying Chen, Argonne National Laboratory; Xuan Zhang, Argonne National Laboratory; Kevin Field, University of Michigan; Donald Brown, Los Alamos National Laboratory; Aida Amroussia, GE Global Research

Tuesday AM | March 21, 2023
25A | SDCC

Session Chair: Kevin Field, University of Michigan

8:00 AM Invited
Utilizing High-energy X-rays for Microstructural Characterization of Metallic Hydrides: *Reeju Pokharel*[1]; Samantha Lawrence[1]; Travis Carver[1]; Sangwon Lee[1]; Donald Brown[1]; [1]Los Alamos National Laboratory

8:30 AM
Deep Learning Defect Detection in Electron Microscopy of Radiation Damage in Metals: *Dane Morgan*[1]; Ryan Jacobs[1]; Mingren Shen[1]; Priyam Patki[2]; Matthew Lynch[2]; Kevin Field[2]; [1]University of Wisconsin-Madison; [2]University of Michigan, Ann Arbor

8:50 AM
Uncovering Transient Grain Boundary Absorption States Using Deep Learning Object Detection: *Emily Hopkins*[1]; Sicong He[2]; Ryan Jacobs[3]; Priyam Patki[4]; Chang-Yu Hung[1]; James Nathaniel[5]; Dane Morgan[3]; Kevin Field[4]; Jaime Marian[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]University of California - Los Angeles; [3]University of Wisconsin - Madison; [4]University of Michigan; [5]Sandia National Laboratories, CA

9:10 AM Invited
Advanced In Situ Mechanical Testing Approaches to Evaluate the Degradation of Nuclear System Components: *Maxim Gussev*[1]; David McClintock[1]; Kevin Field[2]; Ercan Cakmac[1]; Travis Dixon[1]; [1]ORNL; [2]University of Michigan

9:40 AM Break

10:00 AM
Precipitate and Cavity Evolution in Alloy 718 Under High Temperature In-situ Ion Irradiation using Machine Learning: *Stephen Taller*[1]; Timothy Lach[1]; Kai Sun[2]; [1]Oak Ridge National Laboratory; [2]University of Michigan

10:20 AM
Particle-induced X-ray Emission Spectroscopy (PIXE) for In Situ Monitoring of Corrosion Under Proton Irradiation in the Irradiation-corrosion Experiment (ICE): *Franziska Schmidt*[1]; Matthew Chancey[2]; Hyosim Kim[2]; Yongqiang Wang[2]; Peter Hosemann[1]; [1]University of California Berkeley; [2]Los Alamos National Laboratory

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NUCLEAR MATERIALS

Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-cladding Interface — Uranium Carbides, Nitrides and Silicides

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

Committee

Program Organizers: Yi Xie, Purdue University; Miaomiao Jin, Pennsylvania State University; Jason Harp, Oak Ridge National Laboratory; Fabiola Cappia, Idaho National Laboratory; Jennifer Watkins, Idaho National Laboratory; Michael Tonks, University of Florida

Tuesday AM | March 21, 2023
26B | SDCC

Session Chair: Jennifer Watkins, Idaho National Laboratory

8:00 AM Introductory Comments

8:05 AM Invited
Accelerating the Qualification of Nuclear Fuels Through Advanced Characterization and Multiscale Modeling: *Joshua White*[1]; [1]Los Alamos National Laboratory

8:30 AM Invited
Chemical Structures and Thermodynamics of Uranium Nitride and Uranium Carbide: *Xiaofeng Guo*[1]; Vitaliy Goncharov[1]; Juejing Liu[1]; Arjen van Veelen[2]; Joshua White[2]; Hongwu Xu[2]; [1]Washington State University; [2]Los Alamos National Laboratory

8:55 AM
Fabrication and Characterization of Uranium Carbide: *Adrien Terricabras*[1]; Arjen van Veelen[1]; Erofili Kardoulaki[1]; Scarlett Widgeon Paisner[1]; Timothy Coons[1]; Joshua White[1]; [1]Los Alamos National Laboratory

9:15 AM
Nuclear Fuels and Interfaces for Advanced Specialty Microreactors: *Erofili Kardoulaki*[1]; Najeb Abdul-Jabbar[1]; Josh White[1]; Scarlett Widgeon-Paisner[1]; Maria Kosmidou[1]; Mehadi Hassan[1]; Ken McClellan[1]; [1]Los Alamos National Laboratory

9:35 AM Break

9:50 AM
Chemical Interaction and Compatibility of Uranium Nitride and Alumina Forming Austenitic Alloys: *Andre Broussard*[1]; Dong Zhao[1]; Jie Lian[1]; Bruce Pint[2]; Jiheon Jun[2]; Jason Harp[2]; Erofili Kardoulaki[3]; [1]Rensselaer Polytechnic Institute; [2]Oak Ridge National Laboratory; [3]Los Alamos National Laboratory

10:10 AM
Modeling of Fission Gas Behavior in Uranium Nitride Fuel: *Jason Rizk*[1]; Christopher Matthews[1]; Michael Cooper[1]; Anders Andersson[1]; [1]Los Alamos National Laboratory

10:30 AM
High Temperature Steam Oxidation Performance of Alloyed, High Density Fuel Composite: U_3Si_2 + 50wt% UB_2: *Geronimo Robles*[1]; Joshua White[2]; Scarlett Widgeon Paisner[2]; Elizabeth Sooby[1]; [1]University of Texas at San Antonio; [2]Los Alamos National Laboratory

10:50 AM
Assessment of High-density Fuels During Hydrogen Interaction: *Adrian Gonzales*[1]; Elizabeth Sooby[1]; Joshua White[2]; [1]The University of Texas at San Antonio; [2]Los Alamos National Laboratory

11:10 AM
Assessing the Influence of Microstructure on Uranium Hydride Size Distributions via Small Angle Neutron Scattering: *Zachary Harris*[1]; Elena Garlea[2]; Tasha Boyd[2];

Lisa DeBeer-Schmitt[3]; Kenneth Littrell[3]; Sean Agnew[4]; [1]University of Pittsburgh; [2]Y-12; [3]Oak Ridge National Laboratory; [4]University of Virginia

NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Metals in Coupled or Multiple Extreme Environments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Tuesday AM | March 21, 2023
Aqua 303 | Hilton

Session Chair: Youxing Chen, University of North Carolina, Charlotte

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8:00 AM Invited
Coupled Extreme Environments the True Challenge for Nuclear Materials: *Peter Hosemann*[1]; Minsung Hong[2]; Franziska Schmidt[3]; Rasheed Auguste[2]; John Scully[4]; Ho Lun Chan[4]; Farida Selim[5]; Djamel Kaoumi[6]; [1]University of California at Berkeley; [2]University of California, Berkeley; [3]1University of California, Berkeley; [4]University of Virginia; [5]Bowling Green State University; [6]North Carolina State University

8:25 AM Invited
Solute Partitioning and its Influence on Stability and Mechanical Behavior in Nanocrystalline Alloys: Thomas Koenig[1]; Ilias Bikmukhametov[1]; Ankit Gupta[2]; Garritt Tucker[2]; *Gregory Thompson*[1]; [1]University of Alabama; [2]Colorado School of Mines

8:50 AM Invited
Critical Assessment of Grain Size Stability and its Role on Microstructure Preservation Under Extreme Stimuli: *Billy Hornbuckle*[1]; Kris Darling[1]; Anit Giri[1]; Anthony Roberts[1]; Cyril Williams[1]; Scott Turnage[1]; Dan Casem[1]; [1]US Army Research Laboratory

9:15 AM
Nanoindentation Measurements at Combined High Strain Rates and Elevated Temperatures: *Benoit Merle*[1]; Christopher Walker[2]; Christopher Zenk[3]; George Pharr[2]; [1]University of Kassel; [2]Texas A&M University; [3]FAU Erlangen-Nuernberg

9:35 AM Break

9:55 AM Invited
Nanostructured Metallic Materials with Thick Grain Boundaries: Jie Ding[1]; Ruizhe Su[1]; Dajla Neffati[2]; Yashashree Kulkarni[2]; *Xinghang Zhang*[1]; [1]Purdue University; [2]University of Houston

10:20 AM
Radiation Instability of Thermally Stable Nanocrystalline Pt-Au System: *Ryan Schoell*[1]; Chris Barr[1]; Douglas Medlin[1]; Dave Adams[1]; Yasir Mahmood[2]; Remi

Dingreville[1]; Fadi Abdeljawad[2]; Brad Boyce[1]; Khalid Hattar[1]; [1]Sandia National Laboratory; [2]Clemson University

10:40 AM
Irradiation and Corrosion Behavior of Nanostructured Grade 91 and FeCrAl Alloys for Nuclear Applications: *Joshua Rittenhouse*[1]; Matthew Luebbe[1]; Mahmut Cinbiz[2]; Lingfeng He[2]; Haiming Wen[1]; [1]Missouri University of Science and Technology; [2]Idaho National Laboratory

11:00 AM
A Stable and Irradiation Resistant Ultrafine-grained Aluminum Crossover Alloys: *Patrick Willenshofer*[1]; Matheus Tunes[2]; Oliver Renk[1]; Peter Uggowitzer[1]; Stefan Pogatscher[1]; [1]Montanuniversitaet Leoben; [2]Los Alamos National Laboratory

11:20 AM Invited
A New Type of Nuclear Materials: Nanocrystalline ODS Steels: *Tongde Shen*[1]; [1]Yanshan University

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CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Energy Materials

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

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

Tuesday AM | March 21, 2023
Aqua 311B | Hilton

Session Chair: Chen Li, University of California, Riverside

8:00 AM Invited
Atomic Dynamics in Energy Materials: *Olivier Delaire*[1]; [1]Duke University

8:30 AM Invited
Two-dimensional Local Lattice Distortions in Inorganic Halide Perovskites: *Stephan Rosenkranz*[1]; Matthew Krogstad[1]; Xing He[2]; Tyson Lanigan-Atkins[2]; Feng Ye[3]; Yaohua Liu[3]; Duck-Young Chung[1]; Olivier Delaire[2]; Raymond Osborn[1]; [1]Argonne National Laboratory; [2]Duke University; [3]Oak Ridge National Laboratory

9:00 AM
Characterization of Heterogeneously Disordered Oxides with Total Scattering Experiments: *Eric O'Quinn*[1]; Igor Gussev[1]; Maik Lang[1]; [1]University of Tennessee

9:20 AM
Mutual Spin-phonon Driving Effects and Phonon Eigenvector Renormalization in Nickel (II) Oxide: *Qiyang Sun*[1]; Bin Wei[2]; Yaokun Su[1]; Hillary Smith[3]; Jiao Lin[4]; Douglas Abernathy[4]; Chen Li[1]; [1]University of California, Riverside; [2]Henan Polytechnic University; [3]Swarthmore College; [4]Oak Ridge National Laboratory

9:40 AM Break

9:55 AM
Probing the Gas Sorption Mechanism in Spin-crossover MOFs by Neutron Scattering: *Jose Alberto Rodriguez-Velamazan*[1]; Angel Fernandez-Blanco[1]; Roberta Poloni[2]; [1]Institut Laue-Langevin; [2]CNRS, Grenoble-INP, SIMaP, University of Grenoble Alpes

10:15 AM
Quasi-elastic Neutron Scattering Measurements of Hydrogen Diffusion in Zirconium: *Brent Heuser*[1]; Timothy Prisk[2]; Jun-Li Lin[1]; Tanya Dax[2]; Yongfeng Zhang[3]; [1]University of Illinois; [2]NIST; [3]INL

10:35 AM
Entropy Contributions to Explain Thermal Expansion: Thermodynamics of the Invar Effect: *Stefan Lohaus*[1]; Pedro Guzman[1]; Camille Bernal-Choban[1]; Claire Saunders[1]; Brent Fultz[1]; [1]California Institute of Technology

ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — High Temperature Fundamentals

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Tuesday AM | March 21, 2023
33C | SDCC

Session Chairs: Alexandra Anderson, Gopher Resource; Camille Fleuriault, Eramet Norway

8:00 AM Invited
Simulation and Post Mortem Studies: The Holistic Approach for Optimized and Engineered Lining Concepts: *Dean Gregurek*[1]; Günter Unterreiter[1]; Clemens Lind[1]; Alfred Spanring[1]; *Ulrich Marschall*[2]; [1]RHI Magnesita; [2]RHI Magnesita GmbH

8:30 AM
Mixture Solidification Model for Simulation of Freeze Lining: Christian Rodrigues[1]; Menghuai Wu[1]; *Andreas Ludwig*[1]; [1]University of Leoben

8:50 AM
A Kinetic Description of Physico-chemical Processes Taking Place in the Burden of HCFeMn Submerged Arc Furnaces: *Ainur Nigmetova*[1]; Haoxue Han[1]; Astrid Hecquet[1]; Bertil Farjaudon[1]; Gilles Nussbaum[1]; [1]Eramet Ideas

9:10 AM
Lanthanum-light Metal Alloys Production using Secondary Resources - Thermodynamic Analysis: *Ahmad Rizky Rhamdani*[1]; M. Akbar Rhamdhani[1]; Geoffrey Brooks[1]; Mark I. Pownceby[2]; Yudi Nugraha Thaha[3]; Trevor Abbott[1]; John Grandfield[4]; Chris Hartley[5]; [1]Swinburne University of Technology; [2]CSIRO; [3]National Research and Innovation Agency; [4]Grandfield Technology Pty Ltd; [5]Platina Resources

9:30 AM Break

9:50 AM
Selective Chlorination as an Innovative Extraction Method for Valuable Metals from Iron Containing Matrix: *Stefan Steinlechner*[1]; Kerrin Witt[1]; Lukas Höber[1];

[1]Montanuniversität Leoben

10:10 AM
Decarbonizing Steelmaking: Nanoscale Mechanisms in H_2-Based Reduction of Iron Oxides: *Lauren Moghimi*[1]; Xueli Zheng[1]; Subhechchha Paul[1]; Fan Zhang[2]; Leora Dresselhaus-Marais[1]; [1]Stanford University; [2]National Institute of Standards and Technology

10:30 AM
High Vacuum Solar Thermal Dissociation for Metal and Oxide Extraction: Matthew Shaw[1]; Geoffrey Brooks[1]; *M. Akbar Rhamdhani*[1]; Alan Duffy[1]; Mark Pownceby[2]; [1]Swinburne University of Technology; [2]CSIRO

10:50 AM
Development of Dynamic Model of Collision and Coalescence for Molten Matte Droplets in Copper Smelting Reaction Shaft Considering Interfacial Deformation: *Yuko Goto*[1]; Shungo Natsui[2]; Hiroshi Nogami[2]; [1]Sumitomo Metal Mining Co., Ltd.; [2]Tohoku University

11:10 AM
Kinetic Study of Reduction of ZnFe2O4: *Xuefeng Bai*[1]; Chengbo Wu[1]; Yang Wang[1]; Zhihui Guo[1]; [1]Chongqing University

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NUCLEAR MATERIALS

Phase Stability in Extreme Environments — Phase Stability in Nuclear Environments III

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Andrew Hoffman, GE Research; Kinga Unocic, Oak Ridge National Laboratory; Janelle Wharry, Purdue University; Kaila Bertsch, Lawrence Livermore National Laboratory; Raul Rebak, GE Global Research

Tuesday AM | March 21, 2023
28C | SDCC

Session Chairs: Tiankai Yao, Idaho National Laboratory; Stephen Taller, Oak Ridge National Laboratory

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8:00 AM Invited
Phase Stability of δ-U-50wt%Zr under Thermal Treatment and Irradiation: *Amrita Sen*[1]; Tiankai Yao[2]; Mukesh Bachhav[2]; Janelle Wharry[1]; [1]Purdue University; [2]Idaho National Laboratory

8:30 AM
Precipitate Evolution in Post-AM Heat Treated and HFIR Irradiated Inconel 718 Alloys: *Stephen Taller*[1]; Lukas Metzger[2]; Matthew Lynch[3]; [1]Oak Ridge National Laboratory; [2]Virginia Polytechnic Institute and State University; [3]University of Michigan

8:50 AM
Long-range Ordering in Alloy 690 via Isothermal Aging and Irradiation: *Julie Tucker*[1]; Cole Evered[1]; Nicholas Aerne[1]; Luanne Rolly[1]; David Sprouster[2]; [1]Oregon State University; [2]Stony Brook University

9:10 AM
Quantitative Phase Field Modeling of Morphological Evolution of Voids under Ion Irradiation: *Sreekar Rayaprolu*[1]; Cuncai Fan[1]; Xinghang Zhang[1]; Anter El-Azab[1]; [1]Purdue University

9:30 AM Break

9:50 AM
Damage Dependence of Radiation Induced Segregation at Fully Characterized Grain Boundaries in Proton Irradiated 316L Stainless Steel: *Sara Wonner*[1]; Pascal Bellon[1]; [1]The University of Illinois, Urbana Champaign

10:10 AM
Effect of Dose Rate and Composition on the Precipitation Behavior of RPV Steels: *Anshul Kamboj*[1]; Nathan Almirall[2]; Emmanuelle Marquis[1]; G. Robert Odette[3]; [1]University of Michigan Ann Arbor; [2]General Electric Research; [3]University of California, Santa Barbara

10:30 AM
Synergetic Effects of Mn, Ni, and Si on the Formation of Mn-Ni-Si Clusters in the Reactor Pressure Vessel Model Steels: *Deepak Sharma*[1]; Auriane Etienne[1]; Philippe Pareige[1]; Bertrand Radiguet[1]; [1]Groupe de Physique des Matériaux, Université et INSA de Rouen, UMR CNRS 6634

10:50 AM
Fundamental Ionizing and Ballistic Radiation Effects in Multi-component Mineral Phases: *Sean Drewry*[1]; Katharine Page[1]; Kurt Sickafus[1]; Chris Wetteland[1]; [1]University of Tennessee Knoxville

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ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXII — Interconnection Materials

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Chung University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, Bangladesh University of Engineering and Technology (BUET); Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Tuesday AM | March 21, 2023
Sapphire E | Hilton

Session Chairs: Shih-kang Lin, National Cheng Kung University; Sehoon Yoo, Korea Institute of Industrial Technology

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8:00 AM Invited
Microstructure and Interface Evolution of Bare Cu-Cu Bonding Using Cu-Ag Composite Paste during High Temperature Application: *Chuantong Chen*[1]; Takuya Sekiguchi[2]; Katsuaki Suganuma[1]; [1]Osaka University; [2]Toppan Forms Co., Ltd.

8:25 AM Invited
Machine Learning Models of Ultimate Tensile Strength and Elongation for Low-temperature Solder: *Yu-chen Liu*[1]; Ahmad Kholik[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

8:50 AM
Effect of Trace Bi on the Mechanical Strength of Sn Solder Before and After Thermal Aging: *Yu-An Shen*[1]; [1]Feng Chia University

9:10 AM
Effect of Cu Addition on Mechanical Properties of In-Sn Alloy Before and After Isothermal Aging: *Hiroshi Nishikawa*[1]; Han Le Duy[2]; Hiroaki Tatsumi[1]; [1]Osaka University; [2]Hanoi University of Science and Technology

9:30 AM Break

9:50 AM
A Novel Synthesis Method of Cu NWs by Nucleation Control: *Kuan Lin Fu*[1]; [1]National Central University

10:10 AM
Dissolution Behavior in the Cu-2.0 wt% Be Alloy (Alloy 25) in Molten Sn, SAC305, and Sn-58Bi Solders: *Andromeda Laksono*[1]; Yee-wen Yen[1]; [1]National Taiwan University of Science and Technology

10:30 AM
Interfacial Reactions in the Lead-free Solders/Cu-Fe Alloy(C194) Couples: *Yi Chin Liu*[1]; Yu-Yen Lee[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science and Technology

10:50 AM
Solid/Solid State Interfacial Reactions between Lead-free Solders and Cu-Ti Alloy(C1990HP): *Hsiang Yu Chiu*[1]; [1]National Taiwan University of Science and Technology

11:10 AM
Electric Current-induced Lattice Strain and Grain Orientation Change in Silver Strip: *Shih-kang Lin*[1]; Yu-chen Liu[1]; Ciou-Ren Lee[1]; [1]National Cheng Kung University

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Aluminum Alloys

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Tuesday AM | March 21, 2023
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Session Chair: Ramasis Goswami, Naval Research Laboratory

8:00 AM
An Investigation of Nanomechanical Properties of Nanocrystal Embedded Marginal Metallic Glasses: *Can Okuyucu*[1]; Douhan Sarıtürk[1]; Mohammad Abboud[2]; Amir Motallebzadeh[3]; Sezer Özerinç[1]; Ilkay Kalay[4]; Yunus Kalay[1]; [1]Middle East Technical University; [2]Technische Universitat Darmstadt; [3]Koc University; [4]Çankaya University

8:20 AM
Microstructural Evolution in an Aluminum-Cerium Alloy under Long Term Aging Conditions: *Opemipo Adetan*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

8:40 AM
Effect of Mn on Eutectic Phase Equilibria in Al-rich Al-Ce-Ni alloys: *Alice Perrin*[1]; Ying Yang[1]; Richard Michi[2]; Kevin Sisco[3]; Alex Plotkowski[1]; Amit Shyam[1]; [1]Oak Ridge National Lab; [2]Owens Corning; [3]University of Tennessee

9:00 AM
The Effect of Thermomagnetic Processing on the Properties and Microstructure of Aluminum and Ferrous Alloys: *Michael Kesler*[1]; Michael Thompson[2]; Hunter Henderson[3]; David Weiss[4]; Zachary Tener[1]; Ramon Padin-Monroig[5]; Megan Hurley[5]; Steven Flynn[5]; Bart Murphy[1]; Orlando Rios[2]; Gerard Ludtka[5]; Aurelien Perron[3]; Victoria Miller[5]; Michael Tonks[5]; Michele Manuel[5]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]Lawrance Livermore National Lab; [4]Eck Industries; [5]University of Florida

9:20 AM Break

9:40 AM
Diffusion Pathway of Dopant Elements in Grain Boundary Engineered Al Alloys: *Tianjiao Lei*[1]; Jungho Shin[2]; Daniel Gianola[2]; Timothy Rupert[1]; [1]University of California Irvine; [2]University of California Santa Barbara

10:00 AM
Experimental Investigation to Understand the Relationship between Microstructure and Electrical/Thermal Properties of Al-Ni alloys: *Sunyong Kwon*[1]; Richard Michi[2]; Amit Shyam[1]; Dongwon Shin[1]; [1]Oak Ridge National Laboratory; [2]Northwestern University

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Synthesis

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

Tuesday AM | March 21, 2023
25B | SDCC

Session Chairs: Olivia Graeve, University of California, San Diego; Stephen Heywood, Montana State University

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8:00 AM
Combustion Synthesis of ZrC-TiC Composite Nanoparticle by Self-Propagating High Temperature Synthesis (SHS) in ZrO2 – TiO2 – Mg / Al - C System: *Mehmet*

Bugdayci[1]; Ozan Coban[2]; [1]Yalova University; [2]Istanbul Gedik University

8:20 AM
Design and Synthesis of Alkaline-earth Doped Hexaborides with Sodium and Potassium Dopants: Alan Hirales[1]; *Justin Nakamura*[1]; Olivia Graeve[1]; [1]University of California San Diego

8:40 AM
Scalable Synthesis of Flowable Porous Copper Powders and Nanoscale Welding for High Surface Area 3D Printed Parts: *Natalya Kublik*[1]; Stanislau Niauzorau[1]; Bruno Azeredo[1]; [1]Arizona State University

9:00 AM Invited
Synthesis and Crystallography of High Entropy Metal Carbides: A New Class of Ultrahigh Temperature Ceramics: *Olivia Graeve*[1]; [1]University of California San Diego

9:30 AM Break

9:50 AM
Tailored Morphology of TaC Nanoparticles by Introduction of Transition Metal Dopants: *Stephanie Ortega*[1]; Jixuan Dong[1]; Jamie Doan[1]; Katada Siraj[1]; Olivia Graeve[1]; [1]University of California San Diego

10:10 AM
LLZO Powder Synthesis & Design for Maintaining Li Stoichiometry in Powders and Dense Membranes: *Stephen Heywood*[1]; Stephen Sofie[1]; David Driscoll[1]; [1]Montana State University

10:30 AM
Fabrication of Nanoporous Aluminum Powders via Thermal and Chemical Processing: *Jodie Baris*[1]; Jonah Erlebacher[1]; [1]Johns Hopkins University

10:50 AM
Synthesis of Ti-Al Intermetallic Compound Fine Powder Using Shuttle of Proportionation and Disproportionation Reactions in Molten Salt: *Terigele Terigele*[1]; Xin Lu[1]; Osamu Takeda[1]; Hongmin Zhu[1]; [1]Tohoku University

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Energy Storage Devices

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

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

Tuesday AM | March 21, 2023
Sapphire 411B | Hilton

Session Chairs: Changyong Cao, Case Western Reserve University; Majid Beidaghi, Auburn University; Konstantinos Sierros, West Virginia University

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8:00 AM Invited
3D Printing of Energy Storage Devices Based on MXenes: *Majid Beidaghi*[1]; [1]Auburn University

8:25 AM Invited
Synchrotron Nano-tomography and Coherent X-ray Scattering Investigation of 3D Printed Batteries: Dean Yen[1]; Karol Dyro[1]; Xiaoyin Zheng[1]; Cheng-Hung Lin[2]; David Sprouster[2]; Xiaojing Huang[3]; Mingyuan Ge[3]; Lutz Wiegart[3]; *Yu-chen Karen Chen-Wiegart*[2]; [1]Stony Brook University; [2]Stony Brook University / Brookhaven National Laboratory; [3]Brookhaven National Laboratory

8:50 AM
Direct 4D Printing of Stretchable Supercapacitors Using Hybrid Composite Materials: *Changyong Cao*[1]; [1]Case Western Reserve University

9:10 AM
Creating Stretchable Solid-State Lithium Battery Arrays Using Direct Ink Writing: *Nicholas Winch*[1]; Domenic Cipollone[1]; Derrick Banerjee[1]; Harrison Loh[1]; Konstantinos Sierros[1]; [1]West Virginia University

9:30 AM Break

9:50 AM Invited
Laser Nanostructured Al for High Performance of Al-air Batteries for Driving Drones: *Anming Hu*[1]; [1]University of Tennessee

10:15 AM
Additively Manufactured Sodium-ion Battery Electrodes via Digital Light Processing: *Sina Bakhtar Chavari*[1]; Bharat Yelamanchi[1]; Alexis Maurel[2]; Ana C. Martínez[2]; Eric MacDonald[2]; Cameroun Sherrard[3]; Pedro Cortes[1]; [1]Youngstown State University; [2]University of Texas at El Paso; [3]NASA

10:35 AM Invited
Direct Ink Writing of 3D Printed Graphene Based Electrodes Material for Supercapacitors: *Ying Zhang*[1]; [1]Zhengzhou University

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MATERIALS PROCESSING

Rare Metal Extraction & Processing — New Extractant and Biometallurgical Processing

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

Program Organizers: Takanari Ouchi, University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Gisele Azimi, University of Toronto; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Hojong Kim, Pennsylvania State University; Alafara Baba, University of Ilorin; Hong (Marco) Peng, University of Queensland; Athanasios Karamalidis, Pennsylvania State University; Shijie Wang, Coeur Mining, Inc

Tuesday AM | March 21, 2023
30B | SDCC

Session Chairs: Shafiq Alam, University of Saskatchewan; Kerstin Forsberg, KTH Royal Institute of Technology

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8:00 AM Invited
New Insights on Titanium(IV) Speciation to Improve the Purification of Concentrated Phosphoric Acid: *Alexandre Chagnes*[1]; Lucas Mangold[1]; Hubert Halleux[2]; Gerard Cote[3]; [1]Universite De Lorraine-Georess; [2]Prayon; [3]IRCP

8:30 AM
Di-phenols Functionalized Chitosan as Selective Adsorbents for Extraction of Germanium: *Madhav Patel*[1]; Athanasios Karamalidis[1]; [1]Penn State University

8:50 AM
Recycling of Copper and Gold from Waste Printed Circuit Boards by Leaching Followed by Solvent Extraction: *Kamalesh Singh*[1]; Mudila Dhanunjaya Rao[2]; [1]Indian Institute of Technology (Banaras Hindu University); [2]Indian Institute of Technology (Banaras Hindu University), CSIR- National Metallurgical Laboratory

9:10 AM Invited
Recovery and Separation of Vanadium and Tungsten from Spent SCR Catalyst by Hydrometallurgical/ Hybrid Routes: *Rajesh Kumar Jyothi*[1]; Ana Belen Cueva Sola[2]; Jong Hyuk Jeon[1]; Jin-Young Lee[2]; [1]Korea Inst of Geoscience & Mineral Resources; [2]Korea University of Science and Technology (UST)

9:40 AM Break

10:00 AM
Removal of Selenium from Chloride Media using Bioadsorbent: Mohamed Abdallah[1]; *Shafiq Alam*[1]; [1]University of Saskatchewan

10:20 AM
Biosorption as a Vital Tool for Metal Recovery in Effluent Treatment: Review: *Shilpa Kalamani Bawkar*[1]; Pramod Singh[2]; Pankaj Kumar Choubey[1]; Rekha Panda[1]; Jhumki Hait[1]; Manis K Jha[1]; [1]CSIR-National Metallurgy Laboratory; [2]Netaji Subhas University

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LIGHT METALS

Scandium Extraction and Use in Aluminum Alloys — Scandium Containing Aluminum Alloys

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

Program Organizers: Timothy Langan, Sunrise Energy Metals; Samuel Wagstaff, Oculatus Consulting; Phil Chataigneau, PDU Consulting; Efthymios Balomenos, Mytilineos S.A., Metallurgy Bu; Thomas Dorin, Deakin University; Muhammad Akbar Rhamdhani, Swinburne University of Technology; Dimitrios Filippou, Rio Tinto Iron & Titanium; Henk van der Laan, V.I.C. Van der Laan International Consultancy BV; Frank Palm, Airbus Defence and Space GmbH

Tuesday AM | March 21, 2023
30D | SDCC

Session Chair: Timothy Langan, Sunrise Energy Metals

8:00 AM Introductory Comments Timothy Langan

8:05 AM Keynote
Formation of Al3Sc Dispersoids and Associated Strengthening Mechanisms: *Thomas Dorin*[1]; Lu Jiang[1]; Timothy Langan[2]; [1]Deakin University; [2]Sunrise Energy Metals

8:55 AM Invited
Use of Sc to Improve the Properties of AA5083 Cast and Rolled Products: *Paul Rometsch*[1]; Jerome Fourmann[1]; Emad Elgallad[2]; X.-Grant Chen[2]; [1]Rio Tinto Aluminium; [2]University of Québec at Chicoutimi

9:20 AM
Efficiency of Sc for Strengthening and Formability Improvement of 5XXX BiW Sheets: Alexander Gradoboev[1]; Margarita Nikitina[1]; Dmitriy Ryabov[1]; Roman Vakhromov[1]; Aleksandr Krokhin[2]; Viktor Mann[2]; *Dror Shaked*[1]; [1]Lmti Llc (Uc Rusal); [2]UC RUSAL

9:45 AM Break

10:00 AM
Effect of Sc and Zr Additions on Dispersoid Microstructure and Mechanical Properties of Hot-rolled AA5083 Alloys: Ahmed Algendy[1]; Kun Liu[1]; Paul Rometsch[2]; Nick Parson[2]; *X.-Grant Chen*[1]; [1]University of Quebec at Chicoutimi; [2]Rio Tinto Aluminum

10:25 AM
Effect of Cooling Rate on W-phase Formation in Al-Cu-Sc Alloys: *Austin DePottey*[1]; Lu Jiang[2]; Thomas Dorin[2]; Thomas Wood[1]; Timothy Langan[3]; Paul Sanders[1]; [1]Michigan Technological University; [2]Deakin University; [3]Sunrise Energy Metals

10:50 AM Invited
Solute Clustering during Natural Ageing in Al-Cu-(Sc)-(Zr) Alloys: *Lu Jiang*[1]; Kathleen Wood[2]; Robert Knott[2]; Anna Sokolova[2]; Timothy Langan[3]; Thomas Dorin[1]; [1]Deakin University; [2]ANSTO; [3]Sunrise Energy Metals

11:15 AM
Effect of Zr and Sc on Intermetallic Morphology and Hardening of an Al-Fe Alloy: *Suwaree Chankitmunkong*[1]; Dmitry Eskin[2]; Chaowalit Chaowalit Limmaneevichitr[3]; Phromphong Pandee[3]; Onnjira Diewwanit[3]; [1]King Mongkut's Institute of Technology Ladkrabang; [2]Brunel University London; [3]King Mongkut's University of Technology Thonburi

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NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Characterization/Separation II

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Tuesday AM | March 21, 2023
28A | SDCC

Session Chairs: Jean-Christophe Griveau, ITU Karlsruhe; Don Wood, INL

8:00 AM Invited
How to Figure Out Local Order Against Average Order in UO2?: *Lionel Desgranges*[1]; Gianguido Baldinozzi[2]; [1]CEA; [2]CNRS

8:30 AM Invited
Thermochemical Behavior and Microstructural Characterization of Advanced Fuels in Oxidizing and Reducing Atmospheres: *Elizabeth Sooby*[1]; [1]University of

Texas at San Antonio

9:00 AM
A 69Ga NMR Study of Aging in 7 at.% Ga Stabilized -Plutonium: *Seth Blackwell*[1]; Filip Ronning[1]; Michihiro Hirata[1]; Eric Bauer[1]; Joe Thompson[1]; Jeremy Mitchell[1]; Paul Tobash[1]; Tomas Martinez[1]; Carlos Archuleta[1]; Mike Ramos[1]; [1]Los Alamos National Laboratory

9:20 AM
High Energy X-Ray Characterization of Microstructure at Macroscopic Depths in Pu Alloys: *Dale Carver*[1]; Donald Brown[1]; Taylor Jacobs[1]; Alice Smith[1]; Peter Kenesei[1]; Jun-Sang Park[1]; [1]Los Alamos National Laboratory

9:40 AM Break

10:00 AM Invited
Clarifying the Electronic Phase Space for U-based Materials with the ThCr2Si2-type Structure: *Ryan Baumbach*[1]; [1]National High Magnetic Field Laboratory

10:30 AM Invited
The Use of Capillary Electrophoresis assisted by Ligand Complexation for Efficient Separation of Actinides and Lanthanides: *Thibaut Lecrivain*[1]; Chloe Tolbert[1]; Robert Fox[1]; [1]Idaho National Laboratory

11:00 AM
Comparison of the Electronic Transport of UN and ThN versus ThC: *Barbara Szpunar*[1]; Jayangani Ranasinghe[1]; Jerzy Szpunar[1]; [1]University of Saskatchewan

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MATERIALS DESIGN

Thermodynamics and Kinetics of Alloys — Session III

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

Program Organizers: Ji-Cheng Zhao, University of Maryland; Wei Xiong, University of Pittsburgh; Chuan Zhang, CompuTherm LLC; Shuanglin Chen, CompuTherm LLC

Tuesday AM | March 21, 2023
Sapphire M | Hilton

Session Chairs: Qing-Qiang Ren, Oak Ridge National Laboratory; Kamalnath Kadirel, CompuTherm, LLC

8:00 AM Invited
A Quantitative Model for the Electrodeposition of Metals and Alloys Based on In Situ Characterizations: Yifan Ma[1]; Jakub Pepas[1]; *Hailong Chen*[1]; [1]Georgia Institute of Technology

8:20 AM Invited
An investigation and selected applications of the effective bond energy formalism: *Giancarlo Trimarchi*[1]; Qing Chen[1]; [1]Thermo-Calc Software AB

8:40 AM
Phase diagram determination of ternary systems for understanding the TCP phase formation in Ni-based superalloys: *Chuangye Wang*[1]; Ji-Cheng Zhao[1]; [1]University of Maryland

9:00 AM
First-principles Calculations and Thermodynamic Modeling of the Mg-In System with Order-disorder Transitions: *Yuanchen Gao*[1]; Bi-Cheng Zhou[1]; [1]University of Virginia

9:20 AM Break

9:40 AM Invited
High-throughput Design of Multi-principal Element Alloys with Spinodal Decomposition Assisted Microstructures: *Shalini Koneru*[1]; Kamalnath Kadirvel[2]; Yunzhi Wang[1]; [1]The Ohio State University; [2]CompuTherm LLC

10:00 AM Invited
Understanding Precipitation and Age Hardening Of FeCrAl Alloy Using Explainable Artificial Intelligence: *Indranil Roy*[1]; Subhrajit Roychowdhury[1]; Sandipp Krishnan Ravi[1]; Bojun Feng[1]; Rajnikant Umretiya[1]; Andrew Hoffman[1]; Raul Rebak[1]; [1]GE Global Research

10:20 AM
Density-based Phase-field Modelling of the Interplay between Grain Boundary Segregation Transition and Structure: Reza Darvishi Kamachali[1]; *Theophilus Wallis*[1]; [1]Federal Institute for Materials Research and Testing (BAM)

10:40 AM
Thermal Grooving and Grain Growth in a Polycrystalline Thin Film: A Phase-field Study: Miral Verma[1]; Sandeep Sugathan[2]; Saswata Bhattacharya[3]; *Rajdip Mukherjee*[4]; [1]KU Luven Belgium; [2]Kookmin University; [3]Indian Institute of Technology Hyderabad; [4]Indian Institute of Technology Kanpur

11:00 AM
Microstructural Design via Spinodal-mediated Phase Transformation Pathways in High-entropy Alloys (HEAs) Using Phase-field Modelling: *Kamalnath Kadirvel*[1]; Shalini Koneru[1]; Hamish Fraser[1]; Yunzhi Wang[1]; [1]The Ohio State University

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NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Helium, Tritium and Hydrogen Effects I

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Tuesday AM | March 21, 2023
27B | SDCC

Session Chairs: Steven Zinkle, University of Tennessee; Hiroyasu Tanigawa, QST Japan

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8:00 AM Invited
He Irradiation of W First-wall Materials: Parameters at Stake for the Bubble Creation, Behaviour and Impact on Tritium Trapping: *Elodie Bernard*[1]; Ryuichi Sakamoto[1]; Céline Martin[1]; Floriane Montupet-Leblond[1]; Mickaël Payet[1]; Etienne Hodille[1]; Arkadi Kreter[1]; Loic Corso[1]; Frédéric Leroy[1]; Stefano Curiotto[1]; Christian

Grisolia[1]; [1]CEA

8:40 AM
Thermonuclear Fusion: Some Open Issues Concerning Tritium: *Christian Grisolia*[1]; Elodie Bernard[1]; Etienne Hodille[1]; Floriane Montupet-Leblond[1]; Mickael Payet[1]; Marco Utili[1]; Silvano Tosti[1]; Ion Cristescu[1]; samuel Peillon[1]; François Gensdarmes[1]; Arnaud Bultel[1]; [1]CEA Cadarache

9:00 AM
Optimization of Tritium Breeding in Molten Salt Blankets: Materials and Geometries: *Vittorio Badalassi*[1]; [1]Oak Ridge National Laboratory

9:20 AM
Tritium Retention in Beryllium and Titanium Beryllide under Neutron Irradiation to High Damage Doses: *Vladimir Chakin*[1]; Ramil Gaisin[1]; Rolf Rolli[1]; Michael Duerrschnabel[1]; Michael Klimenkov[1]; [1]Karlsruhe Institute of Technology

9:40 AM Break

10:00 AM Invited
Helium Effects on Mechanical Properties of (RA)FM Steels: *Jean Henry*[1]; Yong Dai[2]; Ermile Gaganidze[3]; [1]Université Paris-Saclay, CEA; [2]Paul Scherrer Institut; [3]Karlsruhe Institute of Technology

10:40 AM
The Effect of Helium on Cavity Swelling in Dual-ion Irradiated Fe and Fe-10Cr Ferritic Alloys: *Yan-Ru Lin*[1]; Arunodaya Bhattacharya[1]; Steven Zinkle[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

11:00 AM
Effect of Helium on Low-temperature Hardening/Embrittlement (LTHE) in Neutron Irradiated Isotopically Tailored RAFM Steels: *Arunodaya Bhattacharya*[1]; Steven Zinkle[2]; Samara Levine[2]; Mark Gilbert[3]; Charles Kessel[4]; Hiroyasu Tanigawa[5]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]UKAEA; [4]Oak Ridge National Lab; [5]QST

SPECIAL TOPICS

TMS2023 All-Conference Plenary

Tuesday PM | March 21, 2023
20A | SDCC

Session Chair: W. Jud Ready, Georgia Institute of Technology

12:00 PM Plenary
Gigaton Opportunities at the Intersection of Materials and Climate Technology: *David T. Danielson*[1]; [1]Breakthrough Energy Ventures; Former U.S. Assistant Secretary of Energy Efficiency & Renewable Energy (EERE)

ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Processing, Characterization & Applications II

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology;

Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

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Session Chairs: Heinz Palkowski, Clausthal University of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS

2:30 PM Introductory Comments

2:35 PM Invited
2D-binary, Ternary and Quaternary Crystals for Space Applications: *Narasimha Prasad*[1]; Ching Su[2]; Meghan Brandt[3]; Eric Bowman[3]; Bradley Arnold[3]; Fow-Sen Choa[3]; Brian Cullum[3]; Narsingh Singh[3]; [1]NASA langley Research Center; [2]NASA Marshall Space Flight Center; [3]University of Maryland Baltimore County

3:00 PM Keynote
2D Materials in Advance Electronic and Optoelectronic Applications: *Sina Najmaei*[1]; [1]DEVCOM Army Research Laboratory

3:30 PM Invited
A Rapid, Fully Automated Electrochemical Modular Platform using 2D Materials as a Porous Electrode for Sensing Biological and Chemical Moieties of Interest: Sreerag Kaaliveetil[1]; Yu-Hsuan Cheng[1]; Li Zhenglong[1]; *Sagnik Basuray*[1]; [1]New Jersey Institute of Technology

3:55 PM Invited
Controlled Synthesis of 2D Transition Metal Dichalcogenides for Electronic Biosensors: *Mengqiang Zhao*[1]; [1]New Jersey Institute of Technology

4:20 PM Break

4:40 PM Invited
Introduction of Two-dimensional Nanomaterials for Thin, Elastomeric, Durable Barriers for Chemical Protection (2D@CB): *Tracee Whitfield*[1]; [1]Defense Threat Reduction Agency

5:05 PM Keynote
Membranes for Breathable Barrier/Protective Coatings for Toxic Gases/ Vapors and Chemical Warfare Agents: *Kamalesh Sirkar*[1]; [1]New Jersey Institute of Technology

5:35 PM Invited
Parameter Space of Ferroelectrics and Metals Interfacing with Two-dimensional Materials for Neuromorphic Device Applications: *Wendy Sarney*[1]; M. G. Sales[2]; A. Mazzoni[1]; P.J. Taylor[1]; J. Pearson[1]; S. McDonnell[2]; Sina Najmaei[1]; [1]DEVCOM Army Research Laboratory; [2]University of Virginia

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LIGHT METALS

60 Years of Taking Aluminum Smelting Research and Development from New Zealand to the World: An LMD Symposium in Honor of Barry J. Welch — Joint Barry Welch Honorary Symposium - Reduction & Electrodes Technology Session

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

Program Organizers: Mark Dorreen, CSIRO; Alan Tomsett, Rio Tinto Pacific Operations; David Wong, Atmolite Consulting Pty Ltd; Linus Perander, Yara International; Barry Sadler, Net Carbon Consulting Pty Ltd; Stephan Broek, Kensington Technology Inc.

Tuesday PM | March 21, 2023
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Session Chair: Evan Andrews, Boyne Smelters Limited

2:30 PM Introductory Comments

2:40 PM Invited
The Need to Respect to the Interlink between Science, Physics, and Cell Design in an Environmentally Responsible Manner - The Next Big Challenge for Aluminium Smelting: *Barry Welch*[1]; [1]University of Auckland; University of New South Wales

3:05 PM
Anode Quality Optimisation – Industry Learnings from the Research Supervised by Barry Welch: *Alan Tomsett*[1]; Barry Sadler[2]; [1]Rio Tinto Pacific Operations; [2]Net Carbon Consulting

3:30 PM Invited
Process Recovery to Unlock Power Efficiency Improvement at BSL: *Evan Andrews*[1]; Thomas Booby[1]; Murray Ure[1]; Hao Zhang[2]; [1]Boyne Smelters Limited; [2]Transformation and Technical Support, Pacific Operations

3:55 PM
A Smart Individual Anode Current Measurement System and Its Applications: *Choon-Jie Wong*[1]; Jing Shi[1]; Jie Bao[1]; Barry Welch[1]; Maria Skyllas-Kazacos[1]; Ali Jassim[2]; Mohamed Mahmoud[2]; Konstantin Nikandrov[2]; [1]University of New South Wales; [2]Emirates Global Aluminium

4:20 PM Break

4:35 PM
Light Metals Research at the University of Auckland: *James Metson*[1]; Ron Etzion[1]; Margaret Hyland[2]; [1]University of Auckland; [2]Victoria University of Wellington

5:00 PM
Impact of Aluminium Reduction Cell Parameters on Feeder Hole Condition: *Pascal Lavoie*[1]; Mark Taylor[2]; [1]Alcoa; [2]University of Auckland

5:25 PM
A Dynamic Coupled Mass and Thermal Model for the Top Chamber of the Aluminium Smelting Cells: *Luning Ma*[1]; Choon-Jie Wong[1]; Jie Bao[1]; Maria Skyllas-Kazacos[1]; Barry Welch[1]; Nadia Ahli[2]; Mohamed Mahmoud[2]; Konstantin Nikandrov[2]; Amal Aljasmi[2]; [1]The University of New South Wales; [2]Emirates Global Aluminium

5:50 PM Concluding Comments

SPECIAL TOPICS

Acta Materialia Symposium — Acta Materialia Award Session

Program Organizer: Carolyn Hansson, University of Waterloo

Tuesday PM | March 21, 2023

Sapphire D | Hilton

Session Chair: Carolyn Hansson, University of Waterloo

2:30 PM Introductory Comments

2:40 PM Presentation of Acta Student Awards

3:00 PM Invited
Acta Materialia Gold Medal Lecture: Have Alloy Design and Discovery Fundamentally Changed?: *Tresa Pollock*[1]; [1]University of California - Santa Barbara

3:20 PM Question and Answer Period

3:30 PM Invited
Acta Materialia Silver Medal Lecture: Multi-Disciplinary Systems Optimization Approaches to Alloy Design: *Raymundo Arroyave*[1]; [1]Texas A&M University

3:50 PM Question and Answer Period

4:00 PM Invited
Acta Materialia Hollomon Award for Materials and Society: Bringing Materials and Manufacturing Technology Together: *Charles Ward*[1]; [1]US Air Force Research Laboratory

4:20 PM Question and Answer Period

4:30 PM Invited
Acta Materialia Mary Fortune Global Diversity Lecture: Diversity & Diffraction: *Ben Britton*[1]; [1]Imperial College London

4:50 PM Question and Answer Period

5:00 PM Brief break to prepare for reception

5:10 PM Wine and Cheese Reception with Posters:

Student Award Winners in Acta Materialia Symposium:

- Glenn Balbus - Disordered Interfaces Enable High Temperature Thermal Stability and Strength in a Nanocrystalline Aluminum Alloy
- Bárbara Bellon - Directional Solidification and Microstructure Length Scale Predictions in Binary Alloys
- Avanish Chandan - Temperature-dependent Deformation Behavior and Stacking Fault Energy of Fe40Mn40Co10Cr10 Alloy
- Chuchu Li - Biomechanical Strategies to Reach a Compromise between Stiffness and Flexibility in Specialized Femoral Cuticle
- Mackenzie Perry - Tracing Plastic Deformation Path and Concurrent Grain Refinement during Additive Friction Stir Deposition
- Gabriel Spartacus - Characterization of the Nature and Morphology of Coarse Precipitation in Various Oxide Dispersion Strengthened Steels
- Chihiro Tabata - Quantitative Analysis of Sulfur Segregation at the Oxide/Substrate Interface in Ni-base Single Crystal Superalloy

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Hard and Soft Magnets

Sponsored by: TMS Functional Materials Division, TMS Materials Processing

and Manufacturing Division, TMS: Magnetic Materials Committee, TMS: Additive Manufacturing Committee, TMS: Powder Materials Committee

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas, Sandia National Laboratories; Iver Anderson, Iowa State University Ames Laboratory

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Session Chair: Daniel Salazar, BCMaterials

2:30 PM Invited
In Situ Analysis of the Phase Evolution in AlNiCo: Emily Rinko[1]; Andrrew Chuang[2]; Emma White[3]; Jordan Tiariks[1]; Iver Anderson[4]; *Matthew Kramer*[4]; [1]Iowa State University; [2]Argonne National Laboratory; [3]DECHEMA Forschungsinstitut; [4]Ames Laboratory

2:55 PM Invited
Structural Magnetic Materials Build by Cold Spray Additive Manufacturing: *Fabrice Fabrice*[1]; Jean-Michel Lamarre[1]; [1]National Research Council Canada

3:20 PM
Powder Fabrication and Directed Energy Deposition of AlNiCo Permanent Magnets: *Saikumar Dussa*[1]; Sameehan Joshi[1]; Narendra Dahotre[1]; Rajarshi Benerjee[1]; [1]University of North Texas

3:40 PM Invited
Alignment of Magnetic Particles during Additive Manufacturing of Anisotropic Bonded Permanent Magnets: *Ikenna Nlebedim*[1]; [1]Ames National Laboratory, US-DOE

4:05 PM Break

4:20 PM Invited
Magnetocaloric Composites for Fused Filament Fabrication: *Victorino Franco*[1]; Álvaro Díaz-García[1]; Luis M. Moreno-Ramírez[1]; Jorge Revuelta[1]; Jia Yan Law[1]; [1]Universidad de Sevilla

4:45 PM
Electrohydrodynamic 3D Printing of Magnetic Composites: *Ander Reizabal*[1]; [1]BCMaterials - Basque Center for Materials, Applications and Nanostructures

5:05 PM
Effect of Chromium Content on the Magnetic Behavior of Direct Energy Deposited FeNiCo Alloys: *Madhavan Radhakrishnan*[1]; Michael McKinstry[1]; Sai Kiran Nartu[1]; Varun Chaudhary[2]; Raju Ramanujan[2]; Rajarshi Banerjee[1]; Narendra Dahotre[1]; [1]University of North Texas; [2]Nanyang Technological University

5:25 PM
Process-microstructure-property Relationships in Additively Manufactured Fe-Si-B-Nb-Cu Soft Magnetic Alloy: *Erin Barrick*[1]; Andrew Kustas[1]; Joseph Boro[1]; Eric Theisen[2]; Todd Monson[1]; Levi Van Bastian[1]; Frank Delrio[1]; Jonathan Pegues[1]; Matthew Jones[3]; Carl Frick[4]; [1]Sandia National Laboratories; [2]Metglas Inc.; [3]University of Wyoming; [4]Colorado School of Mines

5:45 PM
Development of Additively Manufactured FeCo-2V and Fe-80Ni-5Mo Soft Magnetic Alloys for Spacecraft Magnetic Shielding Applications: *Samad Firdosy*[1];

Nicholas Ury[1]; Katherine Dang[1]; Pablo Narvaez[1]; Vilupanur Ravi[2]; R. Peter Dillon[1]; [1]Nasa Jet Propulsion Laboratory; [2]California State Polytechnic University, Pomona

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session III

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

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

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Session Chair: Mohsen Seifi, ASTM International/Case Western Reserve University

2:30 PM Invited
Assessment of Fatigue Evolution and Damage Tolerance in Additive Manufactured Metals: Mustafa Awd[1]; Daniel Kotzem[1]; Felix Stern[1]; Mirko Teschke[1]; Jochen Tenkamp[1]; *Frank Walther*[1]; [1]TU Dortmund University

3:00 PM
Role of the Oxide Layer in Cold Sprayed Metallic Structures: *Mobin Vandadi*[1]; Nima Rahbar[1]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute

3:20 PM
Evaluating Residual Stress Effects on Fatigue Crack Growth Behaviour of AM Stainless Steel Processed via DED and PBF: *Christine Smudde*[1]; Christopher San Marchi[2]; Michael Hill[1]; Jeffery Gibeling[1]; [1]University of California, Davis; [2]Sandia National Laboratories, Livermore

3:40 PM
Tunable Fatigue Performance in Laser Powder Bed Fusion Titanium Alloy via Laser Shock Peening: *Nik Hrabe*[1]; Tom Berfield[2]; Jake Benzing[1]; Newell Moser[1]; Orion Kafka[1]; Nicholas Derimow[1]; [1]National Institute of Standards and Technology; [2]University of Louisville

4:00 PM Break

4:20 PM
The Influence of Sample Thickness, Residual Stress, and Surface Condition on Ultrasonic Fatigue Behavior of LPBF 316L: *Megan Trombley*[1]; John Allison[1]; [1]University of Michigan

4:40 PM
Influence of Post-Processing Techniques on Process-induced Defects in AM AlSi10Mg and CP-Ti: *Austin Ngo*[1]; Hannah Sims[1]; John Lewandowski[1]; [1]Case Western Reserve University

5:00 PM
Fatigue of L-PBF Ti-6242 under Different Heat Treatment Processes, and Comparisons to Ti64: Amir Hadadzadeh[1]; Mahdi Habibnejad Korayem[2]; *Reza Molaei*[1]; [1]University of Memphis; [2]AP&C Advanced Powder and Coating, a GE Additive Company,

5:20 PM Invited
Development of Metal Powders for Additive Manufacturing Applications: *Lorena Perez*[1]; Luke Brewer[1]; [1]University of Alabama

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ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications V — Properties, Performance Testing and Modeling II

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

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

Tuesday PM | March 21, 2023
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Session Chair: Michael Kirka, Oak Ridge National Laboratory

2:30 PM Introductory Comments

2:35 PM Invited
Failure Phenomena of Additively Manufactured Ni-base Superalloys at Various Temperatures under Static and Cyclic Loadings: *Shuai Shao*[1]; Nima Shamsaei[1]; [1]Auburn University

3:10 PM
Elevated Temperature Fretting Wear Analysis of Additively Manufactured Inconel 625: *Manisha Tripathy*[1]; LLoyd Hackel[2]; Keivan Davami[3]; Ali Beheshti[1]; [1]George Mason University; [2]Curtiss Wright Surface Technologies; [3]The University of Alabama

3:30 PM
The Effects of Process Parameters and Scan Strategy on the Corrosion Properties of Laser Powder Bed Fusion Additively Manufactured Haynes 282: *Junwon Seo*[1]; Nicholas Lamprinakos[1]; Youyang Zhao[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]National Renewable Energy Laboratory

3:50 PM Break

4:05 PM Invited
Role of Predictive Modeling and Uncertainty Quantification in Qualification of Additively Manufactured Alloys: *David Andersson*[1]; Mariyappan Kumar[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

4:40 PM
Quantification of Uncertainties in Metal Additive Manufacturing Processes in Support of Qualification: *Daniel Moser*[1]; Helen Cleaves[1]; Michael Heiden[1]; Scott Jensen[1]; Kyle Johnson[1]; Mario Martinez[1]; Theron Rodgers[1]; David Saiz[1]; Michael Stender[1]; [1]Sandia National Laboratories

5:00 PM
Surface Roughness of Heat Exchanger Flow Channels Manufactured with Directed Energy Deposition: *Luis Nuñez*[1]; Minseop Song[1]; Sunming Qin[1]; Piyush Sabharwall[1]; Isabella van Rooyen[2]; [1]Idaho National Laboratory; [2]Pacific Northwest

National Laboratory

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Steels

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

Program Organizers: Sougata Roy, University of North Dakota; Sneha Prabha Narra, Carnegie Mellon University; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh; Yashwanth Bandari, AddiTec Technologies LLC

Tuesday PM | March 21, 2023
24A | SDCC

Session Chairs: Sougata Roy, University of North Dakota; Andrzej Nycz, Oak Ridge National Laboratory

2:30 PM
Assessment of As-printed Performance in Wire-Arc Additively Manufactured 410NiMo Steel Components: *Yukinori Yamamoto*[1]; Wei Tang[1]; Andres Marquez Rossy[1]; Andrzej Nycz[1]; Josh Vaughan[1]; Donovan Leonard[1]; Luke Meyer[1]; Derek Vaughan[1]; Yousub Lee[1]; Paul Beckman[2]; [1]Oak Ridge National Laboratory; [2]Carl Zeiss Industrial Metrology, LLC

2:50 PM
Mechanical Properties and Fatigue Performance of a Wire Arc Additive Manufactured ER100S-G Steel for HY-80 Applications: Garrett Webster[1]; Kathleen Chou[2]; Riyanka Ribble[2]; Ajay Krishnamurthy[2]; Shahab Zekriardehani[2]; Joseph Lawrence[1]; *Meysam Haghshenas*[1]; [1]University of Toledo; [2]Eaton Corporation

3:10 PM
Quantifying the Influence of Plastic Anisotropy on the Prediction of Residual Stress and Distortion of Large Scale Additively Manufactured 316L Stainless Steel: *Jason Mayeur*[1]; Yousub Lee[1]; Yukinori Yamamoto[1]; Andrzej Nycz[1]; [1]Oak Ridge National Laboratory

3:30 PM Invited
Large Scale Metal Additive Manufacturing – Towards Qualification and Certification: *Sudarsanam Babu*[1]; Obed Acevedo[1]; Andrzej Nycz[2]; Yukinori Yamamoto[2]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory

4:00 PM Break

4:20 PM
The Effect of Build Platform Temperature and Thermal Post-Processing on the Ferritic/Martensitic T-91 Stainless Steel Additively Manufactured via Directed Energy Deposition Laser technique: *Shmuel Samuha*[1]; Jeff Bickel[1]; Tuhin Mukherjee[2]; Tarasankar DebRoy[2]; Thomas Lienert[3]; Stuart Maloy[4]; Calvin Lear[4]; Peter Hosemann[1]; [1]University of California - Berkeley; [2]The Pennsylvania State University; [3]Optomec; [4]Los Alamos National Laboratory

4:40 PM
Unique Aspects of Structure-Properties Relationships within Large-scale Structural Components of Fusion Additively Manufactured Stainless Steel: *Saket Thapliyal*[1]; Patxi Fernandez-Zelaia[1]; Andres Rossy[1]; Quinn Campbell[1]; Michael Kirka[1]; Rangasayee Kannan[1]; Andrzej Nycz[1]; Anand Kulkarni[2]; Kyle Stoodt[2]; [1]Oak Ridge

National Laboratory; [2]Siemens Energy Inc.

5:00 PM
Wire + Arc Additive Manufacturing of Functionally -graded HSLA and Austenitic Stainless Steel Bi-material Structures: *Jose Luis Galan Argumedo*[1]; Mahdi Mahmoudiniya[2]; Marcel Hermans[1]; Vera Popovich[1]; [1]TU Delft; [2]Ghent University

5:20 PM
Large Scale Metal Additive Manufacturing for Infrastructure Repair: *Zackery Mcclelland*[1]; Kyle Dunsford[1]; [1]US Army ERDC

5:40 PM
Operando Neutron Diffraction Characterization of Wire-Arc Deposited Steels: *Alex Plotkowski*[1]; Kyle Saleeby[1]; Chris Fancher[1]; James Haley[1]; Ke An[1]; Guru Madireddy[1]; Yousub Lee[1]; Tom Feldhausen[1]; Dunji Yu[1]; Clay Leach[1]; [1]Oak Ridge National Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Physics-based and Data-based Modeling II

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

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Session Chair: Lang Yuan, University of South Carolina

2:30 PM
Simulation of Microstructures Produced by Laser Powder Bed Fusion: Theophile Camus[1]; Daniel Maisonnette[2]; Oriane Baulin[2]; Oriane Senninger[1]; Gildas Guillemot[1]; *Charles-Andre Gandin*[1]; [1]PSL University; [2]CETIM

2:50 PM
Prediction of Large-scale 3D Solidification Microstructure Evolution during Metal Additive Manufacturing with High Efficiency and Resolution: *Shunyu Liu*[1]; Yung Shin[2]; [1]Clemson University; [2]Purdue University

3:10 PM
Investigation of Scan Rotation Effects in Additive Manufacturing Using Cellular Automata-based Microstructure Modeling: *Matthew Rolchigo*[1]; John Coleman[1]; Gerry Knapp[1]; Jamie Stump[1]; [1]Oak Ridge National Laboratory

3:30 PM
Testing Analytic Models and Heuristics for Microstructure Evolution with 3D, Dendrite-resolved Phase-field Simulations of Entire Spot Melts: *Stephen DeWitt*[1]; Christopher Newman[2]; Stephen Nichols[1]; Jean-Luc Fattebert[1]; Balasubramaniam Radhakrishnan[1]; John Coleman[1]; Gerry Knapp[1]; James Belak[3]; John Turner[1]; [1]Oak Ridge National Laboratory; [2]Los Alamos National Laboratory; [3]Lawrence Livermore National Laboratory

3:50 PM
Switching of Controlling Mechanisms during the Rapid Solidification of a Melt Pool in Additive Manufacturing: *Yijia Gu*[1]; [1]Missouri University of Science and

Technology

4:10 PM Break

4:25 PM
Prediction of Solidification Cracking in Rene 80 Superalloy during the Directed Energy Deposition Process: *Hamed Hosseinzadeh*[1]; Lang Yuan[1]; Luke Mohr[2]; Lee Kerwin[2]; Anindya Bhaduri[3]; Arushi Dhakad[2]; Chen Shen[3]; Shenyan Huang[3]; Changjie Sun[3]; Alexander Kitt[2]; [1]University of South Carolina; [2]EWI; [3]GE Research

4:45 PM
The Effects of Non-equilibrium Interfaces and Partial Solute Drag on Morphological Stability: *Christopher Hareland*[1]; Gildas Guillemot[2]; Charles-André Gandin[2]; Peter Voorhees[1]; [1]Northwestern University; [2]Mines Paris - PSL University

5:05 PM
Predicting Phase and Morphology for Use in Site Specific Control of Microstructures in L-PBF Stainless Steel: *Michael Haines*[1]; Maxwell Moyle[1]; Nima Haghdadi[1]; Sophie Primig[1]; [1]University of New South Wales

5:25 PM
Eliminating Hot Tearing in Laser Powder Bed Fusion of High Strength Aluminium Alloy 2139 Through Parameter Optimisation and Grain Refinement: Joe Elambasseril[1]; Michael Benoit[2]; Suming Zhu[1]; *Mark Easton*[1]; Edward Lui[1]; Craig Brice[3]; Ma Qian[1]; Milan Brandt[1]; [1]RMIT University; [2]University of British Columbia; [3]Colarado School of Mines

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Deformation Mechanisms and Mechanical Properties

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

Tuesday PM | March 21, 2023
23B | SDCC

Session Chairs: Somayeh Pasebani, Oregon State University; Xinghang Zhang, Purdue University

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2:30 PM Invited
Understanding the Strength and Ductility of Additively Manufactured Metals across Various Length Scales: *Yinmin (Morris) Wang*[1]; [1]University of California - Los Angeles

2:50 PM
Multi-scale Tensile Deformation of Wire Arc Additive Manufactured Titanium from Microscopic Beads to Macroscopic Component: *Tanaji Paul*[1]; Blanca Palacios[1]; Denny John[1]; Kazue Orikasa[1]; Tyler Dolmetsch[1]; Sohail Mohammed[1]; Gonzalo Seisdedos[1]; Sean Langan[1]; Alex Michelson[1]; Cheng Zhang[1]; Arvind Agarwal[1]; [1]Florida International University

3:10 PM
Characterizing Inhomogeneous Deformation Across Melt Pool Boundaries in Additively Manufactured Parts: *John Fite*[1]; Suhas Prameela[1]; John Slotwinski[2]; Tim

Weihs[1]; [1]Johns Hopkins University; [2]JHU Applied Physics Lab

3:30 PM
Mechanical Response of Tailored 304L Stainless Steels, Processed with L-PBF, under Different Stress States: *Christos Sofras*[1]; Jan Capek[1]; Markus Strobl[1]; Efthymios Polatidis[1]; [1]Paul Scherrer Institute

3:50 PM Break

4:10 PM
Deformation Behavior of Aluminum Alloys Deposited by Laser Hot-wire Manufacturing: *Gerald Knapp*[1]; Maxim Gussev[1]; Amit Shyam[1]; Thomas Feldhausen[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

4:30 PM
Microstructures and Deformation Mechanisms in Additively Manufactured 316L Stainless Steels: *Thomas Voisin*[1]; Marissa Linne[1]; Jean-Baptiste Forien[1]; Nicolas Bertin[1]; Tatu Pinomaa[2]; Anssi Laukkanen[2]; Kirubel Teferra[3]; Margaret Wu[1]; Sylvie Aubry[1]; Y. Morris Wang[4]; Nathan Barton[1]; [1]Lawrence Livermore National Laboratory; [2]VTT Technical Research Center of Finland; [3]US Naval Research Laboratory; [4]University of California Los Angeles

4:50 PM
Utilizing Profilometry-based Indentation Plastometry, Nanomechanical Property Mapping and Flat-punch Nanoindentation to Unveil Dynamic Recrystallization-to-Plasticity Relations in Cold Spray Additive Manufacturing: *Bryer Sousa*[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — Aluminum Alloys II

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

Program Organizers: Behrang Poorganji, University of Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

Tuesday PM | March 21, 2023
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Session Chair: Orlando Rios, UTK

2:30 PM Invited
Hypereutectic Al-Si-Cu Alloy for Laser Powder Bed Fusion: *Andrew Bobel*[1]; Yoojin Kim[2]; Lee Casalena[3]; Anil Sachdev[1]; [1]General Motors Corporation; [2]Populus Group; [3]Thermo Fisher Scientific

3:00 PM
A Powder-free Methodology to Develop New High-strength Al-alloys with Unique Microstructures and Mechanical Properties: *Giuseppe Del Guercio*[1]; David McCartney[1]; Christopher Tuck[1]; Marco Simonelli[1]; [1]University of Nottingham

3:20 PM
Microstructure and Mechanical Properties of Near-eutectic Al-Ce-Ni-Fe Alloys Produced by Laser Powder-bed Fusion: *Tiffany Wu*[1]; Amit Shyam[2]; Alex Plotkowski[2];

David Dunand[1]; [1]Northwestern University; [2]Oak Ridge National Laboratory

3:40 PM
Microstructure and High-temperature Mechanical Properties of a Novel Al-Ni-Fe-Zr Alloy Processed by Laser Powder Bed Fusion: *Joshua Dorn*[1]; Hyeji Park[2]; Joseph Croteau[1]; Nhon Vo[1]; David Dunand[2]; [1]NanoAl LLC; [2]Northwestern University

4:00 PM Break

4:20 PM
Physics-constrained, Inverse Design of High-temperature, High-strength, Creep-resistant Printable Al Alloys Using Machine Learning Methods: *S. Mohadeseh Taheri-Mousavi*[1]; [1]Carnegie Mellon University

4:40 PM
Laser Powder Bed Fusion of Nanoparticles-Enabled High-Zinc Al-Zn-Mg-Cu Alloys: *Tianqi Zheng*[1]; Shiqi Zheng[1]; Jingke Liu[1]; Bingbing Li[2]; Xiaochun Li[1]; [1]University of California, Los Angeles; [2]California State University, Northridge

5:00 PM
Microstructure and Mechanical Properties of Al-5Mg2Si-2Mg Alloy Processed by Laser Powder Bed Fusion: *Shouxun Ji*[1]; Hailin Yang[2]; [1]Brunel University London; [2]Central South University

5:20 PM
In-situ Reactive Printing of Aluminum Matrix Composite with Ultra-high Volume Fraction Reinforcement: *Chenxi Tian*[1]; Atieh Moridi[1]; [1]Cornell University

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BIOMATERIALS

Advanced Biomaterials for Biomedical Implants — Advanced Biomaterials for Biomedical Implants

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

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Jing Du, Pennsylvania State University

Tuesday PM | March 21, 2023
Sapphire 400B | Hilton

Session Chairs: Du Jing, Pennsylvania State University ; Thomas Vinoy, University of Alabama at Birmingham

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2:30 PM Invited
Biofunctional Drug-free Anti Inflammatory/Antimicrobial Bone Implants with Enhanced Osseointegration: *Tolou Shokuhfar*[1]; [1]University of Illinois at Chicago

3:05 PM
Analysis of Biometal Alloys in a Clinically Relevant In Vivo Arterial Implant Model: *Roger Guillory*[1]; Patrick Bowen[2]; [1]Michigan Technological University; [2]Deringer-Ney

3:25 PM
Characterization of Zn-Li-WC Nanocomposite for Biodegradable Implants: *Jingke Liu*[1]; Chase Linsley[1]; Yingchao Su[2]; Yuxin Zeng[1]; Benjemin Wu[1]; Donghui Zhu[2]; Xiaochun Li[1]; [1]University of California Los Angeles; [2]State University of New York at Stony Brook

3:45 PM
ZnO-NPs-Coated Implants with Osteogenic Properties for Enhanced Osseointegration: *Kate Mokobia*[1]; Ikhazuagbe Ifijen[2]; Esther Ikhuoria[3]; [1]Department of Science Laboratory Technology, Delta State Polytechnic, Otefe-Oghara, Delta State, Nigeria; [2]Rubber Research Institute of Nigeria; [3]University of Benin, Benin City, Edo State, Nigeria

4:05 PM Break

4:25 PM Invited
Characterization of Spicule Structure: *Fariborz Tavangarian*[1]; Jennifer Gray[2]; Trevor Clark[2]; Chao Gao[3]; [1]Pennsylvania State University Harrisburg; [2]Pennsylvania State University; [3]Norwegian University of Science and Technology

5:00 PM
Candida Albicans Biofilm Formation of an Additive-manufactured Titanium Alloy: *Mari Koike*[1]; Tetsuro Horie[1]; Richard Mitchell[2]; Susan Hummel[3]; Toru Okabe[4]; [1]Nippon Dental University; [2]University of Kentucky College of Dentistry; [3]Harry S. Truman Memorial Veterans' Hospital; [4]Baylor College of Dentistry

5:20 PM
The Stress-corrosion-cracking Resistance of Zinc-based Alloys Designed for Bioresorbable Medical Implants: *Morteza Shaker Ardakani*[1]; Henry Summers[1]; Stephen Kampe[1]; Jaroslaw Drelich[1]; [1]Michigan Tech

5:40 PM
Effects of Grain Size and Inclusions on the Mechanical and Biocorrosion Properties of ZX10 Mg Alloy: *Sreenivas Raguraman*[1]; John Fite[1]; Adam Griebel[2]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]Fort Wayne Metals

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MATERIALS PROCESSING

Advanced Characterization of High-temperature Alloys: Phase Evolution during Manufacturing and Service-induced Deformation — Role of Deformation in Phase Transformations and Microstructural Evolution

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

Program Organizers: Katerina Christofidou, University of Sheffield; Benjamin Adam, Oregon State University; Stoichko Antonov, Max-Planck Institut für Eisenforschung GmbH; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Paraskevas Kontis, Norwegian University of Science and Technology; Stella Pedrazzini, Imperial College London; Sophie Primig, University of New South Wales

Tuesday PM | March 21, 2023
29D | SDCC

Session Chairs: Stella Pedrazzini, Imperial College London; Paraskevas Kontis, Norwegian University of Science and Technology; Cynthia Rodenkirchen, Imperial College London

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2:30 PM Invited
Leveraging Local Phase Transformation Strengthening to Achieve Superior Next Generation Superalloys: *Timothy Smith*[1]; Timothy Gabb[1]; Nikolai Zarkevich[2]; Mikhail Mendelev[2]; Valery Borovikov[2]; Christopher Kantzos[1]; Ashton Egan[3]; John Lawson[2]; Michael Mills[3]; [1]NASA Glenn Research Center; [2]NASA Ames Research Center; [3]The Ohio State University

3:00 PM
Quantifying Creep Deformation Behavior of Optimized Local Phase Transformation Strengthened Next Generation Superalloys: *Ashton Egan*[1]; Longsheng Feng[1]; Timothy Smith[2]; Yunzhi Wang[1]; Michael Mills[1]; [1]Ohio State University; [2]NASA Glenn Research Center

3:20 PM
Microstructural Control of LPBF Inconel 718 through Post Processing of Intentionally Placed AM Discontinuity Distributions: *Elaine Livera*[1]; Katerina Christofidou[1]; Daniel Ryan[2]; Iain Todd[1]; [1]University of Sheffield; [2]Solar Turbines

3:40 PM
Temporal Evolution of Precipitate in HAYNES 282 during Ageing: Growth and Coarsening Kinetics, Solute Partitioning and Lattice Misfit: *Shreya Mukherjee*[1]; Bibhu Sahu[2]; Aniruddha Biswas[3]; Sujoy Kar[4]; Soumitra Tarafder[5]; [1]Indian Institute of Science; [2]University of Michigan; [3]BARC, Mumbai; [4]IIT Kharagpur; [5]CSIR NML

4:00 PM Break

4:30 PM Invited
Effect of Temperature, Stress and Environment on Preferential and Internal Oxidation of Ni-base Alloys: *Karen Kruska*[1]; Elizabeth Kautz[1]; Ziqing Zhai[1]; Matthew Olszta[1]; Daniel Schreiber[1]; [1]PNNL

5:00 PM
Local Phase Transformation Strengthening in CoNi-base Superalloys: *Andreas Bezold*[1]; Nicolas Karpstein[1]; Erdmann Spiecker[1]; Mathias Goken[1]; Steffen Neumeier[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

5:20 PM
Microstructural Characterization of Cost-effective Inconel 738LC Superalloy after Tensile Deformation at Various Temperatures: *Hyo Ju Bae*[1]; Kwang Kyu Ko[1]; Eun Hye Park[1]; Joong Eun Jung[2]; Jung Gi Kim[1]; Hyokyung Sung[1]; Jae Bok Seol[1]; [1]Gyeongsang National University; [2]Korea Institute of Materials Science

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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. Tasan, Massachusetts Institute of Technology; Olivia Jackson, Sandia National Laboratories

Tuesday PM | March 21, 2023
Aqua 311A | Hilton

Session Chairs: Yifan Zhang, Los Alamos National Laboratory; Donald Brown, Los Alamos National Laboratory

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2:30 PM Invited
Coupled Neutron Diffraction and Modeling Study of the Formation and Recovery of Dislocations in Elemental Tantalum and Ferritic HT-9 Steel: *Donald Brown*[1]; Reeju Pokharel[1]; Aaron Kohnert[1]; Laurent Capolungo[1]; Levente Balogh[1]; Bjorn Clausen[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

3:00 PM
Coded Apertures for Fast Depth Resolved Diffraction and In-situ Characterization: *Dina Sheyfer*[1]; Doga Gursoy[1]; Jon Tischler[1]; Wenjun Liu[1]; Michael Wojcek[1]; [1]Argonne National Laboratory

3:20 PM
Monitoring Defect Structure Evolution in Titanium Alloys using High-Energy X-ray Diffraction: *Kenneth Peterson*[1]; Joel Bernier[2]; Jacob Ruff[3]; Darren Pagan[1]; [1]Pennsylvania State University; [2]Lawrence Livermore National Laboratory; [3]Cornell High Energy Synchrotron Source

3:40 PM
Resolving Intragranular Stress Fields in Plastically Deformed Titanium Using Point-focused High-energy Diffraction Microscopy: *Wenxi Li*[1]; Hemant Sharma[2]; Kenesei Peter[2]; Sidharth Ravi[3]; Huseyin Sehitoglu[3]; Ashley Bucsek[1]; [1]University of Michigan; [2]Argonne National Laboratory; [3]University of Illinois at Urbana-Champaign

4:00 PM Break

4:20 PM
Understanding Variant Selections during Phase Transformation and Deformation Twinning in BCC Metals: *Avinash Dongare*[1]; Aadhithyan Kannan[1]; Ke Ma[1]; Avanish Mishra[1]; [1]University of Connecticut

4:40 PM
Using Deep Learning to Reconstruct Grains from Simulated Far-Field Diffraction Data: *Ashley Lenau*[1]; Yuefeng Jin[2]; Ashley Bucsek[2]; Stephen Niezgoda[1]; [1]Ohio State University; [2]University of Michigan

5:00 PM
3D Grain Interactions after Fatigue Loading in an Al-Li Binary Alloy via High Resolution X-ray Characterization Techniques: *Sven Gustafson*[1]; Wolfgang Ludwig[2]; Katherine Shanks[3]; Raquel Rodriguez-Lamas[4]; Can Yildirim[4]; Carsten Detlefs[4]; Michael Sangid[1]; [1]Purdue University; [2]University Lyon I; [3]Cornell High Energy Synchrotron Source; [4]European Synchrotron Radiation Facility

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ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session — Thin Films and Nanostructures for Optoelectronics II

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

Program Organizers: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology

Tuesday PM | March 21, 2023
Aqua E | Hilton

Session Chairs: Karine Mougin, CNRS, IS2M; Ramana Chintalapalle, University of Texas at El Paso

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2:30 PM Introductory Comments

2:35 PM Keynote
Plasma Polymerization: Thin Films and Nanostructures: *Jamerson Carneiro De Oliveira*[1]; Aissam Airoudj[1]; Florence Bally-Le Gall[1]; Vincent Roucoules[2]; [1]Université de Haute-Alsace, Université de Strasbourg, CNRS, IS2M ; [2]Université de Haute-Alsace, Université de Strasbourg, CNRS, IS2M

3:15 PM Invited
Investigation of n- and p-doped Silicon-rich Silicon Oxynitride Thin Films Prepared by ECR-PECVD to Synthesize Doped Silicon Nanocrystals: *Gerald Ferblantier*[1]; Emilie Steveler[1]; Corine Ulhaq-Bouillet[2]; Dominique Muller[1]; Yann Le Gall[1]; [1]University of Strasbourg, ICube Laboratory-CNRS; [2]University of Strasbourg, IPCMS-CNRS

3:45 PM Invited
Localized Surface Plasmon Resonance in Highly Doped Si Nanocrystals Embedded in a Silica Matrix: *Herve Rinnert*[1]; Clavel Berclis Kengne Choumele[1]; Mathieu Stoffel[1]; Xavier Devaux[1]; Etienne Talbot[2]; Jean-Marie Poumirol[3]; Michel Vergnat[1]; Caroline Bonafos[3]; Alix Valdenaire[1]; [1]Universite de Lorraine - Institut Jean Lamour; [2]Normandie Univ., Groupe de Physique des Matériaux; [3]CEMES-CNRS

4:15 PM Break

4:35 PM
Electrodeposition of Nickel Oxides Nano Thin Films on 3-D Porous Nickel for Ultracapacitor Application: *Balwant Singh*[1]; Debabrata Das[1]; C Ramana[1]; [1]The University of Texas at El Paso

4:55 PM
3D Microstructuration by Direct Laser Writing: Xingyu Wu[1]; Quentin Bauerlin[1]; *Sébastien Dominici*[1]; Karine Mougin[1]; Arnaud Spangenberg[1]; [1]Université de Haute-Alsace, CNRS, IS2M; Université de Strasbourg

5:15 PM
Alloying Refractory Diboride Thin Films as a Route to Nanocrystallinity: Samyukta Shrivastav[1]; Dana Yun[1]; Kinsey Canova[1]; John Abelson[1]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign

5:35 PM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Functional Materials for Energy

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

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

Tuesday PM | March 21, 2023
32B | SDCC

Session Chairs: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University

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2:30 PM
Elucidation of the Structure Property Relationships that Enable Grotthuss Diffusion in Prussian Blue Electrodes for Fast Hydrogen Ion Batteries: Weiyi Zhang[1]; Jordan Barr[2]; Yanke Fu[1]; Scott Beckman[2]; Xiulei Ji[3]; *Peter Greaney*[1]; [1]University of California, Riverside; [2]Washington State University; [3]Oregon State University

2:50 PM
New Compounds with Distinct Porous Morphology: *Raj Singh Gaur*[1]; [1]SH Chemicals

3:10 PM
Assembled MXene/Carbon Nanotube Electrodes with Anomalous Electrochemical Response: *Kyle Matthews*[1]; Armin VahidMohammadi[1]; Teng Zhang[1]; Yury Gogotsi[1]; [1]Drexel University

3:30 PM
Mitigate Plating in Graphite Using Electrode Microstructure Simulations: *Affan Malik*[1]; Hui-Chia Yu[1]; [1]Michigan State University

3:50 PM
Synthesis, Characterization and Determination of Electrical Properties of Potassium Jarosite Powders: Eduardo Cerecedo-Sáenz[1]; Carlos O. González-Morán[2]; Juan Hernández-Ávila[1]; José G. M. Miranda-Hernández[2]; Alberto Arenas-Flores[1]; J. Rubén Serralde-Lealba[1]; Otilio A. Acevedo-Sandoval[1]; *E Salinas*[1]; [1]Univ Autónoma Del Estado De Hidalgo; [2]Universida Auónoma del Estado de México

4:10 PM Break

4:30 PM
The Compatibility of Metallic Phase Change Materials and Alumina Coating on Steel Housing Material: *Carolina Villada Vargas*[1]; Nuria Navarrete Argilés[1]; Anthony Rawson[1]; Florian Kargl[1]; [1]Institute of Materials Physics in Space, German Aerospace Center DLR

4:50 PM
The Energy Saving Potential of Thermo-responsive Desiccants for Air Dehumidification: Yi Zeng[1]; Jason Woods[1]; *Shuang Cui*[2]; [1]National Renewable Energy Laboratory; [2]University of Texas at Dallas

5:10 PM
Thermal and Rheological Properties of Sodium Sulfate Decahydrate Phase Change Materials with various Thickening and Stabilization Mechanisms: *Damilola Akamo*[1]; Navin Kumar[2]; Yuzhan Li[3]; Cotton Pekol[1]; Kai Li[4]; Jason Hirschey[5]; Tim LaClair[4]; Monojoy Goswami[4]; Orlando Rios[1]; Kyle Gluesenkamp[4]; [1]University of Tennessee Knoxville; [2]Gas Technology Institute; [3]University of Science and Technology Beijing; [4]Oak Ridge National Laboratory; [5]Georgia Institute of Technology

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ENERGY & ENVIRONMENT

Advances in Magnetic Materials — High Energy Product Permanent Magnets

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

Program Organizers: Jose Maria Porro, Bcmaterials; Huseyin Ucar, California Polytechnic University,Pomona; Patrick Shamberger, Texas A&M University; Min Zou, Lab Magnetics, A Quadrant Company; Gaoyuan Ouyang, Ames Laboratory; Alex Leary, NASA Glenn Research Center

Tuesday PM | March 21, 2023
33A | SDCC

Session Chair: Gaoyuan Ouyang, Ames Laboratory

2:30 PM Invited
A Semi-continuous Hot Deformation Method for Making Anisotropic Nd-Fe-B Magnet: Chaochao Pan[1]; Gaoyuan Ouyang[2]; Wei Tang[2]; *Jun Cui*[1]; [1]Iowa State University; [2]Ames Laboratory

3:00 PM
Increased Energy Product of $Nd_2Fe_{14}B$-based Magnets Processed by Concurrent HDDR within Applied Magnetic Fields: *Zachary Tener*[1]; Xubo Liu[2]; Ikenna Nlebedim[2]; Matthew Kramer[2]; Michael McGuire[1]; Michael Kesler[1]; [1]Oak Ridge National Laboratory; [2]Ames Laboratory

3:20 PM
Investigations into the Processing and Magnetic Properties of Nd-Fe-B Magnets Produced by Extrusion: *Alexander Ruediger*[1]; Sven Gall[2]; Sören Müller[1]; [1]Extrusion Research and Development Center FZS, Technische Universität Berlin; [2]INGWERK GmbH

3:40 PM
On Dysprosium Utilisation in Multi-main-phase Nd–Dy–Fe–B Magnets with Core–shell Microstructures: *Hansheng Chen*[1]; Zhiheng Zhang[2]; Jiaying Jin[2]; Xiaolian Liu[3]; Wei Li[4]; Mi Yan[2]; Simon Ringer[1]; [1]The University of Sydney; [2]Zhejiang University; [3]Hangzhou Dianzi University; [4]Nanchang Hangkong University

4:00 PM Break

4:15 PM
Hard Magnetic SmCo5-Cu Nanocomposites Produced by Severe Plastic Deformation: Franziska Staab[1]; Enrico Bruder[1]; *Karsten Durst*[1]; [1]Technical University Darmstadt

4:35 PM
Influence of Severe Plastic Deformation on the Magnetic Properties of SmCo Permanent Magnets: *Alexander Paulischin*[1]; Lukas Weissitsch[1]; Stefan Wurster[1]; Heinz Krenn[2]; Reinhard Pippan[1]; Andrea Bachmaier[1]; [1]Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences; [2]Institute of Physics, University of Graz

4:55 PM
Toughening Sm-Co Sintered Magnets by Additive-modified Microstructure Engineering: *Baozhi Cui*[1]; Xubo Liu[1]; Cajetan Ikenna Nlebedim[1]; Jun Cui[1]; [1]Ames Laboratory

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Alloy Design and Manufacturing

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Tuesday PM | March 21, 2023

Aqua D | Hilton

Session Chairs: Peter Liaw, The University of Tennesee; Xinghang Zhang, Purdue University

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2:30 PM Keynote
2023 Institute of Metals Lecture/Robert Franklin Mehl Award: Metallurgical Engineering to Materials Science and Engineering: Evolution of a Profession and TMS: *Carl Koch*[1]; [1]North Carolina State University

3:00 PM Keynote
Challenges in the Synthesis and Processing of Complex Concentrated Alloys: Calvin Belcher[1]; Sakshi Bajpai[1]; Benjamin MacDonald[1]; Diran Apelian[1]; *Enrique Lavernia*[1]; [1]University of California Irvine

3:30 PM Invited
Computational Studies of Interfaces in High Entropy Ceramics.: Sam Daigle[1]; Jon Hagelstein[1]; *Donald Brenner*[1]; [1]North Carolina State University

3:50 PM Invited
Additive Manufacturing of Multi-principal Element Ni Alloys with Nanoprecipitates: Bo Yang[1]; Benjamin Stegman[1]; Zhongxia Shang[1]; Jack Lopez[1]; William Jarosinski[2]; *Xinghang Zhang*[1]; [1]Purdue University; [2]Praxair Surface Technologies Inc.

4:10 PM Break

4:30 PM Invited
Unique Magnetism, Hydriding and Irradiation Behaviors of Some Multi-Principal Element Alloys: *Tongde Shen*[1]; [1]Yanshan University

4:50 PM
Recent Developments of Body-centered-cubic (BCC) High-entropy Alloys: Lia Amalia[1]; Xuesong Fan[1]; Hugh Shortt[1]; Baldur Steingrimsson[1]; Fangfei Liu[2]; Yong Zhang[2]; Yanfei Gao[1]; *Peter Liaw*[1]; [1]University of Tennessee; [2]University of Science and Technology Beijing

5:10 PM
Unraveling Hydrogen Embrittlement of Model High Entropy Alloys: *Michela Geri*[1]; Menglei Jiang[1]; Cemal Tasan[1]; [1]MIT

5:30 PM Invited
Interplay of Lattice Distortion and Ordering in Refractory High-entropy Alloys: *Wei Chen*[1]; Geroge Kim[1]; Chenyang Li[1]; Peter Liaw; Peter Liaw[2]; [1]Illinois Institute of Technology; [2]University of Tennessee

5:50 PM Invited
Structural and Compositional Inheritances of Intermetallic Phases in High-entropy Alloys: Ruei-Chi Tsai[1]; Keng-Che Chang[1]; *An-Chen Fan*[1]; Daniel Miracle[2]; Ming-Hung Tsai[1]; [1]National Chung Hsing University; [2]AF Research Laboratory

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MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Advances in Ceramic Materials and Processes II

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Tuesday PM | March 21, 2023
30A | SDCC

Session Chairs: Ruigang Wang, University of Alabama; Faqin Dong, Southwest University of Science and Technology

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2:30 PM Introductory Comments

2:35 PM Invited
Energy Efficient Spark Plasma Sintering Fabricating Transparent Alumina: *Eugene Olevsky*[1]; CheolWoo Park[1]; Elisa Torresani[1]; Chris Haines[2]; [1]San Diego State University; [2]US Army DEVCOM - Army Research Laboratory

2:55 PM Invited
Developing Transparent Ceramics for Laser Power Scaling and Laser Welding: Y Kodera[1]; Xingzhong Wu[1]; E. Penilla[1]; *Javier Garay*[1]; [1]UCSD

3:15 PM
Fabrication of Ultra-lightweight and Highly Porous Alumina Scaffolds by a Novel Sol-gel/Freeze-casting Hybrid Method: *Pei-Chieh Ho*[1]; Haw-Kai Chang[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

3:35 PM
Plasma Sprayed Carbon Nano Fillers Reinforced Lanthanum-cerate Hybrid Composite Coating with Outstanding Toughness: *Pushpender Singh*[1]; Niranjan Pandit[1]; Anup Kumar Keshri[1]; [1]Indian Institute of Technology Patna

3:55 PM Break

4:10 PM Invited
Surface-engineered Metal Oxide Nanocrystals: Redox Chemistry, Catalysis and Beyond: *Ruigang Wang*[1]; [1]The University of Alabama

4:30 PM
Energy Dispersive X-ray Diffraction with Synchrotron Radiation for Measurement of Residual Elastic Mismatch Strain in Composites and Coating Systems for Extreme Environments: *John Ferguson*[1]; J.Y. Peter Ko[2]; Kelly Nygren[2]; Michael Sangid[1]; [1]Purdue University; [2]Materials Solutions Network at CHESS

4:50 PM
Effect of Y2O3 and Al Addition on Mechanical Properties and Micrographic Features of Invar Based ODS Alloy Prepared by Mechanical Alloying + Spark Plasma Sintering: *Arpan Arora*[1]; Suhrit Mula[1]; [1]IIT Roorkee

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MATERIALS PROCESSING

Advances in Pyrometallurgy: Developing Low Carbon Pathways — Energy Valorization in Metallurgy

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

Committee

Program Organizers: Camille Fleuriault, Eramet Norway; Joalet Steenkamp, XPS Glencore; Dean Gregurek, RHI Magnesita; Jesse White, KTH Royal Institute of Technology; Quinn Reynolds, Mintek; Phillip Mackey, P.J. Mackey Technology, Inc.; Lina Hockaday, Curtin University, WASM

Tuesday PM | March 21, 2023
29B | SDCC

Session Chairs: Camille Fleuriault, Eramet Norway; Quinn Reynolds, Mintek

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2:30 PM Invited
The Use of Concentrating Solar Energy for Thermal Decomposition in Oxide and Carbonate Minerals: Lina Hockaday[1]; *Quinn Reynolds*[2]; [1]Gam Aesa; [2]Mintek

3:00 PM
Linde's Industrial Gas Technology in Nonferrous Processing: Combining CFD with Partial Experimental Verification & Validation: *William Mahoney*[1]; Adrian Deneys[2]; Ahmed Abdelwahab[1]; Jiaye Gan[1]; [1]Linde Technology Center; [2]Linde, Inc.

3:20 PM
Sulphuric Acid Plants in Metallurgical Facilities: Options for Energy Optimization: *Shailesh Sampat*[1]; Joseph Kelly[1]; Maria De Campos[1]; Sina Mostaghel[1]; [1]SNC-Lavalin

3:40 PM
Experimental Analysis of Zinc Melting Using CSP: Pieter Bezuidenhout[1]; Willem le Roux[2]; *Joalet Steenkamp*[3]; [1]Mintek; [2]University of Pretoria; [3]University of the Witwatersrand

4:00 PM Break

4:20 PM
Effect of Ore Pre-heating on Furnace Operation in High Carbon Ferromanganese Production - Lessons Learnt from Pilot-scale Testwork: *Samuel Moholwa*[1]; Sello Tsebe[1]; Derek Hayman[1]; Pieter Bezuidenhout[1]; Martin Sitefane[1]; Joalet Steenkamp[2]; [1]Mintek; [2]University of the Witwatersrand

4:40 PM
A Desktop Study on the Potential use of South African Slags as Thermal Storage Medium: *Sifiso Sambo*[1]; Joalet Steenkamp[2]; Pieter Bezuidenhout[1]; [1]Mintek; [2]University of the Witwatersrand

5:00 PM
CO2 Free FeMn/Mn Production through Molten Oxide Electrolysis: Karen Osen[1]; *Halvor Dalaker*[1]; Ana Maria Martinez[1]; Henrik Gudbrandsen[1]; Ida Kero[1]; Zhaohiu Wang[1]; [1]SINTEF

5:20 PM
Ferronickel Production from Nickel Laterite via Sulfide Chemistry: *Caspar Stinn*[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

5:40 PM Invited
Application and Results of MPOT Diluted Combustion in Aluminum Furnaces and the Complete Carbon Free Future Technology: Curtis Bermel[1]; *Michael Potesser*[1]; [1]MPOT LLC

MATERIALS DESIGN

Advances in Titanium Technology — Session IV

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Tuesday PM | March 21, 2023
Cobalt 500 | Hilton

Session Chair: Zachary Kloenne, The Ohio State University

2:30 PM Invited
Effect of the Vibratory Peening Parameters on Surface Properties of Ti-6Al-4V: *Maxime Paques*[1]; Benoit Changeux[2]; Anindya Das[1]; Hongyan Miao[1]; Martin Levesque[1]; Sylvain Turenne[1]; Etienne Martin[1]; [1]Polytechnique Montréal; [2]Safran Tech

3:00 PM Invited
Computational Studies of Deformation Twinning in Metastable Titanium Alloys: Ganlin Chen[1]; *Liang Qi*[1]; [1]University of Michigan

3:30 PM Invited
On the Heterogeneous and Cooperative Deformation in High-strength (+) Titanium Alloys: John Foltz[1]; Shaolou Wei[2]; C Tasan[2]; *Bhuvi Nirudhoddi*[1]; [1]ATI Specialty Materials; [2]Massachusetts Institute of Technology

4:00 PM Break

4:20 PM
Transformation-mediated Twin Nucleation and the Temperature Dependence in Hexagonal Close-packed Metals: *Lei Cao*[1]; Mehrab Lotfpour[1]; Amir Hassan Zahiri[1]; Jamie Ombogo[1]; [1]University of Nevada

4:40 PM
Twin Interface Structures and Fault-energetics in HCP Materials: *Gorkem Gengor*[1]; Ahmed Sameer Khan Mohammed[2]; Huseyin Sehitoglu[2]; [1]University of Illinois Urbana Champaign; [2]University of Illinois Urbana Champaign

5:00 PM
Cottrell Atmospheres around Screw Dislocations in alpha-Ti Alloys: *Eric Rothchild*[1]; Siying Li[2]; Daryl Chrzan[2]; David Jany[2]; [1]Sandia National Laboratories; [2]University of California, Berkeley

5:20 PM
Atomistic Molecular Dynamics Simulations of Crack Tip Behavior in alpha-Ti: *Satish Rao*[1]; Michelle Harr[1]; Vikas Sinha[1]; Adam Pilchak[1]; Tom Broderick[1]; [1]MRL Materials Resources LLC

MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk,

BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Tuesday PM | March 21, 2023
Cobalt 520 | Hilton

Session Chair: Praveen Kumar, Indian Institute of Science

2:30 PM
Closed-loop Discovery of Materials with Simultaneous Electronic and Mechanical Property Targets: *Christopher Stiles*[1]; Elizabeth Pogue[1]; Alexander New[1]; Brandon Wilfong[2]; Gregory Bassen[2]; Izze Hedrick[2]; Edwin Gienger[1]; Christine Piatko[1]; Janna Domenico[1]; Kyle McElroy[1]; Timothy Montalbano[1]; Michael Pekala[1]; Nam Le[1]; Christopher Ratto[1]; Andrew Lennon[1]; Tyrel McQueen[2]; [1]Johns Hopkins University Applied Physics Laboratory; [2]Johns Hopkins University

2:50 PM
An Information Theory Based Approach for Training Machine Learned Potentials: *Jason Gibson*[1]; Jan Janssen[1]; Laura Lopes[1]; Richard Hennig[2]; Danny Perez[1]; [1]Los Alamos National Laboratory; [2]University Of Florida

3:10 PM
Extraction of Creep Parameters from Indentation Creep Experiment: An Artificial Neural Network-Based Approach: Raj Mahat[1]; Vikram Jayaram[1]; *Praveen Kumar*[1]; [1]Indian Institute of Science

3:30 PM
Interlaced Characterization and Calibration: Online Bayesian Optimal Experimental Design for Constitutive Model Calibration: *Denielle Ricciardi*[1]; Tom Seidl[1]; Brian Lester[1]; Amanda Jones[1]; Elizabeth Jones[1]; [1]Sandia National Laboratories

3:50 PM
Machine Learning-based Multi-objective Optimization for Efficient Identification of Crystal Plasticity Model Parameters: *Marko Knezevic*[1]; [1]University of New Hampshire

4:10 PM Break

4:30 PM
Robust and Efficient Method for Calibration of Thermal Models for Additive Manufacturing: *Michael Groeber*[1]; Joy Forsmark[1]; Yang Huo[1]; [1]The Ohio State University

4:50 PM
A Deep Neural Network Formulation for Anisotropic Yield Prediction: *Anderson W Paiva do Nascimento*[1]; Sharan Roongta[2]; Martin Diehl[3]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Max-Planck-Institut für Eisenforschung; [3]Katholieke Universiteit, Leuven

5:10 PM
Training Material Models Using Gradient Descent Algorithms: *Tianju Chen*[1]; Mark Messner[1]; [1]Argonne National Laboratory

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MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Multiscale Algorithms for Crystal Plasticity and Damage Mechanics I

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

Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis; Enrique Martinez Saez, Clemson University; Garritt Tucker, Colorado School of Mines; Hojun Lim, Sandia National Laboratories; Vimal Ramanuj, Oak Ridge National Laboratory

Tuesday PM | March 21, 2023
Aqua 310A | Hilton

Session Chair: Hojun Lim, Sandia National Laboratories

2:30 PM Invited
A New AI/ML Framework for Materials Innovation: *Surya Kalidindi*[1]; [1]Georgia Institute of Technology

3:10 PM
A Non-local Formulation of the Elastoplastic Self-consistent Crystal Plasticity Model: Applications to Modeling Deformation and Recrystallization: *Zhangxi Feng*[1]; Miroslav Zecevic[2]; Ricardo Lebensohn[2]; Marko Knezevic[1]; [1]University of New Hampshire; [2]Los Alamos National Laboratory

3:30 PM
A Peridynamic-based Approach to Study the Influence of Oxide on Impact and Bonding in Cold Spray: *Baihua Ren*[1]; Jun Song[1]; [1]McGill University

3:50 PM
Crystal Plasticity Finite Element Analysis of Crystalline Thermo-mechanical Constitutive Response: *Anderson W Paiva do Nascimento*; Akhilesh Pedgaonkar[1]; Curt A Bronkhorst[1]; Irene Beyerlein[2]; [1]University of Wisconsin-Madison; [2]University of California, Santa Barbara

4:10 PM Break

4:25 PM
Data-Driven Bayesian Model-Based Prediction of Fatigue Crack Nucleation in Ni-based Superalloys: *Somnath Ghosh*[1]; George Weber[2]; Maxwell Pinz[1]; [1]Johns Hopkins University; [2]NASA Langley

4:45 PM
Data-driven Plastic Anisotropy Predictions Using Crystal Plasticity and Deep Learning Models: *Hojun Lim*[1]; Taejoon Park[2]; David Montes de Oca Zapiain[1]; Farhang Pourboghrat[2]; [1]Sandia National Laboratories; [2]The Ohio State University

5:05 PM
Exascale Fracture Mechanics with Peridynamics: *Sam Reeve*[1]; Pablo Seleson[1]; [1]Oak Ridge National Laboratory

5:25 PM
Finite Element Implementation of a Dislocation Thermo-mechanics Model: Application to Study Dislocation Structure Evolution during Laser Scanning: Gabriel Lima Chaves[1]; *Manas Upadhyay*[1]; [1]Ecole Polytechnique

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MATERIALS DESIGN

Alloy Behavior and Design Across Length-Scales: An SMD Symposium Honoring Easo George — Alloy Design and Behavior

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

Program Organizers: Michael Mills, Ohio State University; George Pharr, Texas A&M University; Robert Ritchie, University of California, Berkeley; Muralidharan Govindarajan, Oak Ridge National Laboratory

Tuesday PM | March 21, 2023
Cobalt 502B | Hilton

Session Chair: Robert Ritchie, University of California, Berkeley

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2:30 PM Invited
Functional High Entropy Alloys: *Dierk Raabe*[1]; Zhiming Li[1]; Liuliu Han[1]; Ziyuan Rao[1]; [1]Max-Planck Institute

3:00 PM Invited
Utilizing Nanoprecipitates to Modulate Phase Transformation, Strength, and Ductility of HEAs: *Ying Yang*[1]; Eva Zarkadoula[1]; Easo George[1]; [1]Oak Ridge National Laboratory

3:30 PM Invited
Fracture Properties of High-entropy Alloys: *Bernd Gludovatz*[1]; Robert Ritchie[2]; [1]UNSW Sydney; [2]Lawrence Berkeley National Laboratory

4:00 PM Break

4:20 PM Invited
Factors Affecting Mechanical Twinning in Single-phase FCC and Polycrystalline MEAs and HEAs: *Guillaume Laplanche*[1]; [1]Ruhr-University Bochum

4:50 PM Invited
Predicting High Entropy Alloy Phase Stability across Length Scales: *James Morris*[1]; German Samolyuk[2]; Yury Osetsky[2]; G. Malcolm Stocks[2]; [1]Ames Laboratory; [2]Oak Ridge National Lab

5:20 PM Invited
Low Temperature Deformation Mechanisms of CrMnFeCoNi High-entropy Alloy Polycrystals: *Werner Skrotzki*[1]; G. Dan Sathiaraj[2]; Rolf Schaarschuch[1]; Carl-Georg Oertel[1]; Paul Chekhonin[3]; Robert Chulist[4]; Christian Gadelmeier[5]; Uwe Glatzel[5]; Easo P George[6]; [1]TU Dresden; [2]IIT Indore; [3]Helmholtz-Zentrum Dresden-Rossendorf; [4]Polish Academy of Sciences, Krakow; [5]University of Bayreuth; [6]University of Tennessee

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ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications XI — Session IV

Sponsored by: TMS Functional Materials Division, TMS Structural 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; Wan-Ting Chiu,

Tokyo Institute of Technology; Chenguang Fu, Zhejiang University

Tuesday PM | March 21, 2023
Sapphire A | Hilton

Session Chairs: Wan-ting Chiu, Tokyo Institute of Technology; Bo-Chia Chen, National Yang Ming Chiao Tung university

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2:30 PM Invited
A Tentative of an Initial Materials Specification of the Process Influence on Sulfide-based Ceramics for Enhancing their Thermoelectric Performances: *Cedric Bourges*[1]; Guillaume Lambard[1]; Toshiyuki Nishimura[1]; Satoshi Ishii[1]; Takao Mori[1]; [1]National Institute For Materials Science

2:50 PM Invited
Cluster-Based Molybdenum Chalcogenide Compounds for Thermoelectricity. Dream or Reality? A (Partial) Answer from Theory: *Jean-Francois Halet*[1]; [1]Laboratory for Innovative Key Materials and Structures (LINK)

3:10 PM Invited
Enhancing the SnS-Based Solar Cells by Crystallographic Orientation Engineering and Interfacial Band Alignment Using an Eco-friendly Zinc-Tin-Oxide Buffer Layer: *Li-Chyong Chen*[1]; Thi-Thong Ho[2]; Zi-Liang Yang[1]; Fang-Yu Fu[1]; Efat Jokar[1]; Shaham Quadir[2]; Kuei-Hsien Chen[2]; [1]National Taiwan University; [2]Academia Sinica

3:30 PM Invited
Leveraging Additive Manufacturing to Tailor Thermoelectric Device Configuration, Leg Shape, and Transport Properties: *Saniya Leblanc*[1]; [1]George Washington University

3:50 PM Break

4:10 PM Invited
Spin-mediated Thermal Transport in Low-dimensional Quantum Magnets: *Xi Chen*[1]; [1]University of California, Riverside

4:30 PM Invited
Manipulation of Bi-doping of Polycrystalline Ni-Mn-Ga and Fabrication of Grain Particles for Smart Ni-Mn-Ga/polymer Composites: *Wan-Ting Chiu*[1]; Pimpet Sratong-On[2]; Masaki Tahara[1]; Volodymyr Chernenko[3]; Hideki Hosoda[1]; [1]Tokyo Institute of Technology; [2]Thai-Nichi Institute of Technology; [3]UPV/EHU Science Park

4:50 PM
Stability Study of Cesium-based Triple Cation Perovskite Solar Cells in Elevated Environmental Ambients: *Sujan Aryal*[1]; Anupama Kaul[1]; Mahdi Temsal[1]; Ehsan Ghavaminia[1]; [1]University of North Texas

5:10 PM Concluding Comments

LIGHT METALS

Aluminum Alloys, Characterization and Processing — Characterization and Processes

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek,

Kensington Technology Inc.

Tuesday PM | March 21, 2023
32A | SDCC

Session Chair: Etienne Martin, École Polytechnique

2:30 PM
Characterization of Aluminium Conductors Steel Reinforced in Overhead Transmission Lines: Meysam Hassanipour[1]; *Miguel Diago Martinez*[1]; Denis Valiquette[1]; Fédéric Guay[1]; André Leblond[1]; [1]Institut de Recherche d'Hydro-Québec

2:55 PM
Mechanical Properties and Electrical Properties of Permanent Mold Cast Eutectic Al-1.8Fe Alloy: Sufeng Liu[1]; Anita Hu[1]; Ali Dhaif[1]; Wutian Shen[1]; *Hongfa Hu*[1]; [1]University of Windsor

3:20 PM
Effects of the Friction Stir Welding Sliding and Sticking Mechanisms on the Microhardness, Texture, and Element Concentration: *Nicholas Sabry*[1]; Joshua Stroh[1]; Dimitry Sediako[1]; [1]The University of British Columbia

3:45 PM
Experimental Investigation of the Effect of High Temperature Shot Peening on the Surface Integrity of 7010-T7452 Aluminum Alloy: Abouthaina Sadallah[1]; Anindya Das[1]; Benoit Changeux[2]; Hong-Yan Miao[1]; Etienne Martin[1]; Sylvain Turenne[1]; *Maxime Pauques*[1]; [1]École Polytechnique Montreal; [2]Safran Tech.

4:10 PM Break

4:25 PM
Quality Assessment and Features of Microdrilled Holes in Aluminum Alloy Using Ultrafast Laser: Suman Chatterjee[1]; *Abhijit Cholkar*[1]; David Kinahan[1]; Dermot Brabazon[1]; [1]Dublin City University

4:50 PM
Surface Characterization Methods to Evaluate Adhesive Bonding Performance of 6xxx Automotive Alloys: Greunz Theresia[1]; *Martina Hafner*[1]; Ralph Gruber[2]; Tomasz Wojcik[3]; Jiri Duchoslav[4]; David Stifter[4]; [1]AMAG rolling GmbH; [2]CEST Competence Centre for Electrochemical Surface Technology GmbH; [3]Vienna University of Technology; [4]Johannes Kepler University Linz

5:15 PM
Investigation of Resistance of Intergranular Attack for Various Heat Treated 2011 Alloys After Hard Anodizing: *Ilyas Artunc Sari*[1]; Gorkem Ozcelik[1]; Zeynep Tutku Ozen[1]; Onuralp Yucel[2]; [1]ASAS Aluminum; [2]Istanbul Technical University

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LIGHT METALS

Aluminum Industry Emissions Measurement, Reporting & Reduction — Aluminum Industry Emissions Measurement, Reporting & Reduction

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

Program Organizer: Pernelle Nunez, International Aluminium Institute

Tuesday PM | March 21, 2023
31A | SDCC

Session Chair: Marlen Bertram, International Aluminium Institute

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2:30 PM Introductory Comments

2:35 PM
Reaching Zero Carbon Emissions in Aluminium Electrolysis: *Gudrun Saevarsdottir*[1]; Sai Krishna Padamata[1]; Brandon Velasquez[1]; Halvor Kvande[2]; [1]Reykjavik University; [2]Previously NTNU

3:00 PM
Individual Pot Sampling for Low-voltage PFC Emissions Characterization and Reduction: *Brian Zukas*[1]; Julie Young[1]; [1]Alcoa

3:25 PM
Determination of PFC with Canister Sampling and Medusa GC-MS Analysis in Comparison to General IPCC Estimation Methods: *Henrik Aasheim*[1]; Morten Isaksen[1]; Norbert Schmidbauer[2]; Ove Hermansen[2]; Chris Lunder[2]; [1]Hydro Aluminium AS; [2]Norwegian Institute for Air Research

3:50 PM Break

4:05 PM
Heavy Metal Emissions through Dust from Aluminium Electrolysis: Fride Muller[1]; Thor Anders Aarhaug[2]; *Gabriella Tranell*[1]; [1]The Norwegian University of Science and Technology; [2]SINTEF Industry

4:30 PM
Verification of Open-path Dust Laser for Continuous Monitoring of Diffuse Emissions: *Lars Moen Strømsnes*[1]; Heiko Gaertner[2]; Steinar Olsen[3]; Peter Geiser[3]; Bernd Wittgens[2]; [1]SINTEF Helgeland; [2]SINTEF AS; [3]NEO Monitors AS

4:55 PM
Characterization of Industrial Hydrocarbon Samples from Anode Baking Furnace Off-gas Treatment Facility: *Kamilla Arnesen*[1]; Alexandre Albinet[2]; Claudine Chatellier[2]; Nina Huynh[2]; Thor Aarhaug[3]; Kristian Einarsrud[1]; Gabriella Tranell[1]; [1]Norwegian University of Science and Technology; [2]National Institute for Industrial Environment and Risks (INERIS); [3]SINTEF

BIOMATERIALS

Biological Materials Science — Biological Materials Science IV

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

Tuesday PM | March 21, 2023
Sapphire 402 | Hilton

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

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2:30 PM Invited
Mechanical Properties of Stretchable, Mechanochemically Active Hydrogels: *Jamie Kruzic*[1]; Yuwan Huang[1]; Alaa Ajam[1]; Zihao Li[1]; P. Jayathilaka[1]; Md. Islam[1]; Meredith Silberstein[2]; Kristopher Kilian[1]; [1]University of New South Wales; [2]Cornell University

3:00 PM
3D Printed Stimuli-responsive Hydrogels for Drug Delivery: *Jeffrey Bates*[1]; [1]University of Utah

3:20 PM
Antibacterial Activity of Chitosan-based Spiky Gold Nanoparticles-hydrogel: *Cynthia Sangang*[1]; Jenny Qiu[1]; [1]Texas Tech University

3:40 PM Invited
Probing Dynamic Structure-function Relationship of Bone at the Nanoscale: *Ottman Tertuliano*[1]; [1]University of Pennsylvania

4:10 PM Break

4:30 PM Invited
Probing Function and Degeneration in Elastic Biopolymers: *Anna Tarakanova*[1]; [1]University of Connecticut

5:00 PM
Reusable Hydrogel Drug Delivery Devices and Their Release Kinetics: *Jeffrey Bates*[1]; [1]University of Utah

5:20 PM
Novel Zn-Cu-Al-TiC Nanocomposites for Biodegradable Stent Application: *Yuxin Zeng*[1]; Chase Linsley[1]; Jingke Liu[1]; Benjamin Wu[1]; Xiaochun Li[1]; [1]University of California Los Angeles

5:40 PM Invited
BioactiveTissueDerivedNanocompositeGelforPermanentArterialEmbolization: *Jingjie Hu*[1]; [1]North Carolina State University

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SPECIAL TOPICS

Bladesmithing 2023 — Bladesmithing II

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

Program Organizers: Samuel Wagstaff, Oculatus Consulting; David Sapiro, USNC-Tech

Tuesday PM | March 21, 2023
Sapphire I | Hilton

Session Chairs: Samuel Wagstaff, Oculatus Consulting; David Sapiro, Ultra Safe Nuclear

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2:30 PM Introductory Comments

2:35 PM
The NeverDull Blade: *Gianluca Roscioli*[1]; [1]Massachusetts Institute of Technology

2:55 PM
Characterization of the Differential Heat Treatment of a Sunnobi Tanto: *Megan Klein*[1]; [1]University of Michigan

3:15 PM
MA Blade Smithing Proposal: Juvenal Rodela[1]; Abraham Enchinton[1]; *David Santacruz*[1]; Nicole Jimenez[1]; [1]University of Texas at El Paso

3:35 PM
This is the Way - Discovering the Secrets of Beskar Metallurgy: *Suveen Mathaudhu*[1]; [1]Colorado School of Mines

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Atomic Structure

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

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

Tuesday PM | March 21, 2023
Aqua C | Hilton

Session Chair: Amlan Das, Cornell University

2:30 PM Invited
Crystal Nucleation from a Hard-sphere Liquid: *Frans Spaepen*[1]; Zizhao Wang[1]; David Weitz[1]; [1]Harvard University

2:50 PM
Ordering and Intermittent Structural Relaxation in a Model Binary Solid System: *Zengquan Wang*[1]; Peter Derlet[2]; Robert Maass[3]; [1]Federal Institute of Materials Research and Testing (BAM); [2]Paul Scherrer Institut; [3]Federal Institute of Materials Research and Testing (BAM), University of Illinois at Urbana-Champaign

3:10 PM
Two-step Annealing Induced Structural Rejuvenation: A Cause for Memory Effect in Metallic Glasses: *Xiaodong Wang*[1]; [1]Zhejiang University

3:30 PM Invited
Enhanced Stability of Metallic Glass Thin Films using an Ion Beam at Room Temperature: Vrishank Jambur[1]; Chengrong Cao[1]; Carter Francis[1]; John Perepezko[1]; Izabela Szlufarska[1]; *Paul Voyles*[1]; [1]University of Wisconsin

3:50 PM Break

4:10 PM
Ultrastable States in Bulk Metallic Glasses: Weihua Zhou[1]; Yi Li[1]; *A. Lindsay Greer*[2]; [1]Institute of Metal Research, Chinese Academy of Sciences; [2]University of Cambridge

4:30 PM
Correlating Rejuvenation within the Elastic Limit with Anelasticity in Metallic Glasses: *Miguel B. Costa*[1]; Alan Greer[1]; [1]University of Cambridge

4:50 PM
Structural Dynamics in the Microplastic Regime of a Zr-based Metallic Glass: *Amlan Das*[1]; Birte Riechers[2]; Peter Derlet[3]; Eric Dufresne[4]; Robert Maaß[5]; [1]Cornell High Energy Synchrotron Source, Cornell University; [2]Federal Institute of Materials Research And Testing (BAM); [3]Condensed Matter Theory Group, Paul Scherrer Institute; [4]Advanced Photon Source, Argonne National Laboratory; [5]Federal Institute of Materials Research and Testing (BAM), University of Illinois at Urbana-Champaign

5:10 PM
Across the Field of Bulk Metallic Glass - The Second Amorphous Phase: *Sydney Corona*[1]; Jong Na[2]; Qi An[3]; Yidi Shen[3]; William Goddard[1]; Konrad Samwer[4]; William Johnson[1]; [1]California Institute of Technology; [2]Glassimetal Technologies; [3]University of Nevada, Reno; [4]University of Göttingen

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LIGHT METALS

Cast Shop Technology — DC Casting and Grain Refinement

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

Program Organizers: Halldor Gudmundsson, Century - Nordural; Stephan Broek, Kensington Technology Inc.

Tuesday PM | March 21, 2023
31C | SDCC

Session Chair: Philippe Khalil, HATCH

2:30 PM
Recent Studies Using HR-TEM on the Fundamental Mechanism of Nucleation of α Aluminium on TiB2 in High Efficiency Grain Refiners: *John Courtenay*[1]; [1]Mqp Limited

2:55 PM
A Cellular Automaton Model for Qualifying Current Grain Refiners and Prescribing Next-generation Grain Refiners for Aluminium Alloys: *Georges Salloum-Abou-Jaoude*[1]; Samah Sami[1]; Alain Jacot[2]; Luc Rougier[2]; [1]Constellium C-TEC; [2]ESI group

3:20 PM
Modelling Contactless Ultrasound Treatment in a DC Casting Launder: *Christopher Beckwith*[1]; Georgi Djambazov[1]; Dmitry Eskin[2]; Tungky Subroto[3]; Koulis Pericleous[1]; [1]University Of Greenwich; [2]Brunel University; [3]Constellium

3:45 PM
Numerical Analysis of Channel-type Segregations in DC Casting Aluminum Slab: *Keisuke Kamiya*[1]; Takuya Yamamoto[2]; [1]UACJ Corporation; [2]Tohoku University

4:10 PM Break

4:25 PM
Stability of SiC and Al2O3 Reinforcement Particles in Thermomechanical Processed Direct Chill Cast 6xxx Al MMnCs: *Abdallah Abu Amara*[1]; Guangyu Liu[1]; Dmitry Eskin[1]; Brian McKay[1]; [1]Brunel University London

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NUCLEAR MATERIALS

Ceramic Materials for Nuclear Energy Research and Applications — Processing and Evaluation of Alternative Fuels and Materials

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

Program Organizers: Walter Luscher, Pacific Northwest National Laboratory; Xian-Ming Bai, Virginia Polytechnic Institute and State University; Lingfeng He, North Carolina State University; Sudipta Biswas, Idaho National Laboratory;

Simon Middleburgh, Bangor University

Tuesday PM | March 21, 2023
28B | SDCC

Session Chair: Simon Middleburgh, Bangor University

2:30 PM Invited
Zirconia-coated Uranic Fuel Particles Processing and In Situ Sintering Characterisation: *Phylis Makurunje*[1]; Gareth Stephens[1]; Simon Middleburgh[1]; [1]Nuclear Futures Institute

3:00 PM Invited
Oxidation Behavior and Mechanisms of the SiC Coating in TRISO Fuel Particles: *Haiming Wen*[1]; Adam Bratten[1]; Visharad Jalan[1]; [1]Missouri University of Science and Technology

3:30 PM
Phase Equilibria and Thermodynamics of Tri-carbide Fuels for Nuclear Thermal Propulsion: *Ronald Booth*[1]; Juliano Schrone Pinto[1]; Erofili Kardoulaki[2]; Ken Mcclellan[2]; Jhonathan Rosales[3]; Theodore Besmann[1]; [1]University of South Carolina; [2]Los Alamos National Laboratory; [3]NASA

3:50 PM
Thermomechanical Characterization of Advanced Reactor Alloys and Composites Exposed to High-temperature Gas Environments: *William Searight*[1]; Leigh Winfrey[2]; [1]Pennsylvania State University; [2]SUNY Maritime College

4:10 PM Break

4:30 PM Invited
Improving Uranium Mononitride Behaviour using Uranium Diboride Addition: *Joel Turner*[1]; Tim Abram[1]; Qusai Mistarihi[1]; James Buckley[1]; [1]University of Manchester

5:00 PM
Silica Formation on SiC Following Steam Attack: *Dina ElGewaily*[1]; Jacob Eapen[1]; [1]North Carolina State University

5:20 PM
Exploring Irradiation-induced Phase Evolution in WC: *Charles Hirst*[1]; Diana Shklover[1]; Paola Amadeo[1]; Scott Middlemas[2]; Samuel Humphry-Baker[3]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Idaho National Laboratory; [3]Imperial College London

5:40 PM
Radiation Studies on the TiZrNbHfTa High Entropy Alloy and Its Hydrides: *Christopher Moore*[1]; Alberto Fraile[1]; Caitlin Taylor[2]; Michael Rushton[1]; Simon Middleburgh[1]; [1]Bangor University; [2]Los Alamos National Laboratory

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CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Mechanical Properties

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials

Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Tuesday PM | March 21, 2023
Aqua 313 | Hilton

Session Chairs: Andrew Brown, Army Research Laboratory; Juan Escobedo-Diaz, University of New South Wales

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2:30 PM
Considering Creep in a Thermo-mechanical Finite Element Analysis of a Drum Furnace Lining: *Guenter Unterreiter*[1]; Dean Gregurek[1]; [1]RHI Magnesita GmbH

2:50 PM
Deformation Behavior of Advanced Metallic Materials Studied using Ultra-high-speed Imaging and Acoustic Emission Techniques: *Michal Knapek*[1]; Tomas Tayari[1]; Adam Gres[1]; [1]Charles University

3:10 PM
Dynamic and Quasi-static Mechanical Response and Associated Microstructural Evolution of Damascus Steels: Alec Wackwitz[1]; Ali Ameri[1]; Jianshen Wang[1]; Paul Hazell[1]; Hongxu Wang[1]; *Juan Escobedo-Diaz*[1]; [1]University of New South Wales

3:30 PM
High Strain-rate Testing of Brittle Materials using Miniature All-beryllium Split-hopkinson Pressure Bars: *Bryan Zuanetti*[1]; Kyle Ramos[1]; Carl Cady[1]; Chris Meredith[2]; Dan Casem[2]; Adam Golder[3]; Cynthia Bolme[1]; [1]Los Alamos National Laboratory; [2]DEVCOM Army Reserach Laboratory; [3]Intuitive Surgical Instruments

3:50 PM Break

4:05 PM
Investigation of the Mechanical Properties of (Zr30Hf25Al20Ni10Co10Cu5)99.9Y0.1 Bulk Metallic Glass by Controlled Crystallization: *Fatma Güven*[1]; Yunus Kalay[1]; [1]Middle East Technical University

4:25 PM
Evaluation of Feature Engineering Methods for the Prediction of Sheet Metal Properties by an Artificial Neural Network from Punching Force Curves: *Marcel Goerz*[1]; Adrian Schenek[1]; Mathias Liewald[1]; Kim Riedmüller[1]; [1]Institute for Metal Forming Technology

4:45 PM
Integrated Simulation, Machine Learning, and Experimental Approaches in Small-scale Mechanical Characterization of Materials: *Xing Liu*[1]; Christos Athanasiou[1]; Nitin Padture[1]; Brian Sheldon[1]; Huajian Gao[2]; [1]Brown University; [2]Nanyang Technological University

5:05 PM
Investigation of the Failure Mechanism of a 35CrMo Polycrystalline Diamond Compact Drill Bit: *Xingjie Li*[1]; [1]Sinopec Oilfield Equipment Corporation

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NUCLEAR MATERIALS

Composite Materials for Nuclear Applications II — Graphite/Carbon Composites

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

Committee, TMS: Composite Materials Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Commonwealth Fusion Systems; Peng Xu, Idaho National Laboratory; Johann Riesch, Max-Planck-Insitut Fuer Plasmaphysik

Tuesday PM | March 21, 2023
24B | SDCC

Session Chairs: Dong Liu, University of Bristol; Rick Ubic, Boise State University

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2:30 PM Invited
Nuclear Graphite as a Core Composite Material: *Willliam Windes*[1]; [1]Idaho National Laboratory

3:00 PM
Oxidation Effects on the Microstructure of Nuclear Graphite: *Jose Arregui-Mena*[1]; Phillip Edmondson[1]; James Spicer[2]; Cristian Contescu[1]; Paul Mummery[3]; Lee Margetts[3]; Nidia Gallego[1]; [1]Oak Ridge National Laboratory; [2]Johns Hopkins University; [3]The University of Manchester

3:20 PM
Ruthenium and Silver Diffusion in Nuclear Graphite: *Dina ElGewaily*[1]; Jacob Eapen[1]; [1]North Carolina State University

3:40 PM Invited
Role and Structure of HTGR Matrix Material: *Tyler Gerczak*[1]; Anne Campbell[1]; Grant Helmreich[1]; William Cureton[1]; Elizabeth Sooby[2]; Ryan Latta[3]; Gerald Jellison[1]; John Hunn[1]; [1]Oak Ridge National Laboratory; [2]University of Texas San Antonio; [3]Kairos Power

4:10 PM Break

4:30 PM
Irradiation Effects in the Composite Phases of Graphite and Carbon-Based Materials: *Anne Campbell*[1]; Jose Arregui-Mena[1]; [1]Oak Ridge National Laboratory

4:50 PM
ENHANCED Shield: A Critical Materials Technology Enabling Compact Superconducting Tokamaks: *David Sprouster*[1]; B Cheng[1]; J Trelewicz[1]; G Khose[2]; E Peterson[2]; S Zinkle[3]; Lance Snead[1]; [1]Stony Brook University; [2]Massachusetts Institute of Technology; [3]University of Tennessee Knoxville

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MATERIALS DESIGN

Computational Discovery and Design of Materials — Session IV

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

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha

Vermaak, Lehigh University

Tuesday PM | March 21, 2023
Cobalt 502A | Hilton

Session Chairs: Natasha Vermaak, Lehigh University; Xiaofeng Qian, Texas A&M University

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2:30 PM Invited
Applying Data-driven Models in Materials Science: Unraveling Hidden Relationships between Structures and Properties: *Mingjie Liu*[1]; [1]University of Florida

3:00 PM Invited
Computational Design for Metallic Meso-architected Materials for Dynamics: *H Alicia Kim*[1]; Brianna McNider[1]; Ryan Fancher[1]; Po-Shun Chiu[1]; Jaeyub Hyun[1]; Nicholas Boechler[1]; [1]University of California, San Diego

3:30 PM
Crystal Structure Generation using Wasserstein Generative Adversarial Network: *Zahra Gholami Shiri*[1]; Michael Alverson[1]; Taylor Sparks[1]; Hasan Sayeed[1]; [1]University of Utah

3:50 PM Break

4:10 PM Invited
Atomistic Modeling of Electronic Transport and Electrochemistry: *Yuanyue Liu*[1]; [1]University of Texas at Austin

4:40 PM
Design and Development of High Strength High Conductivity Alloys using ICMD® Approach: *Qiaofu Zhang*[1]; Tom Kozmel[1]; Peter Jacobson[1]; Jiadong Gong[1]; Greg Olson[1]; [1]QuesTek Innovations LLC

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Phase Stability and Diffusion Kinetics

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Tuesday PM | March 21, 2023
26A | SDCC

Session Chairs: Sara Kadkhodaei, University of Illinois Chicago; Frederic Soisson, Cea Saclay

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2:30 PM Invited
A New First Principles Approach for Modeling Diffusion Kinetics in Structurally Unstable Phases: *Sara Kadkhodaei*[1]; Seyyedfaridoddin Fattahpour[1]; [1]University of

Illinois Chicago

3:00 PM
Modeling of Location-Specific Microstructures in Additive Manufacturing of Metallic Alloys by Combining Nonequilibrium Phase-Field and Fast Thermal Models: *Jose Mancias*[1]; Robert Saunders[2]; Damien Tourret[3]; Raymundo Arroyave[1]; [1]Texas A&M University; [2]U.S. Naval Research Laboratory; [3]IMDEA Materials Institute

3:20 PM
Modelling the Kinetics of Phase Transformations with Non-conservative Point Defects: *Frederic Soisson*[1]; [1]CEA Saclay

3:40 PM
Exploring Short-range Order and Phase Stability of CrCoNi Using Machine Learning Potentials: *Sheuly Ghosh*[1]; Vadim Sotskov[2]; Alexander Shapeev[2]; Joerg Neugebauer[1]; Fritz Koermann[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Skolkovo Institute of Science and Technology

4:00 PM Break

4:20 PM Invited
On the Nonlinear Kinetics of Electrodeposition in Metal-Ion Electrodes: *Vahid Attari*[1]; Raymundo Arroyave[1]; [1]Texas A&M University

4:50 PM
Phase-Field Modeling of Iron Oxide Reduction with Hydrogen: *Dierk Raabe*[1]; Yang Bai[1]; Jaber Rezaei Mianroodi[1]; Alisson Kwiatkowski da Silva[1]; Bob Svendsen[1]; Xuyang Zhou[1]; [1]Max-Planck Institute

5:10 PM Invited
Diffusion and Chemo-mechanics of Li-metal Alloys: *Anton Van der Ven*[1]; Sesha Behara[1]; [1]University of California, Santa Barbara

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MATERIALS PROCESSING

Deformation-induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies — Deformation Induced Microstructural Evolution II

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

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign; Suhas Eswarappa Prameela, Massachusetts Institute of Technology; Mostafa Hassani, Cornell University

Tuesday PM | March 21, 2023
29C | SDCC

Session Chair: Mostafa Hassani, Cornell University

2:30 PM Introductory Comments

2:35 PM Invited
Dynamic Recrystallization in Face-centered Cubic Particles during High-velocity Impacts: *Mauricio Ponga*[1]; [1]The University of British Columbia

3:05 PM
Heterogeneous Microstructural Evolution in Cold Sprayed Copper Coatings Using Local Zener-Hollomon Parameter and Strain: *Yu Zou*[1]; [1]University of Toronto

3:25 PM
Effect of Post Deposition Heat Treatment on the Microstructural Evolution and Mechanical Properties of GRCop-42 and HR-1 Cold Spray Deposits: *Bharat Jasthi*[1]; Venkata Kandadai[1]; Terrence Kuca[1]; Marius Ellingsen[2]; Todd Curtis[1]; [1]South Dakota School of Mines & Technology; [2]VRC Metal Systems

3:45 PM
Aging Kinetics in Cold Sprayed AA 7050 Material: *Lorena Perez*[1]; Luke Brewer[1]; [1]University of Alabama

4:05 PM Break

4:20 PM
Recrystallization and Microstructural Evolution in Cold Sprayed SS304L: *Christopher Roper*[1]; Anita Heczel[1]; Ke An[2]; Luke Brewer[1]; [1]University of Alabama; [2]Oak Ridge National Laboratory

4:40 PM
Single Particle Impacts Experiments for Fundamental Understanding of Cold Spray Deposition with Refractory Metals: *Brett Tucker Roper*[1]; Timothy Eastman[2]; Andrew Deal[2]; Luke Brewer[1]; [1]Univerisity Of Alabama Tuscaloosa; [2]Kansas City National Security Campus

5:00 PM
Microparticle Impact Testing at Elevated Temperatures: *Ian Dowding*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

5:20 PM
Process Effects on the Heterogenous Microctructure of an Impact Welded Interface: Anupam Vivek[1]; Brian Thurston[1]; Anil Singh[1]; Manny Gonzalez[2]; *Glenn Daehn*[1]; [1]The Ohio State University; [2]Air Force Research Laboratory

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — 2D Materials and Multilayers

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Tuesday PM | March 21, 2023
Aqua 300AB | Hilton

Session Chairs: Hesam Askari, University of Rochester; Shoeib Chowdhury, University of Rochester

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2:30 PM Invited
Microstructural Evolution of Nanomultilayers with Various Types of Interfaces: *Andrea Hodge*[1]; [1]University of Southern California

3:00 PM
Inter-relationship of Stress and Microstructure in BCC and 'Beta' Tungsten Films: Jonathan Johnson[1]; Tong Su[2]; Eric Chason[3]; *Gregory Thompson*[1]; [1]University of Alabama; [2]Brown University ; [3]Brown University

3:20 PM
High Peak Hardness in Al-Ni Multilayer Thin Films Originate from Intermetallic Interface Contributions: *Nicolas Peter*[1]; Marilaine Moreira de Lima[1]; Xi Li[1]; Ruth Schwaiger[1]; [1]Forschungszentrum Jülich

3:40 PM
Deformation Behavior of the Crystalline/Amorphous Al/Si Nanocomposite Having Nanolaminate and Nano-fiber Morphology: *Bibhu Sahu*[1]; Wenqian Wu[2]; Jian Wang[2]; Amit Misra[1]; [1]University of Michigan; [2]University of Nebraska-Lincoln

4:00 PM Break

4:20 PM
Dislocation Formation and Evolution in Moiré Reconstructed Twisted Bilayer Graphene: *Shoieb Ahmed Chowdhury*[1]; Aditya Dey[1]; Hesam Askari[1]; [1]University of Rochester

4:40 PM
Mechanistic Design of Advanced Hierarchical Ti-Ti_2AlC Metal-MAX Multilayered Nanolaminates: *Skye Supakul*[1]; Krishna Yaddanapudi[2]; Garritt Tucker[3]; Sid Pathak[1]; [1]Iowa State University; [2]University of California, Davis; [3]Colorado School of Mines

5:00 PM
The Effect of Annealing on the Mechanical Behaviors and Failure Mechanisms of Nano Metallic Laminates: Yifan Zhang[1]; *Rodney McCabe*[1]; Jonathan Gigax[1]; Nan Li[1]; Thomas Nizolek[1]; John Carpenter[1]; Matthew Schneider[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

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ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management — Energy Technologies

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

Program Organizers: Shafiq Alam, University of Saskatchewan; Donna Guillen, Idaho National Laboratory; Fiseha Tesfaye, Metso Outotec Finland Oy; Lei Zhang, University of Alaska Fairbanks; Lina Hockaday, Curtin University, WASM; Neale Neelameggham, IND LLC; Hong (Marco) Peng, University of Queensland; Nawshad Haque, Commonwealth Scientific and Industrial Research Organization ; Liu Yan, Northestern University

Tuesday PM | March 21, 2023
33B | SDCC

Session Chairs: Shafiq Alam, University of Saskatchewan; Joseph Hamuyuni, Metso Outotec

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2:30 PM
Investigation of Slag and Condensate from the Charge Top in a FeSi75 Furnace: *Marit Folstad*[1]; Karin Jusnes[2]; Merete Tangstad[1]; [1]Norwegian University of Science and Technology; [2]Finnfjord AS

2:50 PM Invited
Lithium Extraction from Natural Resources to Meet the High Demand in EV and Energy Storage: Valan Namq[1]; *Shafiq Alam*[1]; [1]University of Saskatchewan

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CORROSION

Environmental Degradation of Additively Manufactured Alloys — Environmentally Assisted Cracking (Hydrogen Embrittlement and SCC) / Bio-Corrosion

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

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

Tuesday PM | March 21, 2023
Sapphire 400A | Hilton

Session Chairs: Andrew Hoffman, GE Research, US; Kinga Unocic, ORNL; Sebastien Dryepondt, ORNL

2:30 PM
Combining NanoSIMS and EBSD Analysis to Define Hydrogen Trapping in Additively-manufactured Stainless Steel 316L: *Kaila Bertsch*[1]; P.K. Weber[1]; Shohini Sen-Britain[1]; Thomas Voisin[1]; Chris San Marchi[2]; Brandon Wood[1]; [1]Lawrence Livermore National Laboratory; [2]Sandia National Laboratories

2:50 PM
Stress Corrosion Cracking Growth in Additively Manufactured 316L Stainless Steel: *Ainsley Pinkowitz*[1]; Tressa White[1]; [1]Naval Nuclear Laboratory

3:10 PM
Evaluation of Hydrogen Diffusivity, Uptake, and Trapping in Additively Manufactured 17-4 PH Stainless Steel and Possible Consequences Towards Stress Corrosion Cracking: *Lauren Singer*[1]; Zachary Harris[1]; John Scully[1]; [1]University of Virginia

3:30 PM
Hydrogen Embrittlement of Cathodically Pre-charged Inconel 718 Fabricated via Selective Laser Melting: *Claudia Santos Maldonado*[1]; Alfredo Zafra[1]; Emilio Martinez-Pañeda[1]; Roberto Morana[1]; Minh-Son Pham[1]; [1]Imperial College

3:50 PM
The Effect of Hydrogen Embrittlement on Additively Manufactured IN718 in Dependency of the Delta Phase Volume Fraction: *Andreas Kirchmayer*[1]; Jan-Oliver Hücking[1]; Felfer Peter[1]; Mathias Göken[1]; Steffen Neumeier[1]; [1]Friedrich-Alexander Universität Erlangen-Nürnberg

4:10 PM Break

4:30 PM
Biocorrosion Response of Heterogeneous Microstructure in Laser Additively Deposited CoCrMo: *Sangram Mazumder*[1]; Selvamurugan Palaniappan[1]; Mangesh V. Pantawane[1]; Madhavan Radhakrishnan[1]; Shreyash M. Patil[1]; Narendra Dahotre[1]; [1]University of North Texas

4:50 PM
Biocorrosion Response of Laser Additively Deposited TiNbSn Alloy in Physiological Medium: *Selvamurugan Palaniappan*[1]; Sangram Mazumder[1]; Madhavan Radhakrishnan[1]; Alberto Canales-Cantu[1]; Narendra B. . Dahotre[1]; [1]University of North Texas

5:10 PM
Microstructure and Electrochemical Response of Selective Laser Melted NiTi: *Anurag Srivastava*[1]; Chaudhry Usman[2]; Bilal Mansoor[2]; Chen Zhang[1]; Ibrahim Karaman[1]; Alaa Elwany[1]; [1]Texas A&M University; [2]Texas A&M University at Qatar

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CORROSION

Environmental Degradation of Multiple Principal Component Materials — Aqueous Corrosion and Embrittlement II

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

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; XiaoXiang Yu, Novelis Global Research Center; 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); Gerald Frankel, Ohio State University; ShinYoung Kang, Lawrence Livermore National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Tuesday PM | March 21, 2023
Sapphire 410A | Hilton

Session Chairs: Elizabeth Opila, University of Virginia; Wenjun Cai, Virginia Tech

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2:30 PM
Effect of Niobium Addition on the Passivity and Corrosion Resistance of TiHfZrNbx High-entropy Alloys in a Hanks' Solution: *Ayoub Tanji*[1]; Xuesong Fan[2]; Ridwan Sakidja[3]; Peter K Liaw[2]; Hendra Hermawan[1]; [1]University Laval; [2]university of Tennessee; [3]Missouri State University

2:50 PM Invited
How Alloying Elements Affect Passivation and Dissolution in the NiCrFeCoMn System: New Insights Using Element-resolved Electrochemistry: *Kevin Ogle*[1]; Chenyang Xie[1]; Fan Sun[1]; Junsoo Han[1]; [1]Chimie ParisTech, PSL University

3:10 PM
Hydrogen Diffusion towards Notch Tips in Zirconium Alloys: Alireza Tondro[1]; *Hamidreza Abdolvand*[1]; [1]University of Western Ontario

3:30 PM
Effects of pH on the Corrosion and Tribocorrosion Behavior of Al0.1CrCoFeNi High Entropy Alloys in 0.6 M NaCl Solution: Jia Chen[1]; *Zhengyu Zhang*[2]; Jonathan Poplawsky[3]; Chang-Yu Hung[2]; Wenbo Wang[2]; Yi Yao[4]; Lin Li[4]; Hongliang Xin[2]; Wenjun Cai[2]; [1]Virginia Polytechnic Institute; [2]Virginia Polytechnic Institute and State University; [3]Oak Ridge National Laboratory; [4]University of Alabama

3:50 PM Break

4:05 PM Invited
Passivation and Corrosion Resistance of Compositionally Complex Alloys: Effects of Cr: *John Scully*[1]; Angela Gerard[1]; Samuel Inman[1]; Debashish Sur[1]; Junsoo Han[1];

Elena Romanovskaia[1]; Jie Qi[1]; Mark Wischhusen[1]; Gerald Frankel[2]; Pin Lu[3]; James Saal[3]; SJ Poon[1]; Sean Agnew[1]; Elizabeth Kautz[4]; Daniel Schreiber[4]; Kevin Ogle[5]; [1]University of Virginia; [2]The Ohio State University; [3]QuesTek Innovations LLC; [4]Pacific Northwest National Laboratory; [5]Chimie ParisTech, PSL Research University

4:25 PM
The Hydrogen Charging-induced Surface Degradation on High-entropy Alloys Studied via In-situ Techniques: *Dong Wang*[1]; Xu Lu[1]; Zhiming Li[2]; Roy Johnsen[1]; [1]Norwegian University of Science and Technology; [2]Max-Planck-Institut für Eisenforschung

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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

Tuesday PM | March 21, 2023
Sapphire 410B | Hilton

Session Chairs: Ting Zhu, Georgia Institute of Technology; Xin Pang, Canmetmaterials, Natural Resources Canada

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2:30 PM Invited
Multiscale Modeling of Fatigue Crack Growth and Environmental Effects: *Ting Zhu*[1]; [1]Georgia Institute of Technology

3:00 PM
Atomic Mechanism of Near Threshold Fatigue Crack Growth in Vacuum as a Basis for Understanding Environmental Effects: *Derek Warner*[1]; Mingjie Zhao[1]; Wenjia Gu[1]; [1]Cornell University

3:20 PM
Measuring Crack Tip pH to Elucidate Corrosion Fatigue Susceptibility Differences between Al-Cu-Mg and Al-Zn-Mg-Cu Alloys: *Gabby Montiel*[1]; Jenifer Locke[1]; [1]The Ohio State University

3:40 PM
Advancing the Understanding of the Impact of Atmospheric Environments on Corrosion Fatigue Crack Growth Rates of AA7085-T7451: *Jenifer Locke*[1]; Brandon Free[1]; Mary Cefaratti[1]; Sarah Dorman[1]; [1]Ohio State University

4:00 PM Break

4:20 PM
A Meshless Peridynamics Framework for Physics-based Modeling of Corrosion Crack Dynamics and Fracture: *Srujan Rokkam*[1]; Masoud Behzadinasab[1]; Max Gunzburger[2]; Sachin Shanbhag[2]; Nam Phan[3]; [1]Advanced Cooling Technologies, Inc.; [2]Florida State University; [3]Naval Air Systems Command

4:40 PM
Modelling Environmentally Assisted Cracking (EAC) in Ni-based Superalloys: *Sakina Rehman*

MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Cyclic Plastic Localization, Crack Nucleation, and Propagation I

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

Tuesday PM | March 21, 2023
Sapphire H | Hilton

Session Chair: J.C. Stinville, University of Illinois at Urbana-Champaign

2:30 PM Invited
Strain Localisation in Engineering Alloys – Quantifying Discrete Shear to Improve Understanding of Plasticity and Crack Initiation: *Michael Preuss*[1]; [1]Monash University

2:55 PM
Slip Localization, Slip Transfer at Grain Boundaries and Crack Initiation during Fatigue of Solution-hardened Ni-based Superalloys: Ignacio Escobar-Moreno[1]; *Javier Llorca*[1]; [1]IMDEA Materials Institute & Technical University of Madrid

3:15 PM
Dwell Fatigue Behavior of a Fine-grain Ni-based Superalloy 718 at High Temperature: From Strain Localization to Crack Initiation: *Melanie Bordas-Czaplicki*[1]; Damien Texier[2]; Jonathan Cormier[3]; Patrick Villechaise[3]; Vincent Roué[4]; [1]Ensma - Institut Pprime -Safran Aircraft; [2]Institut Clement Ader (ICA) - UMR CNRS 5312, Université de Toulouse, CNRS, INSA, UPS, Mines Albi, ISAE-SUPAERO; [3]Institut Pprime - ISAE-ENSMA; [4]Safran Aircraft Engines

3:35 PM
Early Stages of Fatigue Crack Initiation in the Cast and Wrought Polycrystalline Nickel-base Superalloy AD730TM: *Julien Prouteau*[1]; Patrick Villechaise[1]; Jonathan Cormier[1]; Loic Signor[1]; [1]Institut Pprime, ISAE ENSMA, CNRS UPR3346

3:55 PM
On the Mechanism of Cyclic Plastic Accumulation in a Polycrystalline Nickel-Based Superalloy.: *Rephayah Black*[1]; Patrick Villechaise[2]; Valéry Vallé[2]; Jean-Charles Stinville[1]; [1]University of Illinois at Urbana-Champaign; [2]Institut PPRIME, Université de Poitiers

4:15 PM Break

4:30 PM Invited
From Slip Activity to Fatigue Crack Nucleation at Basal Twist Grain Boundaries in Titanium Alloys: Cyril Lavogiez[1]; Patrick Villechaise[1]; Jean-Charles Stinville[2]; Fulin Wang[3]; Marie-Agathe Charpagne[2]; Meghan Emigh[3]; Tresa Pollock[3]; Valery Valle[1]; *Samuel Hemery*[4]; [1]Institut Pprime; [2]UIUC; [3]UCSB; [4]Institute Prime - Ensma

4:55 PM
In-site Characterisation of Load Shedding in Macrozones during Dwell Fatigue in Ti-64 Alloy: *Yu Cao*[1]; Yang Liu[1]; Fionn Dunne[1]; [1]Imperial College London

5:15 PM
Role of Microstructural Constituents on Deformation under Monotonic Tensile Strain of Additively Manufactured Ni-Al Bronze: *Veronika Mazanova*[1]; Jean-Charles Stinville[2]; Aeriel Leonard[1]; [1]Ohio State University; [2]University of Illinois Urbana-Champaign

5:35 PM
Fatigue Crack Initiation in Very High Cycle Fatigue of C103: *Madeline Vailhe*[1]; Chris Torbet[1]; Leah Mills[1]; Tresa Pollock[1]; [1]University of California, Santa Barbara

5:55 PM
Crack Nucleation and Propagation in Structural Alloys – Design and Certification Considerations: *Michael Gorelik*[1]; [1]Federal Aviation Administration

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MATERIALS PROCESSING

Friction Stir Welding and Processing XII — FSW of High Melting Temperature Materials

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Tuesday PM | March 21, 2023
29A | SDCC

Session Chairs: Kenneth Ross, Pacific Northwest National Laboratory; Arnold Wright, Bond Technologies

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2:30 PM Invited
Advances in Steel FSW: Stephen Cater[1]; *Jonathan Peter Martin*[1]; [1]TWI

2:50 PM Invited
Assessing Manufacturability of the Oxide Dispersion Strengthened (ODS) 14YWT Alloy Fuel Cladding Tube using SolidStirTM Technology: Shubhrodev Bhowmik[1]; Pranshul Varshney[1]; Osman El Atwani[2]; Stuart Maloy[3]; Kumar Kandasamy[4]; *Nilesh Kumar*[1]; [1]University of Alabama, Tuscaloosa; [2]Los Alamos National Lab; [3]Pacific Northwest National Lab; [4]Enabled Engineering

3:10 PM
Friction Stir Welding of Nickel-based Superalloys: *Mageshwari Komarasamy*[1]; Christopher Smith[1]; Woongjo Choi[1]; Jens Darsell[1]; Glenn Grant[1]; [1]Pacific Northwest National Laboratory

3:30 PM
Friction Stir Welding of Thick Steel Plate by Silicon Nitride Tool: *Yoshiaki Morisada*[1]; Masakazu Mori[2]; Yasushi Hara[3]; Yusuke Katsu[3]; Hidetoshi Fujii[1]; [1]Osaka University; [2]Ryukoku University; [3]NGK Spark Plug Co, LTD

3:50 PM Break

4:10 PM
Friction Stir Welding of Steel with Steel Tool: *Takuya Miura*[1]; Yoshiaki Morisada[1]; Kohsaku Ushioda[1]; Hidetoshi Fujii[1]; [1]Osaka University

4:30 PM
Post-Irradiation Examination of High-dose Ion Irradiated Friction Stir Welding (FSW) MA956 ODS Alloy: *Yu Lu*[1]; Ramprashad Prabhakaran[2]; Yaqiao Wu[1]; Megha Dubey[1]; Lin Shao[3]; [1]Boise State University; [2]Pacific Northwest National Laboratory; [3]Texas A&M University

4:50 PM Invited
Effect of Locally Beta-transformed Area on Fatigue Crack Propagation Resistance in a FSWed Ti-6Al-4V: *Masakazu Okazaki*[1]; Satoshi Hirano[2]; [1]Niigata Institute of Technology; [2]Hitachi Research Lab.

MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — Modeling: From Atomistic to Meso- to Macro-scales

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials Institute

Tuesday PM | March 21, 2023
28E | SDCC

Session Chairs: Alain Karma, Northeastern University; Ingo Steinbach, Ruhr-University Bochum

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2:30 PM Invited
Dealloying of Metals in Molten Salts – From Atomistic to Mesoscale Simulations: Nathan Bieberdorf[1]; Nick Winner[1]; Luke Langford[1]; Andrea Hwang[1]; Raluca Scarlat[1]; Laurent Capolungo[2]; *Mark Asta*[1]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory

3:00 PM Invited
Development of Phase Field Type Theories for Modelling Solidification Across Multiple Length Scales: *Nikolas Provatas*[1]; [1]McGill University

3:30 PM Invited
Molecular Dynamics Simulations of Solid-liquid Interfaces: A Progress Report: *Jeffrey Hoyt*[1]; [1]McMaster University

4:00 PM Break

4:20 PM
Growth and Melting of Crystals: Molecular Dynamics versus Phase Field Modeling: *Peter Galenko*[1]; [1]Friedrich Schiller University Jena

4:40 PM
An Integrated Machine Learning and Phase-field Approach for Accurate Prediction of Dendritic Arm Spacing: Sepideh Kavousi[1]; *Mohsen Asle Zaeem*[1]; [1]Colorado School of Mines

5:00 PM
About the Solidification Path in Multicomponent Alloys: Multiphase-field Simulations versus Gulliver-Scheil: *Markus Apel*[1]; Bernd Böttger[1]; Bei Zhou[1]; [1]Access e.V.

5:20 PM
New Insights in Controlling Freckle Defect Formation Using Magnetic Fields: Xianqiang Fan[1]; Natalia Shevchenko[2]; Catherine Tonry[3]; Samuel Clark[4]; Robert Atwood[5]; Sven Eckert[2]; Koulis Pericleous[3]; Peter Lee[1]; *Andrew Kao*[3]; [1]UCL; [2]HZDR; [3]University of Greenwich; [4]Argonne National Lab; [5]Diamond Light Source

5:40 PM
Modelling of Interface Evolution in Advanced Welding (Mintweld): *Hongbiao Dong*[1]; [1]University of Leicester

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SPECIAL TOPICS

Frontiers of Materials Award Symposium: Ultra-Wide Bandgap Materials and Heterostructures for Next Generation Power, RF and Quantum Applications — Ultra-Wide Bandgap Materials and Heterostructures for Next Generation Power, RF and Quantum Applications

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

Program Organizer: Yuji Zhao, Rice University

Tuesday PM | March 21, 2023
Aqua 309 | Hilton

Session Chair: Yuji Zhao, Rice University

2:30 PM Keynote
Ultrawide Bandgap Materials: Properties, Synthesis and Devices: *Yuji Zhao*[1]; [1]Rice University

2:55 PM Invited
Epitaxial Growth of c-BN on Diamond and Strategies for Electronic Applications: Avani Patel[1]; Saurabh Vishwakarma[1]; Ali Ebadi Yekta[1]; Jesse Brown[1]; David Smith[1]; *Robert Nemanich*[1]; [1]Arizona State University

3:20 PM Invited
Gallium Oxide Semiconductors: Recent Progress and Future Prospective: *Huili Grace Xing*[1]; [1]Cornell University

3:45 PM Invited
Nanoscale Engineering of III-Nitride Heterostructures for High Efficiency UV Optoelectronics and Quantum Photonics: *Zetian Mi*[1]; [1]University of Michigan

4:10 PM Break

4:30 PM Invited
AlN-based Microelectronics for Extreme High Temperature Environments: *Savannah Eisner*[1]; [1]Stanford University

4:55 PM Invited
Quantum Technologies with Diamond: *Shuo Sun*[1]; [1]University of Colorado Boulder

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NANOSTRUCTURED MATERIALS

Functional Nanomaterials 2023 — Session IV

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

Program Organizers: Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Mostafa Bedewy, University of Pittsburgh; Woochul Lee, University of Hawaii at Mnoa; Changhong Cao, McGill University; Kiyo Fujimoto, Idaho National Laboratory; Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

Tuesday PM | March 21, 2023
Aqua 305 | Hilton

Session Chairs: Ying Zhong, University of South Florida; Changhong Cao, McGill University; Michael Cai Wang, University of South Florida

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2:30 PM Keynote
Controlled Epitaxial Growth and Fabrication of Nanostructured Hybrid Halide Perovskites: *Sheng Xu*[1]; [1]University of California, San Diego

3:10 PM Invited
van der Waals Semiconductors and Their Heterostructures for Nanoelectronics: *Joonki Suh*[1]; [1]UNIST

3:40 PM Invited
Extreme Environment Nanocrystalline Soft Magnetic Materials: *Paul Ohodnicki*[1]; Yuankang Wang[1]; Lauren Wewer[1]; Tyler Paplham[1]; Alex Leary[1]; Sam Kernion[1]; Kevin Byerly[1]; [1]University of Pittsburgh

4:10 PM Break

4:30 PM Keynote
3D Printing Active Electronic Devices: *Michael Mcalpine*[1]; [1]University of Minnesota

5:10 PM
Corona Discharge Enabled Electrostatic Printing (CEP) for Ultra-fast Printing and 3D Structure Construction: Zijian Weng[1]; Marcelo Farfan[1]; Parinitha Giridharan[1]; Evan Williams[1]; David Murphy[1]; Long Wang[2]; *Ying Zhong*[1]; [1]University of South Florida; [2]California Polytechnic State University

5:30 PM
Magnetic Robot with Localized Flexibility (MR-LF): *Taylor Greenwood*[1]; Henry Cagle[1]; Benson Pulver[1]; On Shun Pak[2]; Yong Lin Kong[1]; [1]University of Utah; [2]Santa Clara University

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CHARACTERIZATION

Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties — Deformation Mechanisms

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

Mechanical Behavior of Materials Committee

Program Organizers: Yuntian Zhu, City University of Hong Kong; Kei Ameyama, Ritsumeikan University; Irene Beyerlein, University of California, Santa Barbara; Yuri Estrin, Monash University; Huajian Gao, Nanyang Technological University; Ke Lu, Institute of Metal Research; Suveen Mathaudhu, Colorado School of Mines; Xiaolei Wu, State Institute of Mechanics, Chinese Academy of Sciences

Tuesday PM | March 21, 2023
Aqua 314 | Hilton

Session Chairs: Nan Li, Los Alamos National laboratory; Megumi Kawasaki, Oregon State University

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2:30 PM Invited
In Situ Pillar Compression to Understand Dislocation-grain Boundary Interactions in Cu: *Nan Li*[1]; Dongyue Xie[1]; Muh-Jang Chen[2]; Mohammed Zikry[2]; Darby Luscher[1]; Abigail Hunter[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory; [2]North Caroline State University

3:00 PM Invited
Is an Internal Length Gradient (ILG) Extension of Classical Laws Necessary for Understanding Gradient Materials?: *Elias Aifantis*[1]; [1]Aristotle University of Thessaloniki

3:30 PM
Strain-dependent Phase Transformation Mapping of Diffusion-bonded Nanocrystalline Aluminum-magnesium by High-energy Synchrotron X-rays: *Megumi Kawasaki*[1]; Klaus-Dieter Liss[2]; [1]Oregon State University; [2]Guangdong Technion – Israel Institute of Technology

3:50 PM Invited
Significant Bauschinger Effect and Back Stress Strengthening in an Ultrafine Grained Pure Aluminum Fabricated by Severe Plastic Deformation Process: *Nobuhiro Tsuji*[1]; Si Gao[1]; Kota Yoshino[1]; Daisuke Terada[2]; Yoshihisa Kaneko[3]; [1]Kyoto University; [2]Chiba Institute of Technology; [3]Osaka Metropolitan University

4:20 PM Break

4:40 PM Invited
Understanding Interfacial Kinetic Processes during Sintering to Enable Heterostructuring: *Fadi Abdeljawad*[1]; Omar Hussein[1]; Keith Coffman[2]; Eric Lang[3]; Khalid Hattar[3]; Shen Dillon[4]; [1]Clemson University; [2]University of Illinois; [3]Sandia National Laboratories; [4]University of California at Irvine

5:10 PM
Strengthening of 3D Printed Cu Micropillar in Cu-Ni Core-shell Structure: *Manish Jain*[1]; Amit Sharma[2]; Patrik Schürch[3]; Nicolo Maria Della Ventura[2]; Wabe Koelmans[3]; Xavier Maeder[2]; Jakob Schwiedrzik[2]; Johann Michler[2]; [1]University of New South Wales; [2]Empa-Swiss Federal Laboratories for Materials Science and Technology; [3]Exaddon AG

5:30 PM
Strengthening Mechanisms in a Heterostructured and Antimicrobial Stainless Steel: *Liliana Romero Resendiz*[1]; Yuntian Zhu[1]; [1]City University of Hong Kong

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ADVANCED MATERIALS

High Performance Steels — Microstructure Development and Advanced Characterization II

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

Tuesday PM | March 21, 2023
Aqua F | Hilton

Session Chairs: Richard Fonda, Naval Research Laboratory; Benjamin Adam, Oregon State University

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2:30 PM Invited
Advanced Microstructural Characterization of Long-term Thermal Ageing Effects in Ferritic-Martensitic Steels: *David Sprouster*[1]; B Adam[2]; A Koziol[2]; L Rolly[2]; C Huotilainen[3]; J Tucker[2]; [1]Stony Brook University; [2]Oregon State University; [3]TerraPower LLC

3:00 PM
Intercritical Annealing of DP Steels Investigated by In Situ High Energy X-ray Diffraction Experiments: *Clelia Couchet*[1]; Kuan Hong Cheong[1]; Sébastien Allain[1]; Julien Teixeira[1]; Guillaume Geandier[1]; Frédéric Bonnet[2]; [1]Institut Jean Lamour-Ijl (Cnrs Umr 7198); [2]ArcelorMittal Maizières Research

3:20 PM
Improved Toughness of Warm-rolled Medium-Mn Steels Through Nano-sandwich Microstructure: *Mun Sik Jeong*[1]; Jeongho Han[1]; [1]Hanyang University

3:40 PM
Precipitate and Texture Evolution in a Thick-gauge Niobium-microalloyed Line Pipe Steel: Monowar Hossain[1]; Xingshuo Wen[2]; Matthew Enloe[3]; Aaron Litschewski[3]; Murali Manohar[2]; Bertram Ehrhardt[4]; Gregory Thompson[1]; *Nilesh Kumar*[1]; [1]University of Alabama, Tuscaloosa; [2]ArcelorMittal – Global Research and Development; [3]CBMM North America, Inc.; [4]AM/NS Calvert

4:00 PM Break

4:20 PM
Post-partitioning Treatment to Improve Strength-ductility Combination in a Quench and Partitioning Steel: *Berk Soykan*[1]; Jiyun Kang[1]; Narayan Pottore[2]; Hong Zhu[2]; C. Tasan[1]; [1]Massachusetts Institute of Technology; [2]ArcelorMittal - Global Research and Development

4:40 PM
Characterization of Ductility and Microstructure Evolution in HSLA Microalloyed Steel during Continuous Casting: *Alyssa Stubbers*[1]; John Balk[1]; [1]University of Kentucky

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MATERIALS DESIGN

Hume-Rothery Symposium on First-Principles Materials Design — Interface First-principle Method with Machine Learning and Data Mining

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

Program Organizers: Bin Ouyang, Florida State University; Mark Asta, University

of California, Berkeley; Geoffroy Hautier, Dartmouth College; Wei Xiong, University of Pittsburgh; Anton Van der Ven, University of California, Santa Barbara

Tuesday PM | March 21, 2023
Cobalt 501C | Hilton

Session Chair: Maria Chan, Argonne National Laboratory

2:30 PM Invited
Machine Learning Assisted Materials Generation: *Jeffrey Grossman*[1]; [1]MIT

3:00 PM Invited
Advances in Natural Language Processing for Building Datasets in Materials: *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

3:30 PM Invited
Learning Rules for High-throughput Screening of Materials Properties and Functions: Thomas Purcell[1]; *Matthias Scheffler*[1]; [1]The NOMAD Laboratory at the FH of the Max Planck Society and the Humboldt U.

4:00 PM Break

4:20 PM Invited
Available Methods for Predicting Materials Synthesizability Using Computational and Machine Learning Approaches: *Anubhav Jain*[1]; [1]Lawrence Berkeley National Laboratory

4:50 PM Invited
Machine Learning for Simulating Complex Energy Materials with Non-crystalline Structures: *Nong Artrith*[1]; [1]Debye Institute for Nanomaterials Science, Utrecht University

5:20 PM Invited
Probabilistic Approach to Materials Modeling: *Fei Zhou*[1]; [1]Lawrence Livermore National Laboratory

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CORROSION

Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion — Session IV

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

Program Organizers: Penghui Cao, University of California, Irvine; Yang Yang, Pennsylvania State University; Fadi Abdeljawad, Clemson University; Irene Beyerlein, University of California, Santa Barbara; Enrique Lavernia, University of California, Irvine; Robert Ritchie, University of California, Berkeley

Tuesday PM | March 21, 2023
Sapphire 411A | Hilton

Session Chairs: Yang Yang, The Pennsylvania State University; Penghui Cao, University of California, Irvine; Irene Beyerlein, University of California, Santa Barbara

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2:30 PM Invited
Chemical Short-range Order and Passivation of Binary FCC and BCC Single-Phase Alloys: *Karl Sieradzki*[1]; Ian McCue[2]; James Rondinelli[2]; John Cavin[2]; [1]Arizona State University; [2]Northwestern University

3:00 PM Invited
Optimizing Passivation in Multiprincipal Element Alloys through Local Order: *Mitra Taheri*[1]; [1]Johns Hopkins University

3:30 PM Invited
The Role of Short Range Ordering on the Corrosion Behavior of Structural Materials: *John Scully*[1]; Ho Lun Chan[1]; Debashish Sur[1]; Elena Romanovskaia[1]; [1]University of Virginia

4:00 PM Break

4:15 PM Invited
Dynamic Atomic-scale Understanding of the Initial Stages of Cu Oxidation Revealed by Correlated Environmental TEM and Theoretical Simulations: *Judith Yang*[1]; [1]Brookhaven National Laboratory

4:45 PM Invited
Multiscale Irradiation-induced Ordering in Metal Oxides: *Janelle Wharry*[1]; Hui Xiong[2]; Tristan Olsen[2]; Cyrus Koroni[2]; Andy Lau[2]; Dewen Hou[2]; Chao Yang[1]; Caleb Clement[1]; Khalid Hattar[3]; Yongqiang Wang[4]; Wei-Ying Chen[5]; [1]Purdue University; [2]Boise State University; [3]Sandia National Laboratories; [4]Los Alamos National Laboratory; [5]Argonne National Laboratory

5:15 PM Invited
Ordering and Disordering of Helium Bubbles and Precipitates in Materials Studied Using Small Scale Mechanical Testing: *Peter Hosemann*[1]; Mehdi Balooch[1]; Yujun Xie[2]; H. V. Tin[3]; David Frazer[4]; [1]University of California, Berkeley; [2]University of California-Berkeley; [3]Los Alamos National Laboratory; [4]Idaho National Laboratory

5:45 PM Invited
Exploring the Thermal, Mechanical, and Radiation Stability of Refractory High Entropy Alloys via In-situ Electron Microscopy: *Khalid Hattar*[1]; Eric Lang[1]; [1]Sandia National Laboratories

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LIGHT METALS

Magnesium Technology 2023 — Deformation and Advanced Processing

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

Program Organizers: Steven Barela, Terves, Inc; Aeriel Murphy-Leonard, Ohio State University; Petra Maier, University of Applied Sciences Stralsund; Neale Neelameggham, IND LLC; Suveen Mathaudhu, Colorado School of Mines; Victoria Miller, University of Florida

Tuesday PM | March 21, 2023
30C | SDCC

Session Chairs: Domonkos Tolnai, Helmholtz-Zentrum Hereon; Vineet Joshi, Pacific Northwest National Laboratory

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2:30 PM
Barrel Finishing of Magnesium Alloys: Nina Petersen[1]; Björn Wiese[1]; *Norbert Hort*[1]; [1]Helmholtz-Zentrum Hereon

2:50 PM
Influence of Preforging in Extrusion as well as in Equal-channel Angle Extrusion (ECAPEX) on the Properties of Magnesium Rods: *René Nitschke*[1]; Sören Müller[1]; [1]TU Berlin

3:10 PM
Microstructure and Properties of Wrought Mg-Gd-Y-Zn-Zr Alloy (VW94) Alloy: *Joshua Caris*[1]; Janet Meier[2]; Vincent Hammond[3]; Alan Luo[2]; [1]Terves, LLC.; [2]The Ohio State University; [3]US Army Research Laboratory

3:30 PM Invited
Recent Advances in PRISMS-plasticity Software for Simulation of Deformation in Mg Alloys: *Mohammadreza Yaghoobi*[1]; Duncan Greeley[1]; Zhe Chen[1]; Tracy Berman[1]; John E. Allison[1]; Veera Sundararaghavan[1]; [1]University of Michigan

3:50 PM Break

4:05 PM
The Mechanisms to Improve Creep Resistance in a Die-cast MgREMnAl Alloy: Xixi Dong[1]; Lingyun Feng[1]; Eric Nyberg[2]; *Shouxun Ji*[1]; [1]Brunel University London; [2]Kaiser Aluminum

4:25 PM
Solid Phase Processing of Mg-Al-Mn-Ca for High Strength and Ductility: *David Garcia*[1]; Hrishikesh Das[1]; Kumar Sadayappan[2]; Peter Newcombe[2]; Darrel Herling[1]; Glenn Grant[1]; Mageshwari Komarasamy[1]; [1]Pacific Northwest National Laboratory; [2]CANMET - Materials Technology Laboratory

4:45 PM
The Effects of Temperature and Strain Rate on the Tensile Behaviour of Die-cast Magnesium Alloy AE44: Trevor Abbott[1]; *Hua Qian Ang*[2]; Suming Zhu[3]; Mark Easton[2]; [1]Magontec Limited; [2]RMIT University; [3]Monash University

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NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Mechanisms of Corrosion in Molten Salt

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

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

Tuesday PM | March 21, 2023
27A | SDCC

Session Chair: Raluca Scarlat, University of California, Berkeley

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2:30 PM
Ab-initio Molecular Dynamics Examination of Critical Steps for Molten Salt Corrosion of Stainless Steels: Anton Schneider[1]; Lin-Chieh Yu[1]; *Yongfeng Zhang*[1]; [1]University of Wisconsin Madison

2:50 PM
Atomistic Kinetics Monte Carlo Simulations of Molten Salt Corrosion of Ni-Cr Alloys: *Lin-Chieh Yu*[1]; Anton Schneider[1]; Yongfeng Zhang[1]; [1]University of Wisconsin-

Madison

3:10 PM
Solid-Solution Alloying Effects in Molten Chloride Salt Corrosion: Touraj Ghaznavi[1]; Suraj Persaud[2]; *Roger Newman*[1]; [1]University of Toronto; [2]Queen's University

3:30 PM
Corrosion and Dealloying Phenomena of Binary Ni-Cr Alloys in Molten FLiNaK Salts: *Ho Lun Chan*[1]; Elena Romanovskaia[1]; Valentin Romanovski[1]; Minsung Hong[2]; Peter Hosemann[2]; John Scully[1]; [1]University of Virginia; [2]University of California Berkeley

3:50 PM
4D-STEM/EDS Characterization of Molten Salt Corrosion in NiCr Alloy: *Sean Mills*[1]; Ryan Hayes[1]; Steven Zeltmann[1]; Raluca Scarlat[1]; Andrew Minor[1]; [1]University of California-Berkeley

4:10 PM Break

4:25 PM
Understanding the Mechanisms of Corrosion in 316 Stainless Steels and Advanced Ni-based Alloys in Molten FLiNaK at 700oC: William Doniger[1]; Govindarajan Muralidharan[2]; Adrien Couet[1]; *Kumar Sridharan*[1]; [1]University of Wisconsin-Madison; [2]Oak Ridge National Laboratory

4:45 PM
Electrochemical Corrosion Testing in Molten Fluoride (FLiNaK) Salts: *Matthew Lawson*[1]; Drew Glenna[1]; Haiyan Zhao[1]; [1]University of Idaho

5:05 PM
Accelerated Corrosion of Nickel-Chromium by Europium Trifluoride in FLiNaK: *Ryan Hayes*[1]; Sean Mills[1]; Andrew Minor[1]; Raluca Scarlat[1]; [1]University of California Berkeley

5:25 PM
Systematic Corrosion Model for Non-isothermal Molten Salt Loop: *Jinsuo Zhang*[1]; [1]Virginia Polytechnic Institute and State University

5:45 PM
Assessing Environmentally-Assisted Cracking of 316L in Molten FLiNaK: *Xavier Quintana*[1]; Dustin Mangus[1]; Jake Quincey[1]; Julie Tucker[1]; Samuel Briggs[1]; [1]Oregon State University

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MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — Density Functional Theory

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

Tuesday PM | March 21, 2023
Sapphire L | Hilton

Session Chair: Bi-Cheng Zhou, University of Virginia

2:30 PM Invited
Ab Initio Descriptors to Guide Materials Design in High-dimensional Chemical and Structural Configuration Spaces: Fritz Koermann[1]; Tilmann Hickel[1]; *Joerg Neugebauer*[1]; [1]MPI fuer Eisenforschung

3:00 PM Invited
A Solution to the Temperature Evolution of Multi-well Free-energy: *Yi Wang*[1]; Tiannan Yang[1]; Shun-Li Shang[1]; Long-Qing Chen[1]; Zi-Kui Liu[1]; [1]Penn State

3:30 PM Invited
Understanding Interstitial and Substitutional Alloying of Refractory Metals: *Anton Van der Ven*[1]; [1]University of California, Santa Barbara

4:00 PM Break

4:20 PM Invited
Melting Temperature Prediction via Integrated First Principles and Deep Learning: *Qijun Hong*[1]; [1]Arizona State University

4:50 PM Invited
Stability of Transition Metal High Entropy Alloys: From First-principles and Machine Learning: *Ying Chen*[1]; Nguyen-Dung Tran[1]; Chang Liu[2]; Xinming Wang[3]; Jun Ni[3]; [1]Tohoku University; [2]Institute of Statistical Mathematics; [3]Tsinghua University

5:20 PM Invited
A Comprehensive First-principles and Machine Learning Study of Pure Elements and Alloys: From Pure Shear Deformation to Data-driven Insights into Mechanical Properties: *Shun-Li Shang*[1]; Yi Wang[1]; Jingjing Li[1]; Allison Beese[1]; Zi-Kui Liu[1]; [1]Pennsylvania State University

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Modeling

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

Tuesday PM | March 21, 2023
28D | SDCC

Session Chairs: Clarissa Yablinksy, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida

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2:30 PM Invited
A Mesoscale Model of Creep in Monolithic UMo Fuels: *Shenyang Hu*[1]; Benjamin Beeler[2]; [1]Pacific Northwest National Laboratory; [2]North Carolina State University

3:00 PM
Modeling Long-term Radiation Effects on the Concrete Biological Shield: *Amani Cheniour*[1]; Yann Le Pape[1]; Eva Davidson[1]; Mehdi Asgari[1]; Benjamin Spencer[2]; Tara Pandya[1]; Mark Baird[1]; Benjamin Collins[3]; Andrew Godfrey[1]; [1]Oak Ridge National Laboratory; [2]Idaho National Laboratory; [3]University of Texas at Austin

3:20 PM
Robust Constitutive Modeling with Artificial Neural Networks: *Qing-Jie Li*[1]; Mahmut Cinbiz[2]; Yin Zhang[1]; Geoffrey Beausoleil II[2]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]Idaho National Lab

3:40 PM
Liquid Lead Embrittlement: Experiments and Molecular Dynamics Simulations: Alberto Fraile[1]; *Simon Middleburgh*[1]; Nicholas Barron[2]; Paolo Ferroni[3]; Michael Ickes[3]; [1]Nuclear Futures Institute; [2]National Nuclear Laboratory Limited ; [3]Westinghouse Electric Company

4:00 PM Break

4:20 PM
Simulating Irradiation Induced Creep with Coupled Rate Theory and Plasticity Models: *Aaron Kohnert*[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

4:40 PM
Molecular Dynamics Studies of Helium Bubble Effects on Grain Boundary Fracture Vulnerabilities in an Fe70Ni11Cr19-1%H Austenitic Stainless Steel: *Xiaowang Zhou*[1]; Michael Foster[1]; Ryan Sills[1]; [1]Sandia National Laboratories

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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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

Tuesday PM | March 21, 2023
Aqua 310B | Hilton

Session Chairs: Manas Upadhyay, Ecole Polytechnique, LMS, CNRS; Tijmen Vermeij, Eindhoven University Of Technology

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2:30 PM Invited
Directional Hardening in Metals: GND / Bowout Mechanism: *Robert Wagoner*[1]; Stephen Niezgoda[1]; David Fullwood[2]; Guowei Zhou[3]; Ehsan Taghipour[1]; [1]Ohio State University; [2]Brigham Young University; [3]Shanghai Jiao Tong University

3:00 PM Invited
Effect of Macrozone Stereology on Crack Growth Rate Predictions in Ti-6Al-4V: Jaylen James[1]; Reji John[2]; Sushant Jha[3]; Adam Pilchak[4]; Raymundo Arroyave[1]; *Eric Payton*[2]; [1]Texas A&M University; [2]Air Force Research Laboratory; [3]University of

Dayton Research Institute; [4]MRL Materials Resources, LLC

3:30 PM
Explicit Separation of Edge and Screw Dislocation Mobility and Density Evolution Law in BCC Single Crystal Plasticity Model: *Cathy Bing*[1]; Philip Eisenlohr[1]; [1]Michigan State University

3:50 PM
Integrated Experimental-numerical Testing of "2D" Steel Microstructures: *Tijmen Vermeij*[1]; Job Wijnen[1]; Ron Peerlings[1]; Marc Geers[1]; Johan Hoefnagels[1]; [1]Eindhoven University of Technology

4:10 PM Break

4:30 PM Invited
What Happens to a Microstructure after Solidification During Metal Additive Manufacturing? – an Experiment-modeling Synergistic Study: *Manas Upadhyay*[1]; [1]Institut Polytechnique de Paris

5:00 PM Invited
Multiscale Scattering Modeling from Deforming Titanium Alloy Polycrystals: *Darren Pagan*[1]; Kenneth Peterson[1]; Joel Bernier[2]; Jacob Ruff[3]; [1]Pennsylvania State University; [2]Lawrence Livermore National Laboratory; [3]Cornell High Energy Synchrotron Source

5:30 PM
Interfacial Plasticity Mechanism of Hexagonal Dislocation Network in BCC Iron: *Hadi Ghaffarian*[1]; Dongchan Jang[1]; [1]Korea Advanced Institute of Science and Technology

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NUCLEAR MATERIALS

Methods, Techniques, and Materials Discovery of Irradiation Effect Using In-situ Microscopy — Applications of X-ray/Neutron Diffraction and Imaging Techniques

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

Program Organizers: Wei-Ying Chen, Argonne National Laboratory; Xuan Zhang, Argonne National Laboratory; Kevin Field, University of Michigan; Donald Brown, Los Alamos National Laboratory; Aida Amroussia, GE Global Research

Tuesday PM | March 21, 2023
25A | SDCC

Session Chair: Xuan Zhang, Argonne National Laboratory

2:30 PM Invited
Perspectives on Quasi-in-situ Characterization of Nuclear Materials Using Synchrotron X-rays: *Maria Okuniewski*[1]; Alejandro Figueroa Bengoa[1]; Sri Tapaswi Nori[2]; Peter Kenesei[3]; Jun-Sang Park[3]; Jonathan Almer[3]; [1]Purdue University; [2]NOMATEN Centre of Excellence; [3]Argonne National Laboratory

3:00 PM Invited
Revealing 3D Microstructures in Nuclear Materials with High-energy X-rays: *Jonathan Almer*[1]; Peter Kenesei[1]; Jun-Sang Park[1]; Hemant Sharma[1]; Xuan Zhang[1]; Meimei Li[1]; [1]Argonne National Laboratory

3:30 PM
In-situ 3D High-energy X-ray Diffraction Study on Deformation Behavior of Neutron-irradiated Fe-9%Cr: *Dominic Piedmont*[1]; Jun-Sang Park[2]; Peter Kenesei[2]; Jonathon Almer[2]; Matthew Kasemer[3]; Ezra Mengiste[3]; James Stubbins[1]; Meimei Li[2]; Xuan Zhang[2]; [1]University Of Illinois At Urbana-Champaign; [2]Argonne National Laboratory; [3]University of Alabama

3:50 PM Break

4:10 PM Invited
Quantifying the Recovery of Irradiated and Cold-worked Zr-2.5Nb Using X-ray and Neutron Diffraction Line Profile Analysis: *Levente Balogh*[1]; Thalles Lucas[1]; Fei Long[1]; Aaron Barry[2]; Mark Daymond[1]; Donald Brown[3]; [1]Queen's University; [2]Royal Military College of Canada; [3]Los Alamos National Laboratory

4:40 PM
Revealing Heat-treatment Induced Stoichiometric Variations in Neutron-irradiated
Yttrium Hydrides Using In Situ Synchrotron Radiation Diffraction: *Mahmut Cinbiz*[1]; Mehmet Topsakal[2]; Annabelle Le Coq[3]; Kory Linton[3]; [1]INL; [2]Brookhaven National Laboratory; [3]Oak Ridge National Laboratory

5:00 PM
Laboratory-based 3D X-ray Imaging of Neutron-irradiated TRISO Fuel: *Nikolaus Cordes*[1]; Brian Gross[2]; William Chuirazzi[2]; Rahul Kancharla[2]; Fei Xu[2]; Joshua Kane[2]; John Stempien[2]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory

NUCLEAR MATERIALS

Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-cladding Interface — Metallic Fuels

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

Program Organizers: Yi Xie, Purdue University; Miaomiao Jin, Pennsylvania State University; Jason Harp, Oak Ridge National Laboratory; Fabiola Cappia, Idaho National Laboratory; Jennifer Watkins, Idaho National Laboratory; Michael Tonks, University of Florida

Tuesday PM | March 21, 2023
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Session Chair: Joshua White, Los Alamos National Laboratory

2:30 PM Introductory Comments

2:35 PM Invited
The Evolution of the Microstructure of Low-enriched Uranium Fuels During Irradiation in the Advanced Test Reactor: *Dennis Keiser*[1]; Brandon Miller[1]; Jan-Fong Jue[1]; Adam Robinson[1]; Charlyne Smith[1]; [1]Idaho National Laboratory

3:00 PM Invited
Characterization of Crystal Structure Evolution in U-2wt.%Zr Using Neutron Diffraction with Particular Focus on the Beta-Uranium Phase: *Sven Vogel*[1]; Michael Benson[2]; Jason M. Harp[3]; Yi Xie[4]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory; [3]Oak Ridge National Laboratory; [4]Purdue University

3:25 PM Invited
Lower Length Scale Fuel Performance Modeling of U-Mo Fuel: *Benjamin Beeler*[1]; Bei Ye[2]; Zhi-Gang Mei[2]; Yongfeng Zhang[3]; Shenyang Hu[4]; Maria Okuniewski[5]; Sourabh Kadambi[6]; Linu Malakkal[6]; [1]North Carolina State University; [2]Argonne National Laboratory; [3]University of Wisconsin-Madison; [4]Pacific Northwest National Laboratory; [5]Purdue University; [6]Idaho National Laboratory

3:50 PM Break

4:05 PM
Microstructure and Phase Evolutions of U-Zr System in Thermal Cycling Neutron Diffraction Experiments: *Yi Xie*[1]; Sven Vogel[2]; Michael Benson[3]; Jason Harp[4]; [1]Purdue University; [2]Los Alamos National Laboratory; [3]Idaho National Laboratory; [4]Oak Ridge National Laboratory

4:25 PM
The Fabrication, Advanced Characterization, Advanced Test Reactor Irradiation, Post Irradiation Examination, and Materials Informatics for Annular U-10Zr Metallic Fuel: *Tiankai Yao*[1]; Mukesh Bachhav[1]; Fei Xu[1]; Luca Capriotti[1]; Benson Michael[1]; Lingfeng He[1]; Jason Harp[2]; [1]Idaho National Laboratory; [2]Oak Ridge National Laboratory

4:45 PM
Nanoindentation Creep of Metallic Uranium Alloys: Tzu-Yi Chang[1]; Gavin Vandenbroeder[1]; David Frazer[2]; Yushu Dewen[2]; *Tianyi Chen*[1]; [1]Oregon State University; [2]Idaho National Laboratory

5:05 PM
Creep Testing of 70% Theoretical Density U10Zr: *Jake Fay*[1]; Fidelma Di Lemma[2]; Luca Capriotti[3]; Jie Lian[1]; [1]Rensselaer Polytechnic Institute; [2]Idaho National Laboratory ; [3]Idaho National Laboratory

5:25 PM
Characterization of U-10Mo Fuel Exposed to Intermediate Temperature Irradiation Conditions at the High Flux Isotope Reactor: *Peter Doyle*[1]; Jason Harp[1]; Dylan Richardson[1]; Tash Ulrich[1]; Ian Greenquist[1]; Andrew Nelson[1]; Rachel Seibert[1]; Grant Helmreich[1]; Randy Fielding[2]; Caleb Massey[1]; [1]Oak Ridge National Laboratory; [2]Idaho National Laboratory

5:45 PM
Magnetism and Finite Temperature Effects in -UZr2: A Density Functional Theory Analysis: *Shehab Shousha*[1]; Benjamin Beeler[1]; [1]North Carolina State University

6:05 PM
Molecular Dynamics Based Microstructural Evaluation of the Surviving Defects in -U Induced by a Single Displacement Cascade: *Khadija Mahbuba*[1]; Benjamin Beeler[1]; Andrea Jokisaari[1]; [1]North Carolina State University

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NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Ceramics in Extreme Environments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University

of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Tuesday PM | March 21, 2023
Aqua 303 | Hilton

Session Chair: Yue Fan, University of Michigan

2:30 PM Invited
Irradiation Effects in Nanostructured Ceramics: *William Weber*[1]; Chien-Hung Chen[1]; Jagdish Narayan[2]; Yanwen Zhang[3]; [1]University of Tennessee; [2]North Carolina State University; [3]Oak Ridge National Laboratory

2:55 PM Invited
Layering and Interfacial Effects on Radiation Resistance of Covalently-bonded Materials: *Izabela Szlufarska*[1]; [1]University of Wisconsin-Madison

3:20 PM Invited
Design Amorphous Ceramic Composites Through Tailoring Compositions and Heterogeneities: *Jian Wang*[1]; Bingqiang Wei[1]; [1]University of Nebraska-Lincoln

3:45 PM Invited
Defect Transport and Microstructural Evolution in Irradiated Nanocrystalline Oxides: Nachiket Shah[1]; Nathan Madden[2]; Khalid Hattar[2]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign; [2]Sandia National Laboratory

4:10 PM Break

4:30 PM Invited
Enhanced Corrosion Resistance of Nanostructured Pyrochlore and its Mechanistic Understanding: *Jie Lian*[1]; [1]Rensselaer Polytechnic Institute

4:55 PM Invited
Stability and Behavior of MoS2 in Extreme Radiation Environments: Aaron Rabin[1]; Zhihan Hu[2]; Kory Burns[1]; Lin Shao[2]; Khalid Hattar[3]; *Assel Aitkaliyeva*[1]; [1]University of Florida; [2]Texas A&M University; [3]Sandia National Laboratories

5:20 PM Invited
Experimental and Computational Studies of Defect and Microstructure Evolution under Irradiation in Cathode Battery Materials: Muhammad Rahman[1]; Feng Lin[1]; *Xian-Ming Bai*[1]; [1]Virginia Polytechnic Institute and State University

5:45 PM
Microstructural Dependence of Defect Formation in Iron-oxide Thin Films: *Benjamin Derby*[1]; Sean Mills[2]; Sahil Agarwal[3]; James Valdez[1]; J. Baldwin[1]; Matthew Schneider[1]; Andrew Minor[2]; Blas Uberuaga[1]; Farida Selim[3]; Nan Li[1]; [1]Los Alamos National Laboratory; [2]University of California - Berkeley; [3]Bowling Green State University

6:05 PM
Strength, Plasticity and Stability of Dual Phase Ti-SiOC Ceramic Nanocomposites: *Bingqiang Wei*[1]; Kaisheng Ming[2]; Jian Wang[1]; [1]University Of Nebraska-Lincoln; [2]Hebei University of Technology

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CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Techniques, Instrumentation, and Facilities

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

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

Tuesday PM | March 21, 2023
Aqua 311B | Hilton

Session Chair: Jennifer Niedziela, Oak Ridge National Laboratory

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2:30 PM Invited
Neutron Scattering Opportunities for Materials Science at Oak Ridge National Laboratory: *Georg Ehlers*[1]; Kenneth Littrell[1]; [1]Oak Ridge National Laboratory

3:00 PM Invited
In Situ High Pressure Neutron Scattering for Materials Characterization: *Bianca Haberl*[1]; Mary-Ellen Donnelly[1]; Malcolm Guthrie[1]; Garrett Granroth[1]; Reinhard Boehler[1]; [1]Oak Ridge National Laboratory

3:30 PM
Initial Instruments at the Second Target Station: *Leighton Coates*[1]; [1]Oak Ridge National Laboratory

3:50 PM
PIONEER and VERDI, Two Next Generation Neutron Diffractometers for Materials Science at the Second Target Station: *Yaohua Liu*[1]; [1]Oak Ridge National Laboratory

4:10 PM Break

4:25 PM
Operando Neutron Diffraction Reveals Insights into Transient Phases and Residual Stresses during Directed Energy Deposition Additive Manufacturing: *Chris Fancher*[1]; Kyle Saleeby[1]; Ke An[1]; James Haley[1]; Guru Madireddy[1]; Thomas Feldhausen[1]; Yousub Lee[1]; Dunji Yu[1]; Clay Leach[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

4:45 PM
Polychromatic Multiplexing Stress-strain Diffractometer: *Sean Fayfar*[1]; Boris Khaykovich[1]; Theodore Cremer[2]; [1]Massachusetts Institute of Technology; [2]Adelphi Technology

5:05 PM
Coded Apertures for Depth Resolved Diffraction: *Dina Sheyfer*[1]; Doga Gursoy[1]; Wenjun Liu[1]; Jon Tischler[1]; Michael Wojcik[1]; [1]Argonne National Laboratory

5:25 PM
Scalable Rietveld Refinements of Diffraction: *Daniel Savage*[1]; Christopher Biwer[1]; Michael McKerns[1]; Cynthia Bolme[1]; Sven Vogel[1]; [1]Los Alamos National Laboratory

5:45 PM
Evaluation of Boron Carbide's Full Elasticity Tensor via Thermal Diffuse X-ray Scattering: *Arezoo Zare*[1]; B. Wehinger[2]; A. Mirone[2]; D.J. Magagnosc[3]; M.R. He[1]; M. Straker[4]; M. Spencer[4]; T.C. Hufnagel[1]; K.T. Ramesh[1]; [1]Johns Hopkins University; [2]European Synchrotron Radiation Facility; [3]Army Research Laboratory; [4]Morgan State University

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ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Education

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Tuesday PM | March 21, 2023
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Session Chairs: Alexandra Anderson, Gopher Resource; Adamantia Lazou, Norwegian University of Science and Technology

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2:30 PM Invited
Examples of Innovations in Metallurgical Engineering Education and Curriculum Development at the University of Utah: *Michael Free*[1]; [1]University of Utah

3:00 PM Invited
Extractive Metallurgy Education – On the Rim of Extinction or in the Beginning of a New Era: *Merete Tangstad*[1]; [1]Norwegian University of Science and Technology

3:30 PM Invited
Options for Sustaining Metallurgical Engineering Education: Evgueni Jak[1]; Peter Hayes[1]; *Maurits Van Camp*; [1]University of Queensland

4:00 PM Break - Sharing Skills and Best Practices in PYROmetallurgy (SPYRO) - VR Training Demonstration (available during the break): Presenter: *Gaurav Tripathi*, Eramet - This demonstration utilizes Virtual Reality to offer a rare glimpse of a full scale industrial environment in an immersive and interactive manner. This unique training module exposes the learner to the challenges and potential hazards present in a pyrometallurgical plant with an emphasis on safety.

4:20 PM Invited
Art + Engineering at South Dakota Mines: *Brett Carlson*[1]; [1]South Dakota Mines

4:50 PM Invited
Open Innovation in Battery Recycling R&D: *Joseph Grogan*[1]; [1]Gopher Resource

5:20 PM Panel Discussion

NUCLEAR MATERIALS

Phase Stability in Extreme Environments — Hydrogen in Extreme Environments

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Andrew Hoffman, GE Research; Kinga Unocic, Oak Ridge National Laboratory; Janelle Wharry, Purdue University; Kaila Bertsch, Lawrence

Livermore National Laboratory; Raul Rebak, GE Global Research

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Session Chair: Caitlin Taylor, Los Alamos National Laboratory

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2:30 PM Invited
Martensitic Transformations and Shear-band Interactions in Austenitic Stainless Steel: Effects of Hydrogen: *Douglas Medlin*[1]; Julian Sabisch[2]; James Nathaniel[1]; Joshua Sugar[1]; Joseph Ronevich[1]; Christopher San Marchi[1]; [1]Sandia National Laboratories; [2]University of Oklahoma

3:00 PM Invited
Density Functional Study of Short-range Order in Cantor Alloy and Its Effect on Point-defects: *Artur Tamm*[1]; Shinyoung Kang[2]; [1]University of Tartu; [2]Lawrence Livermore National Laboratory

3:30 PM
Phase Stability of Metal Hydrides under Combined Radiation and Thermal Environments: *Caitlin Taylor*[1]; Matheus Tunes[1]; Yongqiang Wang[1]; Matthew Chancey[1]; Tyler Smith[1]; Aditya Shivprasad[1]; Thomas Nizolek[1]; Erik Luther[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

3:50 PM
Revisiting the Atomic Scale Mechanisms of Stress Corrosion Cracking of Fe-based Alloys with State-of-the-Art Microscopy and Computational Modelling: *Arun Devaraj*[1]; Dallin Barton[1]; Tingkun Liu[1]; sten Lambeets[1]; Cheng-han Li[1]; Tanvi Ajantiwalay[1]; Mark Wirth[1]; Daniel Perea[1]; Jinhui Tao[1]; matthew Olszta[1]; Maria Sushko[1]; [1]Pacific Northwest National Laboratory

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ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXII — Reliability of Advanced Electronic Materials

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

Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Chung University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, Bangladesh University of Engineering and Technology (BUET); Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

Tuesday PM | March 21, 2023
Sapphire E | Hilton

Session Chairs: Hiroshi Nishikawa, Osaka University; Chuantong Chen, Osaka University

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2:30 PM Invited
Competitive Degradation Mechanisms and Design Considerations for On-chip Resistor Structures: *Ping-Chuan Wang*[1]; Lina McCary[1]; Rachmadian Wulandana[1]; [1]SUNY New Paltz

2:55 PM Invited
Two Phase Stability Affecting Electromigration Failure Mechanism of Solder Alloys: *Choong-un Kim*[1]; [1]University of Texas at Arlington

3:20 PM
Research on the Mechanism of ENEPIG/Solder Joint Reliability: *Ya-Hui Hsu*[1]; [1]National Central University

3:40 PM
Synchrotron White X-ray Nanodiffraction Study of Tin Whisker Growth Driven by Electric Current: Wan-Zhen Hsieh[1]; Pei-Tzu Lee[1]; *Cheng-Yu Lee*[1]; Cheng-En Ho[1]; [1]Yuan Ze University

4:00 PM Break

4:20 PM
Electric Current Effects upon & ' Cu6Sn5 Intermetallic Compound: *Shubhayan Mukherjee*[1]; Yu-chen Liu[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

4:40 PM
Electromigration-induced Abnormal IMC Volume Expansion in Micro Joints with Au/Pd(P)/Ni(P) Surface Finish: Cheng-Yu Lee[1]; Shun-Cheng Chang[1]; Chih-Tsung Chen[1]; Pei-Tzu Lee[1]; *Cheng-En Ho*[1]; [1]Yuan Ze University

5:00 PM
Solder Joint Properties of Nickel-less Surface Finishes - Direct Electroless Gold (DEG) and Electroless Palladium Immersion Gold (EPIG): *So-Yeon Jun*[1]; Tae-Young Lee[1]; Min-Su Kim[1]; Deok-Gon Han[2]; Tae-Ho Lee[2]; Sehoon Yoo[1]; [1]Korea Institute of Industrial Technology; [2]MK Chem&Tech.

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Shape Memory Alloys

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Tuesday PM | March 21, 2023
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Session Chair: Eric Payton, University of Cincinnati

2:30 PM Invited
Unexpected Mechanical and Functional Behavior in Shape Memory Alloys Beyond Shape Memory and Superelasticity: *Ibrahim Karaman*[1]; [1]Texas A&M University

3:00 PM
Mechanisms of Shock Strength Exhibited by a Nickel-Rich Nickel-Titanium-Hafnium Alloy: *Tyler Knapp*[1]; Aaron Stebner[1]; [1]Georgia Institute of Technology

3:20 PM Invited
Mean-field Approach for High-temperature Shape Memory Alloys: *Jean-Briac le Graverend*[1]; [1]Texas A&M University

3:50 PM Break

4:10 PM
Low-fatigue Ti-based Shape Memory Alloy for Bulk Elastocaloric Material: *Wook Ha Ryu*[1]; Ji Young Kim[1]; Eun Soo Park[1]; [1]RIAM, Seoul National University, South Korea

4:30 PM
Cyclic Degradation of Superelasticity of Fe-Mn-Al-Ni Shape Memory Alloy Studied Complementary In Situ Characterization Techniques: *Robert Lehnert*[1]; Moritz Müller[2]; Malte Vollmer[3]; Philipp Krooß[3]; Thomas Niendorf[3]; Horst Biermann[1]; Anja Weidner[1]; [1]Technische Universität Bergakademie Freiberg; [2]Universität Bergakademie Freiberg; [3]University of Kassel

5:10 PM
Investigating the Effect of L-PBF Process Parameters on 3D Printed Nitinol Part Properties: *Josiah Chekotu*[1]; Dermot Brabazon[1]; [1]Dublin City University

4:50 PM
A New Crystal Plasticity Modeling Framework for Fully Implicit Time Integration of Coupled Phase Transformation and Slip in Shape Memory Alloys: *Rupesh Kumar Mahendran*[1]; Surya Kalidindi[1]; Aaron Stebner[1]; [1]Georgia Institute of Technology

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Sintering

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

Tuesday PM | March 21, 2023
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Session Chairs: Elisa Torresani, San Diego State University; Diletta Giuntini, Eindhoven University of Technology

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2:30 PM Invited
Sintering Mechanism for Polycrystalline Diamond: *Randall German*[1]; [1]San Diego State University

3:00 PM
Gravitation Effects on Sintering: *Elisa Torresani*[1]; Randall German[1]; Eugene Olevsky[1]; [1]San Diego State University

3:20 PM
Minimizing Anisotropy and Cracking During Co-sintering of Layered Ceramics: Examples for Electronics, Energy and Catalysis: *Diletta Giuntini*[1]; [1]Eindhoven University of Technology

3:40 PM
Analytical Models for Initial and Intermediate Stages of Sintering of Stainless Steel Manufactured by Binder Jetting: *Alberto Cabo Rios*[1]; Eugene Olevsky[1]; Eduard Hryha[2]; [1]San Diego State University; [2]Chalmers University

4:00 PM
Multi-scale Modeling of the Electric Field Assisted Sintering Process: *Larry Aagesen*[1]; Stephanie Pitts[1]; Lucas Robinson[2]; R. Garcia[2]; [1]Idaho National Laboratory; [2]Purdue University

4:20 PM Break

4:40 PM Invited
Powder Metallurgy Co Base Superalloys and High Entropy Alloys: Beyond Ni-base Superalloys for High-temperature Applications: *Jose Torralba*[1]; Venkatesh Kumaran[1]; Alexander Mejia-Reinoso[2]; Alberto Meza[3]; Ahad Mohammadzadeh[3]; Dariusz Garbiec[4]; Monica Campos[2]; [1]Universidad Carlos III Madrid-IMDEA Materials Institute; [2]Universidad Carlos III Madrid; [3]IMDEA Materials Institute; [4]Poznan Institute of Technology

5:10 PM
Manufacturing of Porous Tungsten via Place-Holder Spark Plasma Sintering for Nuclear Fusion Applications: *Trevor Marchhart*[1]; Camila Lopez-Perez[1]; Martin Nieto-Perez[1]; Jean Paul Allain[1]; [1]Pennsylvania State University

5:30 PM
A New Hybrid Manufacturing Approach to Diffusion Bond and Functionally Grade Materials Demonstrated Through Titanium Alloys and Nickel-based Superalloys: *Samuel Lister*[1]; Oliver Levano Blanch[1]; Martin Jackson[1]; [1]University of Sheffield

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Session III

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

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

Tuesday PM | March 21, 2023
Sapphire 411B | Hilton

Session Chairs: Yong Lin Kong, University of Utah; Rahul Panat, Carnegie Mellon University; Kai Li, Oak Ridge National Laboratory

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2:30 PM Invited
Reducing Variability Within Printed Electronics Through Process and Material Innovations: *Joseph Andrews*[1]; [1]University of Wisconsin – Madison

2:55 PM
Miniaturizing Direct-write of Porous Graphene Lines by Combining Fiber Laser-induced Carbonization with Photoinitiator Printing: *Soumalya Ghosh*[1]; Moataz Abdulhafez[1]; Mirza Sahaluddin[1]; Mostafa Bedewy[1]; [1]University of Pittsburgh

3:15 PM
Study & Analysis of Ring Assisted Electrohydrodynamic Jet (e-jet) Printing of Micro & Nano Structures: *Savan Suri*[1]; Konstantinos Sierros[1]; [1]West Virginia University

3:35 PM Invited
Unconventional Materials and Device Architectures for Tomorrow's System Needs: *Harish Subbaraman*[1]; [1]Boise State University

4:00 PM Break

4:20 PM
Development of a Metamaterial Honeycomb Structure for Radar Absorbing Materials: *Mariam Mansoori*[1]; Safieh Almahmoud[1]; Daniel Choi[1]; [1]Khalifa University

4:40 PM
Wet Chemical Synthesis of Patterned Bismuth Ferrite Thin Films by Direct Writing (Printing) and Characterization Using Printed Electrodes: *Sanjeev Patil*[1]; Parasuraman Swaminathan[1]; [1]Indian Institute of Technology, Madras

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MATERIALS PROCESSING

Rare Metal Extraction & Processing — Process Development and Optimization

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

Program Organizers: Takanari Ouchi, University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Gisele Azimi, University of Toronto; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Hojong Kim, Pennsylvania State University; Alafara Baba, University of Ilorin; Hong (Marco) Peng, University of Queensland; Athanasios Karamalidis, Pennsylvania State University; Shijie Wang, Coeur Mining, Inc

Tuesday PM | March 21, 2023
30B | SDCC

Session Chairs: Alafara Baba, University of Ilorin; Hong Peng, The University of Queensland

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2:30 PM
Formation Rates of Different Zinc Oxide Crystal Morphologies Associated with the Recycling of Zn-ion Batteries: *Billy Hoogendoorn*[1]; Xiong Xiao[1]; Veerababu Polisetti[1]; Fritjof Nilsson[1]; Kåre Tjus[2]; Kerstin Forsberg[1]; Richard Olsson[1]; [1]KTH Royal Institute of Technology; [2]IVL Swedish Environmental Research Institute

2:50 PM
Production of Micro-sized Metallic Tungsten Particles from Natural Wolframite and Scheelite via Sulfide Chemistry: *Charles Boury*[1]; Sierra Green[1]; Antoine Allanore[1]; [1]Massachusetts Institute of Technology

3:10 PM
Purification of an Indigenous Barite Mineral for Sustainability of Operation in the Nigerian Oil and Gas Industries: *Alafara Baba*[1]; Fausat Akanji[2]; Abdul Ganiyu Alabi[3]; Abdullah Ibrahim[1]; Kuranga Ayinla[1]; Mustapha Raji[1]; Seyi Adeboye[4]; Rasheed Agava[5]; M. Haruna[5]; [1]University of Ilorin; [2]SHEDA Science and Technology Complex; [3]Kwara State University, Malete; [4]National Biotechnology Development Agency; [5]National Agency for Science and Engineering Infrastructure (NASENI)

3:30 PM
Pyrolysis of Waste Printed Circuit Boards: Optimization Using Response Surface Methodology and Characterization of Solid Product: *Kurniawan Kurniawan*[1]; Sookyung Kim[2]; Jae-chun Lee[2]; [1]Korea University of Science and Technology; [2]Korea Institute of Geoscience and Mineral Resources (KIGAM)

3:50 PM
Tantalum Recovery Technique for Recycling of Tantalum Coated Composite Materials: *Akanksha Gupta*[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

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ADVANCED MATERIALS

Refractory Metals 2023 — General Session - Ultimate Plus

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

Program Organizers: Brady Butler, US Army Research Laboratory; Todd Leonhardt, Rhenium Alloys Inc.; Matthew Osborne, Global Advanced Metals; Zachary Levin, Los Alamos National Laboratory

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Sapphire P | Hilton

Session Chair: Brady Butler, US Army Research Laboratory / Texas A&M University

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2:30 PM Introductory Comments

2:35 PM Invited
ULTIMATE: Refractory Metal Alloys for Gas Turbine Applications – A New Age of Ultrahigh Temperature Materials: *Zhigang Fang*[1]; [1]University of Utah

3:00 PM
ULTIMATE: Machine Learning Guided Oxide Dispersion Strengthened Refractory HEA Discovery: *John Sharon*[1]; Ryan Deacon[1]; Soumalya Sarkar[1]; Kenneth Smith[1]; Anthony Ventura[1]; GV Srinivasan[1]; Alexandru Cadar[1]; Michael Gao[2]; [1]Raytheon Technologies Research Center; [2]National Energy Technology Laboratory

3:20 PM
Refractory Alloys for Future Aerospace Applications: *Samuel Kuhr*[1]; Todd Butler[1]; Noah Philips[2]; John Rotella[1]; Donald Weaver[1]; David Mahaffey[1]; [1]Air Force Research Lab; [2]ATI Specialty Alloys and Components

3:40 PM
Study of the Interactions of Niobium with Oxygen from First Principles with Bayesian Uncertainty Quantification: *Colleen Reynolds*[1]; Tresa Pollock[1]; Anton Van der Ven[1]; [1]University of California, Santa Barbara

4:00 PM
Thermal Transport Modeling in Refractory Multi-principal Element Alloys: A High-throughput Density-functional Theory Approach: *Prashant Singh*[1]; Brent Vela[2]; Raymundo Arroyave[2]; Duane D. Johnson[1]; [1]Ames Laboratory; [2]Texas A&M University

4:20 PM Break

4:35 PM Invited
Bcc-Superalloy Nano-structured Tungsten and Refractory High entropy Alloys: *Alexander Knowles*[1]; [1]University of Birmingham

5:05 PM
The Phase, Microstructure and Mechanical Properties of High Entropy Mo-Nb-Ti-V-W-Zr Ultrahigh Temperature Refractory Alloy: *Lavanya Raman*[1]; Marcia Ahn[1]; Arindam Debnath[1]; Shuang Lin[1]; Adnan Eghtesad[1]; Adam Krajewski[1]; Shunli Shang[1]; Wesley Reinhart[1]; Allison Beese[1]; Bed Poudel[1]; Zi-Kui Liu[1]; Wenjie Li[1]; Shashank Priya[1]; [1]Pennsylvania State University

5:25 PM
ULtrahigh TEmperature Refractory Alloys (ULTERA) Database and Data Quality Assurance: *Adam Krajewski*[1]; Arindam Debnath[1]; Shuang Lin[1]; Marcia Ahn[1]; Hui Sun[1]; Allison Beese[1]; Wesley Reinhart[1]; Zi-Kui Liu[1]; [1]The Pennsylvania State University

5:45 PM
Chromium-based bcc-Superalloys Tailored by Iron Addition: *Kan Ma*[1]; Thomas Blackburn[1]; Pedro Ferreirós[1]; Christina Hofer[2]; Paul Bagot[2]; Michael Moody[2]; Tatu Pinomaa[3]; Mathias Galetz[4]; Alexander Knowles[1]; [1]University of Birmingham; [2]University of Oxford; [3]VTT Technical Research Centre of Finland Ltd; [4]DECHEMA-Forschungsinstitut

6:05 PM
Morphological Impacts on the Stress Relaxation and Strain Rate Sensitivity in Tungsten Heavy Alloy (WHA): *Zachary Levin*[1]; Taylor Jacobs[1]; K. T. Hartwig[2]; [1]Los Alamos National Laboratory; [2]Texas A&M University

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LIGHT METALS

Scandium Extraction and Use in Aluminum Alloys — Scandium Containing Aluminum Alloys - Power Transmission and Additive Manufacturing

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

Program Organizers: Timothy Langan, Sunrise Energy Metals; Samuel Wagstaff, Oculatus Consulting; Phil Chataigneau, PDU Consulting; Efthymios Balomenos, Mytilineos S.A., Metallurgy Bu; Thomas Dorin, Deakin University; Muhammad Akbar Rhamdhani, Swinburne University of Technology; Dimitrios Filippou, Rio Tinto Iron & Titanium; Henk van der Laan, V.I.C. Van der Laan International Consultancy BV; Frank Palm, Airbus Defence and Space GmbH

Tuesday PM | March 21, 2023
30D | SDCC

Session Chair: Thomas Dorin, Deakin University

2:30 PM
Effect of Sc, Zr and Other REE on the 1XXX Conductive Aluminium Alloys Properties: Alexander Gradoboev[1]; Dmitry Ryabov[1]; Ruslan Aliev[1]; Viktor Mann[1]; Aleksandr Krokhin[1]; Roman Vakhromov[1]; *Dror Shaked*[1]; [1]Lmti Llc (Uc Rusal)

2:55 PM
Developing Al-Zr-Sc Alloys as High-temperature-resistant Conductors for Electric Overhead Powerline Applications: Quan Shao[1]; Emad Elgallad[1]; Alexandre Maltais[2]; *X.-Grant Chen*[1]; [1]University of Quebec at Chicoutimi; [2]Rio Tinto Aluminum

3:20 PM
The Development of New Aluminum Alloys for the Laser Powder-bed Fusion Process: *Nathan Smith*[1]; Mostafa Yakout[2]; Mohamed Elbestawi[1]; Phil Chataigneau[3]; Peter Cashin[3]; [1]McMaster University; [2]University of Alberta; [3]Imperial Mining Group Ltd.

3:45 PM
Sustainable Scandium Recovery Method from Metallic 3D Printing Powders: *Bengi Yagmurlu*[1]; Carsten Dittrich[2]; [1]TU Clausthal; [2]MEAB Chemie Technik GmbH

4:10 PM Break

4:25 PM
New Scandium Containing Aluminium Welding Wires for Wire + Arc Additive Manufacturing: *Thomas Dorin*[1]; Lu Jiang[1]; Andrew Sales[2]; [1]Deakin University; [2]AML3D Ltd

4:50 PM
Comparative Study of Al-Mg-Ti(-Sc-Zr) Alloys Fabricated by Cold Metal Transfer and Electron Beam Additive Manufacturing: Jiangqi Zhu[1]; Xingchen Yan[2]; Tim Langan[3]; *Jian-Feng Nie*[1]; [1]Monash University; [2]Guangdong Academy of Science; [3]Sunrise Energy Metals

5:15 PM
Dissolution and Development of Al3(Sc,Zr) Dispersoids in 5025 Structures Produced via Wire Arc Additive Manufacturing: Sonja Blickley[1]; *Tori Nizzi*[1]; Anna Palmcook[1]; Austin Schaub[1]; Timothy Langan[2]; Carson Williams[3]; Paul Sanders[1]; [1]Michigan Technological University; [2]Sunrise Energy Metals; [3]Hobart Brothers, LLC

5:40 PM Panel Discussion

NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Actinide Synthesis and Physics

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Tuesday PM | March 21, 2023
28A | SDCC

Session Chairs: Eteri Svanidze, MPI CPfS; Krzysztof Gofryk, Idaho National Laboratory

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2:30 PM Invited
The Quest for Californium(II) and the Importance of Trail Markers from Other Transuranium Elements and Lanthanides: *Thomas Albrecht-Schoenzart*[1]; [1]Colorado School of Mines

3:00 PM Invited
End to End Plutonium Processing at LLNL: *Kiel Holliday*[1]; [1]Lawrence Livermore National Laboratory

3:30 PM
From Mild Hydrothermal to High Temperature Solutions: Crystal Growth of New Uranium and Transuranium Phases: *Hans-Conrad Zur Loye*[1]; Kristen Pace[1]; Travis Deason[1]; Gregory Morrison[1]; Theodore Besmann[1]; Jake Amoroso[2]; David DiPrete[2]; [1]University of South Carolina; [2]Savannah River National Laboratory

3:50 PM
The Path Toward Molecular Beam Epitaxy of Single Crystalline Actinide Materials: *Kevin Vallejo*[1]; Brelon May[1]; Cody Dennett[1]; Paul Simmonds[2]; David Hurley[1]; Krzysztof Gofryk[1]; [1]Idaho National Laboratory; [2]Boise State University

4:10 PM Break

4:30 PM Invited
Enhanced Spin Orbit Coupling in the Actinides: *Peter Riseborough*[1]; [1]Temple University

5:00 PM Invited
Magnetic and Electronic Properties of Actinides Affected by Polar Bonding: *Ladislav Havela*[1]; [1]Charles University

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MATERIALS DESIGN

Thermodynamics and Kinetics of Alloys — Session IV

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

Program Organizers: Ji-Cheng Zhao, University of Maryland; Wei Xiong, University of Pittsburgh; Chuan Zhang, CompuTherm LLC; Shuanglin Chen, CompuTherm LLC

Tuesday PM | March 21, 2023
Sapphire M | Hilton

Session Chairs: Chuan Zhang, CompuTherm, LLC; Giancarlo Trimarchi, Thermo-Calc Software AB

2:30 PM Invited
Improvement of Co-Cr-Ni-Ta Mobility Descriptions: *Kil-Won Moon*[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

2:50 PM Invited
Calculation of Pourbaix Diagrams for Aqueous Corrosion: Kang Wang[1]; *Bi-Cheng Zhou*[1]; [1]University of Virginia

3:10 PM
Thermodynamics and Kinetics of Li-metal Alloys: *Sesha Behara*[1]; Anton Van der Ven[1]; [1]University of California Santa Barbara

3:30 PM
Prediction of the Microstructure and Corrosion Behavior for the $Co_yCr_yFe_yMn_yNi_x$ High-Entropy Alloys by the CALPHAD Method: *Yu-Xuan Ho*[1]; Sin-Yi Chen[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science and Technology

3:50 PM Break

4:10 PM
Calculation of Critical Points: *Shuanglin Chen*; Rainer Schmid-Fetzer[1]; John Morral[2]; [1]Clausthal University of Technology; [2]The Ohio State University

4:30 PM
Symbolic Regression Search for a General Free Energy Function for BCC Alloys: *Luke Wirth*[1]; Snigdhansu Chatterjee[2]; Alexander Urban[3]; Dallas Trinkle[1]; [1]University of Illinois Urbana-Champaign; [2]University of Minnesota; [3]Columbia University

4:50 PM
Interfacial Properties and Crystal Growth of Ni, Ti and $Ni_{50}Al_{50}$ from Molecular Dynamics Simulations: *Roberto Rozas*[1]; Pedro Toledo[2]; [1]University of Bío Bío; [2]University of Concepción

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NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Helium, Tritium and Hydrogen Effects II

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Tuesday PM | March 21, 2023
27B | SDCC

Session Chairs: Jean Henry, CEA-Saclay, University of Paris-Saclay; Arunodaya Bhattacharya, Oak Ridge National Lab

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2:30 PM Keynote
Critical Evaluation of High Temperature Helium Embrittlement Phenomena in Structural Materials: *Steven Zinkle*[1]; Zehui Qi[1]; Arunodaya Bhattacharya[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

3:10 PM
The Effects of High-dose He and H Ion Implantation on the Microstructural Development in EUROFER-ODS Steel: Olga Emelyanova[1]; *Aurelie Gentils*[2]; Katia March[3]; Yuriy Yagodzinskyy[4]; Vladimir Borodin[5]; Pavel Dzhumaev[6]; Pavel Vladimirov[7]; [1]Université Paris-Saclay, CNRS/IN2P3, IJCLab and National Research Nuclear University MEPhI; [2]Université Paris-Saclay, CNRS/IN2P3, IJCLab; [3]Eyring Materials Center, Arizona State University; [4]Aalto University, School of Engineering; [5]National Research Nuclear University MEPhI and NRC "Kurchatov Institute"; [6]National Research Nuclear University MEPhI; [7]Karlsruhe Institute of Technology

3:30 PM Invited
Studies on Transmutation Effects in Reduced Activation Ferritic/Martensitic Steels in Japan: *Hiroyasu Tanigawa*[1]; Yoshiyuki Watanabe[1]; Masami Ando[1]; Dai Hamaguchi[1]; Naoyuki Hashimoto[2]; Shuhei Nogami[3]; Takashi Nozawa[1]; [1]National Institutes for Quantum Science and Technology; [2]Hokkaido University; [3]Tohoku University

4:10 PM Break

4:30 PM Invited
Modeling the Effect of He/dpa Rate on Microstructural Evolution in Ferritic-martensitic Alloys: *Brian Wirth*[1]; [1]University of Tennessee

5:10 PM
Synergistic Effects between Radiation Damage and H/He Co-Injection on Swelling in Candidate Fusion Structural Materials: *Logan Clowers*[1]; Gary Was[1]; Zhijie Jiao[1]; [1]University of Michigan

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ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Modeling & Simulation

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

Wednesday AM | March 22, 2023
Aqua AB | Hilton

Session Chairs: Joshua Young, New Jersey Institute of Technology; Karine Mougin, CNRS - IS2M

8:30 AM Introductory Comments

8:35 AM Invited
A New Experimentally Guided Computational Database for 2D Metal-organic Frameworks: Zeyu Zhang[1]; Dylan Valente[1]; Yuliang Shi[1]; Dil Limbu[1]; *Farnaz Shakib*[1]; [1]New Jersey Institute of Technology

9:00 AM Invited
Carrier Mobility in 2D Semiconductors: Insights and Predictions from First Principles: *Yuanyue Liu*[1]; [1]University of Texas at Austin

9:25 AM Invited
Modeling of Optoelectronic Properties of Charged Defects, Dopants, and Complexes in 2D Materials: *Richard Hennig*[1]; Anne Tan[2]; Biswas Rijal[1]; Christoph Freysoldt[3]; [1]University of Florida; [2]Nanyang Technological University; [3]Max Planck Institut für Eisenforschung

9:50 AM Break

10:05 AM
Modelling and Validation of Multiple Bubbles Dynamics and Their Effect on Liquid Phase Exfoliation of 2D Materials: *Ling Qin*[1]; Jiawei Mi[1]; [1]University of Hull

10:25 AM
Monolayer-like Lattice Dynamics in Bulk WSe2: *Qingan Cai*[1]; Chen Li[1]; Qiyang Sun[1]; Ayman Said[2]; Bin Wei[3]; [1]University of California-Riverside; [2]Argonne National Laboratory ; [3]Henan Polytechnic University

10:45 AM
Phase Field Modeling of Localized Thermal Oxidation of Monolayer WS2: *Maryam Kazemzadeh-Atoufi*[1]; Ye Fan[2]; Ryo Mizuta[2]; Stephan Hofmann[2]; Peter Voorhees[1]; [1]Northwestern University; [2]University of Cambridge

11:05 AM
Theory of the Mechanical Exfoliation of 2D Materials: *Haoye Sun*[1]; Hannah Gramling[1]; Vu Nguyen[1]; Ali Javey[1]; Hayden Taylor[1]; Joel Ager[1]; Daryl Chrzan[1]; [1]University of California

11:25 AM
Tunable Adsorption and Catalysis on Two Dimensional Ferroelectric Materials and Heterostructures: Mo Li[1]; *Joshua Young*[1]; [1]New Jersey Institute of Technology

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LIGHT METALS

60 Years of Taking Aluminum Smelting Research and Development from New Zealand to the World: An LMD Symposium in Honor of Barry J. Welch — Joint Barry Welch Honorary Symposium - Reduction Technology Session- Alumina Feeding, Process Control, Modelling & Industry 4.0

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

Program Organizers: Mark Dorreen, CSIRO; Alan Tomsett, Rio Tinto Pacific Operations; David Wong, Atmolite Consulting Pty Ltd; Linus Perander, Yara International; Barry Sadler, Net Carbon Consulting Pty Ltd; Stephan Broek, Kensington Technology Inc.

Wednesday AM | March 22, 2023
30E | SDCC

Session Chairs: Martin Segatz, Hydro Aluminium Limited; Sylvain Fardeau, Trimet France

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8:30 AM Introductory Comments

8:35 AM
Following Alumina Dissolution Kinetics with Electrochemical and Video Analysis Tools: *Daniel Marinha*[1]; Astrid Meyer[2]; Marían Kucharik[2]; Sylvie Bouvet[1]; Miroslav Boca[3]; Frantisek Simko[3]; Michal Korenko[3]; Vladimir Danielik[3]; [1]Rio Tinto Aluminium; [2]Hydro Aluminium; [3]Slovak Academy of Sciences

9:00 AM
Monitoring Cell Conditions and Anode Freeze Dissolution with Model-based Soft Sensor After Anode Change: Choon-Jie Wong[1]; *Jie Bao*[1]; Maria Skyllas-Kazacos[1]; Ali Jassim[2]; Mohamed Mahmoud[2]; Alexander Arkhipov[2]; [1]University of New South Wales; [2]Emirates Global Aluminium

9:25 AM Invited
EGA's First Holistic Mobile Application for Smelter Operations
: *Ahmed Al Haddad*[1]; [1]Emirates Global Aluminium

9:50 AM Invited
Testing Feeding Alumina in Three Channels in a Wide Cell: *Marc Dupuis*[1]; Valdis Bojarevics[2]; [1]GeniSim Inc.; [2]Greenwich University

10:15 AM Break

10:30 AM
A Pragmatic Model for Bath Temperature Evolution during Alumina Feeding: *Kurian J. Vachaparambil*[1]; Stein Tore Johansen[1]; Asbjørn Solheim[1]; Kristian Etienne Einarsrud[2]; [1]SINTEF; [2]Norwegian University of Science and Technology (NTNU)

10:55 AM
A New Strategy for Transient Heat Transfer Models with Phase Change for the Aluminum Electrolysis Industry: *Bastien Pansiot*[1]; Marc Lebreux[1]; Martin Désilets[1]; Francis Lalancette[1]; Jean-Francois Bilodeau[2]; Alexandre Blais[2]; [1]Université de Sherbrooke; [2]Rio Tinto Alcan

11:20 AM
Development and Deployment Measures in PLC-based Pot Control System at Low Amperage Aluminium Reduction Cell: *Rajeev Yadav*[1]; Shanmukh Rajgire[1]; Md.Imroz Ahmad[2]; Goutam Das[2]; Ravi Pandey[2]; Mahesh Sahoo[2]; Amit Gupta[1]; [1]Aditya Birla Science and Technology Company (P) Ltd; [2]Hindalco Industries Ltd

11:45 AM
A Discussion on Thermal Impact of Anode Change in Aluminum Reduction Cell: Zhibin Zhao[1]; Wei Liu[1]; Yafeng Liu[1]; *Michael Ren*[2]; [1]Shenyang Aluminum and Magnesium Engineering and Research Institute Co. Ltd.; [2]Sunlightmetal Consulting Inc.

12:10 PM Concluding Comments

MATERIALS DESIGN

Accelerated Discovery and Insertion of Next Generation Structural Materials — Accelerated Discovery of Structural Alloys

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

Program Organizers: Soumya Nag, Oak Ridge National Laboratory; Andrew Bobel, General Motors Corporation; Bharat Gwalani, North Carolina State Universtiy; Jonah Klemm-Toole, Colorado School of Mines; Antonio Ramirez, Ohio State University; Matthew Steiner, University of Cincinnati

Wednesday AM | March 22, 2023
Sapphire M | Hilton

Session Chairs: Soumya Nag, ORNL; Bharat Gwalani, PNNL; Antonio Ramirez, Ohio State University

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8:30 AM
Design of a Compact Morphology Cobalt-based Superalloy for Additive Manufacturing: *Krista Biggs*[1]; Brandon Snow[1]; Benjamin Graybill[1]; Christopher Kiehl[1]; Gregory Olson[1]; [1]Massachusetts Institute of Technology

8:50 AM
High-throughput Prediction of Fracture and Brittle to Ductile Transition in Tungsten using Variable Temperature Nanoindentation: *Kevin Schmalbach*[1]; Radhika Laxminarayana[1]; Douglas Stauffer[1]; William Gerberich[2]; Nathan Mara[2]; [1]Bruker Nano; [2]University of Minnesota

9:10 AM
Computational Design of an Ultra-strong High-entropy Alloy: *Mauricio Ponga*[1]; [1]The University of British Columbia

9:30 AM
Computational Design of High Entropy Alloy Hardmetals: *Joshua Berry*[1]; Robert Snell[1]; Magnus Anderson[1]; Olivier Messe[2]; Iain Todd[1]; Katerina Christofidou[1]; [1]University of Sheffield; [2]Oerlikon AM Europe GmbH

9:50 AM
Machine Learning-assisted Discovery of Novel High Temperature Ni-rich NiTiHfZr Multi-component Shape Memory Alloys: *John Broucek*[1]; Daniel Salas[1]; William Trehern[1]; Ibrahim Karaman[1]; [1]Texas A&M University

10:10 AM Break

10:30 AM
Data Efficient Bayesian ICME Workflow for the Design of Targeted Mechanical Properties of Structural Materials: *Anssi Laukkanen*[1]; Tatu Pinomaa[1]; Matti Lindroos[1]; Sicong Ren[1]; Abhishek Biswas[1]; Napat Vajragupta[1]; Tom Andersson[1]; Tomi Suhonen[1]; [1]VTT Technical Research Center of Finland

10:50 AM
Accelerated Discovery of Novel Titanium Alloys using High-throughput Manufacturing, Characterization and Testing: Dian Li[1]; Sydney Fields[1]; *Yufeng Zheng*[1]; [1]University of Nevada-Reno

11:10 AM
A Diffusion Couple Approach to β-Ti Alloy Development: Evaluating the Oxidation Performance of Ti-Fe-X+ Alloys: *Paraic O'Kelly*[1]; Alexander Knowles[1]; [1]University of Birmingham

11:30 AM
Using Machine Intuitive Learning to Predict Advanced Steel Properties: *Krista Limmer*[1]; Andrew Garza[1]; Heather Murdoch[1]; Benjamin Szajewski[1]; Daniel Field[1]; Christopher Rinderspacher[1]; Levi McClenny[1]; Mulugeta Haile[1]; [1]DEVCOM Army Research Laboratory

11:50 AM
Rapid Characterisation of Active Slip Systems in Titanium Ordered-bcc Compounds using an Algorithm for Automated Indentation Slip Trace Analysis.: *Vincent Gagneur*[1]; Alexander Knowles[1]; [1]University of Birmingham

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Structural Materials

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

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas, Sandia National Laboratories; Iver Anderson, Iowa State University Ames Laboratory

Wednesday AM | March 22, 2023
23C | SDCC

Session Chair: Iver Anderson, Iowa State University Ames Laboratory

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8:30 AM Invited
Functional and Structural Materials Enabled by Advanced Manufacturing: *Ryan Ott*[1]; Emrah Simsek[1]; Rakesh Chaudhary[1]; Seungjin Nam[1]; Jun Cui[1]; Matthew Kramer[1]; [1]Ames National Laboratory

9:00 AM
Development of Metallic Matrix Composites and Powders for Metal Additive Manufacturing (MAM) Technologies: James Rosero-Romo[1]; Paula G. Saiz[1]; *Daniel Salazar*[1]; [1]BCMaterials, Basque Center for Materials, Applications and Nanostructures

9:20 AM
Microstructure Evolution and Mechanical Behavior of Ni-NiAl Functionally Integrated Materials (FIMs) Processed via Directed Energy Deposition (DED): *Xin Wang*[1]; Baolong Zheng[1]; Benjamin MacDonald[1]; Calvin Belcher[1]; Penghui Cao[1]; Lorenzo Valdevit[1]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California, Irvine

9:40 AM
Effect of Wire Directed Laser Energy Deposition Parameters and Heat Treatment on the Microstructure and Mechanical Properties of NAB C95800: Ryan Doyle[1]; *Somayeh Pasebani*[1]; Jakub Preis[1]; [1]Oregon State University

10:00 AM Break

10:15 AM
Fatigue Behavior of Additively Manufactured Haynes 230 at Room and Elevated Temperatures: *Muztahid Muhammad*[1]; Rukesh Gusain[1]; Reza Ghiaasiaan[1]; Paul Gradl[2]; Shuai Shao[1]; Nima Shamsaei[1]; [1]Auburn University; [2]NASA Marshall Space Flight Center

10:35 AM
On Enhancing the Mechanical Properties of DED Fabricated Ti–6Al–4V by Boron Addition and In-situ Reheating: *Kavindu Wijesinghe*[1]; Ajit Achuthan[1]; [1]Clarkson University

10:55 AM
Ceramic Reinforced Graded Metal Matrix Composites Using Directed Energy Deposition: *Alberto Canales Cantu*[1]; Shashank Sharma[1]; Yuqi Jin[1]; Sameehan Joshi[1]; Narendra Dahotre[1]; [1]University of North Texas

11:15 AM
Hollow-Strut Metal Lattices by Laser Powder Bed Fusion: *Jordan Noronha*[1]; Ma Qian[1]; Martin Leary[1]; Milan Brandt[1]; Elizabeth Kyriakou[1]; [1]Royal Melbourne Institute of Technology

11:35 AM
Friction Stir Additive Manufacturing Bulk Metal Matrix Composites: Andrew Yob[1]; Shiqin Yan[1]; Michael Kellam[1]; David Renshaw[1]; Ling Chen[1]; Michel Givord[1]; Daniel Liang[1]; *Robert Wilson*[1]; [1]CSIRO

11:55 AM Invited
Additive Manufacturing of Soft and NdFeB Bonded Permanent Magnets: Prospects and Challenges: *Mariappan Paranthaman*[1]; [1]Oak Ridge National Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session IV

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

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

Session Chair: John Lewandowski, Case Western Reserve University

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8:30 AM Invited
Fatigue Crack Initiation in Additively Manufactured Alloys: Synergistic Effect of Microstructure and Volumetric Defects: *Shuai Shao*[1]; Nima Shamsaei[1]; [1]Auburn University

9:00 AM
Fatigue Crack Propagation in Additively Manufactured Titanium Alloy with Lamellar and Bi-lamellar Microstructures: *Zhiying Liu*[1]; Yu Zou[1]; [1]University of Toronto

9:20 AM
Hot Isostatic Pressing to Increase Isotropic Behavior of Wire DED Ti-6Al-4V: *LaRico Treadwell*[1]; Jonathan Pegues[1]; Shaun Whetten[1]; Tyler Chilson[1]; [1]Sandia National Laboratories

9:40 AM
Characterizing Surface Roughness and Linking to Process Parameters in Powder Bed Fusion AM: *Srujana Rao Yarasi*[1]; Elizabeth Holm[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM Invited
Predicting Microstructure-sensitive Fracture Behavior in AM IN625 Using a Damage-enabled Elasto-viscoplastic FFT Framework: *Ashley Spear*[1]; Carter Cocke[1]; Brian Phung[1]; Laura Ziegler[1]; Elliott Marsden[1]; Vignesh Babu Rao[1]; [1]University of Utah

10:50 AM
Predicting the Influence of Inherent Pores on Mechanical Properties of Additive-Manufactured Ti6Al4V via an Empirical Model: *Mu Gao*[1]; [1]Monash Centre of Additive Manufacturing

11:10 AM
Microstructural Origin of Fatigue Resistance in Additively Manufactured Steels: *Punit Kumar*[1]; Jayaraj Radhakrishnan[2]; Alexis Bryl[3]; James McKinnell[3]; Upadrasta Ramamurty[2]; [1]Lawrence Berkeley National Laboratory; [2]Nanyang Technological University; [3]HP Inc.

11:30 AM Invited
Rapid Qualification of Additively Manufactured Fatigue-Limited Applications via Hybrid Experimental/Model Approach: *Amber Andreaco*[1]; Krzysztof Stopka[2]; Andrew Desrosiers[1]; Tyler Nicodemus[1]; Nicholas Krutz[3]; Michael Sangid[2]; [1]GE Additive; [2]Purdue University; [3]Timet

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ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications V — Characterization

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

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

Oak Ridge National Laboratory; Yi Xie, Purdue University

Wednesday AM | March 22, 2023
23A | SDCC

Session Chair: Subhashish Meher, INL

8:30 AM Introductory Comments

8:35 AM Invited
High-throughput Testing and Characterization of Materials for Nuclear Applications: Gregory Wallace[1]; Myles Stapelberg[1]; Elena Botica Artalejo[1]; Eleni Mowery[1]; Isabel Alvarez[1]; Alexander Siemenn[1]; James George Serdy[1]; Tonio Buonassisi[1]; *Michael Short*[1]; [1]Massachusetts Institute of Technology

9:10 AM Invited
Directional Recrystallization of an Additively Manufactured Ni-base Superalloy: *Zachary Cordero*[1]; [1]Massachusetts Institute of Technology

9:45 AM
Microstructural Evolution of Solid State and Liquid State Advanced Manufacturing Processes for 316L Stainless Steel.: *Isabella Van Rooyen*[1]; Saumyadeep Jana[1]; Scott Whalen[1]; Luis Nunez[2]; Piyush Sabharwall[2]; Kennneth Ross[1]; Amrita Lall[2]; [1]Pacific Northwest National Laboratory; [2]Idaho National Laboratory

10:05 AM Break

10:20 AM
Characterization of LPBF and DED Additive-manufactured RAFM/Tungsten Bi-layered Specimens for Nuclear Fusion Applications: Natan Garrivier[1]; *Malgorzata Makowska*[1]; [1]Paul Scherrer Institute

10:40 AM
Compositionally Graded Transition from Tungsten to Ferritic-Martensitic Steels via Directed Energy Deposition: *Deniz Ebeperi*[1]; Adam Bebak[1]; Raiyan Seede[1]; Austin Whitt[1]; Ibrahim Karaman[1]; Raymundo Arroyave[1]; Alaa Elwany[2]; [1]Texas A&M University Department of Materials Science and Engineering; [2]Texas A&M University Department of Industrial & Systems Engineering

11:00 AM
Investigation into the Effect of Recrystallization and Microstructure Control on the Properties of GammaPrint™-1100, a High-γ' crack-resistant Ni-base Superalloy for 3D-printed Parts in Gas Turbines: *Ning Zhou*[1]; Stephane Forsik[1]; Austin Dicus[1]; Tao Wang[1]; Gian Colombo[1]; QQ Ren[2]; Jonathan Poplawsky[2]; Mario Epler[1]; [1]Carpenter Technology Corporation; [2]Oak Ridge National Laboratory

11:20 AM
Laser Powder Bed Fusion of Crack-Free High Gamma Prime Rene 77 Superalloy: Processing, Heat Treatment, Mechanical Properties and Applications: *Marcus Lam*[1]; [1]Monash University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Aluminum and Titanium Alloys/In-situ Monitoring

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

Program Organizers: Sougata Roy, University of North Dakota; Sneha Prabha

Narra, Carnegie Mellon University; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh; Yashwanth Bandari, AddiTec Technologies LLC

Wednesday AM | March 22, 2023
25A | SDCC

Session Chair: Albert To, University of Pittsburgh

8:30 AM
Augmenting Operando Neutron Diffraction Measurement of WAAM with Multispectral Thermal Imaging: *James Haley*[1]; Kyle Saleeby[1]; Clay Leach[1]; Christopher Fancher[1]; Thomas Feldhausen[1]; Guru Madireddy[1]; Yousub Lee[1]; An Ke[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

8:50 AM
Understanding Stress Evloution in Wire Arc Additive Manufacturing of LTT Alloy Using Finite Element Methods: *Guru Charan Reddy Madireddy*[1]; Yousub Lee[1]; Kyle Saleeby[1]; James Haley[1]; Christopher Fancher[1]; Ke An[1]; Wei Tang[1]; Thomas Feldhausen[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

9:10 AM
High Deposition Rate Wire Arc Additive Manufacturing of "Unweldable" Precipitation Hardened Aluminum Alloys: *Joe Kleindienst*[1]; Alex Yearsley[1]; Nick Bagshaw[2]; Jeff Lints[2]; Jeremy Iten[3]; Xun Liu[4]; Dennis Harwig[4]; Zhenzhen Yu[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines; [2]Fortius Metals; [3]Elementum 3D; [4]The Ohio State University

9:30 AM Invited
Ultrasonic Effects on Gas Tungsten Arc Based Wire Additive Manufacturing of Aluminum Nanocomposite: *Xun Liu*[1]; Tianzhao Wang[1]; [1]Ohio State University

10:00 AM Break

10:20 AM Invited
In-Situ Monitoring and Control for Large-Scale Metal AM: *Melanie Lang*[1]; Jeffrey Riemann[1]; [1]Formalloy

10:50 AM
Rapid Process Qualification for W-DED Ti-6Al-4V: *Jonathan Pegues*[1]; Brian Hoover[2]; Timothy Ruggles[1]; Luis Jauregui[1]; Shaun Whetten[1]; Andrew Kustas[1]; [1]Sandia National Laboratories; [2]Advanced Optical Technologies, Inc.

11:10 AM Invited
Thermal Model of Hot-wire Additive Manufacturing of Ti-6Al-4V: Lonnie Smith[1]; Andrew Huck[1]; *Petrus Pistorius*[1]; [1]Carnegie Mellon University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — In-situ Monitoring and Sensing

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi

Chen, University of Wisconsin-Madison

Wednesday AM | March 22, 2023
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Session Chairs: Lianyi Chen, University of Wisconsin-Madison; Wenda Tan, University of Michigan

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8:30 AM
Rapid Characterization of Solidification Phase Transition of Additive Aluminum Alloy: *Fan Zhang*[1]; Andrew Iams[1]; Feng Yi[1]; David LaVan[1]; Jordan Weaver[1]; Brandon Lane[1]; Qilin Guo[2]; Jiandong Yuan[2]; Lianyi Chen[2]; Andrew Chuang[3]; Darby LaPlant[4]; John Martin[4]; [1]National Institute of Standards and Technology; [2]University of Wisconsin, Madison; [3]Argonne National Laboratory; [4]HRL Laboratory

8:50 AM
Pore Dynamics and Formation Mechanisms during Directed Energy Deposition Additive Manufacturing: *Kai Zhang*[1]; Yunhui Chen[1]; Xianqiang Fan[1]; Sebastian Marussi[1]; Imogen Cowley[1]; Maureen Fitzpatrick[2]; Shishira Bhagavath[1]; Martyn Jones[3]; Chu Lun Alex Leung[1]; Peter Lee[1]; [1]University College London; [2]European Synchrotron Radiation Facility; [3]Rolls Royce plc.

9:10 AM
In-situ X-ray Characterization for Additive Manufacturing of Inoculants-treated Aluminum Alloy: *Sen Liu*[1]; Vivek Thampy[2]; Peiyu Quan[1]; Christopher Tassone[2]; [1]Stanford University; [2]SLAC National Accelerator Laboratory

9:30 AM
In-situ/Ex-situ Visualization of Microstructure Evolution in Aluminum Alloys under Additive Manufacturing Conditions: *Oliver Hesmondhalgh*[1]; Alec Saville[1]; Brian Rodgers[1]; Adriana Eres Castellanos[1]; Joseph McKeown[2]; Kester Clarke[1]; Alain Karma[3]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Lawrence Livermore National Laboratory; [3]Northeastern University

9:50 AM Break

10:05 AM Invited
Phase Transformation Dynamics in Laser Additive Manufacturing of Metals: *Lianghua Xiong*[1]; Wenjun Liu[2]; Yang Ren[3]; Peter Kenesei[2]; Chris Benmore[2]; John Low[2]; Anping Dong[1]; Baode Sun[1]; Andrew Chuang[2]; [1]Shanghai Jiao Tong University; [2]Argonne National Laboratory; [3]City University of Hong Kong

10:25 AM
Operando Synchrotron X-ray Diffraction Reveals Stages of Directional Solidification in Additive Manufacturing: *Adrita Dass*[1]; Chenxi Tian[1]; Darren Pagan[2]; Atieh Moridi[1]; [1]Cornell University; [2]Pennsylvania State University

10:45 AM
Automatic Melt Pool Segmentation and Tracking in the X-ray Image Sequence: Maede Maftouni[1]; *Bo Shen*[1]; Andrew Law[1]; Rongxuan Wang[1]; Zhenyu Kong[1]; [1]Virginia Tech

11:05 AM
Solidification Modes during Additive Manufacturing Thermal Conditions Revealed by High-speed X-ray Diffraction: *Hans-Henrik Konig*[1]; Niklas Holländer Pettersson[1]; A Durga[1]; Steven Van Petegem[2]; Daniel Grolimund[2]; Andrew Chihpin Chuang[3]; Qilin Guo[4]; Lianyi Chen[4]; Christos Oikonomou[5]; Fan Zhang[5]; Greta Lindwall[1]; [1]KTH Royal Institute of Technology; [2]Paul Scherrer Institute; [3]Argonne National Laboratory; [4]University of Wisconsin-Madison; [5]Uddeholm AB

11:25 AM
Operando Tomography during Laser-based Powder Bed Fusion - Towards 4D Imaging of Melt Pool Dynamics: *Malgorzata Makowska*[1]; [1]Paul Scherrer Institut

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of W-based Alloys

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

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Omar Mireles, NASA; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Matthew Osborne, Global Advanced Metals; Joao Oliveira, FCT-UNL

Wednesday AM | March 22, 2023
24A | SDCC

Session Chairs: Antonio Ramirez, The Ohio State University; Omar Mireles , NASA MFSC - EM32

8:30 AM
Rhenium Modified Spherical Tungsten Powder for Additive Manufacturing: *Adriana Wrona*[1]; Marcin Lis[1]; Krzysztof Pęcak[1]; Anna Janoszka[1]; Adam Sekua[1]; Monika Czerny[1]; Jacek Mazur[1]; Adrian Kukofka[1]; [1]Lukasiewicz Research Network — Institute of Non-Ferrous Metals

8:50 AM
Crack Mitigation Strategies for Pure Tungsten via Laser Powder-bed-fusion: *Alberico Talignani*[1]; Shiqi Zheng[1]; Philip DePond[2]; Maria Strantza[2]; Jianchao Ye[2]; Y. Morris Wang[1]; [1]University of California, Los Angeles; [2]Lawrence Livermore National Laboratory

9:10 AM
Development of W-based Alloys for High Temperature Applications by Additive Manufacturing: *Ishtiaq Ahmed Fazle Rabbi*[1]; Narendra Dahotre[1]; [1]University of North Texas

9:30 AM
ICME Analysis Microcracking of Tungsten in Rapid Solidification: *Tatu Pinomaa*[1]; Jukka Aho[1]; Matias Haapalehto[1]; Joni Kaipainen[1]; Sicong Ren[1]; Paul Jreidini[2]; Joseph McKeown[3]; Jesper Byggmästar[4]; Kai Nordlund[4]; Nikolas Provatas[2]; Anssi Laukkanen[1]; [1]VTT Technical Research Centre of Finland Ltd; [2]McGill University; [3]Lawrence Livermore National Laboratory; [4]University of Helsinki

9:50 AM Break

10:10 AM
Materials and Processing Design for Binder Jet Additive Manufacturing of Tungsten Alloys: *Daozheng Li*[1]; Wei Xiong[1]; [1]University of Pittsburgh

10:30 AM
Processing, Structure, and Properties of Electron Beam Melting Additively Manufactured Pure Tungsten: *Christopher Ledford*[1]; Patxi Fernandez-Zelaia[1]; Tim Graening[1]; Yutai Kato[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

10:50 AM
Investigating AM High Temperature Multi-materials with Nickel and Niobium Alloys: *Soumya Nag*[1]; Brian Jordan[1]; Ke An[1]; Chuan Zhang[2]; Fan Zhang[2]; Raymond Unocic[1]; Jonathan Poplawsky[1]; Jaimie Tiley[1]; [1]Oak Ridge National Laboratory; [2]Computherm LLC

ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Modeling

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

Wednesday AM | March 22, 2023
23B | SDCC

Session Chairs: Andrew Birnbaum, NRL; Sezer Özerinç, Middle East Technical University

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8:30 AM
Analytic Model for the Softening Factor within Stages of Work Hardening: *Alan Jankowski*[1]; [1]Sandia National Laboratories

8:50 AM
Machine Learning of Inherent Strains for Residual Stress Modeling in Metal Additive Manufacturing: *Kahraman Demir*[1]; Zhizhou Zhang[1]; Grace Gu[1]; [1]University of California Berkeley

9:10 AM
A Mixed Analytical/Empirical Model for Synthetic Generation of As-Printed Microstructures: *Alexander Chadwick*[1]; Peter Voorhees[1]; [1]Northwestern University

9:30 AM
Mesostructure-Based Model for Failure in Ti-6Al-4V Printed by Laser Powder-Bed Fusion: Kartikey Joshi[1]; Patcharapit Promoppatum[2]; *Mark Jhon*[1]; [1]Institute of High Performance Computing; [2]King Mongkut's University of Technology Thonburi

9:50 AM Break

10:10 AM
Crystal Plasticity Study on Porosity and Anisotropic Fracture Behavior of Additively-manufactured 316L Stainless Steel: *Ziyi Ding*[1]; Jun Song[1]; [1]McGill University

10:30 AM
Microscale Modeling of Solidification and Residual Stress in As-Built Additively Manufactured Parts: *Lukasz Kuna*[1]; Kirubel Teferra[1]; [1]Naval Research Lab

10:50 AM
Slip Localization in an Additively Manufactured 316L Stainless Steel: *Christopher Bean*[1]; Fulin Wang[2]; Marie Charpagne[1]; Patrick Villechaise[3]; Valery Valle[3]; Sean Agnew[4]; Dan Gianola[5]; Tresa Pollock[5]; Jean-Charles Stinville[1]; [1]University of Illinois Urbana-Champaign; [2]Shanghai Jiao Tong University; [3]École nationale supérieure de mécanique et d'aérotechnique; [4]University of Virginia; [5]University of California Santa Barbara

11:10 AM
Hierarchical Investigations of Heterogeneities in an As-fabricated Electron Beam Melted Ni-based Superalloy: *Bryan Lim*[1]; Andrew Breen[1]; Xiaozhou Liao[1]; Sophie Primig[2]; Simon Ringer[1]; [1]The University of Sydney; [2]University of New South Wales

11:30 AM
Additive Manufacturing of Platinum-based Alloys for Industrial High Temperature Structural Applications: *Parastoo Jamshidi*[1]; Biao Cai[2]; Moataz Attallah[2]; Selassie Dorvlo[3]; Ian Campbell[3]; Martin Bach[3]; [1]University of Birmingham; Cooksongold; [2]University of Birmingham; [3]Cooksongold

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — Ferous 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 Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

Wednesday AM | March 22, 2023
24C | SDCC

Session Chair: Atieh Moridi, Cornell University

8:30 AM
Effect of Carbon Content on the Microstructure and Mechanical Properties of Steels Additively Manufactured by Laser Powder Bed Fusion: *Thinh Hyunh*[1]; Nemanja Kljestan[2]; Abhishek Mehta[1]; Kevin Graydon[1]; Marko Knezevic[2]; Brandon McWilliams[3]; Kyu Cho[3]; Yongho Sohn[1]; [1]University of Central Florida; [2]University of New Hampshire; [3]DEVCOM Army Research Laboratory

8:50 AM
Ultra-High Strength and Ductility in a Lightweight Fe-Mn-Al-C Austenitic Steel Fabricated via Laser Powder Bed Fusion: *Raiyan Seede*[1]; Jiahui Ye[2]; Austin Whitt[3]; Sean Gibbons[4]; Philip Flater[4]; Bernard Gaskey[4]; Alaa Elwany[2]; Raymundo Arroyave[2]; Ibrahim Karaman[2]; [1]Lawrence Livermore National Laboratory; [2]Texas A&M University; [3]NASA Glenn Research Center; [4]Air Force Research Laboratory

9:10 AM
Manufacturing of MS1-P20 Hybrid Steels via Laser Powder Bed Fusion: Sajad Shakerin[1]; *Mohsen Mohammadi*[1]; [1]Marine Additive Manufacturing Centre of Excellence (MAMCE)

9:30 AM
Unique Microstructure and Phase Transformation Pathway in an Additively Manufactured 316L-ceramic Composite: *Mo-Rigen He*[1]; Joesph Sopcisak[2]; Christopher Marvel[3]; Samuel Price[4]; Ian McCue[4]; Jason Trelewicz[5]; Steven Storck[2]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]Johns Hopkins University Applied Physics Laboratory; [3]Lehigh University; [4]Northwestern University; [5]Stony Brook University

9:50 AM
The Development of a Directed Energy Deposition (DED) Printability Framework for Improving Part Density and Performance in High Strength Martensitic Steels: *Matthew Vaughan*[1]; Michael Elverud[1]; Jiahui Ye[1]; Raiyan Seede[1]; Sean Gibbons[2]; Philip Flater[2]; Bernard Gaskey[2]; Alaa Elwany[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University; [2]AFRL-EGLIN

10:10 AM Break

10:25 AM
Design of a low Manganese TRIP and TWIP steel through additive manufacturing of dissimilar steels: *Noah Sargent*[1]; Samad Firdosy[2]; Xin Wang[1]; Richard Otis[2]; Jonathan Poplawsky[3]; Wei Xiong[1]; [1]University of Pittsburgh; [2]Jet Propulsion Laboratory, California Institute of Technology; [3]Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

10:45 AM
Capturing the Effect of a Novel Inoculant on the Microstructure and Mechanical Properties in a Stainless Steel 316L Alloy Produced by Laser Powder Bed Fusion: *Aakifa Farooq*[1]; Sam Tammas-Williams[2]; Arunabhiram Chutia[3]; Nghia Vo[4]; Peter Lee[5]; Mohammed Azeem[1]; Peter Lee[6]; Mohammed Azeem[6]; [1]University of Leicester; [2]The University of Edinburgh; [3]University of Lincoln; [4]National Synchrotron Light Source II; [5]Harwell; [6]University College London

11:05 AM
Laser Powder Bed Fusion Processing of Mechanically Alloyed 4wt% TiC Nanoparticle Reinforced 316L Stainless Steel: *Ryan Anderson*[1]; Stephen Cooke[1]; Joseph Sims[1]; Madelyne Rushing[1]; Melissa Forton[1]; [1]Quadrus Advanced Manufacturing

11:25 AM
Effects of Oxygen Exposure and Powder Chemistry on Oxide Dispersion Strengthened Steels Printed with Gas Atomization Reaction Synthesis (GARS) Powders: *Matthew deJong*[1]; Sourabh Saptarshi[1]; Iver Anderson[2]; Christopher Rock[1]; Timothy Horn[1]; Djamel Kaoumi[1]; [1]North Carolina State University; [2]Ames Laboratory

11:45 AM
Enhanced Magnetic Properties of Additive Manufactured Fe-Ni Permalloy through the Optimizing the Production Parameters: *Farahnaz Haftlang*[1]; Eun Seong Kim[1]; Hyoung Seop Kim[1]; [1]Pohang University of Science and Technology

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BIOMATERIALS

Advanced Biomaterials for Biomedical Implants — Advanced Biomaterials for Implants I

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

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Jing Du, Pennsylvania State University

Wednesday AM | March 22, 2023
Sapphire 400B | Hilton

Session Chairs: Tolou Shokuhfar, University of Illinois Chicago; Du Jing, Pennsylvania State University; Fariborz Tavangarian, Pennsylvania State University Harrisburg

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8:30 AM Invited
A Combined Experimental and Computational Study of Dental Implant: *Jing Du*[1]; [1]Pennsylvania State University

9:05 AM
Development of Advanced Bioabsorbable Zn-based Materials Using Powder-metallurgy Techniques: *Matjaz Godec*[1]; Irena Paulin[1]; Crtomir Donik[1]; Aleksandra Kocijan[1]; Dalibor Vojtěch[2]; Jií Kubásek[2]; [1]Institute of Metals and Technology; [2]University of Chemistry and Technology Prague

9:25 AM
Hemocompatibility and Biocompatibility Evaluation of an Mg-Ca-Sr Alloy for Vascular Stent Applications: *Sonia Ezenwajiaku*[1]; Vidhya Ramaswamy[2]; Hunter Henderson[3]; Josephine Allen[1]; Michele Manuel[1]; [1]University of Florida; [2]Boston Scientific; [3]Lawrence Livermore National Laboratory

9:45 AM
Polymeric Biodegradable Biomaterials for Tissue Bioengineering and Bone Rejuvenation: *Eribe Jonathan*[1]; Andrew Ohifuemen[2]; Jacob Jacob[3]; Aaron Y. Isaac[4]; Ikhazuagbe Ifijen[2]; [1]Benson Idahosa University; [2]Rubber Research Institute of Nigeria; [3]University of Benin; [4]University of Ilorin

10:05 AM Break

10:25 AM Invited
Plasma Reduction Process for Nanostructured Biomaterials and 3D-Scaffold Surfaces: *Vinoy Thomas*[1]; [1]University of Alabama at Birmingham

11:00 AM
Real-time Raman Spectroscopy of Binder Setting in Bioactive Glass Composite Bone Tissue Scaffolds: Marzieh Matinfar[1]; John Nychka[1]; *Kalan Kucera*[1]; [1]University of Alberta

11:20 AM
Synthesis and Characterization of Novel Antibacterial Ti-Nb-Cu/Ga Alloys for Load-bearing Implant Applications: *Mariana Calin*[1]; Ludovico Andrea Alberta[1]; Jithin Vishnu[1]; Avinash Hariharan[1]; Stefan Pilz[1]; Annett Gebert[1]; [1]IFW Dresden

11:40 AM
Laser Induced Micro/Nano Structured Stainless Steel Surfaces for Biological and Food Storage Applications: *Gopinath Perumal*[1]; Mark Swayne[1]; Dermot Brabzon[1]; [1]Dublin City University

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MATERIALS PROCESSING

Advanced Characterization of High-temperature Alloys: Phase Evolution during Manufacturing and Service-induced Deformation — Advanced Characterisation of Deformation Mechanisms: Diffraction, NDA and Modelling Methods

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

Program Organizers: Katerina Christofidou, University of Sheffield; Benjamin Adam, Oregon State University; Stoichko Antonov, Max-Planck Institut für Eisenforschung GmbH; James Coakley, University of Miami; Martin Detrois, National Energy Technology Laboratory; Paraskevas Kontis, Norwegian University of Science and Technology; Stella Pedrazzini, Imperial College London; Sophie Primig, University of New South Wales

Wednesday AM | March 22, 2023

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Session Chairs: Benjamin Adam, Oregon State University; James Coakley, University of Miami

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9:00 AM Invited
Understanding Phase Evolution and Deformation in High Temperature Materials via In-situ/Operando Neutron Diffraction: *Ke An*[1]; [1]Oak Ridge National Laboratory

9:30 AM
Phase- and Orientation-specific Mechanical Response during High-temperature Deformation of a γ' Strengthened Ni-based Superalloy: Nitesh Raj Jaladurgam[1]; Stefanus Harjo[2]; *Magnus Colliander*[1]; [1]Chalmers University of Technology; [2]Japan Atomic Energy Agency

9:50 AM
Microstructure Evolution and Deformation Micromechanisms in Refractory High Entropy Superalloys: *Muhammad Awais*[1]; William Hixson[1]; Howard Stone[2]; Nicholas Jones[2]; Ke An[3]; Dunji Yu[3]; Raj Banerjee[4]; James Coakley[1]; [1]University of Miami; [2]University of Cambridge; [3]Oak Ridge National Laboratory; [4]University of North Texas

10:10 AM Break

10:30 AM
In Situ High Energy Diffraction Investigation of the Dynamic and Meta-dynamic Recrystallization of Ni Base Superalloy Haynes 282: *Emil Eriksson*[1]; Olof Bäcke[1]; Yao Hu[1]; Magnus Hörnqvist Colliander[1]; [1]Chalmers University of Technology

10:50 AM
Phase-Field Modeling of Rafting in Ni-Based Superalloys with a Varying Lattice Misfit: *Jose Dominic*[1]; Jean-Briac le Graverend[1]; [1]Texas A&M University

11:10 AM
Continuum Scale Approach to Characterization and Modeling of Deformation Mechanisms in Haynes 244 Alloy: *Thomas Mann*[1]; Michael Fahrmann[2]; Marisol Koslowski[1]; Michael Titus[1]; [1]Purdue University; [2]Haynes Intl.

11:30 AM Concluding Comments

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. Tasan, Massachusetts Institute of Technology; Olivia Jackson, Sandia National Laboratories

Wednesday AM | March 22, 2023
Aqua 311A | Hilton

Session Chairs: Ram Devanathan, Pacific Northwest National Laboratory; Carlos Tome, Los Alamos National Laboratory

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8:30 AM Invited
Elasto-visco-plastic Crystallographic Modeling of Thermal Ratcheting in Uranium: *Carlos Tome*[1]; Youngung Jeong[2]; [1]Los Alamos National Laboratory; [2]Changwon National University

9:00 AM
Experimental and Modeling Study of Steel Bending and Springback Using an Elasto-visco-plastic Self-consistent Polycrystal Model Interfaced with a Finite Element Code: *Youngung Jeong*[1]; Mooyeong Joo[1]; Bohye Jeong[1]; Jaeseong Lee[1]; Dirk Steglich[2]; Frederic Barlat[2]; Carlos Tome[3]; [1]Changwon National University; [2]Pohang University of Science and Technology; [3]Los Alamos National Laboratory

9:20 AM
Size Effect in Polycrystalline Nickel-Based Superalloys in The Presence of a Free-Surface: Identification of the Crystal Plasticity of Surface Grains Versus Core Grains: *Damien Texier*[1]; Vincent Velay[2]; Antonio Castro-Moreno[3]; Daniel Monceau[4]; Eric Andrieu[4]; [1]CNRS - Institut Clément Ader; [2]Institut Clément Ader - UMR CNRS 5312; [3]IRT Saint-Exupery; [4]CIRIMAT - UMR CNRS 5085

9:40 AM
On the Selection of Flow Rule and Slip System in Crystal Plasticity Simulations of Cyclic Deformation in Martensitic Steels: *Tim Fischer*[1]; Carl Dahlberg[1]; Peter Hedström[1]; [1]KTH Royal Institute of Technology

10:00 AM Break

10:20 AM Invited
Alloy Rupture Strength Prediction Using Machine Learning and Microstructure Analysis: *Ram Devanathan*[1]; Osman Mamun[1]; Mohammad Taufique[1]; William Frazier[1]; Arun Sathanur[1]; Keerti Kappagantula[1]; Jing Wang[1]; Marissa Masden[1]; Madison Wenzlick[2]; Kelly Rose[2]; [1]Pacific Northwest National Laboratory; [2]National Energy Technology Laboratory

10:50 AM
Damage Accumulation during Creep in Metals: The Role of Microstructure: *Andrea Rovinelli*[1]; Laurent Capolungo[1]; Ricardo Lebensohn[1]; [1]Los Alamos National Laboratory

11:10 AM
Radiation Damage Defect Characterization Using In-situ Positron Spectroscopy: Rasheed Auguste[1]; M. Oskar Liedke[2]; Maik Butterling[2]; Blas Uberuaga[3]; Farida Selim[4]; *Peter Hosemann*[1]; [1]University of California, Berkeley; [2]Helmholtz-Zentrum Dresden - Rossendorf; [3]Los Alamos National Laboratory; [4]Bowling Green State University

11:30 AM
Application of Constant Contact Pressure Nanoindentation on Room Temperature Creep: Reliability and Advantage: *Lizhong Lang*[1]; Zhiying Liu[1]; Yu Zou[1]; [1]University of Toronto

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Sustainability and Energy

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Amit Pandey, Lockheed Martin Space; Partha Mukherjee, Purdue University; Surojit

Gupta, University of North Dakota; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Eric Detsi, University of Pennsylvania

Wednesday AM | March 22, 2023
32B | SDCC

Session Chairs: Surojit Gupta, University of North Dakota; Lan Li, Boise State University

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8:30 AM Invited
Study of the Efficacy of a Perovskite Sensor-Based Non-Invasive Glucose Monitoring System Using Infrared Light Intensity Correlations: Towards the Development of Measurement Metrics Using Data Analytics: David Ryman[1]; Muhilan Manimaran[1]; *Prakhyat Gautam*[1]; Darwyn Ward[1]; Luke Davis[1]; Brent Yang[1]; Diana Govea[1]; Carlos Moreno[1]; Anmol Randhawa[1]; Edgar Perez-Lopez[2]; Saquib Ahmed[3]; Sankha Banerjee[1]; [1]California State University, Fresno; [2]University of California, Merced; [3]State University of New York, Buffalo State

8:55 AM Invited
First-Principles Studies of Metal Nanoparticles on Substrates for Advanced Manufacturing Applications: *Lan Li*[1]; [1]Boise State University

9:20 AM
A Novel Equilibrium Monte Carlo Approach for Efficient Calculation of Phonon Conductivity in Nanostructured Thermoelectric Materials: S. Aria Hosseini[1]; Alathea Davies[2]; Ian Dickey[3]; Giuseppe Romano[1]; Laura de Sousa Oliveira[2]; Neophytos Neophytou[4]; *Peter Greaney*[3]; [1]Massachusetts Institute of Technology; [2]University of Wyoming; [3]University of California, Riverside; [4]University of Warwick

9:40 AM Invited
Experimental Simulation of the Erosive-Corrosive Wear and Shear Rate Dependence of an Iron and Molten Al-Si Thermal Storage System: *Nuria Navarrete Argiles*[1]; Carolina Villada Vargas[1]; Anthony Rawson[1]; Florian Kargl[1]; [1]Deutsches Zentrum für Luft- und Raumfahrt

10:05 AM Break

10:25 AM
Triple-cation Perovskite Photoabsorbers and Solar Cells: *Thomas Mather*[1]; Sujan Aryal[1]; Mahdi Temsal[1]; Anupama Kaul[1]; [1]University of North Texas

10:45 AM Invited
Salt Hydrate Eutectics: Expanding the Palette of Phase Change Materials for Thermal Energy Storage: *Patrick Shamberger*[1]; Sophia Ahmed[1]; Haley Jones[1]; Robert Mach[1]; [1]Texas A&M University

11:10 AM Keynote
Fast-charging Aluminum-chalcogen Batteries Resistant to Dendritic Shorting: *Donald Sadoway*[1]; [1]Massachusetts Institute of Technology

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CHARACTERIZATION

Advanced Real Time Imaging — Additive Manufacturing

Sponsored by: TMS Functional Materials Division, 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 Engergy 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, Sourthern 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

Wednesday AM | March 22, 2023
Aqua 310A | Hilton

Session Chairs: Wangzhong Mu, Kth Royal Institute of Technology; Jinichiro Nakano, US Department of Energy - National Engergy Technology Laboratory

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8:30 AM Invited
Real Time Imaging of Laser Melting and Re-Solidification: *Anthony Rollett*[1]; [1]Carnegie Mellon University

8:50 AM Invited
High-velocity Interactions of Laser-driven Tin Ejecta Microjets via X-ray Radiography: *Yuchen Sun*[1]; J Horwitz[1]; Kyle Mackay[1]; S Ali[1]; J Eggert[1]; B Morgan[1]; Fady Najjar[1]; Hye-Sook Park[1]; Y Ping[1]; J Pino[1]; C Stan[1]; Alison Saunders[1]; [1]Lawrence Livermore National Laboratory

9:10 AM
Prediction of Laser Absorptivity from Synchrotron X-ray Images Using Deep Convolutional Neural Networks: *Runbo Jiang*[1]; Joseph Aroh[1]; Brian Simonds[2]; Tao Sun[3]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]National Institute of Standards and Technology; [3]University of Virginia

9:30 AM
In-situ Monitoring and Post Operando Analysis of Additively Manufacturing Lunar Regolith Simulants Parts: *Caterina Iantaffi*[1]; Chu Lun Alex Leung[1]; Samy Hocine[1]; Elena Ruck[1]; Marta Majkut[2]; Martina Meisnar[3]; Thomas Rohr[3]; Peter D. Lee[1]; [1]University College London; [2]European Synchrotron Radiation Facility; [3]European Space Agency

9:50 AM
Microstructure Evolution during Laser-based Powder Bed Fusion Studied by Operando X-ray Radiography: *Steven Van Petegem*[1]; [1]Paul Scherrer Institut

10:10 AM Break

10:30 AM
Machine Learning for In-situ Detection of Local Heat Accumulation in Additive Manufacturing: *David Guirguis*[1]; Conrad Tucker[1]; Jack Beuth[1]; [1]Carnegie Mellon University

10:50 AM
Mapping the Melt Pool Variability in L-PBF Additive Manufacturing by High-Speed Imaging: *David Guirguis*[1]; Conrad Tucker[1]; Jack Beuth[1]; [1]Carnegie Mellon University

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ENERGY & ENVIRONMENT

Advances in Magnetic Materials — Emerging Topics in Application and Characterization of Magnetic Materials

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

Committee

Program Organizers: Jose Maria Porro, Bcmaterials; Huseyin Ucar, California Polytechnic University,Pomona; Patrick Shamberger, Texas A&M University; Min Zou, Lab Magnetics, A Quadrant Company; Gaoyuan Ouyang, Ames Laboratory; Alex Leary, NASA Glenn Research Center

Wednesday AM | March 22, 2023
33A | SDCC

Session Chair: Min Zou, Lab Magnetics, A Quadrant Company

8:30 AM Invited
Using Soft X-ray Photon Correlation Spectroscopy to Study Magnetic Helical Dynamics: *Sophie Morley*[1]; Arnab Singh[1]; Emily Hollingworth[2]; Ryan Tumbleson[1]; Peter Fischer[1]; Frances Hellman[2]; Stephen Kevan[1]; Sujoy Roy[1]; [1]Lawrence Berkeley National Laboratory; [2]University of California Berkeley

9:00 AM
Superparamagnetic Iron Oxide-based Bulk Nanocomposites: *Diletta Giuntini*[1]; [1]Eindhoven University of Technology

9:15 AM
Crystallization Characteristics in Co-based Magnetic Amorphous Nanocomposites: Alicia Koenig[1]; Ronald Noebe[2]; Alex Leary[2]; Claudia Mewes[1]; Tim Mewes[1]; *Gregory Thompson*[1]; [1]University of Alabama; [2]NASA

9:30 AM Invited
$R'_yR''_{1-y}ScX$: Magnetically Compensated Materials for Spin-based Applications: Tyler Del Rose[1]; *Yaroslav Mudryk*[1]; Daniel Haskel[2]; Arjun Pathak[3]; Kyle Dixon-Anderson[4]; Vitalij Pecharsky[4]; [1]Ames National Laboratory/Iowa State University; [2]Advances Photon Source, Argonne National Laboratory of US DOE; [3]SUNY Buffalo State; [4]Iowa State University

10:00 AM Break

10:15 AM
Incisive Review on Magnetic Iron Oxide Nanoparticles and Their Use in the Treatment of Bacterial Infections
: *Muniratu Maliki*[1]; Stanley Omorogbe[2]; Ikhazuagbe Ifijen[2]; Oscar Aghedo[3]; Augustine Ighodaro[4]; [1]Edo State University Uzairue; [2]Rubber Research Institute of Nigeria; [3]University of Benin; [4]Quantum Pharmaceuticals

10:30 AM Invited
The Impact of Packaging on Soft Magnetic Core Performance: *Alex Leary*[1]; Ron Noebe[1]; Vladimir Keylin[2]; Grant Feichter[2]; [1]NASA Glenn Research Center; [2]HX5

11:00 AM
Mixed Magnetic Phases in AlxCoCrNiFe High Entropy Alloy: *Cameron Jorgensen*[1]; Louis Santodonato[1]; Namila Liyanage[1]; Lizabeth Quigley[1]; Peter Liaw[1]; Dustin Gilbert[1]; Lisa Debeer-Schmitt[2]; Raymond Unocic[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

11:15 AM
High Throughput Evaluation of Magnetic Alloys for Energy Applications: *Li Ping Tan*[1]; Shakti Padhy[1]; Vijaykumar Varma[1]; Zviad Tsakadze[1]; Varun Chaudhary[1]; Raju Ramanujan[1]; [1]Nanyang Technological University

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Structures and Mechanical Properties I

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Wednesday AM | March 22, 2023
Aqua D | Hilton

Session Chairs: Michael Gao, National Energy Technology Laboratory; Koichi Tsuchiya, NIMS

8:30 AM Invited
Tunability of Deformation Mechanisms through Integration of Compositional and Microstructural Domains: *Rajiv Mishra*[1]; [1]University of North Texas

8:50 AM Invited
Creep of High Entropy Alloys and Superalloys at NETL: *Kyle Rozman*[1]; Michael Gao[2]; Martin Detrois[2]; Paul Jablonski[2]; Ömer Doğan[2]; [1]Site Support Contractor; [2]National Energy Technology Laboratory

9:10 AM Invited
Mechanical Determination of Peak Short-range Ordering in CrCoNi via Nanoindentation: *Mingwei Zhang*[1]; Qin Yu[1]; Carolina Frey[2]; Flynn Walsh[3]; Madelyn Payne[3]; Punit Kumar[1]; Dongye Liu[3]; Easo George[4]; Tresa Pollock[2]; Mark Asta[1]; Robert Ritchie[1]; Andrew Minor[1]; [1]Lawrence Berkeley National Laboratory; [2]University of California, Santa Barbara; [3]University of California, Berkeley; [4]University of Tennessee, Knoxville

9:30 AM Invited
Elastic and Plastic Behavior of Binary and Ternary Refractory Multi-principal-element Alloys: *Rui Feng*[1]; George Kim[2]; Dunji Yu[1]; Yan Chen[1]; Wei Chen[2]; Peter Liaw[3]; Ke An[1]; [1]Oak Ridge National Laboratory; [2]Illinois Institute of Technology; [3]The University of Tennessee, Knoxville

9:50 AM Invited
Deformation by Dislocations, Twinning, and Phase Transformations in Compositionally Complex FCC Solid Solutions: *Michael Mills*[1]; Jiashi Miao[1]; Connor Slone[2]; Veronika Mazanova[1]; Milan Heczko[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University; [2]Exponent Inc.

10:10 AM Break

10:30 AM Invited
High Strain Rate Deformation Behavior of Multi-Principal Element Alloys: Shristy Jha[1]; Saideep Muskeri[1]; Phillip Jannotti[2]; Jeffrey Lloyd[2]; Rajiv Mishra[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas; [2]DEVCOM Army Research Laboratory

10:50 AM Invited
Effect of High-pressure and Shear Strainig on FCC-HCP Transformation in Cr20Mn20Fe20Co40-xNix High Entropy Alloys: *Koichi Tsuchiya*[1]; Jangho Yi[1]; Sangmin Lee[1]; Masashi Miyakawa[1]; [1]National Institute for Materials Science

11:10 AM Invited
Low-temperature Deforamtion in High-entropy Alloys: M. Naeem[1]; Haiyan He[1]; Stefanus Harjo[2]; Takuro Kawasak[2]; *Xun-li Wang*[1]; [1]City University of Hong Kong; [2]Japan Atomic Energy Agency

11:30 AM
High-throughput Characterization and Nanoindentation of TiZrHfNbTa High-entropy Alloy Library with Gradient Composition: *Changjun Cheng*[1]; Renfei Feng[2]; Michel Haché[1]; Yu Zou[1]; [1]University of Toronto; [2]Canadian Light Source

11:50 AM
Refractory Alloys with Ru-based B2 Precipitation-strengthened Microstructures: *Sebastian Kube*[1]; Carolina Frey[1]; Kaitlyn Mullin[1]; Chiyo McMullin[1]; Ravit Silverstein[1]; Tresa Pollock[1]; [1]University of California Santa Barbara

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MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Advances in Ceramic Materials and Processes III

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Wednesday AM | March 22, 2023
30A | SDCC

Session Chair: Kathy Lu, Virginia Polytechnic Institute and State University

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8:30 AM Introductory Comments

8:35 AM Invited
Selective Extraction of TiO_2 from Spent SCR Catalysts and Preparation of Fly Ash-based Photocatalysts: Xi Qian[1]; *Weihua Ao*[1]; [1]China University of Geosciences

8:55 AM
Understanding Enhanced Thermal Stability in Zirconia-based Aerogels: Nathaniel Olson[1]; Jordan Meyer[1]; Haiquan Guo[2]; Frances Hurwitz[3]; Jamesa Stokes[4]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign; [2]Universities Space Research Association; [3]NASA Glenn Research Center (Retired); [4]NASA Glenn Research Center

9:15 AM
Modelling and Measuring Optical Properties of Polycrystalline Ceramics: *Wenbo Zhou*[1]; Meir Shachar[1]; Gottlieb Uahengo[1]; Javier Garay[1]; [1]UCSD

9:35 AM
Lithium vs. Sodium Solid State Batteries: Multiscale Modelling Methodology for Diffusion and NMR Properties in Li and Na Ceramics Solid Electrolytes: *Mahmoud Attia*[1]; Said Yagoubi[2]; Jean Paul Crocombette[3]; Thibault Charpentier[2]; [1]CEA, CNRS, NIMBE; CEA, DEN, SRMP; [2]CEA, CNRS, NIMBE; [3]CEA, DEN, SRMP

MATERIALS DESIGN

Advances in Titanium Technology — Session V

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Wednesday AM | March 22, 2023
Cobalt 500 | Hilton

Session Chair: Sriram Vijayan, The Ohio State University

8:30 AM Invited
Towards a Single Crack Nucleation Mechanism Involving Basal Twist Grain Boundaries in Ti Alloys: Cyril Lavogiez[1]; Clement Dureau[1]; Patrick Villechaise[1]; Yves Nadot[1]; *Samuel Hemery*[1]; [1]Institut Pprime

9:00 AM Invited
Reorientation Induced Plasticity (RIP) in High-strength Titanium Alloys: An Insight into Underlying Mechanisms and Resulting Mechanical Properties: *Odeline Dumas*[1]; Loic Malet[1]; Frederic Prima[2]; Stephane Godet[1]; [1]Université Libre de Bruxelles; [2]PSL Chimie ParisTech

9:30 AM Invited
Deformation Micromechanisms Observed in Binary Beta Ti Alloys Using TEM In Situ Tensile Tests: *Nicolas Bello*[1]; Florence Pettinari-Sturmel[1]; Joël Douin[1]; Frédéric Mompiou[1]; Fan Sun[2]; Frédéric Prima[2]; Philippe Vermaut[2]; Thierry Glorian[3]; Philippe Castany[3]; [1]CEMES - Université de Toulouse; [2]IRCP, Chimie ParisTech; [3]ISCR Rennes

10:00 AM Break

10:20 AM
Additive Manufacturing of Titanium – Boron Carbide In situ Composites: *Mohan Sai Kiran Nartu*[1]; Srinivas Mantri[1]; Thomas Scharf[1]; Brandon Mcwilliams[2]; Kyu Cho[2]; Narendra Dahotre[1]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]US Army Research Laboratory

10:40 AM
Investigation to Density and Metallurgical Characteristics of Selective Laser Melted Ti-5Al-5V-5Mo-3Cr Vs. Ti-6Al-4V: David Yan[1]; *Roman Bolzowski*[1]; [1]San Jose State University

11:00 AM
Titanium Metal Matrix Composite Formation in Ternary and Quaternary Compositions and Amenability to Laser Powder Bed Fusion Techniques: *William Hixson*[1]; Howard Stone[2]; Jonathan Poplawsky[3]; James Coakley[1]; [1]University of Miami; [2]University of Cambridge; [3]Oak Ridge National Laboratory

11:20 AM
Understanding the Effect of Process Variables on Melt Pool Dynamics and Solidification Kinetics during Laser Spot Melting of Ti-6Al-4V Alloy Using In-situ Dynamic Synchrotron X-ray Radiography: *Rakesh Kamath*[1]; Raymond Wysmierski[1]; Ryan Heldt[1]; Logan White[1]; Gerald Knapp[2]; John Coleman[2]; Samuel Reeve[2]; Kamel Fezzaa[3]; Hahn Choo[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory; [3]Argonne National Laboratory

11:40 AM
Additive Manufacturing of Ti-Nb-Ta-Zr Beta Ti-Alloys: *Peter Ibrahim*[1]; Moataz Attallah[1]; [1]University of Birmingham

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MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Wednesday AM | March 22, 2023
Cobalt 520 | Hilton

Session Chairs: Ramsey Issa, University of Utah; Kamal Choudhary, National Institute of Standards and Technology

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8:30 AM
Applications of Machine Learning Techniques for Materials Discovery: *Suchismita Goswami*[1]; Ichiro Takeuchi[2]; [1]MEST; [2]University of Maryland

8:50 AM
High-dimensionalFormulation-basedBayesianOptimizationofDentalComposite Resins: *Ramsey Issa*[1]; Taylor Sparks[1]; [1]University of Utah

9:10 AM
Accelerated Discovery of Ultra-high Temperature High Entropy Ceramics by Machine Learning and High Throughput Experiments: *Kun Wang*[1]; Yonggang Yan[1]; [1]Alfred University

9:30 AM
A Generative AI Framework for Designing Nanoporous Silicon Nitride Membranes (NPM) with Optimized Mechanical Properties: *Ali K. Shargh*[1]; Gregory R. Madejski[1]; James McGrath[1]; Niaz Abdolrahim[1]; [1]University of Rochester

9:50 AM
Designing High-Temperature Multicomponent NiTiHfPd SMAs Using Machine Learning: *Hatim Raji*[1]; Soheil Saedi[1]; [1]Florida Institute of Technology

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MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Multiscale Algorithms for Crystal Plasticity and Damage Mechanics II

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

Materials Committee

Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis; Enrique Martinez Saez, Clemson University; Garritt Tucker, Colorado School of Mines; Hojun Lim, Sandia National Laboratories; Vimal Ramanuj, Oak Ridge National Laboratory

Wednesday AM | March 22, 2023
Cobalt 502B | Hilton

Session Chairs: Hojun Lim, Sandia National Laboratories; Enrique Saez, Clemson University

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8:30 AM Invited
Algorithms for Computing Diffraction Patterns from Dislocation Networks Generated via Discrete Dislocation Dynamics Simulations: Darshan Bamney[1]; Aaron Tallman[2]; Laurent Capolungo[1]; *Douglas Spearot*[3]; [1]Los Alamos National Laboratory; [2]Florida International University; [3]University of Florida

9:10 AM
An Automated Approach to Data Extraction for SMAs: *Dylan Kennedy*[1]; Aaron Stebner[1]; Branden Kappes[2]; [1]Georgia Institute of Technology; [2]KMMD, LLC

9:30 AM
Development of Structure-property Linkages for Damage in Crystalline Microstructures Using Bayesian Inference and Unsupervised Learning: *David Montes De Oca Zapiain*[1]; Anh Tran[1]; Hojun Lim[1]; [1]Sandia National Laboratories

9:50 AM
Multifaceted Uncertainty Quantification for Structure-property Relationship: *Anh Tran*[1]; Pieterjan Robbe[1]; Hojun Lim[1]; [1]Sandia National Laboratories

10:10 AM Break

10:25 AM
Novel Multi-scale Plasticity Modeling Using Defect Dynamics Element Method (DDEM): *Nicole Aragon*[1]; Dongchan Jang[2]; Hojun Lim[1]; Ill Ryu[3]; [1]Sandia National Laboratories; [2]Korea Advanced Institute of Science and Technology; [3]The University of Texas at Dallas

10:45 AM
Multiphase Microstructure-based Modeling for Rolling Contact Fatigue Life Prediction: *Jinheung Park*[1]; Kijung Lee[1]; Soonwoo Kwon[2]; Myoung-Gyu Lee[1]; [1]Seoul National University; [2]Hyundai Motor Company

11:05 AM
Prediction of Mechanical Properties in a Bulged and Annealed Steel Tube through a Multiscale Modeling Approach Based on CPFEM: Amir Asgharzadeh[1]; Taejoon Park[1]; *Farhang Pourboghrat*[1]; [1]The Ohio State University

11:25 AM
Symmetry Relation Database and Its Application to Ferroelectric Materials Discovery: *Qiang Zhu*[1]; Byungkyun Kang[1]; Kevin Parrish[1]; [1]University of Nevada, Las Vegas

11:45 AM
Coupling of a Multi-GPU Accelerated Elasto-visco-plastic Fast Fourier Transform Constitutive Model with the Implicit Finite Element Method: *Marko Knezevic*[1]; [1]University of New Hampshire

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LIGHT METALS

Alumina & Bauxite — Session II

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

Program Organizers: Errol Jaeger, The Business Consultants FZ-LLC; Stephan Broek, Kensington Technology Inc.

Wednesday AM | March 22, 2023
31B | SDCC

Session Chairs: Errol Jaeger, The Business Consultants FZ-LLC; Roberto Seno, Cba

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8:30 AM
Improvement Seminars: Continuous Improvement and People´S Engagement to Support the Sustainability: Nathalia Cordeiro[1]; Bruna Cabral[1]; Renan Cruz[1]; Raphael Costa[1]; *Silene Vendrasco*[1]; Jaise Carvallo[1]; Gustavo Silva[1]; Guilherme Silva[1]; Karina Trindade[1]; [1]Norsk Hydro Brasil

8:55 AM
Turning Bauxite Residue to Metal Adsorption Materials through a Low-cost Approach: *Hong (Marco) Peng*[1]; James Vaughan[1]; Shengchun Ma[1]; Sicheng Wang[1]; Xinyu Tian[1]; [1]University of Queensland

9:20 AM
Hematite and Anatase Conversion to Magnetic Phases During Reductive Re-digestion of Gibbsitic Bauxite Residue: Paula Araújo[1]; Andre do Carmo[1]; Fernando Gomes[1]; Raphael da Costa[2]; Marcelo Montini[2]; *Adriano Lucheta*[1]; Patrícia Silva[1]; [1]SENAI Innovation Institute for Mineral Technologies; [2]Norsk Hydro Brasil

9:45 AM
Digestion Efficiency Improvement of Gibbsite-boehmite Bauxite: Fengqin Liu[1]; Songqing Gu[1]; Huaitao Zhang[2]; *Michael Ren*[3]; Zegang Wu[1]; Han Lu[1]; Mingzhuang Xie[1]; [1]University of Science and Technology; [2]Shandong Xinfa Aluminum Group; [3]Sunlightmetal Consulting Inc.

LIGHT METALS

Aluminum Alloys, Characterization and Processing — Casting and Solidification

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek, Kensington Technology Inc.

Wednesday AM | March 22, 2023
32A | SDCC

Session Chair: X.-Grant Chen, University of Quebec at Chicoutimi

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8:30 AM
Fundamental Study on Modified Solidification of 1370 and AlSi7 with and without Commercial Grain Refiners: *Robert Fritzsch*[1]; Amund Ugelstad[1]; Henrik Gobakken[1]; Silje Li[1]; Shahid Akhtar[2]; Lars Arnberg[1]; Ragnhild Aune[1]; [1]Norwegian University of Science and Technology (NTNU); [2]Hydro Aluminium AS

8:55 AM
Improving the Mechanical Properties of Cast Aluminum via Ultrasonication-induced Microstructural Refinement: *Katherine Rader*[1]; Jens Darsell[1]; Jon Helgeland[1]; Nathan Canfield[1]; Timothy Roosendaal[1]; Ethan Nickerson[1]; Adam Denny[1]; Aashish Rohatgi[1]; [1]Pacific Northwest National Laboratory

9:20 AM
Microstructural Changes on the Al–Cu–Si Ternary Eutectic Alloy with Different Cooling Rates: *Seunghwan Oh*[1]; Youngcheol Lee[1]; [1]Korea Institute of Industrial Technology

9:45 AM
Nanoparticle-enhanced Arc Welding of Aluminum Alloys: *Narayanan Murali*[1]; Xiaochun Li[1]; [1]University of California, Los Angeles

10:10 AM Break

10:25 AM
Phase Equilibria in Al-Fe Alloys: *Jozef Medved*[1]; Maja Voncina[1]; Joze Arbeiter[1]; [1]University of Ljubljana

10:50 AM
Secondary Phase Fracture in Molten Aluminum via Low Power Electric Current Processing: *Jonathan Goettsch*[1]; Aaron Gladstein[1]; David Weiss[2]; Ashwin Shahani[1]; Alan Taub[1]; [1]University of Michigan; [2]Eck Industries

11:15 AM
Fluidity and Microstructural Analysis of Al-Ni Alloys with Varied Ni Concentrations: *Vigneshwar Hari*[1]; Dong Xu[1]; Stuart McDonald[1]; Zherui Tong[1]; Dongdong Qu[1]; Kazuhiro Nogita[1]; [1]The University of Queensland

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BIOMATERIALS

Biological Materials Science — Biological Materials Science V

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

Wednesday AM | March 22, 2023
Sapphire 402 | Hilton

Session Chairs: Restrepo David, The University of Texas at San Antonio; Ling Li, Virginia Polytechnic Institute

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8:30 AM Invited
Effect of Collagen Molecular Damage at the Nanoscale on Different Hierarchical Levels: *Claire Acevedo*[1]; Michael Sieverts[1]; Yoshihiro Obata[1]; Dula Parkinson[2]; Daan Pelt[2]; [1]University of Utah; [2]Lawrence Berkeley National Laboratory

9:00 AM
Role of Graphene Nanoscrolls on the Properties of Chitosan-PCL Interconnected Membranes with Double Porosity: *Dilip Depan*[1]; Lillian Mambiri[1]; [1]University of Louisiana at Lafayette

9:20 AM
Porous, Freeze-cast Fluorohydroxyapatite and Hydroxyapatite-titania Composites for Biomedical Applications: *Tony Yin*[1]; Sujee Jeyapalina[1]; Steven

Naleway[1]; [1]University of Utah

9:40 AM Invited
Biofilms as Active Materials: *Jing Yan*[1]; [1]Yale University

10:10 AM Break

10:30 AM
Graphene Foam as an Active Bioscaffold for Cartilage Tissue Engineering: *Monet Alberts*[1]; Michael Eppel[2]; Olivia Nielson[3]; Josh Eixenberger[2]; Raquel Montenegro-Brown[1]; David Estrada[2]; [1]Boise State University; [2]Boise State University ; [3]University of Idaho

10:50 AM
Effect of Calcium Phosphorous Molar Ratio on Biocompatibility of 316L Stainless Steel: *Sreeparna Ghosh*[1]; P. K. Mitra[1]; Mahua Ghosh Chaudhuri[1]; [1]Jadavpur University

11:10 AM
Investigation of Design Principles from the Cholla Cactus using Finite Element Simulations and *In situ* Mechanical Testing: *Swapnil Morankar*[1]; Eugenia Nieto-Valeiras[2]; Amey Luktuke[1]; Yash Mistry[3]; Dhruv Bhate[3]; Clint Penick[4]; Nikhilesh Chawla[1]; [1]Purdue University; [2]IMDEA Materials Institute; [3]Arizona State University; [4]Kennesaw State University

11:30 AM
Fungi-inspired Absorption Materials Made Using Different Biotemplating Methods: *Debora Lyn Porter*[1]; Krista Carlson[2]; Steven Naleway[1]; [1]University of Utah; [2]University of Nevada Reno

11:50 AM
Micro X-ray Computed Tomography Study of Moisture-induced Swelling in the Wood Cellular Structure: *Joseph Jakes*[1]; Xavier Arzola[2]; Carlos Baez[1]; Roderic Lakes[2]; Donald Stone[2]; [1]USDA FS Forest Products Laboratory; [2]University of Wisconsin–Madison

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Atomistic Simulations, Modelling and Theory

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

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

Wednesday AM | March 22, 2023
Aqua C | Hilton

Session Chair: Thomas Hardin, Sandia National Laboratories

8:30 AM Invited
Elucidating the Structure of Glass: Bottom-up or Top-down?: *Takeshi Egami*[1]; [1]University of Tennessee

8:50 AM
Emergent Structural and Temporal Length Scales in Metallic Glasses - An Atomistic Simulation Perspective: Peter Derlet[1]; *Robert Maass*[2]; [1]Paul Scherrer

Institut; [2]Federal Institute of Materials Research and Testing (BAM)

9:10 AM
The Role of Structural Motifs and Outliers in the Deformation of Metallic Glasses: *Porter Weeks*[1]; Suzanne Russo[1]; Katharine Flores[1]; [1]Washington University in St Louis

9:30 AM
Glass Formation and Shear Banding in CrMnFeCoNi High-entropy Metallic Glasses: A Molecular Dynamics Study: *Marie Charrier*[1]; Daniel Utt[1]; Arne Klomp[1]; Karsten Albe[1]; [1]TU Darmstadt

9:50 AM
Origin of Low Temperature Mechanical Loss in Metallic Glass: Leo Zella[1]; Jaeyun Moon[2]; *Takeshi Egami*[1]; [1]University Tennessee Knoxville; [2]Oak Ridge National Laboratory

10:10 AM Break

10:30 AM Invited
Metallic Glasses' Global Energy and Structural Heterogeneity Predicted by Machine Learning: *Yuchu Wang*[1]; Yue Fan[1]; [1]University of Michigan

10:50 AM
Machine Learning versus Human Learning in Complex Materials Discovery and Science: Predicting Glass-forming Ability of Metallic Glasses: *Guannan Liu*[1]; Sungwoo Sohn[1]; Sebastian Kube[1]; Arindam Raj[1]; Andrew Mertz[1]; Anna Gilbert[1]; Mark Shattuck[1]; Corey O'Hern[1]; Jan Schroers[1]; [1]Yale University

11:10 AM
Development and Application of an Atomic Cluster Expansion Potential for the CuZr System: *Niklas Leimeroth*[1]; Karsten Albe[1]; Jochen Rohrer[1]; [1]TU Darmstadt

11:30 AM
Quantifying the Local Structure of Metallic Glass as a Function of Composition, Atomic Size, and Processing History: *Thomas Hardin*[1]; Michael Chandross[1]; Murray Daw[2]; [1]Sandia National Laboratories; [2]Clemson University

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LIGHT METALS

Cast Shop Technology — Continuous Casting

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

Program Organizers: Halldor Gudmundsson, Century - Nordural; Stephan Broek, Kensington Technology Inc.

Wednesday AM | March 22, 2023
31C | SDCC

Session Chair: Halldor Gudmundsson, Nordural ehf

8:30 AM
TRC Combi Box - A Compact Inline Melt Treatment Unit for Continuous Casting: Margarita Gorsunova-Balkenhol[1]; *Mark Badowski*[1]; Marion Betzing[2]; Jan Stotz[2]; Øystein Pedersen[3]; [1]Speira GmbH; [2]Drache Umwelttechnik GmbH; [3]Speira AS Karmøy

8:55 AM
CFD Modeling of Thin Sheet Product Using The Horizontal Single Belt Casting Method: *Daniel Gonzalez Morales*[1]; Mihaiela Isac[1]; Roderick Guthrie[1]; [1]McGill Metals Processing Centre

9:20 AM
Numerical and Experimental Investigation of Twin-roll Casting of Aluminum-lithium Strips: *Olexandr Grydin*[1]; Kai-Uwe Garthe[1]; Xueyang Yuan[1]; Jette Broer[2]; Olaf Keßler[2]; Rostislav Králík[3]; Miroslav Cieslar[3]; Mirko Schaper[1]; [1]Materials Science, Paderborn University; [2]Materials Science, University of Rostock; [3]Physics of Materials, Charles University

9:45 AM
Segregation Mechanisms and Their Effects on the Aluminium Flat Rolled Products (Sheet/Foil) Produced by Twin Roll Casting Tech: *Onur Birbasar*[1]; Feyza Denizli[1]; Eda Özkaya[1]; Samet Sevinç[1]; Ali Ulus[1]; Canan nel[1]; [1]Asas Alüminyum San. ve Tic. A.S.

10:10 AM Break

10:25 AM
Novel Methods for Roll Texturing: EDT and Sandblast Applications for Aluminum Twin Roll Cast and Cold Rolling: *Yusuf Ozcetin*[1]; Onur Birbasar[1]; Ali Ulus[1]; Koray Dündar[1]; Feyza Denizli[1]; Canan nel[1]; [1]ASAS Aluminum I. Company

10:50 AM
Characterization of 8006 Aluminium Alloy Casted by TRC Technology with Steel-steel and Copper-copper Roll Pairs: *Feyza Denizli*[1]; Onur Birbasar[1]; Koray Dündar[1]; Ali Ulus[1]; Canan nel[1]; Yusuf Özçetin[1]; [1]Asas Aluminyum

11:15 AM
Tailoring the As-cast Microstructure of Twin-roll Cast AA3105 Alloy Produced by St/Cu Shell Pair: Cemil Isıksacan[1]; *Mert Gülver*[1]; Hikmet Kayacetin[1]; Onur Meydanoglu[1]; Erdem Atar[2]; [1]Assan Aluminum; [2]Gebze Technical University

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NUCLEAR MATERIALS

Ceramic Materials for Nuclear Energy Research and Applications — Advanced Ceramics for Nuclear Applications

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

Program Organizers: Walter Luscher, Pacific Northwest National Laboratory; Xian-Ming Bai, Virginia Polytechnic Institute and State University; Lingfeng He, North Carolina State University; Sudipta Biswas, Idaho National Laboratory; Simon Middleburgh, Bangor University

Wednesday AM | March 22, 2023
28B | SDCC

Session Chair: Walter Luscher, Pacific Northwest National Laboratory

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8:30 AM Invited
Relating Microstructural Evolution and Stoichiometry to Tritium Release from Ternary Lithium Ceramics: *David Senor*[1]; Andy Casella[1]; Weilin Jiang[1]; [1]Pacific Northwest National Laboratory

9:00 AM Invited
Emulation of Microstructures and Tritium Behavior in Lithium Aluminate by Ion Irradiation: *Weilin Jiang*[1]; Libor Kovarik[1]; Zihua Zhu[1]; Walter Luscher[1]; Andrew Casella[1]; David Senor[1]; [1]Pacific Northwest National Laboratory

9:30 AM
Low-temperature Fabrication of Ceramic Tritium Breeder Materials, for Enhanced Control of Microstructure and Phase Formation: *Enrique Casanas Montesdeoca*[1]; Amy Gandy[1]; Megan Leyland[2]; Lyndsey Mooring[2]; Rachel Strickland[2]; Colm O'Regan[1]; Rebecca Boston[1]; [1]The University of Sheffield; [2]United Kingdom Atomic Energy Authority

9:50 AM
Surface Modification Strategies for Hydrogen Retention in Hydride Moderators: *Reid Bohanon*[1]; Felipe Caliari[2]; Sanjay Sampath[2]; Erik Luther[3]; Stephen Raiman[1]; [1]Texas A&M University; [2]Stony Brook University; [3]Los Alamos National Laboratory

10:10 AM Break

10:30 AM Invited
Radiation Shielding Ceramics with Enhanced Performance and Scalability: *Samuel Humphry-Baker*[1]; [1]Imperial College London

11:00 AM Invited
High-entropy Carbide Ceramics: New Materials for Extreme Environments in Nuclear Energy Applications: *Bai Cui*[1]; Fei Wang[1]; Lanh Trinh[1]; Xueliang Yan[1]; Yongfeng Lu[1]; Kaustubh Bawane[2]; Zilong Hua[2]; Linu Malakkal[2]; Lingfeng He[2]; Cody Dennett[2]; [1]University of Nebraska-Lincoln; [2]Idaho National Laboratory

11:30 AM
Microstructural, Mechanical and Thermal Characterization of High Entropy Carbide Ceramics: *Kaustubh Bawane*[1]; Zilong Hua[1]; Linu Malakkal[1]; Fei Teng[1]; Jordan Hachtel[2]; Lanh Trinh[3]; Samuel Ruiz[3]; Fei Wang[3]; Yongfeng Lu[3]; Bai Cui[3]; Lingfeng He[1]; [1]Idaho National Laboratory; [2]Oak Ridge National Laboratory; [3]University of Nebraska Lincoln

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CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Characterization of Polymers, Composites, Coatings and Ceramics

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Wednesday AM | March 22, 2023
Aqua 313 | Hilton

Session Chairs: Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies, University of Jordan

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8:30 AM Introductory Comments

8:35 AM
Characterization of Natural Flax Fabric Impregnated with Shear Thickening Fluid of Silica Particles: *Matheus Ribeiro*[1]; Pedro Henrique Da Silveira[1]; Sergio Monteiro[1]; [1]Military Institute Of Engineering

8:55 AM
High Fidelity Explosive Mock Development for Dynamic Testing of New Generation Explosive Composites: *Alexandra Burch*[1]; Hugh Grennan[2]; David Bahr[2]; Bryce Tappan[1]; Caitlin Woznick[1]; John Yeager[1]; [1]Los Alamos National Laboratory; [2]Purdue University

9:15 AM
Mechanical Behavior of Functional Ceramic Nanomultilayers: *Danielle White*[1]; Edoardo Rossi[2]; Marco Sebastiani[2]; Andrea Hodge[1]; [1]University of Southern California; [2]"Roma TRE" University

9:35 AM
On the Correlation of Dynamic Compressive Failure and Fragmentation with Flaw Distributions in an Advanced Ceramic: *Arezoo Zare*[1]; Kshitiz Upadhyay[1]; Kevin Hu[1]; Elizabeth Hsieh[1]; Qi Rong Yang[2]; Kent Christian[2]; Jun Du[2]; Richard Haber[2]; Matthew Shaeffer[1]; K.T. Ramesh[1]; [1]Johns Hopkins University; [2]Rutgers University

9:55 AM Break

10:10 AM
Performance Study of 3D Printed Continuous Fiber-reinforced Composites: Xiaofang Liu[1]; *Anil Saigal*[1]; Michael Zimmerman[1]; [1]Tufts University

10:30 AM Concluding Comments

MATERIALS DESIGN

Computational Discovery and Design of Materials — Session V

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

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha Vermaak, Lehigh University

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Cobalt 502A | Hilton

Session Chairs: Sara Kadkhodaei, University of Illinois Chicago; Houlong Zhuang, Arizona State University

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8:30 AM
Designing High-Tc Superconductors with BCS-inspired Screening, Density Functional Theory and Deep-learning: *Kamal Choudhary*[1]; [1]National Institute of Standards and Technology

9:00 AM Invited
Bridging First-principles Calculations with Experiment: Insights from Case Studies on (Photo)Electrochemical Systems: *Wennie Wang*[1]; [1]University of Texas at Austin

9:30 AM
Machine Learning Assisted Discovery of Composite Solid-state Electrolytes in Context of Li-ion Batteries: *Hasan Muhammad Sayeed*[1]; Taylor D. Sparks[1]; [1]University Of Utah

9:50 AM
Design of Bistable Metamaterials for Desired Dynamic Behavior: *Hesaneh Kazemi*[1]; Brianna MacNider[1]; Jaeyub Hyun[1]; Nicholas Boechler[1]; H. Alicia Kim[1]; [1]University of California San Diego

10:10 AM Break

10:30 AM Invited
Closed Loop Computational Materials Discovery: *Raymundo Arroyave*[1]; Brent Vela[1]; Danial Khatamsaz[1]; Prashant Singh[2]; Duane Johnson[2]; Douglas Allaire[1]; [1]Texas A&M University; [2]Ames Lab

11:00 AM
Elucidating the Mechanisms for Fast Diffusion in Doped LLZO: *Juan Verduzco*[1]; Alejandro Strachan[1]; [1]Purdue University

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PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Process Modeling and Thermodynamics

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

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Session Chairs: Hesam Askari, University of Rochester; Naga Sri Harsha Gunda, The Ohio State University

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8:30 AM Invited
Effective Temperature Concept for Steady States in Driven Alloy Systems: *Pascal Bellon*[1]; Robert Averback[1]; Sourav Das[1]; [1]University of Illinois at Urbana-Champaign

9:00 AM
Energy: a Path Forward to Connect Radiation Damage Simulations and Experiments: *Charles Hirst*[1]; Rachel Connick[1]; Penghui Cao[2]; R. Scott Kemp[1]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]University of California Irvine

9:20 AM
An Efficient and Accurate Linear Spline Interpolation Method of Implementing CALPHAD Thermodynamics in Phase Field Models: Kartikey Joshi[1]; *Siu Sin Jerry*

Quek[1]; Yingzhi Zeng[1]; David Wu[1]; [1]Institute of High Performance Computing

9:40 AM
Development of Continuous Cluster Activation Method and Its Application to Grain Growth: *Ryo Yamada*[1]; Munekazu Ohno[1]; [1]Hokkaido University

10:00 AM Break

10:20 AM
Significance of Free Energy Contributions beyond Configurational Entropy in Superalloys and High Entropy Alloys: *Naga Sri Harsha Gunda*[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University

10:40 AM
Assessment of Spinodal Decomposition in Cr-W Based Smart and High-entropy Alloys from First-principles Modelling: *Duc Nguyen-Manh*[1]; Jan Wrobel[2]; Damian Sobieraj[2]; [1]UK Atomic Energy Authority; [2]Warsaw University of Technology

11:00 AM Invited
Data-driven Models of Plasticity and Thermodynamics: Discrete and Continuous State Spaces: *Thomas Swinburne*[1]; [1]CNRS CRCN, Aix-Marseille University

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MECHANICS & STRUCTURAL RELIABILITY

Deformation-induced Manipulation of Defect Structures and Hierarchical Microstructures — Session I

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

Program Organizers: Bharat Gwalani, North Carolina State Universtiy; Kester Clarke, Colorado School of Mines; Eric Lass, University of Tennessee-Knoxville; Vahid Tari, ATI - Allegheny Technologies Incorporated

Wednesday AM | March 22, 2023
Sapphire P | Hilton

Session Chairs: Bharat Gwalani, North Carolina State University; Vahid Tari, Allegheny Technologies Incorporated

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8:30 AM Invited
Processing Heterostructures Using Deformation Techniques: *Yuntian Zhu*[1]; [1]City University of Hong Kong

8:55 AM Invited
Nanostructural Hierarchy in Metallic Materials for Extended High Temperature Stability: *Subhashish Meher*[1]; Sourabh Kadambi[1]; Thomas Lillo[1]; [1]Idaho National Laboratory

9:15 AM
Exploiting Hydrogen Segregation Effects for Controlling Microstructure Evolution: *Haoxue Yan*[1]; C. Cem Tasan[1]; [1]Massachusetts Institute of Technology

9:35 AM
Microstructural Inelastic Deformation and Fracture Modes in Crystalline Materials: *M. Chen*[1]; Dongyue Xie,[2]; N. Li[2]; Mohammed Zikry[1]; [1]North Carolina State University; [2]Los Alamos National Laboratory

9:55 AM Invited
Under Pressure - Exploring the Synergy of High Pressure Deformation Mechanisms of Metals and Rocks: *Suveen Mathaudhu*[1]; [1]Colorado School of Mines

10:15 AM Break

10:35 AM Invited
Phase Stability in Alloys during Severe Plastic Deformation in the High Strain Limit: *Pascal Bellon*[1]; Robert Averback[1]; Yinon Ashkhenazy[2]; [1]University of Illinois at Urbana-Champaign; [2]Hebrew University of Jerusalem

11:00 AM Invited
Universal Trend in the Non-Equilibrium Evolution of Metastable Grain Boundaries at Extreme Conditions: *Yue Fan*[1]; [1]University of Michigan

11:20 AM
Role of Cold Sprayed Microstructure on Tensile and Fatigue Behavior for AA7075: *Christopher Williamson*[1]; Ning Zhu[1]; Arthur Webb[1]; Brian Jordon[2]; Luke Brewer[1]; [1]University of Alabama; [2]Baylor University

11:40 AM
Self-lubricating Ni-based Superalloy Composites Processed by Severe Plastic Deformation: *Manoel Kasalo*[1]; Sebastian Suarez[2]; Andrea Bachmaier[1]; [1]Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences; [2]Department of Materials Science, Campus D3.3, 66123 Saarbrücken, Germany

12:00 PM Invited
The Role of Deformation Induced Defects on Phase Evolution in High Entropy Alloys: Abhishek Sharma[1]; Sriswaroop Dasari[1]; Bharat Gwalani[1]; Mohan Sai Kiran Nartu[1]; Yao-Jen Chang[2]; Stephane Gorsse[3]; An-Chou Yeh[2]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]National Tsing Hua University; [3]University of Bordeaux

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MATERIALS PROCESSING

Deformation-induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies — Deformation Induced Microstructural Evolution III

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

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign; Suhas Eswarappa Prameela, Massachusetts Institute of Technology; Mostafa Hassani, Cornell University

Wednesday AM | March 22, 2023
29C | SDCC

Session Chair: Pascal Bellon, University of Illinois Urbana-Champaign

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8:30 AM Introductory Comments

8:35 AM Invited
Microstructural and Chemical Evolution of Frictional Contacts: *Izabela Szlufarska*[1]; [1]University of Wisconsin-Madison

9:05 AM
Crystal Plasticity Finite Element Modeling Integrated with Transformation Induced Plasticity of Metastable Austenitic Steel at Low Temperature: *Hyukjae*

Lee[1]; Tan Nguyen[2]; Jinwook Jung[1]; Sung-Tae Hong[2]; Myoung-Gyu Lee[1]; Heung Nam Han[1]; [1]Seoul National University; [2]University of Ulsan

9:25 AM
Impact of the Plastic Deformation Microstructure in Metals on the Kinetics of Recrystallization: A Phase-field Study: Ahmed Hamed[1]; Sreekar Rayaprolu[1]; Grethe Winther[2]; *Anter El-Azab*[1]; [1]Purdue University; [2]Technical University of Denmark

9:45 AM
Meshfree Simulation of Solid Phase Processing and Microstructure Analysis Using a Dislocation Density-based Constitutive Model: *Lei Li*[1]; Glenn Grant[1]; Ayoub Soulami[1]; [1]Pacific Northwest National Laboratory

10:05 AM Break

10:20 AM Invited
Crystal Plasticity Simulation of In-grain Microstructure and Microtexture Evolution during Large Deformation of IF-steel: Karo Sedighiani[1]; Konstantina Traka[2]; Martin Diehl[3]; Franz Roters[4]; Jilt Sietsma[2]; *Dierk Raabe*[4]; [1]Tata Steel; [2]Delft University of Technology; [3]KU Leuven; [4]Max-Planck-Institut für Eisenforschung

10:50 AM
An Integrated PRISMS Framework for Simulating Twinning/Detwinning in Mg and Mg alloys: *David Montiel*[1]; Mohammadreza Yaghoobi[1]; Brian Puchala[1]; Zhe Chen[1]; Tracy Berman[1]; Qianying Shi[1]; Anton Van der Ven[1]; Katsuyo Thornton[1]; Veera Sundararaghavan[1]; John Allison[1]; [1]University of Michigan

11:10 AM
An integrated Computational and Experimental Study of the Alloying Effects on Texture Evolution in Mg Alloys: *Tracy Berman*[1]; Ashley Bucsek[1]; Yanjun Lyu[1]; David Montiel[1]; Mohammadreza Yaghoobi[1]; Katsuyo Thornton[1]; Veera Sundararaghavan[1]; John Allison[1]; [1]University of Michigan

11:30 AM
Phase-field Model of Friction Stir Welding Recrystallization and Grain Growth: *Floyd Hilty*[1]; Jacob Bair[2]; [1]Pacific Northwest National Laboratory; [2]Oklahoma State University

11:50 AM Invited
Young Leaders International Scholar – JIM: Strong and Ductile Metastable Single-phase High-entropy Alloys: Design, Processing, and Mechanical Behaviors: *Daixiu Wei*[1]; [1]Tohoku University

12:20 PM
Three-dimensional Phase-field Simulation of Static Recrystallization in Aluminum Alloy Combined with Bayesian Data Assimilation: *Kota Matsumoto*[1]; Eisuke Miyoshi[1]; Yoshiki Mori[2]; Kishu Akiba[3]; Masato Ito[3]; Nobuhiro Kitahara[3]; Kenichi Yaguchi[3]; Akinori Yamanaka[1]; [1]Tokyo University of Agriculture and Technology; [2]MA Aluminum Corporation; [3]Mitsubishi Materials Corporation

NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Small Scale and In-situ Testing

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford

University

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Aqua 300AB | Hilton

Session Chairs: Jeffery Wheeler, FemtoTools AG; Eugen Rabkin, Technion

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8:30 AM Invited
Understanding Deformation Mechanisms in Ultrafine Grained Thin Films by Quantitative In Situ TEM Deformation: *Josh Kacher*[1]; [1]Georgia Institute of Technology

9:00 AM
Direct Measurement of Adhesion for Noble-metal Nanoparticles Using In Situ Transmission Electron Microscopy: Andrew Baker[1]; Sai Bharadwaj Vishnubhotla[1]; Sanjana Karpe[1]; Yahui Yang[1]; Goetz Veser[1]; *Tevis Jacobs*[1]; [1]University of Pittsburgh

9:20 AM
Anisotropy Characterization via Correlated Mechanical Microscopy and EBSD: *Jeffrey Wheeler*[1]; [1]Femto Tools Ag

9:40 AM
Challenges in Cross Sectional Nanoindentation of Multilayers in Modern Electronics: *Stanislav Zak*[1]; Megan Cordill[1]; [1]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

10:00 AM Break

10:20 AM Invited
3D Synchrotron Imaging of Mechanical Properties of Nanoscale Materials: *Marie-Ingrid Richard*[1]; Maxime Dupraz[1]; Corentin Chatelier[1]; Clément Atlan[1]; Sarah Yehya[2]; David Simonne[2]; Stéphane Labat[3]; Steven Leake[4]; Ewen Bellec[4]; Olivier Thomas[3]; Eugen Rabkin[5]; [1]CEA Grenoble; [2]Synchrotron SOLEIL; [3]IM2NP-CNRS; [4]ESRF; [5]Technion

10:50 AM
In Situ Nano-identation of a Pt Nanoparticle Coupled with Bragg Coherent X-ray Diffraction Imaging: *Sarah Yehya*[1]; Thomas Cornelius[2]; Marie-Ingrid Richard[3]; Felisa Berenguer[1]; Eugen Rabkin[4]; Olivier Thomas[2]; Stéphane Labat[2]; [1]Synchrotron SOLEIL; [2]AMU - CNRS; [3]CEA of Grenoble; [4]Technion Institute of Technology

11:10 AM
Recent Advances in Bragg Coherent Diffraction for Nanoscale Imaging of Strain: *Ross Harder*[1]; [1]Argonne National Laboratory

11:30 AM Invited
Mechanical Properties of Nanowires: From In-situ Experiments to High Throughout, Statistically-significant Testing: *Rodrigo Bernal*[1]; [1]University of Texas at Dallas

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ELECTRONIC MATERIALS

Electronic Packaging and Interconnection — Pb Free Solder Alloys II

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

Program Organizers: Kazuhiro Nogita, University of Queensland; Mohd Arif Mohd Salleh, Universiti Malaysia Perlis; Dan Li, Beijing University of Technology; David Yan, San Jose State University; Fan-Yi Ouyang, National Tsing Hua University; Patrick Shamberger, Texas A&M University; Tae-Kyu Lee, Cisco Systems;

Christopher Gourlay, Imperial College London; Albert T. Wu, National Central University

Wednesday AM | March 22, 2023
Sapphire E | Hilton

Session Chairs: Albert Wu, National Central University; Fan-Yi Ouyang, National Tsing Hua University

8:30 AM Introductory Comments

8:35 AM Invited
Effect of Joint Length Scale on Creep Deformation of Sn-rich Dissimilar Metallic Joints: *Praveen Kumar*[1]; Anwesha Kanjilal[1]; [1]Indian Institute of Science

9:00 AM
Properties of Sn-3wt%Ag-5wt%Cu Alloys with Cu6Sn5 Intermetallic Grain Refined by Mg: *Chi Ying Tan*[1]; Mohd Arif Anuar Mohd Salleh[1]; Xin Fu Tan[2]; Hideyuki Yasuda[3]; Norainiza Saud[1]; Tetsuro Nishimura[4]; Kazuhiro Nogita[2]; [1]CEGeoGTech; [2]NS CMEM; [3]Kyoto University; [4]Nihon Superior Co. Ltd

9:20 AM
Ball Drift in SnAgCu/SnBi Hydrid Joints during Thermal Cycling: *Jingwei Xian*[1]; R.J. Coyle[2]; L. Wentlent[3]; J. Wilcox[3]; Christopher Gourlay[1]; [1]Imperial College London; [2]Nokia Bell Labs; [3]Universal Instruments Corporation

9:40 AM
Effects of Different Surface Finish to the Microstructure and Properties of Sn-Ag Solder Joints: *Mohd Arif Anuar Mohd Salleh*[1]; Siti Farahnabilah Muhd Amli[1]; Mohd Izrul Izwan Ramli[1]; Mohd Mustafa Al Bakri Abdullah[1]; Mohd Sharizal Abdul Aziz[1]; Hideyuki Yasuda[1]; Jitrin Chaiprapa[1]; Kazuhiro Nogita[1]; [1]Universiti Malaysia Perlis

10:00 AM Break

10:20 AM
New Insights into the Nucleation and Growth of Ag3Sn Plates in Solder Joints: *Christopher Gourlay*[1]; Yi Cui[1]; Athanasios Zois[1]; [1]Imperial College London

10:40 AM
Thermomigration of Liquid Indium and Nickel Thin Film During Bonding Process: *Po-Hsun Yang*[1]; Fan-Yi OuYang[1]; [1]National Tsing Hua University

11:00 AM
The Effect of Ni Microalloying on the Microstructure Evolution of In-35wt.% Sn Solder Alloy: *May Shin Chang*[1]; Mohd Arif Anuar Mohd Salleh[1]; Dewi Suriyani Che Halin[1]; Hideyuki Yasuda[2]; Tetsuro Nishimura[3]; Kazuhiro Nogita[4]; [1]Centre of Excellence Geopolymer & Green Technology (CeGeoGTech); [2]Department of Materials Science and Engineering; [3]Nihon Superior Co. Ltd.; [4]Nihon Superior Centre for the Manufacture of Electronic Materials (NS CMEM)

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Aqueous and Atmospheric Corrosion I

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

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National

Laboratory; Brendy Rincon Troconis, University of Texas at San Antonio; Andrew Hoffman, GE Research; Xiaoyuan Lou, Purdue University

Wednesday AM | March 22, 2023
Sapphire 400A | Hilton

Session Chairs: Jenifer Locke, OSU; Xiaoyuan Lou, Auburn University

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8:30 AM Invited
Electrochemical Behavior of Laser Powder Bed Fusion FeCrAl Alloys: *Rupesh Rajendran*[1]; Rajnikant Umretiya[2]; Vipul Gupta[2]; Richard Blair[2]; Andrew Hoffman[2]; [1]Georgia Institute of Technology; [2]GE Global Research

9:00 AM Invited
Influence of Feedstock on Corrosion of Additively Manufactured 316L Stainless Steel: Venkata Bhuvaneswari Vukkuma[1]; Ahmed Darwish[1]; Steven Storck[2]; *Rajeev Gupta*[1]; [1]North Carolina State University; [2]Johns Hopkins University Applied Physics Laboratory

9:30 AM
Corrosion Mechanisms of Additively Manufactured 316L Stainless Steels in Chloride Solutions: *Thomas Voisin*[1]; Shohini Sen-Britain[1]; ShinYoung Kang[1]; Yuliang Zhang[1]; Zhen Qi[1]; Nathan Keilbart[1]; Penghao Xiao[2]; Seogkoo Cho[1]; Yakun Zhu[1]; Rongpei Shi[1]; Y. Morris Wang[3]; Roger Qiu[1]; Brandon Wood[1]; [1]Lawrence Livermore National Laboratory; [2]Dalhousie University; [3]University of California Los Angeles

9:50 AM
Local Corrosion Initiation Sites of Additively Manufactured Selective Laser Melted 316L Stainless Steel: *Alex Mirabal*[1]; Ilker Loza-Hernandez[1]; Daniel Hooks[1]; Jamie Stull[1]; [1]Los Alamos National Laboratory

10:10 AM Break

10:30 AM
Localized Corrosion of Additively Manufactured Stainless Steel in Atmospheric Environments: *Peter Renner*[1]; Erin Karasz[1]; Kasandra Escarcega-Herrera[1]; Michael Heiden[1]; Michael Melia[1]; [1]Sandia National Laboratories

10:50 AM
Structure and Semiconducting Properties of the Passive Film Formed on Additively Manufactured 316L Stainless Steel: *Gary Halada*[1]; Jason Trelewicz[1]; Mingxi Ouyang[1]; Nylette Lopez[1]; Jurek Sadowski[2]; Ryan Hulchanski[3]; [1]Stony Brook University; [2]Brookhaven National Laboratory; [3]Clarkson University

11:10 AM
Corrosion Behavior of 7050 and 7075 Aluminum Alloys Processed through Reactive Additive Manufacturing: Vikrant Beura[1]; *Antriksh Sharma*[1]; Yashaswini Karanth[1]; Kiran Solanki[1]; [1]Arizona State University

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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

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; XiaoXiang Yu, Novelis Global Research Center; 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); Gerald Frankel, Ohio State University; ShinYoung Kang, Lawrence Livermore National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Wednesday AM | March 22, 2023
Sapphire 410A | Hilton

Session Chairs: Chris Weinberger, Colorado State University; Lin Li, University of Alabama

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8:30 AM Invited
Atomistic Exploration of Light-weight Refractory High Entropy Alloys by Promoting Short-range Chemical Order Using a Machine Learning Potential: Yao Yi[1]; Xiaoxiang Yu[2]; Qiang Zhu[3]; *Lin Li*[1]; [1]University of Alabama; [2]Novelis Global Research Center; [3]University of Nevada, Las Vegas

8:50 AM
Enabling Oxidation-resistant Refractory Complex, Concentrated Alloys via a Machine Learning for Accelerated Materials Discovery Framework: *Michael Titus*[1]; Sharmila Karumuri[1]; Saswat Mishra[1]; Vincent Mika[1]; Collin Scott[1]; Austin Hernandez[1]; Nimish Awalgaonkar[1]; Kenneth Sandhage[1]; Ilias Bilionis[1]; Alejandro Strachan[1]; [1]Purdue University

9:10 AM Invited
High-Throughput Computation of Short-Range Order Types in MPEA Alloys: *Christopher Wolverton*[1]; [1]Northwestern University

9:30 AM
Modeling Element-resolved Dissolution of Compositionally Complex Alloys in Aqueous Environments: Kang Wang[1]; *Bi-Cheng Zhou*[1]; [1]University of Virginia

9:50 AM
Modelling the Interactions of Zirconium Hydrides: Alireza Tondro[1]; Brooke Bidyk[1]; Ivan Ho[1]; *Hamidreza Abdolvand*[1]; [1]University of Western Ontario

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CORROSION

Environmentally Assisted Cracking: Theory and Practice — Hydrogen Embrittlement II

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

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies, Inc.; Jenifer Locke, Ohio State University

Wednesday AM | March 22, 2023
Sapphire 410B | Hilton

Session Chairs: C. Tasan, Massachusetts Institute of Technology; Tom Depover, Ghent University

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8:30 AM Invited
Hydrogen Embrittlement in Alloys with Metastable Phases: *C. Tasan*[1]; Menglei Jiang[1]; Michela Geri[1]; Hyun Oh[1]; [1]Massachusetts Institute of Technology

9:00 AM
Hydrogen Effects on Mechanical and Toughness Properties of Pipeline Steels: *Xin Pang*[1]; Su Xu[1]; [1]CanmetMATERIALS, Natural Resources Canada

9:20 AM
Some Antagonist Processes of Hydrogen/Plasticity Interaction in fcc Metal Alloys: The Effect of Ni3Al Precipitate State on Nickel Base Alloys: Siva Prasad Murugan[1]; Nadjib Iskounen[1]; Marie Landeiro Dos Reis[1]; Jamaa Bouhattate[1]; Abdelali Oudriss[1]; *Feaugas Xavier*[2]; [1]LaSIE; [2]Lasie Cnrs Umr73

9:40 AM
Effect of Nickel and Chromium Contents on Hydrogen Embrittlement of High Strength Bolt Steel for Offshore Plants: *Byungrok Moon*[1]; Sourav Saha[1]; Jimin Nam[1]; Changhoon Lee[2]; Junho Chung[3]; Namhyun Kang[1]; [1]Pusan National University; [2]Korea Institute of Materials Science; [3]Hyundai-Steel

10:00 AM Break

10:20 AM Invited
Evaluation of the Responsible Hydrogen Embrittlement Mechanism in Martensitic Steels by Advanced Microstructural Characterization: *Tom Depover*[1]; Kim Verbeken[1]; Margot Pinson[1]; [1]Ghent University

10:50 AM
A Unified Fracture Criterion in Consideration of Hydrogen Effect in Martensitic Steel Sheet: *Geonjin Shin*[1]; Hyejin Kim[2]; Chanyang Kim[3]; Kijeong Kim[2]; Seungchae Yoon[2]; Myoung-Gyu Lee[1]; [1]Seoul National University; [2]Hyundai-Steel; [3]Korea Institute of Materials Science

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MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Cyclic Plastic Localization, Crack Nucleation, and Propagation II

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

Wednesday AM | March 22, 2023
Sapphire H | Hilton

Session Chair: J.C. Stinville, University of Illinois at Urbana-Champaign

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8:30 AM
Fatigue and Inclusions in NiTi Shape Memory Alloy: High-magnification Observations of Damage and Crack Formation at Particle/Void Assemblies: *Nathan Rendon*[1]; William LePage[1]; [1]University of Tulsa

8:50 AM
Role of Non-Metallic Inclusions in the Fatigue Behavior of Superelastic Nitinol: *Parisa Shabani Nezhad*[1]; Jacob Rusch[1]; John Moore[1]; Dinc Erdeniz[2]; [1]Marquette University; [2]University of Cincinnati

9:10 AM
On Fatigue Crack Initiation with Fine Granular Area in Metal Matrix without Defect during Very High Cycle Fatigue: *Guocai Chai*[1]; [1]Alleima

9:30 AM
Effects of Frequency and Dwell on the Fatigue Crack Propagation in Single Crystal Ni-based Superalloy CMSX-4 at Intermediate Temperatures: *Jospeh Doyle*[1]; Angelos Evangelou[2]; Nong Gao[1]; Edward Saunders[3]; Jane Woolrich[3]; Mark Hardy[3]; Philippa Reed[1]; [1]University of Southampton; [2]University of Cyprus; [3]Rolls Royce

9:50 AM
Investigation of the Impact of Residual Stresses on Short Crack Propagation in Martensitic Spring Steel: *Anna Wildeis*[1]; Matthias Thimm[1]; Hans-Jürgen Christ[1]; Robert Brandt[1]; Claus-Peter Fritzen[1]; [1]University of Siegen

10:10 AM Break

10:25 AM Invited
Deformation Mechanisms of CoCrNi and CoCrFeMnNi MPEAs under Low-cycle Fatigue Loading: Comparison and Correlation with Lifetime: Kaiju Lu[1]; Ankur Chauhan[1]; Aditya Srinivasan Tirunilai[1]; Alexander Kauffmann[1]; Martin Heilmaier[1]; Mike Schneider[2]; Guillaume Laplanche[2]; Jens Freudenberger[3]; *Jarir Aktaa*[1]; [1]Karlsruhe Institute of Technology; [2]Ruhr-Universität Bochum; [3]Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden)

10:45 AM
Characterization of Low-Cycle Fatigue Deformation Behavior at RT/200 °C of FeMnAlC Lightweight Steel for Low-Pressure Turbine Blade: *Uiseok Ko*[1]; Chi-Won Kim[1]; Sung-Jun Park[2]; Hyun-Uk Hong[1]; [1]Changwon National University; [2]Korea Institute of Materials Science

11:05 AM
Correlation Between Microstructure and Fatigue Properties of Complex-phase Steel: *Nader Heshmati*[1]; Peter Hedström[1]; Annika Borgenstam[1]; Henrik Sieurin[2]; Joachim Larsson[3]; [1]KTH; [2]Scania CV AB; [3]SSAB

11:25 AM
The Influence of Ex-service Steel Turbine Blade Microstructural Variability on Fatigue Behaviour and Lifetime Extension Approaches: *Ara Khodavirdi*[1]; Philippa Reed[1]; Andrew Hamilton[1]; [1]University of Southampton

11:45 AM
Defect Tolerance of Cu Alloyed and Precipitation Hardened Steels with Different C Contents: *David Goerzen*[1]; Hannah Schwich[2]; Bastian Blinn[1]; Wolfgang Bleck[2]; Tilmann Beck[1]; [1]TU Kaiserslautern; [2]RWTH Aachen University

12:05 PM
Mitigating Localized Plastic Strain Accumulation in Cyclic Loading of Polycrystalline Shape Memory Ceramics: A Phase-field Study: *Amirreza Lotfolahpour*[1]; Mohsen Asle Zaeem[1]; [1]Colorado School of Mines

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MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Spot Technologies

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Wednesday AM | March 22, 2023
29A | SDCC

Session Chairs: Axel Meyer, RIFTEC GmbH; Josef Cobb, NASA Marshall Space Flight Center

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8:30 AM
Joining of High Strength Low Ductility AA7055 by Friction Self-piercing Rivet: Yong Chae Lim[1]; Hui Huang[1]; Yiyu Wang[1]; *Yuan Li*[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

8:50 AM
2D Axisymmetric Modeling of RFSSW Repair and Experimental Validation: *Evan Berger*[1]; Michael Miles[1]; Yuri Hovanski[1]; Paul Blackhurst[1]; Andrew Curtis[1]; Ruth Belnap[1]; [1]Brigham Young University

9:10 AM
Production Evaluation of Refill Friction Stir Spot Welding: *Ruth Belnap*[1]; Paul Blackhurst[1]; Andrew Curtis[1]; Heath Misak[2]; Josef Cobb[3]; Yuri Hovanski[1]; [1]Brigham Young University; [2]Spirit AeroSystems, Inc.; [3]NASA - MSFC

9:30 AM
Numerical Simulation of the FSSW Process for Aluminum Alloys 5082-O, 6082-T6 and 7075-T6: Mikhail Ozhegov[1]; *Mark Belousov*[1]; Pavel Uporov[1]; Karolina Vladova[1]; [1]St. Petersburg Polytechical University

9:50 AM Break

10:10 AM
Embedded Anchoring of Multi-material Assemblies by Friction Riveting Process: Hrishikesh Das[1]; Keerti Kappagantula[1]; *Abhinav Srivastava*[1]; Piyush Upadhyay[1]; Jorge F Dos Santos[1]; Md Reza-E-Rabby[1]; [1]Pacific Northwest National Laboratory

10:30 AM Invited
Effect of Welding Parameters on Microstructure and Mechanical Properties of Friction Stir Lap Welds of an Ultrahigh Strength Steel: Yutaka Sato[1]; Shunsuke Mimura[1]; *Shun Tokita*[1]; Yusuke Yasuda[2]; Akihiro Sato[2]; Satoshi Hirano[2]; [1]Tohoku University; [2]Hitachi

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MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — Additive Manufacturing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University;

Damien Tourret, IMDEA Materials Institute

Wednesday AM | March 22, 2023
28E | SDCC

Session Chairs: Charles-André Gandin, Mines ParisTech; Lindsay Greer, University of Cambridge

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8:30 AM Invited
The Development of Grain Structure During Additive Manufacturing: A. Chadwick[1]; A. Birnbaum[1]; J.G. Santos Macias[2]; J. Steuben[3]; I. Athanasios[3]; J. Michopoulos[3]; G. Wagner[1]; M.V. Upadhyay[2]; *Peter Voorhees*[1]; [1]Northwestern University; [2]Ecole Polytechnique, Institut Polytechnique de Paris; [3]Naval Research Laboratory

9:00 AM Invited
Phase Field Study Rapid Solidification during Additive Manufacturing of SX Sample: *Ingo Steinbach*[1]; Murali Uddagiri[1]; [1]Ruhr-University Bochum

9:30 AM
Development of a Multi-phase-field Framework for Powder Bed Fusion Additive Manufacturing: *Tomohiro Takaki*[1]; Shinji Sakane[1]; [1]Kyoto Institute of Technology

9:50 AM
Growth Competition between Columnar Dendritic Grains under Additive Manufacturing Conditions: *Elaheh Dorari*[1]; Kaihua Ji[1]; Adriana Castellanos[2]; Alec Saville[2]; Oliver Hesmondhalgh[2]; Joe McKeown[3]; Amy Clarke[2]; Alain Karma[1]; [1]Northeastern University; [2]Colorado School of Mines; [3]Lawrence Livermore National Laboratory

10:10 AM Break

10:30 AM Invited
Nucleation Burst in Additively Manufactured Inconel 718: *Julien Zollinger*[1]; Ivan Cazic[1]; Thomas Schenk[1]; Michael Engstler[2]; Benoît Appolaire[1]; [1]Universite De Lorraine; [2]Universität des Saarlandes

11:00 AM Invited
Modelling and Validating Solidification Kinetics during Additive Manufacturing: *Peter Lee*[1]; Chu Lun Alex Leung[1]; [1]University College London

11:30 AM Invited
Rationalization of the Modelling of Stress and Strain Evolution in Powder Bed Fusion Additive Manufacturing – A Perspective from a Background in the Simulation of Casting Processes: *Steve Cockcroft*[1]; [1]University of British Columbia

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NANOSTRUCTURED MATERIALS

Functional Nanomaterials 2023 — Session V

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

Program Organizers: Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Mostafa Bedewy, University of Pittsburgh; Woochul Lee, University of Hawaii at Mnoa; Changhong Cao, McGill University; Kiyo Fujimoto, Idaho National Laboratory; Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

Wednesday AM | March 22, 2023
Aqua 305 | Hilton

Session Chairs: Yong Lin Kong, University of Utah; Mostafa Bedewy, University of Pittsburgh; Kiyo Fujimoto, Idaho National Laboratory

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8:30 AM Invited
Matrix Assisted Pulsed Laser Evaporation of Functional Biomaterials: *Roger Narayan*[1]; [1]University of North Carolina

9:00 AM Invited
Printed Sensors for Monitoring Soil and Plant Conditions: *Gregory Whiting*[1]; [1]University of Colorado Boulder

9:30 AM Keynote
Semiconductor Nanomaterials and 3D Systems: *John Rogers*[1]; [1]Northwestern University

10:10 AM Break

10:30 AM Keynote
Functional Mixed-dimensional van der Waals Heterostructures: *Mark Hersam*[1]; [1]Northwestern University

11:10 AM Keynote
Skin-interfaced Wearable Bioelectronics: *Wei Gao*[1]; [1]California Institute of Technology

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CHARACTERIZATION

Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties — Gradient and Nano-twinned Materials

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

Program Organizers: Yuntian Zhu, City University of Hong Kong; Kei Ameyama, Ritsumeikan University; Irene Beyerlein, University of California, Santa Barbara; Yuri Estrin, Monash University; Huajian Gao, Nanyang Technological University; Ke Lu, Institute of Metal Research; Suveen Mathaudhu, Colorado School of Mines; Xiaolei Wu, State Institute of Mechanics, Chinese Academy of Sciences

Wednesday AM | March 22, 2023
Aqua 314 | Hilton

Session Chairs: Darcy Hughes, Sandia National Laboratories; Gianna Valentino, John Hopkins Applied Physics Lab

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8:30 AM Invited
Gradient Bulk Nanostructures with Exceptional Strength via High Load Sliding: *Darcy Hughes*[1]; [1]Sandia National Labs (ret.)

9:00 AM
Defect-interface Interactions and Nanomechanical Behavior of 3D interfaces in Ti/Nb Nanolaminates: *Mauricio De Leo*[1]; Justin Cheng[1]; Shuozhi Xu[2]; Jon Baldwin[3]; Irene Beyerlein[4]; Nathan Mara[1]; [1]University of Minnesota; [2]University of Oklahoma; [3]Los Alamos National Lab; [4]University of California, Santa Barbara

9:20 AM
Influence of Strain Gradients in Heterostructured Nanomaterials: *Daniel Goodelman*[1]; Andrea Hodge[1]; [1]University of Southern California

9:40 AM Invited
Ultrahigh Strength and Strain Localizations in Nanotwinned Ni-Mo-W Alloys: *Gianna Valentino*[1]; [1]Johns Hopkins Applied Physics Laboratory

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ADVANCED MATERIALS

High Performance Steels — Processing - Mechanical Property Relationships I

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

Wednesday AM | March 22, 2023
Aqua F | Hilton

Session Chairs: Jonah Klemm-Toole, Colorado School of Mines; Amit Behera, Questek Innovations

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8:30 AM
Grain Growth and Precipitation Dissolution Modelling in the HAZ during Welding of Nb-Ti Steels: Iñigo Iturrioz[1]; Nerea Isasti[1]; Jose Rodriguez-Ibabe[1]; *Pello Uranga*[1]; Nobuyuki Ishikawa[2]; Daichi Izumi[2]; Douglas Stalheim[3]; David Jarreta[4]; David Martin[4]; [1]CEIT and TECNUN (University of Navarra); [2]JFE Steel Corporation; [3]DGS Metallurgical Solutions; [4]CBMM Asia

8:50 AM
Investigating the Roles of Microstructure on High-temperature Creep Responses of Steels: *Mariyappan Arul Kumar*[1]; Ricardo Lebensohn[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

9:10 AM
Tensile Properties and Microstructures Development of Quenching and Partitioning (Q&P) Steels during Galvannealing Process: *Lei Chen*[1]; Kyeong Sik Shin[1]; Han Sol Maeng[1]; Chun Ku Kang[1]; [1]Hyundai Steel

9:30 AM
The Role of Prior Austenite Grain Boundaries in Liquid Metal Embrittlement of B-added TBF Steels: *Elahe Akbari*[1]; Philipp Kürnsteiner[1]; Heiko Groiss[1]; Martin Arndt[2]; Martin Gruber[2]; Katharina Steineder[2]; Robert Sierlinger[2]; [1]Christian Doppler Laboratory for Nanoscale Phase Transformations, Center for Surface and Nanoanalytics, Johannes Kepler University; [2]voestalpine Stahl GmbH

9:50 AM Break

10:10 AM
Microstructure Evolution and Zinc Infiltration in an Advanced High-strength-Steel during Liquid-metal Embrittlement: *Yuki Ikeda*[1]; Hsu-Chih Ni[2]; Anirban Chakraborty[3]; Hassan Ghassemi-Armaki[4]; Jian-Min Zuo[2]; Reza Darvishi Kamachali[1]; Robert Maaß[5]; [1]Federal Institute of Materials Research and Testing (BAM); [2]University of Illinois Urbana-Champaign; [3]ArcelorMittal Global Research and Development; [4]General Motors R&D; [5]Federal Institute of Materials Research and Testing (BAM), University of Illinois Urbana-Champaign

10:30 AM
New Tensile Specimens Optimized to Characterize the Localized PRW Weld Areas of ODS Steels: *Mohamed Mabrouki*[1]; Diogo Gonçalves[1]; Serge Pascal[1]; Denis Bertheau[2]; Gibert Henaff[2]; Angéline Poulon-Quintin[3]; [1]Service d´Etudes Mécaniques et Thermiques (SEMT), CEA, Université Paris-Saclay, Gif-Sur-Yvette, France; [2]Institut Pprime UPR 3346 ENSMA CNRS Université de Poitiers, F-86361 Futuroscope Chasseneuil, France; [3]Université de Bordeaux, CNRS, Bordeaux INP, ICMCB, UMR 5026, F-33600 Pessac, France

10:50 AM
High Strength and Toughness Combination in Severe Plastically Deformed Martensitic and Austenitic Steels: *Cafer Melik Ensar Acemi*[1]; Matthew Vaughan[1]; Sezer Picak[1]; Robert Barber[1]; Ibrahim Karaman[1]; [1]Texas A&M University

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MATERIALS DESIGN

Hume-Rothery Symposium on First-Principles Materials Design — Interface First-principle Method with Experiments I

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

Program Organizers: Bin Ouyang, Florida State University; Mark Asta, University of California, Berkeley; Geoffroy Hautier, Dartmouth College; Wei Xiong, University of Pittsburgh; Anton Van der Ven, University of California, Santa Barbara

Wednesday AM | March 22, 2023
Cobalt 501C | Hilton

Session Chairs: Hailong Chen, Georgia Institute of Technology; Raphaele Clement, University of California, Santa Barbara

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8:30 AM Invited
Predicting Synthesis and Synthesizability Beyond the DFT Convex Hull: *Wenhao Sun*[1]; [1]University of Michigan

9:00 AM Invited
New Battery Chemistry from Conventional Layered Cathode Materials for Advanced Lithium-ion Batteries: *Ki Suk Kang*[1]; [1]Seoul National University

9:30 AM Invited
Dynamic Stability Design of Materials for Solid-state Batteries: *Xin Li*[1]; [1]Harvard University

10:00 AM Break

10:20 AM Invited
Establishing Links between Synthesis, Defect Landscape, and Ion Conduction in Halide-type Solid Electrolytes: *Raphaele Clement*[1]; [1]University of California, Santa Barbara

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LIGHT METALS

Light Elements Technology — Light Elements: Hydrogen, Boron, Carbon

Sponsored by: TMS Light Metals Division

Program Organizers: Neale Neelameggham, IND LLC; Kiran Solanki, Arizona State University; Prashanth Saraswat, Department of Metallurgy; Huimin Lu, Beijing Ofikintai Technology Co Ltd.; Onuralp Yucel, Istanbul Technical University

Wednesday AM | March 22, 2023
30D | SDCC

Session Chairs: Onuralp Yucel, Istanbul Institute of Technology; Kiran Solanki, Arizona State University

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8:30 AM Introductory Comments by Neale Neelameggham

8:35 AM Keynote
Thoughts on the Role of Light Elements as Alternative Reductants in Major Ferroalloy Production: *Joalet Steenkamp*[1]; [1]University of the Witwatersrand

9:15 AM
Three Light Elements-Carbon-Hydrogen-Oxygen Make the Material World: Neale Neelameggham[1]; Praveen Kalamegham[1]; Ganesan Subramanian[2]; Sundaresan Asokan[3]; K.S. Raja[4]; *Onuralp Yucel*[5]; [1]IND LLC; [2]Sai Systems; [3]Independent Geo Consultant; [4]Vyzag BioEnergy Fuel Ltd.; [5]Istanbul Technical University

9:35 AM
Spark Plasma Sintered Boron Carbide Ceramic Armor: *Besim Dara*[1]; Gamze Sapancı[1]; [1]ROKETSAN Mssiles Inc.

9:55 AM Break

10:10 AM
Utilizing of Tincal Ore Wastes in Ceramic Industry: Levent Özmen[1]; Yldz Yıldırım[2]; Dilek Baolu[3]; *Onuralp Yücel*[4]; [1]MEF University; [2]Kaleseramik; [3]Termal Seramik; [4]Istanbul Technical University

10:30 AM
Spark Plasma Sintering and Characterization of B4C- ZrB2 Composites: *Leyla Yanmaz*[1]; Filiz Cinar Sahin[1]; [1]Istanbul Technical University

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CORROSION

Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion — Session V

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

Program Organizers: Penghui Cao, University of California, Irvine; Yang Yang, Pennsylvania State University; Fadi Abdeljawad, Clemson University; Irene Beyerlein, University of California, Santa Barbara; Enrique Lavernia, University of California, Irvine; Robert Ritchie, University of California, Berkeley

Wednesday AM | March 22, 2023
Sapphire 411A | Hilton

Session Chairs: Blas Uberuaga, Los Alamos National Laboratory; Xiaoqing Pan, University of California, Irvine; Yang Yang, The Pennsylvania State University;

Penghui Cao, University of California, Irvine

8:30 AM Invited
Direct Observation of Local Ordering and Charge Distribution in High Entropy Oxides: Lei Su[1]; Huaixun Huyan[1]; Abhishek Sarkar[2]; Wenpei Gao[1]; Xingxu Yan[1]; Christopher Addiego[1]; Robert Kruk[2]; Horst Hahn[2]; *Xiaoqing Pan*[1]; [1]University of California Irvine; [2]Karlsruhe Institute of Technology

9:00 AM Invited
Characterizing Local Order in Disordered Materials: Shuoyuan Huang[1]; Carter Francis[1]; *Paul Voyles*[1]; [1]University of Wisconsin

9:30 AM Invited
Chemical and Structural Disorder for Tuning Properties of Materials: *Horst Hahn*[1]; [1]Karlsruhe Institute of Technology

10:00 AM Break

10:15 AM Invited
Disorder and Transport in Irradiated Complex Oxides: *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory

10:45 AM Invited
Long- and Short-range Ordering versus Disordering in Compositionally Complex Fluorite-based Oxides: *Jian Luo*[1]; [1]University of California, San Diego

11:15 AM
Short Range Order in Disordered Spinel and the Impact on Cation Vacancy Transport: *Peter Hatton*[1]; Blas Uberuaga[1]; [1]Los Alamos National Lab

11:35 AM Invited
Molten Salt Corrosion of Ni-20Cr Model Alloy: *Lingfeng He*[1]; Kaustubh Bawane[2]; Xiaoyang Liu[3]; Fei Teng[2]; Weiyue Zhou[4]; Laura Hawkins[2]; Trishelle Copeland-Jonson[2]; Yachun Wang[2]; Michael Woods[2]; Ruchi Gakhar[2]; Daniel Murray[2]; Phillip Halstenberg[5]; Karen Chen-Wiegart[3]; Shannon Mahurin[5]; Sheng Dai[5]; Michael Short[4]; Lin Shao[6]; Simon Pimblott[2]; James Wishart[7]; [1]North Carolina State University; [2]Idaho National Laboratory; [3]Stony Brook University; [4]Massachusetts Institute of Technology; [5]Oak Ridge National Laboratory; [6]Texas A&M University; [7]Brookhaven National Laboratory

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LIGHT METALS

Magnesium Technology 2023 — Primary Production and Recycling / Alloy Development

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

Program Organizers: Steven Barela, Terves, Inc; Aeriel Murphy-Leonard, Ohio State University; Petra Maier, University of Applied Sciences Stralsund; Neale Neelameggham, IND LLC; Suveen Mathaudhu, Colorado School of Mines; Victoria Miller, University of Florida

Wednesday AM | March 22, 2023
30C | SDCC

Session Chair: Aaron Palumbo, Big Blue Technologies

8:30 AM
Design of the Continuous Gravity-driven Multiple Effect Thermal System (G-METS) for Efficient Low-cost Magnesium Recycling: *Daniel Mc Arthur Sehar*[1]; Adam Powell[1]; Armaghan Telgerafchi[1]; Chinenye Chinwego[1]; Gabriel Espinosa[1]; Keira Lynch[1]; Benjamin Perrin[1]; [1]Worcester Polytechnic Institute

8:50 AM Invited
Development of Compound-vertical-retort Technology for Magnesium Production and its Application: Fengqin Liu[1]; Shaojun Zhang[2]; Rongbin Li[1]; Peixu Yang[2]; Jinhui Liu[2]; *Michael Ren*[3]; [1]University of Science and Technology Beijing; [2]Zhengzhou University; [3]Sunlightmetal Consulting Inc.

9:10 AM
Development of Magnesium-Strontium / Calcium (Mg-Sr/Ca) Based Alloys with Improved Sinterability for Next Generation Biomedical Implants: *Mert Celikin*[1]; Ava Azadi[1]; Hyeonseok Kim[1]; Ted Vaughan[2]; Eoin O'Cearbhaill[1]; [1]University College Dublin; [2]University of Galway

9:30 AM
Development of Mg-based Superelastic Alloy through Aging Heat Treatment: *Keisuke Yamagishi*[1]; Yukiko Ogawa[2]; Daisuke Ando[1]; Yuji Sutou[1]; [1]Tohoku University; [2]National Institute for Materials Science

9:50 AM
Processing Map and Performance of a Low-cost Wrought Mg Alloy: ZAXEM11100: *Thomas Avey*[1]; Josh Caris[2]; Jiashi Miao[1]; Anil Sachdev[3]; Alan Luo[1]; [1]Ohio State University; [2]Terves Inc; [3]General Motors

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NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Impurity Effects on Molten Salt Properties and Corrosion

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

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

Wednesday AM | March 22, 2023
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Session Chair: Michael Short, MIT

8:30 AM Invited
Elucidating the Role of UCl3 in the Corrosion Mechanism of Ni-based Superalloys Exposed to Chloride Molten Salts: *Trishelle Copeland-Johnson*[1]; Michael Woods[1]; Ruchi Gakhar[1]; Daniel Murray[1]; Guoping Cao[1]; Lingfeng He[1]; [1]Idaho National Laboratory

9:00 AM
Ab Initio Molecular Dynamics Study of Thermophysical for High-temperature NaCl-PuCl3 System: *Kai Duemmler*[1]; Michael Woods[2]; Ruchi Gakhar[2]; Benjamin Beeler[1]; [1]North Carolina State University; [2]Idahol National Laboratory

9:20 AM
Characterization of UCl3, NaCl, and NaCl- 0.352 UCl3 Salts using Neutron Scattering: *Sven Vogel*[1]; A. David R. Andersson[1]; Marisa M. Monreal[1]; J. Matthew Jackson[1]; S. Scott Parker[1]; Gaoxue Wang[1]; Ping Yang[1]; [1]Los Alamos National Laboratory

9:40 AM
Coordination and Thermophysical Properties of Transition Metal Chlorocomplexes and Lanthanides in LiCl-KCl: *Qi An*[1]; [1]Iowa State University

10:00 AM Break

10:20 AM
The Behavior of Oxygen in Molten Fluoride Corrosion Systems: *Weiyue Zhou*[1]; Yang Yang[2]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Pennsylvania State University

10:40 AM
Effect of Impurities on Material Behavior in Molten FLiNaK: *Krishna Moorthi Sankar*[1]; Preet Singh[1]; [1]Georgia Institute of Technology

11:00 AM
Electrochemical Thermodynamic and Kinetic Properties of Ni^{2+} in Molten FLiNaK Salt: *Hojong Kim*[1]; Nathan Smith[1]; Zi-Kui Liu[1]; Shunli Shang[1]; [1]Pennsylvania State University

11:20 AM
Acid/base Effects on Chromium Species in Molten Fluoride Salts: *Haley Williams*[1]; Ruben Cho[1]; Raluca Scarlat[1]; [1]University of California Berkeley

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MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — Kinetics

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

Wednesday AM | March 22, 2023
Sapphire L | Hilton

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

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8:30 AM Invited
About 25 Years of Diffusion-multiple Experiments as Input to CALPHAD: *Ji-Cheng Zhao*[1]; [1]University of Maryland

9:00 AM Invited
Selected Observations in Magnesium Alloys: From Diffusion Couples to Laser Powder Bed Fusion: *Yongho Sohn*[1]; [1]University of Central Florida

9:30 AM Invited
Additive Manufacturing of Steels – Application of Computational Thermodynamics and Kinetics to Alloy Development: *Greta Lindwall*[1]; Chia-Ying Chou[1]; Hans-Henrik König[1]; Niklas Holländer Pettersson[1]; Chrysoula Ioannidou[1]; Ethan Sullivan[1]; [1]KTH Royal Institute of Technology

10:00 AM Break

10:20 AM Invited
High Temperature Creep Induced Phase Transformation in Austenitic Stainless Steels: *Guocai Chai*[1]; Joakim Odqvist[2]; [1]Alleima; [2]KTH

10:50 AM Invited
Materials Modelling for Metals Processing: Jianguo Lin[1]; *Zhusheng Shi*[1]; [1]Imperial College London

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MATERIALS PROCESSING

Materials Processing Fundamentals — Continuous Casting/Slag and Ladle Treatment

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus Consulting; Alexandra Anderson, Gopher Resource; Adrian Sabau, Oak Ridge National Laboratory

Wednesday AM | March 22, 2023
29B | SDCC

Session Chairs: Adrian Sabau, Oak Ridge National Laboratory; Alexandra Anderson, Gopher Resource

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8:30 AM Introductory Comments

8:35 AM
Heat Transfer Characteristic between Ingot and Mold during an Ingot Casting Process: *Yuta Shimamura*[1]; Takanori Yoshioka[1]; [1]Sanyo Special Steel Co.,Ltd.

8:55 AM
How to Prevent Porosity Defects in Steel Casting Component: *Izudin Dugic*[1]; [1]Linnaeus University

9:15 AM
A Self-adaptive Data-driven System for Online Monitoring of Castability During Continuous Casting of Steels.: *Kuthe Sudhanshu*[1]; Björn Glaser[1]; Roman Rössler[2]; Izaskun Alonso Oña[3]; [1]KTH Royal Institute of Technology; [2]Voestalpine Stahl GmbH; [3]Research and Development, Sidenor

9:35 AM
Toward Meso-scale Modelling of Slag Foaming Phenomena in Pyrometallurgy: *Quinn Reynolds*[1]; Oliver Oxtoby[2]; [1]Mintek; [2]ENGYS Ltd

9:55 AM Break

10:15 AM
Effect of High FeOx Containing Material Dissolution in Hisarna Slag: *Bharath Sampath Kumar*[1]; Koen Meijer[2]; Zushu Li[1]; [1]University of Warwick; [2]Tata Steel EU

MATERIALS PROCESSING

Materials Research in Reduced Gravity — General / Solidification (Analogues)

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

Program Organizers: Wilhelmus Sillekens, European Space Agency; Michael Sansoucie, Nasa Marshall Space Flight Center; Robert Hyers, Worcester Polytechnic Institute; Douglas Matson, Tufts University; Gwendolyn Bracker, DLR Institute of Materials Physics in Space

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Session Chairs: Jonathan Raush, University of Louisiana at Lafayette; Gwendolyn Bracker, DLR Institute of Materials Physics in Space

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8:30 AM Introductory Comments

8:40 AM
Overview of NASA's Reduced Gravity Materials Science Research: *Michael Sansoucie*[1]; [1]NASA Marshall Space Flight Center

9:05 AM
What's New in PSI?: *Karen Stephens*[1]; [1]NASA

9:25 AM
ESA's Materials Science in Space Program: Current State of Affairs and Outlook: *Wilhelmus Sillekens*[1]; [1]European Space Agency

9:50 AM
Experiment Preparation and Operation of the Electromagnetic Levitator EML on the ISS: *Stephan Schneider*[1]; Angelika Diefenbach[2]; Mitja Beckers[1]; [1]DLR Institut für Materialphysik im Weltraum; [2]DLR MUSC

10:10 AM Break

10:30 AM
Morphological Stability of Eutectic Growth Patterns: In-situ Experiments in Microgravity with the Transparent Alloys Apparatus: *Silvere Akamatsu*[1]; Sabine Bottin-Rousseau[2]; Mathis Plapp[3]; Ulrike Hecht[4]; Victor Witusiewicz[4]; [1]Cnrs; [2]Sorbonne University; [3]Ecole Polytechnique; [4]Access e.V.

10:50 AM
Peritectic Coupled Growth Under Reduced Gravity: *Andreas Ludwig*[1]; Johann Mogeritsch[1]; [1]Montanuniversitaet Leoben

11:10 AM
Evolution of Dendritic Extended 3D Patterns during Directional Solidification: Microgravity Experiments in DECLIC-DSI Onboard ISS and Phase-field Modeling: *Kaihua Ji*[1]; Fatima Mota[2]; Louise Strutzenberg[3]; Rohit Trivedi[4]; Nathalie Bergeon[2]; Alain Karma[1]; [1]Northeastern University; [2]IM2NP, Aix-Marseille Université and CNRS; [3]Marshall Space Flight Center; [4]Iowa State University

11:30 AM
Visualization of Particle-Interface Interactions: Philipp Ott[1]; Thomas Jauß[1]; Christian Reimann[2]; Holger Koch[2]; Jochen Friedrich[2]; *Tina Sorgenfrei*[1]; [1]University of Freiburg; [2]Fraunhofer IISB Erlangen

NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Early Career

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

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Session Chairs: Osman Anderoglu, University of New Mexico; Djamel Kauomi, North Carolina State University

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8:30 AM Invited
Understanding the Mechanisms Involved in Chlorine-Induced Stress Corrosion Cracking of Stainless Steel 304 under a Simulated Marine Environment: *Ryan Schoell*[1]; Li Xi[1]; Yuchen Zhao[1]; Xin Wu[2]; Yu Hong[2]; Zhenzhen Yu[2]; Peter Kenesei[3]; Jonathan Almer[3]; Zeev Shayer[2]; Khalid Hattar[4]; Djamel Kaoumi[1]; [1]North Carolina State University; [2]Colorado School of Mines; [3]Argonne National Laboratory; [4]Sandia National Laboratories

8:55 AM Invited
Probing Neutron Irradiation Simulated Damage with Ion Irradiation and In-situ Mechanical Testing: *Eric Lang*[1]; Nathan Madden[2]; Dustin Ellis[2]; Bethany Matthews[3]; Patrick Price[2]; Nan Li[4]; Paul Kotula[2]; Rajan Tandon[2]; Arun Devaraj[3]; Khalid Hattar[2]; [1]University of New Mexico; [2]Sandia National Laboratories; [3]Pacific Northwest National Laboratory; [4]Los Alamos National Laboratory

9:20 AM Invited
Deformation Mechanisms in Gen-IV Candidate Structural Steels Studied by In-situ Micromechanical Testing Techniques: *Tanvi Ajantiwalay*[1]; Cheng-Han Li[1]; Tingkun Liu[1]; Christopher San Marchi[2]; Assel Aitkaliyeva[3]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Sandia National Laboratories; [3]University of Florida

9:45 AM Break

10:05 AM Invited
Deformation Twinning Versus Slip in Ni-based Alloys, Containing Pt2Mo-structured, Ni2Cr-typed Precipitates: *Hi Vo*[1]; K Dang[1]; Fei Teng[2]; Matthew Schneider[1]; Stuart Maloy[3]; Julie Tucker[4]; Laurent Capolungo[1]; Peter Hosemann[1]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory; [3]Pacific Northwest National Laboratory; [4]Oregon State University

10:30 AM Invited
Castable Nanostructured Alloy Steels and the Graded Transition to Tungsten for Fusion Reactors: *Tim Graening*[1]; Isthiaque Robin[2]; Ying Yang[1]; Weicheng Zhong[1]; Wei Tang[1]; T.M. Kelsy Green[3]; Kevin Field[3]; Yutai Kato; Yutai Katoh[1]; [1]ORNL; [2]The University of Tennessee; [3]University of Michigan

10:55 AM Invited
Data-driven Surrogate Constitutive Modeling of Mechanical Creep Behavior under Extreme Conditions: *Andre Ruybalid*[1]; Aaron Tallman[2]; Christopher Matthews[1]; Laurent Capolungo[1]; [1]LANL; [2]Florida International University

11:20 AM Invited
Examining Microstructural Effects on Tensile Properties in Irradiated Inconel 718 using Miniaturized Tensile Specimens: *Stephen Taller*[1]; Caleb Massey[1]; [1]Oak Ridge National Laboratory

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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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

Wednesday AM | March 22, 2023
Aqua 310B | Hilton

Session Chairs: Minh-Son Pham, Imperial College London; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization

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8:30 AM Invited
In-situ Micro-tensile Studies on the Effects of Ion Irradiation on the Mechanical Properties of Small-grained Alloys: *Dhriti Bhattacharyya*[1]; Alan Xu[1]; Tao Wei[1]; Mihail Ionescu[1]; [1]Australian Nuclear Science and Technology Organization

9:00 AM Invited
On the Kink-band Formation in True and Brittle Micas: Hemant Rathod[1]; Andreas Kronenberg[1]; Miladin Radovic[1]; *Ankit Srivastava*[1]; [1]Texas A&M University

9:30 AM
Micropillar Compression Testing of Proton Irradiated NiCr2 Alloy: *Chai Peddeti*[1]; Andrew Scott[1]; [1]UC Berkeley

9:50 AM
An In-situ SEM Study on Hydrogen Embrittled Alloy 718: *Hamza Khalid*[1]; Bilal Mansoor[2]; [1]Texas A&M University; [2]Texas A&M University at Qatar

10:10 AM Break

10:30 AM
Dynamic Cryo-mechanical Properties of Dewetted Nickel Microparticles: *Barbara Bellon Lara*[1]; Gerhard Dehm[1]; Rajaprakash Ramachandramoorthy[1]; [1]Max-Planck-Institut für Eisenforschung

10:50 AM
The Effect of Heat Treatment on Full-field Damage Evolution in Laser Powder Bed Fusion-manufactured 316L Stainless Steel: *Marissa Linne*[1]; Margaret Wu[1];

Tatu Pinomaa[2]; Anssi Laukkanen[2]; Nathan Barton[1]; Thomas Voisin[1]; [1]Lawrence Livermore National Laboratory; [2]VTT Technical Research Centre of Finland

11:10 AM
Characterization of Deformation Mechanisms Near Grain Boundaries in Mg Alloys by Means of In-situ EBSD and High-resolution Digital Image Correlation: Biaobiao Yang[1]; Maral Sarebanzadeh[2]; Eugenia Nieto-Valeiras[2]; Alberto Orozco-Caballero[3]; *Javier Llorca*[2]; [1]IMDEA Materials Institute & Central South University; [2]IMDEA Materials Institute & Technical University of Madrid; [3]Technical University of Madrid

11:30 AM
In-situ Nano-indentation of a Pt Nanoparticle Combined with Bragg Coherent X-ray Diffraction Imaging.: *Sarah Yehya*[1]; Thomas Cornelius[2]; Marie-Ingrid Richard[3]; Felisa Berenguer[1]; Eugen Rabkin[4]; Olivier Thomas[2]; Stéphane Labat[2]; [1]Synchrotron SOLEIL; [2]AMU - CNRS; [3]CEA of Grenoble; [4]Technion Institute of Technology

11:50 AM Invited
The Dynamic Signatures of Strain Bursts in Metals: Mostafa Omar[1]; *Jaafar El-Awady*[1]; [1]Johns Hopkins University

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NUCLEAR MATERIALS

Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-cladding Interface — Fuel-Cladding Interaction and Fission Products Retention

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

Program Organizers: Yi Xie, Purdue University; Miaomiao Jin, Pennsylvania State University; Jason Harp, Oak Ridge National Laboratory; Fabiola Cappia, Idaho National Laboratory; Jennifer Watkins, Idaho National Laboratory; Michael Tonks, University of Florida

Wednesday AM | March 22, 2023
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Session Chair: Yi Xie, Purdue University

8:30 AM Introductory Comments

8:35 AM Invited
Thermochemical Investigation of Advanced Reactor Fuels and Fuel-clad Chemical Interaction: *Elizabeth Sooby*[1]; [1]University of Texas at San Antonio

9:00 AM Invited
Fuel Performance Analysis of an Annular Type Metallic U-10Zr Fuel: *Di Yun*[1]; Shilun Zheng[1]; Zhengyu Qian[1]; Linna Feng[1]; [1]Xi'An Jiaotong University

9:25 AM
Lanthanides Migration and Chemical Interaction with U-Zr Fuel Cladding: *Yi Xie*[1]; [1]Purdue University

9:45 AM
Advanced Characterization of Fuel-cladding Chemical Interaction in HT9 Clad U-Mo-Ti-Zr Metallic Fuel Irradiated in Advanced Test Reactor: *Yachun Wang*[1]; Jatuporn Burns[1]; Mukesh Bachhav[1]; Tiankai Yao[1]; Luca Capriotti[1]; [1]Idaho National Laboratory

10:05 AM Break

10:20 AM
High Resolution Microscopic Studies on HT-9 Cladding from U-10Zr Fuel Irradiated at Fast Flux Test Facility: *Mukesh Bachhav*[1]; Tiankai Yao[1]; Luca Capriotti[1]; Jason Harp[2]; Maria Okuniewski[3]; Jonova Thomas[4]; Yachun Wang[1]; [1]Idaho National Laboratory; [2]ORNL; [3]Purdue University; [4]ANL

10:40 AM
Analysis of Secondary Phase Formation at U-10Mo Fuel/Cladding Interfaces During Manufacturing: *Adam Koziol*[1]; Miao Song[2]; Kayla Yano[2]; Alan Schemer-Kohrn[2]; Ayoub Soulami[2]; Vineet Joshi[2]; Samuel Briggs[1]; Elizabeth Kautz[2]; [1]Oregon State University; [2]PNNL

11:00 AM
Interfacial Microstructure Evolution in Al6061-Al6061 HIP Bonded Samples for Cladding Applications on U-10Mo Monolithic Fuel: *Rajib Kalsar*[1]; Miao Song[1]; Cody Miller[2]; Nicole Overman[1]; Kenneth Johnson[1]; Timothy Roosendaal[1]; Curt Lavender[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory; [2]Los Alamos National Laboratory

11:20 AM
Numerical Modeling of AA6061 Cladding Diffusion Bonding for the U-10Mo Monolithic Fuel: *Yucheng Fu*[1]; Taylor Mason[1]; Rajib Kalsar[1]; Zhijie Xu[1]; Kriston Brooks[1]; Ayoub Soulami[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

11:40 AM
Irradiation Performance of Densely Packed UN TRISO Fuel in a 3D-Printed SiC Matrix: *Christian Petrie*[1]; Kory Linton[1]; Gokul Vasudevamurthy[1]; Danny Schappel[1]; Rachel Seibert[1]; Nicolas Woolstenhulme[2]; David Carpenter[3]; Andrew Nelson[1]; Kurt Terrani[4]; [1]Oak Ridge National Laboratory; [2]Idaho National Laboratory; [3]Massachusetts Institute of Technology; [4]Ultra Safe Nuclear Corporation

12:00 PM
Atomistic Simulations of Silicon Carbide Layer in Tristructural Isotropic Fuel Particles: *Cong Dai*[1]; Michael Welland[1]; [1]Canadian Nuclear Laboratories

12:20 PM
Microstructural Characterization of the SiO_2-SiC Interface of Oxidized TRISO Particles: Katherine Montoya[1]; Rachel Seibert[2]; Tyler Gerczak[2]; *Elizabeth Sooby*[2]; [1]University of Texas at San Antonio; [2]Oak Ridge National Laboratory

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NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Materials in Mechanical Extremes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of

Science and Technology Beijing

Wednesday AM | March 22, 2023
Aqua 303 | Hilton

Session Chair: Niaz Abdolrahim, University of Rochester

8:30 AM Invited
Understanding the Superior Strength and Localized Plasticity in Nanotwinned Ni-Mo-W Alloys: Mo Rigen He[1]; Arunima Banerjee[1]; *Kevin Hemker*[1]; [1]Johns Hopkins University

8:55 AM Invited
Phase Stability and Nanomechanical Behavior of Laser Direct Metal Deposited Concentrated Fe-Cu Alloys: *Amit Misra*[1]; [1]University of Michigan

9:20 AM Invited
Enhanced Thermomechanical Stability of Nanolamellar Composites Containing Thick 3-dimensional Interfaces: *Nathan Mara*[1]; Justin Cheng[1]; Zezhou Li[2]; Shuozhi Xu[3]; Youxing Chen[4]; Mauricio De Leo[1]; Jonathan Poplawsky[5]; Nan Li[6]; Jon Baldwin[6]; Irene Beyerlein[3]; [1]University of Minnesota; [2]Beijing Institute of Technology; [3]University of California, Santa Barbara; [4]University of North Carolina, Charlotte; [5]Oak Ridge National Laboratory; [6]Los Alamos National Laboratory

9:45 AM
Influence of Hydrostatic Pressure on Impurity Segregation in Nanocrystalline Metals: *Zuoyong Zhang*[1]; Chuang Deng[1]; [1]University of Manitoba

10:05 AM Break

10:25 AM Invited
Nanoscale Templating of Reinforcing Phases with Linear Complexions to Achieve Extreme Strength: Divya Singh[1]; Edward Li[1]; Hannah Howard[2]; Daniel Gianola[2]; *Timothy Rupert*[1]; [1]University of California, Irvine; [2]University of California, Santa Barbara

10:50 AM Invited
Anomalous Mechanical Behavior of Nanocrystalline Binary Alloys under Extreme Conditions: S srinivasan[1]; B Hornbuckle[2]; S Turnage[2]; K Darling[2]; *Kiran Solanki*[1]; [1]Arizona State University; [2]ARL

11:15 AM
Micromechanics of Strain Localisation and Damage in a Spinodal Bronze: *Felicity Worsnop*[1]; C. Cemal Tasan[1]; [1]Massachusetts Institute of Technology

11:35 AM
Nanotwin Stability under Temperature-dependent Deformation States: *Jarod Robinson*[1]; Akarsh Verma[2]; Eric Homer[2]; Gregory Thompson[1]; [1]The University of Alabama; [2]Brigham Young University

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ENERGY & ENVIRONMENT

Natural Fibers and Its Composites: A Sustainable Solution — Natural Fibers / Natural Fibers Composites

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

Program Organizers: Henry Colorado, Universidad de Antioquia; Sergio Monteiro, Instituto Militar de Engenharia; Carlos Fontes Vieira, State University of

the North Fluminense

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Session Chairs: Sergio Neves Monteiro, Instituto Militar de Engenharia; Henry Colorado, Universidad de Antioquia; Carlos Vieira, Universidade Estadual do Norte Fluminense Darcy Ribeiro; Afonso Azevedo, Universidade Estadual do Norte Fluminense; Joseph Jakes, USDA FS Forest Products Laboratory

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8:30 AM Invited
Recent Advances in Understanding Wood Cell Wall Material Properties: *Joseph Jakes*[1]; [1]USDA FS Forest Products Laboratory

9:00 AM
Characterization of Broom Sorghum Colm Fibers as Potential Natural Fiber Reinforcement for Polymer Composites: Pedro Huang[1]; David Coverdale Velasco[1]; Noan Simonassi[1]; *Felipe Lopes*[1]; Henry Colorado[1]; Sergio Monteiro[1]; Carlos Maurício Vieira[1]; [1]State University of the Northern Rio de Janeiro

9:20 AM
Characterization of "Melga" (Broom Sorghum) Panicle Fibers: Potential use as Natural Fiber Reinforcement for Polymer Composites: Bicalho Weslley[1]; David Coverdale Velasco[1]; *Felipe Lopes*[1]; Noan Simonassi[1]; Henry Colorado[1]; Carlos Maurício Vieira[1]; Sergio Monteiro[1]; [1]State University of Northern Rio de Janeiro

9:40 AM
Natural Fibers Used from Colombia and their Use as Potential Reinforcement for Composite Materials: *Henry Colorado*[1]; Sergio Neves[2]; Geovana Carla Delaqua[3]; Carlos Mauricio Vieira[3]; [1]Universidad de Antioquia; [2]Instituto Militar de Engenharia; [3]State University of the North Fluminense

10:00 AM Break

10:20 AM Invited
Arapaima Gigas Scales, an Inspiration of a Natural Material for Composite Applications: *Henry Colorado*[1]; Sergio Neves[2]; Carlos Mauricio Vieira[3]; [1]Universidad de Antioquia; [2]Instituto Militar de Engenharia; [3]State University of the North Fluminense

10:40 AM Invited
Qualification of Polymeric Composites for Piping Repair by Tensile Testing: Aline de Bessa Schinkoeth Reis[1]; *Felipe Lopes*[1]; Noan Tonini Simonassi[1]; Eduardo Atem de Carvalho[1]; Carlos Fontes Vieira[1]; [1]Universidade Estadual Do Norte Fluminense

11:00 AM
Development of Nouvel Bio-based Epoxy Resin Made with Cardanol, Cashew Nut Shell Liquid Subproduct: *Felipe Lopes*[1]; Noan Tonini Simonassi[1]; Eduardo Atem de Carvalho[1]; Carlos Fontes Vieira[1]; [1]Universidade Estadual Do Norte Fluminense

11:20 AM
Mitigation of Urban Noise through the Implementation of Sound-absorbing Facade Skirting Boards Based on Epoxy Resin and Rice Husk Nanoparticles: *Jeiser Rendón Giraldo*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

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CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Engineering Diffraction

Sponsored by: TMS Functional Materials Division, TMS: Chemistry and Physics of

Materials Committee

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

Wednesday AM | March 22, 2023
Aqua 311B | Hilton

Session Chair: Chihpin (Andrew) Chuang, Argonne National Lab

8:30 AM Invited
Pyrochlore as Potential Nuclear Waste Form – Structure-property Insights from Scattering Experiments: *Sarah Finkeldei*[1]; Maik Lang[2]; Gordon Thorogood[3]; [1]University of California-Irvine; [2]University of Tennessee, Knoxville; [3]Australian Nuclear Science and Technology Organisation

9:00 AM
High Speed Operando X-ray Diffraction and Imaging during 3D Laser Printing: *Steven Van Petegem*[1]; [1]Paul Scherrer Institut

9:20 AM
Determination of Residual Stress and Strain Fields during Cold Expansion Processing Using Complementary Diffraction Techniques: *Nicholas Bachus*[1]; Donald Brown[2]; Christopher Budrow[3]; Bjørn Clausen[2]; J.Y. Peter Ko[4]; Kelly Nygren[4]; Renan Ribeiro[5]; Michael Hill[1]; [1]University Of California Davis; [2]Los Alamos National Laboratory; [3]Budrow Consulting LLC; [4]Cornell High Energy Synchrotron Source; [5]Hill Engineering LLC

9:40 AM
Micromechanical Response of Nitrocarburized Steel Studied by In-situ X-ray Microdiffraction during Nanoindentation: Albin Stormvinter[1]; Shun Yu[1]; Melina da Silva[1]; Gabriel Spartacus[2]; *Peter Hedström*[2]; Anton Davydok[3]; [1]RISE; [2]KTH Royal Institute of Technology; [3]Helmholtz Hereon

10:00 AM Break

10:15 AM
On the Estimation of Elastic Constants in Low Symmetry Materials with In-situ Neutron Diffraction Measurements: *Nathan Peterson*[1]; Daniel Savage[2]; Sean Agnew[1]; Donald Brown[2]; Bjørn Clausen[2]; Aaron Stebner[3]; Elena Garlea[4]; [1]University of Virginia; [2]Los Alamos National Laboratory; [3]Georgia Institute of Technology; [4]Y-12 National Security Complex

10:35 AM
Bulk Residual Stress and Strain Measurements Near Geometrically Large Holes for Improving Cold Expansion Process Models: *Michael Hill*[1]; Nicholas Bachus[1]; Donald Brown[2]; Chris Budrow[3]; Michael Burba[4]; Bjørn Clausen[2]; Adrian DeWald[5]; J.Y. Peter Ko[6]; Kelly Nygren[6]; Mark Obstalecki[4]; Robert Pilarczyk[5]; Renan Ribeiro[5]; Paul Shade[4]; Matthew Shultz[7]; [1]University of California Davis; [2]Los Alamos National Laboratory; [3]Budrow Consulting LLC; [4]Air Force Research Laboratory; [5]Hill Engineering, LLC; [6]Cornell High Energy Synchrotron Source; [7]Fatigue Technology, Inc

10:55 AM
The Application of Neutron Scattering to Hard Metals and Related Systems: Ahmet Bahadir Yildiz[1]; Prasath Babu[2]; Susanne Norgren[3]; *Peter Hedström*[2]; [1]Scatterin AB; [2]KTH Royal Institute of Technology; [3]Lund University, Sandvik Coromant R&D

11:15 AM
The Forging and the Precipitation Behaviour in the New VDM© Alloy 780 Studied via In Situ High Energy X-ray Diffraction: *Massimo Fritton*[1]; Frank Kümmel[1]; Andreas Kirchmayer[2]; Andreas Stark[3]; Masood Hafez Haghighat[4]; Bodo Gehrmann[4]; Steffen Neumeier[2]; Ralph Gilles[1]; [1]Technische Universität München; [2]Friedrich-Alexander-Universität Erlangen-Nürnberg; [3]Helmholtz-Zentrum hereon GmbH; [4]VDM Metals International GmbH

11:35 AM
In Situ X-ray Diffraction Study of the (Ba,Sr)TiO_3 Solid State Reaction: Leah Bellcase[1]; Corrado Harper[1]; Elizabeth Dickey[2]; *Jennifer Forrester*[1]; Jacob Jones[1]; [1]North Carolina State University; [2]Carnegie Mellon University

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ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Hydrometallurgy

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Wednesday AM | March 22, 2023
33C | SDCC

Session Chairs: Edgar Vidal, NobelClad; Judith Vidal, National Renewable Energy Laboratory

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8:30 AM Invited
Enhancing Performance in Hydrometallurgical Extraction, Separation, and Recovery of Metals: *Michael Free*[1]; [1]University of Utah

9:00 AM Invited
The Importance of Autoclave and Piping Materials Selection for HPAL and POX Metals Extraction Processes: *Edgar Vidal*[1]; [1]NobelClad

9:30 AM
Investigation of Cerium, Terbium, and Lantanium Dissolution Parameters in Fluorescent Wastes by Microwave Leaching: *Aysegul Bilen*[1]; U. Hatipoglu[1]; M. Saridede[1]; [1]Yldz Teknik Üniversitesi

9:50 AM Break

10:10 AM Invited
Research and Industrial Application of Selenium and Tellurium Recovery Processes: *Shijie Wang*[1]; [1]Coeur Mining, Inc.

10:40 AM
Nickel Matte as Novel Reductant in Galvanic Leaching of Spent Lithium-ion Battery Black Mass: *Erik Prasetyo*[1]; Sulalit Bandyopadhyay[1]; [1]Norwegian University of Science and Technology

11:00 AM
Recyclability of Proton Exchange Membrane Electrolysers for Green Hydrogen Production: *Nawshad Haque*[1]; Sarb Giddey[1]; Sejuti Saha[1]; Paul Sernia[2]; [1]CSIRO; [2]Endua

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SPECIAL TOPICS

Nix Award and Lecture Symposium: Learning from Nature – From Insight to Sustainable Innovation — Nix IV Award Lecture: From Bioinspiration to Machine Learning – A New Concept for Object Manipulation

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

Program Organizers: Wendelin Wright, Bucknell University; Gang Feng, Villanova University

Wednesday AM | March 22, 2023
Sapphire D | Hilton

Session Chairs: Wendelin Wright, Bucknell University; Gang Feng, Villanova University

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8:30 AM Invited
2023 William D Nix Award Lecture: From Bioinspiration to Machine Learning – A New Concept for Object Manipulation: *Eduard Arzt*[1]; [1]INM – Leibniz Institute for New Materials and Saarland University

9:30 AM Invited
Deep Learning from Nature and Machines for Engineered and Biological Materials: *Subra Suresh*[1]; [1]Nanyang Technological University

10:10 AM Break

10:30 AM Invited
Bioinspired Designs for Micro-object Releasing: *Xuan Zhang*[1]; [1]Leibniz Institute for New Materials

11:00 AM Invited
Artificial Muscles for the Lifelike Robots of the Future: *Christoph Keplinger*[1]; [1]Max Planck Institute for Intelligent Systems

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NUCLEAR MATERIALS

Phase Stability in Extreme Environments — Corrosion and Oxidation in Extreme Environments

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Andrew Hoffman, GE Research; Kinga Unocic, Oak Ridge National Laboratory; Janelle Wharry, Purdue University; Kaila Bertsch, Lawrence Livermore National Laboratory; Raul Rebak, GE Global Research

Wednesday AM | March 22, 2023
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Session Chairs: Kinga Unocic, Oak Ridge National Laboratory; Xiao-Xiang Yu,

Novelis

8:30 AM
High Temperature Oxidation of CrAl Coated Accident Tolerant Fuel Cladding: *Sung Eun Kim*[1]; Dae Ho Kim[1]; Hyun-gil Kim[1]; [1]Korea Atomic Energy Research Institute

8:50 AM
Steam Oxidation Behavior of Environmental Barrier Coatings: *Mackenzie Ridley*[1]; Ken Kane[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

9:10 AM
Cyclic Oxidation Behavior of Novel Ni-based Superalloys: *Richard Oleksak*[1]; Martin Detrois[1]; Paul Jablonski[1]; [1]National Energy Technology Laboratory

9:30 AM Invited
The Morphological Stability and Non-equilibrium Growth of Passive Oxide Films: Rohit Ramanathan[1]; *Peter Voorhees*[1]; [1]Northwestern University

10:00 AM Break

10:20 AM
Corrosion Behavior of Co-Fe4Mn4Nb4Si2B14, Fe49Co49V2, and Fe82Cr18 Alloys in Venusian Environment: *Yuankang Wang*[1]; Alex Leary[2]; Paul Ohodnicki[1]; [1]University of Pittsburgh; [2]NASA

10:40 AM
Surface Roughness and Oxidation Kinetics in Ni-based Single-crystal Superalloys: *Aidan O'Donnell*[1]; Jean-Briac le Graverend[1]; [1]Texas A&M University

11:00 AM
Ab initio Simulations to Investigate Oxidation in Ni-based Single-crystal Superalloys: *Aidan O'Donnell*[1]; Tahir Cagin[1]; Jean-Briac le Graverend[1]; [1]Texas A&M University

11:20 AM
Understanding the Effect of SO2/SO3 Gaseous Environments on the Mixed Deposit-induced Degradation of Advanced Alloys: *Atharva Chikhalikar*[1]; David Poerschke[1]; [1]University of Minnesota, Twin Cities

11:40 AM
Investigation of Alloy Elements on the Enhanced Oxidation Behavior of Nanocrystalline Alloys: *Saurabh Sharma*[1]; Kris Darling[2]; Kiran Solanki[1]; [1]Arizona State University; [2]Army Research Laboratory

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Non-Ferrous Alloys I

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Wednesday AM | March 22, 2023
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Session Chair: Josh Mueller, Los Alamos National Laboratory

8:30 AM Invited
Application of the PRISMS-PF Framework to Recrystallization and Twin Evolution: *David Montiel*[1]; Yanjun Lyu[1]; Mohammadreza Yaghoobi[1]; John Allison[1]; Katsuyo Thornton[1]; [1]University of Michigan

9:00 AM
Phase Transformations and Twin Microstructure in Titanium: *Lei Cao*[1]; Amir Hassan Zahiri[1]; Jamie Ombogo[1]; Eduardo Vitral[1]; Mehrab Lotfpour[1]; [1]University of Nevada

9:20 AM
Understanding The Influence of Interfaces on Grain Nucleation in Highly Textured Mg-(Zn, Ca) Alloys During Static Recrystallization: *Rogine Gomez*[1]; Aeriel Leonard[1]; [1]The Ohio State University

9:40 AM
Deformation Induced Solute Clusters and Precipitates in Light Metallic Alloys: *Suhas Eswarappa Prameela*[1]; Taisuke Sasaki[2]; Peng Yi[3]; Michael Falk[3]; Timothy Weihs[3]; [1]Massachusetts Institute of Technology; [2]NIMS, Japan; [3]Johns Hopkins University

10:00 AM Break

10:20 AM Invited
High-pressure Phase Transformation in Zirconium: Role of Slip Dislocations and Twinning: *Mariyappan Arul Kumar*[1]; T Yu[2]; Y Wang[2]; R McCabe[1]; C Tome[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory; [2]University of Chicago

10:50 AM
Eutectoid Ordering Morphologies in Fe-Pd and Shockley's (Controversial?) L1' Phase: *Adrian Savovici*[1]; William Soffa[1]; Jerrold Floro[1]; [1]University of Virginia

11:10 AM
Micro-addition of Fe in Highly Alloyed Cu-Ti Alloys to Improve Both Formability and Strength: *Baptiste Rouxel*[1]; [1]Ecole Polytechnique Fédérale de Lausanne EPFL

11:30 AM Invited
Alpha-Omega Phase Transformations and Microstructural Evolution in Shocked HCP Metals: *Benjamin Morrow*[1]; David Jones[1]; Ellen Cerreta[1]; [1]Los Alamos National Laboratory

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Control Macro and Microstructures I

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

Wednesday AM | March 22, 2023
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Session Chairs: Elisa Torresani, San Diego State University; Alberto Molinari, University of Trento

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8:30 AM
Additive Manufacturing and Spark Plasma Sintering: Fabrication of Powder Components with Cooling Channels: *Elisa Torresani*[1]; Maricruz Carrillo[1]; Eugene Olevsky[1]; Chris Haines[2]; Darold Martin[3]; [1]San Diego State University; [2]US Army DEVCOM - Army Research Laboratory; [3]US Army DEVCOM – Armaments Center, Picatinny Arsenal

8:50 AM
Cyclic Phase Transition Assisted Spark Plasma Sintering of AlCoCrFeNi High Entropy Alloys: *Runjian Jiang*[1]; Elisa Torresani[1]; Eugene Olevsky[1]; [1]San Diego State University

9:10 AM
Freeze Casting of $LaNbO_4$ Shape Memory Ceramics: *Cesar Martinez-Cruz*[1]; Olivia Graeve[1]; [1]University of California San Diego

9:30 AM
Effects of Inoculants on Melt Pool Geometry and Formation of Grain Structure in Inconel 718 Processed by Laser Powder Bed Fusion: *I-Ting Ho*[1]; Dhruv Tiparti[1]; Kai-Chun Chang[2]; An-Chou Yeh[2]; Sammy Tin[3]; [1]Illinois Institute of Technology; [2]National Tsing Hua University; [3]The University of Arizona

9:50 AM Invited
Anisotropy in Sintering of Parts Produced by BinderJet 3D Printing: *Alberto Molinari*[1]; [1]University of Trento

10:20 AM Break

10:40 AM Invited
Tuning Nano/microstructure and Properties by Densification of Metastable Powders: Gottlieb Uahengo[1]; Darren Dewitt[1]; Yasuhiro Kodera[1]; *Javier Garay*[1]; [1]University of California San Diego

11:10 AM Invited
Young Leaders International Scholar – JIM: Intermetallic Compounds as Catalysts and Usefulness of Metallurgy: *Takayuki Kojima*[1]; [1]Shinshu University

11:40 AM
Effect of Powder Morphology on Densification and Microstructural Gradients of Titanium in Spark Plasma Sintering: Alexander Preston[1]; *Kaka Ma*[1]; [1]Colorado State University

12:00 PM
*Add*FAST: A Hybrid Technique for Tailoring Microstructures in Titanium-Titanium Composites: *Cameron Barrie*[1]; Beatriz Fernandez-Silva[1]; Rob Snell[1]; Iain Todd[1]; Martin Jackson[1]; [1]The University of Sheffield

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Session IV

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

Program Organizers: Tolga Aytug, Oak Ridge National Laboratory; Pooran Joshi, Elbit Systems of America; Rahul Panat, Carnegie Mellon University; Yong

Lin Kong, University of Utah; Konstantinos Sierros, West Virginia University; Changyong Cao, Case Western Reserve University ; Dave Estrada, Boise State University; Ravindra Nuggehalli, New Jersey Institute of Technology

Wednesday AM | March 22, 2023
Sapphire 411B | Hilton

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

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8:30 AM Invited
Liquid Metal Inks for Printed Stretchable Electronics: Gallium Alloy Interactions with the Environment: Robin Dietrich[1]; Zachary Farrell[2]; *Christopher Tabor*[1]; [1]US Air Force; [2]Cornerstone Research Group

8:55 AM Invited
All-carbon Nanomaterial Inks for Print-In-Place, Recyclable, and Water-based Electronics: *Aaron Franklin*[1]; [1]Duke University

9:20 AM Invited
Ultraconductive Copper-Carbon Nanotube Composite for Advanced Conductors: *Kai Li*[1]; Michael McGuire[1]; Andrew Lupini[1]; Fred List[1]; Burak Ozpineci[1]; James Haynes[1]; Tolga Aytug[1]; [1]Oak Ridge National Laboratory

9:45 AM
Conductive Polyhydroxybutyrate/Reduced Graphene Oxide Biocomposite Temperature Sensor: *Dan Li*[1]; [1]Beijing University of Technology

10:05 AM Break

10:25 AM Invited
Microreactor-assisted Nanomaterial Printing for Additive Manufacturing of Functional Materials and Devices: V. Vinay K. Doddapaneni[1]; Jeffery Dhas[1]; Chuankai Song[1]; Havva Aysal[2]; Abbasi Sakineh[1]; Han Mei[1]; Konstantinos Sierros[2]; Somayeh Pasebani[1]; Brian Paul[1]; Mark Rice[1]; Greg Herman[1]; Changqing Pan[1]; *Chih-Hung Chang*[1]; [1]Oregon State University; [2]West Virginia University

10:50 AM Invited
All-printed and Broadband Piezoelectric Force Sensors for Structural Health Monitoring: *Zhangxian Deng*[1]; [1]Boise State University

11:15 AM
Photonic Sintering of Multiprinter Compatible Gold Nanomaterial Inks for Epidermal Electronics: *Tony Valayil Varghese*[1]; David Estrada[1]; Josh Eixenberger[1]; [1]Boise State University

11:35 AM
Evaluating the Electrical Properties of Thermally Decomposed Binders via Terahertz Time-Domain Spectroscopy for Direct Ink Writing of Flexible Electronics: *Harrison Loh*[1]; Alan Bristow[1]; Konstantinos Sierros[1]; [1]West Virginia University

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ADDITIVE TECHNOLOGIES

Quantifying Microstructure Heterogeneity for Qualification of Additively Manufactured Materials — Quality Control, Data Analytics, and Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Advanced Characterization, Testing,

and Simulation Committee

Program Organizers: Sharniece Holland, Washington University in St. Louis; Eric Payton, University of Cincinnati; Edwin Schwalbach, Air Force Research Labroatory; Joy Gockel, Colorado School of Mines; Ashley Paz y Puente, University of Cincinnati; Paul Wilson, The Boeing Company; Amit Verma, LLNL; Sriram Vijayan, Ohio State University; Jake Benzing, National Institute of Standards and Technology

Wednesday AM | March 22, 2023
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Session Chairs: Jake Benzing, National Institute of Standards and Technology; Sharniece Holland, Washington University in St. Louis

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8:30 AM Invited
Opportunities & Challenges with Laser Powder Bed Fusion for Automotive Applications: Steel and Aluminum Alloys: *Whitney Poling*[1]; Andrew Bobel[1]; Md Ashabul Anam[1]; Mark Smith[1]; Tyson Brown[1]; Anil Sachdev[1]; [1]General Motors, Global Research & Development

8:55 AM
Microstructure and Mechanical Property Variations in Commercially Produced Laser Powder Bed Fusion 316L Stainless Steel: Jorge Ramirez[1]; Simon Richardsen[1]; Charles Smith[1]; Grant Zheng[1]; *Garrison Hommer*[1]; Jonah Klemm-Toole[1]; Steve Midson[1]; Xiaoli Zhang[1]; Amy Clarke[1]; Craig Brice[1]; Joy Gockel[1]; [1]Colorado School of Mines

9:15 AM
Long-term Process Stability in Laser Powder Bed Fusion: *Michael Heiden*[1]; Scott Jensen[1]; Jay Carroll[1]; Priya Pathare[1]; David Saiz[1]; Jonathan Pegues[1]; Bradley Jared[2]; Brad Boyce[1]; [1]Sandia National Laboratories; [2]University of Tennessee

9:35 AM
Location Specific Characterization of Additively Manufactured Stainless Steel to Inform Build Data Analytics: *Allyssa Bateman*[1]; Christopher Snyder[2]; Scott Schier[2]; Ana Stevanovic[2]; Amanda Fernandez[2]; Elizabeth Sooby[2]; Brian Jaques[1]; [1]Boise State University; [2]University of Texas at San Antonio

9:55 AM Break

10:20 AM
A Study of Microstructural and Mechanical Properties of 14YWT Oxide Dispersion Strengthened Steel Fabricated Using Laser Powder Bed Fusion Additive Manufacturing from Gas Atomized Reaction Synthesis Feedstock: *Sourabh Saptarshi*[1]; Matthew DeJong[1]; Chrisopher Rock[1]; Iver Anderson[2]; Ralph Napolitano[3]; Djamel Kaoumi[1]; Timothy Horn[1]; [1]North Carolina State University; [2]AMES Laboratory; [3]Iowa State University

10:40 AM
Control of Residual Stress and Distortion in Metal Additive Manufacturing via Inverse Mapping of Textures: *Ruoqi Gao*[1]; Hamid Garmestani[1]; Steven Liang[1]; [1]Georgia Institute of Technology

11:00 AM
Quantitative Analysis of Computed Tomography Characterization of Porosity in AM Ti64 Using Serial Sectioning Ground Truth: *Bryce Jolley*[1]; Christine Henry[1]; Michael Uchic[1]; Daniel Sparkman[1]; [1]Air Force Research Laboratory

11:20 AM
X-ray Diffraction Peak Estimation Using In-Situ Melt-pool Sensors: *Anant Raj*[1]; Benjamin Stegman[1]; Charles Owen[1]; Hany Abdel-Khalik[1]; Xinghang Zhang[1]; John Sutherland[1]; [1]Purdue University

11:40 AM
Synchrotron-based X-ray Microtomography Characterization of Solidification Cracks in Additively Manufactured IN738LC Alloy: *Haoxiu Chen*; Yu Zou[1]; [1]University of Toronto

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ADVANCED MATERIALS

Refractory Metals 2023 — Alloy Design - Ultimate Plus

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

Program Organizers: Brady Butler, US Army Research Laboratory; Todd Leonhardt, Rhenium Alloys Inc.; Matthew Osborne, Global Advanced Metals; Zachary Levin, Los Alamos National Laboratory

Wednesday AM | March 22, 2023
Aqua E | Hilton

Session Chair: Zak Fang, University of Utah

8:30 AM Invited
BIRDSHOT: An Accelerated Program for the Discovery and Optimization of Refractory High Entropy Alloys: *Raymundo Arroyave*[1]; Brent Vela[1]; Danial Khatamsaz[1]; William Trehern[1]; Ibrahim Karaman[1]; Weiwei Zhang[2]; Douglas Allaire[1]; Paul Mason[2]; Duane Johnson[3]; Prashant Singh[3]; Axel van de Walle[4]; Miladin Radovic[1]; Ankit Srivastava[1]; [1]Texas A&M University; [2]ThermoCalc; [3]Ames Lab; [4]Brown University

9:00 AM
Concurrent Design of a Multimaterial Niobium Alloy System for Next-generation Turbine Applications: *Pin Lu*[1]; James Male[1]; Zhi Liang[1]; Peter Jacobson[1]; Jiadong Gong[1]; Greg Olson[1]; [1]QuesTek Innovations

9:20 AM
Data-augmented Property Modeling for Accelerated Closed-loop Multi-Objective Design of Refractory High Entropy Alloys for ULTIMATE: *Brent Vela*[1]; Danial Khatamsaz[1]; William Trehern[1]; Cafer Acemi[1]; Prashant Singh[2]; Douglas Alliare[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; Duane Johnson[2]; [1]Texas A&M University; [2]Ames Laboratory

9:40 AM
High-throughput Design, Synthesis, and Characterization of Refractory Multi-principal Element Alloys (MPEAs) for ULTIMATE: *Eli Norris*[1]; Cafer Melik Ensar Acemi[1]; William Trehern[1]; Brent Vela[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University

10:00 AM Break

10:15 AM
High-throughput Design, Synthesis, and Characterization of W-based Refractory Multi-principal Element Alloys (MPEAs): *Cafer Melik Ensar Acemi*[1]; William Trehern[1]; Eli Norris[1]; Brent Vela[1]; Peter Morcos[1]; Raymundo Arroyave[1]; Alaa Elwany[1]; Ibrahim Karaman[1]; [1]Texas A&M University

10:35 AM
Design and Correlative Mapping Characterizations of High-entropy Alloys for Nuclear Applications: *Pedro Ferreirós*[1]; Kan Ma[1]; Andrew London[2]; Alexandra Cackett[3]; Kiumars Aryana[4]; Patrick Hopkins[4]; Alexander Knowles[1]; [1]University of Birmingham; [2]CCFE, UK Atomic Energy Authority; [3]National Nuclear Laboratory Limited; [4]University of Virginia

10:55 AM
ULTIMATE: Alloy Designs for High Temperature Mo-Si-B Base Systems: *John Perepezko*[1]; Dan Thoma[1]; Longfei Liu[1]; Phalgun Nelaturu[1]; Ankur Agrawal[1]; Zahabul Islam[2]; Fan Zhang[3]; Laurence Marks[4]; [1]University of Wisconsin-Madison; [2]Bowling Green State University; [3]Computherm LLC; [4]Northwestern University

11:15 AM
Understanding Process-performance Trade-offs in Additively Manufactured Refractory Metals and Refractory HEAs to Drive Future RHEA Design: *David Cruddden*[1]; Shaumik Lenka[1]; Yining He[1]; Atsushi Sato[1]; Pimin Zhang[1]; Georgina Frater[1]; Yousefiani Ali[2]; Austin Mann[2]; [1]Alloyed Inc; [2]Boeing

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NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Fuels

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Wednesday AM | March 22, 2023
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Session Chair: Assel Aitkaliyeva, University of Florida

8:30 AM Invited
Microstructural and Mechanical Characterization of High Burnup UO2 Fuel: *Fabiola Cappia*[1]; David Frazer[1]; Kaustubh Bawane[1]; Colby Jensen[1]; Dan Wachs[1]; [1]Idaho National Laboratory

9:00 AM Invited
Alpha-damage Studies of Mixed Oxides Fuels for Fast Reactors: *Thierry Wiss*[1]; [1]European Commission - Jrc

9:30 AM
Oh, My Darling Clementine: A Contemporary Investigation of the Los Alamos Plutonium Fast Reactor: *Hannah Patenaude*[1]; Vedant Mehta[2]; Franz Freibert[2]; [1]University of Nevada, Las Vegas; [2]Los Alamos National Laboratory

9:50 AM
U_3O_8 and UO_2 Microspheres Synthesized Utilizing Sol-gel Chemistry and Microfluidics for Use as Next Generation Nuclear Fuels: *James Kurley*[1]; Rodney Hunt[1]; Jake McMurray[1]; Andrew Nelson[1]; [1]Oak Ridge National Laboratory

10:10 AM Break

10:30 AM Invited
Phase Decomposition in Uranium-Molybdenum Fuels Subjected to Low Neutron Fluences: *Maria Okuniewski*[1]; Gyuchul Park[1]; Mehmet Topsakal[2]; Simerjeet Gill[2]; Lynne Ecker[2]; Daniel Murray[3]; Eric Dooryhee[2]; [1]Purdue University; [2]Brookhaven

National Laboratory; [3]Idaho National Laboratory

11:00 AM Invited
Understanding the Role of Fission Products on the Formation and Collapse of the Gas Bubble Superlattice in U-Mo Fuel: *Charlyne Smith*[1]; Mukesh Bachhav[1]; Dennis Keiser[1]; [1]Idaho National Laboratory

11:30 AM
Pulsed Neutron Characterization of Irradiated Fuels at LANSCE: *Sven Vogel*[1]; Thilo Balke[1]; Charles A. Bouman[2]; Luca Capriotti[3]; Jason M. Harp[4]; Alexander M. Long[1]; Anton S. Tremsin[5]; Brendt Wohlberg[1]; Eric J. Larson[1]; Aaron E. Craft[3]; Brian J. Gross[3]; D. Travis Carver[1]; James R. Angell[3]; Vedant K. Mehta[1]; [1]Los Alamos National Laboratory; [2]Purdue University; [3]Idaho National Laboratory; [4]Oak Ridge National Laboratory; [5]UC Berkeley

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MATERIALS DESIGN

Simulations/Experiments Integration for Next Generation Hypersonic Materials — Session I

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: High Temperature Alloys Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Thomas Voisin, Lawrence Livermore National Laboratory; Jibril Shittu, Lawerence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Joseph McKeown, Lawrence Livermore National Laboratory; Raymundo Arroyave, Texas A&M University

Wednesday AM | March 22, 2023
Sapphire I | Hilton

Session Chairs: Thomas Voisin, Lawrence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Jibril Shittu, Lawrence Livermore National Laboratory

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8:30 AM Introductory Comments

8:35 AM Invited
Simultaneous Bayesian Calibration of Strength, Kinetics, and Phase Boundaries: *William Schill*[1]; Ryan Austin[1]; Kathleen Schmidt[1]; Jon Belof[1]; Justin Brown[2]; Nathan Barton[1]; [1]Lawrence Livermore National Laboratory; [2]Sandia

9:15 AM
Computational Modeling of the Hf-Ta-O System for Oxidation Resistance in HfC-TaC Alloys: *Rahim Zaman*[1]; Bi-Cheng Zhou[1]; [1]University of Virginia

9:35 AM
Computational Discovery and Experimental Validation of Ultra-high Strength BCC Refractory Metal-based MPEAs for Extreme Environments: *Kate Elder*[1]; Joel Berry[1]; Aurelien Perron[1]; Brandon Bocklund[1]; Hunter Henderson[1]; Jibril Shittu[1]; Connor Rietema[1]; Zachary Sims[1]; Scott McCall[1]; Joseph McKeown[1]; [1]Lawrence Livermore National Laboratory

9:55 AM
How Do You Integrate Both Simulations and Experiments into a Materials Discovery Optimization Campaign? A Case Study in Multi-fidelity Optimization: Ramsey Issa[1]; *Sterling Baird*[1]; Taylor Sparks[1]; [1]University of Utah

10:15 AM Break

10:35 AM
The Alloy Optimization Software (TAOS): Application to HEAs: *Aurelien Perron*[1]; Brandon Bocklund[1]; Vincenzo Lordi[1]; [1]Lawrence Livermore National Laboratory

10:55 AM
Computational Design of Ni-based SX Superalloys: A Critical Assessment of Machine-learned and Thermodynamic Models in View of Experimental Properties: *Abel Rapetti*[1]; Cervellon Alice[1]; Menou Edern[2]; Rame Jérémy[3]; Tancret Franck[4]; Cormier Jonathan[1]; [1]Institut Pprime UPR CNRS 3346; [2]Safran Tech; [3]Safran Aircraft Engines; [4]Institut des Matériaux Jean Rouxel (IMN), Université de Nantes, CNRS UMR 6502

11:15 AM
High-throughput CALPHAD Exploration of Multi-principal Element Alloy (MPEA) Space for Targeted Properties and Structure: *Adam Krajewski*[1]; Brandon Bocklund[1]; Aurelien Perron[1]; [1]Lawrence Livermore National Laboratory

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NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Structural, Plasma-facing & Functional Materials

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Wednesday AM | March 22, 2023
27B | SDCC

Session Chairs: Jaime Marian, University of California; Estelle Meslin, CEA-Saclay, University of Paris-Saclay

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8:30 AM Invited
Discrete and Continuum Models for the Sources of Nonlinear Strain for Macrscopic Simulations of Reactor Components: *Sergei Dudarev*[1]; Max Boleininger[1]; Peter Derlet[2]; Pui-Wai Ma[1]; Daniel Mason[1]; Luca Reali[1]; [1]UK Atomic Energy Authority; [2]Paul Scherrer Institut

9:10 AM
Stability of a Li2TiO3 Candidate Solid-breeder Material Following Li Transmutation: *German Samolyuk*[1]; Philip Edmondson[2]; Yuri Osetskiy[1]; [1]Oak Ridge National Laboratory; [2]The University of Manchester

9:30 AM
Grain-boundary Effects on the Irradiated Damages in W-Re Alloys: Sanghyuk Yoo[1]; Younggak Shin[2]; Seunghwan Oh[1]; Hyoungrul Park[1]; Younghyun Kim[2]; Anseung Yoo[2]; Ohkyoung Kwon[3]; Keonwook Kang[1]; *Byeongchan Lee*[2]; [1]Yonsei University; [2]Kyung Hee University; [3]Korea Institute of Science and Technology Information

9:50 AM Break

10:10 AM
Embrittlement and Hardening of Beryllium Under Irradiation at Low Temperatures: *Viacheslav Kuksenko*[1]; Ed Darnbrough[2]; Artem Lunev[1]; [1]UK Atomic Energy Authority; [2]University of Oxford

10:30 AM
Melting Behavior of He-implanted Tungsten Visualized by MeV-ultrafast Electron Diffraction: Ling Wang[1]; Thies Albert[2]; Zhijiang Chen[1]; Leora Dresselhaus-Marais[3]; Samuel Murphy[4]; Nicholas Hartley[1]; Laurenz Kremeyer[2]; Matthias Kling[1]; Emma McBride[1]; Benjamin Ofori-Okai[1]; Alexander Reid[1]; Adam Summers[1]; Klaus Sokolowski-Titen[2]; Xiaozhe Shen[1]; Xueli Zheng[3]; Yongqiang Wang[5]; Siegfried Glenzer[1]; *Mianzhen Mo*[1]; [1]SLAC National Accelerator Laboratory; [2]University of Duisburg-Essen; [3]Stanford University; [4]Lancaster University; [5]Los Alamos National Laboratory

10:50 AM
Analysis of Irradiation Damage Accumulation in Bi-phase Tungsten Heavy Alloy Microstructures: *James Haag*[1]; Weilin Jiang[1]; Matthew Olszta[1]; Wahyu Setyawan[1]; [1]PNNL

ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Energy Related Applications

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

Wednesday PM | March 22, 2023
Aqua AB | Hilton

Session Chairs: Hesam Askari, University of Rochester; Madan Dubey, Army Research Laboratory, Sensors and Electron Devices Directorate

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2:00 PM Introductory Comments

2:05 PM Invited
Application of Phase Change Materials in the Thermal Management of a LiFePO4 Battery Pack in a Cold Temperatures Environment: *Seyed Mojtaba Sadrameli*[1]; Yazdan Azizi[2]; [1]GUTech; [2]TMU

2:30 PM Invited
Bulk Heterojunction Organic Photovoltaic Devices Produced Using Liquid Crystalline Semiconducting Polymer Gel Materials: *John Magno*[1]; [1]Magno Fibers LLC

2:55 PM Invited
Spectroscopic Studies on Sulfides and Selenides of Mo and W for Photoabsorbers: *Anupama Kaul*[1]; [1]University of North Texas

3:20 PM Break

3:35 PM Invited
Super-capacitor Based on Hybrid Architecture with 2D Materials: *Daniel Choi*[1]; [1]Khalifa University of Science and Technology

4:00 PM Invited
Electromechanical Coupling of 2D Materials for Energy and Sensing Applications: *Jun Liu*[1]; [1]University at Buffalo, The State University of New York

4:25 PM
Phase-aligned Growth of Nickel Phosphosulfide Nanostructured Arrays: A Promising Electrocatalyst for Efficient Hydrogen Evolution Reaction: *Navid Attarzadeh*[1]; Debabrata Das[1]; Balwant K Singh[1]; Susheng Tan[2]; CV Ramana[1]; [1]University of Texas at El Paso; [2]University of Pittsburgh

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MATERIALS DESIGN

Accelerated Discovery and Insertion of Next Generation Structural Materials — Process Driven Techniques for Materials Discovery; Investigation of Thin Film Materials

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

Program Organizers: Soumya Nag, Oak Ridge National Laboratory; Andrew Bobel, General Motors Corporation; Bharat Gwalani, North Carolina State Universtiy; Jonah Klemm-Toole, Colorado School of Mines; Antonio Ramirez, Ohio State University; Matthew Steiner, University of Cincinnati

Wednesday PM | March 22, 2023
Sapphire M | Hilton

Session Chairs: Andrew Bobel, GM; Jonah Klemm-Toole, Colorado School of Mines; Matt Steiner, University of Cincinnati

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2:00 PM
Accelerating Multimodal Data Collection: A Workflow for Metallic Films: *Kimberly Bassett*[1]; Brad Boyce[1]; [1]Sandia National Laboratories

2:20 PM
AI and Machine Learning Tools for Development and Analysis of Image Driven 2D Materials: *Hafiz Munsub Ali*[1]; Venkata A. S. Kandadai[2]; Bharat Jasthi[2]; Venkataramana Gadhamshetty[2]; Etienne Gnimpieba[1]; [1]University of South Dakota; [2]South Dakota School of Mines and Techonology

2:40 PM
Efficient Conductivity and Hardness Optimization in Cu-Ag-Ni Alloys using Bayesian Active Learning: *Terrance Life*[1]; Shankarachary Ragi[1]; Bharat Jasthi[1]; Ananth Kandadai[1]; [1]South Dakota School of Mines and Technology

3:00 PM
High-throughput Synthesis and Mechanical Characterization of Sputtered Metallic Alloys: *Adie Alwen*[1]; Vignesh Manoharan[1]; Andrea Hodge[1]; [1]University of Southern California

3:20 PM
A High-throughput Setup for Materials Exposure to Simultaneous Irradiation-corrosion Conditions: *Franziska Schmidt*[1]; Hyosim Kim[2]; Yongqiang Wang[2]; Peter

Hosemann[1]; [1]University of California Berkeley; [2]Los Alamos National Laboratory

3:40 PM Break

4:00 PM
A Design Space for Tunable Ceramic-polymer Composites: *Yan Li*[1]; [1]Dartmouth College

4:20 PM
Combinatorial Mechanical Microscopy via Correlated Nanoindentation and EDX Mapping: *Jeffrey Wheeler*[1]; [1]Femto Tools Ag

4:40 PM
High-throughput Electric-Field-assisted Sintering and Characterization Techniques for Materials Discovery: *Michael Moorehead*[1]; Arin Preston[1]; Zilong Hua[1]; Jorgen Rufner[1]; [1]Idaho National Laboratory

5:00 PM
How Should You Select an Algorithm for a Materials Discovery Campaign with Multiple Objectives, Complex and High-dimensional Structure-processing-property Relationships, and a Small Adaptive Design Budget?: *Sterling Baird*[1]; Jeet Parikh; Trupti Mohanti[1]; Taylor Sparks[1]; [1]University of Utah

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Multifunctional Materials

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

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas, Sandia National Laboratories; Iver Anderson, Iowa State University Ames Laboratory

Wednesday PM | March 22, 2023
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Session Chair: Markus Chmielus, University of Pittsburgh

2:00 PM Invited
The Accelerated Development of Additively Manufactured Multifunctional Components: *Raju Ramanujan*[1]; Varun Chaudhary[1]; Srinivas Mantri[2]; Rajarshi Banerjee[2]; [1]Nanyang Technological University; [2]University of N. Texas

2:25 PM
3D Ink-Extrusion Printing of La_3Te_4 Thermoelectric Legs with Complex Geometries: *Alexander Proschel*[1]; Yunjia Zhang[1]; Araseli Cortez[2]; Jeffery Snyder[1]; David Dunand[1]; [1]Northwestern University; [2]NASA Jet Propulsion Laboratory

2:45 PM
3D Ink-extrusion Printing and Sintering of Thermoelectric Yb14MnSb11: *Ming Chen*[1]; Alexander Proschel[1]; Araseli Cortez[2]; Jeffrey Snyder[1]; David Dunand[1]; [1]Northwestern University; [2]NASA Jet Propulsion Laboratory, California Institute of Technology

3:05 PM
Process-Structure-Property Relationships for Laser Powder Bed Fusion of Thermoelectric Materials for Low and High Temperature Applications: *Saniya Leblanc*[1]; Yahya Oztan[1]; Ryan Welch[1]; Bengisu Sisik[1]; Vijayabarathi Ponnambalam[1]; [1]George Washington University

3:25 PM
The Control of Tailored Microstructure and Thermoelectric Properties in Additively Manufactured Materials: *Connor Headley*[1]; Roberto Herrera del Valle[1]; Ji Ma[1]; Prasanna Balachandran[1]; Vijayabarathi Ponnambalam[2]; Saniya LeBlanc[2]; Dylan Kirsch[3]; Joshua Martin[3]; [1]University of Virginia; [2]George Washington University; [3]National Institute of Standards and Technology

3:45 PM Break

4:00 PM
Rapid 3D Printing of AlN Ceramic Green Bodies for Heat Dissipation Devices: *Luyang Liu*[1]; Xiangfan Chen[1]; [1]Arizona State University

4:20 PM
Manufacturability and Reliability of Additively Manufactured Planar Transformer Windings Using Silver-based Pastes: He Yun[1]; *F. McCluskey*[1]; [1]University of Maryland

4:40 PM
High Resolution Three-Dimensional Printing of Piezoelectric Composites for Sensing Applications: Siying Liu[1]; Wenbo Wang[1]; Luyang Liu[1]; *Xiangfan Chen*[1]; [1]Arizona State University

5:00 PM
The Development of (CoCrFeMnCu)1-xCrx High Entropy Alloy by arc-DED Additive Manufacturing Process: *Sertaç Altınok*[1]; Koray Yurtışık[2]; Yunus Kalay[2]; [1]TAI; [2]Middle East Technical University

5:20 PM
In-Situ Alloying of Nb-47Ti Superconductors Using Laser Powder Bed Fusion: *Tugrul Ersoz*[1]; Moataz Attallah[1]; [1]University of Birmingham

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ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session V 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; Steve Daniewicz, University of Alabama; Mohsen Seifi, ASTM International/Case Western Reserve University

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

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2:00 PM Invited
Predicting the Fatigue Performance of AM Ti-6Al-4V Components: *Derek Warner*[1]; Terrence Moran[1]; Peipei Li[1]; [1]Cornell University

2:30 PM
Experiments to Enable Machine Learning of Fatigue Performance in DMLM Ti-6Al-4V with Respect to Microstructure: *Samuel Present*[1]; Monica Soare[2]; Johan Reimann[2]; Laura Dial[2]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]General Electric Research Laboratory

2:50 PM
In-situ Microscopy of Crack Initiation and Growth in Laser Powder Bed Additively-manufactured Ti-6Al-4V: Matthew Krug[1]; JoAnn Ballor[2]; Lewis Forman[1]; Michael Velez[1]; Molly Walters[1]; *Sushant Jha*[3]; Carl Boehlert[2]; [1]Air Force Research Laboratory; [2]Michigan State University; [3]University of Dayton Research Institute

3:10 PM
Improving the Low Cycle Fatigue Life of Additively Manufactured High-manganese Steels by Tailoring the Crystallographic Textures: Efthymios Polatidis[1]; Miroslav Smid[2]; *Jan Capek*[1]; Michal Jambor[2]; Daniel Koutny[3]; Christian Haase[4]; [1]Paul Scherrer Institute; [2]Czech Academy of Sciences; [3]Brno University of Technology; [4]RWTH Aachen

3:30 PM Break

3:50 PM Invited
Efficient Computational Framework for Image-based Micromechanical Analysis of Additively Manufactured Ti-6Al-4V Alloys: *Somnath Ghosh*[1]; Maxwell Pinz[1]; Steven Storck[2]; [1]Johns Hopkins University; [2]JHU Applied Physics Laboratory

4:20 PM
Influence of Process Parameters on Fatigue Behavior and Defect Characteristics in LPBF Ti-6Al-4V: *Austin Ngo*[1]; David Scannapieco[1]; Francisco Medina[2]; Christian Gobert[3]; Anthony Rollett[3]; Jack Beuth[3]; John Lewandowski[1]; [1]Case Western Reserve University; [2]University of Texas at El Paso; [3]Carnegie Mellon University

4:40 PM
Globularization of Alpha Phase in Additively Manufactured Ti-6Al-4V Alloys and Effects on High-Cycle and Very-High-Cycle Fatigue: *Reza T. Mousavian*[1]; Anthony G. Spangenberger[1]; Austin Mann[2]; Cory Cunningham[2]; Diana A. Lados[1]; [1]Worcester Polytechnic Institute; [2]Boeing Research & Technology

5:00 PM
Enhancing the Fatigue Performance of AM Metals via Conformal Coatings that Activate Uniform Surface Remelting and Smoothening: *Kenny Yetter*[1]; Michael Sangid[2]; William LePage[1]; [1]University of Tulsa; [2]Purdue University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications V — Applications and Case Studies

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

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

Oak Ridge National Laboratory; Yi Xie, Purdue University

Wednesday PM | March 22, 2023
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Session Chairs: Isabella van Rooyen, Pacific Northwest National Laboratory; Yi Xie, Purdue University

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2:00 PM Introductory Comments

2:05 PM Invited
Challenges and New Opportunities for Additive Manufacturing of Oxide Dispersion Strengthened Steels: *Tim Horn*[1]; Djamel Kaoumi[1]; Chris Rock[1]; Iver Anderson[2]; [1]North Carolina State University; [2]AMES Laboratory

2:40 PM
Development of Additive Manufacturing Technology for Micro-reactors: *Hyun-Gil Kim*[1]; Sung Chan Yoo[1]; Sung Eun Kim[1]; Sung Uk Lee[1]; Hyo Chan Kim[1]; [1]Kaeri

3:00 PM
Additively Manufactured Reactor for Steam Methane Reforming: Ward TeGrotenhuis[1]; Danny Bottenus[1]; Paul Humble[1]; *Patrick McNeff*[1]; Richard Zheng[1]; [1]Battelle

3:20 PM
Additively Manufactured Strain Sensors for Nuclear Applications: *Timothy Phero*[1]; Kaelee Novich[1]; Kiyo Fujimoto[2]; Benjamin Johnson[1]; Michael McMurtrey[2]; David Estrada[1]; Brian Jaques[1]; [1]Boise State University; [2]Idaho National Laboratory

3:40 PM Break

3:55 PM
Distributed Strain Measurements in Additively Manufactured SS316 with Embedded Fiber-Optic Sensors: *Holden Hyer*[1]; Christian Petrie[1]; [1]Oak Ridge National Laboratory

4:15 PM
In-situ Embedment and High Temperature Testing of Commercial Thermocouples with Directed Energy Deposition: *Luis Nuñez*[1]; Piyush Sabharwall[1]; Isabella van Rooyen[2]; [1]Idaho National Laboratory; [2]Pacific Northwest National Laboratory

4:35 PM
Laser Directed Energy Deposition Additive Manufacturing of Supercritical CO2 Heat Exchangers: *Christian Sanjurjo-Rodriguez*[1]; Amir Shooshtari[1]; Michael Marshall[2]; Wei Zhong[1]; Ji-Cheng Zhao[1]; [1]University of Maryland; [2]Southwest Research Institute

4:55 PM
Structural Sensing Lattices: *Benjamin White*[1]; Anthony Garland[1]; Brad Boyce[1]; [1]Sandia National Laboratories

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Nickel Alloys/ Hybrid Additive Manufacturing

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

Program Organizers: Sougata Roy, University of North Dakota; Sneha Prabha

Narra, Carnegie Mellon University; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh; Yashwanth Bandari, AddiTec Technologies LLC

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Session Chair: Chantal Sudbrack, National Energy Technology Laboratory

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2:00 PM
Effect of Cooling Rates on the -lathe, Precipitates, and Reconstructed Prior-Grains in Nickel Aluminum Bronze: *Dillon Watring*[1]; Colin Stewart[1]; Richard Fonda[1]; David Rowenhorst[1]; [1]Naval Research Laboratory

2:20 PM
Effect of Varying Machining Conditions on Microstructure and Mechanical Properties of 316L Stainless Steel Fabricated by Hybrid Manufacturing: *Rangasayee Kannan*[1]; Thomas Feldhausen[1]; Peeyush Nandwana[1]; [1]Oak Ridge National Laboratory

2:40 PM
Hybrid Metal Manufacturing of Large Freeform Geometries: *Bradley Jared*[1]; Tony Schmitz[1]; Joshua Penney[1]; Aaron Cornelius[1]; Ross Zameroski[1]; Eduardo Miramontes[1]; Tiffany Quigley[1]; Devon Goodspeed[1]; William Hamel[1]; [1]University of Tennessee, Knoxville

3:00 PM Invited
From Neutron Diffraction to Tool Repair: How Fundamental Scientific Research Translates to Industrial Impact for Hybrid Manufacturing Systems: *Thomas Feldhausen*[1]; Kyle Saleeby[1]; Peeyush Nandwana[1]; Rangasayee Kannan[1]; Alex Plotkowski[1]; Brian Post[1]; [1]Oak Ridge National Laboratory

3:30 PM Break

3:50 PM
Large Area Deposition of Haynes 230: Sergio Ausejo[1]; Laura Acebo[1]; Nerea Burgos[1]; David Linder[2]; Savya Sachi[2]; Ida Berglund[2]; *Mustafa Megahed*[3]; [1]CEIT; [2]QuesTek Europe AB; [3]ESI Group

4:10 PM
Design, Modeling and Optimization of a Light Weight Impact Attenuator for Commercial Vehicles Using Wire Arc Additive/Subtractive Manufacturing (WAASM) Processing: *Mohamed Fawzy Mohamed*[1]; Hanadi Salem[1]; Islam Hamdy[1]; Ahmed Elsokaty[1]; [1]The American University in Cairo

4:30 PM
The Effect of Cryogenic Cooling on the Microstructure and Mechanical Properties of Wire Arc Additively Manufactured Steels: *Constantinos Goulas*[1]; Maximus Akuh[2]; Vignesh Venkata Subramanian[3]; Remco Rook[3]; José Galán Argumedo[4]; Theodoros Michelis[4]; Marco Ameye[2]; Wei Ya[3]; Ian Gibson[1]; Marcel Hermans[4]; [1]University of Twente; [2]AirProducts; [3]RAMLAB BV; [4]Delft University of Technology

4:50 PM Invited
Wire-Arc Additive Manufacturing of Haynes® 282 Superalloy: *Wei Xiong*[1]; Luis Ladinos Pizano[1]; Soumya Sridar[1]; Chantal K. Sudbrack[2]; [1]University of Pittsburgh; [2]National Energy Technology Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Solidification of Advanced Materials I

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

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Session Chair: Lianyi Chen, University of Wisconsin-Madison

2:00 PM Invited
Solidification Cracking in Additive Manufacturing of Metals: *Seyed Mohammad Hojjatzadeh*[1]; Minglei Qu[1]; Ali Nabaa[1]; Qilin Guo[1]; Luis I. Escano[1]; Lianyi Chen[1]; [1]University of Wisconsin-Madison

2:20 PM
A Novel Method for Determining Printability of Aluminum Alloys for LPBF Applications: *John O`Connell*[1]; Bhaskar Majumdar[1]; Timothy Nice[1]; Nathaniel Badgett[1]; Mohammad Choudhury[1]; [1]New Mexico Institute of Mining and Technology

2:40 PM
An Oxygen-stabilized Face-centred Cubic Phase in Additively Manufactured Ti-6Al-4V: *Hao Wang*[1]; Qi Chao[2]; Xiangyuan Cui[1]; Zibin Chen[1]; Andrew Breen[1]; Wei Xu[2]; Sophie Primig[3]; Simon Ringer[1]; Xiaozhou Liao[1]; [1]University of Sydney; [2]Deakin University; [3]UNSW Sydney

3:00 PM
Analysis of Functionally Grade Materials Printing via Direct Energy Deposition Using Thermodynamic and Physical Simulation: *Jorge Valilla*[1]; Damien Tourret[1]; Ilchat Sabirov[1]; [1]IMDEA Materials

3:20 PM
Comparing Microstructure and Mechanical Properties of AlSi10Mg Alloy Produced by Laser Powder Bed Fusion and High Pressure Die Casting Processes: *Indrajeet Katti*[1]; Mark Easton[1]; Dong Qiu[1]; Joy Forsmark[2]; Matthew Barnett[3]; Matthias Weiss[3]; [1]RMIT University; [2]Ford Motor Company; [3]Deakin University

3:40 PM Break

3:55 PM
Effect of Chemical Composition, Crystallographic Orientation and Processing Parameters on Rapid Solidification in Ni-Al-Mo Single Crystals: *Adriana Eres-Castellanos*[1]; Ruben Ochoa[1]; Chandler Becker[1]; Kamel Fezzaa[2]; Jonah Klemm-Toole[1]; Tresa Pollock[3]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Argonne National Laboratory; [3]University of California Santa Barbara

4:15 PM
Exploration of Rapidly Solidified and Near-Ti Alloys Processed by Two Piston Splat Quenching: *Greyson Harvill*[1]; C. Williamson[1]; Grace Schneider[1]; Zach Hasenbusch[1]; Laurentiu Nastac[1]; Ben Brown[2]; Andrew Deal[2]; Luke Brewer[1]; [1]University of Alabama Tuscaloosa; [2]Kansas City National Security Campus

4:35 PM
Use of Magnetic Force to Control Melt Flow and Microstructure during Additive Manufacturing: *Xianqiang Fan*[1]; Tristan Fleming[2]; Samul Clark[3]; Chu Lun Alex Leung[1]; Anna Getley[1]; Sebastian Marussi[1]; Hongze Wang[4]; Robert Atwood[5]; Andrew

Kao[6]; Peter Lee[1]; [1]University College London; [2]Queen's University; [3]Argonne National Laboratory; [4]Shanghai Jiao Tong University; [5]Diamond Light Source Ltd; [6]University of Greenwich

4:55 PM
Grain Boundary Character Distribution in Additively Manufactured Nickel-based Superalloy INC738: *Ming Luo*[1]; Xiaozhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; Nima Haghdadi[1]; [1]UNSW Sydney; [2]The University of Sydney

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of Ta-based, Mo-based, and W-based Alloys

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

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Omar Mireles, NASA; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Matthew Osborne, Global Advanced Metals; Joao Oliveira, FCT-UNL

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Session Chairs: Jeffrey Sowards , NASA MFSC; Matt Osbourne , Global Advanced Metals

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2:00 PM Invited
Influence of Dislocation Structures on Mechanical Response in Additively-manufactured Ta-2.5%W Across Length Scales: *Kaila Bertsch*[1]; Marissa Linne[1]; Stephen Burke[1]; Riley Wraith[1]; Joseph McKeown[1]; Hye-Sook Park[1]; [1]Lawrence Livermore National Laboratory

2:30 PM
Characterizing the High Temperature Mechanical Performance and Microstructure of Additively Manufactured Tantalum and Tungsten Alloys: *Sharon Park*[1]; Mo-Rigen He[1]; Gianna Valentino[2]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]JHU Applied Physics Laboratory

2:50 PM
Elucidating the Porosity-Cracking Tradeoff in Laser-based Additive Manufacturing of Refractory Metals: *Gianna Valentino*[1]; Robert Mueller[1]; Alex Lark[1]; Li Ma[1]; Ian McCue[2]; [1]Johns Hopkins Applied Physics Laboratory; [2]Northwestern University

3:10 PM
Study of Printability and Melt Pool Geometry in W & W -alloys by Laser Powder Bed Fusion: *Amaranth Karra*[1]; Maarten de Boer[1]; Bryan Webler[1]; [1]Carnegie Mellon University

3:30 PM Break

3:50 PM Invited
Enabling Future Concepts in Nuclear Energy through the Use of Additive Manufacturing on Titanium – Zirconium – Molybdenum Alloy: *John Carpenter*[1]; Michael Brand[1]; Rose Bloom[1]; Robin Montoya Pacheco[1]; [1]Los Alamos National Laboratory

4:20 PM
Development of Molybdenum Alloys for Use with Powder Blown Laser Directed Energy Deposition Additive Manufacturing: *Nathaniel Lies*[1]; [1]Georgia Institute of Technology

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Lattice Structures and Miscellaneous I

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

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Session Chairs: Mohsen Mohammadi, University of New Brunswick; Jordan Weaver, NIST

2:00 PM Invited
Invited: Multiscale Phenomena to Inspire Lattice Structures Design: *Kavan Hazeli*[1]; [1]University of Arizona

2:20 PM
Single-point Laser Scanning Strategy for the SLM Fabrication of Ti-6AL-4V Micro-strut Lattices: Strut Size Dependent Mechanical Properties: *Conor O'Keeffe*[1]; D Kelly[1]; [1]Trinity College Dublin

2:40 PM
Investigating the Influence of Grain Boundary Strengthening Assumptions on the Lattice Strain Evolution in Additively Manufactured IN718: *Jason Mayeur*[1]; [1]Oak Ridge National Laboratory

3:00 PM
Effects of Topology on the Compressive Creep Rate of Inconel 625 FCCZ Lattices: Kaitlynn Conway[1]; Hamid Torbati-Sarraf[2]; Thomas Berfield[3]; *Garrett Pataky*[4]; [1]Sandia National Laboratories; [2]Purdue University; [3]University of Louisville; [4]Clemson University

3:20 PM
Toughness Amplification in Bioinspired Nanoarchitectured Materials: *Zainab Patel*[1]; Lucas Meza[1]; [1]University of Washington

3:40 PM Break

4:00 PM Invited
Topological Homogenization of Metamaterial Variability: *Benjamin White*[1]; Anthony Garland[1]; Brad Boyce[1]; [1]Sandia National Laboratories

4:20 PM
New Insights on Dislocation Barrier Effect of the Cellular Subgrain Feature in Directed Energy Deposited SS 316L: *Janith Wanni*[1]; Ajith Achuthan[1]; [1]Clarkson University

4:40 PM
Interlocking Metasurfaces: An Additive Enabled Joining Technology: *Ophelia Bolmin*[1]; Benjamin Young[1]; Philip Noell[1]; Brad Boyce[1]; [1]Sandia National Laboratories

5:00 PM
Interlocking Metasurfaces: Stronger than the Sum of their Parts: *Benjamin Young*[1]; Ophelia Bolmin[1]; Brad Boyce[1]; Philip Noell[1]; [1]Sandia National Laboratories

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — 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 Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

Wednesday PM | March 22, 2023
24C | SDCC

Session Chair: Jiadong Gong , QuesTek

2:00 PM
Bayesian Process Optimization for Porosity Control in Laser-Powder Bed Fusion of IN718 Alloy with Computational Fluid Dynamics Simulation: *Peter Morcos*[1]; Dehao Liu[2]; Alaa Elwany[1]; Ibrahim Karaman[1]; Raymundo Arroyave[1]; [1]Texas A&M University; [2]Binghamton University

2:20 PM
Investigation of Cracking in GRCop42-Inconel 625 Joints: *Jakub Preis*[1]; Somayeh Pasebani[1]; Brian Paul[1]; [1]Oregon State University

2:40 PM
Development of a Gamma-prime-strengthened Ni-base Superalloy for Laser Powder Bed Fusion: *Tomonori Kitashima*[1]; Tomoki Hiraga[1]; Dennis Jodi[1]; Kyoko Kawagishi[1]; Masahiko Demura[1]; Shinya Hibino[2]; Takayoshi Nakano[3]; Makoto Watanabe[1]; [1]National Institute for Materials Science; [2]Kawasaki Heavy Industries, Ltd.; [3]Osaka University

3:00 PM
Directed Energy Deposition (DED) of Ni-Al Functionally Integrated Materials (FIMs) via In-situ Alloying with Elemental Ni and Al Powder Feedstocks: *Baolong Zheng*[1]; Xin Wang[1]; Benjamin MacDonald[1]; Calvin Belcher[1]; Penghui Cao[1]; Lorenzo Valdevit[1]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California, Irvine

3:20 PM Invited
Operando X-ray Diffraction Reveals Solidification Pathway of High Entropy Alloys with Different Degrees of Metastability: Akane Wakai[1]; Amlan Das[2]; *Atieh Moridi*[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron Source

3:50 PM Break

4:10 PM
Understanding the Influence of Boron in Additively Manufactured CoNi-based Superalloys Using Atom Probe Tomography: *Qing-Qiang Ren*[1]; Jonathan

Poplawsky[1]; Evan Raeker[2]; Kira Pusch[2]; Tresa Pollock[2]; Stephane Forsik[3]; Ning Zhiu[3]; Austin Dicus[3]; Michael Kirka[1]; [1]Oak Ridge National Laboratory; [2]University of California Santa Barbara; [3]Carpenter Technology Corporation

4:30 PM
Microstructure and Mechanical Properties of Arc Melted NiSi11Cx Alloys: *Foysal Kabir Tareq*[1]; Even Wilberg Hovig[2]; Ragnhild Aune[3]; Geir Grasmo[1]; [1]University of Agder; [2]SINTEF Industry; [3]Norwegian University of Science and Technology

4:50 PM
Comparing Microstructure and Tensile Properties of Wrought and LP-DED Haynes 233: Effects of Heat Treatment and Test Temperature: *Mikyle Paul*[1]; Reza Ghiaasiaan[1]; Paul Gradl[2]; Shuai Shao[1]; Nima Shamsaei[1]; [1]Auburn University; [2]NASA Marshall Space Flight Center

5:10 PM
Laser Powder Bed Fusion of Defect-Free NiTi Shape Memory Alloy Parts with Superior Mechanical Response: *Abdelrahman Elsayed*[1]; Ibrahim Karaman[1]; Raymundo Arroyave[1]; Alaa Elwany[1]; Kadri Can Atli[1]; Chen Zhang[1]; Lei Xue[1]; [1]Texas A&M University

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BIOMATERIALS

Advanced Biomaterials for Biomedical Implants — Advanced Biomaterials for Implants II

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

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Jing Du, Pennsylvania State University

Wednesday PM | March 22, 2023
Sapphire 400B | Hilton

Session Chairs: Thomas Vinoy, University of Alabama at Birmingham; Du Jing, Pennsylvania State University

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2:00 PM Invited
Application of Magnetic Iron Oxide Nanostructures in Drug Delivery: A Compact Review: Inono C. Omoruyi1[1]; Jeffery Omoruyi[2]; *Oscar Aghedo*[3]; Ukeme Archibong[4]; Ikhazuagbe Ifijen[2]; [1]Department of Chemistry, University of Benin, Benin City, Edo state, Nigeria; [2]Rubber Research Institute of Nigeria; [3]University of Benin; [4] University of Benin

2:30 PM
Design, Characterization, and In Vitro Corrosion Properties of New near Ti- Nb -Ag Alloy for Bio Implant Applications: *Mohamed Hussein*[1]; Arumugam Kumar[1]; Mohamed Abdul Azeem[1]; Ahmad Sorour[1]; Saravanan Sankaran[1]; [1]King Fahd University of Petroleum and Minerals

2:50 PM
Finite Element Analysis of Partially Biodegradable Ti-PGA Composite Implants Assembled with Bone Fractures: *Hassan Mehboob*[1]; [1]Prince Sultan University

3:10 PM
Manufacturing of Mg Wires with Optimized Properties for Biomedical Applications: Wahaaj Ali[1]; Leon Tillmann[2]; Guillermo Domínguez[3]; Muzi Li[1]; Mónica Echeverry-Rendón[1]; Tim Mayer[2]; Carlos González[3]; *Javier Llorca*[3]; Alexander Kopp[2]; [1]IMDEA Materials Institute; [2]Meotec GmbH; [3]IMDEA Materials Institute & Technical University of Madrid

3:30 PM Break

3:50 PM
Developing Strong and Ductile TWIP Zr-based Alloys for Cardiovascular Stent Application: *Junhui Tang*[1]; Philippe Vermaut[1]; Frédéric Prima[1]; Fan Sun[1]; [1]Chimie-ParisTech

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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. Tasan, Massachusetts Institute of Technology; Olivia Jackson, Sandia National Laboratories

Wednesday PM | March 22, 2023
Aqua 311A | Hilton

Session Chairs: Mohsen Taheri Andani, Texas A&M University; Laurent Capolungo, Los Alamos National Laboratory

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2:00 PM Invited
Twin Network Formation and Morphology in Metals with Hexagonal Close Packed Crystal Structure: *Laurent Capolungo*[1]; Dang Khanh[1]; Arul Kumar[1]; Darshan Bamney[1]; Hi Vo[1]; Rodney McCabe[1]; Carlos Tome[1]; [1]Los Alamos National Laboratory

2:30 PM
High Orientation Precision 3D-EBSD with Multi-Modal Data Registration: *Gregory Sparks*[1]; Paul Shade[2]; Michael Uchic[2]; Stephen Niezgoda[1]; Simon Mason[1]; Michael Mills[1]; Mark Obstalecki[2]; [1]Ohio State University; [2]Air Force Research Laboratory

2:50 PM
Evolution of Stresses during Twinning and Detwinning in Magnesium: *Karim Louca*[1]; Jonathan Wright[2]; Marta Majkut[2]; Hamidreza Abdolvand[1]; [1]University of Western Ontario; [2]European Synchrotron Radiation Facility (ESRF)

3:10 PM
Micro Hall-Petch Slope in Mg Alloys: The Influence of Grain Boundary Parameters: *Mohsen Taheri Andani*[1]; Aaditya Lakshmanan[1]; Jeremy Yoo[1]; Veera Sundararaghavan[1]; John Allison[1]; Amit Misra[1]; [1]University of Michigan

3:30 PM Break

3:50 PM
An In-Situ Study of Mechanical Twinning Effects on Strain Localization and Damage in an (+) Titanium Alloy: *Jiyun Kang*[1]; C. Cem Tasan[1]; [1]Massachusetts Institute of Technology

4:10 PM
Capturing the 3D Evolution of Twin Networks in Titanium as a Function of Applied Strain: *Hi Vo*[1]; Rodney McCabe[1]; Patrick Pinney[1]; Matthew Schneider[1]; M. Arul Kumar[1]; Carlos Tome[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

4:30 PM
Slip Transfer at Grain Boundaries and Intergranular Fracture in Ti: Eugenia Nieto[1]; Eshan Ganju[2]; Nik Chawla[2]; *Javier Llorca*[1]; [1]IMDEA Materials Institute & Technical University of Madrid; [2]Purdue University

4:50 PM
Dislocation Pile-ups and Grain Boundary Interactions Studied Using In Situ Cross-Correlation EBSD in High Purity Nickel: *Yang Su*[1]; Thanh Phan[2]; Liming Xiong[2]; Josh Kacher[1]; [1]Georgia Institute of Technology; [2]Iowa State University

5:10 PM
Deformation Behavior of Chondrite Meteorite Using In Situ Correlative Microscopy: *Tai-Jan Huang*[1]; Eshan Ganju[1]; Hamid Torbatisarraf[1]; Sridhar Niverty[1]; Nikhilesh Chawla[1]; [1]Purdue University

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ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Energy Storage with Battery II

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

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

Wednesday PM | March 22, 2023
32B | SDCC

Session Chairs: Rachel Carter, U.S. Naval Research Lab.; Kaustubh Naik, Purdue University

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2:00 PM Keynote
Towards Fracture-free Bulk Silicon Anodes for Lithium-ion Batteries: Matthew Lefler[1]; Junhoon Yeom[1]; Christopher Rudolf[1]; *Corey Love*[1]; [1]Us Naval Research Laboratory

2:30 PM
Atomistic Simulations of Reaction Kinetics at Electrochemical Interface: *Yuanyue Liu*[1]; [1]University of Texas at Austin

2:50 PM
Cathode Materials Recycling, Regeneration, and Reuse: *Meng Shi*[1]; Bor-Rong Chen[1]; Pete Barnes[1]; John Klaehn[1]; Luis Diaz Aldana[1]; Eric Dufek[1]; Tedd Lister[1]; [1]Idaho National Laboratory

3:10 PM
High Recycled Content Aluminum Alloy Current Collector for Lithium-Ion Batteries: *Daehoon Kang*[1]; Martti Kampgen[2]; Sazol Das[1]; Diptarka Majumdar[1]; Matthew McDowell[3]; Rajesh Gopalaswamy[1]; [1]Novelis Global Research and Technology Center; [2]Novelis Deutschland GmbH; [3]Georgia Tech

3:30 PM Break

3:50 PM
Large-Scale Phase-field Modeling of Lithium Dendrite Growth: *Jin Zhang*[1]; Alexander Chadwick[1]; David Chopp[1]; Peter Voorhees[1]; [1]Northwestern University

4:10 PM
Mechanistic Analysis of Interface Stability in Solid-State Batteries: Kaustubh Naik[1]; *Bairav Vishnugopi*[1]; Partha Mukherjee[1]; [1]Purdue University

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CHARACTERIZATION

Advanced Real Time Imaging — Energy, Biomaterials, Emerging Techniques

Sponsored by: TMS Functional Materials Division, 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 Engergy 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, Sourthern 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

Wednesday PM | March 22, 2023
Aqua 310A | Hilton

Session Chair: Jinichiro Nakano, US Department of Energy - National Engergy Technology Laboratory

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2:00 PM Invited
Recent Advances in Ultrafast Real-time Imaging of Sonoprocessing Advanced Materials: *Jiawei Mi*[1]; [1]University of Hull

2:20 PM Invited
Real-time Plasmon-Enhanced Colorimetric Imaging: *Brian Abbey*[1]; [1]La Trobe University

2:40 PM
Behavior of Plastic Ashes in Gasification Environments: *Jinichiro Nakano*[1]; Kristin Tippey[1]; Anna Nakano[1]; Hugh Thomas[1]; Ömer Doğan[1]; [1]US Department of Energy - National Engergy Technology Laboratory

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BIOMATERIALS

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

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

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

Wednesday PM | March 22, 2023
Sapphire 410A | Hilton

Session Chair: Heqi Xu, Zhejiang University

2:00 PM
Investigation of Cell Sedimentation and Cell Aggregation during 3D Bioprinting: *Md Shahriar*[1]; Heqi Xu[1]; Jiachen Liu[1]; Changxue Xu[1]; Dulce Martinez Salazar[1]; [1]Texas Tech University

2:20 PM
Processing and Properties of 3D Printed Bioabsorable Polymer-Metal Composites (PLDL/Mg and PLDL/Zn) for Orthopaedic Applications: Cillian Thompson[1]; Guillermo Domínguez[1]; Jimena de la Vega[1]; Cristina Pascual-González[2]; Monica Echeverry-Rendón[1]; Carlos González[3]; *Javier Llorca*[3]; [1]IMDEA Materials Institute; [2]Rey Juan Carlos University; [3]IMDEA Materials Institute & Technical University of Madrid

2:40 PM
Investigation of Cellular Attachment and Morphology on a 3D-printed Curved Micropillar Substrate: *Eduardo Pena*[1]; Md Shahriar[1]; Changxue Xu[1]; [1]Texas Tech University

3:00 PM
The Influence of Printing Orientation on the Mechanical Properties of 3D Printed Parts by Stereolithography (SLA) Process: *Michael Melly*[1]; Alyssa Napora[1]; Olivia Lowe[1]; Chao Gao[2]; Fariborz Tavangarian[1]; [1]Pennsylvania State University Harrisburg; [2]Norwegian University of Science and Technology

3:20 PM
Improving Predictability of Additively Manufactured Ti-6Al-4V Lattices for Customised Orthopaedic Devices: *Xue Cao*[1]; [1]University of Birmingham

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Structures and Modeling

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Wednesday PM | March 22, 2023
Aqua D | Hilton

Session Chairs: Chelsey Hargather, New Mexico Institute of Mining and Technology; Ying Yang, Oak Ridge National Laboratory

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2:00 PM Invited
Interface-related Deformation Phenomena in High Entropy Alloy / Metallic Glass Nanolaminates: *Jurgen Eckert*[1]; Qi Xu[1]; Daniel Sopu[1]; Xudong Yuan[1]; Daniel Kiener[2]; [1]Erich Schmid Institute of Materials Science; [2]Montanuniversitaet Leoben, Dept. Materials Science

2:20 PM Invited
Effects of Precipitate Size and Spacing on Deformation-induced fcc to bcc Phase Transformation: *Eva Zarkadoula*[1]; Ying Yang[1]; Albina Borisevich[1]; Easo George[1]; [1]Oak Ridge National Laboratory

2:40 PM Invited
The Complexity of High Entropy Alloys: *Huseyin Sehitoglu*[1]; ASK Mohammed[1]; O. Celebi[1]; [1]University of Illinois

3:00 PM Invited
Diffusion-activation Energy in CoCrNi, CoCrFeNiMn, and CoCrFeNiCu High-entropy Alloys from First-principles Calculations, with Comparison to Creep-activation Energy: Christopher Lafferty[1]; Peter Liaw[2]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology; [2]University of Tennessee

3:20 PM Break

3:40 PM Invited
A Physical Model for Accurate Prediction of Lattice Parameter beyond Vegard's Law: An Application in bcc Solid Solution Alloys: *Christopher Tandoc*[1]; Yong-Jie Hu[1]; [1]Drexel University

4:00 PM Invited
Sequential Deformation-induced Phase Transformations in a Fe-Cr-Co-Ni Medium-entropy Alloy Explains Its Mechanical Behavior: *Ying Yang*[1]; Weicheng Zhong[1]; Easo George[1]; [1]Oak Ridge National Laboratory

4:20 PM Invited
Study of Short-Range Orders in Al-Co-Cr-Fe-Ni High-Entropy Alloys and Their Effects on Thermodynamic Properties – Atomistic Simulations and Data Analytics: *Seungha Shin*[1]; Md Abdullah Al Hasan[1]; Peter Liaw[1]; Dustin Gilbert[1]; [1]University of Tennessee

4:40 PM Invited
Understanding the Short-range Ordering and Dislocation Behavior in BCC Refractory High Entropy Alloys: Shuai Chen[1]; Zachary Aitken[1]; Subrahmanyam Pattamatta[2]; Zhaoxuan Wu[2]; Zhi-Gen Yu[1]; David Srolovitz[3]; Peter Liaw[4]; *Yong-Wei Zhang*[1]; [1]Institute of High Performance Computing; [2]City University of Hong Kong; [3]Hong Kong University; [4]University of Tennessee

5:00 PM Invited
First-principles Study of the Phase Stability and Secondary Phase Formation in the AlxCoCrFeNi High-entropy Alloys: *Chin-Lung Kuo*[1]; [1]National Taiwan University

5:20 PM
Numerical and Experimental Exploration of CCAs from the CrFeNiMoTi System for the Development of Cobalt-free Hardfacing Coatings: Clément Vary[1]; *Pascal Aubry*[1]; Ivan Guillot[2]; [1]CEA; [2]CNRS

MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — Advances in Ceramic Materials and Processes IV

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Wednesday PM | March 22, 2023

30A | SDCC

Session Chair: Eugene Olevsky, San Diego State University

2:00 PM Introductory Comments

2:05 PM Invited
Refractories Ceramic Cements Based on Double Oxides: *Nickolai Iliukha*[1]; [1]Kyiv University

2:25 PM
Printed Carbon Nanotubes and Graphene Heaters for Drying Ceramics: *Ziyad Sherif*[1]; John Patsavellas[1]; Konstantinos Salonitis[1]; [1]Cranfield University

2:45 PM
Enhancing Reinforcing Efficiency of Sic Particles in Aluminium Matrix Composites with Intercalated Oxygen Atoms: *Miran Joo*[1]; Donghyun Bae[1]; [1]Yonsei University

3:05 PM
Mixed-Alkali Effect on Metaphosphate Glass Forming Liquids: *Tae-min Yeo*[1]; Jung-Wook Cho[1]; [1]POSTECH

3:25 PM Break

3:40 PM
Weathering Resistance of Post-consumer Glass and Sawdust Reinforced Polyester Composites: *Kator Jomboh*[1]; Mohammed Yakubu[2]; Wilson Eze[3]; Adele Garkida[2]; Emmanuel Alemaka[2]; [1]University of Maiduguri, Borno State; [2]Ahmadu Bello University, Zaria; [3]Nigerian Institute of Leather and Science Technology, Zaria

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MATERIALS PROCESSING

Advances in Surface Engineering V — Thick Coatings

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

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

Wednesday PM | March 22, 2023
29D | SDCC

Session Chairs: Tushar Borkar, Cleveland State University; Ganesh Walunj, Buffalo State College

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2:00 PM Introductory Comments

2:05 PM Invited
Oxidation of Ferrous Alloys and Coatings Under Isothermal, Impulse Heating, and Diesel Engine Operation: John Saputo[1]; Felipe Caliari[1]; *Sanjay Sampath*[1]; [1]Stony Brook University

2:25 PM Invited
Open-air Plasma Surface Processing of Al Alloy 7075 Surface to Form Oxide-based Corrosion Barrier Layer: Yong Chae Lim[1]; *Jiheon Jun*[1]; Yi Feng Su[1]; Harry Meyer, III[1]; Jong Kahk Keum[1]; Bradley Lokitz[1]; Andrew Sy[2]; Ryan Robinson[2]; Daphne Pappas[2]; Zhili Feng[1]; [1]Oak Ridge National Laboratory; [2]Plasmatreat USA, Inc.

2:45 PM
Characterizing Residual Stress Profiles of Nitrogen and Helium Carrier Gas 6061 Aluminum and 6061 Aluminum Metal Matrix Composite Cold Spray Depositions Using X-Ray Diffraction.: *Nathan Staley*[1]; Grant Crawford[1]; Michael Carter[2]; [1]South Dakota School of Mines and Technology; [2]South Dakota School of Mines & Technology

3:05 PM Invited
Effective Utilization of Metallurgical Characterization Methods for Oxidation Resistance Spray Coatings: *Hariharan Sundaram*[1]; Veerakumar Kandaraj[1]; [1]GE Kuwait Technology Center WLL

3:25 PM Break

3:40 PM
Effect of Direct and Pulsed Current on Electrodeposited Zn-Fe Alloy Coatings: *Rajdeep Mondal*[1]; Manindra Manna[1]; Atanu Banerjee[1]; Amar Bhagat[1]; [1]Tata Steel

4:00 PM
Microstructural Evolution and Performance of Si-based Coatings Formed on Refractory Multi-principal Element Alloys: *Brady Bresnahan*[1]; David Poerschke[1]; [1]University of Minnesota

4:20 PM
Peridynamic Simulation of Particles Impact and Bonding in Cold Spray with Tunable Adhesion: *Baihua Ren*[1]; Jun Song[1]; [1]McGill University

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MATERIALS DESIGN

Advances in Titanium Technology — Session VI

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Wednesday PM | March 22, 2023
Cobalt 500 | Hilton

Session Chair: Qing Tan, Max-Planck-Institut für Eisenforschung GmbH

2:00 PM Invited
On the Relationships between Twinning and Stress-induced Martensite in Superelastic Beta Titanium Alloys: *Emmanuel Bertrand*[1]; Philippe Castany[2]; Yang Yang[3]; Isabelle Braems[1]; Thierry Gloriant[2]; [1]Nantes Université; [2]INSA Rennes; [3]Guangdong University of Technology

2:30 PM Invited
Implications for Hydride Formation in Commercially Pure Titanium and their Deformation Mechanism: *Qing Tan*[1]; Stoichko Antonov[2]; Zhiran Yan[3]; David Dye[4]; Baptiste Gault[1]; [1]Max Planck Institut für Eisenforschung, GmbH; [2]National Energy Technology Laboratory; [3]University of Science and Technology Beijing; [4]Imperial College London

3:00 PM
Ti Alloy Wire Fabrication from Waste and Out-of-Specification Particulates: *Robert Wilson*[1]; Geoffrey de Looze[1]; Kun Yang[1]; Shiqin Yan[1]; David Ritchie[1]; Ling

Chen[1]; Andrew Yob[1]; Dayalan Gunasegaram[1]; [1]Csiro

3:20 PM Break

3:40 PM
Phase Transformation Behavior during Ultrasonic Welding of Pure Ti Sheets with Fe Interlayer: Syronn Francisco[1]; *Kuan-Chieh Hu*[1]; Jheyu Lin[1]; [1]National Taipei University of Technology

4:00 PM
Mechanical, Thermal Conductive and Anti-wear Properties Improvement in Titanium Matrix Composites Reinforced with Graphene Nanosheets: *Qi Yan*[1]; Biao Chen[1]; Wenfeng Lu[2]; Hao Wang[2]; Jinshan Li[1]; [1]Northwestern Polytechnical University; [2]National University of Singapore

4:20 PM
Improvement of Mechanical Properties of Pure Ti by Combined Process of Multi-directional Forging and Conventional Thermo-mechanical Processing: *Hiromi Miura*[1]; Yutaro Iwabuchi[1]; Masakazu Kobayashi[1]; Tomotsugu Shimokawa[2]; Chihiro Watanabe[2]; [1]Toyohashi University of Technology; [2]Kanazawa University

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MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Wednesday PM | March 22, 2023
Cobalt 520 | Hilton

Session Chair: Anh Tran, Sandia National Laboratories

2:00 PM Invited
Graph Attention Networks for Microstructural Understanding: Ryan Cohn[1]; *Elizabeth Holm*[1]; [1]Carnegie Mellon University

2:20 PM
Accelerating Microstructurally Small Crack Growth Predictions in Three-dimensional Microstructures Using Deep Learning: *Vignesh Babu Rao*[1]; Brian Phung[1]; Bjorn Johnsson[1]; Ashley Spear[1]; [1]University of Utah

2:40 PM
Adaptive Latent Space Embedding for Real-Time 3D Diffraction Data Analysis: *Alexander Scheinker*[1]; Reeju Pokharel[1]; [1]Los Alamos National Laboratory

3:00 PM
Prediction of Slip Localization and Transmission in Polycrystalline HCP Metals via Incorporation of Micromechanical Modeling and Machine Learning: *Behnam Ahmadikia*[1]; Adolph Beyerlein[2]; Irene Beyerlein[1]; [1]University of California Santa Barbara; [2]Clemson University

3:20 PM
Denoising of Electron Back Scatter Patterns for Improved EBSD Characterization Using Deep Learning: *Mani Krishna Karri*[1]; Radhakrishnan Madhavan[1]; Mangesh Pantawane[1]; Ramniwas Singh[1]; Narendra Dahotre[1]; [1]University of North Texas

3:40 PM Break

4:00 PM
Examining the Effects of Grain Boundary Structure Variability, Solute Atoms, and Interatomic Potential on the non-Arrhenius Migration of Incoherent Twin Grain Boundaries in Nickel: *Akarsh Verma*[1]; Eric Homer[1]; Oliver Johnson[1]; Shigenobu Ogata[2]; Gregory Thompson[3]; [1]Brigham Young University; [2]Osaka University; [3]University of Alabama

4:20 PM
Modelling Nucleation in Crystal Phase Transition from Machine Learning Metadynamics: *Qiang Zhu*[1]; Pedro Santos-Florez[1]; Howard Yanxon[1]; Yansun Yao[2]; [1]University of Nevada, Las Vegas; [2]University of Saskatchewan

4:40 PM
Data Assimilation for Microstructure Evolution in Kinetic Monte Carlo: *Anh Tran*[1]; Theron Rodgers[1]; Yan Wang[2]; [1]Sandia National Laboratories; [2]Georgia Institute of Technology

5:00 PM
How to Lead R&D Digital Transformation in a Chemical Corporation: *Yoshishige Okuno*[1]; Shimpei Takemoto[1]; [1]Showa Denko K.K.

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Solution Algorithms for Solidification Microstructure

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

Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis; Enrique Martinez Saez, Clemson University; Garritt Tucker, Colorado School of Mines; Hojun Lim, Sandia National Laboratories; Vimal Ramanuj, Oak Ridge National Laboratory

Wednesday PM | March 22, 2023
Cobalt 502B | Hilton

Session Chairs: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis

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2:00 PM Invited
A Recursive Grain Remapping Scheme for Irregular Morphologies in Phase-Field Models: *Alexander Chadwick*[1]; Peter Voorhees[1]; [1]Northwestern University

2:40 PM
An OpenMP GPU-Offload Implementation of a cellular automata solidification model for laser fusion additive manufacturing: *Adrian Sabau*[1]; Lang Yuan[2]; Jean-Luc Fattebert[1]; [1]Oak Ridge National Laboratory; [2]University of South Carolina

3:00 PM
Characterization of the evolution of the Grain Boundary Network using Spectral Graph Theory: *Jose Nino*[1]; Oliver Johnson[1]; [1]Brigham Young University

3:20 PM Break

3:40 PM
Characterizing Microstructure Evolution in Latent Space for Machine Learning Applications: Saaketh Desai[1]; *Ankit Shrivastava*[1]; Marta D'Elia[1]; Habib Najm[1]; Remi Dingreville[1]; [1]Sandia National Laboratories

4:00 PM
Data Assimilation for Estimation of Microstructural Evolution during Solid-state Sintering: Integration of Phase-field Simulation and In-situ Experimental Observation: *Akimitsu Ishii*[1]; Akinori Yamanaka[2]; Akiyasu Yamamoto[2]; [1]National Institute for Materials Science; [2]Tokyo University of Agriculture and Technology

4:20 PM
Diffuse Interface Technique to Simulate Fluid Flow and Characterize Complex Porous Media: *Robert Termuhlen*[1]; Genzhi Hu[1]; Jason Nicholas[1]; Hui-Chia Yu[1]; [1]Michigan State University

4:40 PM
Numerical Modeling of Porosity Formation and Dendrite Growth with Lattice Boltzmann Method(LBM) – Cellular Automata(CA): *Wonjoo Lee*[1]; Howon Lee[2]; Seong-hoon Kang[2]; Jonghun Yoon[1]; [1]Hanyang University; [2]Korea Institute of Materials Science

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LIGHT METALS

Aluminum Alloys, Characterization and Processing — Additive Manufacturing

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek, Kensington Technology Inc.

Wednesday PM | March 22, 2023
32A | SDCC

Session Chair: Mohsen Mohammadi, University of New Brunswick

2:00 PM
Compatibility Study of Polymeric Binders for Aluminum Binder Jet Parts: *Solgang Im*[1]; Rasim Batmaz[2]; Arunkumar Natarajan[1]; Etienne Martin[3]; [1]GE Additive; [2]University of Waterloo; [3]Polytechnique Montreal

2:25 PM
Material Evaluation Framework of Additive Manufactured Aluminum Alloys for Space Optical Instruments: *Zachary Post*[1]; Walter Zimbeck[1]; Steven Storck[1]; Floris van Kempen[2]; Gerard Otter[2]; John Boldt[1]; Ludger van der Laan[2]; Steven Szczesniak[1]; Ryan Carter[1]; Robert Mueller[1]; Salahudin Nimer[1]; Doug Trigg[1]; Michael Berkson[1]; Frank Morgan[1]; William Swartz[1]; [1]JHU APL; [2]TNO

2:50 PM
Comparison of Additively Manufactured and Cast Aluminum A205 Alloy: Heidar Karimialavijeh[1]; Morteza Ghasri Khouzani[2]; Apratim Chakraborty[2]; Jean-Philippe Harvey[1]; *Etienne Martin*[1]; [1]Polytechnique Montreal; [2]University of Waterloo

3:15 PM
The Role of Ti and B Additions in Grain Refinement of Al-Mn Alloy during Laser Additive Manufacturing: *Qingyu Pan*[1]; Monica Kapoor[2]; Sean Mileski[2]; John Carsley[2]; Xiaoyuan Lou[1]; [1]Purdue University; [2]Novelis Global Research and Technology Center

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LIGHT METALS

Aluminum Reduction Technology — Alumina Dissolution & Bath Chemistry

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

Program Organizers: Pierre Marcellin, Rio Tinto; Stephan Broek, Kensington Technology Inc.

Wednesday PM | March 22, 2023
30E | SDCC

Session Chair: Daniel Marinha, Rio Tinto

2:00 PM Introductory Comments

2:10 PM
CFD Modelling of Solidification and Melting of Bath during Raft Formation: *Sindre Engzelius Gylver*[1]; Kristian Etienne Einarsrud[1]; [1]Norwegian University of Science and Technology

2:35 PM
Experimental Investigation of the Alumina Cloud During Alumina Injections in Low And High Temperature Conditions: *Thomas Roger*[1]; Laszlo Kiss[1]; Lukas Dion[1]; Jean Francois Bilodeau[2]; Sébastien Guérard[2]; Guillaume Bonneau[1]; [1]Universite Du Quebec A Chicoutimi; [2]Rio Tinto

3:00 PM
Fundamental Mass Transfer Correlations Based on Experimental and Literature Data: *Jonathan Alarie*[1]; Lukas Dion[1]; László Kiss[1]; Sébastien Guérard[2]; Jean-François Bilodeau[2]; [1]University of Quebec-Chicoutimi; [2]Arvida Research and Development Centre, Rio Tinto

3:25 PM Break

3:40 PM
Potential of Production Al-Si Green Alloys in AP18 Aluminium Reduction Cell: *Haris Salihagic Hrenko*[1]; Anton Verdenik[1]; Branko Juršek[1]; Dragan Mikša[1]; Maja Vončina[2]; Jožef Medved[2]; [1]Talum d.d.; [2]University of Ljubljana

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BIOMATERIALS

Biological Materials Science — Biological Materials Science VI

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

Wednesday PM | March 22, 2023
Sapphire 402 | Hilton

Session Chairs: Debora Lyn Porter, University of Utah; Jeffrey Bates, University of Utah

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2:00 PM
Understanding the Fibrous Nodal Design at the Sieve Plate of Glass Sponge E. aspergillum: A Structural-mechanical Exploration: *Hongshun Chen*[1]; Ling Li[1]; [1]Virginia Tech

2:20 PM
Multi-scale Biomechanical Analysis of Fungal Sporocarps and Their Constitutive Components: *Debora Lyn Porter*[1]; Bryn Dentinger[1]; Steven Naleway[1]; [1]University of Utah

2:40 PM
A Review of Nanovanadium Compounds for Cancer Cell Therapy: Ikhazuagbe Ifijen[1]; Nyaknno U. Udokpoh[1]; *Muniratu Maliki*[2]; Esther Ikhuoria[3]; Efosa Obazee[1]; [1]Rubber Research Institute of Nigeria; [2]Edo State University, Uzairue; [3]University of Benin

3:00 PM
Reinforced Freeze-cast Ceramics Using Uniform Magnetic Fields: *Josh Fernquist*[1]; Ashkan Pourkand[1]; Jake Abbott[1]; Henry Fu[1]; Steven Naleway[1]; [1]University of Utah

3:20 PM Break

3:40 PM
Unraveling the Construction of Hexagonal Cells in the Apis mellifera Honeycomb Using Time-Resolved X-ray Microscopy (XRM): *Rahul Franklin*[1]; Brock Harpur[1]; Nikhilesh Chawla[1]; [1]Purdue University

4:00 PM
Biodegradation of Petroleum-based Plastic Using *Bacillus* sp.: Rahulkumar Sunil Singh[1]; Eddie Gilcrease[1]; Ramesh Goel[1]; Michael L Free[1]; *Prashant K Sarswat*[1]; [1]University of Utah

4:20 PM
A Concise Review of the Antibacterial Action of Gold Nanoparticles Against Various Bacteria: Ikhazuagbe Ifijen[1]; Muniratu Maliki[2]; Nyaknno U. Udokpoh[1]; Ifeanyi J. Odiachi[3]; *Best Atoe*[4]; [1]Rubber Research Institute of Nigeria; [2]Edo State University, Uzairue; [3]Delta State Polytechnic Ogwashi-Uku, Nigeria; [4]Worldwide Healthcare, Nigeria

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Physical and Mechanical Properties I

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

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

Wednesday PM | March 22, 2023
Aqua C | Hilton

Session Chair: Robert Maass, Federal Institute of Materials Research and Testing (BAM)

2:00 PM
Structural Development of $(Fe_{36}Co_{36}B_{19.2}Si_{4.8}Nb_4)_{99.5}Cu_{0.5}$ BMG: *Mihai Stoica*[1]; Noemi Cerboni[2]; Alexander Firlus[1]; Stephan Gerstl[1]; Robin Schäublin[1]; Jörg Löffler[1]; [1]ETH Zurich; [2]Paul Scherrer Institute

2:20 PM
Property Studies on Atomically Smooth Metallic Glasses: Amit Datye[1]; Zheng Chen[1]; Chao Zhou[1]; Xinzhe Wang[1]; Shuhan Zhang[1]; Jittisa Ketkaew[1]; Sungwoo Sohn[1]; Omur E. Dagdeviren[2]; Jan Schroers[1]; *Udo Schwarz*[1]; [1]Yale University; [2]University of Quebec

2:40 PM
Atomic-scale Nature of the Invar Effect in Fe-based Bulk Metallic Glasses: *Alexander Firlus*[1]; Mihai Stoica[1]; Stefan Michalik[2]; Gavin Vaughan[3]; Robin Schäublin[1]; Jörg Löffler[1]; [1]ETH Zurich; [2]Diamond Light Source; [3]European Synchrotron Radiation Facility (ESRF)

3:00 PM Invited
Construction of Three-dimensional Deformation Sequence Map in Bulk Metallic Glasses: Wook Ha Ryu[1]; Won-Seok Ko[2]; Haruka Isano[3]; Rui Yamada[3]; Heh Sang Ahn[1]; Geun Hee Yoo[1]; Kook Noh Yoon[1]; Junji Saida[3]; *Eun Soo Park*[1]; [1]Seoul National University; [2]Inha University; [3]Tohoku University

3:20 PM Break

3:40 PM Invited
Effect of Impurities on the Mechanical Properties of Commercial-grade Bulk Metallic Glass: *Douglas Hofmann*[1]; Punnathat Bordeenikasem[1]; Thomas Freeman[1]; Melanie Buziak[1]; [1]NASA Jet Propulsion Laboratory

4:00 PM
Nano-mechanical Probing of Elasticity Length Scales in Metallic Glasses: *Birte Riechers*[1]; Robert Maaß[2]; [1]Federal Institute of Materials Research And Testing (BAM); [2]Federal Institute of Materials Research and Testing (BAM), University of Illinois at Urbana-Champaign

4:20 PM
On the Correlation between Multiscale Structural Heterogeneities and Mechanical Properties in Metallic Glasses: *Dong Han*[1]; Yunjiang Wang[2]; Yanfei Gao[1]; [1]University of Tennessee; [2]Institute of Mechanics, Chinese Academy of Sciences; University of Chinese Academy of Sciences

4:40 PM
Achieving High Strength and Toughness by Modulating Metallic Glass Composition at the Nanoscale: Ali Behboud[1]; Amir Motallebzadeh[2]; *Sezer Ozerinc*[1]; [1]Middle East Technical University; [2]Koç University Surface Science and Technology Center (KUYTAM)

LIGHT METALS

Cast Shop Technology — Casting and Casthouse Operations

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

Program Organizers: Halldor Gudmundsson, Century - Nordural; Stephan Broek, Kensington Technology Inc.

Wednesday PM | March 22, 2023
31C | SDCC

Session Chair: Halldor Gudmundsson, Nordural ehf

2:00 PM
Designing a Safe Casthouse: *Alex Lowery*[1]; [1]Wise Chem LLC

2:25 PM
Operations Assisting and Predictive Maintenance Tools in Casthouses – Examples from AMAG Casting: *Alexander Poscher*[1]; Martin Mönius[1]; Eduard Faschang[1]; Bernd Prillhofer[1]; [1]AMAG casting GmbH

2:50 PM
Counter Gravity Casting of Al Alloys: Microstructure and Properties: *Konstantinos Georgarakis*[1]; Mark Jolly[1]; [1]Cranfield University

3:15 PM
Defect Minimisation in Vacuum Assisted Plaster Mould Investment Casting through Simulation of High Value Aluminium Alloy Components: *Emanuele Pagone*[1]; Christopher Jones[1]; John Forde[2]; Ben Shaw[2]; Mark Jolly[1]; Konstantinos Salonitis[1]; [1]Cranfield University; [2]Sylatech

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NUCLEAR MATERIALS

Ceramic Materials for Nuclear Energy Research and Applications — Characterization of Fuels and Materials

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

Program Organizers: Walter Luscher, Pacific Northwest National Laboratory; Xian-Ming Bai, Virginia Polytechnic Institute and State University; Lingfeng He, North Carolina State University; Sudipta Biswas, Idaho National Laboratory; Simon Middleburgh, Bangor University

Wednesday PM | March 22, 2023
28B | SDCC

Session Chair: Lingfeng He, North Carolina State University

2:00 PM Invited
Scanning Transmission Electron Microscopy of Nanoprecipitates in Spent UO2 Nuclear Fuel: *Edgar Buck*[1]; Dallas Reilly[1]; [1]Pacific Northwest National Laboratory

2:30 PM Invited
Soft X-ray Synchrotron Radiation Spectromicroscopy of Spent Nuclear Fuel Focused Ion Beam Sections: *David Shuh*[1]; [1]Lawrence Berkeley National Laboratory

3:00 PM
Advanced Characterization and Modeling of Nanoprecipitates in Spent Nuclear Fuel: *Lingfeng He*[1]; Mukesh Bachhav[2]; Chao Jiang[2]; [1]North Carolina State University; [2]Idaho National Laboratory

3:20 PM
Microstructural Characterization of Neutron Irradiated Concrete Minerals: *Jose Arregui-Mena*[1]; Ippei Maruyama[2]; Matheus Tunes[3]; Elena Tajuelo Rodriguez[1]; Christa Torrence[4]; Thomas Rosseel[1]; Yann Le Pape[1]; Philip Edmondson[1]; [1]Oak Ridge National Laboratory; [2]Nagoya University; [3]Los Alamos National Laboratory; [4]Texas A&M University

3:40 PM Break

4:00 PM Invited
Comprehensive Characterization of Damage in Ion Irradiated Ceramics for Validation of Atomistic Models: *Marat Khafizov*[1]; Joshua Ferrigno[1]; Erika Nosal[1]; Saqeeb Adnan[1]; Kaustubh Bawane[2]; Amey Khanolkar[2]; Miaomiao Jin[3]; Linu Malakkal[2]; Chao Jiang[2]; Lingfeng He[4]; David Hurley[2]; [1]Ohio State University; [2]Idaho National Laboratory; [3]Pennsylvania State University; [4]North Carolina State University

4:30 PM
Impact of Resonance Scattering on the Thermal Conductivity of ThO_2: *Saqeeb Adnan*[1]; Zilong Hua[2]; Amey Khanolkar[2]; Cody Dennett[3]; David Hurley[2]; Marat Khafizov[1]; [1]The Ohio State University; [2]Idaho National Laboratory; [3]Massachusetts Institute of Technology

4:50 PM
Irradiation- and Dopant-induced Structural Changes in Ceramic Nuclear Fuels Probed via Elastic and Optical Properties: *Amey Khanolkar*[1]; Linu Malakkal[1]; Zilong Hua[1]; Cody Dennett[2]; J. Matthew Mann[3]; Marat Khafizov[4]; David Hurley[1]; [1]Idaho National Laboratory; [2]Massachusetts Institute of Technology; [3]Air Force Research Laboratory; [4]The Ohio State University

5:10 PM
Defect Chemistry and Radiation Stability of (Gd & Zr) Co-doped UO2: *Ritesh Mohun*[1]; Daniel Bailey[2]; Martin Stennett[2]; Claire Corkhill[2]; Simon Middleburgh[1]; [1]Bangor University; [2]University of Sheffield

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CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Metallurgical Processing Analysis and Characterization

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Wednesday PM | March 22, 2023
Aqua 313 | Hilton

Session Chair: Zhiwei Peng, Central South University

2:00 PM
Physico-chemical Characteristics of Deselenized Copper Anode Slime: *Jhumki Hait*[1]; Navneet Randhawa[1]; [1]CSIR-National Metallurgical Laboratory

2:20 PM
Porosity Evolution during Hydrogen-based Direct Reduction of Hematite Probed by 4D Synchrotron X-ray Nano-tomography: *Yan Ma*[1]; Yen-Fan Wang[1]; Katrin Bugelnig[2]; Julie Villanova[3]; Guillermo Requena[2]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung; [2]German Aerospace Center (DLR); [3]ESRF-The European Synchrotron

2:40 PM
Characterization of Chromite and its Role in the Refractory Products: *Dean Gregurek*[1]; Philip Schantl[1]; Alfred Spanring[1]; [1]RHI Magnesita

3:00 PM
Preventing Hydrogen Embrittlement by Electrochemically-assisted Hydrogen Desorption: *Kyung-Shik Kim*[1]; Ju Li[1]; Bilge Yildiz[1]; Cem Tasan[1]; [1]Massachusetts Institute of Technology

3:20 PM
Synthesis and Characterization of Bilayer Cu-Al and Cu-Zn Foams: *Karina Hemmendinger*[1]; Andrea Hodge[1]; [1]University of Southern California

3:40 PM Break

3:55 PM
Low-temperature NH3-SCR Performance with Activated-carbon-supported Nano Manganese Ferrites: *Wang Jia*[1]; Xuejuan Zhao[1]; Zijian Su[1]; Yuanbo Zhang[1]; [1]Central South University

4:15 PM
Understanding Wall Stresses in Powder Die Compaction by Novel Experiments and Coordinated Modeling: *Daniel Bufford*[1]; Dan Bolintineanu[1]; Joel Clemmer[1]; William Erikson[1]; Stewart Silling[1]; [1]Sandia National Laboratories

4:35 PM
Melting and Solidification Behaviors of the Copper Slags with Different Cao Content at Various Oxygen Partial Pressures: *Yannan Wang*[1]; Shuigen Huang[1]; Bart Blanpain[1]; Muxing Guo[1]; [1]KU Leuven

4:55 PM
Impact Behavior of Eucalyptus Wood and Chamotte Residues Reinforcing a Castor Oil Derived Polyurethane Resin Composites: Juvenil Oliveira[1]; *Felipe Lopes*[1]; Noan Simonassi[1]; Carlos Maurício Vieira[1]; Sergio Monteiro[1]; [1]State University of Northern Rio de Janeiro

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MATERIALS DESIGN

Computational Discovery and Design of Materials — Session VI

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

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha Vermaak, Lehigh University

Wednesday PM | March 22, 2023
Cobalt 502A | Hilton

Session Chair: Xiaofeng Qian, Texas A&M University

2:00 PM Invited
BandGapRenormalizationin2DMaterialsfromFirst-principles:*SaharSharifzadeh*[1]; [1]Boston University

2:30 PM
What is a Minimal Working Example for a Self-driving Laboratory: *Sterling Baird*[1]; Taylor Sparks[1]; [1]University of Utah

2:50 PM
Exploiting First-principles Based Interpretation of X-ray Absorption Spectra of Ni, Cr, Fe Elements in Molten-salt System: *Mehmet Topsakal*[1]; Kaifeng Zheng[1]; Nirmalendu Patra[1]; Michael Woods[2]; Ruchi Gakhar[2]; Phillip Halstenberg[3]; Shannon Mahurin[3]; Anatoly Frenkel[4]; Simerjeet Gill[1]; [1]BNL; [2]Idaho National Laboratory; [3]Oak Ridge National Laboratory; [4]Stony Brook University

3:10 PM
Graph Mining in Materials Science for the Prediction of Material Properties: *Mehrdad Jalali*[1]; Christof Wöll[1]; [1]Institute of Functional Interfaces (IFG), Karlsruhe Institute of Technology (KIT

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — AI and ML

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Wednesday PM | March 22, 2023
26A | SDCC

Session Chairs: Mahmood Mamivand, Boise State University; Edwin Garcia, Purdue University

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2:00 PM
Physics-Informed Machine Learning of the Thermodynamics and Kinetics of Point Defects in Alloys: *Anjana Talapatra*[1]; Anup Pandey[1]; Danny Perez[1]; Blas Uberuaga[1]; Ghanshyam Pilania[1]; [1]Los Alamos National Laboratory

2:20 PM
Prediction of High-temperature Elasticity of Tungsten Using Machine Learning and Data-driven Approach: *Anruo Zhong*[1]; Clovis Lapointe[1]; Alexandra Goryaeva[1]; Jacopo Baima[1]; Manuel Athènes[1]; Mihai-Cosmin Marinica[1]; [1]Universite Paris-Saclay, CEA

2:40 PM
Diffusivity in a Multicomponent Alloy Using Machine Learning and Variational Approaches: *Dallas Trinkle*[1]; Soham Chattopadhyay[1]; [1]University of Illinois at Urbana-Champaign

3:00 PM Invited
Chemistry and Processing History Prediction from Microstructure Morphologies: *Mahmood Mamivand*[1]; Amir Abbas Kazemzadeh Farizhandi[1]; [1]Boise State University

3:30 PM Break

3:50 PM
Rapid Machine Learning Estimation of Grain Boundary Segregation Vibrational Entropy Spectra in Dilute Polycrystals: *Nutth Tuchinda*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

4:10 PM Invited
Machine Learning of Phase Diagrams: Applications to Energy Materials: Jarrod Lund[1]; Haoyue Wang[1]; Richard Braatz[2]; *Edwin Garcia*[1]; [1]Purdue University; [2]MIT

4:30 PM Invited
Exploring New Frontiers of Thermal Transport: A Combined First-principles and Machine Learning Approach: *Rinkle Juneja*[1]; [1]Oak Ridge National Laboratory

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MECHANICS & STRUCTURAL RELIABILITY

Deformation-induced Manipulation of Defect Structures and Hierarchical Microstructures — Session II

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

Program Organizers: Bharat Gwalani, North Carolina State Universtiy; Kester Clarke, Colorado School of Mines; Eric Lass, University of Tennessee-Knoxville; Vahid Tari, ATI - Allegheny Technologies Incorporated

Wednesday PM | March 22, 2023
Sapphire P | Hilton

Session Chairs: Kester Clarke, Colorado School of Mines; Michael Lastovich, North Carolina State University; Eric Lass, University of Tennessee-Knoxville

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2:00 PM Invited
Dynamically Reversible Shear Transformations in a CrMnFeCoNi High-entropy Alloy: *Jian Wang*[1]; Kaisheng Ming[2]; Shijian Zheng[2]; [1]University of Nebraska-Lincoln; [2]Hebei University of Technology

2:20 PM Invited
Grain Refinement and Microstructural Evolution in AM High Entropy Alloys through SPD and Thermomechanical Processing: *Benjamin Adam*[1]; Megumi Kawasaki[1]; Tianyi Chen[1]; [1]Oregon State University

2:40 PM Invited
Exploring Joining Mechanism for Immiscible System: Friction Stir Welding of Pure Mg and Pure Fe: *Hrishikesh Das*[1]; Bharat Gwalani[1]; Xiaolong Ma[1]; Piyush Upadhyay[1]; [1]Pacific Northwest National Laboratory

3:00 PM
Effect of Pre-straining on High Strain Rate Compression Behavior of a Complex Concentrated Alloy Exhibiting Transformation Induced Plasticity: *Ravi Sankar Haridas*[1]; Priyanka Agrawal[1]; Jeffrey T Lloyd[2]; Rajiv Mishra[1]; [1]University of North Texas; [2]CCDC Army Research Laboratory

3:20 PM
Deformation of Fe-Rich, Co-Free Multi-Principal Element Alloys at Multiple Strain Rates and Temperature Conditions: *James Frishkoff*[1]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines

3:40 PM Break

4:00 PM
Deformation Mechanisms in Cu-Nb Nanolayered Composite under Pico-indentation and Tribological Testing: *Mayur Pole*[1]; Zexi Lu[1]; Tanvi Ajantiwalay[1]; Matthew Olszta[1]; Shalini Tripathi[1]; Anqi Yu[1]; Hardeep Mehta[1]; Tianhao Wang[1]; Xiaolong Ma[1]; Arun Devaraj[1]; Bharat Gwalani[1]; [1]Pacific Northwest National Laboratory

4:20 PM
Deformation Induced Hierarchical Twinning in Titanium Alloys: *Dian Li*[1]; Yufeng Zheng[1]; [1]University of Nevada, Reno

4:40 PM
A Novel Warm Rolling Induced Microstructure Modification for Evading Strength-Ductility Trade-off in Medium Manganese Steel: *Avanish Chandan*[1]; Gyanaranjan Mishra[2]; Kaushal Kishore[2]; Jay Chakraborty[1]; [1]CSIR- National Metallurgical Laboratory; [2]Tata Steel Ltd

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MATERIALS PROCESSING

Deformation-induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies — Deformation Induced Microstructural Evolution IV

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

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign; Suhas Eswarappa Prameela, Massachusetts Institute of Technology; Mostafa Hassani, Cornell University

Wednesday PM | March 22, 2023
29C | SDCC

Session Chair: Suhas Prameela, MIT

2:00 PM Introductory Comments

2:05 PM Invited
Deformation Induced G.P. Zone Formation in Magnesium Alloys: *Taisuke Sasaki*[1]; Jhe-Yu Lin[1]; Peng Yi[2]; Zehao Li[1]; Eswarappa Prameela Suhas[2]; Abigail Park[2]; Elaine Lipkin[2]; Alice Lee[2]; Michael Falk[2]; Timothy Weihs[2]; Kazuhiro Hono[2]; [1]National Institute for Materials Science; [2]Johns Hopkins University

2:35 PM
A High-Speed Rotational Diamond Anvil Cell for In Situ Analysis of Microstructural Evolution of Metallic Alloys during Solid Phase Processing: *Arun Devaraj*[1]; Tingkun Liu[1]; Changyong Park[2]; Stanislav Sinogeikin[3]; Matthew Olszta[1]; Bharat Gwalani[1]; Lei Li[1]; Nanjun Chen[1]; Qin Pang[1]; Wenkai Fu[1]; Suveen Mathaudhu[1]; Yulan Li[1]; Ayoub Soulami[1]; Shenyang Hu[1]; Peter Sushko[1]; Cynthia Powell[1]; [1]Pacific Northwest National Laboratory; [2]argonne national laboratory; [3]DAC tools

2:55 PM
Enhancing Mechanical Properties of Molybdenum with Equal Channel Angular Extrusion Processing: *Ekaterina Maynor*[1]; David Foley[2]; Brady Butler[1]; James Paramore[1]; Kelvin Xie[1]; [1]Texas A&M University; [2]Shear Form, Inc.

3:15 PM
In-situ Observation of Nucleation and Grain Growth in Recrystallization of Cold-rolled 1100 Aluminum Sheets: *Kishu Akiba*[1]; Masato Ito[1]; Yoshiki Mori[2]; Nobuhiro Kitahara[1]; Kenichi Yaguchi[1]; Kota Matsumoto[3]; Eisuke Miyoshi[3]; Akinori Yamanaka[3]; [1]Mitsubishi Materials Corporation; [2]Mitsubishi Materials Corporation(Current Affiliation: MA Aluminum Corporation); [3]Tokyo University of Agriculture and Technology

3:35 PM Break

3:50 PM Invited
In-situ Observation of the Effects of Thermo-mechanical Processing on Microstructure Evolution in Ferrous and Non-ferrous Materials: An Abridged Summary of Results Obtained Using the FlexiStir Instrument: *Jorge F. dos Santos*[1]; Peter Staron[2]; Luciano Bergmann[2]; Bejamin Klusemann[2]; Arun Devaraj[1]; Julian Escobar[1]; Cynthia Powell[1]; [1]Pacific Northwest National Laboratory; [2]Helmholtz-Zentrum Hereon

4:20 PM
Phase Transformations in Hexagonal Closed Packed Materials during Ultrasonic Additive Manufacturing: *Michael Pagan*[1]; Ningxiner Zhao[2]; Leon Headings[2]; Marcelo Dapino[2]; Andres Rossy[3]; Reece Emergy[1]; Philip Rack[1]; Caleb Massey[3]; Steve Zinkle[1]; Suresh Babu[1]; [1]University of Tennessee; [2]The Ohio State University; [3]Oak Ridge National Laboratory

4:40 PM
Microstructural Evolution during the Laser Forming of Sheet Metal: Nathan Fripp[1]; Justin Norkett[1]; Benjamin Anthony[1]; *Victoria Miller*[1]; [1]University of Florida

5:00 PM
Microstructure Modification in Sintered Copper-tantalum Composites: *Charles Borenstein*[1]; Brady Butler[2]; James Paramore[2]; Karl Hartwig[3]; Michael Demkowicz[1]; [1]Texas A&M University; [2]DEVCOM-ARL, Army Research Lab South at Texas A&M University; [3]Shear Form, Inc.

5:20 PM
Twinning Behaviour Affected by Lowering Basal Stacking Fault Energy in Ti-10 at.%Al Alloy: *Wenqian Wu*[1]; Bingqiang Wei[1]; Mingyu Gong[1]; Jian Wang[1]; [1]University of Nebraska-Lincoln

5:40 PM
The Role of Mechanical Loading in bcc-hcp Phase Transition: Tension-compression Asymmetry and Twin Formation: *Lei Cao*[1]; Amir Hassan Zahiri[1]; Eduardo Vitral[1]; Jamie Ombogo[1]; Mehrab Lotfpour[1]; [1]University of Nevada

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Mechanical Behaviors of Nanoporous and Nanoarchitectured Materials

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Wednesday PM | March 22, 2023
Aqua 300AB | Hilton

Session Chairs: wendy Gu, Stanford University; Dan Mordehai, Technion

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2:00 PM Invited
Second Phase Strengthening in Nanofoams and Nanolayers: *David Bahr*[1]; Alexandra Loaiza[1]; [1]Purdue University

2:30 PM
Development and Characterization of Gradient Nanostructured Metals via Compositional Means: *Alejandro Barrios*[1]; James Nathaniel II[1]; Joseph Monti[1]; Khalid Hattar[1]; Douglas Medlin[1]; Remi Dingreville[1]; Brad Boyce[1]; [1]Sandia National Laboratories

2:50 PM
Microstructure and Mechanical Deformation of Nanoscale Hydrogel Infusion-based Additively Manufactured Ni: *Wenxin Zhang*[1]; Julia Greer[1]; [1]California Institute of Technology

3:10 PM
Silica-coated DNA Lattices as Mechanical Metamaterials: *John Kulikowski*[1]; Shuang Wang[2]; Melody Wang[1]; Yonggang Ke[2]; Wendy Gu[1]; [1]Stanford University; [2]Emory University

3:30 PM Break

3:50 PM Invited
Modelling the Mechanical Properties of Nanoporous Metallic Structures: Santhosh Mathesan[1]; Zhi Chen[1]; Ben Engelman[1]; *Dan Mordehai*[1]; [1]Israel Institute of Technology

4:20 PM
A Machine Learning Approach to Model the Mechanical Response of Nanofoams: Sepideh Kavousi[1]; *Mohsen Asle Zaeem*[1]; [1]Colorado School of Mines

4:40 PM
Micromechanics of Hybrid Ceramic-organic Nanoarchitected Materials: *Diletta Giuntini*[1]; [1]Eindhoven University of Technology

5:00 PM
Size and Shape Effects on the Strength of Platinum Nanoparticles: *Jonathan Zimmerman*[1]; Anuj Bisht[1]; Yuri Mishin[2]; Eugen Rabkin[1]; [1]Technion - Israel Institute of Technology; [2]George Mason University

5:20 PM
Observing and Quantifying Deformation Mechanisms in Metal Nanoparticles: *Ruikang Ding*[1]; Soodabeh Azadehranjbar[1]; Ingrid M. Padilla-Espinosa[2]; Andrew Baker[1]; Muztoba Rabbani[2]; Ashlie Martini[2]; Tevis D. B. Jacobs[1]; [1]University of Pittsburgh; [2]University of California, Merced

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ENERGY & ENVIRONMENT

Electrical Steels — Electrical Steels

Sponsored by: TMS Structural Materials Division, TMS: Steels Committee, TMS: Magnetic Materials Committee

Program Organizers: Youliang He, CanmetMATERIALS, Natural Resources Canada; Kester Clarke, Colorado School of Mines; Jun Cui, Iowa State University

Wednesday PM | March 22, 2023

33B | SDCC

Session Chairs: Youliang He, CanmetMATERIALS; Kester Clarke, Colorado School of Mines; Jun Cui, Iowa State University

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2:00 PM Invited
Report on Some Recent Progress on the Understanding of the Goss Texture in Fe-3 % Si Grain Oriented Electrical Steels: *Dierk Raabe*[1]; [1]Max-Planck Institute

2:30 PM
Effect of Rare Earth Yttrium on Inclusion and Texture of Oriented Silicon Steel: Zhihong Guo[1]; *Xiangyang Li*[1]; Yaxu Zheng[1]; Liguang Zhu[1]; Yuanxiang Zhang[2]; Huilan Sun[1]; Ruifang Cao[3]; [1]Hebei University of Science and Technology; [2]Northeastern University; [3]Beijing Shougang Co., LTD

2:50 PM
Microstructure and Texture Evolution of High Grade Non-oriented Electrical Steel for New Energy Vehicles during Hot Rolling: *Xueying Lv*[1]; Wanlin Wang[1]; Peisheng Lv[1]; Huihui Wang[1]; Yunli Zhang[1]; Lulu Song[1]; [1]Central South University

3:10 PM
A New Approach to Optimise the Microstructure of Non-oriented Electrical Steel Sheets: *Saeed Tamimi*[1]; Youliang He[2]; Winfried Kockelmann[3]; Leo Kestens[4]; [1]AFRC-University of Strathclyde; [2]CanmetMATERIALS; [3]Science and Technology Facilities Council (STFC), Rutherford Appleton Laboratory, ISIS Facility; [4]Ghent University

3:30 PM Break

3:45 PM Invited
The Processing and Application of Fe-6.5%Si Ribbons and Flakes: *Gaoyuan Ouyang*[1]; Iver Anderson[1]; Matthew Kramer[1]; Jun Cui[2]; [1]Ames Laboratory; [2]Iowa State University

4:15 PM
Constitutive Modelling of High-temperature Flow Behavior of a Non-oriented Electrical Steel with 3.2 wt% Si: *Gyanaranjan Mishra*[1]; Kanwal Chadha[1]; Youliang He[2]; Clodualdo Aranas[1]; [1]University of New Brunswick; [2]CanmetMaterials

4:35 PM
Effect of Cold Rolling Reduction Rate and Rare Earth Yttrium on Microstructure and Texture of Oriented Silicon Steel: *Zhihong Guo*[1]; Pengjun Liu[1]; Yaxu Zheng[1]; Liguang Zhu[1]; Yuanxiang Zhang[1]; Huilan Sun[1]; Ruifang Cao[1]; [1]Hebei University of Science and Technology

4:55 PM
The Role of Temper Rolling and Annealing on the Magnetic Property Improvement of a Low Si Non-oriented Electrical Steel: *Youliang He*[1]; Tihe Zhou[2]; Haden Lee[2]; Chad Cathcart[2]; Peter Badgley[2]; [1]CanmetMATERIALS, Natural Resources Canada; [2]Stelco Inc.

LIGHT METALS

Electrode Technology for Aluminum Production — Anode and Cathode Process Improvements

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

Program Organizers: Roy Cahill, Rio Tinto; Stephan Broek, Kensington

Technology Inc.

Wednesday PM | March 22, 2023
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Session Chair: Roy Cahill, Rio Tinto Aluminium

2:00 PM
Investigation of the Stacking Effects on the Electrical Resistivity of Industrial Baked Anodes: *Thierno Saidou Barry*[1]; Donald Picard[2]; Guillaume Gauvin[1]; Julien Lauzon-Gauthier[3]; Houshang Alamdari[1]; [1]REGAL Aluminium Research Center; [2]Eddyfi; [3]Aloca

2:25 PM
New Generation Anode Baking Furnace: Use of Prefabrication for Additional Conversions at Bell-Bay Plant: *Sandra Besson*[1]; David Deneef[1]; Anthony Reeve[2]; Youcef Nadjem[2]; Meaghan Noonan[3]; Roy Cahill[3]; [1]Rio Tinto Aluminium Technology Solutions; [2]Bell Bay Aluminium; [3]Rio Tinto Transformation and Technical Support - Pacific Operations

2:50 PM
AHEX Full Scale Experiences at TRIMET Aluminium SE: *Anders Sorhuus*[1]; Vrauke Zeibig[2]; Eivind Holmefjord[1]; Oemer Mercan[2]; Elmar Sturm[3]; [1]REEL Norway AS; [2]TRIMET Aluminium SE; [3]ESC-Consulting

3:15 PM
Inline Modal Detection System of Anodes and Cathodes Measuring Cracks and Physical Properties: *Dag Herman Andersen*[1]; [1]Hydro Aluminium

3:40 PM Concluding Comments

ELECTRONIC MATERIALS

Electronic Packaging and Interconnection — Advanced Microelectronic Packaging Materials

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

Program Organizers: Kazuhiro Nogita, University of Queensland; Mohd Arif Mohd Salleh, Universiti Malaysia Perlis; Dan Li, Beijing University of Technology; David Yan, San Jose State University; Fan-Yi Ouyang, National Tsing Hua University; Patrick Shamberger, Texas A&M University; Tae-Kyu Lee, Cisco Systems; Christopher Gourlay, Imperial College London; Albert T. Wu, National Central University

Wednesday PM | March 22, 2023
Sapphire E | Hilton

Session Chairs: David Yan, San Jose State University; Tae-Kyu Lee, Cisco Systems

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2:00 PM Introductory Comments

2:05 PM Invited
Effects of Diameter on Copper Pillar with Solder Cap Interconnections during Reflow Soldering Process: Lee Jing Rou[1]; *Mohd Sharizal Abdul Aziz*[1]; Mohd Arif Anuar Mohd Salleh[2]; Khor Chu Yee[3]; Mohammad Hafifi Hafiz Ishak[4]; [1]School of Mechanical Engineering, Universiti Sains Malaysia; [2]Center of Excellence

Geopolymer & Green Technology (CeGeoGTech), Universiti Malaysia Perlis; [3]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis; [4]School of Aerospace Engineering, Universiti Sains Malaysia

2:30 PM
Current-enhanced Presureless Sintering of Cu Nanoparticles at Room Temperature: *Tzu-Hao Shen*[1]; Albert T. Wu[1]; [1]National Central University

2:50 PM
In-situ Observation of the Ga and Cu/Cu6Ni Reaction by Synchrotron Microradiography: *Qichao Hao*[1]; Xin Fu Tan[1]; Shiqian Liu[2]; Stuart McDonald[1]; Hideyuki Yasuda[3]; Kazuhiro Nogita[1]; [1]The University of Queensland; [2]The University of Queensland;Shenzhen Technology University; [3]Kyoto University

3:10 PM
No-Flow Electroless Connections for Die-to-Wafer Attach: *Jeng-Hau Huang*[1]; Po-Shao Shih[2]; Vengudusamy Renganathan[1]; Simon Gräfner[1]; Chang-Hsien Shen[1]; Yu-Chun Lin[1]; Po-Yu Kung[1]; C. Robert Kao[1]; [1]National taiwan university; [2]National Taiwan University

3:30 PM Break

3:50 PM
Influences of Deposition Speed on Void Formation in Electroless Copper Plating Film for Micro-vias: *Ming Chun Hsieh*[1]; Zheng Zhang[1]; Masahiko Nishijima[1]; Chuantong Chen[1]; Katsuaki Suganuma[1]; Hidekazu Honma[2]; Yu Shimizu[2]; Koji Kita[2]; Joonhaeng Kang[2]; Takashi Matsunami[2]; Kuniaki Otsuka[2]; [1]SANKEN, Osaka University; [2]Okuno Chemical Industries Co., Ltd

4:10 PM
Phase-field Simulation of Deposition Profile and Microstructure of Thin Film on Nonplanar Substrate: Hwanwook Lee[1]; Ahmad Nadeem[1]; Kiran Raj[1]; *Yongwoo Kwon*[1]; [1]Hongik University

4:30 PM
Network Structure and Viscoelasticity of Flexible Electronic Interconnects based on Linear Low-density Polyethylene (LLDPE) and Liquid Silicone Rubber (LSR) Conductive Polymer Composites: *Khairul Anwar Abdul Halim*[1]; Mohd Arif Anuar Mohd Salleh[1]; Mohd. Firdaus Omar[1]; Azlin Fazlina Osman[1]; Muhammad Salihin Zakaria[1]; [1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis

4:50 PM
On the Thermal Aging of the Nanoporous Structure of Sintered Ag on a Cu Substrate: *Xavier Milhet*[1]; Jerome Colin[1]; Azdine Nait-Ali[1]; Kokouvi N'Tsouaglo[1]; Loic Signor[1]; [1]Pprime Institute Cnrs Ensma

5:10 PM Concluding Comments

CORROSION

Environmental Degradation of Additively Manufactured Alloys — Aqueous and Atmospheric Corrosion II

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

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Jenifer Locke, Ohio State University; Sebastien Dryepondt, Oak Ridge National Laboratory; Brendy Rincon Troconis, University of Texas at San Antonio; Andrew

Hoffman, GE Research; Xiaoyuan Lou, Purdue University

Wednesday PM | March 22, 2023
Sapphire 400A | Hilton

Session Chairs: Xiaoyuan Lou, Purdue University; Jennifer Locke, OSU

2:00 PM Invited
Small-Scale Mechanical and Corrosion Properties of Additively Manufactured Stainless Steel: *Xiaolei Guo*[1]; Yachun Wang[2]; Eric Schindelholz[1]; Gerald Frankel[1]; [1]The Ohio State University; [2]Idaho National Laboratory

2:30 PM Invited
Comparing the Corrosion Response of Wrought and Cold Sprayed Aluminum Alloys: *Luke Brewer*[1]; Munsu Kim[1]; Ozymandias Agar[1]; Gregory Kubacki[1]; [1]University of Alabama

3:00 PM
Corrosion Behavior of Additively Manufactured Al-Cr-Mn-Co-Zr Alloys: *Sarshad Rommel*[1]; Mingxuan Li[1]; Thomas Watson[2]; Callie Benson[3]; Rainer Hebert[1]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

3:20 PM Break

3:40 PM
High-pressure Cold Spray (HPCS) Coatings for Repair and Retrofit of Existing Large-scale Structures: *Rose Gerani*[1]; Baillie Haddad[1]; Aaron Nardi[1]; [1]VRC Metal Systems

4:00 PM Invited
Corrosion Behavior of Additively Manufactured Al-Ce-X and Al-10SiMg Alloys in 3.5 wt.% NaCl Solution: *Jiheon Jun*[1]; Alex Plotkowski[1]; Amit Shyam[1]; Sumit Bahl[1]; Ryan Dehoff[1]; Yi-Feng Su[1]; J. Allen Haynes[1]; [1]Oak Ridge National Laboratory

4:30 PM
Corrosion and Wear-resistant Coatings for Nuclear and Automotive Applications by Using High-pressure Cold Spray Technology: *Markus Brotsack*[1]; [1]Impact Innovations GmbH

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

Wednesday PM | March 22, 2023
Sapphire 410B | Hilton

Session Chairs: Janelle Wharry, Purdue University; James Burns, University of Virginia

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2:00 PM Invited
CISCC Repair & Mitigation Strategies in Nuclear Waste Storage Canisters: *Janelle Wharry*[1]; Antonio Ramirez[2]; Frank Pfefferkorn[3]; Kumar Sridharan[3]; Indrajit Charit[4]; Vijay Vasudevan[5]; Luke Brewer[6]; Paul Allison[6]; Jonathan Tatman[7]; [1]Purdue University; [2]The Ohio State University; [3]University of Wisconsin; [4]University of Idaho; [5]University of North Texas; [6]University of Alabama; [7]Electric Power Research Institute

2:30 PM
Phase Field Modelling of Stress Corrosion Cracking in Superalloys at High Temperature: *Mustafa Elsherkisi*[1]; Fabian Duarte Martinez[1]; Simon Gray[1]; Gustavo Castelluccio[1]; [1]Cranfield University

2:50 PM
Susceptibility of Manganese Bronze to SCC in Water: *Olaf Manz*[1]; Milo Kral[1]; [1]University of Canterbury

3:10 PM
Stress Corrosion Mitigation in Al-Mg via Zn-Rich Primers in Atmospheric Environment: *Matthew McMahon*[1]; Eric Dau[1]; Allison Akman[1]; [1]Naval Surface Warfare Center, Carderock Division

3:30 PM Break

3:50 PM Invited
On the Applied Potential Dependence of Environment-assisted Cracking Behavior of 7xxx-series Al Alloys in Marine Environments: Towards Informing Metal-rich Primer-based Mitigation Strategies: *James Burns*[1]; Zach Harris[1]; Alen Korjenic[1]; John Scully[1]; [1]University of Virginia

4:20 PM
Understanding the Effect of Applied Potential on Stress Corrosion Cracking of AA6111 Through In-Situ Measurements of Crack Tip pH: Katrina Catledge[1]; *Jenifer Locke*[1]; [1]Ohio State University

4:40 PM
Understanding Sensitization Rate Effects on Stress Corrosion Cracking for 5xxx Marine Grade Aluminum Alloys: *William Golumbfskie*[1]; Emily Holcombe[1]; Eric Dau[1]; Matthew McMahon[1]; [1]Naval Surface Warfare Center-Carderock Division

5:00 PM
Effect of Microstructure on Stress Corrosion Cracking Behavior of Additively Manufactured 7050-based Aluminum Alloy: *Rupesh Rajendran*[1]; Crosby Owens[2]; Jeffrey Eisenhaure[2]; David Spain[2]; Alex Kinsey[2]; Preet Singh[1]; [1]Georgia Institute of Technology; [2]Northrop Grumman Corporation

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MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multiscale Modeling Approaches to Improve Fatigue Predictions I

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

Wednesday PM | March 22, 2023
Sapphire H | Hilton

Session Chair: Antonios Kontsos, Drexel University

2:00 PM
PRISMS-Fatigue Framework: Effects of Sample Size, Grain Neighborhood, and Surface Roughness on Extreme Value Fatigue Response: *Mohammadreza Yaghoobi*[1]; Krzysztof S. Stopka[2]; John E. Allison[1]; David McDowell[3]; [1]University of Michigan; [2]Purdue University; [3]Georgia Institute of Technology

2:20 PM
Modeling Fatigue Resistance in Additively Manufactured Alloys with Porosity Defects: *Krzysztof Stopka*[1]; Michael Sangid[1]; [1]Purdue University

2:40 PM
Integrated Computational Modeling to Link Process with Fatigue Behavior for Metal Additive Manufacturing: *Mehdi Amiri*; Katerine Saleme; Maria Emelianenko; Bernhard Peters; [1]

3:00 PM
Molecular Dynamics Simulations of the Thermal Evolution of Voids in Cu Bulk and Grain Boundaries: *Vasileios Fotopoulos*[1]; Alexander Shluger[1]; Ricardo Grau-Crespo[2]; Corey O'Hern[3]; [1]University College London (UCL); [2]University of Reading; [3]Yale University

3:20 PM Break

3:35 PM
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 Mackey*[1]; Ritwik Bandyopadhyay[1]; Sven Gustafson[1]; Michael Sangid[1]; [1]Purdue University

3:55 PM
Crystal-Plasticity Modeling of Monotonic and Cyclic Softening in Inconel 718 Superalloy: *Jean-Briac le Graverend*[1]; [1]Texas A&M University

4:15 PM
Investigation of Irreversible Slip and Intragranular Lattice Rotations in Polycrystalline Inconel 718 during Cyclic Loading: *Justine Schulte*[1]; Jonathan Hestroffer[1]; Dalton Shadle[2]; Kelly Nygren[3]; Matthew Miller[2]; Tresa Pollock[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Cornell University; [3]Cornell High Energy Synchrotron Source

4:35 PM
A Novel Multiaxial Strain-Life Approach for Nickel-base Superalloys: *Firat Irmak*[1]; Ali Gordon[1]; [1]University of Central Florida

4:55 PM
Phase-field Modeling of Fatigue Microstructures in Ni-based Single Crystal Superalloys: *Jose Dominic*[1]; Jean-Briac le Graverend[1]; [1]Texas A&M University

5:15 PM
Framework to Model Single crystal and Directionally Solidified Nickel Base Superalloys under a Wide Range of Monotonic, Cyclic, Thermomechanical Fatigue and Creep Fatigue Conditions: *Navindra Wijeyeratne*[1]; Ali Gordon[1]; [1]University of Central Florida

MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Tooling & Process Monitoring

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

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Session Chairs: Kevin Colligan, Concurrent Technologies Corporation; Darrell Herling, Pacific Northwest National Laboratory

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2:00 PM Invited
Linking Tool Features to Process Forces: Samuel Merritt[1]; *Yuri Hovanski*[1]; Kenneth Ross[2]; [1]Brigham Young University; [2]Pacific Northwest National Laboratory

2:20 PM
Next Generation Tooling for Friction Stir Technologies: *Supreeth Gaddam*[1]; Amit Behera[2]; Qiaofu Zhang[2]; Noriaki Arai[2]; James Male[2]; Rajiv Mishra[1]; [1]University of North Texas; [2]QuesTek Innovations LLC

2:40 PM
Hybrid FSW Tools for Electromobile Applications: Michael Grätzel[1]; *Markus Weigl*[2]; Michael Hasieber[1]; Jean Pierre Bergmann[1]; [1]Technische Universität Ilmenau; [2]Grenzebach Maschinenbau GmbH

3:00 PM
Measurement of Heat Transfer Coefficient between a Friction Stir Welding Tool and Workpiece during Plunge Using a 3 Sensor: *Matthew Goodson*[1]; Troy Munro[1]; Michael Miles[1]; [1]Brigham Young University

3:20 PM Break

3:40 PM Invited
Friction Stir Welding Operating Window for Aluminum Alloy Obtained by Temperature Measurement: *Moura Abboud*[1]; Laurent Dubourg[2]; Adrien Leygue[3]; Guillaume Racineux[3]; Olivier Kerbrat[4]; [1]Ecole Normale Supérieure de Rennes / Stirweld; [2]Stirweld; [3]Institut de Recherche en Génie Civil et Mécanique (GeM); [4]Ecole Normale Supérieure de Rennes

4:00 PM
The Performance of a Force-based General Defect Detection Method Outside of Calibration: *Johnathon Hunt*[1]; Yuri Hovanski[1]; [1]Brigham Young University

4:20 PM Invited
Material Flow Visualization and Comparison in Different Aluminum Alloys during Friction Stir Welding using High-Speed X-ray Imaging: Hemant Agiwal[1]; Daniel Franke[1]; Mohammad Ansari[1]; Patrick Faue[1]; Samuel Clark[2]; Kamel Fezzaa[2]; Michael Zinn[1]; Shiva Rudraraju[1]; *Frank Pfefferkorn*[1]; [1]University of Wisconsin-Madison; [2]Argonne National Laboratory

4:40 PM
The Role of Fracture Properties on Lap Joint Strength of Friction Stir Welded AA 7055-T6 Sheets: *Kranthi Balusu*[1]; Hrishikesh Das[1]; Xiao Li[1]; Timothy Roosendaal[1]; Robert Seffens[1]; Ayoub Soulami[1]; Piyush Upadhyay[1]; [1]Pacific Northwest National Laboratory

5:00 PM
Simulation and Realization of Friction Stir Welding of Aluminum Joints Using Additively Manufactured Ceramic Bobbin Tools: *Toni Sprigode*[1]; Andreas Gester[1]; Guntram Wagner[1]; Murat Demirtas[2]; Nadja Kratz[2]; Anna Foit[3]; Gerald Ochse[3]; Angelika Brückner-Foit[3]; Adrian Rienäcker[3]; Marcus Emmel[4]; [1]Chemnitz University of Technology; [2]Forschungsinstitut für Glas - Keramik GmbH; [3]University of Kassel; [4]Product Area Ceramics (GROW/PAC), grow platform GmbH

MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — Casting Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials Institute

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Session Chairs: Andre Phillion, McMaster University; Michel Rappaz, EPFL; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials

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2:00 PM Invited
Scaling Analysis In Solidification Process Modeling: *Matthew Krane*[1]; [1]Purdue University

2:30 PM Invited
Computational Models of Microstructure and Thermal Distortion during Initial Solidification of Steel: *Brian Thomas*[1]; Ghavam Azizi[1]; Mohsen Asle Zaeem[1]; [1]Colorado School of Mines

3:00 PM
Mutual Translations between Fundamental Knowledge and Industrial Practice in the Field of Al Alloys Solidification and Casting: *Philippe Jarry*[1]; [1]Constellium C-TEC

3:20 PM Break

3:40 PM
Design of Light Wind Turbine Parts by Simulation Based Machine Learning: Youness Bami[1]; Can Huang[1]; Emir Subasic[1]; Felix Weber[2]; Jannik Zimmermann[2]; Vitali Züch[2]; *Jurgen Jakumeit*[1]; [1]Access E.V.; [2]RWTH Aachen

4:00 PM
Near-congruent Cu-Mn Bronze Produced with Ferro-manganese: *Kevin Trumble*[1]; [1]Purdue University

4:20 PM
Microstructure and Crystallographic Texture in Twin-roll Casting of AA1050: Simulation and Industrial Validation: Jonathan Dantzig[1]; Onur Meydanoglu[2]; Arash Kazazi[3]; Hatice Mollaoglu Altuner[2]; Cemil Isiksacan[2]; *Melis Serefoglu*[4]; [1]University of Illinois; [2]Assan Aluminum; [3]Koc University; [4]Marmara University

4:40 PM Invited
Frontiers in Solidification - 2023: *Jonathan Dantzig*[1]; [1]University of Illinois at Urbana-Champaign

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SPECIAL TOPICS

Frontiers of Materials Award Symposium: Functional Composition Control of Surface Mechanics in Soft, Water-swollen Gels — Functional Composition Control of Surface Mechanics in Soft, Water-Swollen Gels

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

Program Organizer: Alison Dunn, University of Illinois Urbana-Champaign

Wednesday PM | March 22, 2023
Sapphire D | Hilton

Session Chair: Alison Dunn, University of Illinois Urbana-Champaign

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2:00 PM Keynote
Soft Surface Layers on Swollen Gels Mediate Their Contact and Sliding Mechanics: *Alison Dunn*[1]; [1]University of Illinois Urbana-Champaign

2:40 PM Invited
Contact Mechanics of Soft Hydrated Materials: Yang Lai[1]; Dongjing He[1]; *Yuhang Hu*[1]; [1]Georgia Institute of Technology

3:20 PM Invited
Hydrogel Structure and Surface Physics: *Angela Pitenis*[1]; [1]University of California, Santa Barbara

3:40 PM Break

4:00 PM Invited
Controlling Lubricity of Interfaces with Charged Hydrogels: *Rosa Espinosa-Marzal*[1]; [1]University of Illinois Urbana-Champaign

4:40 PM Invited
Friction of Thin Hydrogel Films: Disentangling the Contributions of Poroelastic Flow and Interface Molecular Interactions: *Antoine Chateauminois*[1]; [1]ESPCI, CNRS UMR 7615, Sorbonne Université

SPECIAL TOPICS

Frontiers of Materials Award Symposium: Intermetallic Alloys at the Edge of Complexity: Structural and Kinetic Aspects — Session I

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

Phase Transformations Committee, TMS: Solidification Committee

Program Organizer: Ashwin Shahani, University of Michigan

Wednesday PM | March 22, 2023
28C | SDCC

Session Chair: Ashwin Shahani, University of Michigan

2:00 PM Keynote
Capturing the Growth of Quasicrystals Near- and Far-from-Equilibrium: *Ashwin Shahani*[1]; [1]University of Michigan

2:40 PM Invited
Simulating Complex Crystal Structures and Their Assembly in Hard and Soft Condensed Materials: *Julia Dshemuchadse*[1]; [1]Cornell University

3:20 PM Break

3:40 PM Invited
Influence of Icosahedral Short-range Order in the Liquid on Solidification Morphologies: *Michel Rappaz*[1]; [1]École Polytechnique Fédérale de Lausanne

4:20 PM Invited
Intermetallic Compounds from Metallic-glass Precursors: *A. Lindsay Greer*[1]; [1]University of Cambridge

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ADVANCED MATERIALS

High Performance Steels — Processing - Mechanical Property Relationships II

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

Wednesday PM | March 22, 2023
Aqua F | Hilton

Session Chairs: Jonah Klemm-Toole, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology

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2:00 PM
The Relationship between Hydrogen Embrittlement Behavior and Pre-strain Level of Medium-Mn Steel: *Hyun Wook Lee*[1]; Tak Min Park[1]; Hye-Jin Kim[2]; Jeongho Han[1]; [1]Hanyang University; [2]Hyundai-Steel Co.

2:20 PM
Effect of Nitrogen on the Hardening Mechanisms in the Highly Deformed Steel Rex734: *Manuel Köbrich*[1]; Steffen Neumeier[1]; Mathias Göken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

2:40 PM
Neighborhood Effects on Mechanically Induced Martensitic Transformation in QP Steels: *Jiyun Kang*[1]; C. Cem Tasan[1]; Narayan S. Pottore[2]; Hong Zhu[2]; [1]Massachusetts Institute of Technology; [2]ArcelorMittal

3:00 PM
Residual Stresses Near Inclusion Caused by Martensite Transformation: *Tom Andersson*[1]; Matti Lindroos[1]; Anssi Laukkanen[1]; Tomi Suhonen[1]; Joona Vaara[2]; Tero Frondelius[2]; [1]VTT; [2]Wärtsilä

3:20 PM
Exceptional Fatigue Performance of Si and V Alloyed Nitriding Steels: *Jonah Klemm-Toole*[1]; Michael Burnett[1]; Kip Findley[1]; [1]Colorado School of Mines

3:40 PM Break

3:55 PM
Yielding Behavior of Triplex Medium Mn Steel Alternated with Cooling Strategies: Altering Martensite/Ferrite Interfacial Feature: *Xiao Shen*[1]; Bin Hu[2]; Qinyi Guo[2]; Haiwen Luo[2]; Wenwen Song[1]; [1]RWTH Aachen University; [2]University of Science and Technology Beijing

4:15 PM
Deformation and Damage Evolution of AHSS in Uniaxial Tension and Plane Strain Bending: *Nizia Mendes Fonseca*[1]; David Wilkinson[1]; Jidong Kang[2]; [1]McMaster University; [2]CanmetMATERIALS

4:35 PM
Modeling the Tensile Behavior of Martensitic Low-alloy Steels Accounting of Microstructural Heterogeneities: *Juan Macchi*[1]; Guillaume Geandier[1]; Julien Teixeira[1]; Sabine Denis[1]; Frédéric Bonnet[2]; Sébastien Allain[1]; [1]Institut Jean Lamour Ijl (Cnrs Umr7198); [2]ArcelorMittal Research SA

4:55 PM
Phase Boundary Segregation Induced Strengthening in Ultrafine-grained Duplex Medium-Mn Steels: *Yan Ma*[1]; Binhan Sun[2]; Alexander Schökel[3]; Wenwen Song[4]; Dirk Ponge[2]; Dierk Raabe[2]; Wolfgang Bleck[4]; [1]Max-Planck-Institut für Eisenforschung; RWTH Aachen University; [2]Max-Planck-Institut für Eisenforschung; [3]Deutsches Elektronen-Synchrotron DESY; [4]RWTH Aachen University

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MATERIALS DESIGN

Hume-Rothery Symposium on First-Principles Materials Design — Interface First-principle Method with Experiments II

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

Program Organizers: Bin Ouyang, Florida State University; Mark Asta, University of California, Berkeley; Geoffroy Hautier, Dartmouth College; Wei Xiong, University of Pittsburgh; Anton Van der Ven, University of California, Santa Barbara

Wednesday PM | March 22, 2023
Cobalt 501C | Hilton

Session Chairs: Raphaële Clément, University of California, Santa Barbara; Hailong Chen, Georgia Institute of Technology

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2:00 PM Invited
Origin of the Invar Effect: *Brent Fultz*[1]; Stefan Lohaus[1]; Pedro Guzman[1]; [1]California Institute of Technology

2:30 PM Invited
Structure Determination – From Materials Design to Characterization: *Maria Chan*[1]; [1]Argonne National Laboratory

3:00 PM Invited
Design of Novel Electrode and Solid Electrolyte Materials Guided by Crystal Structure Characterization and Understanding: *Hailong Chen*[1]; [1]Georgia Institute of Technology

3:30 PM Break

3:50 PM Invited
Understanding Key Properties of Disordered Rock-salt Li-ion Cathode Materials Based on Ab Initio Calculations and Experiments: *Jinhyuk Lee*[1]; [1]McGill University

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LIGHT METALS

Light Elements Technology — Light Elements: Lithium & Alkalis and Silicon

Sponsored by: TMS Light Metals Division

Program Organizers: Neale Neelameggham, IND LLC; Kiran Solanki, Arizona State University; Prashanth Saraswat, Department of Metallurgy; Huimin Lu, Beijing Ofikintai Technology Co Ltd.; Onuralp Yucel, Istanbul Technical University

Wednesday PM | March 22, 2023
30D | SDCC

Session Chairs: Alafara Baba, University of Ilorin; Prashant Saraswat, university of utah

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2:00 PM Introductory Comments

2:05 PM
A New Method for Producing Hydrogen, Lithium Metal and High-purity Silicon from Spodumene Ore: Huimin Lu[1]; Neale Neelameggham[2]; *Bin Li*[3]; [1]Beijing Ofikintai Technology Co Ltd.; [2]IND LLC; [3]University of Nevada, Reno

2:30 PM
Electrochemical Technology for Li-isotope Separation: *Prashant Sarswat*[1]; Michael Free[1]; [1]University of Utah

2:50 PM
Recovery of Lithium from Waste LIBs Using Sulfuric Acid Roasting and Water Washing: *Manis Kumar Jha*[1]; Pankaj Kumar Choubey[1]; Rekha Panda[1]; Om Shankar Dinkar[1]; Nityanand Singh[1]; [1]CSIR-National Metallurgical Laboratory

3:10 PM
High-grade Li2SO4 from a Local Montebrasite Ore as Industrial Raw Material for Managing Bipolar Disorder: *Alafara Baba*[1]; Daud Olaoluwa[2]; Ayo Balogun[3]; Oluwagbemiga Adebola[1]; [1]University of Ilorin; [2]University of Ilorin & The Federal Polytechnic, Ede; [3]University of Ilorin & Kogi State College of Education (Technical), Kabba

3:30 PM Break

3:45 PM
Sodium Metal from Sodium Sulfate - Using Aluminum and Molten Iron Reaction Medium: *Jed Checketts*[1]; [1]Powerball Technologies

CORROSION

Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion — Session VI

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

Program Organizers: Penghui Cao, University of California, Irvine; Yang Yang, Pennsylvania State University; Fadi Abdeljawad, Clemson University; Irene Beyerlein, University of California, Santa Barbara; Enrique Lavernia, University of California, Irvine; Robert Ritchie, University of California, Berkeley

Wednesday PM | March 22, 2023
Sapphire 411A | Hilton

Session Chairs: Fadi Abdeljawad, Clemson University; Daniel Gianola, University of California, Santa Barbara

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2:00 PM Invited
Tunable Short-range Order Within Amorphous Complexions and Its Connection to Damage Nucleation: Pulkit Garg[1]; Esther Hessong[1]; Tianjiao Lei[1]; *Timothy Rupert*[1]; [1]University of California, Irvine

2:30 PM
Chemical and Structural Ordering in Amorphous Complexions Determines the Plasticity of Nanocrystalline Cu Alloys: *Esther Hessong*[1]; Tianjiao Lei[1]; Mingjie Xu[1]; Timothy Rupert[1]; [1]University of California, Irvine

2:50 PM Invited
Non-monotonic Role of Chemical Heterogeneity on Interfacial Crack Growth in Fe-Ni-Cr Alloys: *Yue Fan*[1]; [1]University of Michigan

3:20 PM
Grain Boundary Segregation in Polycrystals: Isotherms, Computation, and Data Science: *Malik Wagih*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

3:40 PM Break

3:55 PM Invited
Engineering the Extent of Grain Boundary Ordering via Pre-melting in Nanocrystalline Al Alloys: Jungho Shin[1]; Tianjiao Lei[2]; Hannah Howard[1]; Glenn Balbus[3]; Timothy Rupert[2]; *Daniel Gianola*[1]; [1]University of California-Santa Barbara; [2]University of California Irvine; [3]Air Force Research Laboratory

4:25 PM
The Effects of Local Order in Molten Metals on Glass Formation: *Douhan Sarıtürk*[1]; Can Okuyucu[1]; Yunus Kalay[1]; [1]Middle East Technical University

4:45 PM
Preferential Precipitation on Annealing Twin Boundaries and Its Effect on Strain Localization: *Semanti Mukhopadhyay*[1]; Chaitali Patil[1]; Hariharan Sriram[1]; You Rao[2]; Longsheng Feng[3]; Maryam Ghazisaeidi[1]; Stephen Niezgoda[1]; Yunzhi Wang[1]; Michael Mills[1]; [1]The Ohio State University; [2]EPFL; [3]Lawrence Livermore National Laboratory

5:15 PM Invited
Coupled Grain Boundary and Twin Boundary Deformation in Metallic Materials: *Jiangwei Wang*[1]; Qi Zhu[2]; Haofei Zhou[1]; Xianghai An[3]; [1]Zhejiang University; [2]Nanyang

Technological University; [3]The University of Sydney

NUCLEAR MATERIALS

Materials and Chemistry for Molten Salt Systems — Synthesis and Structure

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

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

Wednesday PM | March 22, 2023
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Session Chair: Jinsuo Zhang, Virginia Polytechnic Institute and State University

2:00 PM Introductory Comments

2:05 PM Invited
Synthesis of Actinide Fluorides and Chlorides for Molten Salt Reactor Fuels: *Pavel Soucek*[1]; O. Beneš[2]; M. Fucina[3]; E. Capelli[4]; P.R. Hania[5]; E. D'Agata[1]; A. Rodrigues[1]; H.J. Uitslag-Doolaard[5]; R. Konings[1]; [1]European Commission, Joint Research Centre (JRC); [2]1European Commission, Joint Research Centre (JRC); [3]Univ. Lille, CNRS, UMR 8181 - UCCS - Unité de Catalyse et Chimie du Solide, F-59000; [4]Orano, 92320 Châtillon; [5]Nuclear Research and Consultancy Group

2:35 PM
Reaction Kinetics of the Chlorination of UO2 with ZrCl4: *Jarom Chamberlain*[1]; Asmat Taunque[1]; Michael Simpson[1]; [1]University of Utah

2:55 PM
Feasibility Study on Aluminum Under Laser Ablation for Corrosion Resistance in Molten Salt: Peggy Cawley[1]; *Supathorn Phongikaroon*[1]; [1]Virginia Commonwealth University

3:15 PM
Solvated Electron Dynamics in Molten Salts via Ultrafast Transient Absorption Spectroscopy: *Alexander Bataller*[1]; Davis Bryars[1]; [1]North Carolina State University

3:35 PM Break

3:55 PM
Electrochemical Characterization of Molten Salt Fuel Systems with Boron-Doped Diamond: *Hannah Patenaude*[1]; Nastasija Damjanovic[1]; Charles Lhermitte[2]; Jason Rakos[1]; Shirmir Branch[3]; Marisa Monreal[2]; Cory Rusinek[1]; [1]University of Nevada, Las Vegas; [2]Los Alamos National Laboratory; [3]Pacific Northwest National Laboratory

4:15 PM
In-situ XAS and Electrochemistry Measurements on Molten FLiNaK: *Sean Fayfar*[1]; Guiqui Zheng[1]; David Sprouster[2]; Eli Stavitski[3]; Denis Leshchev[3]; Boris Khaykovich[1]; [1]Massachusetts Institute of Technology; [2]Stony Brook University; [3]Brookhaven National Lab

4:35 PM
FLiBe Thermodynamic and Physical Properties Validation: *Nathanael Gardner*[1]; Raluca Scarlat[1]; Sven Vogel[1]; Haley Williams[1]; Boris Khaykovich[1]; Sean Fayfar[1]; [1]UC

Berkeley

MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — Machine Learning

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

Wednesday PM | March 22, 2023
Sapphire L | Hilton

Session Chair: Chelsey Hargather, New Mexico Tech

2:00 PM Invited
The Modern-day Blacksmith: *Gareth Conduit*[1]; [1]Cavendish Laboratory

2:30 PM Invited
Data-Driven Discovery and Design of Thermoelectric Materials: *Christopher Wolverton*[1]; [1]Northwestern University

3:00 PM Invited
Computational Design of Novel High-Entropy Alloys: Multi-Strengthening Mechanisms vs Neural Network Model: Jaemin Wang[1]; Hyeon-Seok Do[1]; *Byeong-Joo Lee*[1]; [1]Postech

3:30 PM Break

3:50 PM Invited
Coupling Physics in Data-driven High-temperature Alloys Design via High-throughput CALPHAD: *Dongwon Shin*[1]; Jian Peng[1]; Yukinori Yamamoto[1]; Michael Brady[1]; J. Allen Haynes[1]; Sunyong Kwon[1]; [1]Oak Ridge National Laboratory

4:20 PM Invited
Data-driven Modelling of Metallurgical Processes – A Case Study on BOF Process: *Hongbiao Dong*[1]; [1]University of Leicester

4:50 PM Invited
Efficient Exploration of Compositionally Complex Alloys: *Raymundo Arroyave*[1]; Brent Vela[1]; Danial Khatamsaz[1]; Douglas Allaire[1]; [1]Texas A&M University

MATERIALS PROCESSING

Materials Research in Reduced Gravity — Solidification

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

Program Organizers: Wilhelmus Sillekens, European Space Agency; Michael Sansoucie, Nasa Marshall Space Flight Center; Robert Hyers, Worcester Polytechnic Institute; Douglas Matson, Tufts University; Gwendolyn Bracker, DLR

Institute of Materials Physics in Space

Wednesday PM | March 22, 2023
30B | SDCC

Session Chairs: Robert Hyers, Worcester Polytechnic Institute; Maike Becker, German Aerospace Center (Dlr)

2:00 PM
Solidification of Al-Cu Alloys in Microgravity and Terrestrial Environments: Thomas Williams[1]; *Christoph Beckermann*[1]; [1]University of Iowa

2:20 PM
In-situ Investigation of the Impact of Gravity on CET during Directional Solidification of Al-Cu Alloys: *Guillaume Reinhart*[1]; Fabiola Ngomesse[1]; Lara Abou-Khalil[1]; Gerhard Zimmermann[2]; David Browne[3]; Wilhelmus Sillekens[4]; Henri Nguyen-Thi[1]; [1]Aix-Marseille University; [2]ACCESS e.V.; [3]University College Dublin; [4]European Space Agency

2:40 PM
Nucleation and Growth Dynamics of Equiaxed Dendrites in Thin Metallic Samples in Microgravity and on Ground: *Maike Becker*[1]; Mareike Wegener[1]; Jörg Drescher[1]; Florian Kargl[1]; [1]German Aerospace Center (DLR)

3:00 PM
Analysis of In-Situ Microgravity Equiaxed Solidification Experiment using Machine Learning and Advanced Ground-Based Characterization Techniques: Jonathan Mullen[1]; Shashidhara Marathe[2]; Saranarayanan Ramachandran[3]; Wajira Mirihanage[3]; *David Browne*[1]; [1]University College Dublin; [2]Diamond Light Source; [3]University of Manchester

3:20 PM
CAPTN Simulation of Dendritic Grain Structures: Yijian Wu[1]; Oriane Senninger[1]; *Charles-Andre Gandin*[1]; [1]PSL University

3:40 PM Break

4:00 PM
Structure and Properties of the Solder Joints Produced in Terrestrial and Microgravity Environment: *Manish Kumar*[1]; Sid Pathak[1]; [1]Iowa State University

4:20 PM
Gravity Influence on the Distortion-Densification Trajectory for Liquid Phase Sintering: *Randall German*[1]; Elisa Torresani[1]; Eugene Olevsky[1]; [1]San Diego State University

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Zr Alloys and Beyond

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel

Kaoumi, North Carolina State University

Wednesday PM | March 22, 2023
28D | SDCC

Session Chairs: Caleb Massey, Oak Ridge National Laboratory; Djamel Kauomi, North Carolina State University

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2:00 PM Invited
The Role of Stress-State on the Failure Mechanism, Strain to Failure and Fatigue Resistance of Zircaloy-4: *Brian Cockeram*[1]; Kwai Chan[2]; Bruce Kammenzind[1]; [1]Nnl Fluor Marine Propulsion; [2]Southwest Research Institute

2:30 PM
Impact of Thermal Treatment and Irradiation on Mechanical Behavior of Cold Spray Cr Coatings on Zr-alloy Cladding: *Tyler Dabney*[1]; Hwasung Yeom[1]; Nan Li[2]; Ben Eftink[2]; Kumar Sridharan[1]; [1]University of Wisconsin-Madison; [2]Los Alamos National Laboratory

2:50 PM
Hydride Reorientation Behavior in ZIRLO Using Ring Compression Tests: *Soyoung Kang*[1]; Arthur Motta[1]; Maxim Gussev[2]; Michael Billone[3]; [1]Pennsylvania State University; [2]Oak Ridge National Laboratory; [3]Argonne National Laboratory

3:10 PM
Anisotropic Compressive Strength of Single Crystal Zirconium Pillars and the Effects of Irradiation Hardening and Temperature Through Micro-Pillar Mechanical Testing: *Matthew deJong*[1]; Philip Alarcón-Furman[1]; Ryan Schoell[2]; Djamel Kaoumi[1]; [1]North Carolina State University; [2]Sandia National Laboratories

3:30 PM Break

3:50 PM
Mechanical Behavior of Bare and Cr Coated Zirconium Claddings During Burst Testing via In-situ Strain Measurements: *Samuel Bell*[1]; Mackenzie Ridley[2]; Kenneth Kane[3]; Ben Garrison[2]; Tim Graening[2]; Nathan Capps[2]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory; [3]John Hopkins University - Applied Physics Laboratory

4:10 PM
Cladding Coating Integrity Quantified by Ring Pull and Local Strain Analysis: *Peter Beck*[1]; Mathew Hayne[1]; Emily Proehl[1]; Samuel Briggs[2]; Julie Tucker[2]; Tarik Saleh[1]; Benjamin Eftink[1]; [1]Los Alamos National Laboratory; [2]Oregon State University

4:30 PM
Structure-property Evolution of PM-HIP Fabricated Ni-Alloys 625 and 690 Neutron Irradiated to 1 and 3dpa: *Caleb Clement*[1]; Yu Lu[2]; Sheng Cheng[2]; Megha Dubey[2]; Sowmya Panuganti[1]; Yangyang Zhao[1]; Katelyn Wheeler[3]; Donna Guillen[3]; David Gandy[4]; Janelle Wharry[1]; [1]Purdue University; [2]Boise State University/ Center for Advanced Energy Studies; [3]Idaho National Laboratory; [4]Electric Power Research Institute

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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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

Wednesday PM | March 22, 2023
Aqua 310B | Hilton

Session Chair: Jagannathan Rajagopalan, Arizona State University

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2:00 PM Invited
Precision Strain Measurement During Additive Manufacturing: *Mitra Taheri*[1]; [1]Johns Hopkins University

2:30 PM Invited
In-situ TEM Observations of Dislocation and Twinning Activities of Mg via Nanoindentation: *Kelvin Xie*[1]; Lai Yi-Cheng[1]; Digvijay Yadav[1]; [1]Texas A&M University

3:00 PM
Movement of Charged Dislocations in an Inorganic Compound under an Electric Field: *Yu Zou*[1]; [1]University of Toronto

3:20 PM Invited
Understanding the Unique Thermal and Mechanical Properties of Nanotwinned Ni-Mo-W Alloys: *Mo-Rigen He*[1]; Gianna Valentino[2]; Arunima Banerjee[1]; Jessica Krogstad[3]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]Johns Hopkins University Applied Physics Laboratory; [3]University of Illinois Urbana-Champaign

3:50 PM Break

4:10 PM
Wear of UNCD Studied by In-situ TEM Tribometry: *Rodrigo Bernal*[1]; [1]University of Texas at Dallas

4:30 PM
Nanoindentation Pop-in Analysis of Oxidized Ni-based Superalloys: *Malo Jullien*[1]; Damien Texier[1]; Marc Legros[2]; [1]Institut Clément Ader; [2]CEMES

4:50 PM
High Pressure and In-Situ TEM Deformation of Nanoscale Metallic Interfaces and Precipitates: *Wendy Gu*[1]; Abhinav Parakh[1]; Mehrdad Kiani[2]; [1]Stanford University; [2]Yale University

5:10 PM
Toughening Mechanism in Cu-Graphene Nanolayered Composite: *Seung Min Han*[1]; [1]Korea Advanced Institute of Science and Technology

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NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Materials in Mechanical, Corrosive or Irradiation Environments

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

Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Wednesday PM | March 22, 2023
Aqua 303 | Hilton

Session Chair: Khalid Hattar, Sandia National Laboratories

2:00 PM Invited
Thermal Stability and Mechanical Properties of Nanostructured High-entropy Alloys and Quasicrystals: *Yu Zou*[1]; [1]University of Toronto

2:25 PM Invited
No Ball Milling Needed: Alternative ODS Steel Manufacturing with Gas Atomization Reaction Synthesis (GARS) and Friction-based Processing: Dalong Zhang[1]; Jens Darsell[1]; Glenn Grant[1]; Iver Anderson[2]; Xiaolong Ma[1]; *Jia Liu*[1]; Danny Edwards[1]; Wahyu Setyawan[1]; Takuya Yamamoto[3]; Robert Odette[3]; [1]Pacific Northwest National Laboratory; [2]Ames Laboratory; [3]University of California-Santa Barbara

2:50 PM Invited
Dislocation Cells in Additively Manufactured Metallic Alloys Characterized by Electron Backscatter Diffraction Pattern Sharpness: Fulin Wang[1]; Jean-Charles Stinville[2]; Marie Charpagne[2]; McLean Echlin[3]; Sean Agnew[4]; Tresa Pollock[3]; Marc De Graef[5]; *Daniel Gianola*[3]; [1]Shanghai Jiao Tong University; [2]University of Illinois at Urbana-Champaign; [3]University of California-Santa Barbara; [4]University of Virginia; [5]Carnegie Mellon University

3:15 PM
Microstructural Evolution of Oxide Dispersion Strengthened (ODS) Steel Tubes During Cold Pilgering Process.: *Freddy Salliot*[1]; Denis Sornin[1]; Roland Loge[2]; Thierry Baudin[3]; Yann De Carlan[1]; [1]Université Paris Saclay, CEA; [2]École Polytechnique Fédérale de Lausanne (EPFL); [3]Université Paris-Saclay, CNRS

3:35 PM Break

3:55 PM Invited
The Role of Surface Treatment on Material Performance in High Temperature Molten Salt: *Raluca Scarlat*[1]; [1]University of California, Berkeley

4:20 PM
Cobalt-60 Gamma-Ray Irradiation Effects in Aerosol Jet Printed Two Dimensional Materials: *Twinkle Pandhi*[1]; Gregory P. Horne[2]; Fahima Ouchen[3]; Timothy A. Prusnick[3]; Eniya Karunamurthy[4]; Laura Davidson[3]; Emily M. Heckman[1]; Roberto S. Aga[3]; [1]AFRL; [2]Idaho National Laboratory; [3]KBRwyle; [4]Wright State

4:40 PM
STEM-based Mapping of Point Defects Produced via He-ion Irradiation: *Sean Mills*[1]; Alex Lin[2]; Alexander Pattison[2]; Peter Ercius[2]; Andrew Minor[1]; [1]University of California, Berkeley; [2]National Center for Electron Microscopy, LBNL

5:00 PM
Microstructure Characterization of Ion-irradiated Nano-grained Ni-Mo-Cr Alloy using Diffraction Line Profile Analysis: *Thalles Lucas*[1]; Zhiyang Wang[2]; Tao Wei[2]; Yi Huang[3]; Ping Huai[4]; Ondrej Muransky[2]; Levente Balogh[1]; [1]Queen's

University; [2]Australian Nuclear Science and Technology Organisation; [3]University of Southampton; [4]Shanghai Institute of Applied Physics (SINAP)

CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Micro to Meso Scale Structure

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

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

Wednesday PM | March 22, 2023
Aqua 311B | Hilton

Session Chair: Raphael Hermann, Oak Ridge National Laboratory

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2:00 PM
Effect of Deformation on Microstructure Evolution In Dilute MgYZn Alloys Examined by Combined Use of SWAXS and EXAFS: *Hiroshi Okuda*[1]; Yoshiaki Maegawa[1]; Yoshihito Kawamura[2]; Shin-ichi Inoue[2]; [1]Kyoto University; [2]Kumamoto University

2:20 PM
In-situ High-resolution X-ray Nanotomography of the Thermal Sintering and Densification of a Chlorine Bearing Vanadinite Apatite Nuclear Waste Form: *Joshua Kane*[1]; Jorgen Rufner[1]; Tiankai Yao[1]; William Chuirazzi[1]; Rahul Kancharla[1]; Xianghui Xiao[2]; Dong Zhao[3]; Jie Lian[3]; [1]Idaho National Laboratory; [2]Brookhaven National Laboratory; [3]Rensselaer Polytechnic Institute

2:40 PM
Irradiated Graphite Across Microscopic to Mesoscopic Length-scales: *Boris Khaykovich*[1]; David Sprouster[2]; Anne Campbell[3]; Durgesh Rai[4]; Jan Ilavsky[5]; Lance Snead[2]; [1]Massachusetts Institute of Technology; [2]Stony Brook University; [3]Oak Ridge National Laboratory; [4]Xenocs Inc; [5]Argonne National Laboratory

3:00 PM
Micro X-ray Computed Tomography of TRISO Fuel: *William Chuirazzi*[1]; Joshua Kane[1]; John Stempien[1]; Rahul Kancharla[1]; Fei Xu[1]; Nikolaus Cordes[2]; [1]Idaho National Laboratory; [2]Los Alamos National Laboratory

3:20 PM Break

3:35 PM
Precipitation Microstructure of Al-Mg and Related Alloys Examined by Two-dimensional Anomalous SAXS at the K Absorption Edges of Mg and Al: *Hiroshi Okuda*[1]; Keita Aoyama[2]; Shan Lin[2]; Kazuhiko Mase[3]; Yusuke Tamenori[4]; [1]Kyoto University; [2]Kyoto University graduate student; [3]High Energy Accelerator Organization; [4]Japan Sychrotron Radiation Research Institute

3:55 PM
Abnormal Grain Growth and Nano-oxide Precipitation of Oxide Dispersion Strengthened Steels Throughout Their Consolidation Evaluated by In-situ Wide and Small Angle X-ray Scattering: *Gabriel Spartacus*[1]; Joël Malaplate[2]; Frédéric de Geuser[3]; Denis Sornin[2]; Raphaëlle Guillou[2]; Alexis Deschamps[3]; [1]KTH; [2]CEA Saclay; [3]Univ. Grenoble Alpes

4:15 PM
Investigating the Polymer Network Structure of Epoxy Thermosets Using X-ray Scattering: *Derek Dwyer*[1]; Zach Brubaker[1]; Sara Isbill[1]; Jenn Neu[1]; Wim Bras[1]; Jong Keum[1]; Jennifer Niedziela[1]; [1]Oak Ridge National Laboratory

4:35 PM
In-situ Neutron Diffraction Creep Behavior of Designer Superalloys Tailored for Additive Manufacturing: *Patxi Fernandez-Zelaia*[1]; Christopher Ledford[1]; Kira Pusch[2]; Evan Raeker[2]; Ning Zhou[3]; Stephane Forsik[3]; Austin Dicus[3]; Tresa Pollock[2]; Michael Kirka[1]; [1]Oak Ridge National Laboratory; [2]University of California, Santa Barbara; [3]Carpenter Technology

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ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Electrometallurgy

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Wednesday PM | March 22, 2023
33C | SDCC

Session Chairs: Rajyashree Lenka, The University of Alabama; Uday Pal, Boston University

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2:00 PM Invited
Energy Storage and Recovery Employing Iron-Iron Oxide System as an Electrofuel: *Uday Pal*[1]; Hadassah Flagg[1]; Haoxuan Yan[1]; Achim Seidel[2]; Georg Poehle[3]; Christian Redlich[3]; [1]Boston University; [2]Airbus Defence and Space; [3]Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM

2:30 PM Invited
Electrochemical Mining of Municipal Solid Waste Incinerator Ashes: Michael Wang[1]; *Duhan Zhang*[1]; Yet-Ming Chiang[1]; [1]MIT

3:00 PM Invited
Rare Earth and Critical Base Metals Electrodeposition using Urea - Choline Chloride Ionic Liquids: *Rajyashree Lenka*[1]; Ramana Reddy[1]; [1]The University of Alabama

3:30 PM Break

3:50 PM Invited
Simultaneous Deposition of Nickel and Electrolytic Manganese Dioxide: *Kali Sanjay*[1]; Barsha Marandi[1]; Abdul Sheik[1]; Bhagat Tudu[1]; Sweta Mahapatra[1]; [1]CSIR-Institute of Minerals and Materials Technology

4:20 PM
Solid Oxide Membrane-based Electrolytic Process for the Conversion of Lunar Regolith to Oxygen and Metal (ROXY): Achim Seidel[1]; Matthias Funke[1]; Georg

Poehle[2]; Christian Redlich[3]; *Uday Pal*[4]; [1]Airbus Defence and Space; [2]Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM; [3]Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM; [4]Boston University

4:40 PM
Electrowinning Impurities Out of Flowing Molten Chloride Salt for Heat Transfer Fluid Applications: *Liam Witteman*[1]; Kerry Rippy[2]; Patrick Taylor[1]; Judith Vidal[2]; [1]Colorado School of Mines; [2]National Renewable Energy Laboratory

5:00 PM
Electrochemical Splitting of Salt Bearing Effluents: Abdul Sheik[1]; *Sujana Gude*[1]; Barsha Marandi[1]; Kali Sanjay[1]; Chinmaya Sarangi[1]; S Sharmila[1]; [1]CSIR-Institute of Minerals and Materials Technology

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Non-Ferrous Alloys II

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Wednesday PM | March 22, 2023
25C | SDCC

Session Chair: Swiswaroop Dasari, University of North Texas

2:00 PM Invited
Nucleation of Coupled Body-centered-cubic and Closed-packed Structures in Liquid Ni-Cr Alloys: A Molecular Dynamics Study: *Deep Choudhuri*[1]; [1]New Mexico Institute of Mining and Technology

2:30 PM
Analysis of Self-healing Behavior in Co-based Superalloys by Spontaneous Segregation of Y during In-situ Tensile Test at Elevated Temperature: *Hyun Gi Min*[1]; Kook Noh Yoon[1]; Jung Soo Lee[2]; Eun Soo Park[1]; [1]Seoul National University; [2]Industrial Science and Technology Research Institute, Inha University

2:50 PM Invited
Nanoscale Shuffle Transformation in a Multifunctional Ti-Nb-Zr-Ta Alloy: Dian Li[1]; Deepak Pillai[1]; *Yufeng Zheng*[1]; [1]University of Nevada-Reno

3:20 PM Break

3:40 PM
Combinatorial Design of Nano-scale Precipitate Strengthened High Entropy Alloy Exhibiting Transformation Induced Plasticity: *Pradeep Konda Gokuldoss*[1]; [1]Indian Institute of Technology Madras

4:00 PM
Thermodynamic Study of Hf Addition to Refractory Low-activation W-Ta-Cr-V High Entropy Alloy from First-principles: *Enrique Martinez Saez*[1]; Andrew Alvarado[1]; Hi Vo Tin[2]; Jan Wrobel[3]; Damian Sobieraj[3]; Duc Nguyen-Manh[4]; Saryu Jindal Fensin[2];

Osman El-Atwani[2]; [1]Clemson University; [2]Los Alamos National Laboratory; [3]Warsaw University of Technology; [4]CCFE

4:20 PM Invited
Light-induced Microstructure Evolution in Inorganic Semiconductors: Dislocation vs. Deformation Twinning: *Qi An*[1]; [1]Iowa State University

4:50 PM
Effect of -stabilizer Elements on the - Interfacial Structure and Energies Using First-principles Calculations: *Maheshwari Meesa*[1]; Michael Baskes[1]; Rajarshi Banerjee[1]; Srinivasan Srivilliputhur[1]; [1]University of North Texas

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Characterization and Analysis I

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

Wednesday PM | March 22, 2023
25B | SDCC

Session Chairs: Kathy Lu, Virginia Tech; Chu Lun Alex Leung, University College London

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2:00 PM Invited
Reveal Laser-matter Interaction during Laser Powder Bed Fusion Using a Physical Twin, X-ray and Optical Imaging: *Chu Lun Alex Leung*[1]; Samy Hocine[1]; Andrew Farndell[2]; Rubén Lambert-Garcia[1]; Elena Ruckh[1]; Maureen Fitzpatrick[1]; Anna Getley[1]; Sebastian Marussi[1]; Marta Majkut[3]; Alexander Rack[3]; Nick Jones[2]; Peter Lee[1]; [1]University College London; [2]Renishaw plc.; [3]European Synchrotron Radiation Facility

2:30 PM
Studying SiOC Atomic Structures via Synchrotron X-ray and Reactive Force Field Potential Studies: *Kathy Lu*[1]; Harrison Chaney[1]; [1]Virginia Polytechnic Institute and State University

2:50 PM
Eu-doped $Ca_{4-x-y}(Sr,Ba)_xEu_yLaO(BO_3)_3$ Compounds for Efficient White-light Illumination: *Senam Tamakloe*[1]; Mahdi Amachraa[1]; Jakoah Brgoch[2]; Shyue Ping Ong[1]; Olivia Graeve[1]; [1]University of California San Diego; [2]University of Houston

3:10 PM
Composition Control and Analysis of Sub-stoichiometric Titanium Hydride Powders: *Daniel Bufford*[1]; Hua Wang[1]; [1]Sandia National Laboratories

3:30 PM Break

3:50 PM
Advanced Materials for Neutron Detection Applications: Design and Synthesis of Alkaline-earth Doped Hexaborides: *Alan Hirales*[1]; Victor Vasquez[2]; Olivia Graeve[1]; [1]University of California San Diego; [2]University of Nevada, Reno

4:10 PM
Characterising the Vapour Plume and Preferential Vaporisation of Alloy Elements during Laser Powder Bed Fusion Additive Manufacturing: *Anna Getley*[1]; Samy Hocine[1]; Elena Ruckh[1]; Rubén Lambert-Garcia[1]; Sebastian Marussi[1]; Peter Lee[1]; Mike Towrie[2]; Chu Lun Alex Leung[1]; [1]University College London; [2]Central Laser Facility, STFC

4:30 PM
Powder Quality and Cold Spray Processability Changes with Environmental Exposure: *Jack Grubbs*[1]; Bryer Sousa[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

4:50 PM
Discrete Element Method Based Simulations of Metal Powder Pouring and Raking Processes in Additive Manufacturing: *Michael Fazzino*[1]; Ummay Habiba[1]; Rainer Hebert[1]; Serge Nakhmanson[1]; [1]University of Connecticut

5:10 PM
Friction and Wear Performance of Spark Plasma Sintered Nanocrystalline Al-Mg Materials: *Amanendra Kushwaha*[1]; Manoranjan Misra[1]; Pradeep Menezes[1]; [1]University of Nevada, Reno

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Session V

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

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

Wednesday PM | March 22, 2023
Sapphire 411B | Hilton

Session Chairs: Huanyu Cheng, The Pennsylvania State University; Ben La Riviere, Oak Ridge National Laboratory

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2:00 PM Invited
Standalone Stretchable Device Platform for Human Health Monitoring: *Huanyu Cheng*[1]; [1]Pennsylvania State University

2:25 PM
3D Printable Silicone Elastomeric Pneumatic Actuators with Embedded Sensors: *Derrick Banerjee*[1]; John Burke[1]; Craig Joiner[1]; Akshay Kakar[1]; Han Mei[2]; Chih-Hung Chang[2]; James Neilan[3]; Jennifer Jones[4]; Curtis Hill[4]; Edward Sabolsky[1]; Konstantinos Sierros[1]; [1]West Virginia University; [2]Oregon State University; [3]NASA Langley Research Center; [4]NASA Marshall Space Flight Center, Jacobs Space Exploration Group (ESSCA)

2:45 PM
Detection of Corrosion Using an Additively Printed Microsensor for Bluetooth Use: *Holly Martin*[1]; Stephen Appiah[1]; Brendan Kuzior[1]; Vamsi Borra[1]; Frank Li[1]; Pedro Cortes[1]; [1]Youngstown State University

3:05 PM
Thermal, Hydrothermal, and Ultraviolet Aging of ePTFE/FR PU/Nomex® IIIA Moisture Barrier Used in Firefighters' Protective Clothing: *Laura Munevar-Ortiz*[1]; John Nychka[1]; Patricia Dolez[1]; [1]University of Alberta

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ADDITIVE TECHNOLOGIES

Quantifying Microstructure Heterogeneity for Qualification of Additively Manufactured Materials — Comparing Wrought & AM with a Focus on Ni Alloys

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

Program Organizers: Sharniece Holland, Washington University in St. Louis; Eric Payton, University of Cincinnati; Edwin Schwalbach, Air Force Research Labroatory; Joy Gockel, Colorado School of Mines; Ashley Paz y Puente, University of Cincinnati; Paul Wilson, The Boeing Company; Amit Verma, LLNL; Sriram Vijayan, Ohio State University; Jake Benzing, National Institute of Standards and Technology

Wednesday PM | March 22, 2023
24B | SDCC

Session Chairs: Joy Gockel , Colorado School of Mines; Sriram Vijayan, The Ohio State University

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2:00 PM Invited
NASA's Approach on the Evaluations of "Material Engineering Equivalence" Methodology in Achieving and Sustaining Efficient Qualification and Certification of AM Materials and Parts: *Alison Park*[1]; Richard Russell[1]; Samuel Cordner[1]; Mallory James[1]; Doug Wells[1]; Brian West[1]; Andrew Glendening[1]; [1]NASA

2:25 PM
Optimizing Creep Performance of Haynes 282 Printed via Laser Powder Bed Fusion through Microstructure Control: *Nicholas Lamprinakos*[1]; Junwon Seo[1]; Gregory Wong[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

2:45 PM
Strategizing with Hot Isostatic Pressing Treatments to Increase Productivity during Post-processing of Laser-melted Inconel 718 Parts: *Jake Benzing*[1]; Orion Kafka[1]; Nik Hrabe[1]; Don Godfrey[2]; Philipp Schumacher[2]; Chad Beamer[3]; Frank DelRio[4]; [1]National Institute of Standards and Technology; [2]SLM Solutions; [3]Quintus Technologies; [4]Sandia National Laboratories

3:05 PM
Build Geometry and Parameter Influence on Alloy 718 Microstructure, Properties and Spatial Variation in Additive Manufacturing: Anna Dunn[1]; Dan Young[1]; *Joy Gockel*[2]; [1]Wright State University; [2]Colorado School of Mines

3:25 PM Break

3:45 PM
Intentionally Seeding Pores in Laser Powder Bed Fusion IN718: Microstructure, Defects, and Fatigue: *Krzysztof Stopka*[1]; Andrew Desrosiers[2]; Tyler Nicodemus[2]; Nicholas Krutz[2]; Amber Andreaco[2]; Michael Sangid[1]; [1]Purdue University; [2]GE Additive

4:05 PM
Microstructural and Mechanical Validation of Thin-walled Additively Manufactured Inconel 625: *Connor Varney*[1]; Paul Rottmann[1]; [1]University of Kentucky

4:25 PM
Microstructure Evolution According to Heat Treatment Design of Alloy 625 Produced by Selective Laser Melting: *Tae-Hun Kim*[1]; Jung Min Han[2]; Hyun-Uk Hong[1]; [1]Changwon National University; [2]Doosan Enerbility

4:45 PM
Quantification of Microstructural Heterogeneities in Additively Manufactured and Heat-Treated Haynes 282: Avantika Gupta[1]; *Sriram Vijayan*[1]; Joerg Jinschek[2]; Carolin Fink[1]; [1]Ohio State University; [2]Technical University of Denmark

5:05 PM
Strong Impact of Minor Elements on the Microstructural Evolution of an Additively Manufactured Inconel 625 Alloy: *Mo-Rigen He*[1]; Arunima Banerjee[1]; Christopher Marvel[2]; Samuel Price[3]; Ian McCue[3]; William Musinski[4]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]Lehigh University; [3]Johns Hopkins University Applied Physics Laboratory; [4]U.S. Air Force Research Laboratory

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ADVANCED MATERIALS

Refractory Metals 2023 — Compositionally Complex Alloys - Ultimate Plus

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

Program Organizers: Brady Butler, US Army Research Laboratory; Todd Leonhardt, Rhenium Alloys Inc.; Matthew Osborne, Global Advanced Metals; Zachary Levin, Los Alamos National Laboratory

Wednesday PM | March 22, 2023
Aqua E | Hilton

Session Chair: Zach Levin, Los Alamos National Laboratory

2:00 PM Invited
Recent Developments in Refractory Complex Concentrated Alloys (RCCAs): *Todd Butler*[1]; Tinuade Daboiku[1]; Oleg Senkov[1]; Satish Rao[1]; Samuel Kuhr[1]; Daniel Miracle[1]; Christopher Woodward[1]; Eric Payton[1]; [1]Air Force Research Laboratory

2:30 PM
A Structural Signature for Ductility in Chemically Complex Alloys: *Prashant Singh*[1]; Raymundo Arroyave[2]; Duane D. Johnson[1]; [1]Ames Laboratory; [2]Texas A&M University

2:50 PM
Building Fundamentals for Data-Driven Discovery of Refractory High Entropy Alloys with Targeted Mechanical Properties via First-principles and Machine Learning: *Shun-Li Shang*[1]; Adam Krajewski[1]; Arindam Debnath[1]; Shuang Lin[1]; Wesley Reinhart[1]; Zi-Kui Liu[1]; [1]Pennsylvania State University

3:10 PM
CALPHAD Assessment of Mo-V-W-Nb-Ta High Entropy Alloys with CVM Based, Temperature Dependent Short Range Order Corrections. ULTIMATE: *Sayan Samanta*[1]; Axel van de Walle[1]; Siya Zhu[1]; Helena Liu[1]; Hantong Chen[1]; Chiraag Nataraj[1]; [1]Brown University

3:30 PM
A New Tungsten Alloy for Fusion Reactors: *Neal Parkes*[1]; Alexander Knowles[1]; Chris Hardie[1]; [1]University of Birmingham

3:50 PM Break

4:05 PM Invited
Rhenium Effect on the Microstructure and Mechanical Properties of NbTiZr and TaTiZr Equiatomic Alloys: *Oleg Senkov*[1]; Stephane Gorsse[2]; Robert Wheeler[1]; Eric Payton[1]; Daniel Miracle[1]; [1]Air Force Research Laboratory, Materials and Manufacturing Directorate; [2]CNRS, Univ. Bordeaux

4:35 PM
Impact of Ti and Al on Ordered B2 Formation in Potential High Temperature RCCAs: *Jaimie Tiley*[1]; Soumya Nag[1]; Sriswaroop Dasari[2]; Li Cheng[1]; Christopher Fancher[1]; Raymond Unocic[1]; Jason Gardener[1]; Fan Zhang[3]; Rajarshi Banerjee[2]; [1]Oak Ridge National Laboratory; [2]University of North Texas; [3]Computherm LLC

4:55 PM
Phase Identification in Mo-Si-B-Ti Alloys: *Qingshan Dong*[1]; Longfei Liu[2]; John Perepezko[2]; Laurence Marks[1]; [1]Northwestern University; [2]University of Wisconsin-Madison

5:15 PM
Selection, Processing and Characterization of Cr-containing Multiphase Refractory Complex Concentrated Alloys: *Nelson Delfino De Campos Neto*[1]; Benjamin Ellyson[1]; Todd Butler[2]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Air Force Research Laboratory

5:35 PM
Effects of Cr Content, Second Phase Formation and Sintering Temperature on Characteristics of WMoVTiCr Refractory High-entropy Alloys: *Chun-Liang Chen*[1]; [1]Dong-Hwa University

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NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Radiochemistry/Thermophysical Properties

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Wednesday PM | March 22, 2023
28A | SDCC

Session Chairs: Don Wood, INL; Rory Kennedy, INL

2:00 PM Invited
The Heavy Side of Radiochemistry: Revisiting Actinide Chemistry with Tailored Macromolecules: *Gauthier Deblonde*[1]; Christopher Colla[1]; Ian Colliard[2]; Joseph Cotruvo[3]; Annie Kersting[1]; Jon Lee[1]; Harris Mason[1]; Joseph Mattocks[3]; Keith Morrison[1]; May Nyman[2]; April Sawvel[1]; Paul Wooddy[1]; MAvrik Zavarin[1]; [1]Lawrence Livermore National Laboratory; [2]Oregon State University; [3]Penn State University

2:30 PM Invited
Actinide Radiation Chemistry and Used Nuclear Fuel Reprocessing: *Gregory Horne*[1]; [1]Center for Radiation Chemistry Research, Idaho National Laboratory

3:00 PM
Genetic Algorithm Approach to Interpreting Pu Radiation Damage in EXAFS Data: *Daniel Olive*[1]; Corwin Booth[2]; Ari Foley[1]; Meghan Gibbs[1]; Kasey Hanson[1]; Sarah Hickam[1]; Taylor Jacobs[1]; Jeremy Mitchell[1]; Alison Pugmire[1]; [1]Los Alamos National Laboratory; [2]Lawrence Berkeley National Laboratory

3:20 PM Break

3:40 PM Invited
Superconductivity and Magnetism in Complex Actinide-based Materials: *Eteri Svanidze*[1]; [1]MPI CPfS

4:10 PM Invited
Design and Implementation of the Experimental Setup of The Three-Omega Method for Thermal Conductivity Measurements of Molten Actinide Salts: *Maria del Rocio Rodriguez Laguna*[1]; [1]Idaho National Laboratory

4:40 PM
Dynamical System Scaling for Thermomechanical Properties of Uranium and Plutonium in Pulsed Reactor Experiments: *Ari Foley*[1]; Edward Lum[1]; Daniel Olive[1]; [1]Los Alamos National Laboratory

5:00 PM
A Young's Modulus Comparison Study in Alpha and Delta Plutonium: *Clarissa Yablinsky*[1]; Taylor Jacobs[1]; Meghan Gibbs[1]; Carlos Archuleta[1]; Christopher Cordova[1]; Tomas Martinez[1]; Todd Martinez[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

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MATERIALS DESIGN

Simulations/Experiments Integration for Next Generation Hypersonic Materials — Session II

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: High Temperature Alloys Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Thomas Voisin, Lawrence Livermore National Laboratory; Jibril Shittu, Lawerence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Joseph McKeown, Lawrence Livermore National Laboratory; Raymundo Arroyave, Texas A&M University

Wednesday PM | March 22, 2023
Sapphire I | Hilton

Session Chairs: Thomas Voisin, Lawrence Livermore National Laboratory; Jibril Shittu, Lawrence Livermore National Laboratory

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2:00 PM Invited
Composite Metal/Ceramic Coatings with Exceptional Thermal Shock Resistance: *Zachary Cordero*[1]; Isha Gupta[1]; [1]Massachusetts Institute of Technology

2:40 PM
Phase Transforming Metal-ceramic Multilayers for Ultrahigh Temperatures: John Carter Stotts[1]; Michael Large[2]; Gregory Thompson[2]; *Christopher Weinberger*[1]; [1]Colorado State University; [2]University of Alabama

3:00 PM Invited
On the Deformation Processes of BCC Refractory Complex Concentrated Alloys: *Jean-Philippe Couzinie*[1]; Clémence Tafani[1]; Frederic Mompiou[2]; Milan Hezcko[3]; Veronika Mazanova[3]; Oleg Senkov[4]; Rajarshi Banerjee[5]; Maryam Ghazisaeidi[3]; Michael Mills[3]; [1]Université Paris Est ICMPE; [2]CEMES; [3]Ohio State University; [4]Air Force Research Laboratory; [5]University of North Texas

3:40 PM Break

4:00 PM
Material Design by Additive Manufacturing of Multi-component Metal Alloys: *Wen Chen*[1]; [1]University of Massachusetts-Amherst

4:20 PM
Degradation Resistance of Refractory Multi-principal Element Alloys for Extreme Environments: *Jibril Shittu*[1]; Connor Rietema[1]; Michael Juhasz[1]; Zachary Sims[1]; Hunter Henderson[1]; Alexander Baker[1]; Kate Elder[1]; Joel Berry[1]; Aurélien Perron[1]; Brandon Bocklund[1]; Thomas Voisin[1]; Scott Mccall[1]; Joseph Mckeown[1]; [1]Lawerence Livermore National Laboratory

4:40 PM
Accelerating a Digital Twin of Direct Energy Deposition Additive Manufacturing: *Saad Khairallah*[1]; [1]Lawrence Livermore National Laboratory

NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Helium, Tritium and Hydrogen Effects III

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Wednesday PM | March 22, 2023
27B | SDCC

Session Chairs: Yan-Ru Lin, Oak Ridge National Lab; Mark Gilbert, UK Atomic Energy Authority

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2:00 PM Invited
Transmutation Effects in Fine Grained Tungsten: Gas Behavior and the Role of Grain Boundaries: *Jason Trelewicz*[1]; [1]Stony Brook University

2:40 PM
Interaction of Hydrogen/Helium with Grain Boundaries and Dislocations in Tungsten: *Nithin Mathew*[1]; Enrique Martinez[2]; Blas Uberuaga[1]; Danny Perez[1]; [1]Los Alamos National Laboratory; [2]Clemson University

3:00 PM
Helium Production in Irradiated Low-temperature Solder Candidates for Novel Fusion Magnet Cables: *Christopher Reis*[1]; [1]University of California, Berkeley

3:20 PM
Accurate Fe-He Machine Learning Potential for Studying Helium Effects in Ferritic Steels: *Krishna Pitike*[1]; Wahyu Setyawan[1]; [1]Pacific Northwest National Laboratory

3:40 PM Break

4:00 PM
Behavior of Helium Cavities in Ion-irradiated Ductile-Phase-Toughened Tungsten: *Weilin Jiang*[1]; Libor Kovarik[1]; Karen Kruska[1]; Dalong Zhang[1]; Dongsheng Li[1]; Tamas Varga[1]; Wahyu Setyawan[1]; [1]Pacific Northwest National Laboratory

4:20 PM
Machine-learned Interatomic Potential Development for H Trapping in ZrC Strengthened W: *Ember Sikorski*[1]; Mary Alice Cusentino[1]; Megan McCarthy[1]; Julien Tranchida[2]; Mitchell Wood[1]; Aidan Thompson[1]; [1]Sandia National Laboratories; [2]CEA Cadarache

4:40 PM
Effects of Carbide Dispersoids on Helium Bubble Formation in Dispersion-strengthened Tungsten: *Xing Wang*[1]; Ashrakat Saefan[1]; Eric Lang[2]; Jean Paul Allain[1]; [1]Pennsylvania State University; [2]University of Illinois at Urbana-Champaign

5:00 PM
In-situ Helium Bubble Formation and Thermal Evolution in Lithium Metatitanate: *Amy Gandy*[1]; Sam Waters[2]; Graeme Greaves[3]; Yiqiang Wang[2]; [1]University of Sheffield; [2]UK Atomic Energy Authority; [3]University of Huddersfield

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ADVANCED MATERIALS

2D Materials: Preparation, Properties, Modeling & Applications — Processing, Characterization, Modeling & Applications

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

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Laboratory; Sufian Abedrabbo, Khalifa University; Hesam Askari, University of Rochester; Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Joshua Young, New Jersey Institute Of Technology; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Karine Mougin, CNRS, IS2M; Heinz Palkowski, Clausthal University of Technology

Thursday AM | March 23, 2023
Aqua AB | Hilton

Session Chairs: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Sufian Abedrabbo, Khalifa University

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8:30 AM Introductory Comments

8:35 AM Invited
Multiscale 3D Printing of Nanomaterials-based Electronics: *Yong Lin Kong*[1]; [1]University of Utah

9:00 AM Invited
Well-defined 3D Printing of Titanium Carbide (Ti3C2Tx) MXene Nanosheets into Complex and Hierarchical Microarchitectures with High Aspect Ratio: *Rahul Panat*[1]; Bin Yuan[1]; Azahar Ali[1]; Chunshan Hu[1]; [1]Carnegie Mellon University

9:25 AM Invited
Nitrogen-doped Graphene Catalysts for Advanced Electrochemical Energy Conversion and Storage Systems: *Eon Soo Lee*[1]; Niladri Talukder[1]; [1]New Jersey Institute of Technology

9:50 AM Break

10:05 AM Invited
Process-structure-property Relationships in Crystalline Polymer Processing: *Michael Jaffe*[1]; [1]New Jersey Innovation Institute

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Innovative AM Techniques and Feedstock Materials

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

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas, Sandia National Laboratories; Iver Anderson, Iowa State University Ames Laboratory

Thursday AM | March 23, 2023
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Session Chair: Kyle Johnson, Sandia National Laboratories

8:30 AM
Design of Complex Active Microstrustrures by Melt Electrowriting Printing with Functional Fillers: *Paula Gonzalez*[1]; Ander Reizabal[1]; Simon Luposchainsky[1]; Senentxu Lanceros-Mendez[2]; Paul Dalton[1]; [1]Knight Campus; [2]BCMaterials

8:50 AM
Accelerating Additive Manufacturing Process Design for Energy Conversion Materials using In-situ Sensing and Machine Learning: *Joy Gockel*[1]; Tanvi Banerjee[2]; Saniya LeBlanc[3]; Joe Walker[4]; Vijayabarathi Ponnambalam[3]; Amanuel Alambo[2]; Clayton Perbix[1]; Ankita Agarwal[2]; John Middendorf[4]; [1]Colorado School of Mines; [2]Wright State University; [3]George Washington University; [4]Open Additive

9:10 AM
Characterisation of Gas Atomized Micro-alloyed Nickel Silicide Powders for Additive Manufacturing: *Ibrahim Mohammad*[1]; Geir Grasmo[1]; Ragnhild Aune[2]; [1]University of Agder; [2]Norwegian University of Science and Technology

9:30 AM
Engineered Platelets for Metals Additive Manufacturing: *Vasiliki Poenitzsch*[1]; Carl Popelar[1]; John Macha[1]; [1]Southwest Research Institute

9:50 AM
Embedding Hidden Information in Additively Manufactured Metals via Magnetic Property Grading for Traceability: Deniz Ebeperi[1]; *Daniel Salas Mula*[1]; Ibrahim Karaman[1]; Richard Malak[1]; Raymundo Arroyave[1]; [1]Texas A&M University

10:10 AM Break

10:25 AM
High-Throughput Functional Materials Development with Miniaturized AM Coupons and Novel Characterization Techniques: *Stefan Colton*[1]; Aaron Stebner[1]; Brad Boyce[2]; [1]Georgia Institute Of Technology; [2]Sandia National Laboratories

10:45 AM
Investigation Towards Adaptation of Wire-Powder Laser Directed Energy Deposition Process to Optimized Simulation: *Stephanie Lawson*[1]; Sriram Manoharan[1]; Somayeh Pasebani[1]; Brian Paul[1]; Ali Tabei[1]; [1]Oregon State University

11:05 AM
Manufacturing of Oxide Dispersed Nickel Base Alloy by Laser Powder Bed Fusion from Powders Elaborated by Different Processes: Cécile Blanc[1]; Olivier Hercher[1]; Jérôme Varlet[1]; Fernando Lomello[1]; Hicham Maskrot[1]; *Pascal Aubry*[1]; [1]CEA Paris-Saclay

11:25 AM
Spatially Resolving Structure-Behavior Relations in Laser Directed Energy Deposition Based Additive Manufactured Adaptive Materials: *Arnab Chatterjee*[1]; Reginald Hamilton[1]; [1]Penn State

11:45 AM
Ultrasonic Powder Atomisation for R&D - Inventors Perspective: *Lukasz Zrodowski*[1]; [1]Amazemet

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ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session VI

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; Steve Daniewicz, University of Alabama; Mohsen Seifi, ASTM International/Case Western Reserve University

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Session Chair: Nicholas Derimow, National Institute of Standards and Technology

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8:30 AM Invited
Elevated Temperature Testing of LPBF Ti6Al4V: James Dobbs[1]; *Cory Cunningham*[1]; [1]Boeing Company

9:00 AM
Unnotched Fatigue of Inconel 718 Produced by Laser Beam-Powder Bed Fusion at 25 and 600°C: *Jayaraj Radhakrishnan*[1]; Punit Kumar[2]; Shihao Li[1]; Yakai Zhao[1]; Upadrasta Ramamurty[1]; [1]Nanyang Technological University; [2]Lawrence Berkeley National Laboratory

9:20 AM
Fatigue Crack Growth of Laser Powder Bed Fusion Produced Alloy 718 at Room and Elevated Temperatures: *Jamie Kruzic*[1]; Halsey Ostergaard[1]; [1]University of New South Wales (UNSW Sydney)

9:40 AM
On the Fatigue Performance of Additively Manufactured Metamaterials: A Combined Experimental and Simulation Study: Daniel Barba[1]; Antonio Vazquez Prudencio[1]; *Conrado Garrido*[1]; Sergio Perosanz[1]; Massimiliano Casata[1]; Toby Wilkinson[1]; [1]Universidad Politécnica de Madrid

10:00 AM Break

10:20 AM Invited
Microstructure-Driven Differences in Fatigue Crack Growth Behavior of Laser Powder Bed Fused Low Alloy Steel Parts for Automotive Applications: *Whitney Poling*[1]; Jake Benzing[2]; Tyson Brown[1]; Nik Hrabe[2]; [1]General Motors, Global Research & Development; [2]National Institute of Standards and Technology

10:50 AM
Effects of Heat Treatment on Microstructure of Nickel Silicide Beads Additively Manufactured Using Direct Energy Deposition Technique: *Ibrahim Mohammad*[1]; Geir Grasmo[1]; Ragnhild Aune[2]; [1]University of Agder; [2]Norwegian University of Science and Technology

11:10 AM
Micromechanical and Microstructural Characterization of Filigree Additively Manufactured NiTi Structures: *Thomas Straub*[1]; Mario Schleyer[1]; Bernhard Mueller[2]; Sarah Fischer[3]; [1]Fraunhofer Institute for Mechanics of Materials (IWM); [2]Fraunhofer Institute for Machine Tools and Forming Technology (IWU); [3]Fraunhofer Institute for Nondestructive Testing (IZFP)

11:30 AM
Tensile Properties and Fracture-related Findings of Two NIST AM Benchmark 2022 Challenges: Continuum and Sub-continuum Scales: *Orion Kafka*[1]; Nikolas Hrabe[1]; Jake Benzing[1]; Newell Moser[1]; Nicholas Derimow[1]; Li-Anne Liew[1]; Jordan Weaver[1]; Timothy Quinn[1]; Ross Rentz[1]; [1]National Institute of Standards and Technology

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ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications V — Processes and Optimization I

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

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

Thursday AM | March 23, 2023
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Session Chair: Xiaoyuan Lou, Purdue University

8:30 AM Introductory Comments

8:35 AM Invited
Compositionally Graded Alloys Fabricated by Laser Powder Bed Fusion: Siyuan Wei[1]; Pei Wang[2]; Baicheng Zhang[3]; *Ramamurty Upadrasta*[1]; [1]Nanyang Technological University; [2]Institute for Materials Research; [3]USTB

9:10 AM
DED Additively Manufactured HEAs Optimized via Parametric Study of Functionally Graded Materials: *Calvin Downey*[1]; Luis Nuñez[1]; Jakub Toman[1]; Mohammad Abdo[1]; Isabella van Rooyen[2]; [1]Idaho National Laboratory; [2]Pacific Northwest National Laboratory

9:30 AM
Production of ZrB2 Doped Inconel 718 Composite via Laser Powder Bed Fusion Method: *Emre Tekoglu*[1]; Alexander O'Brien[1]; Jian Liu[2]; Wen Chen[2]; John Hart[1]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]University of Massachusetts Amherst

9:50 AM
Optimization of Laser-wire Direct Energy Deposition (LW-DED) of Superalloy Haynes 282: Rui Feng[1]; Kristin Tippey[1]; *Chantal Sudbrack*[1]; [1]National Energy Technology Laboratory

10:10 AM Break

10:25 AM
CALPHAD-based Design of Graded Transition Joints: *Peeyush Nandwana*[1]; Rangasayee Kannan[1]; Thomas Feldhausen[1]; Kyle Saleeby[1]; Yousub Lee[1]; Andres Rossy[1]; Christopher Fancher[1]; Brian Jordan[1]; [1]Oak Ridge National Laboratory

10:45 AM
Combining Additive Manufacturing Processes to Produce Functionally Graded Metallic Materials for Energy Applications: *Chris Bettencourt*[1]; Hailei Wang[1]; Nadia Kouraytem[1]; [1]Engineering Utah State

11:05 AM
Additive Manufacturing of Inconel 718 + SiC with Enhanced Tensile Strength and Uniform Ductility: *Alexander O'Brien*[1]; Emre Tekoglu[1]; Anastasios Hart[1]; Wen Chen[2]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]University of Massachusetts Amherst

11:25 AM
Nanoparticle-based Additive Manufacturing of Soft Magnetic Composites: *Mingqi Shuai*[1]; Luis Delfin[1]; Maryam Kazembeyki[1]; Melody Wang[1]; Wendy Gu[1]; [1]Stanford University Mechanical Engineering Labs (Gu Group)

11:45 AM
Sintering Process Optimization for FeCrAl Alloys in Metal Extrusion Additive Manufacturing: *Amrita Lall*[1]; Saumyadeep Jana[1]; Zachary Kennedy[1]; Michelle Fenn[1]; [1]Pacific Northwest National Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Novel Applications I/Computation and Numerical Approaches

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

Program Organizers: Sougata Roy, University of North Dakota; Sneha Prabha Narra, Carnegie Mellon University; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh; Yashwanth Bandari, AddiTec Technologies LLC

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Session Chair: Yousub Lee, Oak Ridge National Laboratory

8:30 AM
Rapid Qualification of Wire Feed Direct Energy Deposition Process Builds Using ICME Approach: *Amit Verma*[1]; Andrew Huck[2]; Rajib Halder[2]; Anthony Rollet[2]; [1]Carnegie Mellon University; LLNL; [2]Carnegie Mellon University

8:50 AM
Process-Property Determination of Hot-Wire Laser DED Stainless Steel 316L Using Two Print Directions: *Holly Martin*[1]; Brandon Koenig[1]; Bharat Yelamanchi[1]; Andrew Prokop[1]; Brian Vuksanovich[1]; John Carballo[1]; Jackie Ruller[1]; Pedro Cortes[1]; [1]Youngstown State University

9:10 AM
Dehydrogenation Model for Hydrogen-based Heat Treatments of Large Additively Manufactured Components: *James Paramore*[1]; Michael Hurst[1]; Matthew Dunstan[1]; Daniel Lewis[2]; Brady Butler[1]; [1]DEVCOM Army Research Laboratory; [2]Texas A&M University

9:30 AM
Mitigating Large Distortion in Wire Arc Additive Manufacturing via Topology Optimization and Modified Inherent Strain Modeling: Wen Dong[1]; Xavier Jimenez[1]; *Albert To*[1]; [1]University of Pittsburgh

9:50 AM Break

10:10 AM
Analysis of Bead Geometry and Solidification Behavior during Laser-Wire Directed Energy Deposition: *Mohsen Eshraghi*[1]; Matthew Engquist[1]; Amir Shakibi[1]; [1]California State University-Los Angeles

10:30 AM
Steel-copper Functionally Graded Material Produced by Twin-wire and Arc Additive Manufacturing (T-WAAM): *Joao Oliveira*[1]; [1]FCT-UNL

10:50 AM
Structure-property-processing Relationship of 3D Printed Metals via Hot Wire Direct Energy Deposition: *Bharat Yelamanchi*[1]; Andrew Prokop[1]; Brian Vuksanovich[1]; John Carballo[1]; Jackie Ruller[1]; Brandon Koenig[1]; Holly Martin[1]; Pedro Cortes[1]; [1]Youngstown State University

11:10 AM
Wire Arc Additive Manufacturing (WAAM) of Nano-Treated High Strength Aluminum Alloys: *Yitian Chi*[1]; Shuaihang Pan[1]; Maximillian Liese[1]; Narayanan Murali[1]; Jingke Liu[1]; Xiaochun Li[1]; [1]University of California Los Angeles

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Solidification of Advanced Materials II

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

Thursday AM | March 23, 2023

Session Chairs: Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

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8:30 AM
Improving Ductility of 316L Stainless Steel by Inducing Melt Pool Instability in Directed Energy Deposition: *Lin Gao*[1]; Wenhao Lin[1]; Zhongshu Ren[1]; Ma Ji[1]; Tao Sun[1]; [1]University of Virginia

8:50 AM
Interface Characteristics of a 2205 Duplex Stainless Steel Processed by Laser Powder Bed Fusion Additive Manufacturing: *Nima Haghdadi*[1]; Hansheng Chen[2]; Zibin Chen[3]; Sudarsanam Babu[4]; Xiaozhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; [1]UNSW Sydney; [2]University of Sydney; [3]The Hong Kong Polytechnic University; [4]University of Tennessee, Knoxville

9:10 AM
Microstructural Control of a Multi-Phase PH Steel Printed with Laser Powder Bed Fusion.: *Brandon Fields*[1]; Diran Apelian[1]; Lorenzo Valdevit[1]; [1]University of California Irvine

9:30 AM
Origin of Epitaxy Loss in Laser Powder Bed Fusion: *Prosenjit Biswas*[1]; Ji Ma[1]; [1]University of Virginia

9:50 AM
Phase Transformation Pathways and Solute Behaviour at Boundaries in Ti-6Al-4V Manufactured via Electron Beam Powder Bed Fusion: William Davids[1]; *Andrew Breen*[1]; Simon Ringer[1]; [1]The University of Sydney

10:10 AM Break

10:25 AM
Process-Structure-Property Relationship in Selective Laser Melting of 18Ni-300 Maraging Steel: *Tianyi Lyu*[1]; Sagar Patel[2]; Yu Zou[1]; [1]University of Toronto; [2]University of Waterloo

10:45 AM
Phase Selection of Intermetallic Compounds for an Al-10Ce-8Mn (wt.%) Alloy: *Kevin Sisco*[1]; Suresh Babu[1]; Alex Plotkowski[2]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

11:05 AM
Solidification-Microstructure Relationship Study of Single-track Laser Scanned Mg-RE Alloys: *Wan Ye*[1]; Aijun Huang[1]; Yuman Zhu[1]; Robert Wilson[2]; Kun Yang[2]; [1]Monash University; [2]The Commonwealth Scientific and Industrial Research Organisation

11:25 AM
Alleviate Hot Cracking for Nickel-based Superalloys in Additive Manufacturing: *Zhongji Sun*[1]; Yan Ma[2]; Dirk Ponge[2]; Stefan Zaefferer[2]; Eric Jägle[3]; Baptiste Gault[4]; Anthony Rollett[5]; Dierk Raabe[2]; [1]Max-Planck-Institut für Eisenforschung GmbH, Institute of Materials Research and Engineering, A*STAR, Singapore; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Universität der Bundeswehr München; [4]Max-Planck-Institut für Eisenforschung GmbH, Imperial College London; [5]Carnegie Mellon University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of Nb-based Alloys and Re

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

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Omar Mireles, NASA; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Matthew Osborne, Global Advanced Metals; Joao Oliveira, FCT-UNL

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Session Chairs: Faramarz Zarandi, Raytheon Technologies; Eric A. Lass, University of Tennessee-Knoxville

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8:30 AM Invited
Design of Silicide Strengthened Nb Alloys for Additive Manufacturing: *Alice Perrin*[1]; Ying Yang[1]; Ryan DeHoff[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

9:00 AM
Additive Manufacturing of Refractory Coatings for Ultra-high Temperature Applications: A Study on the Effect of Substate Dilution: Ashlee Gabourel[1]; Poulomi Mukherjee[1]; Nicholas Ury[2]; Samad Firdosy[2]; Douglas Hofman[2]; *Atieh Moridi*[1]; [1]Cornell University; [2]NASA Jet Propulsion Lab, California Institute of Technology

9:20 AM
Direct Energy Deposition of Nb-containing Refractory Alloys: Solidification Behavior, Microstructural Evolution, and Mechanical Properties: *Saket Thapliyal*[1]; Julio Rojas[1]; Patxi Fernandez-Zelaia[1]; Christopher Ledford[1]; Andres Rossy[1]; Michael Kirka[1]; Paul Brackman[1]; Michael Gao[2]; David Alman[2]; [1]Oak Ridge National Laboratory; [2]National Energy Technology Laboratory

9:40 AM
Laser Powder Bed Fusion Process Development for Re: *Joseph Sims*[1]; Stephen Cooke[1]; Ryan Anderson[1]; Melissa Forton[1]; Madelyne Rushing[1]; [1]Quadrus Advanced Manufacturing

10:00 AM Break

10:20 AM
Laser Powder Bed Fusion of Niobium and Exploration of Gradient Composites by Local Addition of Nanoparticles: *Emre Tekoglu*[1]; Alexander O'Brien[1]; Zachery Kutschke[1]; Bethany Lettiere[1]; John Hart[1]; Ju Li[1]; [1]Massachusetts Institute of Technology

10:40 AM
Melt Pool Geometry and Defect Susceptibility in Laser Powder Bed Fusion of Single Phase Refractory Alloys: *Kaitlyn Mullin*[1]; Carolina Frey[1]; James Lamb[1]; Chris Torbet[1]; McLean Echlin[1]; Tresa Pollock[1]; [1]University of California Santa Barbara

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Properties and Failure

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

Nanomechanical Materials Behavior Committee

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

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Session Chairs: Kavan Hazeli, The University of Arizona; Mohsen Taheri Andani, University of Michigan

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8:30 AM
On the Melt Pool Dynamic of Metal Matrix Composites via Hybrid Additive Manufacturing: Laser Powder Bed Fusion and Ink-Jetting: Milad Ghayoor[1]; Omid Sadeghi[1]; Bryce Cox[1]; Joshua Gess[1]; *Somayeh Pasebani*[1]; [1]Oregon State University

8:50 AM
Dynamic Strength Performance of Additively Repaired Small-damage Sites in Stainless Steel: *Jesse Callanan*[1]; David Jones[1]; Saryu Fensin[1]; Daniel Martinez[1]; [1]Los Alamos National Laboratory

9:10 AM
Investigation of The Effects of Size, Geometry, and Temperature in Additively Manufactured Titanium Alloy: *Daniel June*[1]; Andrew Wessman[1]; Kavan Hazeli[1]; [1]The University of Arizona

9:30 AM
Microstructure and Property Variations in Directed Energy Deposited 316L on Super-Austenitic AL6XN: *Anna Rawlings*[1]; Andrew Birnbaum[1]; John Steuben[1]; John Michopoulos[1]; [1]U.S. Naval Research Laboratory

9:50 AM Break

10:10 AM
High Temperature Laser Powder-bed Fusion Austenitic Steels with Outstanding Creep Strength: *Sebastien Dryepondt*[1]; Kinga Unocic[1]; Rangasayee Kannan[1]; Peeyush Nandwana[1]; Patxi Fernandez-Zelaia[1]; Michael Lance[1]; Lisa Debeer-Schmitt[1]; Ken Littrell[1]; [1]Oak Ridge National Laboratory

10:30 AM
High Throughput Bending Creep Testing of a New High Strength Additively ManufacturedA205Alloy:Anup Kulkarni[1];Praveen Ravanappa[1];Dheepa Srinivasan[1]; Callie Benson[2]; Vikram Jayaram[3]; *Praveen Kumar*[3]; [1]Pratt and Whitney Research and Development Center; [2]Collins Aerospace; [3]Indian Institute of Science Bangalore

10:50 AM
Uniaxial Equivalence of Bending Creep in Additively Manufactured AlSi10Mg Alloy: Shobhit Singh[1]; Faizan Hijazi[2]; Vikram Jayaram[3]; Dheepa Srinivasan[4]; *Praveen Kumar*[3]; [1]Indian Institute of Science, Bangalore; The University of Manchester; [2]Indian Institute of Science Bangalore; [3]Indian Institute of Science, Bangalore; [4]Pratt and Whitney Research and Development Center

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — 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 Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

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Session Chair: Behrang Poorganji, Morf3D

8:30 AM
Design and Development of New Metastable Titanium Alloys for Use in Laser Powder Bed Fusion: Zou Zhiyi[1]; *Marco Simonelli*[1]; Adam Clare[1]; Nesma Aboulkhair[1]; Richard Hague[1]; [1]University of Nottingham

8:50 AM
Additively Manufactured -Ti5553 with Laser Powder Bed Fusion: Microstructures and Mechanical Properties of Bulk and Lattice Parts: *Margaret Wu*[1]; Marissa Linne[1]; Thomas Voisin[1]; Nathan Barton[1]; Jianchao Ye[1]; Kavan Hazeli[2]; Y. Morris Wang[3]; [1]LLNL; [2]University of Alabama Huntsville; [3]UCLA

9:10 AM
Fine-tuning Hierarchy: Targeted In-situ Annealing of Additively Manufactured Titanium Lattices: *Connor Rietema*[1]; John Roehling[1]; William Smith[1]; Gabe Guss[1]; Kaila Bertsch[1]; [1]Lawrence Livermore National Laboratory

9:30 AM
Directed-energy Deposition of Ti-6Al-4V Alloy Using Fresh and Recycled Feedstock Powders under Reactive Atmosphere: *Kun Yang*[1]; Geoff de Looze[1]; Vu Nguyen[2]; Robert Wilson[1]; [1]Advanced Materials and Processing, CSIRO Manufacturing; [2]Materials Characterization and Modelling, CSIRO Manufacturing

9:50 AM
In-situ Design of Compositionally Modulated Ti-alloys for Novel Microstructures and Unprecedented Properties by Additive Manufacturing: Tianlong Zhang[1]; Chain-Tsuan Liu[1]; *Yunzhi Wang*[2]; [1]City University of Hong Kong; [2]Ohio State University

10:10 AM Break

10:25 AM
Selective Phase Transformation Behavior in the Heterogeneous Microstructured Ti-Zr-Nb-Sn Alloy Manufactured by Directed Energy Deposition: *Jung Gi Kim*[1]; Yukyeong Lee[1]; Shuanglei Li[1]; Eun Seong Kim[2]; Dong Jun Lee[3]; Jae Bok Seol[1]; Hyokyung Sung[1]; Hyoung Seop Kim[2]; Taekyung Lee[4]; Jung Seok Oh[1]; Tae-Hyun Nam[1]; [1]Gyeongsang National University; [2]Pohang University of Science and Technology; [3]Korea Institute of Materials Science; [4]Pusan National University

10:45 AM
Effect of Stress Relief Temperature on Microstructure and Mechanical Behavior of Additively Manufactured Ti-5Al-5Mo-5V-1Cr-1Fe: *Mohammad Salman Yasin*[1]; Shuai Shao[1]; Nima Shamsaei[1]; [1]Auburn University

11:05 AM
Microstructural Engineering of Metastable Ti-Al-V-Fe Alloy via In Situ Alloying during Laser Powder Bed Fusion: *Ming Chen*[1]; Steven Van Petegem[1]; Zhiyi Zou[2]; Marco Simonelli[2]; Yau Yau Tse[3]; Helena Moens-Van Swygenhoven[1]; [1]Paul Scherrer Institute; [2]University of Nottingham; [3]Loughborough University

11:25 AM
Suppressing Large Columnar Grain Structures in Ti Alloys Processed with Laser Wire Directed Energy Deposition: *Alexander Hansen*[1]; Emma Vetland[2]; John Potter[2]; Chad Henry[2]; Jonah Klemm-Toole[1]; Zhenzhen Yu[1]; [1]Colorado School of Mines; [2]GKN Aerospace

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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 Jackson, Sandia National Laboratories

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Session Chairs: Robert Wagoner, Ohio State University; Rui Feng, National Energy Technology Laboratory

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8:30 AM Invited
SuperiorHigh-temperatureStrengthinaSupersaturatedRefractoryHigh-entropy Alloy: *Rui Feng*[1]; Bojun Feng[2]; Michael Gao[3]; Chuan Zhang[4]; Joerg Neuefeind[1]; Jonathan Poplawsky[1]; Yang Ren[5]; Ke An[1]; Michael Widom[2]; Peter Liaw[6]; [1]Oak Ridge National Laboratory; [2]Carnegie Mellon University; [3]National Energy Technology Laboratory; [4]CompuTherm LLC; [5]Argonne National Laboratory; [6]The University of Tennessee, Knoxville

9:00 AM
Plasticity of Fused Silica Studied by High-temperature Micropillar Compression and Ptychographic X-ray Computed Tomography: Remo Widmer[1]; Alexander Groetsch[2]; Guillaume Kermouche[3]; Ana Diaz[4]; Manish Jain[2]; Rajaprakash Ramachandramoorthy[5]; Laszlo Pethö[2]; Jakob Schwiedrzik[2]; Johann Michler[2]; *Nicholas Randall*[1]; [1]Alemnis AG; [2]Empa; [3]Mines Saint-Etienne; [4]Paul Scherrer Institute; [5]MPIE

9:20 AM
Amorphization of Covalently-Bonded Solids by Laser Shock Compression: A Generalized Deformation Mechanism under Extreme Conditions: *Boya Li*[1]; Alex Li[1]; Shiteng Zhao[2]; Marc Meyers[1]; [1]University Of California San Diego; [2]Beihang University

9:40 AM Invited
How Do Metals Remember Their History?: *Robert Wagoner*[1]; Stephen Niezgoda[1]; David Fullwood[2]; Guowei Zhou[3]; Ehsan Taghipour[1]; [1]Ohio State University; [2]Brigham Young University; [3]Shanghai Jiao Tong University

10:10 AM Break

10:30 AM
Grain Boundary Deformation and Damage: *Veronica Anghel*[1]; Ramon Martinez[1]; James Valdez[1]; [1]Los Alamos National Laboratory

10:50 AM
Special In-situ Diffraction Evaluations in Response to High-temperature Plastic Deformation: *Klaus-Dieter Liss*[1]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT)

11:10 AM
Analyzing Mesoscale Stress Localization and Slip System Activation under Axial-Torsional Loading: *Jerard Gordon*[1]; [1]University of Michigan

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ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session — Advanced Functional and Structural Thin Films and Coatings

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

Program Organizers: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology

Thursday AM | March 23, 2023
Aqua F | Hilton

Session Chairs: Ravindra Nuggehalli, New Jersey Institute of Technology; Karine Mougin, CNRS, IS2M; Gerald Ferblantier, University of Strasbourg, ICube Laboratory, CNRS

8:30 AM Introductory Comments

8:35 AM
Recent Advances in Solid-State Neutron Detectors: *Walter Rose*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

8:55 AM Invited
Oxidation-induced Cracking in Dissimilar Metal Weld Joins for Steam Boiler Applications: *Marissa Brennan*[1]; Voramon Dheeradhada[1]; Shenyan Huang[1]; Patrick Brennan[1]; Enes Sales[1]; Marija Drobjnak[1]; [1]GE Research

9:25 AM
Study of Crystallization of Amorphous Metals through Molecular Dynamics Simulations: *Prashant Dwivedi*[1]; Alberto Fraile[2]; Tomáš Polcar[1]; [1]Czech Technical University in Prague; [2]Bangor University

9:45 AM
Effect of (2-D) Machining-based Severe Plastic Deformation on Microstructure and Mechanical Properties of Titanium Alloys: *Pushpinder Kumar*[1]; Ravinder Joshi[1]; Rohit Singla[1]; [1]Thapar Institute of Engineering and Technology Patiala India

10:05 AM Break

10:25 AM
Efficient Silicon Room-Temperature Bandgap Emission Related To Correlated Electron-Hole Recombination: *Sufian Abedrabbo*[1]; Elmostafa Benchafia[1]; Ali Abdullah[1]; Anthony Fiory[2]; Nuggehalli Ravindra[3]; [1]Khalifa University; [2]Integron Solutions LLC.; [3]New Jersey Institute of Technology

10:45 AM
Trigger Shape Recovery in a Polyurethane with Methanol, Ethanol and 1-propanol: Molecular Mobility, Solubility and Switching Temperatures: *Yucen Shen*[1]; Hakan Dumlu[1]; Klaus Neuking[1]; Gunther Eggeler[1]; [1]Ruhr University Bochum

11:05 AM
Nanosized Cadmium Selenide Thin Coatings for Possible Utilization in Optoelectronics: *Ikhazuagbe Ifijen*[1]; Bala Anegbe[2]; [1]Rubber Research Institute of Nigeria; [2]Federal University, Oye-Ekiti, Nigeria

11:25 AM Concluding Comments

ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Energy Storage with Battery III

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

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

Thursday AM | March 23, 2023
32B | SDCC

Session Chairs: Marm Dixit, Oak Ridge National Laboratory; Leon Shaw, Illinois Institute of Technology

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8:30 AM Invited
Opportunities and Challenges for In Situ Synchrotron Characterization of All Solid State Batteries: *Marm Dixit*[1]; [1]Oak Ridge National Laboratory

8:55 AM
On the Specific Capacity and Cycle Stability of Si Anodes: Effects of Charge/Discharge Protocol: Bingyu Lui[1]; Mei Luo[1]; Ziyong Wang[1]; Christopher Passolano[1]; *Leon Shaw*[1]; [1]Illinois Institute of Technology

9:15 AM Invited
Operando Degradation Analytics Using 3ε Toolbox: *Sobana Perumaram Rangarajan*[1]; [1]General Motors

9:40 AM Invited
Physics-based Understanding of Heterogeneous Nucleation during Lithium Electrodeposition: *Aashutosh Mistry*[1]; Venkat Srinivasan[1]; [1]Argonne National Laboratory

10:05 AM Break

10:25 AM
Rate, Size, and Temperature Effects in Alkali Metal Anodes: *Matt Pharr*[1]; [1]Texas A&M University

10:45 AM Invited
Ultra-Thick Electrodes for High Energy and Power Density Lithium-ion Batteries: *Jonghyun Park*[1]; Tazdik Plateau[1]; Hiep Pham[1]; [1]Missouri University of Science and Technology

11:10 AM Invited
Understanding Improved Alkali Metal Plating of Sodium Compared to Lithium via 2DIR characterization and MD Simulation of Weaker Solvation Behavior for High Energy Battery Systems: *Rachel Carter*[1]; Cynthia Pyles[1]; Michael Swift[1]; Matthew Lefler[1]; Susmita Sarkar[2]; Adam Dunkelberger[1]; Partha Mukherjee[2]; [1]US Naval Research Laboratory; [2]Purdue Universtiy

11:35 AM Keynote
Designing Electrode Architectures Across Length Scales: *Sarbajit Banerjee*[1]; [1]Texas A&M University

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CHARACTERIZATION

Advanced Real Time Imaging — Iron & Steelmaking

Sponsored by: TMS Functional Materials Division, 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 Engergy 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, Sourthern 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

Thursday AM | March 23, 2023
Aqua 310A | Hilton

Session Chair: Noritaka Saito, Kyushu University

8:30 AM Invited
In-situ Visualization of Retrograde Melting Phenomenon During Solidification of Boron-bearing Steels: *Hongbin Yin*[1]; [1]ArcelorMittal Global R&D

8:50 AM
Combination of Confocal Laser Scanning Microscopy and Machine Learning Model for the Prediction of Oxide Dissolution in the Steelmaking Slag: Chunguang Shen[1]; Changji Xuan[2]; *Wangzhong Mu*[1]; [1]KTH Royal Institute of Technology; [2]Sandvik Manufacturing Solutions AB

9:10 AM
Does Confocal Laser Scanning Microscopy Have the Suitable Capability to Use in Physical Metallurgy?: *Wangzhong Mu*[1]; [1]KTH Royal Institute of Technology

9:30 AM Invited
Microstructure Evolution of TRIP-assisted Lean Duplex Stainless Steel UNS S32101 during In-situ Tensile: *Jingyuan Li*[1]; Xinghai Zhang[1]; Wangzhong Mu[2]; [1]University of Science and Technology Beijing; [2]KTH Royal Institute of Technology

9:50 AM Break

10:10 AM
Visualization of Molten Slag Suspension by Electrical Impedance Tomography: Hayato Segawa[1]; Miku Arisato[2]; Kento Nakanishi[2]; Prima Sejati[1]; Yosephus Prayitno[1]; Kunihiko Nakashima[2]; *Noritaka Saito*[2]; Masahiro Takei[1]; [1]Chiba University; [2]Kyushu University

10:30 AM
High-Temperature Wetting of Calcium Alloys and Molten Salts: *Athan Sanders*[1]; Bitong Wang[1]; Douglas Kelley[1]; [1]University of Rochester

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Structures and Mechanical Properties II

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Thursday AM | March 23, 2023
Aqua D | Hilton

Session Chairs: Thomas Bieler, Michigan State University; E-Wen Huang, National Yang Ming Chiao Tung University

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8:30 AM Invited
Investigation of Cobalt Free Multi-Principal Element Alloy Candidates for Reducing Material System Criticality: *Zachary Sims*[1]; Aurelien Perron[1]; Alfred Amon[1]; Hunter Henderson[1]; Brandon Bocklund[1]; [1]Lawrence Livermore National Laboratory

8:50 AM Invited
Correlations between Nanoindentation Hardness and Composition Gradients in TaNbTiV Refractory High Entropy Alloy: *Thomas Bieler*[1]; Zackery Thune[1]; Chanho Lee[2]; Peter Liaw[2]; Eugenia Nieto[3]; Ignacio Escobar[3]; Miguel Monclus[3]; Jon Molina-Aldareguia[3]; [1]Michigan State University; [2]University of Tennessee; [3]IMDEA Materiales

9:10 AM
Tuning Shape Memory Phase Transformation of High-Entropy Alloys by Chemical Compositions: *Yuh Sun*[1]; Jo-Chi Tseng[2]; Mao-Yuan Luo[1]; Che-Wei Tsai[3]; Ching-Yu Chiang[4]; Nien-En Jiang[1]; E-Wen Huang[1]; [1]National Yang Ming Chiao Tung University; [2]Japan Synchrotron Radiation Research Institute; [3]National Tsing Hua University; [4]National Synchrotron Radiation Research Center

9:30 AM Invited
Mechanical Properties and their Evolution in High Entropy Alloys in the High Strain Rate Regime: *Marc Meyers*[1]; Zezhou Li[1]; Aomin Huang[1]; Sheron Tavares[1]; Shiteng Zhao[2]; [1]University of California-San Diego; [2]UC Berkeley

9:50 AM
Phase Stability in the Ternary CoCrNi Alloy: *Sakshi Bajpai*[1]; Calvin Belcher[1]; Benjamin MacDonald[1]; Julia Ivanisenko[2]; Horst Hahn[2]; Diran Apelian[1]; Enrique Lavernia[1]; [1]University of California, Irvine; [2]Karlsruhe Institute of Technology, Germany

10:10 AM Break

10:30 AM
High-Throughput Study of Ion Irradiation and Oxidation Responses in Multi-Principal Element Alloys: *Nathan Curtis*[1]; Benoit Queylat[1]; Michael Moorehead[2]; Daniel Murray[2]; Phalgun Nelaturu[1]; Kim Kriewaldt[1]; Bao-Phong Nguyen[1]; Ryan Jacobs[1]; Mukesh Bachhav[2]; Dan Thoma[1]; Dane Morgan[1]; Adrien Couet[1]; [1]University of Wisconsin - Madison; [2]Idaho National Laboratory

10:50 AM Invited
Uniform Plastic Deformation and Underlying Defect Activities of High-Entropy Alloys and Intermetallic Compounds: Shou-Yi Chang[1]; Chi-Huan Tung[1]; *Ya-Jing Lee*[1]; [1]National Tsing Hua University

11:10 AM
Low-cycle-fatigue Effects on Lattice Distortion of CoCrFeMnNi High-entropy-alloy: *Mao-Yuan Luo*[1]; Jo-Chi Tseng[2]; Tu-Ngoc Lam[1]; E-Wen Huang[1]; [1]National Yang Ming Chiao Tung University; [2]Japan Synchrotron Radiation Research Institute

11:30 AM
Design of High Modulus-low Density AlTiVCr-based Alloys to Enhance Ductility: *Paul Stavroulakis*[1]; Colin Freeman[1]; Dhinisa Patel[1]; Claire Utton[1]; Russell Goodall[1]; [1]The University of Sheffield

11:50 AM Invited
Crystal Plastic Modeling of NbTaTiV Refractory High-entropy Alloy at Room Temperature: Chuhao Liu[1]; Chanho Lee[2]; Xiaochuan Sun[1]; Xiaodan Zhang[1]; Shengyi Zhong[1]; Ke An[3]; Peter Liaw[4]; *Huamiao Wang*[1]; [1]Shanghai Jiao Tong University; [2]Los Alamos National Laboratory; [3]Oak Ridge National Laboratory; [4]University of Tennessee

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MATERIALS PROCESSING

Advances in Powder and Ceramic Materials Science — High Entropy Ceramics III

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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

Thursday AM | March 23, 2023
30A | SDCC

Session Chair: Alexander Dupuy , University of California Irvine

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8:30 AM Introductory Comments

8:35 AM Invited
Interplay Between Structure, Charge, and Spin in Entropy-Stabilized Oxides for Widely Tunable Responses: *John Heron*[1]; [1]University of Michigan

8:55 AM
Rare-earth Doped Polycrystalline Alumina for High-energy Laser Applications: *Ross Turner*[1]; Xingzhong Wu[1]; Yasuhiro Kodera[1]; Javier Garay[1]; [1]UC San Diego

9:15 AM
The Role of Aliovalent Dopants in Multiphase Entropy Stabilized Oxides: *Jacob Norman*[1]; Alexander Dupuy[1]; Julie Schoenung[1]; [1]UCI

9:35 AM
Toughening Mechanisms of Nano-oxide Dispersion Strengthening (NDS) on CoCuNiFeMn High Entropy Alloys with Nano-twin Fabricated via Powder Metallurgy: *Hansung Lee*[1]; Ashutosh Sharma[1]; Byungmin Ahn[1]; [1]Ajou University

9:55 AM Break

10:15 AM
Tunable Self-assembled Metal and Metal-oxide Nanostructures Embedded in Complex Concentrated Oxide Thin Films: *William Bowman*[1]; Xin Wang[1]; Huiming Guo[1]; [1]University of California, Irvine

10:35 AM
Tunable Grain Boundary Conductivity in Sodium Doped High Entropy Oxides: *Justin Cortez*[1]; Alexander Dupuy[1]; Hasti Vahidi[1]; Yiheng Xiao[1]; William Bowman[1]; Julie Schoenung[1]; [1]University of California Irvine

10:55 AM
Compositionally Complex Perovskite for Solar Thermochemical Water Splitting: *Dawei Zhang*[1]; Héctor Santiago[2]; Boyuan Xu[3]; Cijie Liu[2]; Trindell Jamie[4]; Wei Li[2]; Jiyun Park[3]; Josh Sugar[5]; Anthony McDaniel[4]; Stephen Lany[6]; wenyuan Li[2]; Hanchen Tian[2]; Yue Qi[3]; Xingbo Liu[2]; Jian Luo[1]; [1]University of California San Diego; [2]West Virginia University; [3]Brown University; [4]Sandia National Laboratories; [5]Sandia National laboratory; [6]National Renewable Energy Laboratories

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MATERIALS PROCESSING

Advances in Surface Engineering V — Surface Modification and Characterization

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

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

Thursday AM | March 23, 2023
29D | SDCC

Session Chair: Ganesh Walunj, Buffalo State College

8:30 AM Invited
Dry Electrolyte Polishing of As-printed Additively Manufactured Stainless Steel: *Michael Melia*[1]; Erin Karasz[1]; Kasandra Escarcega-Herrera[1]; Jason Taylor[1]; David Saiz[1]; Michael Heiden[1]; Jonathan Pegues[1]; [1]Sandia National Laboratories

8:50 AM
Fatigue Behavior of Laser Polished Laser Powder Bed Fused IN718: Identify a Suitable Heat Treatments and Laser Polishing Combination: *Seungjong Lee*[1]; Martin Bureš[2]; Shuai Shao[1]; Douglas Wells[3]; Miroslav Zetek[2]; Nima Shamsaei[1]; [1]Auburn University; [2]University of West Bohemia; [3]NASA Marshall Space Flight

Center

9:10 AM
A Study of Microstructural Evolution in Peened AISI 304L Stainless Steel: *Sesily Stewart*[1]; Indrajit Charit[2]; Merbin John[3]; Alessandro Ralls[4]; Manoranjan Misra[4]; Pradeep Menezes[4]; [1]University of Idaho; [2]University of Idaho ; [3]University of Nevada Reno; [4]University of Nevada Reno

9:30 AM
Effect of Intercritical Annealing Temperature and Sb Micro-addition on the Selective Oxidation of a Fe-6wt.%Mn Alloy: *Bita Pourbahari*[1]; Joseph R. McDermid[1]; [1]McMaster University

9:50 AM
Hot Stamping of Aluminum 6061 Alloys with Volatile Media Injected through Additive Manufactured Die: *Lihong Cai*[1]; Meiling Geng[1]; Ju-Hoon Lee[2]; Byung-Sun Park[2]; Sung-Tae Hong[1]; [1]University of Ulsan; [2]Dae Sung Company

10:10 AM Break

10:25 AM
Investigation of Surface Properties of Cemented Steel E16NCD13 after Vibratory Peening: *Anindya Das*[1]; Hong-Yan Miao[1]; Benoît Changeux[2]; Etienne Martin[1]; [1]Polytechnique Montreal; [2]SAFRAN Tech - Materials & Processes Department

10:45 AM
Laser Induced Micro/Nano Structured Stainless Steel Surfaces for Biological and Food Storage Applications: *Gopinath Perumal*[1]; Mark Swayne[1]; Dermot Brabzon[1]; [1]Dublin City University

11:05 AM
Mechanical Behavior of AISI 8620 Steel`s Surface Modified through TIG Arcing: *Sachin Balbande*[1]; Nilesh Kumar Paraye[1]; Sourav Das[1]; [1]IIT Roorkee

11:25 AM
Nitriding-Assisted Surface Enhancement of Multi-Principal Element Alloys Containing Refractory Metals: *Yu-Hsuan Lin*[1]; David Poerschke[1]; [1]University of Minnesota

11:45 AM
On Characterization of Microstructure and Surface Attributes in Drilling Processes at High Spatial Resolution: *Abhishek Somani*[1]; James Mann[2]; Srinivasan Chandrasekar[1]; Kevin Trumble[1]; [1]Purdue Univesity; [2]M4 Sciences

12:05 PM
Understanding the Tribo-Corrosion Mechanisms of Laser Processed Steel Deposited by High Deposition Rate Cold Spray Additive Manufacturing Process: *Alessandro Ralls*[1]; Jacob Frizell[1]; Pradeep Menezes[1]; [1]University of Nevada, Reno

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MATERIALS DESIGN

Advances in Titanium Technology — Session VII

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Thursday AM | March 23, 2023

Cobalt 500 | Hilton

Session Chair: Zhi Liang, QuesTek Innovations LLC

8:30 AM Invited
A Holistic Approach to Low-cost Ti: *Zhigang Fang*[1]; [1]University of Utah

9:00 AM Invited
Combined Modeling-Experimental Approach for Investigating Hydrogenation of Titanium: *Tae Wook Heo*[1]; [1]Lawrence Livermore National Laboratory

9:30 AM Invited
Kinetically Induced Fine Secondary -Ti phase Formation in a Novel As-cast Titanium Alloy: *Zhi Liang*[1]; Jiashi Miao[2]; Xuejun Huang[2]; Fan Zhang[3]; James Williams[2]; Alan Luo[2]; [1]QuesTek Innovations LLC; [2]The Ohio State University; [3]National Institute of Standards and Technology

10:00 AM Break

10:20 AM
Development of a Digital Twin for Characterisation of Titanium Alloy Microstructural Features Employing In-Process Machining Data: *Thomas Childerhouse*[1]; Oliver Levano Blanch[1]; Pete Crawforth[1]; Martin Jackson[1]; [1]The University of Sheffield

10:40 AM
Nanoindentation Properties Evolution of Titanium with Different Oxygen Contents: *Damien Texier*[1]; Quentin Sirvin[1]; Charles Romain[1]; Henry Proudhon[2]; Vladislav Yastrebov[2]; Samuel Forest[2]; Marc Legros[3]; [1]CNRS - Institut Clément Ader; [2]Centre des Matériaux, Mines ParisTech; [3]CEMES - UPR CNRS 8011

11:00 AM
The Effect of Dilute Si/Nb Alloying on High-temperature Oxidation of Titanium: *Thomas Valenza*[1]; Emmanuelle Marquis[1]; [1]University of Michigan

11:20 AM
Effect of Macrozone Placement on Cracking in Bimodal Ti-6Al-4V: *Yan Gao*[1]; Nigel Martin[2]; Jamie Moschini[2]; David Dye[1]; [1]Imperial College; [2]Rolls-Royce plc

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MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Thursday AM | March 23, 2023
Cobalt 520 | Hilton

Session Chairs: Shreyas Honrao, NASA Ames Research Center; Sean Donegan, Air Force Research Laboratory

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8:30 AM
Laser Powder Bed Fusion Process Design Via Machine Learning Augmented Process Modeling: *Michael Groeber*[1]; Sandeep Srinivasan[1]; Brennan Swick[1]; [1]The Ohio State University

8:50 AM
A Physics-based Machine Learning Study of the Hot Cracking Phenomenon in the Processes of Additive Manufacturing: *Guannan Tang*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

9:10 AM
Gaussian Process Ensemble Active Learning for Autonomous Parameterization of Direct Ink Write 3D Printing: *Erick Braham*[1]; Marshall Johnson[2]; Surya Kalidindi[2]; James Hardin[3]; [1]Air Force Research Lab and NRC; [2]Georgia Institute of Technology; [3]Air Force Research Lab

9:30 AM
Autonomous Path Planning in Additive Processes Using Semi-supervised Machine Learning: *Sean Donegan*[1]; James Collins[2]; Edwin Schwalbach[1]; [1]Air Force Research Laboratory; [2]The Ohio State University

9:50 AM
Data-enhanced Hybrid Machine Learning Model for Solid-state Friction Surfacing Process: *Benjamin Klusemann*[1]; Frederic Bock[1]; Zina Kallien[1]; Norbert Huber[1]; [1]Helmholtz-Zentrum Hereon

10:10 AM Break

10:30 AM
Developing a Physics-informed Machine Learning Model to Predict Melt-pool Shape in Additive Manufacturing: *Mohammad Parsazadeh*[1]; Sharma Shashank[1]; Sameehan Joshi[1]; Venkata mani Krishna Karri[1]; Narendra Dahotre[1]; [1]University of North Texas

10:50 AM
Interrelated Process-Geometry-Microstructure Relationships for Wire-feed Laser Additive Manufacturing: *Sen Liu*[1]; Craig Brice[2]; Xiaoli Zhang[2]; [1]Stanford University; [2]Colorado School of Mines

11:10 AM
Anomaly Detection in Composite Manufacturing Using Zero-bias Deep Neural Network: *Deepak Kumar*[1]; Sirish Namilae[1]; Yongxin Liu[1]; Houbing Song[1]; [1]Embry Riddle Aeronautical University

11:30 AM
Simulation of Mechanical Properties of TPMS-based Osteoporotic Bone by the Neural Network-Enhanced Finite Element Method: *Yan-Zhen Chen*[1]; Chu-Hao Wang[1]; Tsung-Yeh Hsieh[1]; Tsung-Hui Huang[1]; Cheng-Che Tung[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — AI/ML Algorithms and Applications

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

Materials Committee

Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis; Enrique Martinez Saez, Clemson University; Garritt Tucker, Colorado School of Mines; Hojun Lim, Sandia National Laboratories; Vimal Ramanuj, Oak Ridge National Laboratory

Thursday AM | March 23, 2023
Cobalt 502B | Hilton

Session Chairs: Enrique Saez, Clemson University; Vimal Ramanuj, Oak Ridge National Laboratory

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8:30 AM
Applications of Min-cut Algorithms for Image Segmentation and Microstructure Reconstruction: *Austin Gerlt*[1]; Alexander Brust[2]; Eric Payton[3]; Stephen Niezgoda[1]; [1]The Ohio State University; [2]DNV; [3]Air Force Research Lab

8:50 AM
Machine Learning Models of Effective Properties with Reduced Requirements on Microstructure: *Marat Latypov*[1]; [1]University of Arizona

9:10 AM
Microstructure-Sensitive Calculations of Metal Nanocomposite Electrical Conductivity: *William Frazier*[1]; Bharat Gwalani[1]; Julian Escobar Atehortua[1]; Joshua Silverstein[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

9:30 AM
Persistent Homology for Topological Quantification of Microstructure: *Simon Mason*[1]; Dennis Dimiduk[2]; Steve Niezgoda[1]; [1]Ohio State University; [2]BlueQuartz Software LLC

9:50 AM Break

10:10 AM
Thermographic Process Classification in Electron Beam Additive Manufacturing via Stacked Long Short-Term Memory Networks: *Benjamin Stump*[1]; Alex Plotkowski[1]; Vincent Paquit[1]; [1]Oak Ridge National Laboratory

10:30 AM
Prediction of Cutting Surface Parameters in Punching Processes aided by Machine Learning: *Adrian Schenek*[1]; Marcel Görz[1]; Mathias Liewald[1]; [1]Institute for Metal Forming Technology

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LIGHT METALS

Aluminum Alloys, Characterization and Processing — Alloy Development

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek, Kensington Technology Inc.

Thursday AM | March 23, 2023
32A | SDCC

Session Chair: Alan Luo, Ohio State University

8:30 AM
AMAG CrossAlloy – A Unique Aluminum Alloy Concept for Lightweighting the Future: *Florian Schmid*[1]; Lukas Stemper[1]; Ramona Tosone[1]; [1]AMAG rolling GmbH

8:55 AM
ANewRecycledAl-Si-MgAlloyforSustainableStructuralDieCastingApplications: *Michael Moodispaw*[1]; Emre Cinkilic[2]; Jianyue Zhang[1]; Jiashi Miao[1]; Alan Luo[1]; [1]The Ohio State University; [2]Hakkari University

9:20 AM
Effect of Alloying Elements on Corrosion Resistance of Quench-free Al–Ca Alloys for HPDC: *Dmitry Fokin*[1]; Sergey Matveev[1]; Roman Vakhromov[1]; Dmitry Ryabov[1]; Aleksandr Alabin[2]; [1]Light Materials and Technologies Institute UC RUSAL; [2]JSC RUSAL Management

9:45 AM
Influence of Increased Cu and Fe Concentrations on the Mechanical Properties of the EN AB-42100 (AlSi7Mg0.3) Aluminum Alloy: *Tobias Beyer*[1]; David Ebereonwu[2]; Alexander Koch[2]; Peer Decker[1]; Anna-Lena Kauws[1]; Marcel Rosefort[1]; Frank Walther[2]; [1]TRIMET Aluminium SE; [2]TU Dortmund

10:10 AM Break

10:25 AM
HowCeriumandLanthanumasCoproductsPromoteStableRareEarthProduction and New Alloys: *Zachary Sims*[1]; Michael Kesler[2]; Hunter Henderson[1]; Emilio Castillo[3]; Tomer Fishman[4]; David Weiss[5]; Prentice Singleton[6]; Roderick Eggert[7]; Scott McCall[1]; Orlando Rios[8]; [1]CMI, Lawrence Livermore National Laboratory; [2]CMI, Oak Ridge National Laboratory; [3]University of Chile Santiago; [4]Univesity of Leiden; [5]Eck Industries; [6]Borg Warner Turbo Systems; [7]CMI, Colorado School of Mines; [8]CMI, University of Tennessee Knoxville

10:50 AM
Microstructure and Mechanical Properties of an Al-Mn-Si Alloy Microalloyed with Post Transition Metals: *Amir Farkoosh*[1]; David Dunand[1]; David Seidman[1]; [1]Northwestern University

11:15 AM
Innovative Approaches in Development of Aluminium Alloys for Packaging Industry: *Stanislav Kores*[1]; Simon Strmsek[1]; Maja Voncina[2]; Jozef Medved[2]; [1]Talum D.D.; [2]2 University of Ljubljana, Faculty of Natural Sciences and Engineering

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LIGHT METALS

Aluminum Reduction Technology — Environment & Modelling

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

Program Organizers: Pierre Marcellin, Rio Tinto; Stephan Broek, Kensington Technology Inc.

Thursday AM | March 23, 2023
30E | SDCC

Session Chair: Hervé Roustan, Rio Tinto

8:30 AM Introductory Comments

8:40 AM
Fundamentals of Pot Ventilation in Aluminum Smelters: *Diego Oitaben*[1]; Samaneh Poursaman[1]; Stephen Lindsay[1]; [1]Hatch

9:05 AM
Evaluation of Methodologies for Assessment of SO3 Concentration in Industrial Off-gas: *Thor Anders Aarhaug*[1]; Ole Kjos[1]; Morten Isaksen[2]; Jan Olav Polden[2]; [1]Sintef; [2]Hydro Aluminium

9:30 AM
Mathematical Modelling of the Desulfurization of Electrolysis Cell Gases in a Low Temperature Reactor: *Arash Fassadi Chimeh*[1]; Duygu Kocaefe[1]; Yasar Kocaefe[1]; Yoann Robert[2]; Jonathan Bernier[2]; [1]University of Quebec at Chicoutimi; [2]Rio Tinto

9:55 AM Break

10:10 AM
Recent Improvements to a Mathematical Model Replicating the Wave and Stream at the Bath-metal Interface: *Thomas Richer*[1]; Lukas Dion[1]; Laszlo Kiss[1]; Sébastien Guérard[2]; Jean-françois Bilodeau[2]; Guillaume Bonneau[1]; Martin Truchon[1]; [1]GRIPS; [2]Rio Tinto

10:35 AM
Numerical Investigation of the Thermal, Electrical and Mechanical Behaviour of Aluminum Reduction Cell during Preheating Phase: *Simon-Olivier Tremblay*[1]; Daniel Marceau[1]; Rohini-Nandan Tripathy[2]; Antoine Godefroy[3]; Duygu Kocaefe[2]; Sébastien Charest[3]; Jules Côté[3]; [1]University of Quebec-Chicoutimi; [2]University Research Centre on Aluminium (CURAL) - Aluminium Research Centre (REGAL) - University of Québec at Chicoutimi; [3]Aluminerie Alouette Inc.

11:00 AM
Simplified 3D MHD Model for Quick Evaluation of Aluminium Electrolysis Cell Design: *Ievgen Necheporenko*[1]; Alexander Arkhipov[1]; Abdalla Zarouni[1]; [1]Emirates Global Aluminium

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Physical and Mechanical Properties II

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

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

Thursday AM | March 23, 2023
Aqua C | Hilton

Session Chair: Eun Soo Park, Seoul National University

8:30 AM
The Strain Rate Sensitivity of Heterogeneous Thin Film Metallic Glasses: Interplay between Nanoscale Heterogeneity and Dynamic Plasticity: Yucong Gu[1]; Xiao Han[1]; Feng Yan[1]; *Lin Li*[1]; [1]University of Alabama

8:50 AM
Temperature Dependence of Pressure Sensitivity in a Metallic Glass Composite: *Priyanka Saini*[1]; Long Zhang[2]; Yakai Zhao[3]; Haifeng Zhang[2]; Upadrasta Ramamurty[3]; Lakshmi Ramasubramanian[1]; [1]Indian Institute of Technology; [2]Shi-changxu Innovation Center for Advanced Materials, Institute of Metal Research; [3]Nanyang Technological University

9:10 AM
Pressure-induced Local Structural Crossover in a High-entropy Metallic Glass: *Xin Zhang*[1]; Qiaoshi Zeng[1]; [1]Center for High Pressure Science & Technology Advanced Research (HPSTAR)

9:30 AM
Origin of Super Plastic Behavior of Bulk Metallic Glass with Complex Icosahedral Order: *Geun Hee Yoo*[1]; Wook Ha Ryu[1]; Myeong Jun Lee[1]; Eun Soo Park[1]; [1]Seoul National University

9:50 AM
Investigation of Non-isothermal Crystallization and Mechanical Properties of Zr-based Metallic Glass with Enhanced Icosahedral Ordering: *Myeong Jun Lee*[1]; Geun Hee Yoo[1]; Min Kyung Kwak[1]; Wook Ha Ryu[1]; Eun Soo Park[1]; [1]Seoul National University

10:10 AM Break

10:30 AM
Mechanical Properties and Scaling Laws of Bicontinuous Nanoporous Metallic Glasses: Chang Liu[1]; Suyue Yuan[1]; Jinwoo Im[1]; Felipe de Barros[1]; Sami Masri[1]; *Paulo Branicio*[1]; [1]University of Southern California

10:50 AM
Spectroscopic Evaluation of Tribologically-induced Structural Transformations and Chemical Changes in Zr-based Bulk Metallic Glass: *Hsu-Ming Lien*[1]; Michael Chandross[2]; Joshua Arrington[3]; Filippo Mangolini[1]; [1]University of Texas at Austin; [2]Sandia National Laboratories; [3]Clemson University

11:10 AM
Genetic Algorithm-assisted Discovery and Characterization of New Metallic Glass Coatings For Extreme Conditions: *Jerry Howard*[1]; Leslie Mushongera[1]; Dev Chidambaram[1]; Krista Carlson[1]; [1]University of Nevada, Reno

11:30 AM
Metallic Glass Coating for Improving Dicing Performance of Hard/Brittle Materials: *Jinn Chu*[1]; [1]National Taiwan University of Science and Technology

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NUCLEAR MATERIALS

Ceramic Materials for Nuclear Energy Research and Applications — Microstructural Modeling of Oxide Fuels

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

Program Organizers: Walter Luscher, Pacific Northwest National Laboratory; Xian-Ming Bai, Virginia Polytechnic Institute and State University; Lingfeng He, North Carolina State University; Sudipta Biswas, Idaho National Laboratory; Simon Middleburgh, Bangor University

Thursday AM | March 23, 2023
28B | SDCC

Session Chair: Sudipta Biswas, Idaho National Laboratory

8:30 AM Invited
Diffusion Properties in Uranium-plutonium Mixed Oxides: Atomic Scale Investigation of the Effect of Composition and Chemical Disorder: *Marjorie Bertolus*[1]; Maria Chiara Notarangelo[1]; Didier Bathellier[1]; Michel Freyss[1]; Emeric Bourasseau[1]; Luca Messina[1]; [1]CEA

9:00 AM Invited
Atomic Scale Simulation of Amorphous Intergranular Films in Nuclear Fuel Materials: *Michael Rushton*[1]; Simon Middleburgh[1]; William Lee[1]; [1]Bangor University

9:30 AM
Simulation of Irradiation-induced Bubble Over-pressurization and Application in Fuel Performance: *Michael Cooper*[1]; Christopher Matthews[1]; Larry Aagesen[2]; Chris Stanek[1]; David Andersson[1]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory

9:50 AM
Multiscale Modeling for High-burnup Structure Formation in UO2: *Sudipta Biswas*[1]; Larry Aagesen[1]; Sophie Blondel[2]; Wen Jiang[1]; [1]Idaho National Laboratory; [2]University of Tennessee

10:10 AM Break

10:30 AM
Multiphysics Modeling of High Burnup UO2 at Mesoscale: *Abdurrahman Ozturk*[1]; Merve Gencturk[1]; David Andersson[2]; Wen Jiang[3]; Michael W.D. Cooper[2]; Larry Aagesen[3]; Mohammed Abdoelatef[1]; Jason Harp[4]; Karim Ahmed[1]; [1]Texas A&M University; [2]Los Alamos National Laboratory; [3]Idaho National Laboratory; [4]Oak Ridge National Laboratory

10:50 AM
Quantifying the Impact of Fast Interface Diffusion and Free Surface Evolution on Fission Gas Release in UO_2 Using a Phase-field Model: *Md Ali Muntaha*[1]; Michael Tonks[1]; Larry Aagesen[2]; Anders David Ragnar Andersson[3]; Michael William Donald Cooper[3]; [1]University of Florida; [2]Idaho National Laboratory; [3]Los Alamos National Laboratory

11:10 AM
Predicting Mechanical Behavior of Uranium Oxide Fuel Pellets Using Full-field Defect Diffusion Modeling in a Crystal Plasticity Framework: *Aritra Chakraborty*[1]; Conor Oscar Galvin[1]; Michael W.D. Cooper[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

11:30 AM
Atomistic-scale Simulations used to Simulate Creep in Oxide Fuel: *Conor Galvin*[1]; Aritra Chakraborty[1]; Laurent Capolungo[1]; David Andersson[1]; Michael Cooper[1]; [1]Los Alamos National Laboratory

11:50 AM
Revealing The Microstructure and Irradiation Effects on UO2 Fracture via Coupled Phase-field and MD Simulations Approach: *Merve Gencturk*[1]; Abdurrahman Ozturk[1]; David Andersson[2]; Mohammed Abdoelatef[1]; Larry Aagesen[3]; Wen Jiang[3]; Michael William Donald Cooper[2]; Karim Ahmed[1]; [1]Texas A&M University; [2]Los Alamos National Laboratory; [3]Idaho National Laboratory

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CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Mineralogical Analysis and Process Improvement

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

Thursday AM | March 23, 2023
Aqua 313 | Hilton

Session Chair: Yunus Kalay, Middle East Technical University

8:30 AM
Evaluating the Morphology of Crystalline Glass Developed from Corn Cob Ash: *Bidemi Elesho*[1]; Andrew Adejo[2]; Adele Garkida[3]; [1]The Federal Polytechnic, Ado-Ekiti; [2]Federal University of Lafia; [3]Ahmadu Bello University, Zaria

8:50 AM
Characterization of Zircon and Rare Earth Bearing Minerals in Black Sands of a Gold Dredging Operation in Colombia: *Gustavo Neira-Arenas*[1]; Animesh Jha[2]; Lucia Ochoa-Correa[1]; [1]Universidad Nacional de Colombia; [2]University of Leeds

9:10 AM
Forensic Signatures of Uranium Enrichment in UV Cured Epoxy: *Daniel Reinfurt*[1]; Michael Short[1]; Rachel Connick[1]; Avery Nguyen[1]; Charles Hirst[1]; [1]Massachusetts Institute of Technology

9:30 AM
Research and Practice on the Effect of Different Calcium-containing Fluxes on the Production of Fluxed Pellets: *Xiangjuan Dong*[1]; [1]Central Iron and Steel Research Institute

9:50 AM Break

10:05 AM
Characterization of Rayfield-jos Columbite Deposit for Efficient Beneficiation and Recovery of Niobium and Tantalum: *Nnaemeka Nzeh*[1]; Patricia Popoola[1]; Samson Adeosun[2]; Abraham Adeleke[3]; [1]Tshwane University of Technology, Pretoria; [2]University of Lagos, Akoka; [3]Obafemi Awolowo University, Ile-Ife

10:25 AM
Investigating the Morphology, Hardness, and Porosity of Spherical and Dendritic Copper Powder Filters Produced via Isostatic Pressing: *Hasan Ayub*[1]; Lehar Asip Khan[1]; Eanna McCarthy[1]; Inam ul Ahad[1]; Sithara Sreenilayam[1]; Karsten Fleischer[1]; Dermot Brabazon[1]; [1]Dublin City University

10:45 AM
Conversion of Ferronickel Slag to Thermal Insulation Materials by Microwave Sintering: Effect of Fly Ash Cenosphere Addition: *Xiaolei Fang*[1]; Zhiwei Peng[1]; Lei Yang[1]; Guangyan Zhu[1]; Mingjun Rao[1]; [1]Central South University

11:05 AM
Flexural Strength of Castor Oil Derived Polyurethane Composites Reinforced with Both Chamotte and Wood Chips Residues: Juvenil Oliveira[1]; *Felipe Lopes*[1];

Noan Simonassi[1]; Carlos Maurício Vieira[1]; Sergio Monteiro[1]; [1]State University of Northern Rio de Janeiro

ENERGY & ENVIRONMENT

Composite Materials for Sustainable and Eco-Friendly Material Development and Application — Composite Materials Developed from Naturally Derived Sources

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Muralidharan Paramsothy, NanoWorld Innovations; Simona Hunyadi Murph, Savannah River National Laboratory

Thursday AM | March 23, 2023
31C | SDCC

Session Chair: Brian Wisner, Ohio University

8:30 AM
Friction Extrusion of Lead-free Brass-graphite Composites Made from Powder Feedstock: *Md Reza-E-Rabby*[1]; Aditya Nittala[1]; Mayur Pole[1]; Todd Kidder[1]; Steffen Sigloch[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

8:50 AM
Sustainable and Environmentally Friendly High Filler Content Coal Plastic Composites as Construction Materials: A Study of Mechanical Performance, Thermal Stability, and Flammability: *Yahya Al-Majali*[1]; Jason Trembly[1]; [1]Ohio University

9:10 AM
Fiber-reinforced Polymeric Composites for Low-carbon Construction Applications: *Zhiye Li*[1]; [1]Stanford University

9:30 AM
Natural Carbon Waste as a Filler in Plastic Composite Filaments for Sustainable Fused Deposition Modeling Applications: *Logan Veley*[1]; Yahya Al-Majali[1]; Jason Trembly[1]; [1]Ohio University

9:50 AM Break

10:10 AM
Challenges and Solutions for Nanoparticle Reinforced Lightweight Metal Composites: an Overview: *Qianqian Li*[1]; Zhuocheng Xu[1]; Syazana Hisham[1]; Samaneh Nasiri[2]; Michael Zaiser[2]; Milo Shaffer[1]; [1]Imperial College London; [2]University of Erlangen

10:30 AM
Synthesis of Aluminum/graphene Composites with Enhanced Electrical Properties through Shear Assisted Processing and Extrusion: *Aditya Nittala*[1]; Md. Reza E Rabby[1]; Joshua Silverstein[1]; Bharat Gwalani[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

10:50 AM
Formable Steel Scrap Laminates: *Onur Guvenc*[1]; C. Cem Taan[1]; [1]Massachusetts Institute of Technology

11:10 AM
New Eco-friendly Inorganic Polymeric Materials for the Passive Fire Protection of Structures: Ponsian Robert[1]; Ioanna Giannopoulou[1]; Pericles Savva[2]; Konstantinos-Miltiadis Sakkas[2]; Michael Petrou[3]; *Demetris Nicolaides*[4]; [1]Frederick Research Center; [2]RECS Civil Engineers and Partners L.L.C.; [3]University of Cyprus; [4]Frederick University

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PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Alloys, Design and Properties

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Thursday AM | March 23, 2023
26A | SDCC

Session Chairs: Joerg Neugebauer, Max-Planck-Institut; Qing Chen, Thermo-Calc Software AB

8:30 AM Invited
Constructing Defect Phase Diagrams from Ab Initio Calculations and CALPHAD Concepts: Jing Yang[1]; Mira Todorova[1]; Tilmann Hickel[1]; *Joerg Neugebauer*[1]; [1]MPI fuer Eisenforschung

9:00 AM
First Principles Calculation of Phase Diagrams Including Configurational and Vibrational Entropic Contributions: Wei Shao[1]; Sha Liu[2]; *Javier Llorca*[3]; [1]Technical University of Madrid & IMDEA Materials Institute; [2]Yanshan University; [3]IMDEA Materials Institute & Technical University of Madrid

9:20 AM
DFT Study of the NiTi-X Systems for Shape Memory Alloys (SMAs) Design: *Guillermo Vazquez Tovar*[1]; Sina Hossein Zadeh[1]; Sayan Samanta[1]; Axel Van de Walle[1]; Raymundo Arróyave[1]; [1]Texas A&M University

9:40 AM
Hydrogen Accommodation, Hydride Decomposition, and Hydride Phase Stability in the TiZrNbHfTa High Entropy Alloy: *Christopher Moore*[1]; Jack Wilson[1]; Jack Astbury[2]; Caitlin Taylor[3]; Michael Rushton[1]; Simon Middleburgh[1]; [1]Bangor University; [2]Tokamak Energy; [3]Los Alamos National Laboratory

10:00 AM Break

10:20 AM Invited
Modeling of Spontaneous PE to OE Transition in Carbide Precipitation: *Qing Chen*[1]; Kaisheng Wu[2]; Johan Jeppsson[1]; John Ågren[3]; [1]Thermo-Calc Software AB; [2]Thermo-Calc Software Inc; [3]KTH

10:50 AM
A Novel Approach to Realizing Linear-Superleastic Behavior in NiTi SMA Using Precipitate Dissolution: *Hariharan Sriram*[1]; Longsheng Feng[2]; Yunzhi Wang[1]; [1]Ohio

State University; [2]Lawrence Livermore National Laboratory

11:10 AM
First-principles Tools for the Design of High Temperature Materials: *Anirudh Raju Natarajan*[1]; [1]EPFL

11:30 AM
Progress in Design of High-performance Alloys Guided by Phase-field Simulations: *Yuhong Zhao*[1]; [1]North University of China

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MATERIALS PROCESSING

Deformation-induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies — Deformation Induced Microstructural Evolution V

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

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign; Suhas Eswarappa Prameela, Massachusetts Institute of Technology; Mostafa Hassani, Cornell University

Thursday AM | March 23, 2023
29C | SDCC

Session Chair: Tingkun Liu, Pacific Northwest National Laboratory

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8:30 AM Invited
Physical Metallurgy of Mechanochemical Ignition Processes in High Pressure Oxygen Environments: *Zachary Cordero*[1]; [1]Massachusetts Institute of Technology

9:00 AM
Characterization of Phase and Mechanical Developments of Martensitic α' Phase in Ti-6Al-4V Under Laser Processing via In-Situ Synchrotron X-ray Diffraction: *Seunghee Oh*[1]; Joseph Aroh[1]; Andrew Chuang[2]; Nicholas Lamprinakos[1]; Robert Suter[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory

9:20 AM
Local Modification of Microstructure and Mechanical Properties in 7000 Series Al Alloys Achieved by Friction Stir Processing: *Tanvi Ajantiwalay*[1]; Julian Escobar[1]; Jia Liu[1]; Matthew Olszta[1]; Nasim Wahaz[1]; Hrishikesh Das[1]; Mert Efe[1]; Piyush Upadhyay[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

9:40 AM
On The Plastic Deformation Path and Concurrent Microstructure Evolution During Additive Friction Stir Deposition-Based Solid-State Metal Additive Manufacturing: *Hang Yu*[1]; [1]Virginia Polytechnic Institute and State University

10:00 AM Break

10:15 AM
Strengthening of Pre-treated Aluminum During Ultrasonic Additive Manufacturing: *Michael Pagan*[1]; Ningxiner Zhao[2]; Leon Headings[2]; Marcelo Dapino[2]; Sriram Vijayan[2]; Joerg Jinschek[3]; Steve Zinkle[1]; Suresh Babu[1]; [1]University of Tennessee; [2]The Ohio State University; [3]Technical University of Denmark

10:35 AM
The Relative Rates of Dynamic and Static Grain Growth in an Interstitial-Free Steel: *Thomas Bennett*[1]; Eric Taleff[1]; [1]University of Texas at Austin

10:55 AM
ARB Processing of Bulk Fe-Al and Ti-Al Nano-metallic Laminates: *Thomas Nizolek*[1]; Rodney McCabe[1]; Yifan Zhang[1]; Daniel Savage[1]; Cody Miller[1]; Carl Osborn[1]; Sean Raybon[1]; John Carpenter[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

11:15 AM
Nano-structure, Mechanical Properties and Thermal Transport Properties of Nano-crystalline Eurofer97: *Felix Hofmann*[1]; Kay Song[1]; Gregory Strangward-Pryce[1]; [1]University of Oxford

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Deformation Mechanisms II

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Thursday AM | March 23, 2023
Aqua 300AB | Hilton

Session Chairs: Laurent Beland, Queen's University; Penghui Cao, University of California, Irvine

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8:30 AM
Multi Principal Element Borides from Amorphous Colloidal Nanoparticles: *Melody Wang*[1]; Mehrdad Kiani[2]; Brandon Lum[1]; Wendy Gu[1]; [1]Stanford University; [2]Yale University

8:50 AM
Mechanical Behaviour of Ni and Ni3Al Free-standing and Matrix-embedded Metallic Nanoparticles at Different Temperatures: Alla Ndiaye Dieng[1]; *Celine Gerard*[1]; Jonathan Cormier[1]; [1]Institut Pprime - CNRS - ISAE-ENSMA

9:10 AM
An Experimental and Modeling Investigation of Creep Resistance of a Stable Nanocrystalline Alloy: C Kale[1]; R Koju[2]; B Hornbuckle[3]; K Darling[3]; Y Mishan[2]; *Kiran Solanki*[1]; [1]Arizona State University; [2]Geroge Mason University; [3]ARL

9:30 AM Invited
Exploring Defect Behavior and Size Effects in Micron-scale Germanium from Cryogenic to Elevated Temperatures: *Ming Chen*[1]; Alla Sologubenko[2]; Jeffrey Wheeler[1]; [1]ETH Zürich, Laboratory for Nanometallurgy, Department of Materials Science; [2]ETH Zürich, Scientific Center for Optical and Electron Microscopy

10:00 AM Break

10:20 AM
Hydrogen Effects on Mechanical Deformation, Dislocation Density, and Phase Separation in 4130 Steel: *Zachary Buck*[1]; Matthew Connolly[1]; May Martin[1]; Damian Lauria[1]; Jason Killgore[1]; Peter Bradley[1]; Yan Chen[2]; Ke An[2]; Andrew Slifka[1]; [1]National

Institute of Standards and Technology; [2]Oak Ridge National Laboratory

10:40 AM Invited
Numerical Recipes: Preparing Nanostructured Materials for Computational Studies, from Metals to Colloids: *Laurent Karim Béland*[1]; Hao Sun[1]; Peyman Saidi[1]; Yaoting Zhang[1]; Mark Daymond[1]; Isaac Tamblyn[2]; [1]Queen's University; [2]National Research Council, Canada

11:10 AM
One-dimensional Migration of Prismatic Loop in Refractory High Entropy Alloy and Effects of Local Chemical Order: *Hangman Chen*[1]; Penghui Cao[1]; [1]University of California, Irvine

11:30 AM
Role of Stacking Fault Energy in the Interaction of Extended Dislocations with Nanovoids: *Ashley Roach*[1]; Shuozhi Xu[2]; Darby Luscher[3]; Daniel Gianola[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]University of Oklahoma; [3]Los Alamos National Lab

11:50 AM
Nanoindentation of Alumina and Multiphase Inclusions in 42CrMo4 Steel: *Ruben Wagner*[1]; Robert Lehnert[1]; Enrico Storti[1]; Lisa Ditscherlein[1]; Christina Schröder[1]; Steffen Dudczig[1]; Urs Peuker[1]; Olena Volkova[1]; Christos Aneziris[1]; Horst Biermann[1]; Anja Weidner[1]; [1]TU Bergakademie Freiberg

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CORROSION

Environmentally Assisted Cracking: Theory and Practice — Corrosion and Degradation in Harsh Environments

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

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies, Inc.; Jenifer Locke, Ohio State University

Thursday AM | March 23, 2023
Aqua 314 | Hilton

Session Chairs: Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Mohsen Dadfarnia, Seattle University

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8:30 AM Invited
A Comprehensive Study to Evaluate Sensitization of As-fabricated Coated TPBAR Cladding: *Ramprashad Prabhakaran*[1]; Venkateshkumar Prabhakaran[1]; Dan Edwards[1]; David Senor[1]; Andy Casella[1]; [1]Pacific Northwest National Laboratory

9:00 AM
Utilizing Predictions from Precipitation Modeling to Produce 5XXX Series Aluminum Alloy Plate with Lowered Sensitization Responses: *Matthew Steiner*[1]; Likun Sun[1]; [1]University of Cincinnati

9:20 AM
Preventing the Sensitization in Aluminum Magnesium Alloys: *Ramasis Goswami*[1]; [1]Naval Research Laboratory

9:40 AM
Localized Corrosion Behavior of Aged High Zinc 7068 Aluminium Alloy: *Ankur Kumar*[1]; G P Chaudhari[1]; S K Nath[1]; [1]IIT Roorkee

10:00 AM Break

10:20 AM Invited
Mechanistic Model for Hydrogen Accelerated Fatigue Crack Growth in a Low Carbon Steel: *Mohsen Dadfarnia*[1]; Zahra Hosseini[2]; Masanobu Kubota[3]; Akihide Nagao[3]; Brian Somerday[2]; Petros Sofronis[2]; Robert Ritchie[4]; [1]Kyushu University; Seattle University; [2]Kyushu University; University of Illinois at Urbana-Champaign; [3]I2CNER, Kyushu University; [4]University of California, Berkeley

10:50 AM
Influence of Pre-Deformation on High Temperature Oxidation of a Model Fe-Cr-Ni Alloy in Pressurized Water Reactor Environments: *Dallin Barton*[1]; Tingkun Liu[1]; Cheng-Han Li[1]; Matthew Olszta[1]; Ziqing Zhai[1]; Ferdinan Colin[1]; Mychailo Toloczko[1]; [1]Pacific Northwest National Laboratory

11:10 AM
Effect of Mo and W on Corrosion of Ni-superalloys: *Cynthia Rodenkirchen*[1]; [1]Imperial College London

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MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multiscale Modeling Approaches to Improve Fatigue Predictions II

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

Thursday AM | March 23, 2023
Aqua 311B | Hilton

Session Chair: Antonios Kontsos, Drexel University

8:30 AM
Computation of Stress Intensity Factors by A Phase-Field Fracture Approach: *William Huber*[1]; Mohsen Asle Zaeem[1]; [1]Colorado School of Mines

8:50 AM
Fracture Mechanics Based Approach for Fatigue Assessment of Ultra-High Strength Steels: *Thomas Straub*[1]; Igor Varfolomeev[1]; Andreas Kleemann[2]; Michael Luke[1]; [1]Fraunhofer Institute for Mechanics of Materials (IWM); [2]Institute of Materials Research and Testing at the Bauhaus-University Weimar

9:10 AM
Predicting Microstructurally Sensitive Fatigue-crack Path in WE43 Magnesium Using High-fidelity Numerical Modeling and Three-dimensional Experimental Characterization: *Brian Phung*[1]; Duncan Greeley[2]; Mohammadreza Yaghoobi[2]; John Allison[2]; Ashley Spear[1]; [1]University of Utah; [2]University of Michigan

MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Dissimilar & Non-Ferrous

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Thursday AM | March 23, 2023
29A | SDCC

Session Chairs: Piyush Upadhyay, Pacific Northwest National Laboratory; Xiao Li, Pacific Northwest National Laboratory

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8:30 AM Invited
High Speed Butt Joining of 1" Thick 2139-T8: Hrishikesh Das[1]; *Piyush Upadhyay*[1]; Reza Rabby[1]; Uchechi Okeke[2]; Martin McDonnell[2]; [1]Pacific Northwest National Laboratory; [2]DEVCOM GVSC

8:50 AM Invited
Friction Stir Welding to Seal 5 cm Thick Copper Canisters Containing Sweden´s Nuclear Waste: *Lars Cederqvist*[1]; [1]Swedish Nuclear Fuel and Waste Management Company (SKB)

9:10 AM Invited
Joining Cast Mg AZ91 and Wrought Al 6082 through Friction Stir Welding: Krzysztof Mroczka[1]; Stanisaw Dymek[2]; Adam Pietras[3]; Aleksandra Wglowska[3]; *Carter Hamilton*[4]; Mateusz Kopyściański[2]; [1]Cracow University of Technology; [2]AGH University of Science and Technology; [3]The ukasiewicz Research Network Institute of Welding; [4]Miami University

9:30 AM Invited
Dissimilar Copper and Aluminium Joining Using a Solid-state Friction-stir Welding Process: Nishkarsh Srivastava[1]; Arpan Rout[1]; *Amit Arora*[1]; [1]Indian Institute of Technology Gandhinagar

9:50 AM Break

10:10 AM
Copper-aluminum Hybrid Induction Motor Rotors Using Friction Stir Welding: *Hrishikesh Das*[1]; Piyush Upadhyay[1]; Glenn Grant[1]; John Agapiou[2]; Blair Carlson[2]; [1]Pacific Northwest National Laboratory; [2]General Motors

10:30 AM
Mechanism of Joint Formation in Dissimilar Friction Stir Welding of Aluminum to Steel: *Amlan Kar*[1]; Todd Curtis[1]; Bharat Jasthi[1]; Grant Crawford[1]; [1]Arbegast Materials Processing and Joining Laboratory (AMP),

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SPECIAL TOPICS

Frontiers of Materials Award Symposium: Intermetallic Alloys at the Edge of Complexity: Structural and Kinetic Aspects — Session II

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

Phase Transformations Committee, TMS: Solidification Committee

Program Organizer: Ashwin Shahani, University of Michigan

Thursday AM | March 23, 2023
28C | SDCC

Session Chair: Ashwin Shahani, University of Michigan

8:30 AM Invited
In-Situ Growth of PtSn4, a Complex Layered Intermetallic: Lin Zhou[1]; Feng Zhang[2]; Jiaqi Yu[1]; Xiaotian Fang[3]; Wenyu Huang[1]; *Matthew Kramer*[1]; [1]Ames National Laboratory; Iowa State University; [2]Ames National Laboratory; [3]Iowa State University

9:10 AM Invited
Direct Evaluation of Quasicrystal Bulk and Surface Energies in Density Functional Theory: *Wenhao Sun*[1]; [1]University of Michigan

9:50 AM Break

10:10 AM Invited
Complex Intermetallic Compounds: Original Surface Structures for Unusual Surface Properties: *Emilie Gaudry*[1]; [1]Université de Lorraine

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MATERIALS PROCESSING

Materials Processing Fundamentals — New Processes and Insights

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus Consulting; Alexandra Anderson, Gopher Resource; Adrian Sabau, Oak Ridge National Laboratory

Thursday AM | March 23, 2023
29B | SDCC

Session Chair: Samuel Wagstaff, Oculatus Consulting

8:30 AM Introductory Comments

8:35 AM
Scaling Up of Contactless Ultrasonic Cavitation: *Catherine Tonry*[1]; Christopher Beckwith[1]; Valdis Bojarevics[1]; Georgi Djambazov[1]; Koulis Pericleous[1]; [1]University of Greenwich

8:55 AM
Reductant Formation Enthalpy in DC Ferrochrome Smelting: Merely Academic or Fundamental to Operation: *Harmen Oterdoom*[1]; Markus Reuter[2]; Johan Zietsman[1]; [1]University of Pretoria; [2]SMS Group

9:15 AM
Measuring and Processing of Electrical Parameters in a Submerged Arc Furnace: *Hákon Haraldsson*[1]; Halldór Traustason[1]; Yonatan Tesfahunegn[1]; Merete Tangstad[2]; Gúðrún Sævarsdóttir[1]; [1]Reykjavík University; [2]Orwegian University of Science and Technology

9:35 AM
Virtual Reality for Die Casting Industry Workforce Preparation: John Moreland[1]; Cristina Cabascango[1]; *Kyle Toth*[1]; Chenn Zhou[1]; [1]Purdue University Northwest

9:55 AM Break

10:15 AM
Machining Fluid Filtration and Particle Count Measurement: *Chaitanya Ruhatiya*[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

10:35 AM
Comprehensive Recovery of Elemental Sulfur and Sulfide Minerals from Pressure Acid Leaching Residue of Zinc Sulfide Concentrate with an Integrated Flocculation Flotation-hot Filtration Process: *Guiqing Liu*[1]; Bangsheng Zhang[2]; Zhonglin Dong[3]; Fan Zhang[2]; Fang Wang[2]; Jintian Wu[3]; Tao Jiang[3]; Bin Xu[3]; [1]Northeastern University; [2]Jiangsu BGRIMM Metal Recycling Science & Technology Co. Ltd; [3]Central South University

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MATERIALS PROCESSING

Materials Research in Reduced Gravity — Solidification (Levitation) / Thermophysical Properties (Levitation)

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

Program Organizers: Wilhelmus Sillekens, European Space Agency; Michael Sansoucie, Nasa Marshall Space Flight Center; Robert Hyers, Worcester Polytechnic Institute; Douglas Matson, Tufts University; Gwendolyn Bracker, DLR Institute of Materials Physics in Space

Thursday AM | March 23, 2023
30B | SDCC

Session Chairs: Michael Sansoucie, Nasa Marshall Space Flight Center; Kaihua Ji, Northeastern University

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8:30 AM
Containerless Solidification of Al-22.5wt%Cu in Reduced Gravity Using the ISS-EML: *Jonas Valloton*[1]; Sven Vogel[2]; Hani Henein[1]; [1]University of Alberta; [2]Los Alamos National Laboratory

8:50 AM
Anomalous Kinetics of Rapidly Solidified Al-rich Al-Ni Alloys: *Peter Galenko*[1]; [1]Friedrich Schiller University Jena

9:10 AM
Transient Convective Transport during Undercooled Droplet Solidification: *Andrew Kao*[1]; Valdis Bojarevics[1]; Catherine Tonry[1]; Koulis Pericleous[1]; [1]University of Greenwich

9:30 AM
Influence of Undercooling and Convective Stirring on Phase Transformations in Electromagnetically Levitated Fe-Co: *Brian Stanford*[1]; Olga Shuleshova[2]; Douglas Matson[1]; [1]Tufts University; [2]Ifw Dresden

9:50 AM Break

10:10 AM
Relating Cooling Rates in Superheated Liquid and during Solidification: *Peace Muusha*[1]; Douglas Matson[1]; Matthias Kolbe[2]; [1]Tufts University; [2]DLR-Koln

10:30 AM
Effects of Oxygen on the Surface Tension of Liquid Inconel 718: *Michael Sansoucie*[1]; Elizabeth Hodges[2]; Robert Hyers[2]; [1]NASA Marshall Space Flight Center; [2]University of Massachusetts

10:50 AM
Experimental and Numerical Investigation of Dynamic Behavior of an Oscillating High-density Drop Processed using Electrostatic Levitation Furnace Aboard the International Space Station: *Ali Rabeh*[1]; Makrand Khanwale[2]; Masahito Watanabe[3]; Robert Hyers[4]; Michael SanSoucie[5]; Jonghyun Lee[1]; Baskar Ganapathysubramanian[1]; [1]Iowa State University; [2]Stanford University; [3]Gakushuin University; [4]University of Massachusetts Amherst; [5]NASA Marshall Space Flight Center

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — In-situ Testing and Novel Techniques

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

Thursday AM | March 23, 2023
28D | SDCC

Session Chairs: Assel Aitkaliyeva, University of Florida; Kayla Yano, PNNL

8:30 AM Invited
Mechanical Martensites in Nuclear Steels: *Janelle Wharry*[1]; Patrick Warren[1]; Haozheng Qu[1]; Chao Yang[1]; Yangyang Zhao[1]; Keyou Mao[2]; [1]Purdue University; [2]Florida State University

9:00 AM
Evaluation of Size Effects in Small Scale Mechanical Testing Combining Multi-length Scale Models and Experiments: *David Frazer*[1]; Stephanie Pitts[1]; Brennan Harris[1]; Fei Teng[1]; Trishelle Copeland-Johnson[1]; Kaustubh Bawane[1]; Sebastian Lam[2]; Dewen Yushu[1]; Peter Hosemann[2]; Fabiola Cappia[1]; [1]Idaho National Laboratory; [2]UC Bereley

9:20 AM
Micromechanical Aspects of Deformation and Failure of Advanced Iron-Chromium-Aluminum Alloys: Ercan Cakmak[1]; Maxim Gussev[1]; *Nedim Cinbiz*[2]; Kevin Field[3]; Ke An[1]; [1]Oak Ridge National Laboratory; [2]Idaho National Laboratory; [3]University of Michigan

9:40 AM
The Influence of Nanoindentation Orientation on Deformation Mechanisms in Irradiated Fe – P and Fe – N: *Patrick Warren*[1]; Keyou Mao[2]; Janelle Wharry[1]; [1]Purdue University; [2]Florida State University

10:00 AM Break

10:20 AM Invited
Non-destructive Stress Evaluation in Nuclear Materials by Positron Annihilation Spectroscopy: *Farida Selim*[1]; Djamel Kaoumi[2]; [1]Bowling Green State University; [2]North Carolina State University

10:50 AM
Error in RUS Measurements Due to Geometric Uncertainties: *Mathew Hayne*[1]; Luke Beardslee[1]; Anna Buckthorpe[1]; Paul Geimer[1]; Timothy Ulrich II[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

11:10 AM
Optimizing Nuclear Cladding Mechanical Property Output for Hot-cell Testing: *Benton Garrison*[1]; Caleb Massey[1]; Maxim Gussev[1]; Nathan Capps[1]; Jason Harp[1]; [1]Oak Ridge National Lab

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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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

Thursday AM | March 23, 2023
Aqua 310B | Hilton

Session Chairs: Robert Wheeler, Microtesting Solutions LLC; Daniel Hong, Ohio State University

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8:30 AM Invited
In situ Synchrotron Observation of Deformation Mechanisms, from Hot Tears during Superalloy Solidification to Volcanic Eruptions: *Peter Lee*[1]; Mohammed Azeem[2]; Nolween Le Gall[1]; Robert Atwood[3]; [1]University College London; [2]University of Leicester; [3]Diamond Light Source

9:00 AM
Understanding AM 316L Steel Microstructure Evolution due to Post-process Laser Scanning: A Thermo-mechanical Modeling and In-situ Laser-SEM Study: Nikhil Mohanan[1]; *Juan Guillermo Santos Macias*[1]; Jérémy Bleyer[2]; Thomas Helfer[3]; Manas Upadhyay[1]; [1]Laboratoire de Mécanique des Solides, École Polytechnique; [2]Laboratoire Navier, ENPC, Université Gustave Eiffel; [3]CEA, DEN/DEC/SESC

9:20 AM
Monitoring Crystal-scale Evolution in Real-time using In-situ High Energy Diffraction Microscopy and Principal Component Analysis: *Dalton Shadle*[1]; Kelly Nygren[2]; Matthew Miller[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron Source

9:40 AM
Numerical Modeling and Advanced Characterization Techniques to Study the Influence of Process-inherited Local Deformation on In-service Behavior of an Inconel 718: Julien Genee[1]; *Sylvain Vallot*[1]; Damien Texier[1]; Denis Delagnes[1]; [1]Clement Ader Institute

10:00 AM Break

10:30 AM
Gradient Shape Memory Alloys: An Exploration of Pseudo and Thermo-elastic Response: *Daniel Hong*[1]; Xuesong Gao[1]; Peter Anderson[1]; [1]Ohio State University

10:50 AM
In-situ Microstructure Evolution during High Temperature Deformation of Fe-C-Mn-Si Steel: *Abhishek Arya*[1]; Muhammad Nabeel[1]; Andre Phillion[1]; [1]McMaster University

11:10 AM
Numerical Examination of the Oliver-Pharr Method for Nanoindentation of Shape Memory Alloys: *Xuesong Gao*[1]; Daniel Hong[1]; Harshad Paranjape[2]; Wei Zhang[1]; Peter Anderson[1]; [1]Ohio State University; [2]Confluent Medical Technologies, Inc

11:30 AM
Micro-tensile Experiments on Low-carbon Martensitic Stainless Steel Alloy S41500: *Pierre-Antony Deschenes*[1]; Robert Wheeler[2]; Daniel Paquet[3]; Jacques Lanteigne[3]; A.M. Serventi[1]; Laurent Tôn-Thât[1]; Henri Champliaud[4]; [1]Hydro-Quebec; [2]Microtesting Solutions LLC; [3]Hydro-Quebec ; [4]Ecole de technologie supérieure

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NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Modeling and Simulation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Thursday AM | March 23, 2023
Aqua 303 | Hilton

Session Chair: Yue Fan, University of Michigan

8:30 AM Invited
Exploring the Shear Localization in Metallic Nanolayered Composites via Atomistic Simulations: *Caizhi Zhou*[1]; Shujing Dong[1]; [1]University of South Carolina

8:55 AM Invited
The Role of Chemical Short-range Order on Defects Migration and Evolution in Multi-principal Element Alloys: Bin Xing[1]; Xinyi Wang[1]; *Penghui Cao*[1]; [1]University of California, Irvine

9:20 AM
Shock Compression of Nanocrystalline Boron Carbide from Deep Learning Molecular Dynamics Simulations: *Qi An*[1]; Jun Li[1]; [1]Iowa State University

9:40 AM
Multi-scale Framework to Simulate the Long-term Diffusion Radiation-induced Defects in Nano-crystalline Materials: *Mohamed Hendy*[1]; Okan Orhan[1]; Mauricio Ponga[1]; [1]The University of British Columbia

10:00 AM Break

10:20 AM
Coarsening Kinetics in Surface-doped Nanoporous Metals: *Luis Granadillo*[1]; Ian McCue[1]; [1]Northwestern University

10:40 AM
The Role of Grain Boundaries in the Morphological Instabilities of Nanoscale Geometries: *Omar Hussein*[1]; Keith Coffman[2]; Khalid Hattar[3]; Eric Lang[3]; Shen Dillon[4]; Fadi Abdeljawad[1]; [1]Clemson University; [2]University of Illinois Urbana-Champaign; [3]Sandia National Laboratories; [4]University of California, Irvine

11:00 AM
A Grain Boundary Solute Drag in Regular Solution Alloys: *Malek Alkayyali*[1]; Fadi Abdeljawad[1]; [1]Clemson University

ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Mineral Processing

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Thursday AM | March 23, 2023
33C | SDCC

Session Chairs: Edgar Vidal, NobelClad; Tao Wang, Rio Tinto

8:30 AM Invited
Titanomagnetites: Ores of the Future?: *Thomas Battle*[1]; [1]Extractive Metallurgy Consultant

9:00 AM
NbC-containing High Carbon Steel Grinding Media Development: *Casey Brown*[1]; John Heerema[2]; Charles Enloe[3]; Erik Spiller[4]; John Speer[1]; Emmanuel De Moor[1]; [1]Colorado School of Mines, Advanced Steel Processing and Products Research Center; [2]Gerdau Long Steel; [3]CBMM; [4]Colorado School of Mines

9:20 AM
Evaluating Waste Reprocessing: Framework Development: *Joseph Trouba*[1]; Nina Zaronikola[1]; Roderick Eggert[1]; Elizabeth Holley[1]; [1]Colorado School of Mines

9:40 AM
Investigation of Heavy Metal Levels in Tin Mine Wastes and the Implication to Mine Closure Plan: A Case Study of Rutongo Mine, Rwanda: Jean Ishimwe[1]; *Abubakary Salama*[1]; Kenneth Sichone[2]; Kenneth Sichone[3]; [1]University of Dar es Salaam; [2]Harvest University; [3]University of Rwanda

10:00 AM Break

10:20 AM
Processing of Luanshya Copper Smelting Slag: *Yaki Namiluko*[1]; Yotamu Hara[1]; Rainford Hara[1]; Nachikonde Fumpa[1]; Agabu Shane[1]; Makwenda Ngomba[1]; Ireen Musukwa[1]; Ronald Hara[1]; [1]Copperbelt University

10:40 AM
Separation of Li and Co from LiCoO2 Cathode Material through Aluminothermic Reduction Using Different Aluminum Sources: Chemical Grade, Swarf, and Dross: *Deddy Nababan*[1]; Reiza Mukhlis[1]; Yvonne Durandet[1]; Leon Prentice[2]; M. Akbar Rhamdhani[1]; [1]Swinburne University of Technology; [2]CSIRO Manufacturing

11:00 AM
Towards Framework Development for Benchmarking Energy Efficiency in Foundation Industries: A Case Study of Granulation Process: *Shoaib Sarfraz*[1]; Ziyad Sherif[1]; Mark Jolly[1]; Konstantinos Salonitis[1]; [1]Cranfield University

NUCLEAR MATERIALS

Phase Stability in Extreme Environments — Stress Induced Transformations and Mechanical Properties in Extreme Environments

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee

Program Organizers: Andrew Hoffman, GE Research; Kinga Unocic, Oak Ridge National Laboratory; Janelle Wharry, Purdue University; Kaila Bertsch, Lawrence Livermore National Laboratory; Raul Rebak, GE Global Research

Thursday AM | March 23, 2023
27A | SDCC

Session Chairs: Caleb Clement, Purdue University; Kelvin Xie, Texas A&M University

8:30 AM Invited
Taming the Pseudoelastic Response of Nitinol Using Ion Implantation: *Peter Anderson*[1]; Alejandro Hinojos[1]; Daniel Hong[1]; Hariharan Sriram[1]; Chao Yang[2]; Janelle Wharry[2]; Xuesong Gao[1]; Khalid Hattar[3]; Nan Li[4]; Jeremy Schaffer[5]; Yunzhi Wang[1]; Michael Mills[1]; [1]The Ohio State University; [2]Purdue University; [3]Sandia National Labs; [4]Los Alamos National Labs; [5]Fort Wayne Metals

9:00 AM Invited
Grain-subdivision-dominated Microstructure Evolution in Shear Bands at High Rates: *Kelvin Xie*[1]; [1]Texas A&M University

9:30 AM
Heat Treatment Design of Inconel 740H Superalloy for Microstructure Stability and Creep Properties Enhancement: Dong-Min Kim[1]; *Cheol-Hyeok Yang*[1]; Hyun-Uk Hong[1]; Hi-Won Jeong[2]; [1]Changwon National University; [2]Korea Institute of Materials Science

9:50 AM
Investigation of Effect of Stress on Laves Phase Precipitation and Growth in Creep-ruptured Grade 92 Steel: *Emily Proehl*[1]; Steven Zinkle[1]; Lizhen Tan[2]; Ying Yang[2]; David Sprouster[3]; Weicheng Zhong[2]; [1]University of Tennessee-Knoxville; [2]Oak Ridge National Laboratory; [3]Stony Brook University

10:10 AM Break

10:25 AM Invited
Decoupling Irradiation Effects on Unusual Deformation Mechanisms in Alloy 625: *Caleb Clement*[1]; Janelle Wharry[1]; [1]Purdue University

10:55 AM Invited
The Impact of Short-order Order on Deformation Phase Transformation and Microstructure Evolution in Multi-principal Element Alloys: Hangman Chen[1]; Mingjie Xu[1]; Xin Wang[1]; Enrique Lavernia[1]; Xiaoqing Pan[1]; *Penghui Cao*[1]; [1]University of California, Irvine

11:25 AM
Effect of Annealing Temperature on the Structure and Mechanical Properties of a Single-phase WFeNiMo Multi-principal Element Alloy Film: *Zahidur Rahman*[1]; Michael Detisch[1]; John Balk[1]; [1]University of Kentucky

11:45 AM
Oxidation Effects in High-temperature Shape Memory Alloys: Tom Ralph[1]; *Jean-Briac le Graverend*[1]; [1]Texas A&M University

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Additive Manufacturing

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Thursday AM | March 23, 2023
25C | SDCC

Session Chair: Ashley Paz y Puente, University of Cincinnati

8:30 AM
Compositional Redistribution, Phase Transformation, Microstructural Development in SS316L/IN718 Bimetallic Structure Fabricated by Laser Powder Bed Fusion: *Asif Mahmud*[1]; Nicolas Ayers[1]; Thinh Huynh[1]; Kevin Graydon[1]; Yongho Sohn[1]; [1]University of Central Florida

8:50 AM
Tracking Precipitate Evolution in an AM 316L Steel during Solid-state Thermal Cycling: A 3D Synchrotron X-ray Nanotomography Study: Steve Gaudez[1]; Meriem Ben Haj Slama[1]; Lluis Yedra[2]; Eva Héripré[3]; Mario Scheel[4]; Hakim Gharbi[1]; Simon Hallais[1]; *Manas Upadhyay*[1]; [1]Ecole Polytechnique, LMS, CNRS; [2]Universitat de Barcelona; [3]CentraleSupélec, CNRS, Université Paris-Saclay; [4]Anatomix beamline,

Soleil synchrotron

9:10 AM
Recrystallization Kinetics of 316L Stainless Steel Processed by Laser Powder Bed Fusion (LPBF): *Edouard de Sonis*[1]; Sylvain Dépinoy[2]; Pierre-François Giroux[3]; Hicham Maskrot[4]; Louis Lemarquis[3]; Olivier Hercher[4]; Flore Villaret[5]; Anne-Françoise Gourgues-Lorenzon[2]; [1]Université Paris-Saclay, CEA, Service de Recherches Métallurgiques Appliquées; [2]Mines Paris, PSL University, MAT - Centre des Matériaux, CNRS UMR 7633, BP 87; [3]Université Paris-Saclay, CEA, Service de Recherches Métallurgiques Appliquées, F-91191; [4]Université Paris-Saclay, CEA, Service d'Études Analytiques et de Réactivités des Surfaces, F-91191; [5]EDF R&D, Département Matériaux et Mécanique des Composants (MMC), Les Renardières, F-77250

9:30 AM
Rationalization of the Solidification Behavior in Additively Manufactured PH Steels Using In-situ Radiography, Ex-situ Orientation Image Microscopy and Thermodynamic Modelling: *Rakesh Kamath*[1]; Logan White[1]; Serena Beauchamp[1]; Kamel Fezzaa[2]; Eric Lass[1]; Hahn Choo[1]; [1]University of Tennessee Knoxville; [2]Argonne National Laboratory

9:50 AM
Measurements of Retained Austenite in Additively Manufactured Nitrogen Atomized 17-4PH Stainless Steel: *James Zuback*[1]; Fan Zhang[1]; Daniel Gopman[1]; Mark Stoudt[1]; Maureen Williams[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

10:10 AM Break

10:30 AM
Phase Transformations during Laser-based Powder Bed Fusion Studied by Operando X-ray Diffraction: *Steven Van Petegem*[1]; [1]Paul Scherrer Institut

10:50 AM
Quantifying the Beta-to-Alpha Solid-State Phase Transformation in Additive Manufactured Ti-6Al-4V Using High-Energy X-ray Diffraction Measurements and Phase Field Modeling: *Bonnie Whitney*[1]; Anthony Spangenberger[1]; Dan Savage[2]; Donald Brown[2]; Travis Carver[2]; Diana Lados[1]; [1]Worcester Polytechnic Institute; [2]Los Alamos National Laboratory

11:10 AM
Structural Evolution during Nanostructuring and Heating of an Additive-Manufactured CoCrFeNi Alloys Examined by X-ray and In-situ Neutron Diffraction Analyses: *Megumi Kawasaki*[1]; Jae-Kyung Han[1]; Xiaojing Liu[2]; Klaus-Dieter Liss[2]; [1]Oregon State University; [2]Guangdong Technion - Israel Institute of Technology

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Control Macro and Microstructures II

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

Thursday AM | March 23, 2023

25B | SDCC

Session Chairs: Claude Estournès, CIRIMAT/CNRS; Iver Anderson, Iowa State University Ames Laboratory; Charles Maniere, CRISMAT laboratory

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8:30 AM
Investigation of Gas Atomization Reaction Synthesis (GARS) Processing Parameters for Controlled Synthesis of Oxide Dispersion Strengthened (ODS) Ferritic Stainless Steels for Advanced Nuclear Reactor Applications: Jordan Tiarks[1]; Landon Hickman[1]; Emma Cockburn[1]; Ralph Napolitano[2]; Trevor Riedemann[1]; Nicolas Argibay[1]; *Iver Anderson*[1]; [1]Ames National Laboratory; [2]Iowa State University

8:50 AM
Additive Manufacturing of Powder Components Based on Subtractive Sintering Approach: *Maricruz Carrillo*[1]; Eugene Olevsky[1]; Charles Maniere[1]; Geuntak Lee[1]; [1]San Diego State University

9:10 AM
Immobilization of Laccases on ZnO and CuO Nanoparticles and the Effect of Copper Ions on Their Stability and Catalytic Activity: *F. Suarez*[1]; Eesa Khan[1]; Rafael Vazquez-Duhalt[2]; Olivia Graeve[1]; [1]University of California San Diego; [2]Universidad Nacional Autónoma de México

9:30 AM
Evolution of Microstructure and Defects in Laser Powder Bed Fused Alloys after Hot Isostatic Pressing: *Penn Rawn*[1]; Le Zhou[1]; [1]Marquette University

9:50 AM Invited
Toward the Flash Sintering of Complex Shapes, the Key Steps of Microwave Energy and 3D Printing: *Charles Maniere*[1]; Geuntak Lee[2]; Elisa Torresani[2]; Guillaume Riquet[3]; Sylvain Marinel[3]; Eugene A. Olevsky[2]; [1]CRISMAT laboratory; [2]San Diego State University; [3]CRISMAT Laboratory

10:20 AM Break

10:40 AM Invited
Spark Plasma Sintering of Stabilized Zirconia: Strategies to Design Ceramics with Tailored Properties: *Claude Estournes*[1]; Andréas Flaureau[2]; Amaud Fregeac[3]; Mélanie Rousselle[3]; Thomas Herisson de Beauvoir[1]; Geoffoy Chevallier[1]; Alicia Weible[1]; Florence Ansart[1]; Guillaume Fradet[4]; Serge Selezneff[4]; Catherine Elissalde[5]; Fabrice Mauvy[5]; [1]CIRIMAT, Université de Toulouse; [2]CIRIMAT; [3]CIRIMAT, Université de Toulouse, SAFRAN Aircraft Engines; [4]SAFRAN Aircraft Engines; [5]ICMCB, CNRS Université Bordeaux

11:10 AM
Understanding Solidification and Alloying Effects in Oxide Dispersoid Strengthened Alloy Powders Produced by Gas Atomization Reaction Synthesis: *Emma Cockburn*[1]; Iver Anderson[2]; Nicolas Argibay[2]; Jordan Tiarks[2]; Trevor Reidemann[2]; Ralph Napolitano[1]; [1]Iowa State University; [2]Ames National Laboratory

11:30 AM
Morphology Control of Doped Hafnium Carbide Powders: *Shari Estrada*[1]; Rafael Chavez[1]; Olivia Graeve[1]; [1]University of California San Diego

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ADDITIVE TECHNOLOGIES

Quantifying Microstructure Heterogeneity for Qualification of Additively Manufactured Materials — Roles for Modeling and Data Science

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS

Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Sharniece Holland, Washington University in St. Louis; Eric Payton, University of Cincinnati; Edwin Schwalbach, Air Force Research Labroatory; Joy Gockel, Colorado School of Mines; Ashley Paz y Puente, University of Cincinnati; Paul Wilson, The Boeing Company; Amit Verma, LLNL; Sriram Vijayan, Ohio State University; Jake Benzing, National Institute of Standards and Technology

Thursday AM | March 23, 2023
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Session Chairs: Edwin Schwalbach, Air Force Research Laboratory; Amit Verma, Carnegie Mellon University

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8:30 AM Invited
Towards Validation of Thermo-mechanical Finite Element Modeling of the Additive Manufacturing Solidification Process: *William Musinski*[1]; Paul Shade[1]; Edwin Schwalbach[1]; [1]US Air Force Research Laboratory

8:55 AM
Effects of Laser Process Parameters on Denudation Zone Width in Laser Powder Bed Fusion Additive Manufacturing: *Mehdi Amiri*; Eric Payton[1]; [1]Air Force Research Laboratory

9:15 AM
3D Computer Vision and Deep Learning for Porosity Analysis in Additive Manufacturing: *Daniel Diaz*[1]; Xingyang Li[1]; Yuheng Nie[1]; Elizabeth Holm[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

9:35 AM
Quantitative Analysis of Low Concentration Elements at the Nanoscale in Additively Manufactured Alloys: *Pritesh Parikh*[1]; Darshan Jaware[1]; Jiangtao Zhu[1]; Karol Putyera[2]; Rajiv Soman[2]; [1]Eurofins Nanolab Technologies; [2]Eurofins EAG Laboratories

9:55 AM Break

10:20 AM
Predicting Crystallographic Texture in Laser Powder Bed Fusion via a Machine Learning Approach: *Gregory Wong*[1]; Elizabeth Holm[1]; Anthony Rollett[1]; Gregory Rohrer[1]; [1]Carnegie Mellon University

10:40 AM
Effects of Processing Conditions and Build Geometry on Microstructure Development in Laser Powder Bed Fusion and Wire Arc Additively Manufactured 316L: *Charles Smith*[1]; Olivia Denonno[1]; Matthew Schreiber[1]; Anthony Petrella[1]; Amy Clarke[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines

11:00 AM
Additive Manufacturing Beyond the Gaussian Beam: Insights from Microstructure-based Modeling Studies: *Daniel Moore*[1]; Theron Rodgers[2]; Sergio Turteltaub[3]; Daniel Moser[2]; Heather Murdoch[4]; Fadi Abdeljawadf[1]; [1]Clemson University; [2]Sandia National Laboratories; [3]Delft University of Technology; [4]Army Research Laboratory

11:20 AM
The Impact of Volumetric Energy Density on Mechanical Properties of Additively Manufactured 718 Ni Alloy: *Benjamin Stegman*[1]; Anyu Shang[1]; Luke Hoppenrath[1]; Anant Raj[1]; Hany Abdel-Khalik[1]; John Sutherland[1]; David Schick[2]; Victor Morgan[2];

Kirti Jackson[2]; Xinghang Zhang[1]; [1]Purdue University; [2]Proto Precision Additive LLC

ADVANCED MATERIALS

Refractory Metals 2023 — Mechanical Behavior - Ultimate Plus

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

Program Organizers: Brady Butler, US Army Research Laboratory; Todd Leonhardt, Rhenium Alloys Inc.; Matthew Osborne, Global Advanced Metals; Zachary Levin, Los Alamos National Laboratory

Thursday AM | March 23, 2023
Aqua E | Hilton

Session Chair: Todd Leonhardt, Rhenium Alloys Inc

8:30 AM
Mechanistic Models of the Inelastic Deformation of Refractory BCC Metals: *Christopher Weinberger*[1]; Anik Faisal[1]; Hunter Brumblay[1]; [1]Colorado State University

8:50 AM
Dislocation Emission from Crack Tips in Cr Studied by In-situ TEM: *Daniel Kiener*[1]; Michael Burtscher[1]; Inas Issa[1]; Klemens Schmuck[1]; Christoph Gammer[2]; Stefan Sandfeld[3]; [1]University of Leoben; [2]Erich Schmid Institute; [3]Forschungszentrum Juelich

9:10 AM
Insights on the Fatigue Crack Growth Behaviour of Rolled Tungsten for Its Application in Nuclear Fusion: *Michael Pegritz*[1]; Stefan Wurster[1]; Reinhard Pippan[1]; Anton Hohenwarter[2]; [1]Erich Schid Institute of Materials Science of the Austrian Academy of Sciences; [2]Montanuniversität Leoben

9:30 AM
The Influence of Thermally Activated Dislocation Motion on the Brittle-ductile Transition of BCC Refractory Metals: *Hunter Brumblay*[1]; Tariqul Islam[2]; Gregory Thompson[2]; Christopher Weinberger[1]; [1]Colorado State University; [2]University of Alabama

9:50 AM
Mechanical Properties of WMoFeNi Alloys during High Strain-rate Testing: *Kerry Baker*[1]; Riya Barua[1]; Zahidur Rahman[1]; T Balk[1]; [1]University of Kentucky

10:10 AM Break

10:25 AM
Stress Relaxation Behavior of Molybdenum Sheet: Alex Xie[1]; *Gary Rozak*[2]; Oliver Horst[1]; [1]QSIL; [2]H.C. Starck Solutions

10:45 AM
Alloys of Chromium-Silicon Alloys with Iron and Nickel for Structural High Temperature Applications: Michael Kerbstadt[1]; Emma White[1]; *Mathias Galetz*[1]; [1]DECHEMA-Forschungsinstitut

11:05 AM
Strengthening in Mo-La Alloys at Temperatures from 1500 C to 1700 C: *Monica Martinez*[1]; Gary Rozak[2]; Eric Taleff[1]; [1]University of Texas at Austin; [2]H.C. Starck Solutions

NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Thermodynamic/Radiobiology

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Thursday AM | March 23, 2023
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Session Chairs: Shuxiang Zhou, INL; Rory Kennedy, INL

8:30 AM Invited
Elucidating the Corrosion Mechanism of Commercial Ni-based Superalloys in UCl3 Containing-chloride Molten Salt Systems: *Trishelle Copeland-Johnson*[1]; Xavier Quintana[2]; Michael Woods[1]; Ruchi Gakhar[1]; Daniel Murray[1]; Guoping Cao[1]; Lingfeng He[1]; [1]Idaho National Laboratory; [2]Oregon State University

9:00 AM Invited
Practical Approach to Modeling the Complex Thermochemistry of Actinide-Containing Molten Salts: *Theodore Besmann*[1]; Jacob Yingling[1]; Juliano Schorne-Pinto[1]; Johnathan[1]; Mina Aziziha[1]; Clara Dixon[1]; Jorge Paz Soldan Palma[1]; Ronald Booth[1]; Amir Mehdi Mofrad[1]; joshua Wermers[1]; [1]University of South Carolina

9:30 AM
Revisiting the U-Zr Phase Diagram: A Critical Review: Walter Williams[1]; Jarrod Lund[2]; Maria Okuniewski[2]; *Edwin Garcia*[2]; [1]INL; [2]Purdue University

9:50 AM
Thermodynamics of Plutonium, Its Alloys and Defects: *Franz Freibert*[1]; [1]Los Alamos National Laboratory

10:10 AM Break

10:30 AM Invited
Elucidating the Radiobiology of Alpha Particles in Cancer Therapy: *Sandra Davern*[1]; Miguel Toro-Gonzalez[1]; Amber Bible[1]; [1]Oak Ridge National Laboratory

11:00 AM Invited
Advancing Actinium-225 Coordination Chemistry and Chelator Development for Targeted Alpha Therapy: Megan Simms[1]; Caroline Lara[1]; Alex Ivanov[1]; *Nikki Thiele*[1]; [1]Oak Ridge National Laboratory

11:30 AM
Structural Changes in Molten Salt Fuel and/or Waste Stream Compounds Cs2UCl6 and Cs2UO2Cl4 from Room Temperature to Melting: *Benjamin Walusiak*[1]; Alice Smith[2]; Sven Vogel[2]; Stepehn Parker[2]; Shane Mann[2]; Alberto Gomez[2]; Adam Phelan[2]; Christopher Cahill[1]; [1]George Washington University; [2]Los Alamos National Laboratory

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NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path

Forward — Radiation Damage Characterization, Modeling & Alloy Design I

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Thursday AM | March 23, 2023
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Session Chairs: Lance Snead, Stony Brook University; Aurelie Gentils, University of Paris-Saclay, CNRS

8:30 AM Invited
Characterizing Transmutation Products in Materials via STEM and Machine Learning: *Chad Parish*[1]; [1]Oak Ridge National Laboratory

9:10 AM
Suppression of Rhenium and Osmium Production in Tungsten-based Materials for Fusion Energy: *Mark Anderton*[1]; Matthew Lloyd[2]; Thomas Davis[1]; [1]Oxford Sigma Ltd; [2]Singapore University of Technology and Design

9:30 AM
Investigation of High Temperature He Embrittlement Effects in High Performance Nickel-based Alloys: *Zehui Qi*[1]; Steven Zinkle[1]; [1]University of Tennessee, Knoxville

9:50 AM
Machine Learning Generation of Trajectories for Accurate Modeling Plasma Material Interactions: *Osetsky Yury*[1]; German Samolyuk[1]; Eva Zarkadoula[1]; Markus Eisenbach[1]; Cornwall Lau[1]; Juergen Rapp[1]; [1]Oak Ridge National Laboratory

10:10 AM Break

10:30 AM Invited
Magic Numbers on the Shape of Voids Formed by Electron Irradiation in Aluminium: *Estelle Meslin*[1]; Camille Jacquelin[1]; C.-C. Fu[1]; Maylise Nastar[1]; [1]CEA

11:10 AM
No Ball Milling Needed: Revamping Fabrication Route of ODS Steel Plate with Cold Spray and Friction Stir Processing: *Dalong Zhang*[1]; Jens Darsell[1]; Kenneth Ross[1]; Glenn Grant[1]; Iver Anderson[2]; Jia Liu[1]; Xiaolong Ma[1]; Danny Edwards[1]; Wahyu Setyawan[1]; [1]Pacific Northwest National Laboratory; [2]Ames Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Steels II

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

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas,

Sandia National Laboratories; Iver Anderson, Iowa State University Ames Laboratory

Thursday PM | March 23, 2023
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Session Chairs: Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut

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2:00 PM
Directed Energy Deposition of AF9628: Process Optimization and Overhang Compensation: *Clara Mock*[1]; Josh Taggart-Scarff[2]; Brandon McWilliams[1]; [1]DEVCOM Army Research Laboratory; [2]SURVICE Engineering

2:20 PM
Process-microstructure-mechanical Property Correlations of a 3D Printed Austenitic Steel – From Powder Bed Fusion to Directed Energy Deposition: *Shubham Chandra*[1]; Xipeng Tan[2]; Upadrasta Ramamurty[1]; [1]Nanyang Technological University; [2]National University of Singapore

2:40 PM
Thermal-Stress Modeling during DED Hybrid Technology Using 316L Stainless Steel: *Mukesh Kalel*[1]; Pedro Cortes[1]; Kyosung Choo[1]; Jose Angel Diosdado De la Pena[1]; Eric Haake[1]; [1]Youngstown State University

3:00 PM
Microstructure and Mechanical Properties of 17-4PH Stainless Steels Manufactured by Material Extrusion Additive Manufacturing: *Yong-Hoon Cho*[1]; So-Yeon Park[1]; Ju Yong Kim[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]Reprotech

3:20 PM
Additive Manufacturing of Multi-material Metal Structures Using Powders Produced by Machining: *Puli Saikiran*[1]; Harish Dhami[1]; Priti Panda[1]; Koushik Viswanathan[1]; [1]Indian Institute of Science

3:40 PM Break

3:55 PM
Alloy Development through In-situ Mixing of Stainless Steel 316L and Inconel 718 Using Directed Energy Deposition: *Noah Sargent*[1]; Samad Firdosy[2]; Kinga Unocic[3]; Jonathan Poplawsky[3]; Richard Otis[2]; Wei Xiong[1]; [1]University of Pittsburgh; [2]Jet Propulsion Laboratory, California Institute of Technology; [3]Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

4:15 PM
In-situ Synthesis of Invar Alloys by Dual-wire Deposition Using WAAM: *Arjun Sood*[1]; Jim Schimmel[1]; Constantinos Goulas[2]; Vera Popovich[1]; Marcel Hermans[1]; [1]Delft University of Technology; [2]University of Twente

4:35 PM
Laser Beam Directed Energy Deposition of High-Si Content Fe-Si Soft Magnetic Alloys: *Andrew Kustas*[1]; Don Susan[1]; Todd Monson[1]; Sarah Birchall[1]; Shaun Whetten[1]; Mark Wilson[1]; Kyle Johnson[1]; Jonathan Pegues[1]; Erin Barrick[1]; [1]Sandia National Laboratories

4:55 PM
Additive Manufacturing of Titanium/Diamond Metal Matrix Composites: Cherry Chen[1]; *Robert Wilson*[1]; Geoff de Looze[1]; Kun Yang[1]; [1]CSIRO

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — Session VII

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; Steve Daniewicz, University of Alabama; Mohsen Seifi, ASTM International/Case Western Reserve University

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Session Chair: Dillon Watring, Naval Research Laboratory

2:00 PM Invited
Process-structure-property Relationships of Additively Manufactured Materials: Challenges and Opportunities: *Pooriya Nezhadfar*[1]; [1]GE Aviation

2:30 PM
High Cycle Fatigue Properties of Laser Metal Deposited Waspaloy: *Romain Bordas*[1]; Jonathan Cormier[1]; Patrick Villechaise[1]; Azdine Nait-Ali[1]; André Malié[2]; Alice Cervellon[2]; Roland Fortunier[3]; [1]Ensma - Institut Pprime - Upr Cnrs 3346; [2]Safran Aircraft Engines; [3]LTDS, école centrale Lyon / ENISE, on secondment to ENSMA

2:50 PM
Comparison of Fatigue Properties, Fractography, and Microstructures of Laser Powder Bed Fusion Al 6XRAM2, 7XRAM2, and 7A77 Aluminum Alloys: Teri Juarez[1]; *Molly Hwang*[1]; Bryan McEnerney[1]; [1]NASA JPL

3:10 PM
CuCrZr Processed by Laser-Based Powder Bed Fusion - Processability and Influence of Heat Treatment on Electrical Conductivity, Microstructure and Mechanical properties: *Thomas Wegener*[1]; Julian Koopmann[2]; Julia Richter[1]; Philipp Krooß[1]; Thomas Niendorf[1]; [1]University of Kassel; [2]Group Research, Volkswagen AG

3:30 PM Break

3:50 PM
Development of Post-process Heat Treatments Strategy for an Additively Ti-B2 Reinforced AlCu Alloy: *Francesco Careri*[1]; Raja Khan[2]; Moataz Attallah[1]; [1]University of Birmingham; [2]TWI Ltd

4:10 PM
Capturing Cracking during Blown Powder Additive Manufacturing Using Correlative Synchrotron X-ray and IR Imaging: *David Rees*[1]; Tristan Fleming[2]; Xianqiang Fan[1]; Yuze Huang[3]; Imogen Cowley[1]; Sebastian Marussi[1]; Robert Atwood[4]; Martyn Jones[5]; Ben Saunders[5]; Cu Lun Alex Leung[1]; Peter Lee[1]; [1]University College London; [2]Queen's University; [3]Coventry University; [4]Diamond Light Source Ltd; [5]Rolls-Royce plc

4:30 PM
Residual Stress Induced Fracture of As-Fabricated Laser Powder Bed Fusion Parts: *Albert To*[1]; Hai Tran[1]; [1]University of Pittsburgh

4:50 PM
Surface Roughness Measurements of Laser Deposited AlCoCrFeNiTi and AlCoCrFeNiCu High Entropy Alloys for Aerospace Applications: *Modupeola Dada*[1];

Patricia Popoola[1]; [1]Tshwane University of Technology

ADDITIVE TECHNOLOGIES

Additive Manufacturing for Energy Applications V — Processes and Optimization II

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

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

Thursday PM | March 23, 2023
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Session Chair: Yi Xie, Purdue University

2:00 PM Introductory Comments

2:05 PM Invited
Enabling Part-Scale Scanwise Process Simulation of Laser Powder Bed Fusion by Combining Matrix-free Finite Element Modeling, Adaptive Remeshing, and GPU Computing: *Albert To*[1]; Alaa Olleak[1]; Florian Dugast[1]; [1]University of Pittsburgh

2:40 PM
Inspection Results from a Real Time Non-Destructive Evaluation of 3D Manufactured Metal Parts: *Araz Yacoubian*[1]; [1]LER Technologies Inc.

3:00 PM
Assessment of Laser Powder Bed Melting for Obtaining Ferritic/Martensitic ODS: Lucas Autones[1]; *Yann De Carlan*[1]; Pascal Aubry[1]; Joel Ribis[1]; Hadrien Leguy[1]; Alexandre Legris[1]; Jean Henry[1]; [1]CEA

3:20 PM
Additive Manufacturing of an Oxide Dispersion Strengthened Nickel-based Alloy for Molten Salt Reactor Application Using Hastelloy N Powder: Fedi Fehri[1]; *Matthew deJong*[1]; Sourabh Saptarshi[1]; Timothy Horn[1]; Djamel Kaoumi[1]; [1]North Carolina State University

3:40 PM Break

3:55 PM
Wire-Arc Additive Manufacturing of Soft-magnetic Alloy: *Soumyajit Koley*[1]; Kuladeep Rajamudili[1]; Supriyo Ganguly[1]; [1]Cranfield University

4:15 PM
Effect of Precipitate Wettability on Nanoscale Oxide Precipitation of Additively Manufactured FeCrAl via *In Situ* Oxidation: *Ty Austin*[1]; Steven Zinkle[1]; Niyanth Sridharan[2]; [1]University of Tennessee, Knoxville; [2]Lincoln Electric

4:35 PM
An Additively Manufactured Integrated Heat Pipe and Heat Exchanger with Thermoelectric Devices: *Donna Guillen*[1]; Miu Lau[2]; Kari Perry[1]; Dennis Tucker[1]; Arin Preston[1]; Laura Ziegler[1]; [1]Idaho National Laboratory; [2]Boise State University

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Large-scale Metallic Components — Novel Applications II

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

Program Organizers: Sougata Roy, University of North Dakota; Sneha Prabha Narra, Carnegie Mellon University; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh; Yashwanth Bandari, AddiTec Technologies LLC

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Session Chair: Kyle Johnson, Sandia National Laboratories

2:00 PM
Distortion Compensation for Metal Additive Manufacturing: Theresa Honein[1]; *Collette Gillaspie*[1]; Mehmet Sirtalan[1]; Kyle Johnson[1]; Carl Herriott[1]; Michael Stender[1]; Ellen Wagman[1]; Richard Deering[2]; [1]Sandia National Laboratories; [2]Kansas City National Security Campus

2:20 PM
Effect of Aging and Quenching Media on the Mechanical Behavior of AlSi10Mg: *Bryan Mcenerney*[1]; R. Dillon[1]; Molly Hwang[1]; John Paul Borgonia[1]; Richard Otis[1]; [1]NASA Jet Propulsion Laboratory

2:40 PM
In Situ Monitoring of Residual Stress during Heat Treatment of High Strength Additively Manufactured Steel via Laser Ultrasound Measurements: *Franklyn Kellogg*[1]; Stephen Cluff[1]; Josh Taggart-Scarff[1]; Brandon McWilliams[1]; [1]US Army DEVCOM ARL

3:00 PM
Comparing the Fatigue Behavior of Laser Powder Bed Fused Ti-6Al-4V: Single-laser vs. Dual-laser: *Seungjong Lee*[1]; Jiwon Jung[1]; Shuai Shao[1]; Donald Godfrey[2]; Nima Shamsaei[1]; [1]Auburn University; [2]SLM Solutions NA, Inc.

3:20 PM Break

3:35 PM
A Microstructure Development Model for Wire Arc Additively Manufactured Haynes 282: Sophie Hill[1]; *Jonah Klemm-Toole*[1]; Anthony Petrella[1]; [1]Colorado School of Mines

3:55 PM
Assessing the Properties of Stainless Steels Fabricated via Wire-arc Additive Manufacturing: *Ching-Hao (Cliff) Yu*[1]; Shiqi Zheng[1]; Yu-Keng Lin[1]; Alberico Talignani[1]; Xiaochun Li[1]; Jenn-Ming Yang[1]; Yinmin (Morris) Wang[1]; [1]University of California, Los Angeles

4:15 PM
High-Throughput, Force-Based Measurements of Residual Stress and Comparison to Numerical Predictions: *Kyle Johnson*[1]; Dale Cillessen[1]; [1]Sandia National Laboratories

4:35 PM
Multiscale Characterisation and Evaluation of the Effect of Recycling on Powder and Build Parts Performance: *Rotimi Oluleke*[1]; John Duffy[2]; Scott Speakman[2]; [1]Carpenter Additive; [2]Malvern Panalytical Ltd

4:55 PM
Numerical Investigation of Gas-driven Powder Motion in Laser Powder Bed Fusion: *Fangzhou Li*[1]; Wenda Tan[1]; [1]The University of Michigan

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Solidification of Advanced Materials III

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

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Session Chair: Alex Plotkowski, Oak Ridge National Laboratory

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2:00 PM
The Effect of Thermoelectric Magnetohydrodynamics on Microstructure Evolution in Additive Manufacturing: *Andrew Kao*[1]; Xianqiang Fan[2]; Catherine Tonry[1]; Peter Soar[1]; Peter Lee[2]; Koulis Pericleous[1]; [1]University of Greenwich; [2]UCL

2:20 PM
Phase Transformation Dynamics Guided Alloy Development for Additive Manufacturing: Qilin Guo[1]; *Minglei Qu*[1]; Chihpin Andrew Chuang[2]; Lianghua Xiong[3]; Ali Nabaa[1]; Zachary Young[1]; Yang Ren[2]; Peter Kenesei[2]; Fan Zhang[4]; Lianyi Chen[1]; [1]University of Wisconsin Madison; [2]Argonne National Laboratory; [3]Missouri University of Science and Technology; [4]National Institute of Standards and Technology

2:40 PM
Solidification Cracking Behaviour of AA 6061 Aluminium Alloy with Heated Substrate in Laser Powder Bed Fusion Additive Manufacturing: *Sivaji Karna*[1]; Rimah Al-Aridi[1]; Tianyu Zhang[1]; Timothy Krentz[2]; Dale Hitchcock[2]; Andrew Gross[1]; Lang Yuan[1]; [1]University of South Carolina; [2]Savannah River National Laboratory

3:00 PM
Solidification Mechanisms during Selective Laser Melting of Binary Ni-Cu, Ni-Al and Ni-Zr Alloys: Clara Galera-Rueda[1]; María Teresa Pérez-Prado[2]; *Javier Llorca*[1]; [1]IMDEA Materials Institute & Technical University of Madrid; [2]IMDEA Materials Institute

3:20 PM
Solidification Microstructure in Invar-Cu Intrinsic Nanocomposites by Selective Laser Melting: *Haobo Wang*[1]; Prosenjit Biswas[1]; Ji Ma[1]; Jerrold Floro[1]; [1]University of Virginia

3:40 PM Break

3:55 PM
The Effect of Solidification Pathway on Grain Boundary Fractality: *Akane Wakai*[1]; Amlan Das[2]; Atieh Moridi[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron

Source

4:15 PM
Layer-wise Optimization of Powder-bed Fusion Parameters Using Machine Learning Models in Metal Additive Manufacturing: *Najmeh Samadiani*[1]; Dayalan Gunasegaram[1]; [1]Commonwealth Scientific and Industrial Research Organisation (CSIRO)

4:35 PM
Microstructure and Hardness Evolutions of Stainless Steel 316L and Nimonic 90 Bimetallic Components along the Build Direction: *Samia Razzaq*[1]; Bosheng Dong[2]; Zengxi Pan[2]; Huijun Li[2]; Simon Ringer[1]; Xiaozhou Liao[1]; [1]University of Sydney; [2]University of Wollongong

4:55 PM
Using Defects as 'Fossil Records' in Metallic Parts Produced with Electron Beam Powder Bed AM: *Katie O'Donnell*[1]; Amamchukwu Ilogebe[1]; Maria Quintana[1]; Peter Collins[1]; [1]Iowa State University

5:15 PM
Temporal Transients of Plastic Strain Partitioning between Alpha and Beta Phases in Ti6Al4V during Thermo-mechanical Gyrations: *Sabina Kumar*[1]; Kate Shanks[2]; Dieter Ishiem[3]; Sudarsanam Babu[1]; [1]University of Tennessee Knoxville; [2]FAST Beamline, CHESS; [3]NUCAPT, Northwestern University

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Additive Manufacturing of High Entropy Refractory Alloys

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

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Omar Mireles, NASA; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Matthew Osborne, Global Advanced Metals; Joao Oliveira, FCT-UNL

Thursday PM | March 23, 2023
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Session Chairs: Joao Pedro Oliveira, Universidade NOVA de Lisboa; Antonio Ramirez, The Ohio State University

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2:00 PM Invited
Novel Refractory Metals Optimized for Additive Manufacture to Improve Printability and Properties: *Carly Romnes*[1]; Fernando Reyes Tirado[2]; Brian Taylor[2]; Ryan Wilkerson[2]; Jeff Sowards[2]; Omar Mireles[2]; James Stubbins[1]; [1]University of Illinois at Urbana-Champaign; [2]NASA Marshall Space Flight Center

2:30 PM
A 3D Printable Refractory High Entropy Alloy with Excellent Mechanical Properties: *Advika Chesetti*[1]; Sucharita Banerjee[1]; Mohan Sai Kiran Kumar Yadav Nartu[1]; Sriswaroop Dasari[1]; Abhishek Sharma[1]; Rajarshi Banerjee[1]; [1]University of North Texas

2:50 PM
Development and Additive Manufacturing of RHEA for Extreme Environment Applications: *Ali Ozalp*[1]; Eda Aydoan Güngör[1]; [1]Middle East Technical University

3:10 PM
Probing Processing Defects in Novel Refractory High Entropy Alloys via In-situ Dynamic X-ray Radiography: *Jerard Gordon*[1]; [1]University of Michigan

3:30 PM Break

3:50 PM
Towards High-Throughput Assessment of Printability in Refractory Alloys Systems for Laser-Powder Bed Fusion: *Peter Morcos*[1]; Brent Vela[1]; Cafer Acemi[1]; Alaa Elwany[1]; Ibrahim Karaman[1]; Raymundo Arroyave[1]; [1]Texas A&M University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Miscellaneous II

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

Thursday PM | March 23, 2023
23B | SDCC

Session Chair: Robert Lancaster, Swansea University

2:00 PM
Optimization of Post-built Annealing of Ni Alloy718 Processed by Powder Bed Fusion: *Jan Capek*[1]; Efthymios Polatidis[1]; Magnus Niekter[2]; Joe Kelleher[3]; Nicola Casati[1]; Markus Strobl[1]; [1]Paul Scherrer Institute; [2]University West; [3]ISIS Neutron and Muon Source

2:20 PM
Scale Effects in Application of Profilometry-based Indentation Plastometry (PIP) to Additively Manufactured Components: *Jimmy Campbell*[1]; John Reidy[2]; Animesh Bose[2]; Hannah Zhang[3]; Tony Fry[3]; Becky Musgrove[1]; Wenchen Gu[1]; Bill Clyne[1]; [1]Plastometrex Ltd; [2]Desktop Metals; [3]National Physical Laboratory

2:40 PM
Revealing Intragranular Orientation and Strain Evolution during Additive Manufacturing of a Stainless Steel: A Synchrotron X-ray Diffraction Study: Steve Gaudez[1]; Kouider Abdesselam[1]; Hakim Gharbi[1]; Zoltan Hegedues[2]; Ulrich Lienert[2]; Wolfgang Pantleon[3]; *Manas Upadhyay*[1]; [1]Ecole Polytechnique, LMS, CNRS; [2]PETRA III, DESY; [3]Technical University of Denmark

3:00 PM
Combined Effects of Pre-straining and Hydrogenation on the Nanomechanical Behavior of Selectively Laser Melted High-/medium-entropy Alloys: *Zhe Gao*[1]; Dong-Hyun Lee[2]; Yakai Zhao[3]; A-Hyun Jeon[1]; Upadrasta Ramamurty[3]; Jae-il Jang[1]; [1]Hanyang University; [2]Chungnam National University; [3]Nanyang Technological University

3:20 PM Break

3:40 PM
A Micropillar Compression Investigation into the Plastic Flow Properties of Additively Manufactured Alloys: *Ramamurty Upadrasta*[1]; Shi-hao Li[1]; [1]Nanyang Technological University

4:00 PM
An Efficient Method for the Prediction of Mechanical Properties from the Microstructures of Additively Manufactured Parts: *Nathan March*[1]; Dayalan Gunasegaram[1]; [1]CSIRO

4:20 PM
Investigation of the Mechanical Properties in Additively Manufactured Haynes 230 Alloy with Hierarchical Microstructure: *Bo Yang*[1]; Zhongxia Shang[1]; Jie Ding[1]; Jack Lopez[1]; Tianyi Sun[1]; William Jarosinski[2]; Yifan Zhang[3]; Nicholas Richter[1]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Praxair Surface Technologies; [3]Los Alamos National Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — Advanced 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 Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

Thursday PM | March 23, 2023
24C | SDCC

Session Chair: Behrang Poorganji, Morf3D

2:00 PM Invited
Microstructure and Mechanical Properties of In-situ Nano Oxide Reinforced CrMnFeCoNi High Entropy Alloy Matrix Composite Manufactured by Laser Powder Bed Fusion: *Kee-Ahn Lee*[1]; Young-Kyun Kim[2]; [1]Inha University; [2]Korea Institute of Materials Science

2:30 PM
Expansion of Additive Manufacturing Capabilities into In-situ Alloying of Dispersion Strengthened, High Temperature Cu Alloys: *David Scannapieco*[1]; David Ellis[2]; John Lewandowski[1]; [1]Case Western Reserve University; [2]NASA Glenn Research Center

2:50 PM
Development of a High Throughput Method to Assess the Suitability of New Metals for Additive Manufacturing: *Daniel Porter*[1]; Moataz Attallah[1]; [1]University of Birmingham

3:10 PM
Evaluation of SLM Parameters for Producing Elementally Homogeneous Printed Products Using Novel Dry Metal Alloy (DMA) Powder Feedstock: *Stephen Hanson*[1]; Sudhakar Vadiraja[1]; Nathan Huft[1]; Peter Lucon[1]; Daniel Jacintho[1]; [1]Montana Technological University

3:30 PM Break

3:45 PM
Oxide Coarsening Effects during Melt-based Additive Manufacturing -- Physics-based Modeling: *Roger Hou*[1]; Timothy Stubbs[2]; Aijun Huang[2]; Zachary Cordero[1];

[1]Massachusetts Institute of Technology; [2]Monash University

4:05 PM
Oxide Coarsening Effects during Melt-based Additive Manufacturing: Experiment and Characterization: *Timothy Stubbs*[1]; Roger Hou[2]; Zachary Cordero[2]; Yuman Zhu[1]; Aijun Huang[1]; [1]Monash University; [2]Massachusetts Institute of Technology

4:25 PM
A Calibration-Free Physics-based Framework to Predict Printability Maps in Additive Manufacturing Process: *Sofia Sheikh*[1]; Pejman Honarmandi[1]; Brent Vela[1]; Peter Morcos[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; Alaa Elwany[1]; [1]Texas A&M University

4:45 PM
Development of a Methodology for AM-compatible Rapid Alloy Development: *Philipp Stich*[1]; Markus Apel[2]; Mustafa Megahed[3]; Patrick Köhnen[4]; Christian Haase[5]; [1]EOS GmbH; [2]Access e.V.; [3]ESI Group; [4]DAP, RWTH Aachen; [5]IEHK,RWTH Aachen

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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 Jackson, Sandia National Laboratories

Thursday PM | March 23, 2023
Aqua 311A | Hilton

Session Chairs: Mohamed Hamza, Arizona State University; Daryl Chrzan, University of California

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2:00 PM Invited
The Relationship between Dislocation Core Structures and Oxygen Sensitivity in α-Ti: *Daryl Chrzan*[1]; Eric Rothchild[1]; Max Poschmann[1]; Siying Li[1]; Ian Winter[1]; Yan Chong[1]; Ruopeng Zhang[1]; Shiteng Zhao[1]; Mohammad Hooshmand[1]; David Olmsted[1]; John W. Morris[1]; Mark Asta[1]; Andrew Minor[1]; [1]University of California, Berkeley

2:30 PM
The Characteristics of Strain Burst Acoustic Emissions during In Situ Microcompression Experiments: *Mostafa Omar*[1]; Jaafar El-Awady[1]; [1]Johns Hopkins University

2:50 PM
Characterizing Structure and Deformation in Molecular Dynamics Simulations of Shock Compressed Silicon and Diamond Carbon: *Alex Li*[1]; Rob Rudd[2]; Boya Li[1]; Marc Meyers[1]; [1]University of California San Diego; [2]Lawrence Livermore National Labs

3:10 PM
Effect of Self-Annealing Phenomena on the Microstructural and Texture Evolution in Cryogenically Rolled Cu-Fe-P alloy: *Aman Gupta*[1]; Lalit Kaushik[1]; Tae-Hyeon Yoo[1]; Shi-Hoon Choi[1]; [1]Sunchon National University

3:30 PM Break

3:50 PM
Numerical Investigation of the Strain Development at the Substrate / Laser Metal Deposition - Powder Refurbishment Interface: *Romain Bordas*[1]; Mathieu Calvat[1]; Jonathan Cormier[1]; Azdine Nait-Ali[1]; Patrick Villechaise[1]; Roland Fortunier[2]; [1]Ensma - Institut Pprime - Upr Cnrs 3346; [2]LTDS, école centrale Lyon / ENISE, on secondment to ENSMA

4:10 PM
Characterization and Mechanical Testing of Ordinary Chondrites: *Mohamed Hamza*[1]; Charles Galluscio[2]; M.F. Rabbi[1]; Laurence Garvie[1]; Desireé Cotto-Figueroa[3]; Erik Asphaug[4]; Aditi Chattopadhyay[1]; [1]Arizona State University; [2]University of Florida; [3]University of Puerto Rico at Humacao; [4]University of Arizona

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ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Energy Conversion and Storage Mix II

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

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

Thursday PM | March 23, 2023
32B | SDCC

Session Chairs: Surojit Gupta, University of North Dakota; Partha Mukherjee, Purdue University

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2:00 PM Invited
Development of Novel Green Manufacturing Technologies for Fabricating Functional Materials: *Surojit Gupta*[1]; [1]University of North Dakota

2:25 PM Invited
Grain Boundary Metal-Insulator Transitions in Polycrystalline LiCoO2: Lucas Robinson[1]; Jarrod Lund[1]; KSN Vikrant[2]; *Edwin Garcia*[1]; [1]Purdue University; [2]IIT Delhi

2:50 PM
Optically Sensitive Mott-insulator for Supercapacitor: *Abha Misra*[1]; [1]Indian Institute of Science

3:10 PM
Structural Integrity at Elevated Temperature Assessment of Solid Particles for Concentrated Solar Power Systems Using ICME Approach: Napat Vajragupta[1]; Tatu Pinomaa[1]; Matti Lindroos[1]; *Abhishek Biswas*[1]; Tom Andersson[1]; Anssi Laukkanen[1]; [1]VTT Technical Research Centre of Finland Ltd

3:30 PM Break

3:50 PM Invited
How Safe Are Solid-State Batteries? An Exploration of Heat Release: Alex Bates[1]; Jill Langendorf[1]; Joshua Lamb[1]; Yuliya Preger[1]; Loraine Torres-Castro[1]; *Megan Diaz*[1]; [1]Sandia National Laboratories

4:15 PM
Probing the Role of SEI Heterogeneity on Sodium Plating and Stripping: *Susmita Sarkar*[1]; Partha Mukherjee[1]; [1]Purdue University

4:35 PM
Micro Plasma-based Surface Modification of Biocompatible Polymers and Composites towards the Modification of Surface Properties for Biomedical Applications: Mai Yang[1]; *Edgar Perez-Lopez*[1]; Edbertho Leal-Quiros[2]; Saquib Ahmed[3]; Sankha Banerjee[1]; [1]California State University, Fresno; [2]University of California, Merced; [3]State University of New York at Buffalo State

4:55 PM Invited
Hybrid Halide Solid Electrolytes and Bottom-up Cell Assembly Enable High Voltage Solid-state Lithium Batteries: *Beniamin Zahiri*[1]; [1]University of Illinois Urbana-Champaign

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Thermal and Other Properties

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

Thursday PM | March 23, 2023
Aqua D | Hilton

Session Chairs: Zhenzhen Yu, Colorado School of Mines; Elizabeth Opila, University of Virginia

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2:00 PM Invited
Phase Transformation Pathways in Compositionally-Complex BCC-B2 Alloys: *Eric Lass*[1]; [1]University of Tennessee-Knoxville

2:20 PM Invited
Multi-Principal Element Alloy Fillers to Mitigate Weldability and Joining Issues: *Zhenzhen Yu*[1]; Benjamin Schneiderman[1]; Abdelrahman Abdelmotagaly[1]; [1]Colorado School of Mines

2:40 PM Invited
Impact of Ti on Phase Evolution and Oxidation Mechanisms within TiAlTa Alloys: *Jaimie Tiley*[1]; Yanbo Wang[2]; Soumya Nag[1]; Ercan Cakmak[1]; Raymond Unocic[1]; Pania Newell[2]; [1]Oak Ridge National Laboratory; [2]University of Utah

3:00 PM Invited
Processing of Refractory Multi-Principal Element Alloys for Ultrahigh Temperature Performance: *Amy Clarke*[1]; Benjamin Ellyson[1]; Adira Balzac[1]; Nathan Peterson[1]; William Waliser[1]; Nelson Delfino de Campos Neto[1]; Megan Le Corre[1]; Abigail Miklas[1]; Jonah Klemm-Toole[1]; Francisco Coury[2]; Kester Clarke[1]; Michael Kaufman[1]; [1]Colorado School of Mines; [2]Federal University of São Carlos

3:20 PM Invited
Oxidation of Group IV-V Refractory Multi-principal Element Alloys: Charlotte Brandenburg[1]; David Beaudry[2]; Michael Waters[3]; Loïc Perrière[4]; Jean-Philippe

Couzinie[4]; James Rondinelli[3]; Mitra Taheri[2]; *Elizabeth Opila*[1]; [1]University of Virginia; [2]Johns Hopkins University; [3]Northwestern University; [4]Univ Paris Est Creteil, CNRS, ICMPE

3:40 PM Break

4:00 PM Invited
Attainments and Challenges of High Temperature Oxidation Resistance of Refractory High Entropy Alloys: Literature Review and Own Results: *Bronislava Gorr*[1]; Steven Schellert[2]; Hans Juergen Christ[2]; Stephan Laube[1]; Alexander Kauffmann[1]; Martin Heilmaier[1]; [1]Karlsruhe Institut für Technologie (KIT); [2]Universität Siegen

4:20 PM Invited
In-situ Investigation of the Initial Oxidation Steps in Refractory High-entropy Alloys by O_2 Gas Exposure: *Heath Kersell*[1]; Xuesong Fan[2]; Alexander Herman[1]; Zongyang Lyu[2]; Baldur Steingrimsson[3]; Peter Liaw[2]; Gregory Herman[1]; [1]Oregon State University; [2]The University of Tennessee; [3]Imagars LLC

4:40 PM Invited
Synergistic Discontinuous Reactions Leading to Nano-lamellar Hierarchical Microstructures in High Entropy Alloys: Sriswaroop Dasari[1]; Abhishek Sharma[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas

5:00 PM Invited
Phase Formation in Compositionally Complex Alloy Thin Films: The Role of "Small" and "Large" Elements: *Andrea Hodge*[1]; Daniel Goodelman[1]; [1]University of Southern California

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MATERIALS PROCESSING

Advances in Surface Engineering V — Corrosion Behavior and Thin Films

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

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

Thursday PM | March 23, 2023
29D | SDCC

Session Chair: Bharat Jasthi, South Dakota School of Mines & Technology

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2:00 PM
AlCrFe Complex Metallic Alloys as Novel and Versatile Coatings: *Malgorzata Lewandowska*[1]; Ewa Ura-Binczyk[1]; Michal Tarnowski[1]; [1]Warsaw University of Technology

2:20 PM
Synthesis of Corrosion Resistant Hexagonal Boron Nitride Coatings on Iron Substrates by Pulsed Laser Deposition: *Venkata A.S. Kandadai*[1]; Venkata Ramana Gadhamshetty[1]; Bharat K. Jasthi[1]; [1]South Dakota School of Mines & Technology

2:40 PM
Effects of Aging and Surface Mechanical Attrition Treatment on Corrosion Behavior of Aluminum 7075 Alloys: *Antriksh Sharma*[1]; Vikrant Beura[1]; Kiran Solanki[1]; [1]Arizona State University

3:00 PM
Single Step Sputtered Chromium Nitride Nano-clusters Coating for Enhanced Mechanical, Wetting and Corrosion Protection Properties: *Ankit Kumar*[1]; Rahul Mulik[1]; [1]IIT Roorkee

3:20 PM Break

3:35 PM
Electrochemical Properties of Electrodeposited Porous AuCu Dendrite for the Oxygen Reduction Reaction in Alkaline Solutions: *Kyu Hwan Lee*[1]; Min-Yeong Kim[1]; Sung Mook Choi[1]; [1]Korea Institute of Materials Science

3:55 PM
Bio-inspired Materials as Protective Coatings for Corrosion Prevention: *Pawan Sigdel*[1]; Venkata A.S. Kandadai[1]; Jawaharraj Kalimuthu[1]; Bharat Jasthi[1]; Venkataramana Gadhamshetty[1]; [1]South Dakota School of Mines and Technology

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MATERIALS DESIGN

Advances in Titanium Technology — Session VIII

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno; Zachary Kloenne, Ohio State University; Fan Sun, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

Thursday PM | March 23, 2023
Cobalt 500 | Hilton

Session Chair: Zachary Kloenne, Ohio State University

2:00 PM
Exploration of Young's Modulus and Acoustic Velocity Variation in Ti-5Al-5V-5Mo-3Cr Metastable Phase Transitions: *Ruth Sunderman*[1]; Maria Quintana[1]; Andrew Temple[1]; Ben Brown[2]; Thomas Ales[1]; Peter Collins[1]; [1]Iowa State University; [2]Kansas City National Security Campus

2:20 PM
Effects of Short-time Solution Treatment and Subsequent Short-time Annealing on the Microstructure and Deformation Behavior of Ti-6Al-4V Sheet Metal: *Nina Pfeffer*[1]; Stefanie Jäger[1]; Lukas Kytzia[1]; Heinz Werner Höppel[1]; Mathias Göken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

2:40 PM
A Microstructure-informed Crystal Plasticity Based Constitutive Model for DED Ti6Al4V Alloy: *Chamara Herath*[1]; Kavindu Wijesinghe[1]; Ajit Achuthan[1]; [1]Clarkson University

3:00 PM
Effect of Volumetric Defects on the Fatigue Behavior of Laser Powder Bed Fused Ti-6Al-4V: *Muztahid Muhammad*[1]; Shuai Shao[1]; Nima Shamsaei[1]; [1]Auburn University

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MATERIALS DESIGN

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

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

Program Organizers: Saurabh Puri, Microstructure Engineering; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

Thursday PM | March 23, 2023
Cobalt 520 | Hilton

Session Chairs: Lu Cai, Idaho National Lab; Kamal Choudhary, National Institute of Standards and Technology

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2:00 PM
Machine Learning Assisted Candidate Search For Niobium Alloy: *Trupti Mohanty*[1]; K. S. Ravi Chandran[1]; Taylor D. Sparks[1]; [1]University of Utah

2:20 PM
Prediction of Glass Transition Temperature by Machine Learning Method with Soft Constraint: *Jin Myoung Jeon*[1]; Tae-Min Yeo[1]; Jung Wook Cho[1]; [1]Postech

2:40 PM
Annular Metallic Nuclear Fuel Informatics at 50-nm Resolution: Fei Xu[1]; *Lu Cai*[1]; Daniele Salvato[1]; Fidelma Dilemma[1]; Michael Benson[1]; Daniel Murray[2]; Cynthia Adkins[1]; Joshua Kane[1]; Luca Capriotti[2]; Tiankai Yao[1]; [1]Idaho National Lab; [2]Idaho National Laboratory

3:00 PM
Large-scale Search of High-strength Aluminum Alloys at High Temperature Using Bayesian Learning for Neural Networks: Ayami Hattori[1]; *Shimpei Takemoto*[1]; Takeshi Kaneshita[1]; Kenji Nagata[2]; Yoshishige Okuno[1]; Junya Inoue[3]; Manabu Enoki[3]; [1]Showa Denko K.K.; [2]National Institute for Materials Science; [3]The University of Tokyo

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MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Atomistic Simulations, Interatomic Potential, and Computer Science Models

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

Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis; Enrique Martinez Saez, Clemson University; Garritt Tucker, Colorado School of Mines; Hojun Lim, Sandia National Laboratories; Vimal Ramanuj, Oak Ridge National Laboratory

Thursday PM | March 23, 2023
Cobalt 502B | Hilton

Session Chairs: Garritt Tucker, Colorado School of Mines; Vimal Ramanuj, Oak Ridge National Laboratory

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2:00 PM
EAM-X: Simple Parameterization of Embedded Atom Method Potentials for FCC Metals and Alloys: *Murray Daw*[1]; Michael Chandross[2]; [1]Clemson University; [2]Sandia National Laboratory

2:20 PM
EAM-X: Universal trends in FCC Grain Boundary Energies: *Yasir Mahmood*[1]; Murray Daw[1]; Michael Chandross[2]; Fadi Abdeljawad[1]; [1]Clemson University; [2]Sandia National Laboratories

2:40 PM Invited
Enabling Long Timescale Molecular Dynamics Simulation with ab initio Precision: *Jan Janssen*[1]; Danny Perez[1]; [1]Los Alamos National Laboratory

3:00 PM
Investigating Magnetic Phase Transitions with Ising Models Accounting for Long-range Spin Interactions: *Ender Eger*[1]; Arulmurugan Senthilnathan[1]; Mahmudul Hasan[1]; Pinar Acar[1]; [1]Virginia Tech

3:20 PM Break

3:40 PM
Modular and Scalable Solutions for Training Machine Learned Interatomic Potentials: *Mitchell Wood*[1]; Andrew Rohskpof[1]; Charles Sievers[2]; Danny Perez[3]; Aidan Thompson[1]; [1]Sandia National Laboratories; [2]Boeing; [3]Los Alamos National Lab

4:00 PM Invited
PyEBSDIndex: Fast Indexing of EBSD data: *David Rowenhorst*[1]; Patrick Callahan[1]; Håkon Wiik Ånes[2]; [1]The US Naval Research Laboraory; [2]Norwegian University of Science and Technology

4:20 PM
Training Machine-learned Interatomic Potentials for Chemical Complexity - Application to Refractory CCAs: *Megan McCarthy*[1]; Jacob Startt[1]; Remi Dingreville[1]; Mitchell Wood[1]; [1]Sandia National Laboratories

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LIGHT METALS

Aluminum Alloys, Characterization and Processing — Formability and Simulation

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek, Kensington Technology Inc.

Thursday PM | March 23, 2023
32A | SDCC

Session Chair: Julie Levesque, Quebec Metallurgy Center

2:00 PM
The Role of Microstructure on Strength and Fracture Anisotropy Effects in Al-Mg-Si Extrusion Alloys: Setareh Kordmir[1]; Nick Parson[2]; *Warren Poole*[1]; [1]University of British Columbia; [2]Rio Tinto Aluminium

2:25 PM
Comparison of Experimental Test and Finite Element Simulations of Car Crash Boxes which Manufactured with Different Aluminum Alloys: Melih Caylak[1]; *Gorkem Ozcelik*[1]; [1]ASAS Aluminum

2:50 PM
Exploring Semi-solid Deformation of Al-Cu Alloys by a Quantitative Comparison between Drained Die Compression Experiments and 3D Discrete Element Method Simulations: *Te-Cheng Su*[1]; Meng-Chun Chen[1]; Huai-Ren Hu[1]; Ying-Hsuan Ko[1]; Ling-En Yao[1]; [1]Department of Materials Science and Engineering, National Taiwan University

3:15 PM
The Role of Through-thickness Variation of Texture and Grain Size on Bending Ductility of Al-Mg-Si Profiles: *Philip Goik*[1]; Andreas Schiffl[2]; Heinz Werner Höppel[1]; Mathias Göken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg; [2]Hammerer Aluminium Industries Extrusion GmbH

3:40 PM Break

3:55 PM
Anisotropy of Tearing Behavior in AA7075-T6 Sheet at 200 °C: *Daniel Nikolai*[1]; Eric Taleff[1]; [1]University of Texas Austin

4:20 PM
Evaluating the Earing Amount of Materials Under Various Chemical Composition and Heat Treatment Process with Finite Element Simulations of Cup Drawing Tests: Melih Caylak[1]; *Gorkem Ozcelik*[1]; Abdullah Kinaci[1]; Koray Dündar[1]; [1]ASAS Aluminum

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LIGHT METALS

Aluminum Reduction Technology — Pot Design & Start-Up

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

Program Organizers: Pierre Marcellin, Rio Tinto; Stephan Broek, Kensington Technology Inc.

Thursday PM | March 23, 2023
30E | SDCC

Session Chair: Abdalla Zarouni, Emirates Global Aluminium

2:00 PM Introductory Comments

2:10 PM
Achieving Low Pot Failure Rate at Aditya Aluminium: Atanu Maity[1]; Venkannababu Thalagani[2]; Bhanu Shankar[1]; Deepak Dash[1]; *Anish Das*[1]; Kamta Gupta[1]; Shanmukh Rajgire[2]; Amit Gupta[2]; Madhusmita Sahoo[1]; [1]Hindalco Industries Ltd.; [2]Aditya Birla Science and Technology, Mumbai

2:35 PM
Dissimilar Results in Restarting Two Different Potlines: *Maria Daviou*[1]; Maria Alejandra Mollecker Rausch[1]; Ricardo Alonso[1]; Maria Fernanda Jaitman[1]; [1]Aluar Aluminio Argentino Saic

3:00 PM
Restart of Albras' Potline 2 – Improving Performance and Changing Paradigms: Bruno Vasconcelos[1]; Ana Renata Monteiro[1]; Ana Carolina Guedes[1]; *Michel Pena*[1];

João Vilckas[1]; Johnson Machado[1]; Flávio Silva[1]; Márcio Souza[1]; [1]Albras

3:25 PM
Application of Cell Retrofit in GP320 Aluminum Reduction Cell Line: *Zhuojun Xie*[1]; Jian Lu[1]; Weibo Li[2]; Song He[1]; Xingyu Yang[1]; [1]Guiyang Aluminum & Magnesium Design & Research Institute Co. Ltd.; [2]Guangyuan Zhongfu High Precision Aluminum Co., Ltd.

3:50 PM Break

4:05 PM
The Expanded Industrial Pilot of SAMI's NCCT+ Technology: Xi Cao[1]; Yafeng Liu[1]; Hongwu Hu[1]; Xuan Wang[1]; Jinlong Hou[1]; Wei Liu[1]; Kangjian Sun[1]; *Michael Ren*[2]; [1]Shenyang Aluminum and Magnesium Engineering and Research Institute Co. Ltd.; [2]Sunlightmetal Consulting Inc.

4:30 PM
The SY500 Potline Technology Development: Kangjian Sun[1]; Yafeng Liu[1]; Hongwu Hu[1]; Xuan Wang[1]; Jinlong Hou[1]; Wei Liu[1]; Xi Cao[1]; *Michael Ren*[2]; [1]Shenyang Aluminum and Magnesium Engineering and Research Institute Co. Ltd.; [2]Sunlightmetal Consulting Inc.

4:55 PM
Preheat, Start-up and Early Operation of DX+ Ultra Pots at 500 kA: Nadia Ahli[1]; *Mustafa Mustafa*[1]; Abdalla Alzarooni[1]; Konstantin Nikandrov[1]; [1]Emirates Global Aluminium

ADVANCED MATERIALS

Bulk Metallic Glasses XX — Fracture and Deformation

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

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

Thursday PM | March 23, 2023
Aqua C | Hilton

Session Chair: Daniel Sopu, Erich Schmid Institute of Materials Science of The Austrian Academy of Sciences

2:00 PM Invited
Are Metallic Glasses Brittle or Ductile?: *Jan Schroers*[1]; [1]Yale University

2:20 PM Invited
Fracture Toughness of Bulk Metallic Glass Composites: *Ramamurty Upadrasta*[1]; Devashish Rajpoot[2]; Parag Tandaiya[2]; R Lakshmi Narayan[2]; Long Zhang[3]; [1]Nanyang Technological University; [2]IIT-Bombay; [3]Institute of Metal Research

2:40 PM
Medium-range Order Controls Hardness and Fracture Toughness in Bulk Metallic Glasses: *Jamie Kruzic*[1]; Keita Nomoto[2]; Bosong Li[1]; Christoph Gammer[3]; Anna Ceguerra[2]; Huma Bilal[2]; Anton Hohenwarter[4]; Jürgen Eckert[4]; Bernd Gludovatz[1]; Simon Ringer[2]; [1]University of New South Wales (UNSW Sydney); [2]University of Sydney; [3]Austrian Academy of Sciences; [4]University of Leoben

3:00 PM
Effect of Annealing and Cryogenic Treatment on the Size-dependent Deformation Behavior of the Metallic Glass: *Akib Jabed*[1]; Golden Kumar[1]; [1]UT-Dallas

3:20 PM Invited
An Atomic-level Perspective of Shear Banding in Metallic Glasses: *Daniel Sopu*[1]; Jürgen Eckert[1]; [1]Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences

3:40 PM Break

4:00 PM Invited
Observation of Deformation Features in Metallic Glasses: Sangjun Kang[1]; Xiaoke Mu[1]; Di Wang[1]; Arnaud Caron[2]; Christian Minnert[3]; Karsten Durst[3]; *Christian Kuebel*[1]; [1]Karlsruhe Institute of Technology; [2]Korea University of Technology and Education; [3]TU Darmstadt

4:20 PM
Steady-state Serrated Flow Induced by Rejuvenation Gradient in Zr-based Bulk Metallic Glass: *Wook Ha Ryu*[1]; Won-Seok Ko[2]; Rui Yamada[3]; Geun Hee Yoo[1]; Junji Saida[3]; Eun Soo Park[1]; [1]RIAM, Seoul National University; [2]Inha University; [3]Tohoku University

4:40 PM
Structure-Dynamics Relationships in Cryogenically Deformed Bulk Metallic Glass: *Jurgen Eckert*[1]; Florian Spieckermann[2]; Baran Sarac[1]; Daniel Sopu[1]; [1]Erich Schmid Institute of Materials Science; [2]Montanuniversitaet Leoben

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NUCLEAR MATERIALS

Ceramic Materials for Nuclear Energy Research and Applications — Alternate and Doped Fuels - Modeling and Experiments

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

Program Organizers: Walter Luscher, Pacific Northwest National Laboratory; Xian-Ming Bai, Virginia Polytechnic Institute and State University; Lingfeng He, North Carolina State University; Sudipta Biswas, Idaho National Laboratory; Simon Middleburgh, Bangor University

Thursday PM | March 23, 2023
28B | SDCC

Session Chairs: David Bai, Virginia Tech; Miaomiao Jin, The Pennsylvania State University

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2:00 PM Invited
Atomistic Investigation of Radiation-induced Defects in ThO2: *Miaomiao Jin*[1]; Hamdy Arkoub[1]; Lingfeng He[2]; Chao Jiang[2]; Marat Khafizov[3]; David Hurley[2]; [1]Pennsylvania State University; [2]Idaho National Laboratory; [3]Ohio State University

2:30 PM Invited
Hidden Defect Evolution Mechanism in ThO2 Revealed by Atomistic Modeling: *Chao Jiang*[1]; Lingfeng He[1]; Cody Dennett[1]; Marat Khafizov[2]; James Mann[3]; David Hurley[1]; [1]Idaho National Laboratory; [2]The Ohio State University; [3]United States Air Force

3:00 PM
Cluster Dynamics Modeling of Defects and Fission Gas in Gd Doped UO_2 under Irradiation: Vancho Kocevski[1]; *Michael Cooper*[1]; David Andersson[1]; [1]Los Alamos National Laboratory

3:20 PM Break

3:40 PM Invited
Susceptibility of Nuclear Fuel Ceramics to Oxidation and Hydridization during Off Normal Events: *Elizabeth Sooby*[1]; Adrian Gonzales[1]; Geronimo Robles[1]; Joshua White[2]; [1]University of Texas at San Antonio; [2]Los Alamos National Laboratory

4:10 PM
Development of UC/UO_2 Composite Fuels for Light Water Reactors: *Scarlett Widgeon Paisner*[1]; Joshua White[1]; Ian Porter[2]; Russell Fawcett[2]; [1]Los Alamos National Laboratory; [2]Global Nuclear Fuels

4:30 PM
Atomistic and Mesoscale Modeling of Fission Gas and Fission Products Diffusivity in TRISO Fuel Kernels: *Xiang-Yang Liu*[1]; Christopher Matthews[1]; Wen Jiang[2]; Michael Cooper[1]; Jason Hales[2]; David Andersson[1]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory

4:50 PM
Modelling the Melting Temperature of $CrUO_4$ to Assess its Behaviour during the Sintering of Cr-doped UO_2: *Sarah Vallely*[1]; Conor Galvin[2]; Michael Cooper[2]; Simon Middleburgh[1]; [1]Bangor University; [2]Los Alamos National Laboratory

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ENERGY & ENVIRONMENT

Composite Materials for Sustainable and Eco-Friendly Material Development and Application — Recycled Materials for Improved Composite Properties

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Muralidharan Paramsothy, NanoWorld Innovations; Simona Hunyadi Murph, Savannah River National Laboratory

Thursday PM | March 23, 2023
31C | SDCC

Session Chairs: Yahya Al-Majali, Ohio University; Simona Hunyadi Murph, Savannah River National Laboratory

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2:00 PM
Recyclable Aluminum Metal Matrix Composites (MMC) for Electric Vehicle (EV) Powertrain Applications: *Mert Efe*[1]; Jung-Pyung Choi[1]; Xiao Li[1]; Hrishikesh Das[1]; Xiaolong Ma[1]; Glenn Grant[1]; Darrell Herling[1]; [1]Pacific Northwest National Laboratory

2:20 PM
Design of Metal-ceramic In-situ Interpenetrating Phase Composite (IPC) Architecture for High Toughness Parts: *Sreekumar Madam*[1]; [1]Malaviya National Institute of Technology Jaipur

2:40 PM
Optimization of Post-consumer Glass and Sawdust Reinforced Polyester Hybrid Composite by Mixture Design Analysis: *Kator Jomboh*[1]; Adele Garkida[2]; Emmanuel Alemaka[2]; Mohammed Yakubu[2]; Vershima Alkali[2]; Wilson Eze[3]; [1]University of

Maiduguri, Borno State; [2]Ahmadu Bello University, Zaria; [3]Nigerian Institute of Leather and Science Technology, Zaria

3:00 PM
Nanocomposite Materials for Accelerating Decarbonization: *Simona Hunyadi Murph*[1]; [1]Savannah River National Laboratory

3:20 PM Break

3:35 PM
Facile Ball-milling Synthesis of Cellulosic Metal Oxide Composite for Removal Tetracycline Antibiotic from Aqueous Solution: *Nergiz Zeynep Kanmaz Kelesoglu*[1]; Pelin Demircivi[1]; Mehmet Bugdayci[1]; [1]Yalova University

3:55 PM
Detection and Mitigation of Radionuclides in the Environment: Toward a Clean Ecosystem: *Simona Hunyadi Murph*[1]; [1]Savannah River National Laboratory

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PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Electrons and Phonons

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

Thursday PM | March 23, 2023
26A | SDCC

Session Chairs: Zhenglu Li, Lawrence Berkeley National Lab/UC Berkeley/ University of Southern California; Hesam Askari, University of Rochester

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2:00 PM Invited
Correlation-enhanced Electron-phonon Coupling in Oxide Superconductors from Ab Initio GW Perturbation Theory: *Zhenglu Li*[1]; [1]Lawrence Berkeley National Lab/UC Berkeley/University of Southern California

2:30 PM
A Finite-element Phase-field Model of Topological Defect Formation in Epitaxially Grown Ferroelectric Thin Films: *Soumya Bandyopadhyay*[1]; Ranjith Ramadurai[2]; Saswata Bhattacharyya[2]; [1]School of Advanced Materials Engineering, Kookmin University; [2]Indian Institute of Technology Hyderabad

2:50 PM
An Electrochemical Repertoire for Triggering Phase Transitions in Insulators: The Case of Monoclinic/Tetragonal Transition in ZrO2: *Mostafa Youssef*[1]; [1]The American University in Cairo

3:10 PM
Controlling the Stability and Reliability Issues of the Electrical Responses of Resistive RAM and Neuromorphic Computing Devices: A Phase Field Study: *Arijit Roy*[1]; Min-Gyu Cho[1]; Hwi-Jae Cho[1]; Pil-Ryung Cha[1]; [1]Kookmin University

3:30 PM Break

3:50 PM
A High-Throughput Framework for Lattice Dynamics: *Zhuoying Zhu*[1]; Junsoo Park[1]; Anubhav Jain[1]; [1]LBNL

4:10 PM
Strain Engineering of Ferroelectric Domains in Epitaxially Grown Barium Zirconate Titanate – Barium Calcium Titanate (BZT-xBCT) Films near Morphotropic Phase Boundary Composition: Phase-field Simulations and Experimental Realization: Vaishnavi S M[1]; Soumya Bandyopadhyay[2]; Sabarigresan Murugan[1]; Saswata Bhattacharya[1]; *Ranjith Ramadurai*[1]; [1]Indian Institute of Technology, Hyderabad; [2]School of Advanced Materials Engineering, Kookmin University

4:30 PM
Examining the Alpha-epsilon Transition in Iron Using Molecular-spin Dynamics: *Svetoslav Nikolov*[1]; Andrew Rohskopf[1]; Julien Tranchida[2]; Kushal Ramakrishna[3]; Attila Cangi[3]; Mitchell Wood[1]; [1]Sandia National Laboratories; [2]CEA; [3]CASUS

4:50 PM
High Pressure Phonon Thermodynamics of B2-ordered Equiatomic Iron-vanadium (FeV): Homero Reyes[1]; Ravhi Kumar[2]; Bimal K C[1]; Russell Hemley[2]; *Jorge Munoz*[1]; [1]University of Texas at El Paso; [2]University of Illinois Chicago

5:10 PM
Thermodynamic and Kinetic Temperature-electric Field Diagrams for Ferroelectric HfO2 Based on Atomistic Simulation: *Sahar Abdelazim*[1]; Mostafa Youssef[1]; [1]The American University in Cairo

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Interface and Grain Boundary Effects

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

Thursday PM | March 23, 2023
Aqua 300AB | Hilton

Session Chairs: Fadi Abdeljawad, Clemson; Douglas Spearot, University of Florida

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2:00 PM Invited
Theoretical and Machine Learning Studies of Grain Boundary Solute Drag in Nanocrystalline Alloys: *Fadi Abdeljawad*[1]; Malek Alkayyali[1]; [1]Clemson University

2:30 PM
Heterostructured Interfaces in Lamellar Metallic Composites (LMCs) and Their Contribution to Materials Properties on Different Length Scales: *Moritz Kuglstatter*[1]; Heinz Werner Höppel[1]; Mathias Göken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

2:50 PM
Local Structural Ordering Affects the Toughening Ability of Amorphous Grain Boundary Complexions: *Pulkit Garg*[1]; Timothy Rupert[1]; [1]University of California, Irvine

3:10 PM Invited
Mesoscale Model for Stress Field Evolution at Grain Boundaries Motivated by Atomistic Simulations of Dislocation-Grain Boundary Interactions: Darshan Bamney[1]; Royce Reyes[2]; Laurent Capolungo[1]; *Douglas Spearot*[2]; [1]Los Alamos National Laboratory; [2]University of Florida

3:40 PM Break

4:00 PM
Modeling Interfaces in Strain Gradient Plasticity: *Miroslav Zecevic*[1]; Aritra Chakraborty[1]; Ricardo Lebensohn[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

4:20 PM
Dislocation Transmission across 3D Interfaces in Cu/Nb Nanolaminates: *Shuozhi Xu*[1]; Justin Cheng[2]; Mauricio Leo[2]; Nathan Mara[2]; Irene Beyerlein[3]; [1]University of Oklahoma; [2]University of Minnesota, Twin Cities; [3]University of California, Santa Barbara

4:40 PM
Effect of Interfacial Structure on Mechanical Behavior of Nanolayered Ti/TiN Composites: *Ashlie Hamilton*[1]; Justin Cheng[1]; Mauricio De Leo[1]; Kevin Baldwin[2]; Nathan Mara[1]; [1]University of Minnesota - Twin Cities; [2]Los Alamos National Laboratory

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MATERIALS PROCESSING

Friction Stir Welding and Processing XII — Derivative Technologies

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

Program Organizers: Yuri Hovanski, Brigham Young University; Yutaka Sato, Tohoku University; Piyush Upadhyay, Pacific Northwest National Laboratory; Anton Naumov, Peter The Great St. Petersburg Polytechnic University; Nilesh Kumar, University of Alabama, Tuscaloosa

Thursday PM | March 23, 2023
29A | SDCC

Session Chairs: Carter Hamilton, Miami University; Keerti Kappagantula, Pacific Northwest National Laboratory

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2:00 PM Invited
Assessing the Performance of Liquid Cooled Plates for Inverter Stacks Produced by CoreFlow: Joao Gandra[1]; Sam Holdsworth[1]; *Jonathan Peter Martin*[2]; [1]TWI Ltd.; [2]TWI

2:20 PM Invited
Submerged Bobbin Tool (SBT) Tunneling Technology: *Dwight Burford*[1]; Maurizio Manzo[1]; Hector Siller[1]; Supreeth Gaddam[1]; Anurag Gumaste[1]; James Koonce[1]; Aleandro Saez[1]; Rajiv Mishra[1]; [1]University of North Texas

2:40 PM
Friction Extrusion of Thermoplastics: Manufacturing and Recycling: *Xiao Li*[1]; Tianhao Wang[1]; Russ Burnett[1]; Aye Meyer[1]; Yelin Ni[1]; Wenbin Kuang[1]; Kevin Simmons[1]; [1]Pacific Northwest National Laboratory

3:00 PM
In-Situ Friction Stir Forging: An Innovative and Alternative Approach towards Gear Fabrication: *Hrishikesh Das*[1]; Vineet Joshi[1]; Lei Li[1]; Nicole Overman[1]; Jens Darsell[1]; Piyush Upadhyay[1]; Ayoub Soulami[1]; Darrell Herling[1]; Mark Rhodes[1]; [1]Pacific Northwest National Laboratory

3:20 PM
Investigation of Shear Deformation Introduction n Friction Extrusion from Al-Cu Alloy: Lars Rath[1]; Uceu Suhuddin[1]; *Benjamin Klusemann*[1]; [1]Helmholtz-Zentrum Hereon

3:40 PM Break

4:00 PM
Robust Temperature Control for Shear Assisted Processing and Extrusion (ShAPE): *Woongjo Choi*[1]; Xiao Li[1]; Kenneth Ross[1]; [1]Pacific Northwest National Laboratory

4:20 PM
The Effect of Additional Impulses on Microstructure and Mechanical Performance of Impulse Friction Stir Welded AA7075-T6 Joints: *Keqi Wang*[1]; Svetlana Shalnova[2]; Anton Naumov[1]; Olga Klimova[2]; Fedor Isupov[1]; Ahmad Alali Alkhalaf[1]; [1]Peter The Great St. Petersburg Polytechnic University; [2]St. Petersburg State Marine Technical University

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MATERIALS PROCESSING

Materials Processing Fundamentals — Additive Manufacturing and Materials First Principles

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: Samuel Wagstaff, Oculatus Consulting; Alexandra Anderson, Gopher Resource; Adrian Sabau, Oak Ridge National Laboratory

Thursday PM | March 23, 2023
29B | SDCC

Session Chair: Samuel Wagstaff, Oculatus Consulting

2:00 PM Introductory Comments

2:05 PM
Automatic Process Mapping for Ti64 Single Tracks in Laser Powder Bed Fusion: *Toby Wilkinson*[1]; Massimiliano Casata[1]; Daniel Barba[1]; [1]Universidad Politécnica de Madrid

2:25 PM
A High-fidelity Numerical Model Informed Machine Learning Framework for Melt Pool Prediction in Laser Additive Manufacturing: *Shashank Sharma*[1]; Mohammad Parsazadeh[1]; Zhaochen Gu[1]; Narendra Dahotre[1]; Song Fu[1]; [1]Center for Agile and Adaptive Additive Manufacturing, UNT

2:45 PM
A Mesoscale Thermo-mechanical Numerical Model for Residual Stress Prediction in Laser Powder Bed Fusion Process: *Shashank Sharma*[1]; Mangesh Pantawane[1]; Sameehan Joshi[1]; Narendra Dahotre[1]; [1]Center for Agile and Adaptive Additive Manufacturing, UNT

3:05 PM
Investigation of the Keyhole and Molten Pool Stability in Laser Welding Process Depending on Intensity Distribution of Dual Beam: *Juyeong Lee*[1]; Jin-young Kim[1]; Junmyoung Jang[1]; Taehwan Ko[1]; Jaeheon Lee[1]; Geonmin Kim[1]; Seung Hwan Lee[1]; [1]Hanyang University

3:25 PM Break

3:45 PM
Activation Energy of Simulated Surface Diffusion in Nanoporous Gold.: *Conner Winkeljohn*; Sadi Shahriar[1]; Erkin Seker[1]; Jeremy Mason[1]; [1]University of California Davis

4:05 PM
Machine Learning and Monte Carlo Simulations of the Gibbs Free Energy of the Fe-C System in a Magnetic Field: *Ming Li*[1]; Luke Wirth[2]; Stephen Xie[3]; Ajinkya Hire[1]; Michele Campbell[4]; Dallas Trinkle[2]; Richard Hennig[1]; [1]University of Florida; [2]University of Illinois Urbana-Champaign; [3]KBR at NASA Ames Research Center; [4]University of California-Merced

4:25 PM
Carbon Diffusion in Bcc Fe Under Magnetic Fields From First Principles: *Luke Wirth*[1]; Ming Li[2]; Richard Hennig[2]; Dallas Trinkle[1]; [1]University of Illinois Urbana-Champaign; [2]University of Florida

4:45 PM
Simulation of Fe Diffusion in Thermal Decomposition of γ'-Fe_4N using Molecular Dynamics: *Jianxin Zhu*[1]; Jian-Ping Wang[1]; [1]University of Minnesota

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MATERIALS PROCESSING

Materials Research in Reduced Gravity — Thermophysical Properties (Levitation)

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

Program Organizers: Wilhelmus Sillekens, European Space Agency; Michael Sansoucie, Nasa Marshall Space Flight Center; Robert Hyers, Worcester Polytechnic Institute; Douglas Matson, Tufts University; Gwendolyn Bracker, DLR Institute of Materials Physics in Space

Thursday PM | March 23, 2023
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Session Chairs: Wilhelmus Sillekens, European Space Agency; Birte Riechers, Federal Institute of Materials Research And Testing (BAM)

2:00 PM
Melt Flow Sensitivity to Sample Properties and Changes in the Electromagnetic Field During Oscillating Drop Experiments in EML: Gwendolyn Bracker[1]; *R. W. Hyers*[1]; [1]University of Massachusetts

2:20 PM
Contactless Material Properties Measurement using AC or DC Magnetic Fields: *Valdis Bojarevics*[1]; [1]University of Greenwich

2:40 PM
AC Calorimetry of Liquid Metals in Electromagnetic Levitation: Comparison of Procedures in Microgravity and Terrestrial Conditions: Romain Pons[1]; Annie Gagnoud[1]; Didier Chaussende[1]; *Olga Budenkova*[1]; [1]UGA/CNRS/SIMAP

3:00 PM
Convection during Modulation Calorimetry Experiments in Electromagnetic Levitation: *Gwendolyn Bracker*[1]; R. W. Hyers[1]; [1]University of Massachusetts

3:20 PM
Containerless Thermophysical Property Measurement of Bulk Metallic Glasses in the Liquid State under Microgravity: *Markus Mohr*[1]; Yue Dong[1]; Hans Fecht[1]; [1]Ulm University

3:40 PM Break

4:00 PM
Thermophysical Properties of Ge- and Si-based Semiconductors: *Birte Riechers*[1]; Yuansu Luo[2]; Bernd Damaschke[3]; Konrad Samwer[3]; Robert Maaß[4]; [1]Federal Institute of Materials Research And Testing (BAM); [2]Georg-August-Universität Göttingen ; [3]Georg-August-Universität Göttingen; [4]Federal Institute of Materials Research and Testing (BAM), University of Illinois at Urbana-Champaign

4:20 PM Concluding Comments

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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

Thursday PM | March 23, 2023
Aqua 310B | Hilton

Session Chairs: Ryan Hurley, Johns Hopkins University; Alain Reiser, Massachusetts Institute of Technology

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2:00 PM Invited
Advances in Micromechanics and Digital Twin Modeling of Concrete and Geologic Materials Aided by In-situ Tomography and 3D X-ray Diffraction: *Ryan Hurley*[1]; Mohmad Thakur[1]; Ghassan Shahin[1]; [1]Johns Hopkins University

2:30 PM
Advanced Impactors for Laser-induced Particle Impact Testing: *Alain Reiser*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

2:50 PM
Atomistic Perspective of Grain Boundary Plasticity in Metals: *Qi Zhu*[1]; Haofei Zhou[2]; Huajian Gao[1]; Jiangwei Wang[2]; [1]Nanyang Technological University; [2]Zhejiang University

3:10 PM
Compressive Behavior of Pure Polycrystalline Cobalt and Other HCP Metals Investigated Using Acoustic Emission: *Adam Greš*[1]; Michal Knapek[1]; Patrik Dobroň[1]; Peter Minárik[1]; František Chmelík[1]; [1]Charles University

3:30 PM Break

3:50 PM
In situ Extreme Micromechanics – Recent Innovations and Prospects: Remo Widmer[1]; *Nicholas Randall*[1]; Renato Pero[1]; Jean-Marc Breguet[1]; [1]Alemnis AG

4:10 PM
Optically Pumped Magnetometer Measuring Fatigue-induced Damage in Steel: *Thomas Straub*[1]; Ali Riza Durmaz[1]; Simon Philipp[1]; Andreas Blug[2]; Alexander Bertz[2]; [1]Fraunhofer Institute for Mechanics of Materials (IWM); [2]Fraunhofer Institute for Physical Measurement Techniques (IPM)

4:30 PM
Stress-strain Responses from Spherical Nanoindentation and Micro-pillar Compression Experiments in Fe-3% Si: A Comparative Study: *Soumya Varma*[1]; Sid Pathak[1]; Jordan Weaver[2]; Surya Kalidindi[3]; Johann Michler[4]; [1]Iowa State University; [2]NIST; [3]Georgia Institute of Technology; [4]EMPA

NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Nanostructured Materials in Space and Other Extreme Environments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

Thursday PM | March 23, 2023
Aqua 303 | Hilton

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

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2:00 PM
Characterization of Newly Developed Nanolubricants for Space Applications: *Ayten Bakhtiyarova*[1]; Mostafa Hassanalian[1]; Sayavur Bakhtiyarov[1]; [1]New Mexico Institute of Mining and Technology

2:20 PM
Cu NW Degradation Under High Vacuum Environment: *Diego Santa Rosa Coradini*[1]; Stefan Pogatscher[1]; Cameron Quick[1]; Matheus Tunes[2]; Peter J. Uggowitzer[1]; Thomas

Kremmer[1]; [1]Montauniversty Leoben; [2]Los Alamos National Laboratory

2:40 PM
Oxidation Resistance of Silicon-Boron Coatings on TZM Molybdenum Alloy: *Miriem Santander Borrego*[1]; Chris Wood[1]; [1]Defence Science and Technology Group

3:00 PM
Study on Advanced Cementing Practices using Inert Graphene Nanoplatelets and Hydraulic Fracturing Fluids for Wellbore Integrity and Sustainability: Havila Jupudi[1]; Gabriel Awejori[1]; Cody Massion[1]; *Mileva Radonjic*[1]; [1]Oklahoma State University

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ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Recycling

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

Thursday PM | March 23, 2023
33C | SDCC

Session Chairs: Erik Spiller, Colorado School of Mines; Mark Strauss, Idaho National Laboratory; Corby Anderson, Colorado School of Mines; Fangyu Liu, Hatch Ltd.

2:00 PM Invited
Requirements for an Extreme Make-over of the Metals Industry: *Maurits Van Camp*[1]; [1]The University of Queensland

2:30 PM
Utilization of Value Creation Potential in Municipal Solid Waste Incineration (MSWI) Fly Ash: *Edzhe Soylu*[1]; Gabriella Tranell[1]; [1]Norwegian University of Science and Technology

2:50 PM
Nano-/Superfine Metallic Particles from Waste Printed Wiring Boards: A Cradle-to-gate Sustainability Assessment: *Haoyang He*[1]; Eric Schwartz[1]; Oladele Ogunseitan[1]; Julie Schoenung[1]; [1]University of California - Irvine

3:10 PM
Sensor-based Sorting. A New Workhorse in the Recycling and Mining Community: Harold Cline[1]; *Jordan Rutledge*[1]; [1]Tomra Sorting, Inc

3:30 PM Break

3:50 PM
Separation of Copper in Steel Scarp for Recycling: *Hyunsoo Jin*[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

4:10 PM
Recycling of Spent Lithium-ion Batteries at Swerim: Xianfeng Hu[1]; Elsayed Mousa[1]; Ludvug Ånnhagen[1]; *Guozhu Ye*[1]; [1]Swerim

4:30 PM
Comparison of Hydrogen Reduction of Different Lead-bearing Materials for Lead Recovery: Asywendi Rukini[1]; *M. Akbar Rhamdhani*[1]; Geoffrey Brooks[1]; Amy Van den Bulck[2]; [1]Swinburne University of Tecnology; [2]Umicore

PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Structure and Properties

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou, Marquette University

Thursday PM | March 23, 2023
25C | SDCC

Session Chair: Le Zhou, Marquette University

2:00 PM
Precipitate Size Distribution Evolution in an Additively Manufactured High Temperature Al-Cr-Zr Alloy: *Darby LaPlant*[1]; J. Hunter Martin[1]; Tresa Pollock[2]; [1]Hrl Laboratories, LLC; [2]University of California, Santa Barbara

2:20 PM
Microstructures in Icosahedral-Phase-Strengthened Aluminum Alloy Powders for Additive Manufacturing: *Mingxuan Li*[1]; Sarshad Rommel[1]; Thomas Watson[2]; Callie Benson[3]; Rainer Hebert[1]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

2:40 PM
Thermal Stability of Quasicrystals in a Candidate Al Alloy for Additive Manufacturing: *Baris Yavas*[1]; Mingxuan X. Li[1]; S. Pamir Alpay[1]; Mark Aindow[1]; [1]University of Connecticut

3:00 PM
Physics-based Simulations of Microstructural Evolution Using Graph Theory: *Iman Javaheri*[1]; Veera Sundararaghavan[2]; [1]NASA Langley Research Center; [2]University of Michigan

3:20 PM
A Self Consistent Phase Field Crystal Plasticity (CPPFM) Approach in the Realm of Small and Large Deformation Framework: *Tariq Ali*[1]; Soumya Bandyopadhyay[1]; Hyung-Uk Jang[1]; Pil-Ryung Cha[1]; [1]Kookmin University

3:40 PM Break

4:00 PM
Fatigue Properties of Microstructural Gradients in Ti-6Al-4V Generated with Thermohydrogen Treatment: *Christopher David Schmidt*[1]; Hans-Jürgen Christ[1];

Axel von Hehl[1]; [1]University of Siegen

4:20 PM
Micro-beam Diffraction of Nano-structured Severe Plastically Deformed Metals Following Their Structural Evolution upon Heating: *Klaus-Dieter Liss*[1]; Xiaojing Liu[1]; Jae-Kyung Han[2]; Malte Blankenburg[3]; Megumi Kawasaki[2]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT); [2]Oregon State University; [3]Deutsches Elektronen-Synchrotron (DESY)

4:40 PM
Evolution of Phases and Interfaces in Self-healing Composites Made of Al5083 Matrix and Encapsulated ZnAl Particles: *Baolong Zheng*[1]; Xin Wang[1]; David Svetlizky[2]; Lorenzo Valdevit[1]; Noam Eliaz[2]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Tel-Aviv University

5:00 PM
Phase-field Modeling of Interaction Between Phase Transformation and Cracking in Shape Memory Ceramics: *Amirreza Lotfolahpour*[1]; Mohsen Asle Zaeem[1]; [1]Colorado School of Mines

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Characterization and Analysis II

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

Thursday PM | March 23, 2023
25B | SDCC

Session Chairs: Nicholas Derimow, National Institute of Standards and Technology; Wenwu Xu, San Diego State University

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2:00 PM Invited
X-ray Synchrotron Imaging of Laser Melted Ti-6Al-4V Powders with Varying Oxygen Content, Powder Size Distributions, and Gaseous Environments: *Nicholas Derimow*[1]; Orion Kafka[1]; Samuel Clark[2]; Jake Benzing[1]; Ed Garboczi[1]; Nik Hrabe[1]; [1]National Institute of Standards and Technology; [2]Argonne National Laboratory

2:30 PM
The Improvement of Surface Roughness on Vertical Surfaces for 316L Stainless Steel in Laser Powder Bed Fusion Additive Manufacturing: *Tianyu Zhang*[1]; Lang Yuan[1]; [1]University of Southern California

2:50 PM
Unveiling New Insights into Computer Vision and Machine Learning for Reusability Assessment of Ti-6Al-4V Powder in Additive Manufacturing: *Saeid Alipour Masoumabad*[1]; Sanaz Vajedian[1]; Arezoo Emdadi[1]; [1]Missouri University of Science & Technology

3:10 PM
Metal Powder Characterization Through the Experimental Method and Machine Learning Approach in Selective Laser Melting: *Jiahui Zhang*[1]; Manvinder Lalh[1]; Yu

Zou[1]; [1]University of Toronto

3:30 PM Break

3:50 PM
Mapping Directed Energy Deposition of Nickel Superalloys Through *In-situ* Synchrotron Radiography: *Imogen Cowley*[1]; Yunhui Chen[2]; Sebastian Marussi[1]; Kai Zhang[1]; Chu Lun Alex Leung[1]; Marta Majkut[3]; Maureen Fitzpatrick[1]; Martyn Jones[4]; Peter Lee[1]; [1]University College London; [2]University of Manchester; [3]European Synchrotron Radiation Facility; [4]Rolls-Royce plc.

4:10 PM
Methodology for Material Selection of Optimal Additive Manufactured Alloys and Parameter Sets for Space Optical Instruments: *Zachary Post*[1]; Walter Zimbeck[1]; Steven Storck[1]; Floris van Kempen[2]; Gerard Otter[2]; John Boldt[1]; Ludger van der Laan[2]; Steven Szczesniak[1]; Ryan Carter[1]; Robert Mueller[1]; Salahudin Nimer[1]; Doug Trigg[1]; Michael Berkson[1]; Frank Morgan[1]; William Swartz[1]; [1]JHU APL; [2]TNO

4:30 PM
Thermogravimetric Analysis of Additive Ti-6Al-4V Powders in Gaseous Environments: *Nicholas Derimow*[1]; Elisabeth Mansfield[1]; Nik Hrabe[1]; [1]National Institute of Standards and Technology

4:50 PM
The Microstructure and Hardness of Zn-3(wt.%)Mg Powders Processed via High Pressure Torsion: Tanzilur Rahman[1]; Burak Dikici[2]; Hakan Yılmazer[3]; Kaveh Edalati[4]; Hendra Hermawan[5]; *Carl Boehlert*[1]; [1]Michigan State University; [2]Ataturk University; [3]Yildiz Technical University; [4]Kyushu University; [5]Laval University

5:10 PM
Novel Method of $BiFeO_3$ Purification by Acid Washing Determined from ICP-MS Analyses: *Jenna Metera*[1]; Anna Wilke[1]; Olivia Graeve[1]; [1]University of California San Diego

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ADDITIVE TECHNOLOGIES

Quantifying Microstructure Heterogeneity for Qualification of Additively Manufactured Materials — Characterization of Heterogeneity

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

Program Organizers: Sharniece Holland, Washington University in St. Louis; Eric Payton, University of Cincinnati; Edwin Schwalbach, Air Force Research Labroatory; Joy Gockel, Colorado School of Mines; Ashley Paz y Puente, University of Cincinnati; Paul Wilson, The Boeing Company; Amit Verma, LLNL; Sriram Vijayan, Ohio State University; Jake Benzing, National Institute of Standards and Technology

Thursday PM | March 23, 2023
24B | SDCC

Session Chairs: Ashley E. Paz y Puente, University of Cincinnati; Paul Wilson, Boeing

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2:00 PM Invited
In Situ Monitoring of Recrystallization during Laser Powder Bed Fusion of 316L Stainless Steel by Means of Synchrotron X-ray Diffraction: *Claire Navarre*[1]; Milad

Hamidi[1]; Reza Esmaeilzadeh[1]; Charlotte de Formanoir[1]; Lucas Schlenger[1]; Steven van Petegem[2]; Nicola Casati[3]; Roland Logé[1]; [1]École polytechnique fédérale de Lausanne (EPFL), Switzerland / Laboratory of Thermomechanical Metallurgy (LMTM); [2]Structure and Mechanics of Advanced Materials Group (SMAM), Paul Scherrer Institut (PSI), Switzerland; [3]Swiss Light Source (SLS), Paul Scherrer Institut (PSI), Switzerland

2:25 PM
Large-scale Image Analysis of Melt Pools in Complex Additively Manufactured Artifacts: *Guangyu Hu*[1]; Hunter Taylor[2]; Ryan Wicker[2]; Marat Latypov[1]; [1]University of Arizona; [2]University of Texas at El Paso

2:45 PM
Heterogeneous Microstructure and Location-specific Mechanical Performance of Ti-6Al-4V Parts Made by Laser Directed Energy Deposition: Janelle Hobbs[1]; Xiaochuan Tang[1]; *Kaka Ma*[1]; [1]Colorado State University

3:05 PM
Correlative Modeling of Laser Powder Bed Fusion Surface Characteristics to Internal Defects: *Sean Dobson*[1]; Ashely Paz y Puente[1]; [1]University of Cincinnati

3:25 PM Break

3:40 PM
Characterization of Titanium Additions in Selectively Laser Melted High-strength Aluminum Alloy by Correlative X-ray and Electron Microscopy: *Daniel Sinclair*[1]; Nikhilesh Chawla[1]; Amey Luktuke[1]; [1]Purdue University

4:00 PM
Use of Profilometry-based Indentation Plastometry (PIP) to Study Inhomogeneities in Additively Manufactured Components: *Max Burley*[1]; Jimmy Campbell[1]; Gael Guetard[2]; Charlie Pearson[2]; Becky Reiff-Musgrove[1]; Wenchen Gu[1]; Bill Clyne[1]; [1]Plastometrex Ltd; [2]Alloyed

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ADVANCED MATERIALS

Refractory Metals 2023 — Processes and Coatings - Ultimate Plus

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

Program Organizers: Brady Butler, US Army Research Laboratory; Todd Leonhardt, Rhenium Alloys Inc.; Matthew Osborne, Global Advanced Metals; Zachary Levin, Los Alamos National Laboratory

Thursday PM | March 23, 2023
Aqua E | Hilton

Session Chair: Matt Osborne, Global Advanced Metals

2:00 PM Invited
ULTIMATE: Additive Manufacturing of Ultrahigh Temperature Mo-Si-B Alloys: Zahabul Islam[1]; Longfei Liu[2]; John Perepezko[2]; Phalgun Nelaturu[2]; Ankur Agrawal[2]; *Dan Thoma*[2]; [1]Bowling Green State University; [2]University of Wisconsin-Madison

2:30 PM
Ultimate: Affordable, Durable Precipitation Strengthened Refractory High Entropy Alloys for Use at 1300 Celsius and Above: Michael Gao[1]; Michael Kirka[2]; Michael Widom[3]; Chantal Sudbrack[1]; Vishnu Raghuraman[3]; Saro San[1]; Saket Thapliyal[2]; Chris Ledford[2]; Julio Rojas[2]; Brian Jordon[2]; Paul Jablonksi[1]; *David Alman*[1]; [1]National

Energy Technology Laboratory; [2]Oak Ridge National Laboratory; [3]Carnegie Mellon University

2:50 PM
ULTIMATE: Arc Melting and Additive Manufacturing of Refractory Complex Concentrated Alloys and Composites: Fei Wang[1]; Xin Chen[1]; *Bai Cui*[1]; Michael Gao[2]; Shanshan Hu[3]; Xingbo Liu[3]; Dongsheng Li[4]; [1]University of Nebraska Lincoln; [2]National Energy Technology Laboratory; [3]West Virginia University; [4]Advanced Manufacturing LLC

3:10 PM
Development of Ruthenium-Based Alloy Wire for Highly Efficient OLED Vacuum Deposition: *Rikito Murakami*[1]; Kei Kamada[1]; Kenichi Umetsu[2]; Shiika Itoi[3]; Hiroaki Yamaguchi[3]; Takashi Yoshioka[4]; Katsunari Oikawa[1]; Junji Kido[2]; Akira Yoshikawa[1]; [1]Tohoku University; [2]Yamagata University; [3]C&A Corporation; [4]Sunric Co., Ltd.

3:30 PM Break

3:45 PM
New Environmental-thermal Barrier Coatings for Ultrahigh Temperature Alloys: *Hua Xie*[1]; Victor Champagne[2]; Wei Zhong[1]; Bryson Clifford[1]; Yunhui Gong[3]; David Clarke[2]; Liangbing Hu[1]; Ji-Cheng Zhao[1]; [1]University of Maryland; [2]Harvard University; [3]HighT-Tech LLC

4:05 PM
Novel Refractory Bond Coat Alloy Capable of Alumina Formation Up to 1400°C (ULTIMATE Project): *Collin Holgate*[1]; Carolina Frey[1]; Melina Endsley[1]; Akane Suzuki[2]; Carlos Levi[1]; Tresa Pollock[1]; [1]University of California Santa Barbara; [2]GE Research

4:25 PM
High Entropy Rare-earth Oxide (HERO) Coatings for Refractory Alloys: Kristyn Ardrey[1]; Mackenzie Ridley[2]; Prasanna Balachandran[1]; Bi-Cheng Zhou[1]; Patrick Hopkins[1]; *Elizabeth Opila*[1]; [1]University of Virginia; [2]Oak Ridge National Lab

4:45 PM
Microstructural and Compositional Evolution in the Tantalum Vanadium System: Towards Refractory Alloys for Extreme Environments: *Connor Rietema*[1]; Jibril Shittu[1]; Alex Baker[1]; Aurélien Perron[1]; Brandon Bocklund[1]; Hunter Henderson[1]; Scott McCall[1]; Joseph McKeown[1]; [1]Lawrence Livermore National Laboratory

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NUCLEAR MATERIALS

Seaborg Institutes: Emerging Topics in Actinide Materials and Science — Metallurgy

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

Program Organizers: J. Rory Kennedy, Idaho National Laboratory; Taylor Jacobs, Los Alamos National Laboratory; Krzysztof Gofryk, Idaho National Laboratory; Assel Aitkaliyeva, University of Florida; Don Wood, Idaho National Laboratory

Thursday PM | March 23, 2023
28A | SDCC

Session Chairs: Ladia Havela, Charles University ; Krzysztof Gofryk, Idaho National Laboratory; Rory Kennedy, INL

2:00 PM Invited
Magnetic Dichroism in Ga-stabilized d-Pu: *Jason Jeffries*[1]; Alexander Baker[1]; G Fabbris[2]; Daniel Haskel[2]; [1]Lawrence Livermore National Laboratory; [2]Argonne National Laboratory

2:30 PM Invited
Understanding Self-irradiation Damage Mechanisms in -Pu from First-principles: *Sarah Hernandez*[1]; [1]Los Alamos National Laboratory

3:00 PM
Recovery in Stabilized Delta Pu and Its Effects on Thermal Expansion: *Najeb Abdul-Jabbar*[1]; Shane Mann[1]; Jeremy Mitchell[1]; [1]Los Alamos National Laboratory

3:20 PM
A Time-of-Flight Neutron Diffraction Study of -phase 239PuGa Alloys at Cryogenic Temperatures: *Alice Smith*[1]; Franz Freibert[1]; Sven Vogel[1]; Bjorn Clausen[1]; Jianzhong Zhang[1]; Donald Brown[1]; Joan Siewenie[1]; Travis Carver[1]; Scott Richmond[1]; Michael Ramos[1]; [1]Los Alamos National Laboratory

3:40 PM Break

4:00 PM Invited
Hydrogen Embrittlement in Uranium: From Hydrides to Plastic Effects: *Mary O'Brien*[1]; Jason Cooley[1]; Samantha Lawrence[1]; [1]Los Alamos National Laboratory

4:30 PM Invited
Experimental Investigation of the U-Mo Solidus and Liquidus: *Kara Luitjohan*[1]; Seth Imhoff[1]; [1]Los Alamos National Laboratory

5:00 PM
Thermal Stability of Alpha-phase Plutonium: *Jeremy Mitchell*[1]; Najeb Abdul-Jabbar[1]; [1]Los Alamos National Laboratory

5:20 PM Concluding Comments

NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Radiation Damage Characterization, Modeling & Alloy Design II

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory; Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

Thursday PM | March 23, 2023
27B | SDCC

Session Chairs: Thomas Davis, Oxford Sigma; Ling Wang, Stanford Linear Accelerator Centre

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2:00 PM Invited
Effect of Elemental Segregation in High-entropy Alloys on Materials Transport Properties: *Kai Nordlund*[1]; [1]University of Helsinki

2:40 PM
Impact of Pre-existing Damage on He Irradiated Sintered 3C-SiC: *Nabil Daghbouj*[1]; Bingsheng Li[1]; Miroslav Karlik[1]; Mauro Callisti[1]; Tomas Polcar[1]; Huseyin Sener[1]; [1]Czech Technical University in Prague

3:00 PM
Molecular Dynamics Simulations of Mixed Materials Effects in Tungsten: *Mary Alice Cusentino*[1]; Megan McCarthy[1]; Ember Sikorski[1]; Mitchell Wood[1]; Aidan Thompson[1]; [1]Sandia National Laboratories

3:20 PM
Ultrafast Measurement of Microscopic Energy Flow in He-implanted W: *Mianzhen Mo*[1]; Artur Tamm[2]; Zhijiang Chen[1]; Erki Metsanurk[3]; Ling Wang[1]; Yongqiang Wang[4]; Mungo Frost[1]; Nicholas Hartley[1]; Fuhao Ji[1]; Samuel Murphy[5]; Silvia Pandolfi[1]; Peihao Sun[1]; Xiaozhe Shen[1]; Correa Alfredo[6]; Siegfried Glenzer[1]; [1]SLAC National Accelerator Laboratory; [2]University of Tartu; [3]Uppsala University; [4]Los Alamos National Laboratory; [5]Lancaster University; [6]Lawrence Livermore National Laboratory

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SPECIAL TOPICS

2023 Technical Division Student Poster Contest — EPD 2023 Technical Division Graduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPG-1: Determination of Mechanical, Thermal and Barocaloric Properties of Elastomers by Rheological Techniques for Hydrostatic Pressure based Solid State Refrigeration: *Naveen Weerasekera*[1]; Agnimitra Biswas[2]; [1]University of Louisville; [2]National Institute of Technology-Silchar

SPG-2: Extraction of Niobium and Tantalum Oxides from Columbite Concentrate: *Himanshu Tanvar*[1]; Brajendra Mishra[1]; [1]Worcester Polytechnic Institute

SPG-3: Flexural Properties of Low Density Polyethylene Hybrid Nanocomposite Reinforced with Linen and Aramid Fabric: *Andressa Souza*[1]; Sergio Monteiro[1]; Lucio Fabio Nascimento[1]; [1]IME

SPG-4: Phytomining of Rare Earth Elements: *David Zirker*[1]; Amin Mirkouei[1]; [1]University of Idaho

SPG-5: Selective Recovery of Copper from Metal Concentrate of Waste Printed Circuit Boards by Ammoniacal Solvo-leaching: *Kurniawan Kurniawan*[1]; Jae-chun Lee[2]; Mooki Bae[2]; Hyunju Lee[2]; Sookyung Kim[2]; [1]Korea University of Science and Technology; [2]Korea Institute of Geoscience and Mineral Resources (KIGAM)

SPECIAL TOPICS

2023 Technical Division Student Poster Contest — FMD 2023 Technical Division Graduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPG-6: Electronic Transport Properties of Mn2Sb: *Salil Paranjape*[1]; [1]University of

Illinois Urbana Champaign

SPG-7: First-Principles Study of Vacancy Formation Energy in High-Entropy Alloys: *Christopher Lafferty*[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

SPG-8: Investigation of Functional Coatings for Improving Performance of Carbon Nanotube-based Supercapacitors: *Julia Allen*[1]; [1]Georgia Institute of Technology

SPG-9: Material-based Characterization of Carbon Nanotube Field Emission Cathodes: *Arega Margousian*[1]; [1]Georgia Institute of Technology

SPG-11: Optimized Design of Interlocking Metasurfaces: *Nathan Brown*[1]; Ben Young[2]; Ophelia Bolmin[2]; Brad Boyce[2]; Philip Noell[2]; [1]Sandia National Laboratories; Clemson University; [2]Sandia National Laboratories

SPG-12: Synthesis and Characterization of Fullerene-Antibody Conjugate Energetic Nanoparticles (FACE-NP) for Bladder Cancer Treatment: *Carolina Colon*[1]; [1]Georgia Institute of Technology

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SPECIAL TOPICS

2023 Technical Division Student Poster Contest — FMD 2023 Technical Division Undergraduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPU-1: Cultural Heritage Science: Authentication of Native American Artwork via Materials Characterization and Forensic Analysis: *Cody Marshall*[1]; Ava Knutson[1]; Jon Kellar[1]; Grant Crawford[1]; [1]South Dakota School of Mines and Technology

SPU-2: Investigation of High Entropy Precursor Powder Synthesis for Transparent Ceramic Synthesis: *Marlena Alexander*[1]; Kaden Anderson[1]; Chuck Melcher[2]; Mariya Zhuravleva[2]; [1]University of Tennessee Knoxville; [2]Scintillation Materials Research Center

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SPECIAL TOPICS

2023 Technical Division Student Poster Contest — LMD 2023 Technical Division Graduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPG-14: Mechanical Properties of Laser Fabricated and Arc Melted AlCuFeNiSi High Entropy Alloy for Energy Storage Applications: Comparative Study: *Modupeola Dada*[1]; Patricia Popoola[1]; Evlly Mtileni[1]; [1]Tshwane University of Technology

SPG-15: Transition Mechanism for the Metastable Phases in Al-Zn-Mg Alloys: A Novel Molecular Dynamics Approach: *Yu-ning Chiu*[1]; Chung-yi Yu[2]; Shih-kang Lin[1]; [1]National Cheng Kung University; [2]China Steel Corp, Aluminum Prod R&D Sect, New Mat R&D Dept

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SPECIAL TOPICS

2023 Technical Division Student Poster Contest — LMD 2023 Technical Division Undergraduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPU-3: Correlating Local and Global Tensile Deformation Behavior of AlSi10Mg Specimens Fabricated Via Laser Powder Bed Fusion: *Caleb Fronk*[1]; Ritam Pal[1]; Amrita Basak[1]; [1]Penn State University

SPU-4: Developing a Metallography Procedure to Investigate Compositional Effects on the Microstructure of Lightweight Metal Matrix Composites: *Caleb Schenck*[1]; Andrew O'Connor[1]; Michele Manuel[1]; [1]University of Florida

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SPECIAL TOPICS

2023 Technical Division Student Poster Contest — MPMD 2023 Technical Division Graduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPG-16: A Computer Vision Method of Grain Segmentation for Additive-manufactured Haynes 282 Alloys Under Various Heat Treatments: *Yu-Tsen Yi*[1]; Nicholas Lamprinakos[1]; Junwon Seo[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

SPG-17: Characterization of Failure Mechanisms for Multimaterial Interfaces Manufactured with Additive Friction Stir Deposition: *Cole Franz*[1]; [1]University of Tennessee

SPG-18: Characterization of Microstructural Heterogeneities in Electron Beam Additively Manufactured Haynes 282: *Alivia Mourot*[1]; [1]Ohio State University

SPG-19: Comparison of Experimental and Analytical Melt Pool Geometries for High Thermal Conductivity Refractory Metals Using ANSYS: *Aditya Rohan Narra*[1]; Venkata Satya Surya Amaranth Karra[1]; Bryan Webler[1]; [1]Carnegie Mellon University

SPG-20: Correlating Laser Process Conditions to Balling Severity with Time-Resolved Synchrotron X-ray Visualization: *John Smith*[1]; Runbo Jiang[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

SPG-21: Development of a Generalized Fatigue Assessment Approach for Steel Castings: *Matthew Batson*[1]; Brian Jordon[1]; Paul Allison[1]; Yu Hong[1]; [1]Baylor University

SPG-22: Effect of Chemical Pretreatment on Properties of Natural Fiber Reinforced Composites for 3D Printing: *Athira Nair Surendran*[1]; Sreesha Malayil[1]; Kunal Kate[1]; Jagannadh Satyavolu[1]; [1]University of Louisville

SPG-23: Effect of Laser Surface Remelting on the Microstructure, Mechanical, Tribological and Corrosion Properties of the Ti40Nb25Zr25Ta10 (with 0.5 at. % O) Medium Entropy Alloy (MEA): *Labani Mustafi*[1]; Ma Qian[1]; Alan Jones[1]; Van Thuong Nguyen[2]; Qiushi Deng[1]; Tingting Song[1]; Xiaobo Chen[1]; Daniel Fabijanic[3]; [1]RMIT University; [2]University of Queensland; [3]Deakin University

SPG-24: Effect of Process Parameters on Texture and Anisotropy of Ti-6Al-4V Wall Components Made by Wire-feed DED Process: *Rajib Halder*[1]; Jake Benzing[2];

Anthony Rollett[1]; Zhening Yang[3]; [1]Carnegie Mellon University; [2]National Institute of Standards and Technology; [3]Penn State University

SPG-25: Effects of the Reduction Temperature and Amount of Diluent on the Properties of High-purity Tantalum Powder Prepared via the Hunter Process: *Yongkwan Lee*[1]; Sunggue Heo[1]; Jae-Jin Sim[2]; MiHye Lee[2]; Soong Ju Oh[1]; JaeHong Shin[2]; Kyoung-Tae Park[2]; [1]Korea University; [2]Korea Institute of Industrial Technology

SPG-26: Effects of Varying Heat Accumulation in Laser Powder Bed Fusion on Microstructure Outcomes in Ti-6Al-4V: *Evan Adcock*[1]; [1]Carnegie Mellon University

SPG-27: Evaluating the Effect of Tool Offset on Repaired AA7050 by Additive Friction Stir Deposition: *Victor Rojas*[1]; Ismael Hidalgo[1]; J. Brian Jordon[1]; Paul Allison[1]; [1]Baylor University

SPG-28: Evaluation of As-deposited Tensile Behavior and Microstructure of Additive Friction Stir Deposition 304L Stainless Steel: *Jessica Lopez*[1]; [1]University of Alabama

SPG-29: In Operando Synchrotron X-ray Tomography Study of Fine Eutectic Polyphase Solidification Patterns: *Paul Chao*[1]; George Lindemann[1]; Shanmukha Aramanda[1]; Ashwin Shahani[1]; [1]University of Michigan

SPG-30: Induction-Coupled Thermomagnetic Processing of Fe-C Alloys: *Megan Hurley*[1]; Ramon Padin-Monroig[1]; Benjamin Begley[1]; Zach Tener[2]; Steven Flynn[1]; Mike Kesler[3]; Michele Manuel[1]; Mark Meisel[1]; Victoria Miller[1]; [1]University of Florida; [2]Oak Ridge National Laboratory ; [3]Oak Ridge National Laboratory

SPG-31Laser-PowderBedFusionofTi-6Al-2Sn-4Zr-2Mo-0.08Si(Ti-6242):As-built Properties, Kinetics of to Phase Transformation, and Design of Heat Treatment: *Harish Kaushik*[1]; Mahdi Habibnejad Korayem[2]; Amir Hadadzadeh[1]; [1]University of Memphis; [2]AP&C Advance Powder and Coating, a GE Additive Company

SPG-32: Melt-pool Dynamics during Multiple-laser-beamed Powder Bed Fusion of Stainless Steel: *Marco Rupp*[1]; Shuichiro Hayashi[1]; Claire Dashe[1]; Wenxuan Zhang[1]; Craig Arnold[1]; [1]Princeton University

SPG-33: Modeling for Time Dependent Grain Boundary Evolution: *Lucero Lopez*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

SPG-34: Multi-scale In Situ Studies of Deformation Mechanism of L-PBF 316L Stainless Steels: *Wanxuan Teng*[1]; Biao Cai[1]; Moataz Attallah[1]; [1]University of Birmingham

SPG-35: Multi-scale Modelling for Material Design in Additive Manufacturing: *Weiling Wang*[1]; Wei Wen[1]; Hossein Eskandari Sabzi[1]; Pedro Rivera-Diaz-del-Castillo[1]; [1]Lancaster University

SPG-36: On the Influence of Gaussian and Ring-shaped Beam Profiles on Quality and Energy Consumption in L-PBF of Inconel 718: *Ersilia Cozzolino*[1]; Austin Tiley[1]; Edward D. Herderick[1]; [1]Center for Design and Manufacturing of Excellence, The Ohio State University

SPG-37: Oxide Morphology and Growth Kinetics for Additively Manufactured 316L Austenitic Stainless Steel High Temperature Steam Exposures: *Scott Schier*[1]; Katherine Montoya[1]; Allyssa Bateman[2]; Ethan Schneider[1]; Elizabeth Sooby[1]; Brian Jaques[2]; [1]UTSA; [2]Boise State University

SPG-38: Printability and Defects in W & W -alloys by Directed Energy Deposition: *Amaranth Karra*[1]; Bryan Webler[1]; [1]Carnegie Mellon University

SPG-39: Recycled Battlefield Titanium Scrap for Cold Spray Applications: *Kiran*

Judd[1]; [1]Worcester Polytechnic Institute

SPG-40: Removal of Rare Metal Impurities by Electron-beam Melting Refining Process: *YongKwan Lee*[1]; Hyunchul Kim[1]; Sung Gue Heo[1]; Seok-Jun Seo[1]; SoongJu Oh[1]; Kyoung-Tae Park[1]; [1]Korea Institute of Industrial Technology

SPG-41: Strain Evolution and Damage Development during Tight-radius Bending of Advanced High Strength Steels: *Nizia Mendes Fonseca*[1]; David Wilkinson[1]; [1]McMaster University

SPECIAL TOPICS

2023 Technical Division Student Poster Contest — MPMD 2023 Technical Division Undergraduate Student Poster Contest

Monday PM | March 20, 2023
Exhibit Hall G | SDCC

SPU-5: A High-speed Radiography Study for Validating the Effect of Dwell Time on Melt-pool Dynamics during Laser Powder Bed Fusion: *Raymond Wysmierski*[1]; Rakesh Kamath[1]; Gerry Knapp[2]; John Coleman[2]; Stuart Slattery[2]; Sam Reeve[2]; Hahn Choo[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

SPU-6: Assessing Laser Powder Bed Additive Manufacturing Part Quality via In-Situ Monitoring & Machine Learning: *Ana Love*[1]; [1]Sandia National Labs; University of New Mexico

SPU-7: Burn Rate Analysis of an Energetic Initiator Ink for 3D Printing: *Kayleigh Cameron*[1]; Dr. Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

SPU-8: Development of a Pyrotechnic Initiator Ink for Additive Manufacturing Methodology: *Benito Silva*[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

SPU-9: Effects of LPBF Parameters on Fatigue Life of AlSi10Mg Alloys: *Timothy Nice*[1]; Bhaskar Majumdar[1]; Nathaniel Badgett[1]; John O'Connell[1]; [1]New Mexico Institute of Mining & Technology

SPU-10: Mechanochemistry for Creation of Functional Surface Treatments: *Jennifer Johnson*[1]; Jon Kellar[1]; William Cross[1]; [1]South Dakota School of Mines and Technology

SPU-11: Study of the Pyrometallurgical Recycling Process to the Recovery of Zinc and Manganese Oxide from Spent Alkaline and Zn-C Batteries: *Seoung-Uk Bae*[1]; Kyoung-Tae Park[2]; Jae Hong Shin[2]; Junghoon Lee[3]; [1]Incheon National University; [2]Korea Institute of Industrial Technology; [3]Other

SPU-12: Viscosity Characterization of an Energetic Initiator Ink for 3D Printing: *Hannah Morgan-Smith Myers*[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

SPECIAL TOPICS

2023 Technical Division Student Poster Contest — SMD 2023 Technical Division Graduate Student Poster Contest

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SPG-44: Advanced Characterization of the Local Atomic Orders and Their Effects on the Mechanical Properties in Metallic Glasses: *Can Okuyucu*[1]; Doguhan Sariturk[1]; Fatma Saadet Guven[1]; Emel Erdal[1]; Yunus Eren Kalay[1]; [1]Middle East Technical University

SPG-45: Atomistic Modeling of Energy Barriers to Dislocation Processes in Metals: *Yipin Si*[1]; Ting Zhu[1]; [1]Georgia Institute of Technology

SPG-46: Automating Selective Area Electron Diffraction Pattern Phase Identification Using Image Analysis and Machine Learning: *Mitchell Mika*[1]; Assel Aitkaliyeva[1]; [1]University of Florida

SPG-47: Bulk Material Libraries through Laser-Remelting: Combinatorial Analysis of the CrCoNi System: *Tobias Gaag*[1]; Maximilian Heidowitzsch[1]; Carolin Körner[1]; Christopher Zenk[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

SPG-48: Corrosion Control of Structural Materials for 4th Gen Nuclear Reactors: *Krishna Moorthi Sankar*[1]; Preet Singh[1]; [1]Georgia Institute of Technology

SPG-49: Deformation Mechanism Characterization for Bi-modally Distributed ' Precipitates in Allvac 718plus Superalloy: *Geeta Kumari*[1]; Carl Boehlert[1]; S Sankaran[2]; M Sundararaman[2]; [1]Michigan State University; [2]Indian Institute of Technology, Madras

SPG-50: Effect of Ag on the Microstructures in Al-Cu-Ni-Mn High Entropy Alloy: *Gina Zavala Alvarado*[1]; S.K. Varma[1]; Mckenna Hitter[1]; [1]The University of Texas at El Paso

SPG-51: Experimental Observation of Heteroepitaxial Recrystallization (HeRX) outside of Low Lattice Misfit Ni-based Superalloys: *Yonguk Lee*[1]; Eitan Hershokovitz[1]; Honggyu Kim[1]; Eric Payton[2]; Victoria Miller[1]; [1]University of Florida; [2]University of Cincinnati

SPG-52: Investigation of Corrosion Mechanisms and Fatigue Property of Friction-stir Welded Joints between 6022 Al and ZEK100 Mg Alloy: *Qingli Ding*[1]; [1]Worcester Polytechnic Institute

SPG-53: Methods for Estimating the Microscopic and Macroscopic Behaviors of Materials: Mathew Aibinu[1]; Kemi Adewale[2]; *Joba Morakinyo*[3]; [1]Durban University of Technology; [2]University of KwaZulu-Natal; [3]Ladoke Akintola University of Technology

SPG-54: Microstructural Characterization and Oxidation of Non-BCC High Entropy Alloys: *Mckenna Hitter*[1]; S.K. Varma[1]; [1]University of Texas at El Paso

SPG-55: Modeling of Non-equilibrium Phenomena in Laser Additive Manufacturing Using Molecular Dynamics: *Gurmeet Singh*[1]; Veera Sundararaghavan[1]; [1]University of Michigan

SPG-56: Nanoscale Differences in Tooth Enamel with Aging by Atom Probe Tomography: *Jack Grimm*[1]; Cameron Renteria[1]; Arun Devaraj[2]; Dwayne Arola[1]; [1]University of Washington; [2]Pacific Northwest National Laboratory

SPG-57: Sintering and Densification Mechanism of HfB2 Based Ultra High Temperature Ceramics for Hypersonic Space Vehicles: *Shruti Dubey*[1]; Kantesh

Balani[1]; [1]Indian Institute of Technology

SPG-58: Thermal Stability of Novel Multicomponent Al-based High-performance Alloys and Its Direct Implication on Their Mechanical Properties: *Gourav Mundhra*[1]; Hao-En Peng[2]; Jien-Wei Yeh[2]; B. S. Murty[3]; [1]IIT Madras and NTHU Taiwan; [2]NTHU Taiwan; [3]IIT Madras and IIT Hyderabad

SPG-59: Understanding Nanostructures in the Binary Ti-Fe Alloy Using Advanced Electron Microscopy: *Deepak V Pillai*[1]; Dian Li[1]; Cameron Tucker[1]; Ahsan Habib[1]; Yufeng Zheng[1]; [1]University of Nevada, Reno

SPG-60: Understanding the Microstructural Evolution in the Modeled Ti-18Mo-5Al Alloy Using Scanning Electron Microscopy: *Ahsan Habib Munna*[1]; Dian Li[1]; Yufeng Zheng[1]; [1]University of Nevada Reno

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SPECIAL TOPICS

2023 Technical Division Student Poster Contest — SMD 2023 Technical Division Undergraduate Student Poster Contest

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SPU-13: An In-situ Radiography Study on Meltpool Dynamics and Fluid Flow as a Function of Laser Power in Ti-6Al-4V Raster Melts: *Garrett Fields*[1]; Rakesh Kamath[1]; Gerry Knapp[2]; John Coleman[2]; Stuart Slattery[2]; Sam Reeve[2]; Hahn Choo[2]; [1]The University of Tennessee-Knoxville; [2]Oak Ridge National Laboratory

SPU-14: Understanding the Microstructure-Property Relationship in the Additive Manufactured Titanium Alloy for Aerospace Applications: *Sydney Fields*[1]; Dian Li[1]; Yufeng Zheng[1]; [1]University of Nevada, Reno

SPU-15: Using Microstructural Modifications to Influence Intense Strain Localization in Inconel 718Plus: *Olivia Egbers*[1]; Jenna Benko[1]; Nathan Heniken[1]; Michael Mills[1]; Semanti Mukhopadhyay[1]; [1]Ohio State University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials — Poster Session

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

Program Organizers: Daniel Salazar, BCMaterials; Markus Chmielus, University of Pittsburgh; Emily Rinko, Iowa State University; Emma White, DECHEMA Forschungsinstitut; Kyle Johnson, Sandia National Laboratories; Andrew Kustas, Sandia National Laboratories; Iver Anderson, Iowa State University Ames Laboratory

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Session Chair: Daniel Salazar, BCMaterials

A-1: 3D Ink-Extrusion Printing of NbFeSb Thermoelectric Legs with Complex

Shape: *Alexander Proschel*[1]; Duncan Zavanelli[1]; Jeffery Snyder[1]; David Dunand[1]; [1]Northwestern University

A-2: Additive Manufacturing of Iron and Iron-Alloy Lattices for Magnetic Nanoparticle Capture: *Sammy Shaker*[1]; Juyeon Won[2]; Daniel Shoemaker[2]; Steven Hetts[3]; Vitaliy Rayz[4]; Julia Greer[1]; [1]California Institute of Technology; [2]University of Illinois Urbana-Champaign; [3]University of California-San Francisco; [4]Purdue University

A-3: Comparison of Laser Wire and Powder Blown Directed Energy Deposition for C103: *Daniel Palacios*[1]; Aaron Stebner[1]; [1]Georgia Institute of Technology

A-4: FeSiBCCr Amorphous Fine Powders with High Saturation Magnetization Based on Particle Size Classification and Its Magnetic Powder Cores with Low Core Loss: *Yan-nan Dong*[1]; Zheng-qu Zhu[1]; Jia-qi Liu[1]; Huan Zhao[2]; Jing Pang[2]; Pu Wang[1]; Jia-quan Zhang[1]; [1]University of Science & Technology Bejing; [2]Qingdao Yunlu Advanced Materials Technology Co., Ltd.

Laser Powder Bed Fusion of the LaCe(Fe,Mn,Si)13 Magnetocaloric Material: *Kun Sun*[1]; Abdelmoez Hussein[1]; Moataz Attallah[1]; [1]University of Birmingham

A-5: New Aluminium-based Composite Powders Dedicated for Additive Manufacturing: Krzysztof Pecak[1]; *Marcin Lis*[1]; Adriana Wrona[1]; Adrian Kukofka[2]; Jacek Mazur[1]; Anna Janoszka[1]; Magorzata Osadnik[1]; [1]Lukasiewicz Research Network - Institute of Non-Ferrous Metals; [2]Progresja New Materials Sp. z o.o.

A-81: Rapid 3D Printing of Nd:YAG Ceramic for Lasing Media: *Luyang Liu*[1]; Xiangfan Chen[1]; [1]Arizona State University

A-83: Role of Additive Manufacturing (AM) in Developing Iron-Silicon Electric Steels for Soft Magnetic Applications: *SaiSree Varahabhatla*[1]; Kiran Nartu[1]; Sameehan Joshi[1]; Srinivas Mantri[1]; Narendra Dahotre[1]; Raj Banerjee[1]; [1]University of North Texas

A-6: Study on the Optimization of Fe Content of FeSiBC Amorphous Powders: *Zheng-qu Zhu*[1]; Yan-nan Dong[1]; Jia-qi Liu[1]; Jing Pang[2]; Pu Wang[1]; Jia-quan Zhang[1]; [1]University of Science & Technology Bejing; [2]Qingdao Yunlu Advanced Materials Technology Co., Ltd.

ADDITIVE TECHNOLOGIES

Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment — 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; Steve Daniewicz, University of Alabama; Mohsen Seifi, ASTM International/Case Western Reserve University

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Session Chair: Nik Hrabe, National Institute of Standards and Technology

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Evolution of Fatigue Behavior of Low Carbon Multiphase Steel Developed through Quench and Partitioning Method: *Sk Md Arif*[1]; [1]National Institute of Technology

Durgapur

A-7: Investigating the Effect of Heat Treatment on the Process-Structure-Property Relationship of AlSi10Mg Produced through Selective Laser Melting: *Youssef Salib*[1]; Hatem Zurob[1]; David Wilkinson[1]; [1]McMaster University

Microstructural Evolution and Mechanical Behaviour of L-PBF Processed 17-4 PH Stainless Steel: *Bijit Kalita*[1]; Jayaganthan R.[1]; [1]Indian Institute of Technology Madras

A-8: Parameterizing Surface Defects and Internal Porosity to Predict Fracture Location in As-built AM Tensile Specimens Using a Modified Void Descriptor Function: *Elliott Marsden*[1]; Dillon Watring[2]; John Erickson[3]; Laura Ziegler[1]; Andrew Chuang[4]; Ashley Spear[1]; [1]University of Utah; [2]United States Naval Research Laboratory; [3]Sandia National Laboratories; [4]Argonne National Laboratory

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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: Sougata Roy, University of North Dakota; Sneha Prabha Narra, Carnegie Mellon University; Andrzej Nycz, Oak Ridge National Laboratory; Yousub Lee, Oak Ridge National Laboratory; Chantal Sudbrack, National Energy Technology Laboratory; Albert To, University of Pittsburgh; Yashwanth Bandari, AddiTec Technologies LLC

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Controlling Heterogeneity of Inconel 625 and 316L Interface by Functionally Gradient Method Using L-PBF Process: *Seong Gyu Chung*[1]; Jung Wook Cho[1]; [1]Postech, Graduate Institute of Technology

A-9: Inclusion Modification in AISI 316L by Addition of AlN via Laser Powder Bed Fusion: *Seung Hoon Lee*[1]; Jung-Wook Cho[1]; [1]Graduate Institute of Ferrous and Energy Materials Technology

A-10: Influence of Exposure Strategy on Part Quality in Multi-Laser-Powder-Bed-Fusion (M-LPBF): *Tino Pfalz*[1]; Astrid Rota[1]; [1]EOS GmbH

ADDITIVE TECHNOLOGIES

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Poster Session

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

Program Organizers: Wenda Tan, The University of Michigan; Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Lianyi Chen, University of Wisconsin-Madison

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Session Chair: Wenda Tan, University of Michigan

A-11: A New Cellular Automaton Model for Simulating the Formation of Aluminum Microstructure in Laser Powder Bed Fusion Process: *Michael Moodispaw*[1]; Buwei Chen[1]; Qiqui Wang[2]; Andy Wang[2]; Alan Luo[1]; [1]The Ohio State University; [2]General Motors

A-12: A Study on the Effect of VED, Particle Size Distribution, Moisture content, and Powder Reuse on the Densification and Mechanical Properties of L-PBFed Nickel Alloy 718 Using Design of Experiment and ANOVA: *Peter Morcos*[1]; David Shoukr[1]; Tayler Sundermann[1]; Thomas Dobrowolski[2]; Nicholas Barta[2]; Jayesh Jain[2]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; Alaa Elwany[1]; [1]Texas A&M University; [2]Baker Hughes

A-13: Achieving Single Crystals of Pure Ni via Laser Powder Bed Fusion with a Flat-top Laser Profile: *Dennis Jodi*[1]; Tomonori Kitashima[1]; Yuichiro Koizumi[2]; Takayoshi Nakano[2]; Makoto Watanabe[1]; [1]National Institute for Materials Science; [2]Osaka University

Additive Manufacturing Process Map of Ti6Al4V Using In Situ and Operando Synchrotron Radiography: *Elena Ruckh*[1]; Samy Hocine[1]; Sebastian Marussi[1]; Andy Farndell[2]; Ruben Lambert-Garcia[1]; Maureen Fitzpatrick[3]; Anna Getley[1]; Caterina Iantaffi[1]; Saurabh Shah[1]; Marta Majkut[3]; Alexander Rack[3]; Nick Jones[2]; Peter Lee[1]; Chu Lun Alex Leung[1]; [1]University College London; [2]Renishaw plc; [3]European Synchrotron Radiation Facility

A-14: Directed Energy Deposition of Al-0.5Sc-0.5Si Alloy: Effect of Thermal Cycles in Microstructure and Mechanical Properties: Amit Singh[1]; Yasham Mundada[2]; Priyanshu Bajaj[3]; Sushil Mishra[1]; *Amit Arora*[2]; [1]Indian Institute of Technology Bombay; [2]Indian Institute of Technology Gandhinagar; [3]Max-Planck-Institut für Eisenforschung GmbH

Effects of Nanoscale Compositional Inhomogeneity on the Mechanical Properties of a Cu-9Al Alloy Produced by Wire Arc Additive Manufacturing: *Hao Wang*[1]; Bosheng Dong[2]; Huijun Li[2]; Simon Ringer[1]; Xiaozhou Liao[1]; [1]University of Sydney; [2]University of Wollongong

A-15: Effects of Thermal Cycling on Microstructural Evolution in Ni-Mo-Al Single Crystals: *Ruben Ochoa*[1]; Adriana Eres-Castellanos[1]; Gus Becker[1]; Kamel Fezzaa[2]; Jonah Klemm-Toole[1]; Kester Clarke[1]; Tresa Pollock[3]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Argonne National Laboratory; [3]University of California Santa Barbara

A-16: Feasibility Study of Solidification Microstructure Control in Laser Powder Bed Fusion Based on Thermal Analysis and Microstructure Simulation: *Masahiro Kusano*[1]; Makoto Watanabe[1]; [1]National Institute for Materials Science

A-17: Hot Cracking during Powder Direct Energy Deposition: Experimental and Numerical Study: Pilar Rodriguez[1]; Monica Gonzalez[1]; *Mustafa Megahed*[2]; [1]AIMEN; [2]ESI Group

A-18: Impact of Laser Power and Scanning Velocity on Microstructure and Mechanical Properties of Inconel 738LC Alloys Fabricated by the Constant Volumetric Energy Input of Laser Powder Bed Fusion (LPBF): *Yixuan Chen*[1]; Weihao Wang[1]; Yao Ou[1]; Yingna Wu[1]; Zirong Zhai[1]; Rui Yang[2]; [1]ShanghaiTech University; [2]The Institute of Metal Research (IMR), Chinese Academy of Sciences (CAS)

A-19: In-situ Homogenization of Inconel 718 during Induction Heating Assisted-laser Direct Energy Deposition: *Junmyoung Jang*[1]; Juyeong Lee[1]; Taehwan Ko[1];

Jaeheon Lee[1]; Geonmin Kim[1]; Seung Hwan Lee[1]; [1]Hanyang University

A-20: IN939 Fabricated by the Laser Powder Bed Fusion: The Effect of Process Parameters on the Density, Surface Roughness and Microstructural Properties: *Merve Dogu*[1]; Muhannad Ahmed Obeidi[1]; Hengfeng Gu[2]; Dermot Brabazon[1]; [1]Dublin City University; [2]ANSYS

A-21: Laser Powder Bed Fusion of 17-4 PH Stainless Steel: Multiscale Microstructure and Property Relationships: *Maxwell Moyle*[1]; Nima Haghdadi[1]; Xioazhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; [1]The University of New South Wales; [2]The University of Sydney

A-22: LPBF Fabrication of Thin Cross Sections; Challenges and Printability: *Shahrooz Nafisi*; John Daniel Arputharaj[1]; Reza Ghomashchi[1]; [1]University of Adelaide

A-23: Machine Learning Based Parameters Optimization for Selective Laser Melting: *Jiahui Zhang*[1]; Yu Zou[1]; [1]University of Toronto

A-24: Microsegregation Model Dedicated to Rapid Solidification – Application to Multicomponent Alloys of Industrial Interest.: Paul Martin[1]; François Pichot[2]; Nicolas Leriche[2]; Gildas Guillemot[1]; *Charles-André Gandin*[1]; [1]CEMEF; [2]Safran Additive Manufacturing Campus

A-25: Microstructures of 316L Steel Processed by Laser Powder Bed Fusion: *Carlos Capdevila-Montes*[1]; Adriana Eres-Castellanos[2]; Ana Santana[1]; Rosalia Rementeria[3]; Francisca Caballero[1]; [1]CENIM CSIC; [2]Colorado School of Mines; [3]ArcelorMittal Global R&D SLab

A-26: Modification of H950 Condition for 17-4 PH Stainless Steel Processed by DED: *Ipfi Mathoho*[1]; [1]CSIR Pretoria

A-27: Phase Field Simulation of Microstructure Evolution during Epitaxial Solidification in Additive Manufacturing Processes: *Abdur Al Azad*[1]; Philip Cardiff[1]; David Browne[1]; [1]University College Dublin

A-28: Printability of Nickel Alloy 718 Using a Systematic Process Optimization Framework with Different Layer Thicknesses: David Shoukr[1]; *Peter Morcos*[1]; Tayler Sundermann[1]; Thomas Dobrowolski[2]; Chad Yates[2]; Jayesh Jain[2]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; Alaa Elwany[1]; [1]Texas A&M University; [2]Baker Hughes

Probing Surface Structures in Metal Powders Produced by Abrasion and Rapid Solidification: *Harish Dhami*[1]; Puli Saikiran[1]; Koushik Viswanathan[1]; [1]Indian Institute of Science

A-29: Process Modification and Alloy Design of Ni-base Superalloys: *Mohammad Tashfiul A Chowdhury*[1]; John M. O'Connell[1]; Nathaniel Badgett[1]; Anthony E. Lavelle[1]; Bhaskar S. Majumdar[1]; [1]New Mexico Institute of Mining and Technology

A-30: Quantification of the Microstructure of Additively Manufactured Parts Utilizing Local Orientation Image Analysis: *Sahar Beigzadeh*[1]; Jeffrey Shield[1]; [1]University of Nebraska-Lincoln

A-31: Rapid Solidification in Ternary Alloys: A Phase-Field Study: *Yitao Wang*[1]; Fadi Abdeljawad[1]; [1]Clemson University

A-32: Strength Enhancement of Al Alloy via Microstructure Design Strategy Using Laser Powder Bed Fusion: *Ankita Roy*[1]; Saket Thapliyal[1]; Ravi Haridas[1]; Priyanka Agrawal[1]; Abhijeet Dhal[1]; Rajiv Mishra[1]; Eric Faierson[1]; [1]University of North Texas

A-33: Thermal and Mechanical Behavior of Powder Blown Directed Energy Deposited Nickel-Titanium Shape Memory Alloys: *Dyuti Sarker*[1]; Aaron Stebner[1];

Samad Firdosy[2]; Ali Komilian[1]; Zachary Haataja[1]; [1]Georgia Institute of Technology; [2]Jet Propulsion Laboratory

A-34: Thermal Cycles Induced Phase Evolution in IN718 during Additive Manufacturing: a Gleeble Study: *Nana Adomako*[1]; Nima Haghdadi[1]; Xiaozhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; [1]UNSW Sydney; [2]The University of Sydney

A-35: Ultrafine Austenite in Laser Powder Bed Fusion Processed Duplex Stainless Steels Through Microstructural Engineering: *Xinyi He*[1]; Xiaozhou Liao[2]; Simon Ringer[2]; Sophie Primig[1]; Nima Haghdadi[1]; [1]UNSW Sydney, NSW 2052; [2]Australian Centre for Microscopy & Microanalysis, The University of Sydney, Sydney, NSW 2006

A-82: 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 Mantri[1]; Brian Welk[2]; Narendra Dahotre[1]; Hamish Fraser[2]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]The Ohio State University

A-36: Understanding the Impact of Residual Stresses on Microstructure Evolution in Additive Manufacturing: *Michael Haines*[1]; Nima Haghdadi[1]; Sophie Primig[1]; [1]University of New South Wales

A-37: Using Analytical Solidification Models to Solve Solidification Cracking in Laser Powder Bed Fusion Processed Ni-based Alloys: *Dan McConville*[1]; Ruben Ochoa[1]; Benjamin Rafferty[2]; Kevin Eckes[2]; Jeremy Iten[2]; Amy Clarke[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines; [2]Elementum 3D

A-80: Using Laser Powder Bed Fusion to Exploit Transformation Induced Plasticity in Beta-Titanium: Chris Jasien[1]; *Alec Saville*[1]; Jonah Klemm-Toole[1]; Kamel Fezzaa[2]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Advanced Photon Source, Argonne National Laboratory

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ADDITIVE TECHNOLOGIES

Additive Manufacturing of Refractory Metallic Materials — Poster Session

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

Program Organizers: Antonio Ramirez, Ohio State University; Jeffrey Sowards, NASA Marshall Space Flight Center; Omar Mireles, NASA; Eric Lass, University of Tennessee-Knoxville; Faramarz Zarandi, Raytheon Technologies; Matthew Osborne, Global Advanced Metals; Joao Oliveira, FCT-UNL

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Session Chairs: Joao Pedro Oliveira, Universidade NOVA de Lisboa; Eric A. Lass , University of Tennessee-Knoxville

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A-38: Development and Assessment of a Novel TiVNbMo-based Refractory High Entropy Alloy Manufactured by Laser Powder Bed Fusion for High Temperature Applications: *Lucy Farquhar*[1]; Lova Chechik[1]; Alexander Goodall[1]; Abdallah Reza[2]; Felix Hofmann[2]; Iain Todd[1]; Russell Goodall[1]; [1]University of Sheffield; [2]University of Oxford

A-39: Development of Molybdenum Parts for High Temperature Applications with Laser Directed Energy Deposition Additive Manufacturing: *Andrew Hutchinson*[1];

[1]Georgia Institute of Technology

Directed Energy Deposition of Niobium and Related Alloys: *Sucharita Banerjee*[1]; Advika Chesetti[2]; Mohan Sai Kiran Nartu[2]; Venkata Mani Krishna Karri[2]; Sameehan Joshi[2]; Eric Taleff[1]; Narendra Dahotre[2]; Rajarshi Banerjee[2]; [1]University of Texas at Austin; [2]University of North Texas

Interfacial Microstructures between Mo and Stainless Steel Fabricated by Directed Energy Deposition for High Temperature Service Applications: *Sumin Lee*[1]; Seunghyun Lee[1]; Jaeyoon Bae[1]; Sanghoon Noh[1]; [1]Pukyong National University

A-40: Investigation into Wire Arc Additive Manufacturing Titanium-Zirconium-Molybdenum (TZM) Alloy: *Saiful Islam*[1]; DuckBong Kim[1]; [1]Tennessee Tech University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Beyond on the Beam IV — Poster Session

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

Program Organizers: James Paramore, US Army Research Laboratory; Daniel Lewis, Texas A&M University; Kyle Tsaknopoulos, Worcester Polytechnic Institute; Paul Prichard, Kennametal Inc.

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A-41: Redeposition and Grain Refinement of AA6061 Produced Using Additive Friction Stir Deposition: *Michael Amling*[1]; Mark Weaver[1]; Brian Jordon[2]; Paul Allison[2]; [1]University of Alabama; [2]Baylor University

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Length-Scale Phenomena in Mechanical Response — Poster Session

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

Program Organizers: Meysam Haghshenas, University of Toledo; Andrew Birnbaum, US Naval Research Laboratory; Robert Lancaster, Swansea University; Xinghang Zhang, Purdue University; Aeriel Leonard

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Session Chair: Meysam Haghshenas, University of Toledo

A-43: Additively Manufactured Structured Fabrics for Deployable Antenna Structures: *Punnathat Bordeenithikasem*[1]; Tracy Lu[2]; Connor McMahan[2]; Chiara Daraio[2]; [1]NASA Jet Propulsion Laboratory; [2]California Institute of Technology

A-42: A Comparative Study of Microstructure and Multiscale Mechanical Properties of Additively Manufactured Near-, + and Titanium Alloys: Zhiying Liu[1];

Yu Zou[1]; *Jiahui Zhang*[1]; [1]University of Toronto

A-44: Correlation between Strengthening Mechanism and Dislocation Characteristics of Selective Laser Melted H13 Hot Work Tool Steel: *Sung-Ho Kim*[1]; Yeonggeun Cho[1]; Sung-Joon Kim[1]; [1]Graduate Institute of Ferrous & Energy Materials Technology(GIFT), POSTECH

Development of a MATLAB Script to Analyze c_b, a New Constitutive Mechanical Property Parameter: *Ryan Holdsworth*[1]; Benjamin MacDonald[2]; Enrique Lavernia[2]; Diran Apelian[2]; Alan Jankowski[1]; Joshua Yee[1]; [1]Sandia National Laboratories; [2]University of California, Irvine

Effect of Short Cycle Heat Treatment on the Microstructure and Mechanical Properties of Additively Manufactured Mar-M 509: *Siba Sundar Sahoo*[1]; Balila Nagamani Jaya[1]; Dheepa Srinivasan[2]; [1]Indian Institute of Technology Bombay; [2]Pratt & Whitney Research and Development Center

A-45: Green Geopolymer Materials for 3D printing of Built Environment-Numerical Modelling and Experimental Validation: Shoukat Alim Khan[1]; Huseyin Ilcan[2]; Oguzhan Sahin[3]; Mustafa Sahmaran[2]; *Muammer Koc*[1]; [1]Division of Sustainable Development, College of Science and Engineering, Hamad Bin Khalifa University, Qatar Foundation, Doha, Qatar; [2]Department of Civil Engineering, Hacettepe University, Beytepe, Ankara, Turkey; [3]Ankara University, Engineering Faculty, Civil Engineering Department

A-46: Investigation and Optimization of Compressive Mechanical Properties of Additive Manufactured TPMS-type Interpenetrating Phase Composites: *Wei-Hsuan Liao*[1]; Cheng-Che Tung[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

A-47: Liquation Cracking Study of Additively Manufactured Alloy 718 Using Thermal-mechanical Simulator: *Sangguk Jeong*[1]; Gangaraju Manogna Karthik[1]; Soung Yeoul Ahn[1]; Eun Seong Kim[1]; Hyoung Seop Kim[1]; [1]POSTECH

A-48: Mechanical Behavior of Additively Manufactured GRCop-84 Copper Alloy Lattice Structures: *Daniel June*[1]; Behzad Babamiri[2]; Kavan Hazeli[1]; [1]The University of Arizona; [2]The University of Alabama in Huntsville

A-49: Microstructural and Mechanical Property Response to Build Parameters and Material Property Suite Development of Laser Powder Bed Fusion NASA HR-1: *Madelyne Rushing*[1]; Ryan Anderson[1]; Stephen Cooke[1]; Joseph Sims[1]; Melissa Forton[1]; [1]Quadrus Corporation - Advanced Manufacturing

A-50: Microstructure and Deformation Behavior of Microstructurally Manipulated Multi-phase Laser Powder Bed Fusion 3D-printed Novel Low Nickel Steels: *Jan Capek*[1]; Ashiah Ganvir[2]; Tuomas Kantonen[2]; Sneha Goel[2]; Antti Salminen[2]; Efthymios Polatidis[1]; [1]Paul Scherrer Institute; [2]University of Turku

A-51: Nano-scale Heterogeneity-driven Metastability Engineering in Ferrous Medium-entropy Alloy Induced by Additive Manufacturing: *Jeong Min Park*[1]; Peyman Asghari-Rad[2]; Alireza Zargaran[2]; Jae Wung Bae[3]; Jongun Moon[2]; Hyeonseok Kwon[2]; Jungho Choe[1]; Sangsun Yang[1]; Ji-Hun Yu[1]; Hyoung Seop Kim[2]; [1]Korean Institute of Materials Science; [2]Pohang University of Science and Technology; [3]Pukyong National University

A-52: Operando Synchrotron Powder XRD Reveal 316L Stainless Steel Microstructure Evolution during Additive Manufacturing: *Kouider Abdesselam*[1]; Steve Gaudez[1]; Hakim Gharbi[1]; Steven Van Petegem[2]; Manas Upadhyay[1]; [1]Centre National de la Recherche Scientifique (CNRS), Ecole Polytechnique, Institut Polytechnique de Paris; [2]Paul Scherrer Institute

Tailored Microstructure and Creep Behavior of Laser Powder Bed Fusion Inconel

939: *Nandha Kumar Eswaramoorthy*[1]; Sarath Chandra Reddy Karumudi[2]; Dheepa Srinivasan[1]; Vishwanath Chintapentha[2]; Vikram Jayaram[3]; Praveen Kumar[3]; [1]Pratt & Whitney R & D Center, Indian Institute of Science, Bangalore; [2]Indian Institute of Technology Hyderabad; [3]Indian Institute of Science Bangalore

A-53: The Investigation of Copper Alloy Fabricated by Selective Laser Melting: *Kangwei Chen*[1]; Simon Ringer[1]; Keita Nomoto[1]; [1]The University of Sydney

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ADDITIVE TECHNOLOGIES

Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals — 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 Toledo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Jiadong Gong, Questek Innovations LLC; Orlando Rios, University of Tennessee; Atieh Moridi, Cornell University

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Development of Low-Mn added Fe Based Lightweight Steel via Direct Energy Deposition: *Kwang Kyu Ko*[1]; HyoJu Bae[1]; EunHye Park[1]; Hyokyung Sung[1]; Junggi Kim[1]; JaeBok Seol[1]; [1]Gyeongsang National University

A-54: Enhanced Mechanical Properties of Functional Grade Materials Fabricated from 316L Stainless Steel and Fe-based Medium Entropy Alloy Using Direct Energy Deposition Process: *Eun Seong Kim*[1]; Gangaraju Manogna Karthik[2]; Soung Yeoul Ahn[1]; Sang Guk Jeong[1]; Yoon-Uk Heo[1]; Hyoung Seop Kim[1]; [1]POSTECH; [2]BITS Pilani

A-55: Optimization of Directed Energy Deposition Processed Inconel 625 Alloy via Response Surface Methodology: *Minseok Gwak*[1]; Gideok Park[2]; Jae Bok Seol[1]; Hyokyung Sung[1]; Jung Gi Kim[1]; [1]Gyeongsang National University; [2]Doosan Heavy Industries & Construction

Peculiarities of Structure Formation in Aluminum Alloys Alloyed with Transition Metals during Laser Powder Bed Fusion: *Ivan Grushin*[1]; Dmitriy Ryabov[1]; Igor Yadroytsev[1]; [1]Light Materials and Technologies Institute UC RUSAL

A-56: Synchrotron X-ray Imaging of the Effect of TiB2 Additions on Laser Powder Bed Fusion (LPBF) of Al-2139: *David Rees*[1]; Chu Lun Alex Leung[1]; Joe Elambasseril[2]; Sebastian Marussi[1]; Saurabh Shah[1]; Shashidhara Marathe[3]; Milan Brandt[2]; Mark Easton[2]; Peter Lee[1]; [1]University College London; [2]RMIT University; [3]Diamond Light Source Ltd

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ENERGY & ENVIRONMENT

Advanced Materials for Energy Conversion and Storage 2023 — Poster Session

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

Program Organizers: Jung Choi, Pacific Northwest National Laboratory; Amit

Pandey, Lockheed Martin Space; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota; Soumendra Basu, Boston University; Paul Ohodnicki, University of Pittsburgh; Eric Detsi, University of Pennsylvania

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Session Chairs: Partha Mukherjee, Purdue University; Eric Detsi, University of Pennsylvania

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Aluminum-Anodes for Metal-Air-Batteries: *Janne Max Heydrich-Bodensieck*[1]; Sören Müller[2]; [1]Extrusion Research and Development Center; [2]Extrusion Research and Development Center, Technical University of Berlin

Atomic Level Understanding of the Na Hosting Environments in Hard Carbon Anodes for Sodium Ion Batteries: Wesley Surter[1]; Edward Koh[2]; Xiulei Ji[3]; Michelle Dolgos[4]; *Peter Greaney*[5]; [1]University of Liverpool; [2]Harvard University; [3]Oregon State University; [4]University of Calgary; [5]University of California, Riverside

D-1: Computational Study for Structural Evolution and Ion Migration in Li-Mn-rich Layered Electrode: *Zhuoying Zhu*[1]; Xin He[2]; Robert Kostecki[1]; Anubhav Jain[1]; [1]Lawrence Berkeley National Laboratory; [2]Sichuan University

Development of High Energy-density and High-power Density Lithium-ion Capacitors Based on MnO2/GO Nanocomposite Electrode for Energy Storage System: *Mariam Binari*[1]; Daniel Choi[1]; Faisal Almarzooqi[2]; Abhishek Lokhande[1]; [1]Khalifa University; [2]Khalifa University

D-2: Electrochemical Hydrogenation of Furfural to 2-Methylfuran under Mild pH Environment over Silver/Nanoporous Copper Catalyst: *Yu-Shuo Lee*[1]; Wen-Yueh Yu[1]; I-Chung Cheng[1]; [1]National Taiwan University

D-3: Enhanced Reversibility in Calcium Chloride Hexahydrate with Nucleation Agents for Thermal Energy Storage Applications: *Denali Ibbotson*[1]; Sophia Ahmed[1]; Patrick Shamberger[1]; [1]Materials Science and Engineering, Texas A&M University

Fabrication and Electrochemical Characterization of Si-C Hybrid Nanocomposites for High-performance Li Ion Batteries: *Aamna Hameed*[1]; Daniel Choi[1]; [1]Khalifa University of Science and Technology

Fabrication of the Seamless Stainless Tube for Hydrogen Refueling Stations: *Yoon Oh*[1]; Sungmo Hong[2]; [1]Research Institute of Science and Technology; [2]Sechang Steel

D-4: In-situ and Ex-situ Surface Engineering, Processing, and Characterization of PLA-based Biocompatible Composites Using Micro-plasma-based Techniques: *Manan Sehgal*[1]; Prakhyat Gautam[1]; Edgar Lopez[2]; Saquib Ahmed[3]; Sankha Banerjee[1]; [1]California State University, Fresno; [2]University of California, Merced ; [3]State University of New York at Buffalo State

D-5: Investigation Mechanical Process of New Alloy Electrode Using All Solid State Battery: *Sangwoo Kim*[1]; DongEung Kim[1]; [1]Korea Institute of Industrial Tech

D-6: Lithium-Ion Battery Silicon Anodes: Reducing Mechanical Degradation through Morphological Design: *Sierra Gross*[1]; Meng-Ting Hsieh[1]; Ali Mohraz[1]; Daniel Mumm[1]; Lorenzo Valdevit[1]; [1]University of California, Irvine

D-7: Mechanical Testing of Novel Chromium Superalloys Strengthened by Intermetallic Precipitates: *Tom Blackburn*[1]; Kan Ma[1]; Rebeca Hernandez[2]; Marta

Serrano[2]; Alexander Knowles[1]; [1]University of Birmingham; [2]CIEMAT

Modelling and Optimization of Nanofiber-based Triboelectric Nanogenerators: Chenxi Yuan[1]; Neda Mohaghegh[2]; *Ensieh Hosseini*[1]; [1]Department of Engineering, Durham University; [2]Terasaki Institute for Biomedical Innovation

D-8: Non-destructive Evaluation of Defects in Composite Pressure Vessels for Hydrogen Storage: *Sushrut Karmarkar*[1]; Vikas Tomar[1]; [1]Purdue University - School of Aeronautics and Astronautics

D-9: Novel Thermal Barrier Coatings Stable up to 1700°C: *Melina Endsley*[1]; Thomas Drtina[1]; Erin Lewis[1]; Collin Holgate[1]; Akane Suzuki[2]; Joshua Margolies[3]; Carlos Levi[1]; Tresa Pollock[1]; [1]University of California Santa Barbara; [2]GE Research; [3]GE Gas Power

D-10: Rapid Thermal Buffering via Sorption based Energy Storage Materials: *Sourav Chakravarty*[1]; Wenting Mo[1]; Patrick Shamberger[1]; [1]Texas A&M University

D-11: Reversible Aqueous Formate-based Na-CO_2 Battery Enabled through Earth-abundant Nanoporous Metals: *Jintao Fu*[1]; Eric Detsi[1]; [1]University of Pennsylvania

D-12: Spectroscopic Investigation of Long Cycling Al-ion Batteries Enabled by Ionic Liquid Electrolytes with Organic Additives: Zhen Wei[1]; Maya Smith[1]; Yiwen Wang[1]; Mieko Smith[1]; *Ruigang Wang*[1]; [1]University of Alabama

D-13: Surface Engineered TiO2 Nanostructures as Effective Cathode Host Materials in Li-S Batteries: *John Barlow*[1]; Ruigang Wang[1]; [1]University of Alabama

D-14: Surface Oxidation of MNiSn (M=Ti, Zr, Hf) Half-Heusler Alloys: *Oshrat Appel*[1]; Shai Cohen[1]; Ofer Beeri[1]; Yaniv Gelbstein[2]; Shimon Zalkind[1]; [1]NRCN; [2]BGU

ENERGY & ENVIRONMENT

Advances in Magnetic Materials — Poster Session

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

Program Organizers: Jose Maria Porro, Bcmaterials; Huseyin Ucar, California Polytechnic University,Pomona; Patrick Shamberger, Texas A&M University; Min Zou, Lab Magnetics, A Quadrant Company; Gaoyuan Ouyang, Ames Laboratory; Alex Leary, NASA Glenn Research Center

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Session Chair: Patrick Shamberger, Texas A&M University

D-15: Effects of Machining and Electroplating on Magnetic Properties of Small Sintered NdFeB Magnets: *Min Zou*[1]; Jinghui Di[2]; Abby Shen[3]; Michelle Qian[4]; Hui Meng[5]; Qifeng Wei[5]; Christina Chen[4]; [1]Lab Magnetics, A Quadrant Company; [2]Hangzhou Magmax Technology Co., Ltd.; [3]Quadrant Solutions Inc.; [4]Quadrant International Inc.; [5]Hangzhou Foresee Group Holding Co., Ltd.

D-16: Investigating Irradiated Superconducting Magnet Insulation Materials for Particle Accelerators and Other High-dose Environments: *Christopher Reis*[1]; [1]University of California, Berkeley

D-17: Microstructural Processing and Phase Stabilization Analysis of Off-

stoichiometric
Fe-Mn-Ga Shape Memory Alloy: Nana Adoo[1]; *Nickolaus Bruno*[1]; [1]South Dakota School of Mines and Technology

D-18: Order-disorder Transition and Antiferromagnetism in Cu-Mn-Al BCC Alloys: *Tatsuya Ito*[1]; Xiao Xu[1]; Toshihiro Omori[1]; Kaoru Namba[2]; Takashi Saito[2]; Ryosuke Kainuma[1]; [1]Tohoku University; [2]J-PARC Center

D-19: Polyurethane Based Composites for Magnetic Actuator Applications: Antonio Veloso-Fernández[1]; Asier Aguilera-Grande[1]; Borja González[1]; José Manuel Laza[1]; Daniel Salazar Jaramillo[2]; *Ana Catarina Lopes*[1]; José Luis Vilas-Vilela[1]; [1]University of Basque Country; [2]BCMaterials- Basque Center for Materials, Applications and Nanostructures

D-20: The Effect of Stress-annealing on the Mechanical and Magnetic Properties in Fe-based Metal-amorphous Nanocomposites: *Nickolaus Bruno*[1]; Andrew Scherrer[1]; Elijah Meakins[1]; Ronald Noebe[2]; Alex Leary[2]; Vladimir Keylin[2]; Grant Feichter[2]; Maria Willard[2]; [1]South Dakota School of Mines and Technology; [2]NASA Glenn Research Center

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ELECTRONIC MATERIALS

Alloys and Compounds for Thermoelectric and Solar Cell Applications XI — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Structural 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; Wan-Ting Chiu, Tokyo Institute of Technology; Chenguang Fu, Zhejiang University

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C-1: Compositional Modification Improves the Thermoelectric Performance of $AgSbTe_2$: *Chen Bo-Chia*[1]; Hsin-Jay Wu[1]; [1]National Yang-Ming Chiao Tung University

C-2: Eliciting Promising p-type Bi_2Te_3 with Sizeable Thermoelectric Performances: *Hung-Wei Chen*[1]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University

C-3: Interfacial Reactions in Cu/Se, Cu2Se/Te and Cu2Te/Se Couples: *Yohanes Hutabalian*[1]; Sinn-wen Chen[1]; [1]National Tsing Hua University

C-4: Liquid-like Copper Ionic and Multiscale Crystal Imperfections Eliciting Record-High Thermoelectric zT in n-type Bi_2Te_3: *Wan-Ting Yen*[1]; Hsin-jay Wu[1]; Kuang-Kuo Wang[2]; [1]National Yang Ming Chiao Tung University; [2]National Sun Yat-sen University

C-5: Low Crystallinity Cu-Te-S Compounds Elicit Ultralow Lattice Thermal Conductivity in GeTe Thermoelectric Materials: *Yi-Fen Tsai*[1]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University

C-6: Minor Cu Addition in -Zn_4Sb_3 Leads to High Thermoelectric Performance via Phase Diagram Engineering: *I-Lun Jen*[1]; You-Kai Su[2]; Hsin-Jay Wu[1]; [1]National Yang

Ming Chiao Tung University; [2]National Sun Yat-Sen University

LIGHT METALS

Aluminum Alloys, Characterization and Processing — Poster Session

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

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Stephan Broek, Kensington Technology Inc.

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E-1: Aluminum Alloy Design and Mechanical Properties for Next-generation Mobility Structural Materials: *Minsang Kim*[1]; Hyun Joo Choi[2]; Young Do Kim[3]; Se Hoon Kim[1]; [1]KATECH; [2]Kookmin University; [3]Hanyang University

E-2: Comparison Finite Element Simulations with Tensile Tests of Different Aluminum Alloys: Melih Caylak[1]; *Gorkem Ozcelik*[1]; Ilyas Sari[1]; [1]ASAS Aluminum

E-3: Correlation between the Precipitation Phase and Mechanical Properties of Al-Mg-Si(-Cu) Based Aluminum Alloy Sheets According to the Change in Mg Content: *GyeongSeok Joo*[1]; YongWook Song[2]; MinSang Kim[3]; Hyunjoo Choi[2]; SeHoon Kim[3]; JaeHyuk Shin[3]; SoonMok Choi[4]; [1]Korea Automotive Technology Institute- Korea University of Technology & Education; [2]Kookmin University; [3]Korea Automotive Technology Institute; [4]Korea University of Technology & Education

E-4: Depth Dependent Microstructure and Mechanical Properties of Hot Rolled AA 7075 - T651: *Damilola Alewi*[1]; Paul Rottmann[1]; [1]University Of Kentucky

Effect of Eu and Er on Mechanical Properties of 201 and 206 Alloys: *Hayati Sahin*[1]; Derya Dispinar[1]; [1]Foseco

E-5: Effect of Thermal Treatment (T5) on Microstructure and Tensile Properties of Vacuum High Pressure Die Cast Al-Si-Mg Alloy: *Hongfa Hu*[1]; Ali Dhaif[1]; Kazi Ahmed[1]; [1]University of Windsor

E-6: Effects of Mn Addition on Electrical Conductivities, Tensile Properties and Microstructure of Wrought Al Alloys: An Overview: Wutian Shen[1]; Ali Dhaif[1]; Anita Hu[1]; Sufeng Liu[1]; *Hongfa Hu*[1]; [1]University of Windsor

E-7: Effects of Zn and Cu Contents and Heat Treatment Conditions on the Precipitation Behavior of 7xxx Series Al Alloy: *Suwon Park*[1]; Dae Cheol Yang[2]; Min Sang Kim[3]; Heon Kang[1]; Seok Su Sohn[2]; Se Hoon Kim[3]; Hyunjoo Choi[1]; [1]Kookmin University; [2]Korea University; [3]Korea Automotive Technology Institute

E-35: Evaluating Fractional Crystallization Methods for Closed-Loop Recycling of End-of-Life Automotive Aluminum Sheet: *Alissa Tsai*[1]; Daniel Cooper[1]; [1]University of Michigan

E-8: Experimental Investigation and Thermodynamic Consideration of Oxide Inclusions Formation in Al-Mg Alloys: *Young-Ok Yoon*[1]; Nam-Seok Kim[1]; Seung-Yoon Yang[1]; Seong-Ho Ha[1]; Bong-Hwan Kim[1]; Hyun-Kyu Lim[1]; Shae K. Kim[1]; [1]Korea Institute of Industrial Technology

High Temperature Deformation Analysis of A1-12Ce Alloy: Ashutosh Sonule[1]; *Srinu*

Gangolu[2]; [1]National Institute of Technology, Calicut; [2]IIT Kanpur

E-9: Investigation the Effects of Natural Aging Parameters on Mechanical Properties of 6082 Alloys: *Zeynep Tutku Ozen*[1]; Abdullah Kagan Kinaci[1]; Gorkem Ozcelik[1]; Ilyas Artunc Sari[1]; Anil Umut Ozdemir[1]; Alptug Tanses[1]; Emre Cankaya[1]; Mustafa Serkan Ozcan[1]; [1]Asas Aluminyum As

E-33: Laser Powder-Bed Fusion AA 7075 Aluminium Alloy Synthesis and Characterization: *Irena Paulin*[1]; Crtomir Donik[1]; Nejc Velikajne[1]; Matjaž Godec[1]; [1]Institute of Metals and Technology

Local Formability Improvement of Commercial Aluminum Sheets Using Friction Stir Processing: *Wahaz Nasim*[1]; Hrishikesh Das[1]; Mert Efe[1]; Piyush Upadhyay[1]; [1]Pacific Northwest National Laboratory

Mapping the Laser Additive Manufacturing Process of Aluminium Alloys Through In-situ Synchrotron Radiography: *Rubén Lambert-Garcia*[1]; Samy Hocine[1]; Sebastian Marussi[1]; Andy Farndell[2]; Elena Ruckh[1]; Maureen Fitzpatrick[3]; Anna Getley[1]; Martha Majkut[3]; Alexander Rack[3]; Nick Jones[2]; Peter Lee[1]; Chu Lun Alex Leung[1]; [1]UCL Mechanical Engineering; [2]Renishaw plc; [3]European Synchrotron Radiation Facility

E-10: Mechanical Properties of Aluminum Matrix Composites Containing Sub-micron High-entropy Alloy (HEA) Particles: *Jung Chahee*[1]; Son Hansol[1]; Jung Jaewon[2]; Choi Hyunjoo[1]; [1]Kookmin University; [2]Korea Institute of Materials Science

E-11: Meshfree Simulation and Analysis of Contact Conditions and Microstructure Evolution in Shear Assisted Processing and Extrusion (ShAPE) of Aluminum Alloy 7075: *Lei Li*[1]; Tianhao Wang[1]; Scott Whalen[1]; Suveen Mathaudhu[2]; Glenn Grant[1]; Ayoub Soulami[1]; [1]Pacific Northwest National Laboratory; [2]Colorado School of Mines

Microhardness Analysis of Directionally Solidified Al-Si Alloys: Edgar Ibañez[1]; Paula Alonso[2]; *Alicia Ares*[1]; [1]Universidad Nacional de Misiones (UNaM). Facultad de Ciencias Exactas, Químicas y Naturales (FCEQyN). Instituto de Materiales de Misiones (IMAM). Programa de Materiales y Fisicoquímica (ProMyF).; [2]Comisión Nacional de Energía Atómica (CNEA). División Aleaciones Especiales. Departamento Transformaciones y Propiedades. Gerencia de Materiales. Gerencia de Área Energía Nuclear. Instituto Sabato.

Microstructural Evolution, Mechanical Properties and Faster Aging Kinetics in Friction Extruded AA6061 and AA7075 Alloys: *Rajib Kalsar*[1]; Benjamin Schuessler[1]; Julian Atehortua[1]; Xiaolong Ma[1]; Tianhao Wang[1]; Lei Li[1]; Jens Darsell[1]; Nicole Overman[1]; Ayoub Soulami[1]; Darrell Herling[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

Resistance Heating Analysis of a 7xxx Aluminum Sheet for Hot Forming System: *Jaehyuck Shin*[1]; Gyeongseok Joo[1]; Beomsuck Han[1]; Sanggyu Bae[1]; Kyeonggeun Jung[1]; [1]Korea Automotive Technology Institute

ENERGY & ENVIRONMENT

Composite Materials for Sustainable and Eco-Friendly Material Development and Application — Poster Session

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

Program Organizers: Brian Wisner, Ohio University; Ioannis Mastorakos, Clarkson University; Muralidharan Paramsothy, NanoWorld Innovations; Simona Hunyadi

Murph, Savannah River National Laboratory

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Session Chair: Brian Wisner, Ohio University

D-21: Solvent-free Ball-milling Synthesis of BaO Modified Zeolite for Tetracycline Adsorption: *Pelin Demircivi Baran*[1]; Nergiz Kanmaz[1]; Mehmet Bugdayci[1]; [1]Yalova University

D-42: Weather Aged Fique Fabric Reinforced Epoxy Composite: Impact Property Analysis: *Michelle Oliveira*[1]; Fernanda da Luz[1]; Sergio Monteiro[1]; Noan Simonassi[2]; Artur Pereira[1]; Andressa Teixeira[1]; [1]Military Institute of Engineering; [2]UENF

PHYSICAL METALLURGY

Computational Thermodynamics and Kinetics — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Solidification Committee

Program Organizers: Hesam Askari, University of Rochester; Damien Tourret, IMDEA Materials Institute; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Frederic Soisson, Cea Saclay; Fadi Abdeljawad, Clemson University; Ziyong Hou, Chongqing University

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A Machine Learned Spin-Lattice Potential for Bulk Iron: *Benjamin Seddon*[1]; James Elliott[1]; Christoph Ortner[2]; [1]University of Cambridge; [2]University of British Columbia

H-1: Accurate Evaluation of the Mechanical Properties of Ideal Single Crystals: A Comparative *Ab Initio* Study: *Jaylan ElHalawani*[1]; Mostafa Youssef[1]; [1]American University in Cairo

H-2: Application of Multi-Cell Monte Carlo Method to BCC Refractory Alloys: *Junxin Wang*[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

H-27: Atomistic Simulations of Liquid/Metal Interfaces with Applications to Active Brazing: *Ian Winter*[1]; Michael Chandross[1]; [1]Sandia National Laboratories

CFD Informed Strategy for the 3D Printing of Crack-free High-strength Al-alloys: *Giuseppe Del Guercio*[1]; David McCartney[1]; Sebastien Faron[1]; Adam Clare[1]; Marco Simonelli[1]; [1]University of Nottingham

Deducing Surface-scale Chemical Conditions from Equilibrium Nanoparticle Shapes: *Mujan Seif*[1]; T. John Balk[1]; Matthew Beck[1]; [1]University of Kentucky

H-3: Driving Force Induced Transition in Thermal Behavior of Grain Boundary Migration in Ni: *Xinyuan Song*[1]; Chuang Deng[1]; [1]University of Manitoba

H-4: Thermodynamic and Elastic Properties of Body-centered-cubic Refractory,

High-entropy Alloys: NbTaTiV, TaNbHfZrTi, VNbMoTaW: *Danielsen Moreno*[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

H-5: Time-cone Based Models of Nucleation and Growth in Polycrystalline Systems: *Siu Sin Jerry Quek*[1]; Jing Xiang Ng[2]; David Wu[1]; [1]Institute of High Performance Computing; [2]Nanyang Technological University

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NANOSTRUCTURED MATERIALS

Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials — Poster Session

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

Program Organizers: Niaz Abdolrahim, University of Rochester; Matthew Daly, University of Illinois-Chicago; Hesam Askari, University of Rochester; Eugen Rabkin, Technion; Jeffrey Wheeler, Femto Tools Ag; Wendy Gu, Stanford University

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A Discrete Dislocation Dynamics Investigation of the Mechanical Behavior of Irradiated FeCrAl Alloys: *Yash Pachaury*[1]; Anter El-Azab[1]; [1]Purdue University

G-1: Change of Ni Composition According to pH Value of Fe-Ni Invar Manufactured by Electroforming: *Jihan Gwak*[1]; Jun Ha Lee[1]; Seung-Joon Lee[2]; Se-Eun Shin[1]; Yong-Bum Park[1]; [1]Sunchon National University; [2]Tech University of Korea

G-2: Deformation Mechanisms of Metal Matrix Nanocomposites: A Molecular Dynamics Study: *Wenwu Xu*[1]; Md. Shahrier Hasan[1]; [1]San Diego State University

G-3: Energetics and Mechanisms of Slip-Grain Boundary Interaction in Magnesium and Its Alloys: *Vaidehi Menon*[1]; Yong-Jie Hu[2]; Liang Qi[1]; [1]University of Michigan; [2]Drexel University

Epoxy Based GFRP Nanocomposites Containing Silanized Nanoclay and Compatibilized Polyethylene Fibers for High Impact Strength Applications: Daksh Shelly[1]; *Tarun Nanda*[1]; Rajeev Mehta[1]; [1]Thapar University

G-4: In Situ Nanomechanical Testing Under Cryogenic Conditions: Eric Hintsala[1]; Kevin Schmalbach[1]; Sanjit Bhowmick[1]; *Douglas Stauffer*[1]; [1]Bruker Nano Surfaces and Metrology

G-5: In Situ SEM Tension Study of Al-Si Nanofibrous Composite: *Wenqian Wu*[1]; Bingqiang Wei[1]; Amit Misra[2]; Jian Wang[1]; [1]University of Nebraska-Lincoln; [2]University of Michigan

G-6: Influence of Substrate Topography and Mechanical Compliance on the Morphology of Nanoporous Gold Thin Films: *Sadi Md Shahriar*[1]; Noah Goshi[1]; Conner Winkeljohn[1]; Jeremy Mason[1]; Erkin Seker[1]; [1]University of California- Davis

G-7: Mechanical Characterization of Stacked Single-Crystal of Polyethylene and Monolayer MoSe2: *Gang Feng*[1]; Dong Zhou[1]; Henna Khosla[1]; Scott Retterer[2]; Bo Li[1]; [1]Villanova University; [2]Oak Ridge National Laboratory

G-8: Mechanical Properties of Nickel-Platinum Nanoparticles Fabricated by Solid-State Dewetting: *Mor Levi*[1]; Anuj Bisht[1]; Eugen Rabkin[1]; [1]Technion – Israel

Institute of Technology

G-9: Micro-mechanical Characterization on Amorphous Carbon and its Nanoporous Structures: *Zhongyuan Li*[1]; Ayush Bhardwaj[2]; James Watkins[2]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]University of Massachusetts Amherst

G-10: Molecular Dynamics of Nanosuspension Droplet Impact on Solid Surfaces: *Baiou Shi*[1]; Siddharth Ravi[1]; [1]Pennsylvania State University

Multiscale Chemistry for Hydrogen-based Direct Reduction of Iron in Steelmaking: *Xueli (Sherry) Zheng*[1]; Lauren Moghimi[1]; Subhechchha Paul[1]; Yi Cui[1]; Leora Dresselhaus-Marais[1]; [1]Stanford University

G-11: Nanoindentation Studies on the Surface Properties of Irradiated Concentrated Solid-solution Alloys: *Youxing Chen*[1]; Liuqing Yang[2]; Jimmie Miller[2]; William Weber[3]; Hongbin Bei[4]; Yanwen Zhang[5]; [1]University of North Carolina at Charlotte ; [2]University of North Carolina at Charlotte; [3]University of Tennessee; [4]Zhejiang University; [5]Oak Ridge National Laboratory

G-12: Nanomechanical Testing of Limited Slip System Materials: Deformation and Fracture: *Hugh Grennan*[1]; David Bahr[1]; [1]Purdue University

G-13: Nanoscale Liquid Infiltration – an Ultra-fast Deformation Mechanism for Energy Mitigation: Mingzhe Li[1]; *Weiyi Lu*[1]; [1]Michigan State University

G-14: Optimization of Nanocrystalline, Ultra-fine Grained and Bimodal Nickel According to Mechanical Properties: *Michael Marx*[1]; Dominic Rathmann[1]; Christian Motz[1]; [1]Saarland University

G-15: Orientation Dependent Micro-mechanical Deformation Behavior of Refractory High Entropy Alloy as a Function of Strain Rate and Temperature: *Shristy Jha*[1]; Sundeep Mukherjee[1]; Saideep Muskeri[1]; Maryam Sadeghilaridjani[1]; Abhishek Sharma[1]; Sriswaroop Dasari[1]; Rajarshi Banerjee[1]; Yu-Chia Yang[1]; [1]University of North Texas

G-16: Phase Transition and Nanomechanical Properties of Refractory High-entropy Alloy Thin Films: Effects of Co-sputtering Mo and W to a TiZrHfNbTa System: *Changjun Cheng*[1]; Michel Haché[1]; Xiaofu Zhang[2]; Yu Zou[1]; [1]University of Toronto; [2]Chinese Academy of Sciences

G-17: Photo-stable Thermoset Shape-memory Polymers: Role of Unique Graphene Nanoscrolls for Superior Service Life: *Dilip Depan*[1]; Owolabi Akanni[1]; William Chirdon[1]; Ahmed Khattab[1]; [1]University of Louisiana at Lafayette

Stochastic Mechanical Modeling of Cavitary Defects in Porous Aluminum Structures: *Mujan Seif*[1]; Alexandre Martin[1]; Matthew Beck[1]; [1]University of Kentucky

G-18: Structures and Nanomechanical Behavior of Cu-Mo-W Nanocomposite Thin Films: *Forrest Wissuchek*[1]; Bibhu Sahu[1]; Amit Misra[1]; [1]University of Michigan

G-19: Surface Film-induced Reversible Electrochemical Actuation in Nanoporous Metals Investigated using In Situ Small- and Wide-angle X-ray Scattering.: *Alexander Ng*[1]; Eric Detsi[1]; [1]University of Pennsylvania

G-20: The Effects of Local Structures on the Dislocation Transmission Across Symmetric Tilt Grain Boundaries in Cu via Atomistic Simulations: *Khanh Dang*[1]; Sumit Suresh[1]; Avanish Mishra[1]; Nithin Mathew[1]; Edward Kober[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

G-21: The Impact of Interface Orientation on the Vibration Behavior of Joined Aluminum Substrates: *Milad Khajehvand*[1]; Henri Seppänen[2]; Panthea Sepehrband[1];

[1]Santa Clara University; [2]Kulicke & Soffa Industries, Inc.

ELECTRONIC MATERIALS

Electronic Packaging and Interconnection — Poster Session

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

Program Organizers: Kazuhiro Nogita, University of Queensland; Mohd Arif Mohd Salleh, Universiti Malaysia Perlis; Dan Li, Beijing University of Technology; David Yan, San Jose State University; Fan-Yi Ouyang, National Tsing Hua University; Patrick Shamberger, Texas A&M University; Tae-Kyu Lee, Cisco Systems; Christopher Gourlay, Imperial College London; Albert T. Wu, National Central University

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Session Chairs: Kazuhiro Nogita, The University of Queensland; Chris Gourlay, Imperial College London

C-7: Dynamic Material Characterization through In-Situ Electrical Resistivity Measurements of High Temperature Transient Liquid Phase Sinter Alloys: *Gilad Nave*[1]; Patrick McCluskey[1]; [1]University of Maryland

C-8: Low-temperature CMOS Compatible SLID & Eutectic Bonding for Wafer Level Packaging: Gürel Dimez[1]; Özgün Yurdakul[1]; Mertcan Sevinç[1]; Ouzhan Temel[1]; Tayfun Akın[1]; *Yunus Kalay*[1]; [1]Middle East Technical University

ENERGY & ENVIRONMENT

Energy Technologies and CO2 Management — Poster Session

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

Program Organizers: Shafiq Alam, University of Saskatchewan; Donna Guillen, Idaho National Laboratory; Fiseha Tesfaye, Metso Outotec Finland Oy; Lei Zhang, University of Alaska Fairbanks; Lina Hockaday, Curtin University, WASM; Neale Neelameggham, IND LLC; Hong (Marco) Peng, University of Queensland; Nawshad Haque, Commonwealth Scientific and Industrial Research Organization; Liu Yan, Northestern University

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D-22: Hydrogen Storage Properties of Graphitic Carbon Nitride Nanotubes Synthesized by Mix-grind Technique: *Barton Arkhurst*[1]; Ruiran Guo[1]; Ghazaleh Bahman Rokh[1]; Sammy Chan[1]; [1]University of New South Wales

CORROSION

Environmental Degradation of Multiple Principal Component Materials — Poster Session

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

Program Organizers: Wenjun Cai, Virginia Polytechnic Institute and State University; XiaoXiang Yu, Novelis Global Research Center; 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); Gerald Frankel, Ohio State University; ShinYoung Kang, Lawrence Livermore National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

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B-1: Concentration Effect of Tellurium on the Corrosion and Mechanical Properties of 304 Stainless Steel in Molten FLiNaK Salt: *Minsung Hong*[1]; Yujun Xie[1]; Ho Lun Chan[2]; Elena Romanovskia[2]; John R. Scully[2]; Peter Hosemann[1]; [1]UC Berkeley; [2]University of Virginia

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NANOSTRUCTURED MATERIALS

Functional Nanomaterials 2023 — Poster Session

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

Program Organizers: Yong Lin Kong, University of Utah; Sarah Ying Zhong, University of South Florida; Mostafa Bedewy, University of Pittsburgh; Woochul Lee, University of Hawaii at Mnoa; Changhong Cao, McGill University; Kiyo Fujimoto, Idaho National Laboratory; Surojit Gupta, University of North Dakota; Michael Cai Wang, University of South Florida

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Facile Synthesis of Novel Quaternary Zn-Cu-In-S/ZnS QDs- mTHPP Porphyrin Conjugate and Its Photodynamic Therapy of Cancer and Antibacterial Activities: *Samuel Oluwafemi*[1]; [1]University of Johannesburg

Second NIR-absorbing Gelatin Stabilized Gold Nanorods with High Media and Photothermal Stability for Photothermal Cancer Therapy: Thabang Lebepe[1]; *Samuel Oluwafemi*[1]; [1]University of Johannesburg

Study on Aluminum Oxide Thin Film as Etch Stop Layer: *Sangwoo Lee*[1]; Taekjib Choi[1]; Jaeyoung Yang[2]; Joohyun Park[2]; [1]Sejong University; [2]TES Co.,Ltd

Synthesis, Characterization and Comparative Study of Polyethylene Oxide / Carbon Nanotubes and Polymethyl Methacrylate Carbon Nanotubes Composites: *Sabiha Sultana*[1]; Noor Saeed[1]; Mohib Khan[1]; [1]Islamia College Peshawar

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MECHANICS & STRUCTURAL RELIABILITY

High Temperature Creep Properties of Advanced Structural Materials — Poster Session

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

Program Organizers: Gianmarco Sahragard-Monfared, University of California, Davis; Mingwei Zhang, Lawrence Berkeley National Lab; Jeffery Gibeling, University of California, Davis

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F-1: A Study on Microstructure and Mechanical Properties of Fe-Cr-Ni-Al-V Alloys: *Kanghyun Park*[1]; Ho-seop Song[1]; Jeongeun Kim[1]; Ka Ram Lim[2]; Chanho Lee[3]; Gian Song[1]; [1]Kongju National University; [2]Advanced Metals Division, Korea Institute of Materials Science; [3]Materials Science and Technology Division, Los Alamos National Laboratory

F-2: Effects of Controlling Ti and Al on Microstructure and Mechanical Properties of Fe-Cr-Co-Al-Ti Ferritic Alloys: *Jeongeun Kim*[1]; Kanghyun Park[1]; Byungchan Cho[1]; Karam Lim[2]; Chanho lee[3]; Jiwoon Lee[1]; Gian Song[1]; [1]Kongju National University; [2]Advanced Metals Division, Korea Institute of Materials Science (KIMS); [3]Materials Science and Technology Division, Los Alamos National Laboratory

F-3: Strengthening Against Creep at Elevated Temperature of HEA Alloys of the CoNiFeMnCr Type Using MC-carbides: *Patrice Berthod*[1]; [1]University of Lorraine

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SPECIAL TOPICS

Late News Poster Session — Additive Technologies

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3-D Printed Storage Container for Nuclear Materials: *Tyler Brunstein*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

A-61: Additive Manufacturing of Aluminum Alloys via Liquid Metal Jetting: *Kellen Traxel*[1]; Nicholas Watkins[1]; Eric Elton[1]; Viktor Sukhotskiy[1]; Alex Wilson-Heid[1]; Andrew Pascall[1]; Jason Jeffries[1]; [1]Lawrence Livermore National Laboratory

A-62: Additive Manufacturing of Functionally Graded Soft Magnetic Alloys: *Jesse Adamczyk*[1]; Erin Barrick[1]; Samad Firdosy[2]; Nichole Valdez[1]; Andrew Kustas[1]; [1]Sandia National Laboratories; [2]NASA Jet Propulsion Laboratory

Additive Manufacturing of Nitinol Parts via Optimised Laser-powder Bed Fusion: *Muhannad Ahmed Obeidi*[1]; Dermot Brabazon[1]; [1]Dublin City University

A-63: Additive Manufacturing of TiNiSn Half-Heusler Thermoelectric Compound: *Seoung-Ho Lim*[1]; Pyuck-Pa Choi[1]; Chanwon Jung[2]; [1]Korea Advanced Institute of Science and Technology; [2]Max-Planck-Institut für Eisenforschung

A-64: As-Deposited Microstructure and Strain Rate Dependence of Aluminum Alloy 7020 Produced via Additive Friction Stir Deposition: *Malcolm Williams*[1]; Brian Jordon[1]; Paul Allison[1]; [1]Baylor University

A-65: Challenges in the Production of Duplex and Martensitic Stainless Steels: *Martina Koukolikova*[1]; Pavel Podaný[1]; Sylwia Rzepa[1]; Michal Brázda[1]; Aleksandra

Kocijan[2]; [1]COMTES FHT a.s.; [2]Institute of Metals and Technology (IMT)

Drop-on-demand Metal Jetting: Direct 3D Printing of Silver: *Negar Gilani*[1]; [1]University of Nottingham

A-66: Fatigue Life Predictions of Additive Friction Stir Deposition Repairs using a Smooth Particle Hydrodynamic Model: *Nick Palya*[1]; [1]Baylor

A-67: Heat Treatment Effects on Microstructure and Mechanical Properties of Wire Arc Additively Manufactured (WAAM) and Electron Beam Additively Manufactured (EBAM) Ti-6Al-4V: *Hannah Sims*[1]; Jonathan Pegues[2]; Natalia Saiz[2]; Shaun Whetten[2]; Andrew Kustas[2]; [1]Sandia National Laboratoriess; [2]Sandia National Laboratories

Improved Cryogenic Tensile Properties of Additive Manufacturing-processed STS316L Steel by the Reuse of Powder: *Chohyeon Lee*[1]; Taekwan Koo[1]; Muhammad Ishtiaq[1]; Hyoungseop Kim[2]; Jaebok Seol[1]; [1]Gyeongsang National University; [2]Pohang University of Science and Engineering

A-68: Investigation of the Simple Layer Made by Additive Manufacturing on Forging Tools: *Miroslav Urbánek*[1]; [1]COMTES FHT

A-69: Leveraging Spatial Gradation in Lattice Structure Development for Enhanced Energy Absorption from High Rate Loads: *David Failla*[1]; Haley Petersen[1]; Matthew Priddy[1]; Zackery McClelland[2]; [1]Mississippi State University; [2]U.S. Army Engineer Research and Development Center

A-70: Metal AM with Green Lasers is Propelling the Next Generation of Space Exploration: *Eliana Fu*[1]; Marco Goebel[1]; Ulli Kraske[1]; [1]Trumpf

Microstructural Characterization of Electron Beam Additively Manufactured (EBAM) and Wire Arc Additively Manufactured (WAAM) Ti-6Al-4V: *Luis Jauregui*[1]; Joseph Boro[1]; John Williard[1]; Robert Craig[1]; Timothy Ruggles[1]; Hannah Sims[1]; Jonathan Pegues[1]; [1]Sandia National Laboratories

A-71: Microstructure Prediction in Powder Bed Metal Additive Manufacturing Using Coupled Nucleation and Monte Carlo Method: *Aashique Rezwan*[1]; Theron Rodgers[1]; Daniel Moser[1]; [1]Sandia National Laboratories

A-72: Neutron Diffraction Measurement of Residual Stresses in AFSD AA6061 Deposits: *Ning Zhu*[1]; Luke Brewer[2]; Brian Jordon[1]; Paul Allison[1]; [1]Baylor University; [2]The University of Alabama

A-73: Physics-based Analytical Modeling of Defects Formation in Metal Additive Manufacturing: *Wenjia Wang*[1]; Oladayo Ariyo[1]; Wei Huang[2]; Aixi Zhou[1]; Steven Liang[2]; [1]North Carolina Agricultural and Technical State University; [2]Georgia Institute of Technology

A-74: Powder Particle Impact and Pore Release Behavior in Laser, Powder-blown Directed Energy Deposition: *Samantha Webster*[1]; Shuheng Liao[2]; Sanjana Subramaniam[2]; Jihoon Jeong[2]; Anchen Tong[2]; Rujing Zha[2]; Jian Cao[2]; [1]NIST; [2]Northwestern University

A-75: Powder Spreading Mechanism in Laser Powder Bed Fusion Additive Manufacturing: Experiments and Computational Approach Using Discrete Element Method: *Ummay Habiba*[1]; Michael Fazzino[1]; Serge Nakhmanson[1]; Rainer Hebert[1]; [1]University of Connecticut

A-76: Recyclability Study of APO-BMI: *Alexander Hatmaker*[1]; [1]Los Alamos National Laboratory

A-77: Tooling Influence on Deposition Width in Additive Friction Stir Deposition

of AA 6061: *Isaac Liu*[1]; Paul Allison[1]; Brian Jordon[1]; [1]Baylor University

A-78: Understanding Material Flow Behavior of Additive Friction Stir Deposition Using Smoothed Particle Hydrodynamics: *Jacob Hoarston*[1]; Kirk Fraser[2]; Brian Jordon[1]; Paul Allison[1]; [1]Baylor University; [2]National Reserach Council Canada

A-79: The Effect of Beam Shaping Strategies on Additively Manufactured Microstructures: *Giovanni Orlandi*[1]; Robert Moore[1]; Theron Rodgers[2]; Fadi Abdeljawad[1]; [1]Clemson University; [2]Sandia National Labs

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SPECIAL TOPICS

Late News Poster Session — Corrosion

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B-2: Comparative Corrosion Evaluation of Additively Manufactured and Commercial Aluminum Alloys for Automotive Applications: *Evangelia Kiosidou*[1]; Jiheon Jun[1]; Alex Plotkowski[1]; Amit Shyam[1]; Sumit Bahl[1]; Ryan Dehoff[1]; James A. Haynes[1]; [1]Oak Ridge National Laboratory

B-3: The Effects of Atmospheric Corrosion on Additively Manufactured Stainless Steel: *Kasandra Escarcega Herrera*[1]; [1]Sandia National Laboratories

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SPECIAL TOPICS

Late News Poster Session — Electronic Materials

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C-13: Crystallization Mechanism of Amorphous NbCo1.1Sn Induced by Ball Milling: *Hail Park*[1]; Chanwon Jung[2]; Seung-Hoon Yi[3]; Pyuck-Pa Choi[1]; [1]Korea Advanced Institute of Science and Technology (KAIST); [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Kyungpook National University

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SPECIAL TOPICS

Late News Poster Session — Energy & Environment

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Coadditive Engineering for High Open Circuit Voltage Nearly 1V in Tin-Based Perovskite Solar Cells: *Ashraful Islam*[1]; Emrul Kayesh[1]; [1]National Institute for Materials Science (NIMS)

D-37: Development of Xe Gas Recycling System: *Chang-Hoon Kwak*[1]; Ro Youngju[1]; Hong Eun Sun[1]; Shin Hye Sun[2]; Kim Jun Woo[2]; [1]Samsung Electronics; [2]Research

Institute of Industrial Science and Technology

D-38: Photoelectron Extraction via Inserted Carbon Nanotube in Photosynthetic Cells and Analysis by Scanning Electrochemical Microscopy (SECM): *Hyojin Gwon*[1]; Hyun S. Ahn[1]; [1]Yonsei University

D-39: Platinized Carbon Nanoelectrodes for Electrochemical Measurement of Reactive Oxygen and Nitrogen Species in Neural Stem Cells: *Donghoon Liim*[1]; Hyun S. Ahn[1]; [1]Yonsei University

D-40: Spin-orbit Torque Switching Enabled by Uniaxial Magnetocrystalline Anisotropy: *Shreyes Nallan*[1]; Jian-Gang (Jimmy) Zhu[1]; [1]Carnegie Mellon University

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SPECIAL TOPICS

Late News Poster Session — Light Metals

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E-34: A Comparative Study on the Homogenization Process of the Aluminum Billets in the Batch and Continuous Homogenizing Furnace Using with CFD Simulations and Microstructure Analysis: *Murat Dogan*[1]; Deniz Guler[1]; Deniz Urk[1]; Gokcen Gokce[1]; Akin Obali[1]; [1]Sistem Teknik Industrial Furnaces LTD

E-32: Combining In-situ Diffraction, In-situ Acoustic Emission and High-resolution Digital Image Correlation to Study Tension-compression Asymmetry in the WZ21 Alloy: *Gerardo Garces*[1]; Pablo Pérez[1]; Edurne Laurin[1]; Judit Medina[1]; Andreas Stark[2]; Norbert Schell[2]; Alberto Orozco[3]; Kristian Mathis[4]; Paloma Adeva[1]; [1]Cenim-CSIC; [2]Helmholtz-Zentrum Hereon; [3]Universidad Politécnica de Madrid; [4]Charles University

Current State of Technology of Next-Generation Ceramic Foam Filter: Jochen Schnelle[1]; *Elisabeth Wischhoff*[1]; Ragnhild Aune[2]; [1]Drache; [2]NTNU

Effect of Fine Precipitates on the Mechanical Properties of Lightweight Mg-Li Alloy with Rare Earth Addition: Yong-Ho Kim[1]; Byeong-Kwon Lee[1]; Eun-chan Ko[1]; *Hyeon-Taek Son*[1]; [1]Korea Institute of Industrial Technology

Effect of Mg Addition on the Mechanical Properties and Microstructure of Al-Li-Ce Alloys: *ByeongKwon Lee*[1]; Eun-Chan Ko[1]; Yong-Ho Kim[1]; Hyeon-Taek Son[1]; Sung-Kil Hong[2]; [1]Korea Institute of Industrial Technology; [2]Chonnam National University

Effects of Mg Contents on Microstructure and Mechanical Properties of the Rolled Al-xMg-0.12Mn-0.12Cr Based Alloy with Thin Plate: *Hyeon-Taek Son*[1]; Yong-Ho Kim[1]; Byong-Kwon Lee[1]; En-Chan Ko[1]; [1]Korea Institute of Industrial Technology

Evaluation of Yield in the Production of Machined vs High Pressure Die Cast A360: *Deniz Cil*[1]; Ceren Ciytak[1]; Kerem Dizdar[2]; Hayati Sahin[3]; Derya Dispinar[3]; [1]GP HPDC; [2]Istanbul Technical University; [3]Foseco

Machine Learning for Joint Quality Performance-A Comparison Study of the Relationship between Process Parameters and Weld Microstructure of Al/Steel Resistance Spot Welds: *Alejandro Ojeda*[1]; Moses Obiri[1]; [1]Pacific Northwest National Laboratories

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SPECIAL TOPICS

Late News Poster Session — Mechanics & Structural Reliability

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F-4: An End-to-end Crystal Plasticity Framework for Single and Multiscale Analysis as it Relates to ICME: *Deepankar Pal*[1]; Grama Bhashyam[1]; Anupam Neogi[1]; [1]Ansys

Microstructural Effect on the Resistance to Fatigue Crack Growth of High-entropy Alloys: *Wonhui Jo*[1]; Chohyeon Lee[1]; Jae Bok Seol[1]; Hyokyung Sung[2]; [1]Gyeongsang National University; [2]Kookmin University

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SPECIAL TOPICS

Late News Poster Session — Nanostructured Materials

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Ultra-fast 4D-STEM Detector for Rapid Nanoscale Strain/Phase Mapping: *Kalani Moore*[1]; [1]Direct Electron

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LIGHT METALS

Magnesium Technology 2023 — Poster Session

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

Program Organizers: Steven Barela, Terves, Inc; Aeriel Murphy-Leonard, Ohio State University; Petra Maier, University of Applied Sciences Stralsund; Neale Neelameggham, IND LLC; Suveen Mathaudhu, Colorado School of Mines; Victoria Miller, University of Florida

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A Comparative Corrosion Study of Magnesium Alloys Processed via Shear Assisted Processing and Extrusion: *Vikrant Beura*[1]; Antriksh Sharma[1]; Vineet Joshi[2]; Kiran Solanki[1]; [1]Arizona State University; [2]Pacific Northwest National Laboratory

E-12: A Thermodynamic Approach for Precipitation Hardening of Magnesium Alloy with High Formability: *Jong-Kwan Lee*[1]; Hyo-Sun Jang[2]; Nack Joon Kim[1]; Byeong-Joo Lee[1]; [1]POSTECH; [2]Korea Institue of Materials Science

E-13: Advanced In-situ Investigation of Deformation Behavior in a Textured Magnesium Alloy AZ31: *Jan Dittrich*[1]; Michal Knapek[1]; Daria Drozdenko[1]; Peter Minárik[1]; [1]Charles University

Advances in Magnesium Primary Production by Reactive Cathode Molten Salt Electrolysis with G-METS Distillation: *Zujian Tang*[1]; Keira Lynch[1]; Benjamin Perrin[1]; Armaghan Telgerafchi[1]; Gabriel Espinosa[1]; Daniel Sehar[1]; Madison Rutherford[1];

Adam Powell[1]; [1]Worcester Polytechnic Institute

E-14: Critical Resolved Shear Stresses for Slip and Twinning in Mg-Y-Ca Alloys and Their Effect on Ductility: Mingdi Yu[1]; Jingya Wang[1]; Xiaoqin Zeng[1]; *Javier Llorca*[2]; [1]Shanghai Jiao Tong University; [2]IMDEA Materials Institute & Technical University of Madrid

Designing Highly Corrosion-resistant Mg Alloys via Second-phase Control: *Sung Soo Park*[1]; [1]UNIST

E-15: Effect of Differential Speed Rolling (DSR) on the Dynamic Recrystallization of Mg5Zn Under Different Temperatures: *Christopher Hale*[1]; [1]North Carolina Agricultural and Technical State University

E-16: Effect of Grain Size on Bio-corrosion Properties of AZ31 Magnesium Alloy: Wenli Zhao[1]; *Qizhen Li*[1]; [1]Washington State University

Effect of Second Phases Evolved Through Heat Treatment on Mechanical and Bio-corrosion Behaviour of a Mg-Zn-Ca-Mn Alloy: *Darothi Bairagi*[1]; Sumantra Mandal[1]; Manas Paliwal[1]; [1]IIT Kharagpur

E-17: European Sustainable Magnesium from Chromite Production and Dolomite Excavation Residues: Duane Runciman[1]; Matt Dey[1]; *Henk van der Laan*[2]; Carsten Dittrich[3]; Edward Peters[3]; Thore Perlitz[3]; Blaz Likozar[4]; Alen Rupnik[4]; Konstantinos Sakkas[4]; Beate Orberger[5]; [1]Mures SRL; [2]V.I.C. Van der Laan International Consultancy BV; [3]MEAB Chemietechnik GmbH; [4]National Institute of Chemistry of Slovenia; [5]CATURA Geoprojects

E-18: Flammability Resistant Magnesium Alloys Processed by Equal Channel Angular Pressing: *Stanislav Šašek*[1]; Jitka Stráská[1]; Peter Minárik[1]; Robert Král[1]; Jozef Veselý[1]; Jií Kubásek[2]; [1]Charles University; [2]University of Chemistry and Technology

E-19: Formation of CO2 Absorption Induced Corrosion Resistant Magnesium Carbonate Layer Formation on Various Magnesium Alloys: *Gyoung Gug Jang*[1]; Jiheon Jun[1]; Yi-Feng Su[1]; [1]Oak Ridge National Lab

E-20: In Vitro and In Vivo Degradation Behavior of Novel Corrosion-resistant Mg Alloys: *Du-Won Min*[1]; Jung Gu Lee[2]; Sung Soo Park[1]; [1]UNIST; [2]University of Ulsan

E-21: Investigating the Corrosion Response of Cast and Extruded ZK60 Magnesium Alloy Processed via Shear Assisted Processing and Extrusion: Vikrant Beura[1]; *Antriksh Sharma*[1]; Vineet Joshi[2]; Kiran Solanki[1]; [1]Arizona State University; [2]Pacific Northwest National Laboratory

E-22: Investigation of Transformation-mediated Nanotwin Nucleation Mechanisms in Magnesium Using Deep Neural Network Interatomic Potentials: *Mehrab Lotfpour*[1]; Iyyappa Rajan[1]; Amir Hassan Zahiri[1]; Jamie Ombogo[1]; Lei Cao[1]; [1]University of Nevada

E-23: Kink Bands Strengthening of LPSO Mg-Zn-Y alloys After Processing by High-pressure Sliding (HPS): *Yongpeng Tang*[1]; Shinichi Inoue[2]; Yoshihito Kawamura[2]; Zenji Horita[2]; [1]Kyushu Institute of Technology; [2]Kumamoto University

E-24: Nucleation of {1012} Twins in Magnesium Through Reversible Martensitic Phase Transformation: *Jamie Ombogo*[1]; Amir Hassan Zahiri[1]; Lei Cao[1]; [1]University of Nevada

E-25: Simulations of Microgalvanic Effects in Corrosion of Mg Alloys: *Vishwas*

Goel[1]; Yanjun Lyu[1]; David Montiel[1]; Katsuyo Thornton[1]; [1]University of Michigan

E-26: Strain Rate Dependent Deformation Behavior and Microstructure Evolution of Magnesium Alloys: *Xinyu Xu*[1]; Yizhuang Li[1]; Chengpeng Huang[1]; MingXin Huang[1]; [1]The University of Hong Kong

E-27: Strain-localized Deformation Banding during Tensile Deformation of Pre-compressed AZ31 Mg Alloy: *Jongbin Go*[1]; Myeong-heom Park[1]; Si Gao[1]; Nobuhiro Tsuji[1]; [1]Kyoto University

E-28: Towards Improved Understanding of Press and Sinter Processing of Mg and Mg Alloy Powders: *Steven Johnson*[1]; William Caron[1]; [1]Central Connecticut State University

E-29: Understanding the Influence of Alloying on Texture Development in Mg-(Zn-Ca) Alloys During Recrystallization: *Rogine Gomez*[1]; Aeriel Leonard[1]; [1]The Ohio State University

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NANOSTRUCTURED MATERIALS

Nanostructured Materials in Extreme Environments — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nuclear Materials Committee

Program Organizers: Haiming Wen, Missouri University of Science and Technology; Nan Li, Los Alamos National Laboratory; Youxing Chen, University of North Carolina Charlotte; Yue Fan, University of Michigan; Niaz Abdolrahim, University of Rochester; Khalid Hattar, Univerisity of Tennessee Knoxville; Ruslan Valiev, UFA State Aviation Technical University; Zhaoping Lu, University of Science and Technology Beijing

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G-22: Development of Nanostructured Ferritic Superalloys for Nuclear Environments: *Sophia von Tiedemann*[1]; Kan Ma[1]; Pedro Ferreirós[1]; Alexander Knowles[1]; [1]University of Birmingham

G-23: Scalable Fabrication and Mechanical Response of Composites with Nano-architected Features: *Kevin Nakahara*[1]; Matias Kagias[1]; Seola Lee[1]; Julia Greer[1]; [1]California Institute of Technology

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ENERGY & ENVIRONMENT

Natural Fibers and Its Composites: A Sustainable Solution — Poster Session

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

Program Organizers: Henry Colorado, Universidad de Antioquia; Sergio Monteiro, Instituto Militar de Engenharia; Carlos Fontes Vieira, State University of the North Fluminense

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Cement Composites Made with Powdered Coffee and Rice Husks: *Melissa Zapata*[1]; Afonso Azevedo[2]; Henry Colorado[1]; [1]Universidad de Antioquia UdeA; [2]Universidade Estadual do Norte Fluminense

Characterization of Ubim Fiber by Fourier Transform Infrared Spectroscopy (FTIR): *Belayne Marchi*[1]; Sergio Monteiro[1]; [1]Instituto Militar de Engenharia

D-23: Corozo Palm Fibers: Mechanical Behavior and Potential Use for Composites: *Henry Colorado*[1]; Jimmy Unfried-Silgado[2]; Luis Espitia-San Juan[2]; [1]Universidad de Antioquia; [2]Universidad de Córdoba

D-43: Effects of Aging by Immersion in Water and Functionalized Epoxy Matrix with Graphene Nanoplates in Fique Fabric-reinforced Composites: *Michelle Oliveira*[1]; Sergio Monteiro[1]; Fernanda da Luz[1]; Fabio Braga[2]; Artur Pereira[1]; [1]Military Institute of Engineering; [2]UFF

D-24: Feasibility Study of Incorporation of Dyeing Sludge in Red Ceramics: Hugo Rangel[1]; Geovana Carla Delaqua[1]; José Alexandre Linhares Junior[1]; Afonso de Azevedo[1]; Sérgio Monteiro[2]; Michelle Babisk[1]; *Carlos Maurício Fontes Vieira*[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia

Influence of the Incorporation of Particulates from the Pineapple Crown on the Impact Strength of Epoxy Systems: David Coverdale Velasco[1]; José Alexandre Linhares[1]; *Noan Simonassi*[1]; Carlos Maurício Vieira[1]; Afonso Azevedo[1]; Markssuel Marvila[1]; Sergio Monteiro[1]; [1]State University of the Northern Rio de Janeiro

Mitigation of Urban Noise through the Implementation of Pumice with an Air Chamber on Building Facades: *Jeiser Rendón Giraldo*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

D-25: Tensile and Bend Properties of High Density Polyethylene Matrix Composites Reinforced with Graphene Nanoplatelets and Jute Fabric: Ulisses Costa[1]; Wendell Bezerra[1]; Sergio Monteiro[1]; *Andressa de Souza*[1]; Lucio Nascimento[1]; [1]Military Institute of Engineering

ENERGY & ENVIRONMENT

New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor — Poster Session

Sponsored by: Society for Mining Metallurgy and Exploration, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee, TMS: Energy Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Ramana Reddy, University of Alabama; Corby Anderson, Colorado School of Mines; Erik Spiller, Colorado School of Mines; Edgar Vidal, NobelClad; Camille Fleuriault, Eramet Norway; Alexandra Anderson, Gopher Resource; Mingming Zhang; Christina Meskers, SINTEF

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Alternative Fluxes for Lead Bullion Refining: *Samuel Asante*[1]; Patrick Taylor[1]; [1]Colorado School of Mines

D-26: Critical Review of Chemical Metallurgy of Tungsten: *Raj Singh Gaur*[1]; [1]SH Nano Energy Powders

D-28: Estimated End-of-life Lithium-ion Battery Resources for Potential Recycling in Bangladesh: Md Rakibul Qadir[1]; Miao Chen[1]; *Nawshad Haque*[1]; Warren Bruckard[1]; [1]CSIRO

D-29: Gravity Driven Multiple-effect Thermal System (G-MET) Distillation for Continuous Efficient Lead Refining: *Armaghan Ehsani Telgerafchi*[1]; Daniel McArthur[1]; Chinenye Chinwego[1]; Adam Powell[1]; [1]Worcester Polytechnic Institute

D-30: In-situ Microscopy Observations of Oxide Phases Formation during High-temperature Oxidation of End-of-life Ni/Cu/Ni-coated-NdFeB Permanent Magnets: *Deddy Nababan*[1]; Reiza Mukhlis[1]; Yvonne Durandet[1]; Mark Pownceby[2]; Leon Prentice[3]; M. Akbar Rhamdhani[1]; [1]Swinburne University of Technology; [2]CSIRO Mineral Resources; [3]CSIRO Manufacturing

D-31: Introducing Membrane Percrystallisation Technology for Hydrometallurgical Applications: *Siti Nurehan Abd Jalil*[1]; Julius Motuzas[1]; James Vaughan[1]; [1]The University of Queensland

D-32: Investigating the Influence of Temperature and Atmosphere on the Formation and Decomposition of PAHs from Carbonaceous Materials Used in Industrial Processes: Method Development: *Katarina Jakovljevic*[1]; Thor Aarhaug[2]; Gabriella Tranell[1]; [1]Norwegian University of Science and Technology; [2]SINTEF

Leaching of Arsenopyrite Contained in Tailings Using the TU-OX System: *Erick Muñoz Hernandez*[1]; Julio Cesar Juarez Tapia[1]; Martin Reyes Pérez[1]; Aislinn Michelle Teja Ruiz[1]; Gabriel Cisneros Flores[1]; Miguel Perez Labra[1]; Francisco Raúl Barrientos Hernández[1]; [1]Universidad Autonoma del Estado de Hidalgo

D-33: Rare Earth Reduction – A Technological Overview of State-of-the-art Technology and Novel Developments: *Robert Rush*[1]; Patrick Taylor[1]; [1]Colorado School of Mines

D-34: Recovery of Bismuth in Blast Furnace Dust by Carbothermal Volatilization Reduction: *Feng Huaixuan*[1]; Yan Li[1]; Jingsong Wang[1]; Xuefeng She[1]; Qingguo Xue[1]; Guang Wang[1]; [1]University of Science and Technology Beijing

D-35: Recovery of Valuable Metals from Li-ion Battery Waste through Carbon and Hydrogen Reduction: Thermodynamic Assessment and Experimental Verification: *Bintang Nuraeni*[1]; Katri Avarmaa[1]; Leon Prentice[2]; W. John Rankin[1]; M. Akbar Rhamdhani[1]; [1]Fluid and Process Dynamics (FPD) Group, Swinburne University of Technology; [2]CSIRO Manufacturing

Recycling End-of-Life Acrylonitrile Butadiene (ABS) as Reductant for Metallic Iron Production from the Opon Mansi Iron Ore: *James Dankwah*[1]; David Asubonteng[1]; Georgina Thompson[1]; [1]University of Mines and Technology

Removal of Iron from an Electrolytic Solution Rich in Copper by Selective Hydrometallurgical Routes: Ana Belen Cueva Sola[1]; Jungshin Kang[2]; Jin-Young Lee[2]; *Rajesh Kumar Jyothi*[2]; [1]University of Science and Technology; [2]Korea Institute of Geoscience and Mineral Resources

D-41: Solar Thermal Application in Zn/ZnO Recovery from Spent Alkaline Batteries: Reiza Mukhlis[1]; *Deddy Nababan*[1]; Andrew Mackenzie[2]; Muhammad

Akbar Rhamdhani[1]; [1]Swinburne University of Technology; [2]Envirostream Australia Pty. Ltd.

D-36: SPYRO: Share Skills and Good Practices in PYROmetallurgy: *Gaurav Tripathi*[1]; [1]Eramet Ideas

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ELECTRONIC MATERIALS

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXII — 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; Chao-hong Wang, National Chung Chung University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, Bangladesh University of Engineering and Technology (BUET); Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University; Ting-Li Yang, National Yang Ming Chiao Tung University

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Session Chair: Hiroshi Nishikawa, Osaka University

C-9: 3D Electromagnetic Analysis and VNA Measurement of High-speed Signal Transmission in HLC-PCBs: Via Stub Effect: *Pei-Chia Hsu*[1]; Ying-Chih Chiang[1]; Shun-Cheng Chang[1]; Sheng-Wei Wu[1]; Cheng-Hao Ching[1]; Cheng-En Ho[1]; [1]Yuan Ze University

C-10: Bi-Sb-Se-Te Phase Equilibria Isothermal Tetrahedron at 400: Sinn-wen Chen[1]; Cheng-chun Ching[1]; *Yohanes Hutabalian*[1]; Chia-chun Chen[1]; [1]National Tsing Hua University

C-11: Effect of De-twinning on Tensile Strength of Nano-twinned Cu Films: *Chiahung Lee*[1]; [1]National Central University

C-12: Laser-assisted Die Attach Process for SiC Power Semiconductor: Dongjin Kim[1]; Jiyoon Youm[1]; So-Jeong Lee[1]; Sehoon Yoo[1]; *Min-Su Kim*[1]; [1]Korea Institute of Industrial Technology

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PHYSICAL METALLURGY

Phase Transformations and Microstructural Evolution — Poster Session

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

Program Organizers: Ashley Paz y Puente, University of Cincinnati; Mark Aindow, University of Connecticut; Sriswaroop Dasari, University of North Texas; Ramasis Goswami, Naval Research Laboratory; Megumi Kawasaki, Oregon State University; Eric Lass, University of Tennessee-Knoxville; Josh Mueller, Los Alamos National Laboratory; Eric Payton, University of Cincinnati; Le Zhou,

Marquette University

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A Tool to Aid Microstructure-sensitive Design Using High-throughput Phase-field Calculations and Generative Machine Learning Models: *Allison Kaye Arabelo*[1]; Vahid Attari[1]; Raymundo Arróyave[1]; [1]Texas A&M University

H-6: Analysis of the Cooling Rate and Heat Transfer Coefficients Associated with Boron Steel Probes Subjected to Quenching Media Using Polyalquileneglycol (PAG): *Brandon Buenrostro*[1]; Constantin Alberto Bocanegra[2]; José Angel Banderas[3]; Luis Enrique Valdovinos[1]; Esperanza Morales[4]; [1]Tecnológico Nacional de México; [2]CATEDRAS-CONACyT; [3]TECNM I.T.Morelia; [4]TECNM I.T.Querétaro

H-7: Atomic Structure and Evolution of {111} Precipitate Plates in Al-Cu-Mg-Ag Alloys: *Shenlan Yang*[1]; Nick Wilson[2]; Jian-Feng Nie[1]; [1]Monash University; [2]CSIRO Mineral Resources

H-8: Comprehensive Investigation of the Solidification Behavior of Alloys through Comparative Analysis of Undercooling and Fluidity: Min Kyung Kwak[1]; Wook Ha Ryu[1]; Geun Hee Yoo[1]; Eun Soo Park[1]; *Myeong Jun Lee*[1]; [1]Seoul National University

H-9: Constitutive Modeling of Metastable Ferrous Medium Entropy Alloy: *Jihye Kwon*[1]; Jungwan Lee[1]; Hyoung Seop Kim[1]; [1]POSTECH

Development of Porous Ti with Self-constructed Hexagonal Faceted Ligaments Fabricated via Water-etchable LMD Process: *Kook Noh Yoon*[1]; Je In Lee[2]; Hidemi Kato[3]; Eun Soo Park[1]; [1]Seoul National University; [2]Pusan National University; [3]Institute for Materials Research, Tohoku University

Effect of Starting Microstructure on Austenite Nucleation and Growth during Intercritical Annealing of Third Generation Medium-Mn Advanced High Strength Steels (3G AHSS): *Azin Mehrabi*[1]; Joseph McDermid[1]; Hatem Zurob[1]; [1]McMaster University

H-10: Effect of Cooling Rate on the Microstructure and Mechanical Properties of Al-Ce Based Alloys: *Obidimma Ikeh*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

H-11: Effect of Zr Addition on Metastable Phase Separation of Cu-Fe Alloy and Microstructure Control: *Hojoon Moon*[1]; Jungwook Cho[1]; [1]Pohang University of Science and Technology

H-12: Evaluation of Inductively Heated Laboratory Continuous Casting Plant for Alloy Design: *Andreas Weidinger*[1]; Sebastian Samberger[1]; Stefan Pogatscher[1]; Lukas Stemper[2]; [1]Nonferrous Metallurgy Montanuniversität Leoben; [2]AMAG rolling GmbH

Evolution of Phase Transformation Texture during Annealing in the Electroformed Invar: *In Gyeong Kim*[1]; Jun Ha Lee[1]; Yong Bum Park[1]; [1]Sunchoen National University

Experimental Analysis of Rhombohedral NiTi Tube Actuators Using in Contact Conductive/Convective Heating Stage: *Lehar Asip Khan*[1]; Hasan Ayub[1]; Corné Muilwijk[1]; Eanna McCarthy[1]; Inam Ul Ahad[1]; Dermot Brabazon[1]; [1]I-Form Advanced Manufacturing Research Centre, Dublin City University

H-13: Fracture Analysis for Intermediate Slabs of Wear-resistant Steel Based on Evolution of Surface Decarburization Behavior: *Hao Geng*[1]; Yun-he Chang[2]; Zhuang Zhang[1]; Jian-feng Jin[2]; Pu Wang[1]; Jia-quan Zhang[1]; [1]University of Science

& Technology Bejing; [2]Nanjing Iron and Steel Co., Ltd.

H-14: Heterogeneous Martensitic Nucleation of Single Microparticles Irradiated by Helium Ions: *Juan Lago*[1]; Adelaide Bradicich[1]; Yongchang Li[1]; Woohyun Cho[1]; Daniel Salas[1]; Ibrahim Karaman[1]; Lin Shao[1]; Patrick Shamberger[1]; [1]Texas A&M University

H-15: Improvement of High-temperature Oxidation Resistance of Co-based Superalloys by the Addition of Yttrium: *Hyun Gi Min*[1]; Kook Noh Yoon[1]; Jung Soo Lee[2]; Eun Soo Park[1]; [1]Seoul National University; [2]Industrial Science and Technology Research Institute, Inha University

H-16: Investigating Ti-6Al-4V Microstructure Evolution during Additive Manufacturing Via Operando Synchrotron Powder XRD: *Kouider Abdesselam*[1]; Steve Gaudez[1]; Hugo Pinsard[1]; Ulrich Lienert[2]; Zoltan Hegedues[2]; Wolfgang Pantleon[3]; Manas V. Upadhyay[1]; [1]Laboratoire de Mécanique des Solides (LMS), Centre National de la Recherche Scientifique (CNRS), Ecole Polytechnique, Institut Polytechnique de Paris; [2]Deutsches Elektronen Synchrotron (DESY); [3]Technical University of Denmark

H-17: Micromechanisms of the Phase Transformation in NiTi Shape Memory Alloys: *Conrado Garrido*[1]; Yuanbo Tang[2]; Roger Reed[2]; Daniel Barba[1]; [1]E.T.S Ingeniería Aeronáutica y del Espacio, Universidad Politécnica de Madrid; [2]University of Oxford

Microstructural Evolution of Quaternary CrFeNiCu Based High Entropy Alloys by the Addition of Specific Al and Ti Minor Elements: *Dilshodbek Yusupov*[1]; Aoun Abbas Muhammad[1]; Hae Jin Park[1]; Gyeol Chan Kang[1]; Jinoh Seo[1]; Jiwoo Shin[1]; Sunghwan Hong[1]; Ki Buem Kim[1]; [1]Sejong University

H-18: Microstructure and Deflection Behavior of Diffusion Bonded Fe-Ni-Mo/Invar Bimetallic Strips: Gin Kyu Lee[1]; JunHee Han[2]; Jae-Yeol Jeon[2]; Dae-Guen Kim[3]; Jae-Young Song[4]; *Jin Kyu Lee*[1]; [1]Kongju National University; [2]Korea Institute of Industrial Technology; [3]Institute for Advanced Engineering; [4]Shin Saeng Metal Ind. Co.

Microstructure Rearrangements in Magnesium Alloys Upon Thermo-mechanical Processing Followed by Advanced In-situ Synchrotron Radiation: *Xiaojing Liu*[1]; Emil Zolotoyabko[1]; Klaus-Dieter Liss[2]; [1]Technion – Israel Institute of Technology; [2]Guangdong Technion – Israel Institute of Technology

Modelling of Martensitic Interfaces in Beta-Ti Alloys: *Tomáš Škraban*[1]; Hanuš Seiner[2]; Josef Stráský[1]; [1]Charles University; [2]Institute of Thermomechanics, Czech Academy of Sciences

Phase Transformation Kinetics in Group IVB and VB Transition Metal Carbide Multilayer Composites: *John Stotts*[1]; Christopher Weinberger[1]; [1]Colorado State University

Phase Transformations in Binary Ti-Mo Alloys: *Veronika Kociscakova*[1]; Jana Šmilauerová[1]; Josef Stráský[1]; Petr Harcuba[1]; Dalibor Preisler[1]; Anna Veverková[1]; Miloš Janeček[1]; [1]Charles University

H-19: Primary Intermetallic Phases Formed Upon Casting in AlMgZn(Cu) Crossover Alloys with High Content of Fe and Si: *Sebastian Samberger*[1]; Lukas Stemper[2]; Ramona Tosone[2]; Peter Uggowitzer[3]; Stefan Pogatscher[1]; [1]Christian Doppler Laboratory for Advanced Aluminum Alloys, Montanuniversitaet Leoben; [2]AMAG rolling GmbH; [3]Montanuniversitaet Leoben

H-20: Residual Stress Mitigation via Cryogenic Temperature Induced Martensitic Phase Transformation in Stainless Steels: *John Chrystal*[1]; Richard Moat[1]; [1]The

Open University

H-21: Study of the Evolution of the Crystallographic Texture of the Microstructure during Grain Growth: *Jose Nino*[1]; Oliver Johnson[1]; [1]Brigham Young University

H-22: The Effect of Grain Size and Annealing Twin Boundary Density on FeMnSi-based Shape Memory Alloys: Ji Young Kim[1]; Wook Ha Ryu[1]; *Geun Hee Yoo*[1]; Eun Soo Park[1]; [1]Seoul National University

The Formation and Stability of Nanosphere Composites: *Rahul Basu*[1]; [1]UGC JNTU

The Impact of Graphene Nanoplatelets (GNPs) on the Hydration Mechanism of Alite (C3S) in Class-H Wellbore Cement with Focus on Microstructural Properties: *Havila Jupudi*[1]; Cody Massion[1]; Mileva Radonjic[1]; [1]Oklahoma State University

H-23: The Role of Co on Suzuki Segregation in Ni- and Co-based Superalloys: *Victoria Tucker*[1]; Sae Matsunaga[1]; Dongsheng Wen[1]; Michael Titus[1]; [1]Purdue University

H-24: Transition Metal Alloying of Mo(Si,Al)2 – Phase Formation and Element Partitioning: *Aina Edgren*[1]; Magnus Hörnqvist Colliander[1]; Erik Ström[2]; [1]Chalmers University of Technology; [2]Kanthal AB

H-25: Use of the Hollomon-Jaffe Tempering Parameter to Optimize the Microhardness in a Medium-carbon Low-alloy Cr-Mo Steel: *Perla Díaz-Villaseñor*[1]; Edgar López-Martínez[2]; Octavio Vázquez-Gómez[1]; Pedro Garnica-González[1]; Héctor Vergara-Hernández[1]; [1]Tecnológico Nacional de México / I.T. Morelia; [2]Universidad del Istmo

H-26: Validation of Casting Simulations for Prediction of Microstructural Evolution: *Jonah Duch*[1]; Mathew Hayne[2]; Meghan Gibbs[2]; [1]Los Alamos National Labratory; [2]Los Alamos National Laboratory

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ADDITIVE TECHNOLOGIES

Powder Materials Processing and Fundamental Understanding — Poster Session

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

Program Organizers: Elisa Torresani, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Ma Qian, Royal Melbourne Institute of Technology; Diletta Giuntini, Eindhoven University of Technology; Paul Prichard, Kennametal Inc.; Wenwu Xu, San Diego State University

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Combustion Synthesis of B4C-TiB2 Composite Nanoparticle by Self-propagating High Temperature Synthesis (SHS) in B2O3 – TiO2 – Mg - C System: *Ozan Coban*[1]; Mehmet Bugdayci[2]; Serkan Baslayici[3]; Ercan Acma[1]; [1]Istanbul Technical University; [2]Yalova University; [3]stanbul Medipol University

A-57: Efficient Production of Y2O3-Decorated Ti4822 Powder as an Oxide Dispersion Strengthened Material for Powder-Bed-Based Additive Manufacturing: *Saeid Alipour Masoumabad*[1]; Arezoo Emdadi[1]; [1]Missouri University of Science &

Technology

A-58: Instance Segmentation for the Characterization of Metal Powders Using Synthetic Datasets: *Kyle Farmer*[1]; Ryan Cohn[2]; Elizabeth Holm[2]; [1]KCNSC/Carnegie Mellon University; [2]Carnegie Mellon University

A-59: The Characterization of CoCrFeMnCu High Entropy Alloy Powders Produced by Gas Atomization for Powder-based Additive Manufacturing Processes: *Sertaç Altınok*[1]; Yunus Kalay[2]; [1]TAI; [2]Middle East Technical University

A-60: Understanding Surface Roughness on Vertical Surfaces via Computational Simulations in Laser Powder Bed Fusion Additive Manufacturing: *Zilong Zhang*[1]; Tianyu Zhang[1]; Lang Yuan[1]; [1]University of South Carolina

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ELECTRONIC MATERIALS

Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications — Poster Session

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

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

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3-D Printed Temperature Sensors: *Samiha Hossain*[1]; Airefetalo Sadoh[1]; Cameron von Tulganburg[1]; Richard Daly[1]; Balraj Mani[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

Multi-material Micromixing for On-demand Manufacture of Modular Soft Robotic Actuators: *Craig Joiner*[1]; Derrick Banerjee[1]; John Burke[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; [1]West Virginia University

Permanent Magnet Integrated Shock Absorber and Electric Generator: *Richard Daly*[1]; B.S. Mani[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

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LIGHT METALS

Scandium Extraction and Use in Aluminum Alloys — Poster Session

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

Program Organizers: Timothy Langan, Sunrise Energy Metals; Samuel Wagstaff, Oculatus Consulting; Phil Chataigneau, PDU Consulting; Efthymios Balomenos, Mytilineos S.A., Metallurgy Bu; Thomas Dorin, Deakin University; Muhammad Akbar Rhamdhani, Swinburne University of Technology; Dimitrios Filippou, Rio Tinto Iron & Titanium; Henk van der Laan, V.I.C. Van der Laan International Consultancy BV; Frank Palm, Airbus Defence and Space GmbH

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E-30: Scandium Extraction from TiO2 Pigment Production Residues by Ion Exchange: Evaluation of Two Commercial Ion Exchange Resins: *Eleni Mikeli*[1]; Danai Marinos[1]; Dimitrios Panias[1]; Efthymios Balomenos[1]; Carsten Dittrich[2]; Robin Scharfenberg[2]; Bengi Yagmurlu[2]; Beate Orberger[3]; Georges Croise[4]; [1]National Technical University of Athens; [2]MEAB Chemie Technik GmbH; [3]Catura Geoprojects; [4]ORANO Mining-Cime

Sustainable Selective Separation of Scandium from Acidic Industrial Wastes: *Thanos Karamalidis*[1]; James Howard[1]; [1]Anactisis LLC

E-31: Effect of Sc on Surface Recrystallization of AA7050 Extrusions: *Keaton Schmidt*[1]; Tom Wood[1]; Timothy Langan[2]; Paul Sanders[1]; [1]Michigan Technological University; [2]Sunrise Energy Metals

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BIOMATERIALS

Advanced Biomaterials for Biomedical Implants — Poster Session

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

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Jing Du, Pennsylvania State University

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K-1: Case Hardening of a Biomedical Cobalt- and Nickel-Free Stainless Steel: *Stephane Forsik*[1]; Logan Smith[1]; Gaurav Lalwani[1]; Mario Epler[1]; [1]Carpenter Technology Corporation

K-3: The Effects of Thermal Treatment on the Properties and Performance of Hot Extruded Zn-based Bioresorbable Alloy for Vascular Stenting Applications: *Henry Summers*[1]; Morteza Ardakani[1]; Jaroslaw Drelich[1]; [1]Michigan Technological University

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CHARACTERIZATION

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Poster Session

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 Jackson, Sandia National Laboratories

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L-1: Elastic Mismatch and Mixed-mode Buckling-induced Delamination: Influence on Mode I Adhesion Measurements: *Stanislav Zak*[1]; Megan Cordill[1]; [1]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

L-2: Grain-scale Multiaxial Deformation in Multicomponent Alloys: *Yaozhong Zhang*[1]; [1]University of Michigan

L-3: Overview of a Versatile Loading System for Anisotropic Material Property Characterization: *Malachi Nelson*[1]; David Kamerman[1]; Peter Hosemann[2]; [1]Idaho National Laboratory ; [2]University of California, Berkeley

L-4: Pythonic ODFs and SODFs for EBSD and Far Field HEDM: *Austin Gerlt*[1]; Eric Payton[2]; Donald Boyce[3]; Joel Bernier[4]; Paul Shade[2]; Mark Obstalecki[2]; Stephen Niezgoda[1]; [1]Ohio State University; [2]Air Force Research Lab; [3]Cornell University; [4]Lawrence Livermore National Laboratory

L-5: Shear Behavior of AL2024-T351: Experiments and Modeling: *Sara Ricci*[1]; Saryu Fensin[2]; Benjamin Derby[2]; J. Valdez[2]; George Gray[2]; Gianluca Iannitti[1]; Andrew Ruggiero[1]; Nicola Bonora[1]; G. Testa[1]; [1]University of Cassino and Southern Lazio; [2]Los Alamos National Laboratory

L-6: Tensile Properties and Damage Tolerance of FiberForm: Robert Quammen[1]; *Connor Varney*[1]; Paul Rottmann[1]; [1]University of Kentucky

L-7: Validating Texture and Lattice Strain Models via In-situ Neutron Diffraction and Shear Tests: Efthymios Polatidis[1]; Manas Upadhyay[2]; *Jan Capek*[1]; [1]Paul Scherrer Institute; [2]Ecole Polytechnique

L-8: (S)TEM Characterization of Stability of Retained Austenite in Medium Mn Steel under Severe Deformation: *Italo Oyarzabal*[1]; [1]Institut Jean Lamour

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ADVANCED MATERIALS

Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session — Poster Session

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

Program Organizers: Gerald Ferblantier, University of Strasbourg - IUT LP / ICube Laboratory - CNRS; Adele Carrado, University of Strasbourg - IUT LP / IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology

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Session Chairs: Adele Carrado, University of Strasbourg, IPCMS, CNRS; Ramana Chintalappale, University of Texas at El Paso; Gerald Ferblantier, University of Strasbourg, ICube Laboratory, CNRS; Karine Mougin, CNRS, IS2M; Ravindra Nuggehalli, New Jersey Institute of Technology; Heinz Palkowski, Clausthal University of Technology, Institute of Metallurgy

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A Review of P(St-MMA-AA) Synthesis via Emulsion Polymerization, 3D P(St-MMA-AA) Photonic Crystal Fabrication and Photonic Application: Ikhazuagbe Ifijen[1]; *Esther Ikhuoria*[2]; Stanley Omorogbe[1]; Aireguamen Aigbodion[1]; Salisu Ibrahim[3]; [1]Rubber Research Institute of Nigeria; [2]University of Benin; [3] Rubber Research

Institute of Nigeria

Enhancing Cutting Performance for Difficult-to-cut Workpiece by Oxide Hard Coating: *Joonbong Lee*[1]; Ki Buem Kim[1]; Taekjib Choi[1]; [1]Sejong University

J-1: Growth, Structure, Phase Stabilization and Optical Properties of Wide Band Gap Germanium Oxide Thin Films: *Paul Nalam*[1]; Debabrata Das[1]; Ramana Chintalapalle[1]; [1]The Center for Advanced Materials Reserach, UTEP

J-2: Influence of Light Intensity and Temperature on Solar Cell Performance: *Allyson Tarifa*[1]; Aditya Barman[2]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology; [2]Middlesex County Academy for Science, Mathematics, and Engineering Technologies

Self-Assembly of Particles Adsorbed on the Drop Surface: *Kinnari Shah*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

Utilization of Plant Oil Based-Fatliquor in the Processing of Leather: Ikhazuagbe Ifijen[1]; Isiaka Bakare[1]; Efosa Obazee[1]; Oghomwen Ize-Iyamu[1]; *Nyaknno U. Udokpoh*[1]; A. Ohifuemen[1]; F Mohammed[1]; E. Fagbemi,[1]; P Ayeke[1]; [1]Rubber Research Institute of Nigeria

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CHARACTERIZATION

Advanced Real Time Imaging — Poster Session

Sponsored by: TMS Functional Materials Division, 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 Engergy 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, Sourthern 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

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L-9: In-situ Magnetic Computed Tomography for Additive Manufacturing: *Bhairav Ramanathan*[1]; [1]Georgia Institute of Technology

Reinforcement of Band Delta-Ferrite Stability by Secondary Particles in AISI 416 Stainless Steel Investigated by In-situ Characterization: Qianren Tian[1]; Jianxun Fu[2]; *Wangzhong Mu*[3]; [1]Shanghai University; KTH Royal Institute of Technology; [2]Shanghai University; [3]KTH Royal Institute of Technology

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BIOMATERIALS

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

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

Biomaterials Committee

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

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Session Chair: Jiachen Liu, Texas Tech University

K-4: 3D Printing in Thermosensitive Nanoclay-Pluronic F127 Nanocomposite: *Yifei Jin*[1]; [1]University of Nevada Reno

ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Poster Session I

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

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J-4: A Dynamic Recrystallization-induced Heterostructuring Strategy via Hot Rolling in a Ferrous Multi-principal Element Alloy: *Jungwan Lee*[1]; Hyojin Park[1]; Sujung Son[1]; Jae Wung Bae[2]; Jinyou Kim[3]; Sung Kyu Kim[3]; Hyoung Seop Kim[1]; [1]POSTECH; [2]Pukyong National University; [3]POSCO

J-5: A Facile Strengthening Method by Co-doping Boron and Nitrogen in CoCrFeMnNi High-entropy Alloy
: *Sujung Son*[1]; Jungwan Lee[1]; Peyman Asghari-Rad[2]; Gang Hee Gu[1]; Farahnaz Haftlang[1]; Hyoung Seop Kim[1]; [1]Pohang University of Science and Technology; [2]The Pennsylvania State University

A High-Throughput Investigation of Composition-Microstructure Relationships in NbVZrMx Alloys: *Katharine Padilla*[1]; Zhaohan Zhang[1]; Rohan Mishra[1]; Katharine Flores[1]; [1]Washington University in St. Louis

J-6: A Micromechanical Investigation of the Orientation Dependent Plasticity of a MoNbTi Alloy: *Glenn Balbus*[1]; Satish Rao[1]; Oleg Senkov[1]; Eric Payton[1]; [1]Air Force Research Laboratory, Materials and Manufacturing Directorate

J-7: A Neural Network Model for High Entropy Alloy Design: *Jaemin Wang*[1]; Hyeonseok Kwon[1]; Hyoung Seop Kim[1]; Byeong-Joo Lee[1]; [1]Pohang University of Science and Technology

A Statistical Study on Incipient Plasticity of Medium-/High-entropy Alloys: *A-Hyun Jeon*[1]; Yakai Zhao[2]; Zhe Gao[1]; Upadrasta Ramamurty[2]; Jae-il Jang[1]; [1]Hanyang

University; [2]Nanyang Technological University

J-8: Abrupt Fluorite-pyrochlore and Pyrochlore-weberite Phase Transformations in Single-phase 20-component Ultrahigh-entropy Oxides: *Keqi Song*[1]; Dawei Zhang[1]; Jian Luo[1]; [1]University of California, San Diego

J-9: Activated Sintering of Ni-doped NbMoTaW Guided by a Computed Grain Boundary Diagram: *Sashank Shivakumar*[1]; Keqi Song[1]; Mingde Qin[1]; Chunyang Wang[2]; Tianjiao Lei[2]; Huolin Xin[2]; Tim Rupert[2]; Jian Luo[1]; [1]University of California San Diego; [2]University of California Irvine

J-10: An Investigation on Structure-property Correlation in TiVZrNb Light-weight High-entropy Alloy: *Juree Jung*[1]; Jinwoo Seok[1]; Jongtae Kim[1]; Songyi Kim[1]; Jiwoon Lee[2]; Gian Song[2]; Jaeyeol Jeon[1]; Junhee Han[1]; [1]KITECH; [2]Kongju National University

J-11: An Investigation on Transformation-induced-plasticity Mechanisms of Metastable Refractory Medium-entropy Alloys by Controlling Chemical Composition: *Yunjong Jung*[1]; Kangjin Lee[1]; Jiwoon Lee[1]; Junhee Han[2]; Ke An[3]; Chanho Lee[4]; Peter Liaw[5]; Gian Song[1]; [1]Kongju National University; [2]Korea Institute of Industrial Technology; [3]Oak Ridge National Laboratory; [4]Los Alamos National Laboratory; [5]The University of Tennessee

Atomistic Investigation of Elementary Dislocation Properties Influencing Mechanical Behaviour of Cr15Fe46Mn17Ni22 Alloy and Cr20Fe70Ni10 Alloy: *Ayobami Daramola*[1]; Anna Fraczkiewicz[1]; Ghiath Monnet[2]; Christophe Domain[2]; Gilles Adjanor[2]; [1]Ecole des MINES SMS centre; [2]DF Lab, Département Matériaux et Mécanique des Composants

J-12: Atomistic Modeling of Physical Vapor Deposition and Melt-quenching of CoCrFeNiTix High Entropy Alloys: *Aoyan Liang*[1]; Andrea Hodge[1]; Diana Farkas[2]; Paulo Branicio[1]; [1]University of Southern California; [2]Virginia Tech

Bridge Martensite Phase Transformation through Microbands for Superior Dynamic Mechanical Properties in a Metastable High-entropy Alloy: *Aomin Huang*[1]; [1]Univerisity of California San Diego

J-14: Combinatorial Study of Rhenium Additions on the Non-Equiatomic VNbMoTaW System: *Taohid Bin Nur Tuhser*[1]; Thomas Balk[1]; [1]University of Kentucky

J-15: Combinatorial Thin Film and Bulk Alloy Approach to Identify Non-equiatomic Compositions in MnFeCoNiCu System with Superior Phase Stability and Mechanical Properties: *Tibra Das Gupta*[1]; Thomas Balk[1]; [1]University of Kentucky

J-16: Comparison of Select High Entropy Alloys as Binders for Cemented Carbide: *Jannette Chorney*[1]; Jerome Downey[1]; K.V. Sudhakar[1]; [1]Montana Technological University

J-17: Comparison of Tensile and Compression Properties of Refractory High Entropy Alloys Developed by Natural Mixing Guided Design: Jae Kwon Kim[1]; Sang Jun Kim[1]; Eun Soo Park[1]; Taeyeop Kim[2]; Dongwoo Lee[2]; *Hyun Gi Min*[1]; [1]Seoul National University; [2]Sungkyunkwan University

J-18: Crystal Plasticity Modeling and Machine Learning for High-Strength, High-Temperature Alloys: *Stephanie Taylor*[1]; Jaime Marian[1]; Amartya Banerjee[1]; [1]University of California Los Angeles

J-102: Crystallographic and Compositional Evolution during Isothermal Annealing of Refractory High Entropy Alloys: Insights into High Temperature Phase Stability: Sriswaroop Dasari[1]; Abhishek Sharma[1]; Rajarshi Banerjee[1]; *Vishal*

Soni[1]; [1]University of North Texas

J-19: Data-driven Search and Selection of Ti-containing Multi-principal Element Alloys for Aeroengine Parts: *Tanjore Jayaraman*[1]; Ramachandra Canumalla[2]; [1]University of Michigan-Dearborn; [2]Weldaloy Specialty Forgings

J-20: Design of Ductile Low-Activation Bcc Multi-principal Element Alloys: *Heng Jiang*[1]; Ming Wang[1]; MingXin Huang[1]; [1]The University of Hong Kong

J-21: Design of MoWTaTiZr Refractory Multi-principal Element Alloys for High-temperature Applications: *Gaoyuan Ouyang*[1]; Prashant Singh[1]; Jun Cui[2]; Matthew Kramer[1]; Oleg Senkov[3]; Daniel Miracle[3]; Duane Johnson[1]; [1]Ames Laboratory; [2]Iowa State University; [3]Air Force Research Laboratory

J-22: Design of Novel AlCoCrNbNi Eutectic High Entropy Alloy with Adequate Strength, Ductility, and Oxidation Resistance: *Lavanya Raman*[1]; Shweta Sharma[1]; Gagan Goyal[1]; Saurabh Singh[1]; Yu Zhang[1]; Na Liu[1]; Amin Nozariasbmarz[1]; Bed Poudel[1]; Ravi Sankar Kottada[2]; Wenjie Li[1]; Shashank Priya[1]; [1]Pennsylvania State University; [2]Indian Institute of Technology Madras

J-103: Development and Application of WC-based Cemented Carbide Bonded with Co Based Multi-component Alloy Binder: *Jinwoo Seok*[1]; Jun-Woo Song[1]; Juree Jung[1]; Jong Tae Kim[1]; SongYi Kim[1]; Hyoseop Kim[1]; Moon-Jo Kim[1]; Seul-Ki Han[1]; Junhee Han[1]; [1]KITECH

J-23: Accelerated Development of Refractory Multi-principal Element Alloys via Machine Learning: *Carolina Frey*[1]; Anthony Botros[1]; Chris Borg[2]; James Saal[2]; Bryce Meredig[2]; Noah Phillips[3]; Tresa Pollock[1]; [1]University of California Santa Barbara; [2]Citrine Informatics; [3]ATI

J-24: Development of Refractory High Entropy Alloys via Natural Mixing Guided Design: Jae Kwon Kim[1]; Sang Jun Kim[1]; Taeyeop Kim[2]; Dongwoo Lee[2]; Eun Soo Park[1]; *Hyun Gi Min*[1]; [1]Seoul National University; [2]Sungkyunkwan University

J-25: DFT Investigation of FeNiCoCrMnAl and FeNiCoCrPdAl High Entropy Alloys: Fully Disordered versus Partially Disordered: *Nguyen-Dung Tran*[1]; Ying Chen[1]; [1]Tohoku University

Diffusion (Atomic Mobility) Databases for High-entropy Alloys: *Wei Zhong*[1]; Ji-Cheng Zhao[1]; [1]University of Maryland

Directional Solidification of the Medium-entropy Alloys from Al-Cr-Fe-Ni System: *Oleg Stryzhyboroda*[1]; Ulrike Hecht[1]; Victor Witusiewicz[1]; [1]Access e.V.

J-26: Ductility at Room Temperature of BCC-RHEAs: *Jin Wang*[1]; Nicolas Peter[1]; Ruth Schwaiger[1]; [1]Forschungszentrum Juelich Gmbh

J-27: Dynamic Precipitate Transformation in Ultrastrong and Ductile Maraging Medium-entropy Alloy: *Hyun Chung*[1]; Won Seok Choi[2]; Hosun Jun[2]; Pyuck-Pa Choi[2]; Heung Nam Han[3]; Won-Seok Ko[4]; Seok Su Sohn[1]; [1]Korea University; [2]Korea Advanced Institute of Science and Technology; [3]Seoul National University; [4]Inha University

J-28: Effect of Composition and Dose Rate on the Irradiation Behavior of Ni-based MPEAs: *Anshul Kamboj*[1]; Emmanuelle Marquis[1]; [1]University of Michigan, Ann Arbor

J-29: Effect of the BCC Phase on Microstructures and Mechanical Properties of the FeCrNi Equiatomic Alloy: *Jin-Seob Kim*[1]; Jin-Kyung Kim[1]; [1]Hanyang University

J-30: Effects of Oxygen Interstitials on Phase Stability and Phase Evolution in

the HfNbTaTiZr RMPE Alloy: *Leah Mills*[1]; Ravit Silverstein[1]; Noah Philips[2]; Daniel Gianola[1]; Tresa Pollock[1]; [1]University of California-Santa Barbara; [2]ATI Specialty Alloys and Components

J-31: Effects of Potential Energy Statistics on Deformation Behavior in Concentrated Solid Solutions: *Amir Shirsalimian*[1]; Ritesh Jagatramka[2]; Junaid Ahmed[2]; Matthew Daly[2]; [1]University of Illinois Chicago; [2]University of Illinois-Chicago

J-32: Enabling High-strength Refractory Complex, Concentrated Alloys via Multi-fidelity Experiments and Simulations: *Michael Titus*[1]; Austin Hernandez[1]; Sharmila Karumuri[1]; Saswat Mishra[1]; Zachary McClure[1]; Kenneth Sandhage[1]; Ilias Bilionis[1]; Alejandro Strachan[1]; [1]Purdue University

J-33: Enhanced Mechanical Properties of Ti-rich Medium Entropy Alloys via Phase Diagram Engineering: *Wen-Chi Yang*[1]; Ping-Yuan Deng[1]; Hsin-Jay Wu[1]; [1]National Yang Ming Chiao Tung University

Evolution of Hierarchical Nanotwins in the Annealed Mn-free FeCoNiCr High-entropy Alloy Subjected to Ex-situ Tensile Deformation at a Cryogenic Temperature: *Tsai-Fu Chung*[1]; Ching-Wen Yeh[1]; Chih-Yuan Chen[2]; Chien-Nan Hsiao[3]; Cheng-Si Tsao[4]; Jer-Ren Yang[5]; [1]National Yang Ming Chiao Tung University; [2]National Taipei University of Technology; [3]Taiwan Instrument Research Institute; [4]Institute of Nuclear Energy Research; [5]National Taiwan University

Fabrication of AlCoCrFeNi High Entropy Alloys via Binder Jetting and Direct Energy Deposition: Characterization, Microstructural Modification, and Analysis: *Olujide Oyerinde*[1]; Justin Almeida[1]; Ioannis Mastorakos[1]; Philip Yuya[1]; Ajit Achuthan[1]; [1]Clarkson University

J-34: Grain Boundary Segregation and Solute Drag in Multicomponent Alloys: *Milad Taghizadeh*[1]; Malek Alkayyali[1]; Fadi Abdeljawad[1]; [1]Clemson University

J-35: Grain Boundary Segregation Effects in Multi-Principal Element Alloys: *Sarah Paguaga*[1]; Sarah Hunt[1]; Joshua Arrington[1]; Fadi Abdeljawad[1]; [1]Clemson University

J-36: GTA Weldability of Metastable Ferrous Medium-entropy Alloys with Various Welding Materials: *Yoona Lee*[1]; Sanghyeon Park[1]; Yoonsuk Choi[1]; Nokeun Park[2]; Youngsang Na[3]; Namhyun Kang[1]; [1]Pusan National University; [2]Yeungnam University; [3]Korea Institute of Materials Science

J-37: High-density Nanoscale L12 Phase Strengthened FeNiCr-based Medium Entropy Alloys: *Guanghui Yang*[1]; Jinkyung Kim[1]; [1]Hanyang University

J-38: High-throughput Calculation of the Alloying Effects on the Thermodynamic Properties of Al2Cu10Fe20MnxNiyCrz High Entropy Alloys: *Md Abdullah Al Hasan*[1]; Xuesong Fan[1]; Seungha Shin[1]; Peter Liaw[1]; [1]University of Tennessee

J-39: High-throughput CALPHAD-type Calculation in Design of Coherent Precipitate-strengthening Al-Co-Cr-Mo-Ti Refractory High Entropy Superalloys: *Shao-Yu Yen*[1]; Hideyuki Murakami[2]; Shih-kang Lin[1]; [1]National Cheng-Kung University; [2]National Institute for Materials Science

J-40: High-throughput Creation of Refractory High-Entropy Alloys: *Rayna Mehta*[1]; Jesse Grant[1]; Tim Weihs[1]; [1]Johns Hopkins University

J-41: High Temperature B2 Precipitation of Ru-Containing Refractory Alloys: *Haojun You*[1]; Carolina Frey[1]; Sebastian Kube[1]; Kaitlyn Mullin[1]; Andrew Detor[2]; Scott Oppenheimer[2]; Tresa Pollock[1]; [1]UCSB Pollock Group; [2]GE Research

J-42: In-Situ Investigation of Damage in the AlCoCrFeNi2.1 High Entropy Alloy:

Cal Siemens[1]; David Wilkinson[1]; [1]McMaster University

J-43: In-situ Quasi-static Deformation Studies of CoCrNi Multi-principal Element Alloys: *Nathan Peterson*[1]; John Copley[2]; Benjamin Ellyson[1]; Connor Rietema[3]; Francisco Coury; Francisco Coury[4]; Gustavo Bertoli[4]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Princeton University; [3]Lawrence Livermore National Laboratory; [4]Federal University of São Carlos

J-44: In-situ Tensile Testing Using Synchrotron Radiation in a CrCoNi Multi-Principal Element Alloy: *Gustavo Bertoli*[1]; Benjamin Ellyson[2]; Amy Clarke[2]; Claudio Kiminami[1]; Francisco Coury[1]; [1]Federal University of São Carlos; [2]Colorado School of Mines

J-45: In Situ Neutron Diffraction Analyses of Dislocation Slip and Twinning Deformation in an Additively Manufactured CrCoNi Medium Entropy Alloy: *Wanchuck Woo*[1]; Hobyung Chae[1]; Soo Yeol Lee[2]; Stefanus Harjo[3]; Ke An[4]; [1]Korea Atomic Energy Research Institute; [2]Chungnam National University; [3]Japan Atomic Energy Agency; [4]Oak Ridge National Laboratory

Investigation on Formation of Duplex Microstructure and Mechanical Properties in CrMnFeCoNiAlxTiy High-entropy Alloy: *Jongtae Kim*[1]; Juree Jung[1]; Jinwoo Seok[1]; Junwoo Song[1]; Jeongeun Kim[2]; Gian Song[2]; Junhee Han[1]; [1]KITECH; [2]Kongju National University

J-46: Irradiation-induced Segregation in Complex Concentrated Alloys: *Daniele Fatto Offidani*[1]; Anshul Kamboj[1]; Emmanuelle Marquis[1]; [1]University of Michigan - Ann Arbor

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ADVANCED MATERIALS

Advances in Multi-Principal Element Alloys II — Poster Session II

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Yang Ming Chiao Tung University; Jennifer Carter, Case Western Reserve University; Srivatsan Tirumalai; Xie Xie, FCA US LLC; James Brechtl, Oak Ridge National Laboratory; Gongyao Wang, Globus Medical

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J-47: Machine Learning On-the-fly KMC Study of Vacancy Diffusion of Concentrated Ni-Fe Model Alloys: *Wenjiang Huang*[1]; Xianming Bai[1]; [1]Virginia Polytechnic Institute

Mechanical Properties and Deformation Mechanisms in TiMoNbZr Medium Entropy Alloys: A Molecular Dynamics Study: *Avinash Chavan*[1]; Mangal Roy[1]; [1]IIT Kharagpur

J-48: Mechanical Properties and Dislocation Activities of B2 High-Entropy Intermetallic Compounds: *Ya-Jing Lee*[1]; Ting-Ying Shih[1]; Cheng-Yuan Tsai[1]; Shou-Yi Chang[1]; [1]National Tsing Hua University

J-49: Mechanical Properties and Plastic Instabilities of FeAlCr-based Complex Concentrated Alloys: *Tomáš Tayari*[1]; Michal Knapek[1]; Peter Minárik[1]; Josef Stráský[1];

Josef Pešička[1]; [1]Charles University

J-50: Mechanical Properties of Medium Entropy Alloys: *Sheron Tavares*[1]; Bingfeng Wang[2]; Saryu Fensin[3]; Marc Meyers[1]; [1]University of California San Diego; [2]Central South University; [3]Los Alamos National Laboratory

J-51: Metastability Engineering of Partially Recrystallized C-doped Non-equiatomic CoCrFeNiMo Medium-entropy Alloy: *Hyeonseok Kwon*[1]; Alireza Zargaran[1]; Peyman Asghari-Rad[2]; Eun Seong Kim[1]; Gang Hee Gu[1]; Jungwan Lee[1]; Jongun Moon[1]; Jae Wung Bae[3]; Hyoung Seop Kim[1]; [1]POSTECH; [2]Pennsylvania State University; [3]Pukyong National University

Microalloying Technology: A Promising Strategy for Designing Nanostructured High-entropy Alloy Films: *Wenyi Huo*[1]; Łukasz Kurpaska[1]; Hyoung Seop Kim[2]; Stefanos Papanikolaou[1]; [1]National Centre for Nuclear Research; [2]Pohang University of Science and Technology

J-52: Microstructural and Mechanical Analysis of Cobalt-Free High Entropy Alloys: *Morgan Ashbaugh*[1]; Jerome Downey[1]; Jannette Chorney[1]; [1]Montana Technological University

J-53: Microstructure and Hardness of (CoCrCuTi) 100-x Fex with Duplex Hexagonal-Cubic Multi Principal Element Alloys: *Brittney Terry*[1]; Reza Abbaschian[1]; [1]University of California, Riverside

Microstructure and Mechanical Properties of In-situ TiC Reinforced Nb-Ta-V-Ti High Entropy Alloys: *Jeong Pyo Lee*[1]; Jeong Eun Kim[1]; Gian Song[1]; Jin Kyu Lee[1]; [1]Kongju National University

Microstructure and Mechanical Property of Gas Tungsten Arc and Friction Stir Welds of L12 Precipitate FCC High-entropy Alloy: Po-Ying Hsieh[1]; *Chih-Hsien Liao*[1]; Hung-Chih Liu[1]; Po-Ting Lin[1]; Pai-Keng Shen[1]; Shao-Wei Hunag[1]; Yutaka S. Sato[2]; Che-Wei Tsai[1]; [1]National Tsing Hua University; [2]Tohoku University

J-54: Microstructure, Mechanical Properties, and Long-term Stability of FeMnNiAlCr High Entropy Alloys for Concentrated Solar Power Systems: *Edwin Jiang*[1]; Xiaoxue Gao[1]; Andrew Pike[1]; Ian Baker[1]; Jifeng Liu[1]; Geoffroy Hautier[1]; [1]Dartmouth College

J-55: Minor Addition of Boron on Macro- and Micro-Mechanical Properties of Refractory High-Entropy Alloys: *Ping-Hsu Ko*[1]; Ya-Jing Lee[1]; Shou-Yi Chang[1]; [1]National Tsing Hua University

J-56: Nanoindentation Creep of Electrodeposited Nanocrystalline NiFeCo Medium Entropy Alloy: *Lizhong Lang*[1]; Michel Haché[1]; Yu Zou[1]; [1]University of Toronto

J-57: Neutron Diffraction and Total Scattering Investigation of an Unusual Long-range Order-Disorder Transition Competing with Short-range Ordering in 10-component Oxides: *Dawei Zhang*[1]; Yan Chen[2]; Heidy Vega[1]; Tianshi Feng[1]; Dunji Yu[2]; Michelle Everett[2]; Joerg Neuefeind[2]; An Ke[2]; Renkun Chen[1]; Jian Luo[1]; [1]University of California San Diego; [2]Oak Ridge National Laboratory

J-58: Non-Equatomic Composition Effect on the Thermodynamic Properties of MoNbTaW: *Sarah O'Brien*[1]; Matthew Beck[1]; [1]University of Kentucky

J-59: On the Molten State Processing of Refractory Complex Concentrated Alloys: *Calvin Belcher*[1]; Sakshi Bajpai[1]; Benjamin MacDonald[1]; Enrique Lavernia[1]; Diran Apelian[1]; [1]University of California Irvine

J-60: On the Pursuit of Stress-induced Transformation Effect in the High-entropy Ti-Zr-Nb-Mo-Al System: *Mariano Casas Luna*[1]; Dalibor Preisler[1]; Jií Kozlík[1]; Miloš

Janeček[1]; Josef Stráský[1]; [1]Charles University

J-61: Order-Disorder Effects in Mixed BCC/FCC FeNiMoW MPEA: *Sarah O'Brien*[1]; Matthew Beck[1]; [1]University of Kentucky

J-62: Phase-field Crystal Modeling of Deformation Mechanics in BCC Refractory Metal-based MPEAs: *Kate Elder*[1]; Joel Berry[1]; Amit Samanta[1]; Aurelien Perron[1]; Scott McCall[1]; Joseph McKeown[1]; [1]Lawrence Livermore National Laboratory

J-63: Phase Stability in Ti-Zr-Nb Refractory Medium Entropy Alloys from Atomistic Simulations: Sally Issa[1]; *Céline Varvenne*[1]; Guy Tréglia[1]; Hakim Amara[2]; [1]Aix Marseille Université, CNRS, CINAM; [2]LEM ONERA

Phase Stability of Hf-Mo-Nb-Ta-Ti Refractory Multi-Principal Element Alloys: *Anthony Botros*[1]; Carolina Frey[1]; Noah Phillips[2]; Tresa Pollock[1]; [1]UCSB; [2]ATI

J-64: Plastic Behavior of Phase-separated FCC Complex Concentrated Alloys: Shawn Chen[1]; *Ibrahim Altarabshe*[1]; [1]Louisiana Tech University

J-65: Plastic Deformation of BCC Medium-entropy Alloys in the Ti-Zr-Nb Systems: *Shohei Onda*[1]; Shu Han[1]; Zhenghao Chen[1]; Kyosuke Kishida[1]; Haruyuki Inui[1]; [1]Kyoto University

J-66: Plastic Deformation of Single Crystals of Ternary Equiatomic Alloys with the FCC Structure: *Seiko Tei*[1]; Shougo Kuroiwa[1]; Le Li[1]; Zhenghao Chen[1]; Kyosuke Kishida[1]; Haruyuki Inui[1]; [1]Kyoto University

J-67: Preferential Composition during Nucleation and Growth in Multi-Principal Elements Alloys: *Saswat Mishra*[1]; Alejandro Strachan[1]; [1]Purdue University

J-68: Processing-Structure Relationship in Additive Friction Stir Deposited AlxCoCrFeNi Complex Concentrated Alloys: *Michael Amling*[1]; Malcolm Williams[2]; Paul Allison[2]; Mark Weaver[1]; [1]University of Alabama; [2]Baylor University

J-69: Recrystallization Behavior of NbTiZr-Containing Refractory Multi-Principal Element Alloys: *Adira Balzac*[1]; Benjamin Ellyson[1]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines

J-71: Relaxation and Diffusion Processes at High Temperature in Fe-Mn-Cr-Ni-Co High Entropy Alloy Studied by Mechanical Spectroscopy: *Jose San Juan*[1]; Lucía Del-Río[1]; Guillaume Laplanche[2]; María Nó[1]; [1]Universidad del Pais Vasco; [2]Ruhr Universität Bochum

J-72: Shape Memory Effect in CrMnFeCoNi Multi-principal Element Alloys: *Je In Lee*[1]; Jinsurang Lim[1]; Wook Ha Ryu[2]; Hyun Seok Oh[3]; Eun Soo Park[2]; Koichi Tsuchiya[4]; [1]Pusan National University; [2]Seoul National University; [3]Massachusetts Institute of Technology; [4]National Institute for Materials Science

J-73: Solid Particle Erosion Resistance of Eutectic High-entropy Alloys Using an Improved Air-jet Sandblaster Method: *Wandong Wang*[1]; Yu Zou[1]; [1]University of Toronto

J-74: Study of the Grain Growth Kinetics and Hall-Petch Relationship in Fe-rich Multi-principal Element Alloys: *David Silva*[1]; Gustavo Bertoli[1]; Michael Kaufman[2]; Amy Clarke[2]; Francisco Coury[1]; Claudemiro Bolfarini[1]; [1]Federal University of São Carlos; [2]Colorado School of Mines

Synchrotron X-ray Diffraction and Tomography Simultaneous Studies of Multiple Phase Transformation Dynamics in Al-based Multiple Component Alloys: *Kang*

Xiang[1]; Shi Huang[1]; Hongyuan Song[1]; Jiawei Mi[1]; [1]University of Hull

J-75: Synthesis and Characterization of Novel Multi-element Magnesium-based Medium Entropy Alloys: *Srivatsan Tirumalai*[1]; Khin Tun[1]; Manoj Gupta[1]; [1]The University of Akron

J-76: The AlMo0.5NbTa0.5TiZr Refractory High Entropy Superalloy: Experimental Findings and Comparison with Calculations Using the CALPHAD Method: *Patricia Suarez Ocano*[1]; Leonardo Agudo Jácome[1]; Suzana G. Fries[2]; Inmaculada Lopez-Galilea[2]; Reza Darvishi Kamachali[1]; [1]Bundesanstalt für Materialforschung und -prüfung (BAM); [2]Ruhr-Universität Bochum (Bochum, Nordrhein-Westfalen)

The Precipitated Strengthening of Eta Phase on the Non-equimolar CoCrNiTi Medium-entropy Alloys: *Pai-Keng Shen*[1]; Hung-Chih Liu[1]; Shao-Lun Lu[2]; Hung-Wei Yen[2]; Jien-Wei Yeh[2]; Che-Wei Tsai[1]; [1]National Tsing Hua University; [2]National Taiwan University

Thermal Super-jogs Control High-temperature Strength in Nb-Mo-Ta-W Alloys: *Sicong He*[1]; Xinran Zhou[1]; Jaime Marian[1]; [1]University of California, Los Angeles

J-77: Transmission Electron Microscopy of Temperature Dependent Deformation Mechanisms in Multi-principal Element Alloys: *Madelyn Payne*[1]; Mingwei Zhang[2]; Punit Kumar[2]; Mark Asta[2]; Robert Ritchie[2]; Andrew Minor[2]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

Ultra-low Thermal Conductive Metallic Material: High Entropy Alloy Foam: *Kook Noh Yoon*[1]; Khurram Yaqoob[2]; Je In Lee[3]; Jin Yeon Kim[1]; Eun Soo Park[1]; [1]Seoul National University; [2]National University of Sciences and Technology; [3]Pusan National University

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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; Dipankar Ghosh, Old Dominion University; Eugene Olevsky, San Diego State University; Kathy Lu, Virginia Polytechnic Institute and State University; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences; Ruigang Wang, The University of Alabama; Alexander Dupuy, University of California, Irvine

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Session Chair: Kathy Lu, Virginia Polytechnic Institute and State University

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N-1: Effect of Milling Time and Powder Particle Size on Microstructure and Mechanical Properties of Al- oxide-CNT Composites: *Suhyun Bae*[1]; Seoyoon Gong[1]; Donghyun Bae[2]; Se-Eun Shin[1]; [1]Sunchon National University; [2]Yonsei University

N-2: Influence of Microstructure and Sodium Doping on Charge Transport in High Entropy Oxides: *Yiheng Xiao*[1]; Justin Cortez[1]; Alexander Dupuy[1]; Julie Schoenung[1]; [1]University of California Irvine

Influence of Secondary Phase Segregation on Electrical Behavior in Entropy Stabilized Oxides: *Alina Vizcaya*[1]; Arturo Meza[1]; Alexander Dupuy[1]; Julie Schoenung[1];

[1]University of California Irvine

N-3: Mechanical Behavior of Milli-Scale AM Metallic Lattice Structures as Reinforcement for Ceramic Matrix Composites: *Catherine Barrie*[1]; Dajie Zhang[2]; Steven Storck[2]; Gianna Valentino[2]; Don King[2]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]Johns Hopkins Applied Physics Lab

N-4: Role of Phase Heterogeneity on Mechanical Behavior in Entropy Stabilized Oxides: *Luz Gomez*[1]; Salma El-Azab[1]; Alexander Dupuy[1]; Julie Schoenung[1]; [1]University of California, Irvine

N-5: TEM Investigation of the Strengthening Effects from Grain Boundary Segregation and Precipitation in W- and W-Mo-containing High-entropy Borides: *Huolin Xin*[1]; Chunyang Wang[1]; [1]University of California - Irvine

N-6: Use of Ceramic Waste in Different Percentages as a Replacement of the Fine Aggregate In Mortars: Mariana Cherene[1]; Gustavo Xavier[1]; *Afonso Azevedo*[1]; Sergio Monteiro[2]; [1]UENF - State University of the Northern Rio de Janeiro; [2]IME - Military Institute of Engineering

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MATERIALS PROCESSING

Advances in Surface Engineering V — Poster Session

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

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

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N-7: Effect of Ultrasonic Impact Peening on Austenitic Stainless Steel Welds for Nuclear Canister Applications: Merbin John[1]; *Alessandro Ralls*[1]; Manoranjan Misra[1]; Pradeep Menezes[1]; [1]University of Nevada

N-32: Evaluation of LME Susceptibility of Al-Zn-Si Coated TRIP Steel: *Daehoon Jeong*[1]; Seok-Hyun Hong[1]; Suk-Kyu Lee[2]; Sung-Joon Kim[1]; [1]GIFT, POSTECH; [2]POSCO Technical Research Laboratories

N-8: Microstructural Changes of Electron Beam Treated AISI 316L with the Combination of Computation of Thermal and Mechanical Fields: *Crtomir Donik*[1]; Irena Paulin[1]; Federica Rimoldi[2]; Matjaž Godec[1]; Massimiliano Bestetti[2]; [1]Institute Of Metals And Technology; [2]Politecnico di Milano, Dipartimento di Chimica, Materiali e Ingegneria “Giulio Natta”

N-9: Novel Fretting-Corrosion Mechanisms of Friction Stir Processed Steel Manufactured by High Deposition Rate Additive Manufacturing Process: *Alessandro Ralls*[1]; Pradeep Menezes[1]; [1]University of Nevada, Reno

Production of Gold Nano Films by Pulse Electrodeposition: *Ugur Barut*[1]; Metehan Erdogan[1]; [1]Ankara Yildirim Beyazit University

N-10: Use of Novel Degradable Surface Coatings for Enhanced Biofilm Growth: *Cody Allen*[1]; Whytneigh Duffie[1]; Timothy Brenza[1]; Travis Walker[1]; Venkataramana Gadhamshetty[1]; [1]South Dakota School of Mines and Technology

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, CNRS - PSL Research University; Stoichko Antonov, National Energy Technology Laboratory; Rongpei Shi, Harbin Institute of Technology (Shenzhen)

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M-1: Development of a TWIP/TRIP Titanium Alloy: *Mathew Cohen*[1]; Brian Welk[1]; Gopal Viswanathan[1]; Hamish Fraser[1]; [1]The Ohio State University

M-2: Effect of Micro-texture Regions on the Creep Behavior of Rolled Ti-64 with Small-scale Cantilever Bending: Faizan Hijazi[1]; Barna Roy[1]; Dheepa Srinivasan[2]; *Praveen Kumar*[1]; Vikram Jayaram[1]; [1]Indian Institute of Science Bangalore; [2]Pratt and Whitney

M-27: Investigation of Complex Microstructure in Selective Laser Melted Near Alpha Titanium Alloy Using Scanning Electron Microscopy: *Cameron Tucker*[1]; Deepak Pillai[1]; Ahsan Habib Munna[1]; Yufeng Zheng[2]; [1]University of Nevada Reno; [2]University of Nevada-Reno

M-3: Numerical Analysis of Oxide Growth and Oxygen Dissolution during High-temperature Oxidation of Ti–Al Alloys: *Tomonori Kitashima*[1]; Makoto Watanabe[1]; [1]National Institute for Materials Science

Systematic Review of the Synthesis of Titanium Oxide Nanoparticles via Plant Mediated Green Approach: *Ifeanyi Odiachi*[1]; Oghomwen Ize-Iyamu[2]; Osaro Ize-Iyamu[3]; Chikaodili Ikechukwu[4]; Ikhazuagbe Ifijen[2]; [1]Delta State Polytechnic Ogwashi-Uku; [2]Rubber Research Institute of Nigeria; [3] Ambrose Alli University; [4]University of Benin

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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; Francesca Tavazza, National Institute of Standards and Technology; Dennis Dimiduk, BlueQuartz Software LLC; Darren Pagan, Pennsylvania State University; Kamal Choudhary, National Institute of Standards and Technology; Saaketh Desai, Sandia National Laboratories; Shreyas Honrao, NASA Ames Research Center; Ashley Spear, University of Utah; Houlong Zhuang, Arizona State University

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M-4: A Deep-learning Enabled Reliability Enhancement System for the Fused Deposition Modelling Process: *Xiao Shang*[1]; Xingchen Liu[1]; Jiahui Zhang[1]; Qiyan Mao[2]; Yu Zou[1]; [1]University of Toronto; [2]Crescent School

Active Learning of Powder Milling Machine for Optimized Silicon Particle Size Control: *Jong Ho Kim*[1]; [1]Research Institute of Industrial Science and Technology

Adaptive Learning from Scarce and Multi-Fidelity Data: *Amin Yousefpour*[1]; Mehdi Shishehbor[1]; Zahra Zanjani Foumani[1]; Ramin Bostanabad[1]; [1]University of California Irvine

M-5: Advanced Analytics on 3D X-ray Tomography of Irradiated Silicon Carbide Claddings: *Fei Xu*[1]; Joshua Kane[1]; Peng Xu[1]; Jason Schulthess[1]; Sean Gonderman[1]; [1]Idaho National Laboratory

M-6: Design of Casting-friendly TiAl Alloy by Artificial Neuron Network: *Yu-Jen Tseng*[1]; Hong-Yuan Sun[2]; Yi-Hsuan Sun[1]; Cheng-Hsueh Chiang[2]; Hung-Wei Yen[1]; [1]National Taiwan University; [2]Metal Institute Research & Development Centre

Effective Bulk Properties and Structure-property Relationships in Additively Manufactured Metal with Micron- and Nanometer-scale Structural Complexity: *Mir Al-Masud*[1]; Ryan Griffith[1]; Naji Mashrafi[1]; Mujan Seif[1]; Matthew Beck[1]; [1]University of Kentucky

Glass Forming Ability of Silica Glasses with Machine Learning Based Prediction Technique: *Jong Ho Kim*[1]; [1]Research Institute of Industrial Science and Technology

M-7: How Can I Use Machine Learning to Predict all the Process Parameters that will lead to a Specific Material Property in my Advanced Manufacturing Process?: *Lizzy Coda*[1]; Loc Truong[1]; Colby Wight[1]; WoongJo Choi[1]; Tegan Emerson[1]; Keerti Kappagantula[1]; Henry Kvinge[1]; [1]Pacific Northwest National Lab

How Do You Optimize Your Parameters? Realistically Complex Hyperparameter Optimization of 23 Parameters of a Black Box Function over a Realistically Low Budget of 100 Iterations: *Sterling Baird*[1]; Marianne Liu[2]; Taylor Sparks[1]; [1]University of Utah; [2]West High School

M-9: Loss Curvature-informed Multi-property Prediction for Materials and Chemicals via Graph Neural Networks: *Alex New*[1]; Michael Pekala[1]; Nam Le[1]; Janna Domenico[1]; Christine Piatko[1]; Christopher Stiles[1]; [1]Johns Hopkins Applied Physics Laboratory

M-10: Modeling the Phase Transition of 2-D Magnetic Materials under the Effects of External Parameters Uncertainty: *Md Mahmudul Hasan*[1]; Zekeriya Ender Eger[1]; Arulmurugan Senthilnathan[1]; Pinar Acar[1]; [1]Virginia Tech

M-11: Optimized Print Parameter Prediction by Machine Learning: *Kevin Graydon*[1]; Yongho Sohn[1]; [1]University of Central Florida

M-12: Scaling Microstructure-dependent Mechanical Properties to Bulk Material Properties Using 3D Convolutional Neural Networks: *Laura Ziegler*[1]; Carter Cocke[1]; Ashley Spear[1]; [1]University of Utah

M-13: Synthetic Data-assisted Unsupervised Domain Adaptation for Hierarchical Microstructure Reconstruction: Ali Durmaz[1]; Muhammad Karim[1]; Oleg Shchyglo[2]; *Akhil Thomas*[1]; Chris Eberl[3]; [1]Fraunhofer IWM; [2]Ruhr-Universität Bochum; [3]University of Freiburg

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MATERIALS DESIGN

Algorithm Development in Materials Science and Engineering — Poster Session

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

Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Ebrahim Asadi, University of Memphis; Enrique Martinez Saez, Clemson University; Garritt Tucker, Colorado School of Mines; Hojun Lim, Sandia National Laboratories; Vimal Ramanuj, Oak Ridge National Laboratory

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M-14: Differential Property Prediction: A Machine Learning Approach to Experimental Design in Advanced Manufacturing: Loc Truong[1]; WoongJo Choi[1]; Colby Wight[1]; *Elizabeth Coda*[1]; Tegan Emerson[1]; Keerti Kappagantula[1]; Henry Kvinge[1]; [1]PNNL

MATERIALS DESIGN

Alloy Development for Energy Technologies: ICME Gap Analysis — Poster Session

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

Program Organizers: Ram Devanathan, Pacific Northwest National Laboratory; Raymundo Arroyave, Texas A & M University; Carelyn Campbell, National Institute of Standards and Technology; James Saal, Citrine Informatics

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Session Chair: Ram Devanathan, Pacific Northwest National Lab

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M-15: Molecular Dynamics Study of Gradient Energy Coefficient and Grain-boundary Migration in Aluminum Foam: *Chaimae Jouhari*[1]; Yucheng Liu[1]; Doyl Dickel[2]; [1]South Dakota State University; [2]Mississippi State University

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BIOMATERIALS

Biological Materials Science — Poster Session

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

Program Organizers: Jing Du, Pennsylvania State University; David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Ning Zhang, Baylor University; Ling Li, Virginia Polytechnic Institute

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Session Chairs: Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama; Li Ling, Virginia Polytechnic Institute

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K-5: A Systematic, Phylogeny-based Study of the Structural, Crystallographic, and Mechanical Properties of Avian Eggshells: *Zhifei Deng*[1]; Zian Jia[1]; Emily Peterman[2]; Mary Stoddard[3]; Ling Li[1]; [1]Virginia Polytechnic Institute and State University; [2]Bowdoin College; [3]Princeton University

K-6: Bioinspired Magnetic Freeze Casting with Particles of Differing Shapes: *Maddie Schmitz*[1]; Steven Naleway[1]; [1]University of Utah

K-7: Complex Variable Method to Analyze Bio-inspired Phononic Metamaterials: *Juan C. Velasquez-Gonzalez*[1]; Juan David Navarro[1]; William Beck[1]; David Restrepo[1]; [1]The University of Texas at San Antonio

K-8: Effect of Substrate Density on Structure and Physiology of Fungal Hyphal Systems: *Elise Hotz*[1]; Steven Naleway[1]; [1]University of Utah

K-9: On the Mechanical Properties of Dual-scale Microlattice of Starfish Ossicles: A Computational Study: *Hongshun Chen*[1]; Zian Jia[1]; Zhifei Deng[1]; Ling Li[1]; [1]Virginia Tech

K-10: Revealing Toughening Mechanisms in Coconut Endocarp: *Ning Zhang*[1]; Sharmi Mazumder[2]; [1]Baylor University; [2]University of Alabama

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ADVANCED MATERIALS

Bulk Metallic Glasses XX — Poster Session

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

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

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J-78: A Study of Ideal Glass State via High Entropy Metallic Glasses: Ji Young Kim[1]; *Geun Hee Yoo*[1]; Jung Soo Lee[2]; Hye-Jung Chang[3]; Jinwoo Hwang[4]; Eun Soo Park[1]; [1]Seoul National University; [2]Seoul National University / Inha University; [3]Korea Institute of Science and Technology; [4]The Ohio State University

A Theoretical Framework for Predicting the Ultimate Strength of Metals: *Nicolas Argibay*[1]; Michael Chandross[2]; [1]DOE Ames Laboratory; [2]Sandia National Laboratories

J-79: Comprehensive Investigation of Glass Formation Behavior of Ni-based Binary Alloys Considering Thermodynamics and Kinetics: Min Kyung Kwak[1]; Heh Sang Ahn[1]; Wook Ha Ryu[1]; Eun Soo Park[1]; *Myeong Jun Lee*[1]; [1]Seoul National University

J-80: Evidence of Pre-crystallization Structures in a Zr-based Metallic Glass: Amlan Das[1]; Ruitao Zhao[2]; Eric Dufresne[3]; Yonghao Sun[2]; *Robert Maass*[4]; [1]Cornell High Energy Synchrotron Source; [2]Institute of Physics, Chinese Academy of Sciences; [3]Advanced Photon Source, Argonne National Laboratory; [4]Federal

Institute of Materials Research and Testing (BAM), University of Illinois at Urbana-Champaign

J-81: Investigation of Isothermal Crystallization Behavior of Zr-Cu-Ni-Al Metallic Glass with Enhanced Icosahedral Ordering via Flash DSC: *Myeong Jun Lee*[1]; Geun Hee Yoo[1]; Eon Su Kim[1]; Wook Ha Ryu[1]; Eun Soo Park[1]; [1]Seoul National University

J-83: Microstructure and Wear Properties of Novel Fe Metamorphic Alloy Manufactured by Thermal Spray Process: *Yu-Jin Hwang*[1]; Yong-Hoon Cho[1]; Gi-Su Ham[2]; Choongyun Paul Kim[2]; Kee-Ahn Lee[1]; [1]Inha university; [2]KOLON Industries

J-84: Tailoring Structure and Properties of Bulk Metallic Glass through a Laser-process and Thermomechanical Process: *Geun Hee Yoo*[1]; Tae Gyu Park[1]; Jin Yeon Kim[1]; Eun Soo Park[1]; [1]Seoul National University

Thermodynamic Analysis and Modeling of Novel Ternary Ni-Pd-S Bulk Metallic Glass-forming System: *Maryam Rahimi Chegeni*[1]; Wenhao Ma[2]; Sascha Sebastian Riegler[1]; Magnus Rohde[2]; Amirhossein Ghavimi[1]; Hans Jürgen Seifert[2]; Isabella Gallino[1]; Ralf Busch[1]; [1]Saarland University; [2]Karlsruhe Institute of Technology

J-85: Using Machine Learning to Find Correlations of Structure Motifs with Metallic Glass States and Mechanical Properties: *Suyue Yuan*[1]; Paulo Branicio[1]; [1]University of Southern California

NUCLEAR MATERIALS

Ceramic Materials for Nuclear Energy Research and Applications — Poster Session

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

Program Organizers: Walter Luscher, Pacific Northwest National Laboratory; Xian-Ming Bai, Virginia Polytechnic Institute and State University; Lingfeng He, North Carolina State University; Sudipta Biswas, Idaho National Laboratory; Simon Middleburgh, Bangor University

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Radiation Damage in Lithium Oxide, a Surrogate for Beryllium Carbide: *David Magee*[1]; Diego Muzquiz[2]; Stephen Raiman[3]; David Holcomb[4]; [1]Lancaster University; [2]University of Michigan; [3]Texas A&M University; [4]Oak Ridge National Laboratory

O-1: Uranium Silicide Processing for Advanced Reactors: *Zach Huber*[1]; Elise Conte[1]; [1]Pacific Northwest National Laboratory

CHARACTERIZATION

Characterization of Minerals, Metals and Materials — Poster Session

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

Program Organizers: Mingming Zhang; Zhiwei Peng, Central South University; Jian Li, CanmetMATERIALS; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Rajiv Soman, Eurofins EAG Materials

Science LLC; Jiann-Yang Hwang, Michigan Technological University; Yunus Kalay, Middle East Technical University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, DEVCOM ARL Army Research Office; Shadia Ikhmayies

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Session Chairs: Rajiv Soman, Eurofins EAG Materials Science LLC; Andrew Brown, Army Research Laboratory

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L-10: Activating Components in Activated Alkali Paste of Metakaolin and Ceramic Waste: André Marques Junior[1]; Lucas Cruz[1]; Luis Tambara Júnior[1]; Markssuel Marvila[1]; Carlos Mauricio Vieira[1]; Sergio Monteiro[2]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]IME

L-11: An Innovative Instrument Determines Chemistry at the Scale of 3D Printing: *Jonathan Putman*[1]; Ellen Williams[1]; Peyton Willis[1]; [1]Exum Instruments

Analysis of Bioextracts from Fruits the Brazilian Amazon: *Luana Demosthenes*[1]; Sergio Neves Monteiro[1]; [1]Military Engineering Institute

L-12: Analysis of the Performance of Cementitious Mortars Reinforced with Pineapple Crown Leaf Fiber and Coconut Fiber: Iully Pereira[1]; José Alexandre Linhares Junior[1]; Isabela Batista[1]; Karine Tavares[1]; Mariana Pereira[1]; Sergio Monteiro[1]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense

L-13: Analysis of the Properties in the Fresh State of Alkali Activated Paste of Metakaolin and Flue Gas Desulfurization Waste: Davi Vaz Junior[1]; Leandro Oliveira[1]; Luis Tambara Júnior[1]; Markssuel Marvila[2]; Carlos Mauricio Vieira[1]; Sergio Monteiro[3]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFV; [3]IME

L-14: Analysis of the Properties in the Hardened State of an Alkali Activated Paste of Metakaolin and Flue Gas Desulfurization (FGD) Residue: Leandro Oliveira[1]; Markssuel Marvila[2]; Davi Andre Junior[1]; Luís Tambara Júnior[1]; Carlos Muricio Vieira[1]; Sergio Monteiro[3]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFV; [3]IME

L-15: Characterization and Mechanical Behavior of Pineapple Fiber Reinforced Geopolymer Composites: Jose Alexandre Linhares[1]; Carlos Maurício Vieira[1]; Iully Pereira[1]; *Afonso Azevedo*[1]; Sergio Monteiro[2]; Luís Tambara[1]; Markssuel Marvila[3]; [1]Universidade Estadual do Norte Fluminense; [2]Instituto Militar de Engenharia; [3]Universidade Federal de Viçosa - CRP

L-16: Characterization and Thermal Behaviour of Different Type of Glassy Wastes: *Carlos Fontes Vieira*[1]; Victor Bicalho Gava[1]; Geovana Girondi Delaqua[1]; Rubén Sánchez[1]; Djalma Souza[1]; Juraci Aparecido Sampaio[1]; Agda Eunice de Souza[2]; Douglas Henrique Sales[2]; Silvio Rainho Teixeira[1]; [1]State University of the North Fluminense; [2]Universidade Estadual Paulista

L-17: Characterization of Açaí Fibers (Euterpe Oleracea Mart.) for Application in Cement Composites: Tulane Silva[1]; Paulo Matos[2]; Luis Tambara Júnior[1]; Markssuel Marvila[3]; Sergio Monteiro[1]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFSM; [3]UFV

L-18: Characterization of Aged and Recycled Metal Powder Feedstocks by LALI-TOF-MS: *Madeline Martelles*[1]; Jonathan Putman[2]; Peyton Willis[2]; [1]University of Tulsa; [2]Exum Instruments

L-19: Characterization of Artificial Stone with Quartizitic Sand and with the

Incorporation of Steel Residue: Tatiane Silva[1]; Maria Luiza Gomes[1]; Elaine Carvalho[1]; Gabriela Barreto[1]; Sérgio Monteiro[2]; *Carlos Maurício Vieira*[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia

Characterization of Flotation and Leaching in Cyanide and Thiourea Medium of a Gold, Silver and Copper Ore: Martín Reyes Pérez[1]; Iván Alejandro Reyes Domínguez[2]; Mizraim Uriel Flores Guerrero[3]; Elia Guadalupe Palacios Beas[4]; Julio Cesar Juárez Tapia[1]; Miguel Pérez Labra[1]; Francisco Raúl Barrientos Hernández[1]; Aislinn Michelle Teja Ruiz[1]; *Ian Medina Estrada*[1]; [1]Autonomous University of the State of Hidalgo; [2]Autonomous University of San Luis Potosí; [3]Technological University of Tulancingo; [4]National Polytechnic Institute

L-20: Characterization of Glass Polishing Sludge Waste to Produce Clayey Rustic Floor Tiles: *Carlos Fontes Vieira*[1]; Henry Colorado Lopera[2]; Afonso Rangel Garcez de Azevedo[1]; Geovana Girondi Delaqua[1]; Sergio Neves Monteiro[1]; [1]State University of the North Fluminense; [2]University of antioquia

Characterization of the Dissolution of Gold and Silver Contained in a High-grade Mineral Concentrate using Thiourea: Martín Reyes Pérez[1]; *Arleth Martínez Escamilla*[1]; David Ponce Vergara[1]; Iván Alejandro Reyes Domínguez[1]; Mizraim Uriel Flores Guerrero[2]; Elia Guadalupe Palacios Beas[3]; Julio Cesar Juárez Tapia[1]; Miguel Pérez Labra[1]; Francisco Raúl Barrientos Hernández[1]; [1]Autonomous University of the State of Hidalgo; [2]Technological University of Tulancingo; [3]National Polytechnic Institute

Chemical Characterization of Filin-kokuwa Gold Deposit in North-east Nigeria: *Markus Bwala*[1]; Furqan Abdulfattah[1]; Oladunni Alabi[2]; Suleiman Hassan[1]; [1]Nigerian Institute of Mining and Geosciences (NIMG), Jos.; [2]Federal University of Technology, Akure

Comparative Study of the Mechanical Behavior of Pressed and Burned Ceramic Block Prisms with and without Grouting: *Niander Cerqueira*[1]; Afonso Azevedo[2]; Victor Souza[3]; Jonas Alexandre[2]; Gustavo Xavier[2]; [1]Centro Universitário Redentor; [2]UENF; [3]Marinha do Brazil

Construction Waste in Replacement of Aggregate in Concrete Production: *Niander Cerqueira*[1]; Victor Souza[1]; Afonso Azevedo[2]; [1]Centro Universitário Redentor; [2]UENF

L-22: Creep Behavior at 600 °C of 5Cr-0.5Mo Steel: Maribel Saucedo-Muñoz[1]; Shin-Ichi Komazaki[2]; *Victor Lopez-Hirata*[1]; [1]Instituto Politecnico Nacional-ESIQIE; [2]Kagoshima University

L-23: DMA Analysis of a Novel Epoxy Matrix Reinforced with Cyperus malaccensis: *Lucas Neuba*[1]; Thuane Teixeira[1]; Matheus Ribeiro[1]; Raí[1]; Andressa[1]; Artur Camposo[1]; Sergio Neves[1]; [1]Instituto Militar de Engenharia

L-24: Durability of Alkali Activated Tiles Produced with Residual Gray from the Ceramic Industry: Ariana Cruz[1]; Luis Tambara Júnior[1]; Markssuel Marvila[2]; Carlos Mauricio Vieira[1]; André Marques Junior[1]; Sergio Monteiro[3]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFV; [3]IME

L-25: Eco-friendly Mortar with Partial Replacement of the Fine Aggregate by Polyethylene Terephthalate (PET): Isabela Batista[1]; Karine Tavares[1]; Mariana Pereira[1]; Iully Pereira[1]; Jonas Alexandre[1]; Sergio Monteiro[2]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]IME

Effect of Fly Ash as Additive or Substitute for Portland Cement on the Initial Absorption of Concrete Blocks (Vibro–compacted): *Hugo Garcia Ortiz*[1]; Edgar Martinez Rojo[1]; Julio Juárez Tapia[1]; Martín Reyes Pérez[1]; Aislinn Teja Ruiz[1];

[1]Universidad Autonoma del Estado de Hidalgo

L-26: Evaluation of Coating Mortars with the Addition of Natural and Treated Açaí Seed (Euterpe Oleracea Mart): Gabriel Monteiro[1]; Markssuel Marvila[1]; Roman Fediuk[2]; Sergio Monteiro[3]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]Far Eastern Federal University; [3]IME

Evaluation of Different Treatment Methods of Natural Açaí Fibers (Euterpe Oleracea Mart.) for Cement Composites: Diego Rocha[1]; Markssuel Marvila[2]; Daiane Cecchin[3]; *Maria Carollina Silva*[1]; Afonso Azevedo[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFV; [3]UFF

L-27: Evaluation of Fique Fabric Compatibility with Non-newtonian Liquid: Sergio Monteiro[1]; Michelle Oliveira[1]; André Figueiredo[1]; Murilo Narciso[1]; Arthur Trentin[1]; Marco Campanha[1]; Francisco Nazário[1]; Levy Ribeiro[1]; Ivo Lin[1]; *Andressa Teixeira*[1]; [1]Military Institute of Engineering

L-28: Evaluation of the Degradation Effects of Durability Cycles in Geopolymer Mixtures with Glass Waste Incorporation: Lucas Cruz[1]; Ariana Cruz[1]; Markssuel Marvila[2]; Luis Tambara Júnior[1]; Sergio Monteiro[3]; Carlos Mauricio Vieira[1]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFV; [3]IME

L-29: Evaluation of the Durability of Adobe Bricks Made with Cattle Manure: Marina Brito[1]; Samuel Dutra Jr.[1]; *Afonso Azevedo*[2]; Markssuel Marvila[1]; [1]Universidade Federal de Viçosa - CRP; [2]Universidade Estadual do Norte Fluminense

L-30: Evaluation of the Impact of the Incorporation of Pineapple Crown Particles on the Compressive Properties of Composites: Jose Alexandre Linhares[1]; David Velasco[1]; *Afonso Azevedo*[1]; Felipe Lopes[1]; Sergio Monteiro[1]; Carlos Maurício Vieira[1]; Markssuel Marvila[2]; [1]Universidade Estadual do Norte Fluminense; [2]Universidade Federal de Viçosa - CRP

Fabrication and Structural Analysis of $BaTiO_3$ Based Solid Solutions Codoped with La^{3+} and Bi^{3+}: *María Inés Valenzuela Carrillo*[1]; Miguel Pérez Labra[1]; Ricardo Martínez López[1]; José Antonio Romero Serrano[2]; Francisco Raúl Barrientos Hernández[1]; Martin Reyes Pérez[1]; Julio Cesar Juárez Tapia[1]; Aurelio Hernández Ramírez[2]; Gustavo Urbano Reyes[1]; [1]Autonomous University of Hidalgo State; [2]National Polytechnic Institute of Mexico

L-31: Fundamental Study on Wettability of Pure Metal for Water –Theoretical Approach –: *Jun-Ichi Saito*[1]; Yohei Kobayashi[2]; Hideo Sibutani[3]; [1]Japan Atomic Energy Agency; [2]National Institute of Technology, Maizuru College; [3]Kurume Institute of Technology

L-32: Fundamental Study on Wettability of Pure Metal for Water - Experimental Approach -: *Jun-Ichi Saito*[1]; Yohei Kobayashi[2]; [1]Japan Atomic Energy Agency; [2]National Institute of Technology, Maizuru College

Impact Resistance of Aluminum Foam Against High-energy Ammunition: *Fabio Garcia Filho*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

L-33: Influence of the Time of Staining Agents on Ornamental Rocks: Bianca Maciel[1]; Evanizis Frizzera[1]; Thuany Lima[2]; Niander Cerqueira[2]; Marcelo Barreto[3]; Sergio Monteiro[2]; Carlos Mauricio Vieira[2]; *Afonso Azevedo*[2]; [1]IFES; [2]Universidade Estadual do Norte Fluminense; [3]IFF

Interlocking Concrete Block Paving with Added Green Sand Waste: *Niander Cerqueira*[1]; Afonso Azevedo[2]; Victor Souza[3]; [1]Centro Universitário Redentor; [2]UENF; [3]Marinha do Brazil

L-34: Izod Impact Characterization of Engineered Artificial Stone Reinforced

by Arapaima Gigas Fish Scales: Elaine Costa[1]; Rafael Miranda[1]; Noan Simonassi[1]; Maria Luiza Gomes[1]; Henry Colorado[1]; Sérgio Neves Monteiro[1]; *Carlos Maurício Vieira*[1]; [1]Universidade Estadual do Norte Fluminense

L-35: Magnetic and Structural Properties of Cu1-xCoxFe2O4 Nanoparticles Prepared by a Modified Solgel Method: *Imaddin Al-Omari*[1]; Smitha Bhaskaran[2]; Veena Gopalan E.[2]; [1]Sultan Qaboos University; [2]Vimala College

L-36: Mechanical and Rheological Characterization of Cement Pastes with Marble Dust Waste: Karine Tavares[1]; Isabela Batista[1]; Mariana Pereira[1]; Iully Pereira[1]; Gustavo Xavier[1]; Sergio Monteiro[2]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]IME

L-37: Mechanical Behavior of Geopolymer Matrix Composites with the Addition of Steel Fibers: Jose Alexandre Linhares[1]; Samuel Azevedo[1]; *Afonso Azevedo*[1]; Carlos Maurício Vieira[1]; Sergio Monteiro[2]; Luís Tambara[1]; Markssuel Marvila[3]; [1]Universidade Estadual do Norte Fluminense; [2]Instituto Militar de Engenharia; [3]Universidade Federal de Viçosa - CRP

L-38: Mechanical Properties of Silica Fume-based Mortars Alkaline Activated by NaOH: Pedro Henrique Caldas[1]; *Afonso Azevedo*[2]; Markssuel Marvila[1]; [1]Universidade Federal de Viçosa - CRP; [2]Universidade Estadual do Norte Fluminense

Microstructural Evolution of the CoCrFeNiMo0.2 High Entropy Alloy under Different Annealing Conditions: *Fabio Garcia Filho*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

L-39: Microstructure Analysis of Trip Fe-1.39Si-2.57Mn-0.17C Steel: *Victor Lopez-Hirata*[1]; Maribel Saucedo-Muñoz[1]; Brena Sandoval-Reyes[1]; Jose Villegas-Cardenas[1]; Felipe Hernandez-Santiago[1]; Hector Javier Dorantes-Rosales[1]; [1]Instituto Politecnico Nacional-ESIQIE

L-40: Performance Evaluation of Pineapple Crown Fibers (Ananas Comosus) in Cementitious Composites: Samuel Malafaia[1]; Tulane Rodrigues[1]; Luis Tambara Junior[1]; José Alexandre Linhares Junior[1]; Iully[1]; Sergio Monteiro[2]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]IME

Performance of Amazonian Titica Vine Fibers in Pull-out tests: *Juliana Cunha*[1]; Lucio Nascimento[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering

L-41: Physicochemical and Environmental Features of Rice Husk Ash from Brazil to Use in Cement Materials: Anderson Muller[1]; Lisandro Simão[1]; Eduarda Fraga Olivo[1]; Afonso Azevedo[2]; Markssuel Marvila[3]; *Carlos Mauricio Vieira*[2]; Fabiano Raupp-Pereira[1]; [1]UNESC; [2]Universidade Estadual do Norte Fluminense; [3]UFV

Production of Natural Fiber Composites by Additive Manufacturing: *Jullie Anne Sampaio*[1]; [1]Instituto Militar de Engenharia

L-42: Production of Sustainable Artificial Stone from Granite Waste and Steel Waste and Polyurethane from Castor Oil: Maria Luiza Gomes[1]; José Lucas Lirio[1]; *Carlos Maurício Vieira*[1]; Sérgio Monteiro[2]; Elaine Carvalho[1]; Gabriela Barreto[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia

Quality Assessment of Concrete Blocks for Structural Masonry Produced in the North and Northwest Region of The State of Rio De Janeiro: *Niander Cerqueira*[1]; Victor Souza[2]; Afonso Azevedo[3]; Jonas Alexandre[3]; Gustavo Xavier[3]; [1]Centro Universitário Redentor; [2]Marinha do Brasil; [3]UENF

L-43: Shine Behavior of Ornamental Rock Plates with the Reduction of Water Consumption in Polishing: Larissa Santos[1]; Evanizis Frizzera[1]; Thuany Lima[2]; Carlos

Mauricio Vieira[2]; Sergio Monteiro[3]; Niander Cerqueira[2]; Marcelo Barreto[4]; *Afonso Azevedo*[2]; [1]IFES; [2]Universidade Estadual do Norte Fluminense; [3]IME; [4]IFF

Structural Characterization of Europium-doped BaTiO3 Obtained by Solid-state Reaction Synthesis: *J. P. Hernández-Lara*[1]; A. Hernández-Ramírez[1]; J. A. Romero-Serrano[1]; M. Pérez-Labra[2]; F. R. Barrientos-Hernández[2]; R. Martinez-Lopez[2]; M. I. Valenzuela-Carrillo[2]; [1]ESIQIE-IPN; [2]Autonomous University of the State of Hidalgo

L-44: Study of Cement-based Mortars Reinforced with Guaruman Fibers in the Fresh State: Thuany Lima[1]; Leandro Oliveira[1]; Verônica Candido[2]; Alisson Rios[2]; Markssuel Marvila[3]; Sergio Monteiro[4]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense; [2]UFPA; [3]UFV; [4]IME

L-45: Study of Mortar with Incorporation of Different Proportions of Coconut Fiber with and without Previous Treatment: Mariana Pereira[1]; Isabela Batista[1]; Iully Pereira[1]; Karine Tavares[1]; Sergio Monteiro[1]; Luis Tambara Júnior[1]; *Afonso Azevedo*[1]; [1]Universidade Estadual do Norte Fluminense

L-46: Study of the Properties of Geopolymeric Mortars with the Addition of Natural Pineapple Fibers in the Fresh State: Jose Alexandre Linhares[1]; Iully Pereira[1]; *Afonso Azevedo*[1]; Sergio Monteiro[2]; Luís Tambara[1]; Carlos Maurício Vieira[1]; Markssuel Marvila[3]; [1]Universidade Estadual do Norte Fluminense; [2]Instituto Militar de Engenharia; [3]Universidade Federal de Viçosa - CRP

Synthesis and Characterization of SnO2 Nanoparticles Obtained by Sol-gel Method: *Mizraim Flores*[1]; Atxayacalt Flores[1]; Frida Yañez[1]; Irais Cardenas[1]; Ivan Reyes[1]; Laura García[1]; Pedro Ramírez[1]; Rubén Olcay[2]; [1]Universidad Tecnológica de Tulancingo; [2]Universidad Arturo Prat

Synthesis and Structural Characterization of Eu2TiO5 Using Atomic Substitution with Eu+3 in BaTiO3: *Ricardo Martinez Lopez*[1]; Miguel Pérez Labra[1]; Francisco Raúl Barrientos Hernández[1]; José A. Romero Serrano[2]; Aurelio Hernández Ramírez[2]; María Inés Valenzuela Carrillo[1]; Martín Reyes Pérez[1]; Julio Cesar Juárez Tapia[1]; Victor Esteban Reyes Cruz[1]; [1]Universidad Autonoma del Estado de Hidalgo; [2]Metallurgy and Materials Department, ESIQIE-IPN. UPALM, Zacatenco

The Comparison of Mechanical Properties on Ni-Base Superalloy Casting Alloys For A-USC Power Generation Application: *Jaihyun Park*[1]; [1]Research Institute of Industrial Science and Technology

Thermal Characterization of Epoxy Matrix Composites Reinforced with Babassu Fibers (Attalea speciosa): *Yago Chaves*[1]; Sergio Monteiro[1]; Lucio Nascimento[1]; Raí Junio[1]; Lucas Neuba[1]; Foluke De Assis[2]; Thais Gajo[1]; Wendell Bezerra[1]; Matheus Ribeiro[1]; [1]Military Engineering Institute (IME); [2]Instituto de Pesquisa da Marinha do Brasil

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MATERIALS DESIGN

Computational Discovery and Design of Materials — Poster Session

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

Program Organizers: Houlong Zhuang, Arizona State University; Duyu Chen, University of California, Santa Barbara; Ismaila Dabo, Pennsylvania State University; Yang Jiao, Arizona State University; Sara Kadkhodaei, University of Illinois Chicago; Mahesh Neupane, Army Research Laboratory; Xiaofeng Qian, Texas A&M University; Arunima Singh, Arizona State University; Natasha

Vermaak, Lehigh University

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Session Chair: Houlong Zhuang, Arizona State University

M-16: Building an ImageNet for Materials Grain Boundaries: *Huolin Xin*[1]; Jose Venegas[2]; Chengyun Zhao[1]; [1]University of California - Irvine; [2]Syracuse University

M-17: Generative Adversarial Networks and Diffusion Models in Material Discovery: *Michael Alverson*[1]; Sterling Baird[1]; Taylor Sparks[1]; [1]Department of Material Science and Engineering

M-28: Molecular Dynamics Investigation of Electrochemical Systems: *Lingxiao Mu*[1]; Ismaila Dabo[1]; Susan Sinnott[1]; [1]The Pennsylvania State University

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MATERIALS PROCESSING

Deformation-induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies — Poster Session

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

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign; Suhas Eswarappa Prameela, Massachusetts Institute of Technology; Mostafa Hassani, Cornell University

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Hybrid Rate Theory Model: Alternative Approach for Analysis of Radiation-induced Growth: *Mahdi Mohsini*[1]; Peyman Saidi[1]; Mark Daymond[1]; [1]Queen's University

Microstructure Evolution for Modulate Color of Alloy: Study about Cu-Al-Zn-Sn Alloy: *Gyeol Chan Kang*[1]; Hae Jin Park[1]; Seogyeon Namgung[1]; Ahjin Shim[1]; Hyo Soo Lee[2]; Jin Kyu Lee[3]; Taek Jib Choi[1]; Ki Buem Kim[1]; [1]Sejong University; [2]Korea Institute of Industrial Technology; [3]Kongju National University

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MATERIALS DESIGN

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Poster Session

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

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M-18: Comparison of Defect Structures and Fatigue Behavior of Ti-6Al-4V Specimens from Two Different L-PBF Machines: *Mohammad Salman Yasin*[1]; Jia Liu[1]; Shuai Shao[1]; Nima Shamsaei[1]; [1]Auburn University

M-19: Creep and Dwell Fatigue Studies of Ti-7Al with High-Energy Diffraction Microscopy and Acoustic Emission Measurements: *Yuefeng Jin*[1]; Amlan Das[2]; Wenxi Li[1]; Katherine Shanks[2]; Ashley Bucsek[1]; [1]University of Michigan; [2]Cornell High Energy Synchrotron Source

M-20: Fatigue Behavior of 304SS using Synchrotron X-ray Tomography and Diffraction: *Ryan Schoell*[1]; Li Xi[1]; Harvey West[1]; Peter Hosemann[2]; Jun-Sang Park[3]; Peter Kenesei[4]; Jonathan Almer[4]; Zeev Shayer[5]; Djamel Kaoumi[1]; [1]North Carolina State University; [2]University of California Berkeley ; [3]Argonne National Laboratory ; [4]Argonne National Laboratory; [5]Colorado School of Mines

M-21: Fatigue Crack Initiation and Growth Behaviour Within Various Notch Geometries in the Low-cycle Fatigue Regime of FV566 In-service Steam Turbine Blade Material: Benjamin Cunningham[1]; Philippa Reed[1]; *Ara Khodavirdi*[1]; [1]University of Southampton

M-22: Fatigue Evaluation of Additively Manufactured 316L Stainless Steel: *Khandokar Abu Talha*[1]; [1]University of Southmapton

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MATERIALS PROCESSING

Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Aluminum Committee, TMS: Chemistry and Physics of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Andre Phillion, McMaster University; Michel Rappaz, Ecole Polytechnique Fédérale De Lausanne; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials Institute

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Session Chairs: Andre Phillion, McMaster University; Michel Rappaz, EPFL; Melis Serefoglu, Marmara University; Damien Tourret, IMDEA Materials

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N-11: Development of a Data Assimilation System that Integrates Phase-field Simulation and In-situ X-ray Imaging in Dendrite Growth: *Ayano Yamamura*[1]; Shinji Sakane[1]; Munekazu Ohno[2]; Hideyuki Yasuda[3]; Tomohiro Takaki[1]; [1]Kyoto Institute of Technology; [2]Hokkaido University; [3]Kyoto University

N-12: Effect of Process Transients on Fall-in Material Behavior in Vacuum Arc Remelting: *Caleb Schrad*[1]; Matthew Krane[1]; [1]Purdue University

N-13: Fundamental Study on Nanoparticles Enhance Fluidity of Aluminum Alloys:

Guan-Cheng Chen[1]; Xiaochun Li[1]; [1]University of California Los Angeles

Graphite Microstructures within Solidified Hypereutectic Iron and Nickel Alloys: *Steven Herrera*[1]; [1]University of California, Riverside

N-14: Modelling Three-dimensional Microstructure Solidification Incorporating Interdependent Structural Mechanisms: Peter Soar[1]; *Andrew Kao*[1]; Georgi Djambazov[1]; Koulis Pericleous[1]; [1]University of Greenwich

N-15: Peering into Peritectic Microstructures in Three Dimensions: *Shanmukha Kiran Aramanda*[1]; Geordie Lindemann[1]; Ashwin Shahani[1]; [1]University of Michigan

N-16: Physics-embedded Graph Network for Accelerating Phase-field Simulation of Microstructure Evolution in Additive Manufacturing: *Zhengtao Gan*[1]; [1]Northwestern University

Regular Fluctuation Cooling as an Alternative Crystal Growth Route to Control the Microstructure during Peritectic Solidification: *Babak Alinejad*[1]; Amir Mostafaei[1]; Haruhiko Udono[2]; [1]Illinois Institute of Technology; [2]Ibaraki University

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CHARACTERIZATION

Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties — Poster Session

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

Program Organizers: Yuntian Zhu, City University of Hong Kong; Kei Ameyama, Ritsumeikan University; Irene Beyerlein, University of California, Santa Barbara; Yuri Estrin, Monash University; Huajian Gao, Nanyang Technological University; Ke Lu, Institute of Metal Research; Suveen Mathaudhu, Colorado School of Mines; Xiaolei Wu, State Institute of Mechanics, Chinese Academy of Sciences

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L-47-Invited Poster: Chemically-induced Gradient Nanostructures: *Brad Boyce*[1]; Alejandro Barrios[1]; James Nathaniel[1]; Joseph Monti[1]; Khalid Hattar[1]; Douglas Medlin[1]; Remi Dingreville[1]; [1]Sandia National Laboratories

L-48: Mechanical Properties and Microstructural Evolution of High-pressure Torsion-processed Al7068 Alloy: *Juhee Oh*[1]; Sujung Son[2]; Hyoung Seop Kim[2]; Jae Bok Seol[1]; Hyokyung Sung[1]; Jung Gi Kim[1]; [1]Gyeongsang National University; [2]Pohang University of Science and Technology(POSTECH)

L-49: Microstructures and Nanomechanical Behavior of Laser Processed Sr-modified Al-Si Eutectic: *Arkajit Ghosh*[1]; Bibhu Sahu[1]; Jian Wang[2]; Amit Misra[1]; [1]University of Michigan; [2]University of Nebraska-Lincoln

L-50: Towards a Novel Approach for Integrating Tungsten and Reduced Activation Ferritic Martensitic Steel for Fusion Reactors: Ishtiaque Robin[1]; *Tim Graening*[2]; Ying Yang[2]; Yutai Katoh[2]; Steven Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

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ADVANCED MATERIALS

High Performance Steels — Poster Session

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Ana Luiza Araujo, CBMM North America Inc.; C. Tasan, Massachusetts Institute of Technology; Richard Fonda, Naval Research Laboratory; Amit Behera, QuesTek Innovations LLC; Benjamin Adam, Oregon State University; Krista Limmer, DEVCOM Army Research Laboratory; Kester Clarke, Colorado School of Mines

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Bridging the Precipitation Behaviour and Mechanical Properties of Cu-Ti Modified Quenched and Tempered Steel: *Kapil Sharma*[1]; Anagh Dutta[2]; Sudipta Patra[3]; Anish Karmakar[1]; [1]Indian Institute of Technology Roorkee; [2]National Institute of Technology, Tiruchirappalli; [3]Indian Institute of Technology (BHU)

Contradicting Role of Martensitic Transformation on Ductility and Toughness in a Medium Mn Steel: C. Hu[1]; C.P. Huang[1]; Y.X. Liu[1]; K. Y. Zhu[2]; A. Perlade[2]; *MingXin Huang*[1]; [1]The University of Hong Kong; Shenzhen Institute of Research and Innovation; [2]ArcelorMittal Research, Voie Romaine-BP30320

J-86: Dissimilar Metal Friction Weld Development for Enhanced Capability for Power Generation Components: *Voramon Dheeradhada*[1]; Sharon Huang[1]; Steve Buresh[1]; Marissa Brennan[1]; Patrick Brennan[1]; Genghis Khan[1]; Akbar Bagri[1]; Alireza Namazifard[1]; Martin Morra[1]; Tim Stotler[2]; [1]GE Research; [2]EWI

J-87: Effect of Si on the Liquid Metal Embrittlement Susceptibility of Advanced High Strength Steels: *Fateme Abdiyan*[1]; Joseph McDermid[1]; Hatem Zurob[1]; [1]McMaster University

J-88: Effects of Cr on Corrosion Behaviors of Hadfield Steel in a Neutral Aqueous Environment: *Sung Jin Kim*[1]; Duck Bin Yun[1]; Jin Sung Park[1]; [1]Sunchon National University

J-89: Enhancing Tensile Property and Hydrogen Embrittlement Resistance of a Medium Mn Steel by Warm Rolling: *Yuxuan Liu*[1]; [1]The University of Hong Kong

J-90: High-speed Deformation Behavior of a Heterogeneous-nano Structured Austenitic Stainless Steel: *Chihiro Watanabe*[1]; Ayumu Terada[1]; Norimitsu Koga[1]; Tomotsugu Shimokawa[1]; Masakazu Kobayashi[2]; Hiromi Miura[2]; [1]Kanazawa University; [2]Toyohashi University of Technology

J-91: Low-temperature Impact Properties of X70 Line Pipe Steel Depending on Location and Orientation: *Seoyoon Gong*[1]; Jeongho Han[2]; Se-Eun Shin[1]; Jihan Gwak[1]; [1]Sunchon National University; [2]Hanyang University

J-92: Microstructural Characterization of EUROFER97/3-type Steels Before Neutron Irradiation: *Michael Thomas Duerrschnabel*[1]; Ute Jäntsch[1]; Michael Rieth[1]; [1]Karlsruhe Institute of Technology

Microstructural Evolution and Mechanical Properties of Zinc Coated Press Hardened Steels with Increased Carbon Content: *Sara Kheiri*[1]; Joseph McDermid[1]; Mike Bruhis[1]; [1]McMaster University

Microstructure and Mechanical Properties of Rolled Homogenized Armor Steel during Linear Friction Welding Under Different Loads: *Kanwal Chadha*[1]; Clodualdo

Aranas Jr[1]; John Spray[1]; [1]University of New Brunswick

SPECIAL TOPICS

Late News Poster Session — Advanced Materials

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J-99: Can the Effective Bond Energy Formalism (EBEF) Improve the CALPHAD Database for Co-based Superalloys?: *Julio Cesar Pereira Dos Santos*[1]; Chuan Liu[2]; Sean Griesemer[2]; Peisheng Wang[3]; Ursula Kattner[4]; Carelyn Campbell[4]; [1]NIST / Northwestern University; [2]Northwestern University; [3]Central South University; [4]NIST

Enhanced High-temperature Elongation of Ni-based Superalloys by Reducing Co and Increasing Mo: *Saurabh Tiwari*[1]; Jae Hoon An[1]; Muhammad Ishtiaq[1]; Hyoju Bae[1]; Jae Bok Seol[1]; [1]Gyeongsang National University

J-100: In-situ Formation of Transition Metal-Aluminates as an Interfacial Modifier in YSZ based Cermets: *Amanda Marotta*[1]; David Driscoll[1]; Stephen Sofie[1]; [1]Montana State University

J-101: Mechanical Behaviour of Forged Al5Co15Cr30Fe25Ni25 High Entropy Alloy: *Pablo Perez*[1]; Gerardo Garcés[1]; María Fernanda Vega[2]; Judit Medina[1]; Paloma Adeva[1]; [1]CENIM-CSIC; [2]INCAR-CSIC

Mechanical Strengthening of a Soft-magnetic High-entropy Alloy via Widmanstätten Microstructure: *Liuliu Han*[1]; [1]Max Planck Institute for Iron Research

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SPECIAL TOPICS

Late News Poster Session — Biomaterials

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Bioinspired Microstructured Adhesives for Biomedical Applications: *Gabriela Moreira Lana*[1]; Katharina Sorg[1]; Gentiana Wenzel[2]; Xuan Zhang[1]; Eduard Arzt[1]; [1]INM – Leibniz Institute for New Materials; [2]Saarland University Medical Center – Homburg

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SPECIAL TOPICS

Late News Poster Session — Characterization

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L-60: An Evaluation of Advanced EBSD Methods for Phase Detection in Martensitic Steels: *Patrick Callahan*[1]; David Rowenhorst[1]; Richard Fonda[1]; [1]US Naval Research

Laboratory

L-61: Analysis of Alkali Element Distributions Using Atom Probe Tomography: *Daniel Schreiber*[1]; Kayla Yano[1]; [1]Pacific Northwest National Laboratory

L-62: Characterization of Precipitate Size Distribution in Friction-stir Processed Al-7085 Using Small-angle X-ray Scattering and Correlative Microscopy Techniques: *Rakesh Kamath*[1]; Jonova Thomas[1]; Hrishikesh Das[2]; Tanvi Ajantiwalay[2]; Julian Escobar[2]; Jia Liu[2]; Jan Ilavsky[1]; Piyush Upadhyay[2]; Mert Efe[2]; Arun Devaraj[2]; Dileep Singh[1]; [1]Argonne National Laboratory; [2]Pacific Northwest National Laboratory

L-66: Characterizing Mechanical Properties Using Physics-Informed Neural Networks and Multi-Fidelity Deep Learning: *Ming Dao*[1]; [1]Massachusetts Institute of Technology

L-63: Crack Propagation Behavior of Fex(CoCrMnNi)100-x Multi-component Alloys: Hyunwoo Seo[1]; Hoodahm Lee[1]; Yubeen Hong[1]; Junggeun Park[1]; *Hyokyung Sung*[1]; [1]Kookmin University

Differential Scanning Calorimetry as a Fingerprinting Technique to Detect Historical Uranium Enrichment in PCTFE: *Nouf Almousa*[1]; Rachel Connick[2]; Kevin Woller[2]; R. Scott Kemp[2]; Michael Short[2]; [1]Princess Nourah University; [2]MIT

L-64: In Situ Observation Study of MgO–C Dissolution Behavior in CaO–SiO2–Al2O3 Slag at High Temperature: *Yongsug Chung*[1]; Seungwook Lee[1]; [1]Tech University of Korea

L-65: Microstructural Characterization of Malachite Green Particles in Treated Wood: *Mohamad Zbib*[1]; Temitope Aminu[2]; David Bahr[1]; [1]Purdue University; [2]Intel Corporation

Nano-scale Structural Evolution and Mechanical Characteristics of Equiatomic AlCoCrNi High-entropy Alloy: *Elyorjon Jumaev*[1]; Orifjon Mikhliev[2]; Khasanjon Shanazarov[2]; Amir Abidov[1]; [1]Almalyk Mining and Metallurgical Combine JSC; [2]FDI «UZLITI ENGINEERING» LLC

SPECIAL TOPICS

Late News Poster Session — Materials Design

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Exhibit Hall G | SDCC

M-25: High Throughput Testing Apparatus to Enable Electrodeposition of Rhenium: *Nathan Brown*[1]; Michael McBride[1]; Courtney Clark[1]; Enkeleda Dervishi[1]; [1]Los Alamos National Lab

M-26: Hall-Petch Effect in Crystal Plasticity: Comparing the Predictive Capability of Two Modeling Approaches: *Junyan He*[1]; Anupam Neogi[1]; Deepankar Pal[1]; Ali Najafi[1]; Grama Bhashyam[1]; [1]Ansys Inc.

SPECIAL TOPICS

Late News Poster Session — Materials Processing

Tuesday PM | March 21, 2023
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A Closed-loop Recycling Process for Recovery of Critical Metals from Spent Lithium-ion Batteries through Organic Acid Leaching: *Jaeyeon Kim*[1]; Jaeheon Lee[1]; Jiajia Wu[2]; Jaiwon Byeon[3]; Yoojin Kim[3]; [1]Colorado School of Mines; [2]University of Arizona; [3]Seoul National University of Science and Technology

A Comparison of Microstructure and Mechanical Properties of TIG and MIG Welded Dissimilar AA7075 / AA6061 Aluminium Alloys Subjected to Friction Stir Processing: Rajeev Rana[1]; *Dagarapu Karunakar*[1]; Anish Karmakar[1]; [1]Indian Institute of Technology Roorkee

N-19: An S-STEM Program to Expand Career Opportunities in Engineering Materials: *Dwayne Arola*[1]; Eleftheria Roumeli[1]; Lilo Pozzo[1]; Junlan Wang[1]; [1]University of Washington

N-20: Analysis of the Phase Stability in the Directionally Solidified Ni-based Superalloy MAR-M247: *Rafal Cygan*[1]; Dorota Wyrobek[1]; Łukasz Rakoczy[2]; [1]Consolidated Precision Products Poland; [2]AGH University of Science and Technology

N-21: Dephosphorization of Iron Ore Containing Phosphorus: *Hirokazu Konishi*[1]; Shuna Kushibe[1]; Yuichiro Koizumi[1]; Osamu Ishiyama[2]; Kenichi Higuchi[2]; [1]Osaka University; [2]Nippon Steel Corporation

N-22: Development and Characterization of a Two-phase Cerium Yttrium Alloy: Effect of Heat Treatment and Composition on Microstructure in Ce-Y Alloys: *Casey Shoemaker*[1]; [1]Los Alamos National Laboratory

Effect of Multi-axial Forging on Mechanical Properties and Microstructure of AA7075/TaC Composites: John Khalkho[1]; *Dagarapu Karunakar*[1]; [1]Indian Institute of Technology Roorkee

N-23: Effects of Advanced Peening Techniques on Corrosion Behavior of Stainless Steel: Dmytro Lesyk[1]; *Hossam Hassan*[2]; Hitoshi Soyama[3]; Bohdan Mordyuk[4]; Krishnan Raja[2]; Bartosz Powalka[5]; Indrajit Charit[2]; [1]National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"; [2]University of Idaho; [3]Tohoku University; [4]G.V. Kurdyumov Institute for Metal Physics of the NAS of Ukraine; [5]West Pomeranian University of Technology

Evaluation of Microstructure and Mechanical Properties of Al-Mg-Si Alloy Deposited via Submerged Additive Friction Stir Deposition: *Ryan Kinser*[1]; Malcom Williams[1]; James Jordon[1]; Paul Allison[1]; [1]Baylor University

N-25: Machine Learning for Joint Quality Performance-A Comparative Study of the Relationship between Process Parameters and Joint Performance of Al/Steel Resistance Spot Welds: *Moses Yeboah Obiri*[1]; Alejandro Ojeda[1]; Deb Fagan[1]; [1]Pacific Northwest National Laboratories

N-26: Machine Learning to Model the Relationship between Heat Affected Zone and Weld Join Quality Performance of Aluminum-Steel Resistance Spot Welds: *Narmadha Mohankumar*[1]; Moses Obiri[1]; Deb Fagan[1]; Alejandro Ojeda[1]; Luke Durell[1]; Shoieb Chowdhury[1]; Hassan Ghassemi-Armaki[2]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory; [2]General Motors

N-27: Mechanical Properties of AA5083/Coal Composites Fabricated via Friction Stir Processing Technique: *Velaphi Msomi*[1]; Sipokazi Mabuwa[1]; Oritonda Muribwathoho[1]; [1]Cape Peninsula University of Technology

N-28: Microstructure Evaluation of the Turbine High Pressure HPT Aircraft Engine Rotor Blades with Internal Channels Reproduced by Monolithic Cores: *Dorota*

Wyrobek[1]; Rafa Cygan[1]; [1]Consolidated Precision Products Poland

N-29: Processing of LIB for Metal Recovery: *Amalie Olsen*[1]; [1]Norwegian University of Science and Technology

N-30: Synthesis and Characterization of Next-generation Multiphase Silicon Nitride-based Ceramics: *Katherine Brizzolara*[1]; Curtis Martin[2]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]Naval Surface Warfare Center, Carderock Division

The Beneficiation Process Development for the Ashram REE and Fluorine Project: *Maziar Sauber*[1]; Tony Di Feo[1]; Darren Smith[2]; [1]CanmetMINING; [2]Commerce Resources Corp.

N-31: The Effect of Sampling Direction and Mechanical Characterization of the Friction Stir Processed TIG Welded Joints: *Sipokazi Mabuwa*[1]; Velaphi Msomi[1]; [1]Cape Peninsula University of Technology

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SPECIAL TOPICS

Late News Poster Session — Nuclear Materials

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O-17: Ceramic Crucibles for Nuclear Materials Pyroprocessing: *Thomas Dalger*[1]; Ludovic Deliere[1]; Sophie Le Gallet[2]; [1]CEA; [2]ICB, Université de Bourgogne

O-18: Change of Regulatory's Cladding Model and Its Effects on Steady State Fuel Performance: Yong sik Yang[1]; *Hyun-Gil Kim*[1]; Ju Yeop Park[2]; [1]Korea Atomic Energy Research Institute; [2]Korea Institute of Nuclear Safety

O-19: Comparison of Solid-state Structures, Magnetic Susceptibilities and Electronic Properties of UTc_3 and URu_3: *Josephine Libero*[1]; Frederic Poineau[1]; Daniel Koury[1]; [1]UNLV

O-20: High Temperature in-SEM Nanoindentation of TRISO SiC Coatings: *Alexander Leide*[1]; Eric Hintsala[2]; Dong Liu[3]; [1]United Kingdom Atomic Energy Authority; [2]Bruker Corporation; [3]University of Bristol

O-21: Influence of Machining Parameters on Stress Corrosion Cracking Susceptibility of 08CH18N10T Austenitic Steel in Primary Water Environment: Marek Kudlac[1]; *Peter Brziak*[2]; Vladimir Magula[2]; Katarina Bartova[1]; Maria Domankova[1]; Alena Kosinova[1]; [1]Slovak University of Technology; [2]Welding Research Institute

O-22: Microstructural and Micromechanical Analysis of Steels After Neutron Irradiation: *Brandon Bohanon*[1]; Assel Aitkaliyeva[1]; [1]University of Florida

O-23: Oxidation Studies of UN/UB_2: *Megan Pritchard*[1]; Joel Turner[1]; Timothy Abram[1]; [1]The University of Manchester

O-24: Radiation Enhanced Diffusion Along Fast Pathways in Model Oxides: *Kayla Yano*[1]; Tiffany Kaspar[1]; Aaron Kohnert[2]; Hyosim Kim[2]; Yongqiang Wang[2]; Blas Uberuaga[2]; Daniel Schreiber[1]; [1]Pacific Northwest National Laboratory; [2]Los Alamos National Laboratory

O-25: Semi-empirical Modeling of Irradiation Induced Dimensional Change of Nuclear Graphites: *Steven Johns*[1]; William Windes[1]; Anne Campbell[2]; [1]Idaho

National Lab; [2]Oakridge National Lab

O-26: Study of of Thermal Oxidation to Helium Implantation in 316L Stainless Steel: *Minsung Hong*[1]; Angelica Lopez[2]; Mehdi Balooch[1]; Yujun Xie[1]; Ho Lun Chan[3]; Elena Romanovskia[3]; John R. Scully[3]; Djamel Kauomi[2]; Peter Hosemann[1]; [1]UC Berkeley; [2]North Carolina State University; [3]University of Virginia

O-27: Synchrotron XRD Hydride Phase Mapping In Zicracloy-2 Cladding: Aaron Colldeweih[1]; *Malgorzata Makowska*[1]; Johannes Bertsch[1]; [1]PSI

O-28: The Response of Silicon Carbide Composites to He Ion Implantation and Ramifications for Use as a Fusion Reactor Structural Material: Max Rigby-Bell[1]; *Alex Leide*[1]; Slava Kuksenko[1]; Chris Smith[1]; Gyula Zilahi[1]; Louise Gale[2]; Tony Razzell[2]; James Wade-Zhu[1]; David Bowden[1]; [1]UKAEA; [2]Rolls-Royce plc

O-29: $U(Al_xSi_{1-x})_3$ Surface Composition and Its Interactions with Water Vapor at the Temperature Range of 300-800 K: *Shai Cohen*[1]; Maayan Matmor[1]; Genadi Rafailov[1]; Moshe Vaknin[1]; Oshrat Appel[1]; Noah Shamir[2]; Shimon Zalkind[1]; [1]Nuclear Research Centre-Negev; [2]Ben-Gurion University of the Negev

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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, University of Michigan; Raluca Scarlat, University of California, Berkeley; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory

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Session Chair: Stephen Raiman, University of Michigan

O-2: Corrosion of 316H Stainless Steel and Graphite in Static Molten FLiNaK Salt: *Sarah McQuaid*[1]; Stephen Raiman[2]; [1]Texas A&M University; [2]University of Michigan

O-3: Detection of Transition Metals in Solid and Molten Salts Using UV-Vis Spectra: *Diego Macias*[1]; Stephen Raiman[1]; Dino Sulejmanovic[2]; [1]The University of Michigan; [2]Oak Ridge National Laboratory

O-4: High-Throughput Ex-situ Quantification of Corrosion Products from Molten Salt Corrosion Experiments of High Entropy Alloys by Laser Induced Breakdown Spectroscopy (LIBS): *Bonita Goh*[1]; Isabelle Baggenstoss[1]; Adrien Couet[1]; [1]University of Wisconsin Madison

Optimization of Phase Equilibria and Thermodynamics for Actinide Chloride Systems Relevant for Molten Salt Reactors: *Juliano Schorne Pinto*[1]; Jacob Yingling[1]; Johnathon Ard[1]; Theodore Besmann[1]; [1]University of South Carolina

O-6: Purification of Lithium, Sodium, and Potassium-based Chloride Salts via Hydrochlorination with Real-time Monitoring: *Mario Alberto Gonzalez*[1]; Jarom Chamberlain[1]; Jacob Yankee[1]; Suhee Choi[1]; Matthew Newton[1]; Ethan Hamilton[1];

Michael Simpson[1]; [1]University of Utah

Reducing Graphite Interactions with Structural Corrosion Products: *Cody Falconer*[1]; Hongliang Zhang[1]; Kumar Sridharan[1]; Adrien Couet[1]; [1]University of Wisconsin Madison

O-7:The Reduction of Solid Uranium Dioxide in Calcium Salt: *Nagihan Karakaya*[1]; Jinsuo Zhang[1]; [1]Virginia Tech

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MATERIALS DESIGN

Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Yu Zhong, Worcester Polytechnic Institute; Richard Otis, Jet Propulsion Laboratory; Bi-Cheng Zhou, University of Virginia; Chelsey Hargather, New Mexico Institute of Mining and Technology; James Saal, Citrine Informatics; Carelyn Campbell, National Institute of Standards and Technology

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M-23: Electronic Origin of Phase Stability in Mg–Zn–Y Alloys with a Long-Period Stacking Order: A First-Principles Study: *Takao Tsumuraya*[1]; Hiroyoshi Momida[2]; Tamio Oguchi[2]; [1]Kumamoto University; [2]Osaka University

M-24: Revealing the Materials Genome for Advanced High-entropy Materials: *Jiaqi Lu*[1]; William Yi Wang[1]; Fengpei Zhang[1]; Pingxiang Zhang[1]; Jinshan Li[1]; [1]Northwestern Polytechnical University

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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 Consulting; Alexandra Anderson, Gopher Resource; Adrian Sabau, Oak Ridge National Laboratory

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Agglomeration Behavior of Fine Particles Using the Acoustic Wave: *Hyo-Soo Lee*[1]; Hai-Joong Lee[1]; Tae-Hoon Park[1]; [1]Kitech

N-17: Analysis of the Thermal Distribution in a Conventional Slab Reheating Furnace Through Mathematical Simulation.: *Mario Calderon Rojas*[1]; Constantin Alberto Hernandez-Bocanegra[2]; José Ángel Ramos-Banderas[1]; Gildardo Solorio-Diaz[3]; Nancy Lopez-Granados[1]; [1]Instituto Tecnologico de Morelia; [2]Catedras

CONACYT; [3]Universidad Michoacana de San Nicolás de Hidalgo

Mathematical Simulation Study on the Effect of Nozzle Side Hole Structure Parameters on the Behavior of Molten Steel in Stainless Steel Mold: *Sikun Peng*[1]; Ming-mei Zhu[1]; Kun-chi Jiang[1]; Cheng-hong Li[1]; [1]Chongqing University

N-18: Numerical Simulation of Thermal Stratification and Fluid Dynamic Behavior of Liquid Steel in an Electric Arc Furnace: *Mario Herrera-Ortega*[1]; José Ángel Ramos-Banderas[1]; Constantin Alberto Hernández-Bocanegra[2]; Alberto Beltrán-Morales[3]; Nancy Margarita López-Granados[1]; Vera Contreras-Vega[4]; [1]TecNM Campus Morelia; [2]Cátedras-CONACYT; [3]Instituto de Investigaciones en Materiales, UNAM Campus Morelia; [4]Universidad Michoacana de San Nicolás de Hidalgo

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NUCLEAR MATERIALS

Mechanical Behavior of Nuclear Reactor Materials and Components III — Poster Session

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

Program Organizers: Assel Aitkaliyeva, University of Florida; Clarissa Yablinsky, Los Alamos National Laboratory; Osman Anderoglu, University of New Mexico; Eda Aydogan, Middle East Technical University; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

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Session Chair: Osman Anderoglu, University of New Mexico

O-30: Computer Vision-assisted Oxide Thickness Determination of 304 Stainless Steel in PWR Environments: *Txai Sibley*[1]; Rachel English[1]; Bryan Webler[1]; Elizabeth Holm[1]; [1]Carnegie Mellon Unviversity

O-8: Effects of Helium Implantation on Mechanical Properties Near the Tungsten-carbide Interfaces of Dispersion Strengthened Tungsten Alloy: *Ashrakat Saefan*[1]; Xing Wang[1]; Eric Lang[2]; Jean Paul Allain[1]; [1]Pennsylvania State University; [2]University of Illinois at Urbana-Champaign

Fabrication and Characterization of Oxide Dispersion Strengthened Nickel Alloys for Advanced Molten Salt Reactor Components: *Jaeyoon Bae*[1]; Sumin Lee[1]; Juwook Lee[1]; Sanghoon Noh[1]; [1]Pukyong National University

O-9: Hyper-localized Strengthening of Inconel 617 for Very High Temperature Reactor Applications: *Noah Holtham*[1]; Keivan Davami[1]; [1]University of Alabama

O-10: Mechanical Testing and Characterization of an Integrated Welding and Thermal Processing Method on Eurofer97: *Daniel Codd*[1]; Joseph McCrink[2]; Tim Lach[3]; Xiang (Frank) Chen[3]; [1]University of San Diego/KVA Stainless; [2]KVA Stainless; [3]Oak Ridge National Laboratory

O-11: Migration of Intergranular He Gas Bubbles under a Thermal Gradient in Fe by Phase-field Modeling: *Yixi Shen*[1]; Peng Wen[1]; An Ta[1]; Simon Phillpot[1]; Douglas Spearot[1]; [1]University of Florida

Multi-scale Modeling of Defect Recombination in Collision Cascade with Molecular Dynamics and Binary Collision Monte Carlo: Md Riaz Kayser[1]; Benjamin

Beeler[2]; *Andrea Jokisaari*[1]; [1]Idaho National Laboratory; [2]North Carolina State University

O-12: Welding Repair : Behavior Study of the Heat-Affected Zone Regarding the Risk of HAC: *Alexandre Paget*[1]; Abdelali Oudriss[2]; Vincent Robin[3]; Jefri Draup[3]; Sofiane Hendili[3]; Stéphane Cohendoz[2]; Josselin Delmas[3]; Xavier Feaugas[2]; Michael C. Smith[4]; [1]EDF & The University of Manchester; [2]La Rochelle University; [3]EDF; [4]The University of Manchester

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, Korea Advanced Institute of Science and Technology; Shailendra Joshi, University of Houston; Minh-Son Pham, Imperial College London; Jagannathan Rajagopalan, Arizona State University; Robert Wheeler, Microtesting Solutions LLC; Josh Kacher, Georgia Institute of Technology

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L-51: Development and Applications of a Fiber-based Instrument for In-situ Thermal Property Measurements: *Zilong Hua*[1]; Robert Schley[1]; Colby Jensen[1]; Austin Fleming[1]; Jorgen Rufner[1]; Michael Short[2]; David Carpenter[3]; David Hurley[1]; [1]Idaho National Laboratory; [2]MIT; [3]MIT nuclear reactor laboratory

Forward Model Based Strain Analysis in Highly Deformed Metallic Systems Using EBSD Patterns: *Chenxi Yu*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

KRaStk – A Multi-scale Toolkit to Compute Fibrous Material Properties: *Adnan Taqi*[1]; Mujan Seif[1]; Matthew Beck[1]; [1]University of Kentucky

Ligament Aspect Ratio Effects on Elastic Properties of Porous Network Materials: *Naji Mashrafi*[1]; Ryan Griffith[1]; Mujan Seif[1]; Matthew Beck[1]; [1]Department of Materials Engineering

L-52: Micromechanics, Kleindiek Manipulators for Increased Flexibility: *Olof Baecke*[1]; Ren Qiu[1]; Magnus Colliander[1]; [1]Chalmers University of Technology

L-53: Modeling of the Bending Behavior to Study Nested-Cylinder Structure in Spicules: *Olivia Lowe*[1]; Michael Melly[1]; Alyssa Napora[1]; Christian Peco[1]; Fariborz Tavangarian[1]; [1]Pennsylvania State University

L-54: Tensile Deformation of Polycrystalline Pure Cobalt Studied by In-situ High Energy X-ray Diffraction: *Takumi Suzumura*[1]; Si Gao[1]; Shuhei Yoshida[1]; Nobuhiro Tsuji[1]; [1]Kyoto University

Variation in the Bulk Elasticity of Nanoporous Materials from Solid Structure Mechanical Properties: *Ryan Griffith*[1]; Naji Mashrafi[1]; Matthew Beck[1]; [1]University of

Kentucky

NUCLEAR MATERIALS

Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-cladding Interface — Poster Session

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

Program Organizers: Yi Xie, Purdue University; Miaomiao Jin, Pennsylvania State University; Jason Harp, Oak Ridge National Laboratory; Fabiola Cappia, Idaho National Laboratory; Jennifer Watkins, Idaho National Laboratory; Michael Tonks, University of Florida

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Session Chair: Yi Xie, Purdue University

O-13: An Efficient and Oxidation-preventive Method for UN Surrogate Pellets Fabrication: Logan Joyce[1]; *Yi Xie*[1]; [1]Purdue University

O-14: Calculation of Grain Boundary Diffusion Coefficients in Gamma U-Mo Using Atomistic Simulations: *ATM Jahid Hasan*[1]; Benjamin Beeler[1]; [1]North Carolina State University

O-15: Experimental Methods for Comprehensive PIE of Test Fuel Rods: *Chai Peddeti*[1]; [1]UC Berkeley

CHARACTERIZATION

Neutron and X-ray Scattering in Materials Science — Poster Session

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

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Chen Li, University of California-Riverside; Jennifer Niedziela, Oak Ridge National Lab; Hillary Smith, Swarthmore College

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Longitudinal Conical Magnetic Structure in Scandium Doped M-type Barium Hexaferrite: *Surbhi Gupta*[1]; [1]Indian Institute of Technology, Bombay

L-55: Neutron Compton Scattering of Hydrogen in Zirconium: *Brent Heuser*[1]; Timothy Prisk[2]; Alexander Kolesnikov[3]; Garrett Granroth[3]; Jun-Li Lin[1]; [1]University of Illinois; [2]NIST; [3]ORNL

L-56: Plastic Scintillators Using Nanocrystal Emitters: *Gerard Ducharme*[1]; Amanda Graff[1]; [1]Los Alamos National Lab

Quantification of Nanoscale Precipitation in Al Using SAXS and Electron Microscopy-based Automatic Particle Counting Software Techniques: *Alyssa*

Stubbers[1]; Ning Zhu[2]; Luke Brewer[2]; Anthony Naccarelli[3]; Timothy Eden[3]; John Balk[1]; [1]University of Kentucky; [2]University of Alabama; [3]Pennsylvania State University

L-57: Recent Developments at the Forming and Shaping Technology (FAST) Beamline: *Katherine Shanks*[1]; Amlan Das[1]; [1]Cornell University

L-58: Residual Stress Mapping in a Dissimilar Metal Weldment Using Neutron Diffraction: *Brent Heuser*[1]; Weicheng Zhong[2]; Jun-Li Lin[1]; Yan Chen[2]; Zhen Li[1]; Ke An[2]; Benjamin Sutton[3]; [1]University of Illinois; [2]ORNL; [3]EPRI

L-59: Thermodynamics of Elinvar Behavior: An Experimental Study with Nuclear X-ray Scattering: *Pedro Guzman*[1]; Stefan Lohaus[1]; Camille Bernal-Choban[1]; Brent Fultz[1]; [1]California Institute of Technology

Unveiling Structural Disorders and Their Correlation with Ionic Conductivity in a Potential Na-Ion Battery Material: Na2Mn3O7: *Bikash Saha*[1]; Anup Bera[2]; Seikh Yusuf[2]; [1]Bhabha Atomic Research Centre; [2]Bhabha Atomic Research Centre

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MATERIALS PROCESSING

Rare Metal Extraction & Processing — Poster Session

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

Program Organizers: Takanari Ouchi, University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Gisele Azimi, University of Toronto; Shafiq Alam, University of Saskatchewan; Neale Neelameggham, IND LLC; Hojong Kim, Pennsylvania State University; Alafara Baba, University of Ilorin; Hong (Marco) Peng, University of Queensland; Athanasios Karamalidis, Pennsylvania State University; Shijie Wang, Coeur Mining, Inc

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Session Chair: Takanari Ouchi, The University of Tokyo

The Behaviour of Minor Metals in BOF Slag Under Different Additives: *Gerald Haslinger*[1]; [1]Montanuniversity of Leoben

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ADVANCED MATERIALS

Refractory Metals 2023 — Poster Session

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

Program Organizers: Brady Butler, US Army Research Laboratory; Todd Leonhardt, Rhenium Alloys Inc.; Matthew Osborne, Global Advanced Metals; Zachary Levin, Los Alamos National Laboratory

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J105: Accelerated Design of Radiation Tolerant Alloys for Nuclear Fusion:

Matthew Lloyd[1]; Glenn Lim[1]; Mark Anderton[2]; Thomas Davis[2]; Michael Short[3]; Robert Simpson[1]; [1]Singapore University of Technology and Design; [2]Oxford Sigma Ltd.; [3]Massachusetts Institute of Technology

J-93: An Additive Manufacturing System for High-resolution Composition Grading Combining Inkjet Deposition with Laser Powder Bed Fusion: *Zach Kutschke*[1]; Ryan Penny[1]; Alexander O'Brien[1]; Emre Tekoglu[1]; Ju Li[1]; John Hart[1]; [1]MIT

J-94: Challenges in the Development of a Creep-Resistant Nb- Alloy Capable of 1300°C Service: *Govindarajan Muralidharan*[1]; Ying Yang[1]; Glenn Romanoski[1]; Roger Miller[1]; Thomas Muth[1]; George Ulrich[1]; [1]Oak Ridge National Laboratory

J-95: Fundamentals of Recrystallization in Binary Nb Alloys: *William Waliser*[1]; [1]Colorado School of Mines

J104: Investigating Heat-treatment and Strain Path Effects on the Recrystallization of High-purity Niobium: *Zackery Thune*[1]; Conor McKinney[1]; Nathan Fleming[1]; Thomas Bieler[1]; [1]Michigan State University

J-97: The Oxidation Behavior of the Eutectic Alloy Mo-20Si-52.8Ti in Dry and Wet Atmospheres: *Matthias Weber*[1]; Steven Schellert[1]; Hans-Jürgen Christ[1]; Aditya Tirunilai[2]; Alexander Kauffmann[2]; Martin Heilmaier[2]; Bronislava Gorr[3]; [1]Universität Siegen; [2]Karlsruhe Institut für Technologie (KIT IAM-WK); [3]Karlsruhe Institut für Technologie (KIT IAM-AWP)

J-98: Ultrahigh Temperature Testing Methodology for Refractory Alloys: *Michael Patullo*[1]; Arunima Banerjee[1]; Kevin Hemker[1]; [1]Johns Hopkins University

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MATERIALS DESIGN

Simulations/Experiments Integration for Next Generation Hypersonic Materials — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: High Temperature Alloys Committee, TMS: Refractory Metals & Materials Committee

Program Organizers: Thomas Voisin, Lawrence Livermore National Laboratory; Jibril Shittu, Lawerence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Joseph McKeown, Lawrence Livermore National Laboratory; Raymundo Arroyave, Texas A&M University

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Modeling Thermomechanical Buckling in Combined Extreme Environments: *Adedotun Banjo*[1]; Ali Gordon[1]; [1]University of Central Florida

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NUCLEAR MATERIALS

Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward — Poster Session

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

Program Organizers: Arunodaya Bhattacharya, Oak Ridge National Laboratory;

Steven Zinkle, University of Tennessee; Philip Edmondson, The University of Manchester; Aurelie Gentils, Université Paris-Saclay; David Sprouster, Stony Brook University; Takashi Nozawa, National Institutes for Quantum and Radiological Science and Technology (QST); Martin Freer, University of Birmingham

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Session Chair: Yan-Ru Lin, Oak Ridge National Laboratory

O-16: Microstructural Investigation of Irradiated REBCO Coated Conductors for Future HTS Fusion Magnets and Other High-dose Environments: *Christopher Reis*[1]; [1]University of California, Berkeley