AIME–TMS 150th CELEBRATION

TMS2021

Annual Meeting & Exhibition

SINCE 1871

TMS2021 VIRTUAL

MARCH 15-18, 2021 • #TMSAnnualMeeting

PRELIMINARY TECHNICAL PROGRAM

The content in this preliminary program was generated on February 8, 2021. However, changes are still being implemented for the technical program. Please refer to the online session sheets for the most up-to-date information. A final program will be posted online at the start of the event.

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Symposium and Session	Day	Time	Page
Bulk Metallic Glasses XVIII			
Poster Session	MON EVE	5:30 PM	140
Alloy Development and Application I	TUE AM	8:30 AM	47
Alloy Development and Application II	TUE PM	2:00 PM	68
Structures and Characterization	WED AM	8:30 AM	85
Structures and Modeling	WED PM	2:00 PM	106
Structures and Mechanical Properties	THU AM	8:30 AM	121
Alloy Design and Development	THU PM	2:00 PM	132
High Entropy Alloys IX: Alloy Development and Properties			
Alloy Development and Application I	MON AM	8:30 AM	13
Alloy Development and Application II	MON PM	2:00 PM	33
Structures and Mechanical Properties I	TUE AM	8:30 AM	53
Alloy Development and Application III	TUE PM	2:00 PM	74
Joint Session with Materials for High Temperature Applications: Next Generation Superalloys and Beyond	WED AM	8:30 AM	92
Structures and Mechanical Properties II	WED PM	2:00 PM	111
Poster Session	WED EVE	5:30 PM	152
Alloy Development and Application IV	THU AM	8:30 AM	126
Thermal and Other Properties	THU PM	2:00 PM	136
High Entropy Alloys IX: Structures and Modeling			
Structures and Modeling I	MON AM	8:30 AM	13
Structures and Modeling II	MON PM	2:00 PM	33
Structures and Modeling III	TUE AM	8:30 AM	53
Structures and Characterization I	TUE PM	2:00 PM	74
Structures and Characterization II	WED AM	8:30 AM	92
Modeling and Machine Learning	WED PM	2:00 PM	111
Structures and Characterization III	THU AM	8:30 AM	126
Structures and Characterization IV	THU PM	2:00 PM	136
Materials for High Temperature Applications: Next Generation Superalloys and Beyond			
Superalloys: Alloy Development	MON AM	8:30 AM	15
Superalloys: Mechanical Behavior	MON PM	2:00 PM	35
Superalloys: Beyond Nickel-based Superalloys	TUE AM	8:30 AM	55
Refractory Alloys: Design and Mechanical Properties	TUE PM	2:00 PM	76
Superalloys: Processing	WED AM	8:30 AM	94
Refractory Alloys: Processing and Properties of Novel Materials	WED PM	2:00 PM	113
Poster Session	WED EVE	5:30 PM	152
Superalloys and Beyond: Oxidation and Mechanical Behavior I	THU AM	8:30 AM	127
Superalloys and Beyond: Oxidation and Mechanical Behavior II	THU PM	2:00 PM	137
Electronic Materials			
Alloys and Compounds for Thermoelectric and Solar Cell Applications IX			
Session I	MON AM	8:30 AM	6
Session II	MON PM	2:00 PM	25
Poster Session	MON EVE	5:30 PM	140
Session III	TUE AM	8:30 AM	46
Session IV	TUE PM	2:00 PM	67
Electronic Packaging and Interconnections 2021			
Pb-free Solder Alloys I	MON AM	8:30 AM	11
3D Microelectronic Packaging and Emerging Interconnects	MON PM	2:00 PM	31
Solder Joint Intermetallics	TUE AM	8:30 AM	50
Pb-free Solder Alloys II	TUE PM	2:00 PM	71
Advanced Microelectronic Packaging Materials	WED AM	8:30 AM	89

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100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture in Complex Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniverstität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: 100 Years and Still Cracking: A Griffith Fracture Symposium: *M. Cordill*[1]; [1]Erich Schmid Institute of Materials Science

8:35 AM Invited
Designing Ductility in BCC High Entropy Alloys?: E. Mak[1]; B. Yin[1]; *W. Curtin*[1]; [1]Epfl Sti Igm Lammm

9:15 AM
2,000 Years and Still Getting Dull: Mechanisms of Blade Chipping: *G. Roscioli*[1]; S. Taheri-Mousavi[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

9:35 AM
A Length-scale Independent Phase-Field Model for Quantitative Prediction of Ductile Fracture: *W. Huber*[1]; M. Asle Zaeem[1]; [1]Colorado School of Mines

9:55 AM
Quantitative Phase-Field Modeling of Crack Propagation in Multi-Phase Material Based on Griffith's Fracture Theory: *A. Emdadi*[1]; M. Asle Zaeem[2]; [1]Missouri University of Science and Technology; [2]Colorado School of Mines

10:15 AM Invited
On the Fracture of Multi-element Metallic Alloys: *B. Gludovatz*[1]; R. Ritchie[2]; [1]UNSW Sydney; [2]Lawrence Berkeley National Laboratory

10:55 AM
On the Transition from Shear Banding to Fracture in Metals: In Situ Analysis of Plastic Flow and Deformation Fields: S. Yadav[1]; H. Chawla[1]; *D. Sagapuram*[1]; [1]Texas A&M University

11:15 AM
Probing Small-scale Fracture and Plasticity in Quasicrystals and High-entropy Alloys: *Y. Zou*[1]; [1]University of Toronto

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Aluminum

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Monday AM **March 15, 2021**

8:30 AM Invited
Mechanical Behavior of Induced Lack of Fusion Flaws in AlSi10Mg: *J. Lewandowski*[1]; B. Conner[2]; A. Ngo[1]; V. De Silva Jayasekera[3]; G. Jones[4]; K. Meinert[4]; [1]Case Western Reserve University; [2]DOE KC National Security Campus; [3]Youngstown State University; [4]Penn State University

9:00 AM
Cold Spray of Al and 6061 Al Alloy Powders: Effects of Oxide Thickness: *T. Bond*[1]; M. Vandadi[1]; A. Navabi[1]; V. Rahneshin[1]; R. Ahmed[1]; N. Rahbar[1]; V. Champagne[2]; W. Soboyejo[1]; [1]Worcester Polytechnic Institute; [2]Army Research Laboratory

9:20 AM
Critical Fracture Toughness of Al 6061 Cold Spray Deposits: *S. Julien*[1]; S. Muftu[1]; [1]Northeastern University

9:40 AM
Notch Sensitivity of AlSi10Mg Aluminum Alloy Produced by Laser Powder Bed Fusion Process: *A. Ojha*; W. Lai[1]; C. Engler-Pinto[1]; X. Su[1]; [1]Ford Motor Company

10:00 AM Invited
Interplay between Geometry, Defects, and Porosity on the Mechanical Behavior of AM Components: *G. Pataky*[1]; B. Smith[1]; C. Laursen[2]; J. Bartanus[1]; J. Carroll[2]; [1]Clemson University; [2]Sandia National Laboratories

10:30 AM
Managing Heat Buildup and Standardizing Melt Pool Dimensions in Laser Powder Bed Fusion through a "Powder Moat" Scan Strategy: E. Diewald[1]; C. Gobert[1]; *J. Beuth*[1]; [1]Carnegie Mellon University

10:50 AM
Using Post Build Porosity Analysis to Inform Future Build Strategies: *C. Varney*[1]; R. Quammen[1]; N. Telesz[1]; J. Balk[1]; A. Wessman[2]; P. Rottmann[1]; [1]University of Kentucky; [2]University of Arizona

Additive Manufacturing for Energy Applications III — Characterization of Additive Manufactured Products

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Nuclear Materials Committee
Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University

Monday AM **March 15, 2021**

8:30 AM Invited
Microstructural, Mechanical, and Corrosion Behavior of a High Entropy Alloy (HEA) Designed for Harsh Aqueous Environments: *N. Kucza*[1]; M. Morra[1]; K. Kuwabara[2]; [1]GE Global Research; [2]Global Research & Innovative Technology Center GRIT

8:50 AM
Microstructural Stability and Creep Behavior of an Additively Manufactured Al-Ce-Ni-Mn Alloy: *R. Michi*[1]; K. Sisco[2]; S. Bahl[1]; J. Poplawsky[1]; L. Allard[1]; R. Dehoff[1]; A. Plotkowski[1]; A. Shyam[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee, Knoxville

9:10 AM
Microstructure-property of a Novel 9Cr Ferritic Martensitic Steel via Additive Manufacturing Directed Energy Deposition: *W. Zhong*[1]; L. Tan[1]; K. Field[2]; N. Sridharan[3]; Y. Yang[1]; K. Terrani[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan, Ann Arbor; [3]Lincoln Electric Company

9:30 AM
The Effect of Grain Orientation on Nanoindentation Behavior of Selective Laser Melted Austenitic Stainless Steel: *S. Tekumalla*[1]; S. Raman[1]; M. Seita[1]; [1]Nanyang Technological University

9:50 AM
Quality Evaluation of As-printed Wire Arc Additively Manufactured 316L Stainless Steel Blocks: *Y. Yamamoto*[1]; L. Tan[1]; Y. Yang[1]; A. Nycz[1]; M. Noakes[1]; Y. Lee[1]; L. Meyer[1]; W. Carter[1]; T. Byun[1]; R. Dehoff[1]; K. Terrani[1]; [1]Oak Ridge National Laboratory

10:10 AM
Elevated Temperature Dip in Tensile Elongation of an Additively Manufactured Al-Cu-Ce Alloy: *S. Bahl*[1]; K. Sisco[2]; J. Poplawsky[1]; R. Michi[1]; L. Allard[1]; R. Dehoff[1]; A. Plotkowski[1]; A. Shyam[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee-Knoxville

10:30 AM
Microstructure and Properties Comparison for 316L Wire-fed Laser Metal Deposition AM Under Vacuum Conditions: *N. Brubaker*[1]; N. van Rooyen[2]; H. Ali[1]; M. Jaster[3]; I. Charit[1]; M. Maughan[1]; [1]University of Idaho; [2] University of Idaho; [3]Premier Technology

10:50 AM
Advances in Digital Light Printing for Energy Applications: *D. Guillen*[1]; P. Moo[1]; M. Shaltry[1]; R. O'Brien[1]; [1]Idaho National Laboratory

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Continuum Scale Modeling and Experiments

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Solidification Committee
Program Organizers: Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Kevin Chaput, Northrop Grumman; Mohsen Asle Zaeem, Colorado School of Mines; Wenda Tan, University of Utah; Lianyi Chen, University of Wisconsin-Madison

Monday AM **March 15, 2021**

8:30 AM
Statistical Modeling of Microstructure Signatures in Laser Powder Bed Fusion: *S. Ghosh*[1]; R. Seede[1]; J. James[1]; I. Karaman[1]; A. Elwany[1]; D. Allaire[1]; R. Arroyave[1]; [1]Texas A&M University

8:50 AM
Solidification Behavior of Martensitic Precipitation-hardenable Stainless Steels Produced via Additive Manufacturing: *E. Lass*[1]; [1]University of Tennessee, Knoxville

9:10 AM
3D Characterisation of Cracks Formed in AA2024 and Implications for Alloy Design: *G. Del Guercio*[1]; M. Simonelli[1]; N. Aboulkhair[1]; G. McCartney[1]; C. Tuck[1]; [1]University of Nottingham

9:30 AM
Quantification and Propagation of Aleatoric Uncertainty Through Numerical Simulation of Laser Powder Bed Fusion Process for IN625: *S. Wells*[1]; [1]Purdue University

9:50 AM
Quantifying Impact of Fluid Flow on Melt Pool Model Predictions Across AM Processing Regimes: *G. Knapp*[1]; M. Rolchigo[2]; T. DebRoy[1]; J. Belak[2]; A. Plotkowski[3]; [1]The Pennsylvania State University; [2]Lawrence Livermore National Laboratory; [3]Oak Ridge National Laboratory

10:10 AM
Alternative Scan Strategies for Laser Powder Bed Additive Manufacturing to Expand Process Space: *E. Chang-Davidson*[1]; N. Jones[1]; J. Beuth[1]; [1]Carnegie Mellon University

10:30 AM
Microstructure Control with Advanced Scan Strategies Developed via Fast Analytic Thermal Modeling of Additive Processes: *B. Stump*[1]; P. Fernandez[1]; M. Rolchigo[2]; A. Plotkowski[1]; J. Belak[2]; [1]ORNL; [2]LLNL

10:50 AM
Consistent Coupling between Melt Pool Heat Transfer and Grain-scale CA Calculations for Additive Manufacturing: *J. Coleman*[1]; A. Plotkowski[1]; M. Rolchigo[2]; [1]Oak Ridge National Laboratory; [2]Lawrence Livermore National Laboratory

Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments — Fundamentals

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee
Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments: *B. Poorganji*[1]; [1]University of Waterloo

8:35 AM Invited
AM Enabled Super Materials for Extreme Environments Applications: *Y. Gao*[1]; J. Porter[1]; C. Schmidt[1]; [1]Castheon Inc

9:05 AM Invited
Development of a Rapid Alloy Selection Tool for Rapid Solidification Processing Conditions: *E. White*[1]; R. Napolitano[1]; T. Prost[1]; D. Johnson[1]; S. Tatar[2]; N. Raghavan[3]; M. Kirka[3]; A. Kustas[4]; N. Argibay[4]; I. Anderson[1]; [1]Ames Laboratory; [2]Kansas City National Security Campus; [3]Oak Ridge National Laboratory; [4]Sandia National Laboratories

9:35 AM
Additive Manufacturing and Characterization of High-density Materials for Aerospace Applications: *K. Kadala*[1]; S. Smith[1]; [1]Lockheed Martin ATC

9:55 AM Invited
Computational Design and Additive Manufacturing-Enabled Fabrication of Functionally Graded Steel-to-Tungsten Joints for Fusion Energy Applications: *D. Frankel*[1]; M. Thomas[1]; P. Lu[1]; O. Eliseeva[2]; T. Kirk[2]; R. Arroyave[2]; I. Karaman[2]; [1]QuesTek Innovations LLC; [2]Texas A&M University

10:25 AM Invited
Rapid Exploration of Refractory Complex Concentrated Alloys via Additive Manufacturing and Molecular Dynamics: *A. Kustas*[1]; J. Pegues[1]; M. Melia[1]; R. Puckett[1]; S. Whetten[1]; M. Jones[1]; N. Argibay[1]; M. Chandross[1]; [1]Sandia National Laboratories

10:55 AM
Application of Taguchi, Response Surface, and Artificial Neural Networks for Rapid Optimization of Laser-based Powder-Bed Fusion Process: *E. Asadi*[1]; [1]University of Memphis

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session I

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara ; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Monday AM **March 15, 2021**

8:30 AM Invited
Mechanism of Hardening and Damage Initiation in Oxygen Embrittlement of Body-Centred-Cubic Niobium: *W. Han*[1]; [1]Xi'an Jiaotong University

9:00 AM
Evaluation Method of Ductile-to-Brittle Transition Temperature Using Nano-indentation and Molecular Dynamics Simulation: *Y. Oh*[1]; W. Ko[2]; N. Kwak[1]; T. Ohmura[3]; H. Han[1]; [1]Seoul National University; [2]University of Ulsan; [3]National Institute for Materials Science

9:20 AM
Migration kinetics of twinning disconnections in nanotwinned Cu: an in situ HRTEM deformation study: *Q. Li*[1]; J. Song[1]; G. Liu[1]; Y. Liu[1]; X. Zeng[1]; [1]Shanghai Jiao Tong University

9:40 AM
High Angular Resolution EBSD From Spherical Harmonic Transform Indexing: *G. Sparks*[1]; M. Obstalecki[2]; P. Shade[2]; M. Uchic[2]; S. Niezgoda[1]; M. Mills[1]; [1]Ohio State University; [2]Air Force Research Laboratory

10:00 AM
Kinking in MAX Phases Studied via a Combined Experimental/ Computational Approach: *G. Plummer*[1]; G. Tucker[1]; [1]Colorado School of Mines

10:20 AM
Studying Dislcoation Interactions in the Bulk Using Dark Field X-ray Microscopy: *H. Friis Poulsen*[1]; [1]DTU

10:40 AM
Interactions between Dislocations and a Low-angle Grain Boundary in a Single Crystalline CrCoNi Medium-entropy Alloy: *F. Habiyaremye*[1]; A. Antoine Guitton[1]; F. Schafer[2]; F. Scholz[3]; M. Schneider[3]; J. Frenzel[3]; G. Laplanche[3]; N. Maloufi[1]; [1]Université de Lorraine–CNRS–Arts et Métiers ParisTech–LEM3; [2]Saarland University; [3]Institut für Werkstoffe, Ruhr–Universität Bochum, Universitätsstr. 150

11:00 AM
Electron Microscopy-based Assessment of the Role of Short Range Order on Deformation Behavior of High and Medium Entropy Alloys: *D. Foley*[1]; J. Hart[1]; E. Anber[2]; R. Ritchie[3]; A. Minor[3]; M. Asta[3]; F. Walsh[4]; D. Spearot[5]; M. Taheri[1]; [1]Johns Hopkins University; [2]Drexel University; [3]University of California, Berkeley; [4]Lawrence Berkeley National Laboratory; [5]University of Florida

Advanced High Strength Steels V — Session I

Sponsored by: TMS Structural Materials Division, TMS: Steels Committee
Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; Louis Hector, General Motors Global Technical Center; Igor Vieira, Nucor Steel; Lijia Zhao, ArcelorMittal USA; Krista Limmer, CCDC Army Research Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Sebastien Allain, Institut Jean Lamour; MingXin Huang, University of Hong Kong

Monday AM **March 15, 2021**

8:30 AM
Ferrite Recrystallization Investigated by In Situ High Energy X-ray Diffraction Experiments: *C. Couchet*[1]; S. Allain[1]; J. Teixeira[1]; M. Moreno[2]; G. Geandier[1]; F. Bonnet[3]; [1]Institut Jean Lamour; [2]Transvalor S.A.; [3]ArcelorMittal

8:50 AM
Carbon Content in Carbide-free Bainite during Isothermal Transformations: I. Pushkareva[1]; B. Shalchi-Amirkhiz[1]; *S. Allain*[2]; G. Geandier[2]; F. Danoix[3]; F. Fazeli[1]; M. Sztanko[1]; C. Scott[1]; [1]CanMet Materials - Natural Resources Canada; [2]Institut Jean Lamour; [3]Groupe de Physique des Matériaux

9:10 AM
Dislocation Densities during Martensite Transformation in a Low-carbon Steel Determined by In Situ High Energy X-ray Diffraction: *J. Macchi*[1]; S. Gaudez[1]; G. Geandier[1]; J. Teixeira[1]; S. Denis[1]; F. Bonnet[2]; S. Allain[1]; [1]Institut Jean Lamour; [2]ArcelorMittal Research SA

9:30 AM
Effect of Phase Stability of Retained Austenite during Deformation in Low-alloy Multiphase Steels: *A. Lavakumar*[1]; M. PARK[1]; H. Adachi[2]; M. Sato[3]; N. Tsuji[1]; [1]Kyoto University; [2]University of Hyogo; [3]Japan Synchrotron Radiation Research Institute (JARSI), Sayo-gun, Hyogo

9:50 AM
Microstructural and Plastic Deformation Study of a Multi-phase Advanced High Strength Steel: A. Hossain[1]; *N. Kumar*; [1]University of Alabama Tuscaloosa

10:10 AM
Strain Rate Sensitive Martensite Transformation in a Q&P Steel: *C. Finfrock*[1]; M. Thrun[1]; T. Ballard[1]; J. Copley[1]; B. Ellyson[1]; A. Clarke[1]; K. Clarke[1]; [1]Colorado School of Mines

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

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Monday AM **March 15, 2021**

8:30 AM Keynote
Infiltration Strategies to Improve the Performance of Solid Oxide Fuel Cell Anodes: *S. Basu*[1]; B. Mo[1]; J. Rix[1]; S. Gopalan[1]; U. Pal[1]; [1]Boston University

9:10 AM Keynote
Thermal Implications of Diverging Degradation Modes in Battery Electrodes and Opportunities to Enable Anode-free Systems: *C. Love*[1]; R. Carter[1]; R. Atkinson[2]; T. Kingston[3]; [1]US Naval Research Laboratory; [2]EXCET, Inc.; [3]NRC/NRL Postdoctoral Research Associate

9:50 AM Keynote
Designing Electrode Architectures across Length Scales: Some Lessons Learned from Li-ion and "Beyond Li" Chemistries: *S. Banerjee*[1]; [1]Texas A&M University

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 Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, KTH Royal Institute of Technology; David Veysset, Stanford University

Monday AM **March 15, 2021**

8:30 AM
An In Situ and Operando Additive Manufacturing Process Replicator for High Speed Optical, Infra-red and Synchrotron X-ray Imaging: *S. Marussi*[1]; C. Leung[1]; S. Clark[1]; L. Stranger[2]; R. Atwood[3]; V. Honkimäki[4]; A. Rack[4]; M. Besston[5]; J. Willmott[2]; P. Lee[1]; [1]University College London; [2]The University of Sheffield; [3]Diamond Light Source Ltd; [4]European Synchrotron Radiation Facility; [5]Oxford Lasers Ltd

8:50 AM
In Situ Characterization of the Balling Phenomenon in Additive Manufacturing: *D. Basu*[1]; J. Beuth[1]; B. Webler[1]; [1]Carnegie Mellon University

9:10 AM
In-Situ Machine Learning Enabled Spatter Detection in Laser Powder Bed Fusion Additive Manufacturing: *B. Abranovic*[1]; J. Beuth[1]; R. Magar[1]; L. Ghule[1]; A. Farimani[1]; [1]Carnegie Mellon University

9:30 AM
High-speed Synchrotron X-ray Imaging of Metal Additive Manufacturing Processes: *T. Sun*[1]; K. Fezzaa[2]; [1]University of Virginia; [2]Argonne National Laboratory

9:50 AM Invited
Characterizing Laser-Driven Metal Ejecta Interactions: *A. Saunders*[1]; C. Stan[1]; K. Mackay[1]; S. Ali[1]; H. Rinderknecht[2]; H. Park[1]; J. Eggert[1]; F. Najjar[1]; T. Haxhimali[1]; B. Morgan[1]; M. Echeverria[3]; J. Horwitz[1]; Y. Ping[1]; [1]Lawrence Livermore National Laboratory; [2]Laboratory for Laser Energetics; [3]University of Connecticut

10:10 AM
Quantifying Spatter in Powder Bed Fusion Processes with High-Speed Video Observations and Machine Learning: *C. Gobert*[1]; E. Diewald[1]; J. Beuth[1]; [1]Carnegie Mellon University

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

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Materials Characterization Committee, TMS: Powder Materials Committee
Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Kathy Lu, Virginia Polytechnic Institute and State University; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama; Eugene Olevsky, San Diego State University

Monday AM **March 15, 2021**

8:30 AM Invited
Structural Integrity of Complex Oxide Scales for Improved Oxidation Resistance of Ultra-high Temperature Ceramics: *A. Nisar*[1]; C. Zhang[1]; B. Boesl[1]; A. Agarwal[1]; [1]Florida International University

8:50 AM Invited
New Insights into Sintering Processing for Solid State Electrolytes – A Phase-Field Simulation Study: *R. Shi*[1]; M. Wood[1]; J. Espitia[1]; X. Gao[2]; J. Hammons[1]; L. Wan[1]; S. Kang[1]; D. Mukund[1]; K. Kim[1]; T. Heo[1]; B. Wood[1]; J. Ye[1]; [1]Lawrence Livermore National Laboratory; [2]Cornell University

9:10 AM
Flash Sintering of Gadolinium-doped Ceria: Densification and Microstructure: *T. Mishra*[1]; V. Avila[2]; R. Neto[2]; R. Raj[2]; O. Guillon[1]; M. Bram[1]; [1]Forschungszentrum Jülich GmbH; [2]University of Colorado Boulder

9:30 AM
Processing of TiB2-TiC Based Materials with Fine Microstructure and Improved Mechanical Properties: *Z. Fu*[1]; [1]University of Wisconsin Platteville

9:50 AM
Discovery of Novel High-entropy Ceramics via Machine Learning: *K. Kaufmann*[1]; W. Mellor[1]; T. Harrington[1]; C. Zhu[1]; A. Rosengarten[1]; D. Maryanovsky[1]; K. Vecchio[1]; [1]University of California, San Diego

10:10 AM
Elucidating the Influence of the Thermodynamics, Kinetics, and Chemistries of Molten Salts to Synthesize Ceramics for Energy Applications: *B. Levitas*[1]; K. Kakinuma[2]; S. Gopalan[1]; [1]Boston University; [2]University of Yamanashi

10:30 AM
Effects of Yttria Content and Atmosphere on Structural Evolution of Highly Porous Yttria-stabilized Zirconia Aerogels: *N. Olson*[1]; F. Hurwitz[2]; H. Guo[3]; J. Krogstad[1]; [1]University of Illinois Urbana Champaign; [2]NASA Glenn Research Center; [3]Ohio Aerospace Institute

AI/Data Informatics: Applications and Uncertainty Quantification at Atomistics and Mesoscales — Session I

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

Program Organizers: Kamal Choudhary, National Institute of Standards and Technology; Garvit Agarwal, Argonne National Laboratory; Wei Chen, Illinois Institute of Technology; Mitchell Wood, Sandia National Laboratories; Vahid Attari, Texas A&M University; Oliver Johnson, Brigham Young University; Richard Hennig, University of Florida

Monday AM **March 15, 2021**

8:30 AM
Are We Making Progress on ML Algorithms for Structure-property Relationships? Using MatBench as a Test Bed: *A. Jain*[1]; [1]Lawrence Berkeley National Laboratory

9:00 AM
Model Comparison and Uncertainty Prediction for ML Models of Crystalline Solids Material Properties: *F. Tavazza*[1]; K. Choudhary[1]; B. De Cost[1]; [1]NIST

9:30 AM
Data Science Approaches to Develop Predictive Models for Energy-relevant Materials: *B. Narayanan*[1]; [1]University of Louisville

10:00 AM
Discovery and Classification of Double Spinel Chemical Space: *G. Pilania*[1]; V. Kocevski[1]; B. Uberuaga[1]; [1]Los Alamos National Laboratory

10:30 AM
Inverse Design of Energy Storage Materials via Active Learning: *H. Doan*[1]; G. Agarwal[1]; R. Assary[1]; [1]Argonne National Laboratory

10:50 AM
Accelerating the Discovery of Self-Reporting Redox-active Materials Using Quantum Chemistry Guided Machine Learning: *G. Agarwal*[1]; H. Doan[1]; L. Robertson[1]; L. Zhang[1]; R. Assary[1]; [1]Argonne National Laboratory

Algorithm Development in Materials Science and Engineering — Machine Learning and Atomistic Algorithms to Accelerate Materials Study and Design

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

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

Monday AM **March 15, 2021**

8:30 AM Invited
Theory-infused Machine Learning Algorithms of Chemisorption at Metal Surfaces: *H. Xin*[1]; [1]Virginia Polytechnic Institute and State University

9:00 AM Invited
Accelerating Atomistic Monte Carlo Simulations with Autoregressive Models: *R. Gomez-Bombarelli*[1]; J. Damewood[1]; [1]Massachusetts Institute of Technology

9:30 AM
Application of a Shape Moment Descriptor Set Towards a Robust and Transferable Description of Local Atomic Environments: *J. Tavenner*[1]; E. Kober[2]; G. Tucker[1]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory

9:50 AM Invited
High Speed Artificial Neural Network Implementation of Interatomic Force Fields in Metals: *D. Dickel*[1]; C. Barrett[1]; M. Nitol[1]; [1]Mississippi State University

10:20 AM
Machine Learning and Supercomputing to Accelerate the Development of ReaxFF Interatomic Potentials: *N. Gunda*[1]; J. Peng[1]; Y. Shin[2]; S. Lee[1]; A. Van Duin[2]; D. Shin[1]; [1]Oak Ridge National Laboratory; [2]Pennsylvania State University

10:40 AM
Development of Machine Learned SNAP Potentials for Studying Radiation Damage in Materials: *M. Cusentino*[1]; M. Wood[1]; A. Thompson[1]; [1]Sandia National Laboratories

11:00 AM
Computational Synthesis of Substrates by Crystal Cleavage: *J. Paul*[1]; A. Galdi[2]; R. Hennig[1]; [1]University of Florida; [2]Cornell University

Alloys and Compounds for Thermoelectric and Solar Cell Applications IX — 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; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Tiejun Zhu, Zhejiang University; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Alloys and Compounds for Thermoelectric and Solar Cell Applications IX: *H. Wu*[1]; [1]National Chiao Tung University

8:35 AM Invited
n-Bi2-xSbxTe3 as an Alternative to Mainstream n-Bi2Te3-xSex Near Room Temperature: *J. He*[1]; L. Hu[2]; [1]Clemson University; [2]Shenzhen University

8:55 AM Invited
Enhanced Thermoelectric Figure-of-Merit in Nanostructured n-type Bi2Te3 via Phase Diagram Engineering: H. Huang[1]; W. Yen[2]; *H. Wu*[2]; [1]National Sun Yat-sen University; [2]National Chiao Tung University

9:15 AM Invited
Unique Influences of Laser Additive Manufacturing on Multiscale Structuring of Bismuth Telluride Thermoelectric Materials: *S. Leblanc*[1]; R. Welch[1]; B. Sisik[1]; [1]George Washington University

9:35 AM Invited
Assessment of Electroless Cobalt Diffusion Layer for Bi_2Te_3-based Thermoelectric Module: *A. Wu*[1]; C. Wang[1]; [1]National Central University

9:55 AM
Effect of Interfacial Reaction on Bi2Te3 and Sb2Te3 Thin-film Thermoelectric Module: *K. Cheng*[1]; Z. Sun[1]; A. Wu[1]; [1]National Central University

10:15 AM
Thermomagnetic Properties of Single-crystal 2H-$NbSe_2$ and Bi_2Te_3: *M. Akhanda*[1]; S. Rezaei[1]; M. Rosul[1]; K. Esfarjani[1]; S. Krylyuk[2]; A. Davydov[2]; M. Zebarjadi[1]; [1]University of Virginia; [2]National Institute of Standards and Technology

Bio-Nano Interfaces and Engineering Applications — Bio-Nano I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

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8:30 AM Invited
Bio-imaging with Photoluminescence of Single-layer MoS2: *Y. Hayamizu*[1]; [1]Tokyo Institute of Technology

9:00 AM Invited
Stickiness at Bio-nano-interfaces: From Nanoscale Characterization to Macroscale Properties: *H. Schniepp*[1]; [1]College of William & Mary

9:30 AM Invited
Insight into the Mechanobiological Progression of Cancer Metastasis to Bone: *D. Katti*[1]; S. Jaswandkar[1]; K. Katti[1]; [1]North Dakota State University

10:00 AM
Control of Scaffold Shear Forces Through a Perfusion Bioreactor for Design of Prostate Cancer Bone Metastasis Testbed: *H. Jasuja*[1]; A. Lahcen[1]; T. Le[1]; D. Katti[1]; K. Katti[1]; [1]North Dakota State University

Characterization of Minerals, Metals and Materials 2021 — Advanced Characterization Methods I

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

Monday AM **March 15, 2021**

8:30 AM
Performance of High Fidelity Inert Thermomechanical Mocks Over a Diverse Range of Strain Rates and Temperatures: *A. Burch*[1]; B. Morrow[1]; C. Cady[1]; D. Bahr[2]; J. Yeager[1]; [1]Los Alamos National Laboratory; [2]Purdue University

8:50 AM
Microstructure Characterization of Aluminum 1100 Using Ultrasonic Backscatter Measurements and Synthetic Polycrystals: *M. Norouzian*[1]; J. Turner[1]; [1]University of Nebraska-Lincoln

9:10 AM
A Lightweight Mossbauer Spectrometer for Lunar Exploration Using a Piezoelectric Doppler Drive: *P. Guzman*[1]; S. Lohaus[1]; V. Scott[2]; B. Fultz[1]; [1]California Institute of Technology; [2]Jet Propulsion Laboratory, California Institute of Technology

9:30 AM
SAXS Tomography of Precipitation Hardened Multilayer Al Alloy Sheets: *S. Lin*[1]; H. Okuda[1]; [1]Kyoto University

9:50 AM
APT Composition Profiling for Accurate Evaluation of Diffusion Coefficients in the Zr-Ta Binary System: *Y. Wu*[1]; M. Dubey[1]; S. Wang[1]; C. Wang[2]; J. Zhao[2]; [1]Boise State University; [2]University of Maryland

10:10 AM
Large-scale Crystal Orientation Mapping by Directional Reflectance Microscopy: *M. Seita*[1]; X. Wang[1]; M. Wittwer[1]; [1]Nanyang Technological University

10:30 AM
Utilization of Magneto-optical Kerr Effect Microscopy for Microstructural Characterization of Steels: *M. Jovicevic-Klug*[1]; P. Jovicevic-Klug[1]; L. Thormählen[2]; J. McCord[2]; B. Podgornik[1]; [1]Institute of Metals and Technology; [2]Institute for Materials Science, Kiel University

10:50 AM
Characterization of Dealloyed Gradient Nanoporous Foams: *K. Hemmendinger*[1]; A. Hodge[1]; [1]University of Southern California

Characterization of Nuclear Materials and Fuels with Advanced X-ray and Neutron Techniques — X-ray Diffraction/Scattering I

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee
Program Organizers: Xuan Zhang, Argonne National Laboratory; Jonathan Almer, Argonne National Laboratory; Maria Okuniewski, Purdue University; Joshua Kane, Idaho National Laboratory; Donald Brown, Los Alamos National Laboratory; J. Kennedy, Idaho National Laboratory; Arthur Motta, Pennsylvania State University

Monday AM **March 15, 2021**

8:30 AM Invited
Synchrotron High-energy X-ray Studies of Nuclear Reactor Materials: *M. Li*[1]; X. Zhang[1]; J. Almer[1]; J. Park[1]; P. Kenesei[1]; A. Chuang[1]; [1]Argonne National Laboratory

9:00 AM
Evolution of Stresses in Deformation Twins in the Plastic Zone Using Three-dimensional Synchrotron X-ray Diffraction: H. Abdolvand[1]; *K. Louca*[1]; C. Mareau[2]; M. Majkut[3]; J. Wright[3]; [1]Western University; [2]Arts et Métiers ParisTech; [3]European Synchrotron Radiation Facility (ESRF)

9:20 AM
Characterization of Long Range Ordering in Ni-based Alloys with Ex-situ and In-situ Synchrotron X-ray Diffraction: *N. Aerne*[1]; D. Sprouster[2]; F. Teng[3]; M. Topsakal[4]; A. Couet[5]; K. Sridharan[5]; J. Tucker[1]; [1]Oregon State University; [2]Stony Brook University; [3]Idaho National Lab; [4]Brookhaven National Lab; [5]University of Wisconsin-Madison

9:40 AM
Irradiation-induced Effects in HT-UPS Steel Using Far-field X-ray Diffraction and Grain Tracking Analysis: *S. Nori*[1]; A. Figueroa[1]; J. Thomas[1]; H. Sharma[2]; J. Park[2]; P. Kenesei[2]; J. Almer[2]; M. Okuniewski[1]; [1]Purdue University; [2]Argonne National Laboratory

10:00 AM Invited
Multimodal Synchrotron Characterization of Transmutation Products in Structural Materials: *D. Sprouster*[1]; J. Trelewicz[1]; D. Morrall[2]; X. Hu[2]; C. Parish[2]; B. Wirth[3]; Y. Katoh[2]; L. Snead[1]; [1]Stony Brook University; [2]ORNL; [3]University of Tennessee, Knoxville

10:30 AM
4D X-ray Diffraction Microscopy Study of Tensile Deformation of Neutron-irradiated Fe-9Cr Alloy: *X. Zhang*[1]; D. Piedmont[2]; J. Park[1]; P. Kenesei[1]; J. Almer[1]; M. Li[1]; [1]Argonne National Laboratory; [2]University of Illinois at Urbana-Champaign

10:50 AM
In-Situ XRD Study of Alloy 709's Mechanical Behavior for Advanced Fast Reactor Applications: *D. Piedmont*[1]; D. Park[1]; V. Riso[1]; X. Liu[1]; J. Stubbins[1]; [1]University of Illinois at Urbana Champaign

Coatings and Surface Engineering for Environmental Protection III — Protection from Environmental Degradation, Session I

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Arif Mubarok, PPG; Tushar Borkar, Cleveland State University; Rajeev Gupta, North Carolina State University; Mary Lyn Lim, PPG Industries; Raul Rebak, GE Global Research; Brian Okerberg, PPG Industries

Monday AM **March 15, 2021**

8:30 AM
Revealing the Long-term Growth Kinetics and Morphology of Atmospheric Corrosion Pitting in Aluminum via In-operando Microtomography: *P. Noell*[1]; M. Melia[1]; E. Schindelholz[2]; [1]Sandia National Laboratories; [2]The Ohio State University

8:50 AM
Pitting Corrosion in Powder-processed Aluminum Alloys Containing Quasicrystalline Dispersoids: *S. Rommel*[1]; H. Leonard[1]; M. Li[1]; T. Watson[2]; T. Policandriotes[3]; M. Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

9:10 AM
The Effect of Surface Treatment on the Formation, Structure, and Chemistry of Protective Oxide Scale on High-temperature Oxidation-resistant Nickel Alloys: *S. House*[1]; H. Ayoola[1]; J. Lyons[1]; M. Li[1]; B. Li[1]; J. Yang[1]; W. Saidi[1]; B. Gleeson[1]; [1]University of Pittsburgh

9:30 AM
Cycling Corrosion Testing of Al-Mg Friction Stir Welding Bi-metallic Joints: *Q. Ding*[1]; B. Mishra[1]; A. Powell[1]; K. Karayagiz[1]; [1]Worcester Polytechnic Institute

9:50 AM
Dealloying and Passivation of Cu-doped Carbide-reinforced Martensitic Steels in a Sulfuric Acid: *K. Yamanaka*[1]; M. Mori[2]; K. Yoshida[1]; K. Omura[1]; Y. Onuki[3]; S. Sato[3]; A. Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College; [3]Ibaraki University

Composite Materials for Nuclear Applications — TRISO Fuel

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee, TMS: Nuclear Materials Committee
Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Oak Ridge National Laboratory; Peng Xu, Idaho National Laboratory; Johann (Hans) Riesch, Max Planck Institute for Plasma Physics

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8:30 AM Invited
Tristructural Isotropic (TRISO) Fuel for High-Temperature, Passively-Safe Nuclear Reactors: *J. Stempien*[1]; P. Demkowicz[1]; J. Hunn[2]; [1]Idaho National Laboratory; [2]Oak Ridge National Laboratory

9:00 AM
Experimental Characterisation of the Variation of Local Residual Stresses in TRISO Coatings: *A. Leide*[1]; S. Knol[2]; A. Vreeling[2]; D. Goddard[3]; D. Liu[1]; [1]University of Bristol; [2]NRG; [3]National Nuclear Laboratory

9:20 AM
Post-irradiation Examinations of TRISO Particles Corroded in Molten FLiBe Salt under Neutron Irradiation: *G. Zheng*[1]; D. Carpenter[1]; [1]Massachusetts Institute of Technology

Computational and Modeling Challenges in Metals and Alloys for Extreme Environments — Extreme Environment Simulations from Nano- to Macro-scale

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jean-Briac le Graverend, Texas A&M University; Jaafar El-Awady, Johns Hopkins University; Giacomo Po, University of Miami; Beñat Gurrutxaga-Lerma, University of Birmingham

Monday AM **March 15, 2021**

8:30 AM
Molecular Dynamics Modeling of the Influence of Magnesium Dopants on Grain Boundary Stabilization in Nanocrystalline Aluminum: *W. Ye*[1]; L. Mushongera[1]; [1]University of Nevada, Reno

8:50 AM
Understanding Interface Properties Through Dislocation Dynamics Simulations in Metallic Nanolaminates: *A. Chakraborty*[1]; M. Zecevic[1]; A. Hunter[1]; X. Liu[1]; R. Lebensohn[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

9:10 AM
A Thermo-mechanical Model of the Dynamics of Dislocation Fields in Transient Heterogeneous Temperature Fields: *M. Upadhyay*[1]; [1]LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris

9:30 AM
Multi-scale Simulations of Crystallographic Facet-orientation Dependent Corrosion Behavior in Metallic Alloys: *R. Shi*[1]; S. Weitzner[1]; T. Hsu[1]; X. Chen[1]; T. Heo[1]; T. Pham[1]; C. Orme[1]; M. Wang[1]; B. Wood[1]; [1]Lawrence Livermore National Laboratory

9:50 AM
The Role of Precipitates on the Microstructure-sensitive Creep Response of 347H Steel via Crystal Plasticity Simulations: *V. Prithivirajan*[1]; N. Beets[1]; A. Chakraborty[1]; M. Arul Kumar[1]; R. Lebensohn[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

10:10 AM
Lattice Orientation Effect on Intragranular Void Growth in Single- and Poly-crystalline Metals: *P. Christodoulou*[1]; S. Dancette[2]; R. Lebensohn[3]; E. Maire[2]; I. Beyerlein[1]; [1]University of California, Santa Barbara; [2]Institut National des Sciences Appliquées de Lyon; [3]Los Alamos National Laboratory

Computational Thermodynamics and Kinetics — Grain Boundary Properties and Kinetics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Computational Thermodynamics and Kinetics: *N. Ofori-Opoku*[1]; [1]Canadian Nuclear Laboratories

8:35 AM
Extracting and Examining the Grain Boundary Diffusivity Tensor of Hydrogen in Nickel Using Atomistic Simulations: *D. Page*[1]; H. Peay[1]; K. Varela[1]; O. Johnson[1]; D. Fullwood[1]; E. Homer[1]; [1]Brigham Young University

8:55 AM Invited
Elastic Interactions in Grain Boundary Phase Transformations: *I. Winter*[1]; R. Rudd[1]; T. Oppelstrup[1]; T. Frolov[1]; [1]Lawrence Livermore National Laboratory

9:25 AM
Atomistic Modeling of Carbon Atom Redistribution in the Fe-C Martensite: H. Zapolsky[1]; F. Schwab[1]; *G. Demange*[2]; F. Danoix[1]; R. Patte[1]; A. Khachaturyan[3]; [1]Cnrs, Gpm, Umr 6634; [2]Cnrs-University of Rouen Normandy; [3]Rutgers University

9:45 AM Invited
Density-based Thermodynamics of Microstructure Defects: L. Wang[1]; *R. Darvishi Kamachali*[1]; [1]Federal Institute for Materials Research and Testing (BAM)

Continuous Phase Transformations — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee
Program Organizers: Jessica Krogstad, University of Illinois at Urbana-Champaign; Gregory Thompson, University of Alabama; Matthew Steiner, University of Cincinnati; Janelle Wharry, Purdue University

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8:30 AM Invited
Cluster Variation Model of Phase Behavior in Heusler-forming Alloy Systems: *M. Widom*[1]; [1]Carnegie Mellon University

9:00 AM Invited
Interfacial Spinodals: *R. Darvishi Kamachali*[1]; [1]Federal Institute for Materials Research and Testing (BAM)

9:30 AM
Competitive Partitioning and Decomposition Evolution in Nanocrystalline Alloys: *G. Thompson*[1]; X. Zhou[2]; R. Kamachali[3]; J. Mianroodi[4]; A. Kwiatkowski da Silva[4]; P. Shanthraj[5]; D. Ponge[4]; B. Gault[4]; B. Svendsen[6]; D. Raabe[4]; B. Boyce[7]; B. Clark; B. Clark; B. Clark[7]; [1]University of Alabama; [2]Max-Planck-Institut für Eisenforschung ; [3]Federal Institute for Materials Research and Testing (BAM); [4]Max-Planck-Institut für Eisenforschung; [5]The University of Manchester; [6]Aachen University; [7]Sandia National Laboratories

9:50 AM
Study of Precipitation Behavior of High-Cr Ni-based Filler Metals Using In-situ S/TEM: *C. Li*[1]; S. Vijayan[1]; C. Fink[1]; J. Jinschek[1]; [1]The Ohio State University

10:10 AM Invited
Microstructural Engineering of Ni-based Superalloys Processed by Conventional and Additive Manufacturing: F. Theska[1]; N. Haghdadi[1]; *S. Primig*[1]; [1]University of New South Wales

10:40 AM
Phase Competition in the Two Steps Continuous Phase Transformation during Solidification of Terbium: *H. Song*[1]; M. Mendelev[2]; [1]Physics and Chemistry of Materials, Los Alamos National Lab; [2]Ames Laboratory, US Department of Energy

Corrosion in Heavy Liquid Metals for Energy Systems — Materials Compatibility with Liquid Metal Coolants I

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
Program Organizers: Osman Anderoglu, University of New Mexico; Alessandro Marino, SCK-CEN; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California; Mike Ickes, Westinghouse Electric Company

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8:30 AM
Material Needs and Developments for the Westinghouse Lead Fast Reactor: *M. Ickes*[1]; A. Parsi[1]; L. Czerniak[1]; P. Ferroni[1]; [1]Westinghouse Electric Company

8:50 AM Invited
Compatibility of Alumina-forming Austenitic Steels in Static and Flowing Pb: *B. Pint*[1]; J. Jun[1]; M. Brady[1]; Y. Yamamoto[1]; M. Ickes[2]; [1]Oak Ridge National Laboratory; [2]Westinghouse Electric Company

9:15 AM
Fundamental Interactions of Steels and Nickel-based Alloys with Lead-based Liquid Alloys or Liquid Tin: *C. Schroer*[1]; [1]Karlsruhe Institute of Technology (KIT)

9:35 AM Invited
Exposure Tests of Different Materials in Liquid Lead for LFRs: Effect of the Dissolved Oxygen on Corrosion: *S. Bassini*[1]; C. Sartorio[1]; A. Antonelli[1]; S. Cataldo[1]; A. Fiore[1]; M. Angiolini[1]; D. Martelli[1]; M. Ickes[2]; P. Ferroni[2]; I. Di Piazza[1]; M. Tarantino[1]; [1]ENEA; [2]Westinghouse Electric Company

10:00 AM Invited
Corrosion of Refractory Metals and Advanced Steels in Lead-bismuth Eutectic: *S. Maloy*[1]; K. Woloshun[1]; E. Olivas[1]; R. Wahlen[2]; T. Grimm[2]; [1]Los Alamos National Laboratory; [2]Niowave Inc.

10:25 AM
Corrosion Investigations of Materials in Antimony-tin and Antimony-bismuth Alloys For Liquid Metal Batteries: *T. Zhang*[1]; A. Heinzel[1]; A. Jianu[1]; A. Weisenburger[1]; G. Müller[1]; [1]Karlsruhe Institute of Technology

10:45 AM
Lead Bismuth Eutectic Corrosion on Austenitic Stainless Steel: *P. Hosemann*[1]; K. Lambrinou[1]; D. Frazer[1]; E. Stergar[1]; [1]University of California Berkeley

11:05 AM
Corrosion Behaviour and Microstructural Stability of Alumina-forming Austenitic Steels Exposed to Oxygen-containing Molten Lead: *A. Heinzel*[1]; A. Jianu[1]; A. Weisenburger[1]; H. Shi[1]; R. Fetzer[1]; G. Müller[1]; [1]Karlsruher Institut of Technology

11:25 AM
Liquid Metal Embrittlement of Al-containing High-entropy Alloys Exposed to Lead-bismuth Eutectic: *X. Gong*[1]; [1]Shenzhen University

Data Science and Analytics for Materials Imaging and Quantification — Session I: Data-led Approaches for 2D Characterization & EBSD

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Emine Gulsoy, Northwestern University; Charudatta Phatak, Argonne National Laboratory; Stephan Wagner-Conrad, Carl Zeiss Microscopy; Marcus Hanwell, Brookhaven National Laboratory; David Rowenhorst, Naval Research Laboratory; Tiberiu Stan, Northwestern University

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Data Science and Analytics for Materials Imaging and Quantification: *E. Gulsoy*[1]; [1]Northwestern University

8:35 AM
Computer Vision and Machine Learning for Microstructural Characterization and Analysis: *E. Holm*[1]; R. Cohn[1]; N. Gao[1]; K. Jones[1]; B. Lei[1]; S. Yarasi[1]; [1]Carnegie Mellon University

9:00 AM
Microstructure Image Segmentation with Deep Learning: from Supervised to Unsupervised Methods: *B. Lei*[1]; E. Holm[1]; [1]Carnegie Mellon University

9:20 AM
Improved EBSD Indexing through Non-Local Pattern Averaging: *D. Rowenhorst*[1]; P. Brewick[1]; [1]Naval Research Laboratory

9:45 AM
Resolving Pseudosymmetry in Tetragonal ZrO_2 Using EBSD with a Modified Dictionary Indexing Approach: *E. Pang*[1]; P. Larsen[1]; C. Schuh[1]; [1]Massachusetts Institute of Technology

10:05 AM
Dictionary Indexing of EBSD Patterns Assisted by Convolutional Neural Network: *Z. Ding*[1]; M. Graef[1]; [1]Carnegie Mellon University

10:25 AM
Advancements in EBSD Using Machine Learning: *K. Kaufmann*[1]; C. Zhu[1]; A. Rosengarten[1]; D. Maryanovsky[1]; T. Harrington[1]; H. Lane[2]; [1]University of California, San Diego; [2]Tangible AI LLC

Deformation Induced Microstructural Modification — Session I: Deformation of Pure Metals and Model Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Suveen Mathaudhu, University of California-Riverside ; Kester Clarke, Colorado School of Mines; Bharat Gwalani, Pacific Northwest National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Deformation Induced Microstructural Modification: *A. Devaraj*[1]; [1]Pacific Northwest National Laboratory

8:35 AM Invited
Phase Evolution in Two-phase Alloys during Severe Plastic Deformation: N. Pant[1]; N. Verma[1]; Y. Ashkenazy[1]; *P. Bellon*[1]; R. Averback[1]; [1]University of Illinois at Urbana-Champaign

9:05 AM
Extreme Shear-deformation-induced Modification of Defect Structures and Hierarchical Microstructure in Immiscible Alloy: *B. Gwalani*[1]; M. Olszta[1]; A. Yu[2]; K. Bozhilov[2]; S. Varma[3]; S. Pathak[3]; A. Rohatgi[1]; S. Mathaudhu[1]; P. Sushko[1]; C. Powell[1]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]University of California, Riverside; [3]Iowa State University

9:25 AM
Effect of Cryogenic Equal Channel Angular Pressing on Mechanical Behavior and Microstructure of Pure Copper: *P. Oliveira*[1]; D. Magalhães[1]; A. Kliauga[1]; V. Sordi[1]; [1]Federal University of São Carlos

9:45 AM
Influence of Deformation on Microstructure of Al4Si and Cu4Nb Alloys during Friction Stir Processing: A Multi-modal Microstructural Characterization Study: *J. Escobar*[1]; B. Gwalani[1]; M. Olszta[1]; J. Silverstein[1]; L. Bergmann[2]; J. dos Santos[2]; P. Staron[2]; E. Maawad[2]; B. Klusemann[2]; S. Mathaudhu[2]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Helmholtz-Zentrum Geesthacht

10:00 AM Invited
Hierarchical Microstructure in Shear Bands of Pure Titanium: X. Ma[1]; D. Zhao[2]; D. Sagapuram[2]; *K. Xie*[2]; [1]Pacific Northwest National Lab; [2]Texas A&M University

Design and Manufacturing Approaches for the Next Generation of Sustainable Materials: The 2021 Student-led Symposium — Challenges in Sustainable Materials: Novel Processing and Recycling

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Mary Dougherty, Colorado School of Mines; Christopher Finfrock, Colorado School of Mines; Brady McBride, Colorado School of Mines; Jaden Zymbaluk, Colorado School of Mines; Desmond Mills, Colorado School of Mines; Casey Gilliams, Colorado School Of Mines

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Design and Manufacturing Approaches for the Next Generation of Sustainable Materials: The 2021 Student-led Symposium: *C. Finfrock*[1]; [1]Colorado School of Mines

8:35 AM Invited
Research with a Sustainable Materials Science and Engineering Approach: *B. Boudouris*[1]; L. Madsen[1]; [1]National Science Foundation

8:55 AM Invited
Research Requirements for Sustainable Materials: *D. Cooper*[1]; [1]University of Michigan

9:15 AM Invited
Creating New Green Jobs Starts at the Product Design Stage: *J. Burt*[1]; [1]Appraccel

9:35 AM Invited
Materials Innovations Towards Decarbonization of Industrial Processes: *E. Olivetti*[1]; [1]Massachusetts Institute of Technology

9:55 AM Invited
Genomic Computational Design: Materials for Sustainability: *G. Olson*[1]; [1]Massachusetts Institute of Technology

10:15 AM Invited
Additive Manufacturing of High Temperature Materials: New Alloys and Sustainability Considerations: *T. Pollock*[1]; [1]University of California, Santa Barbara

10:35 AM Invited
Challenges in Optimizing Structural Metamaterials: *B. Boyce*[1]; A. Garland[1]; B. White[1]; R. Alberdi[1]; [1]Sandia National Laboratories

10:55 AM Invited
Microstructural Development and Powder Feedstock Recyclability in Additive Manufacturing by Laser Powder Bed Fusion: *Y. Sohn*[1]; S. Park[1]; H. Hyer[1]; N. Diaz Vallejo[1]; T. Huynh[1]; A. Mahmud[1]; K. Graydon[1]; C. Lucas[1]; N. Ayers[1]; A. Mehta[1]; L. Zhou[1]; [1]University of Central Florida

11:15 AM Invited
Shaping a Sustainable World Together – Delivering Novelis' Commitment to Sustainability: *J. Fekete*[1]; [1]Novelis Global Research and Technology Center

11:35 AM Invited
Using Rapid Alloy Prototyping to Investigate the Effects of Increased Levels of Residual Elements from Recycled Scrap on DP800 Steel: *C. Norrish*[1]; C. Llovo-Vidal[2]; R. Underhill[2]; C. Pleydell-Pearce[1]; N. Lavery[1]; [1]Swansea University, Bay Campus; [2]Tata Steel Europe

Electronic Packaging and Interconnections 2021 — Pb-free Solder Alloys I

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Mehran Maalekian, Mat-Tech; Christopher Gourlay, Imperial College London; Babak Arfaei, Ford Motor Company; Praveen Kumar, Indian Institute of Science; Sai Vadlamani, Intel Corporation; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University

Monday AM **March 15, 2021**

8:30 AM Invited
Nucleation and Growth Kinetics of Sn Whiskers Under Applied Pressure: *E. Chason*[1]; P. Jagtap[1]; N. Jain[1]; A. Bower[1]; [1]Brown University

8:50 AM
Development of Near Room Temperature Solder Alloys and Soldering Processes in Microelectronics: *S. Liu*[1]; S. McDonald[1]; T. Nishimura[2]; K. Nogita[1]; [1]University of Queensland; [2]Nihon Superior Co., Ltd

9:10 AM Invited
Comparison of Corrosion for Ni- and Co-based Surface Finishes: *A. Wu*[1]; S. Lin[1]; S. Ku[2]; N. Li[2]; [1]National Central University; [2]Taiwan Uyemura Co., Ltd

9:30 AM Invited
Microstructural Evolution in Low-temperature Pb-free Solders: *N. Chawla*[1]; [1]Purdue University

9:50 AM
Tailoring ßSn Grain Orientations in Electronic Interconnections via Manipulating Textures of Interfacial Intermetallics: *Z. Ma*[1]; C. Li[1]; X. Cheng[1]; S. Yang[1]; [1]Beijing Institute of Technology

10:10 AM
Reliability Evaluation of Ag Sinter-joining Die Attach under a Harsh Thermal Cycling Test: *Z. Zhang*[1]; C. Chen[1]; S. Aiji[1]; M. Hsieh[1]; I. Aya[1]; K. Suganuma[1]; [1]Osaka University/ISIR

10:30 AM
Modeling Effect of Copper Solute on Electromigration Induced Stress Generation in Al-based Interconnects: *K. Cavanagh*[1]; P. Wang[1]; [1]SUNY New Paltz

Energy Technologies and CO2 Management — Session I

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
Program Organizers: Alafara Baba, University of Ilorin; Lei Zhang, University of Alaska Fairbanks; Donna Guillen, Idaho National Laboratory; Xiaobo Chen, RMIT University; John Howarter, Purdue University; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology; Hong Peng, University of Queensland; Yu Lin Zhong, Griffith University

Monday AM **March 15, 2021**

8:30 AM
CO_2 Emission Calculation Model of Integrated Steel Works Based on Process Analysis: X. Li[1]; *H. Li*[2]; W. Tian[2]; Z. Chen[2]; H. Bai[2]; [1]China Metallurgical Industry planning and Research Institute; [2]University of Science and Technology Beijing

8:50 AM
In-situ Electrode Temperature Monitoring and Thermal Runaway Detection of Li-ion Pouch Cell: B. Li[1]; M. Parekh[1]; V. Pol[1]; T. Adams[1]; J. Fleetwood[1]; *C. Jones*; V. Tomar[1]; [1]Purdue University

9:10 AM
Experimental Study on Dust Removal Performance of Dynamic Wave Scrubber for Smelting Flue Gas: *F. Dong*[1]; Y. Liu[1]; X. Li[1]; G. Liu[1]; T. Zhang[1]; [1]Northeastern University

9:30 AM
Homogenization of the Dense Composite Membranes for Carbon-dioxide Removal: *D. Nedeljkovic*[1]; [1]American University of the Middle East

9:50 AM
Hydrodynamics of Gas-liquid Two-phase Flow in Reverse Spray Washing Process: *X. Li*[1]; T. Zhang[1]; Y. Liu[1]; G. Liu[1]; F. Dong[1]; [1]Northeastern University

10:10 AM
Influence of Coal Reactivity on Carbon Composite Briquette Reaction in Blast Furnace: *H. Tang*[1]; Z. Yu[1]; T. Rong[1]; [1]University of Science and Technology Beijing

Friction Stir Welding and Processing XI — Lightweight Materials & High Entropy Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

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8:30 AM
Case Study: Implementation of FSW in the Colombian Rail Transport Sector: *E. Hoyos*[1]; J. De Backer[2]; S. Escobar[1]; J. Martin[2]; M. Palacio[3]; [1]Universidad EIA; [2]TWI; [3]Metro de Medellín

8:50 AM
Three Sheet Al Alloy Assembly for Automotive Application: *P. Upadhyay*[1]; H. Das[1]; D. Graff[1]; [1]Pacific Northwest National Laboratory

9:10 AM
Bobbin Friction Stir Processing of AZ31B Mg Alloy Plates: E. Khalid[1]; V. Shunmugasamy[1]; *B. Mansoor*; [1]Texas A&M University at Qatar

9:30 AM
Characterization and Analysis of the Effective Wear Mechanisms on FSW Tools: *M. Hasieber*[1]; M. Grätzel[1]; J. Bergmann[1]; [1]Technische Universität Ilmenau

9:50 AM
Friction Stir Lap Welding between Al and FeCoCrNiMn High Entropy Alloy: H. Yao[1]; *K. Chen*[1]; M. Jiang[1]; M. Wang[1]; X. Hua[1]; L. Zhang[1]; A. Shan[1]; [1]Shanghai Jiao Tong University

10:10 AM
Modified Friction Stir Welding of Al-Mg-Cu-Zn Aluminum Alloy: *A. Alali Alkhalaf*[1]; A. Tesleva[1]; P. Polyakov[1]; M. Moschinger[2]; S. Fritsche[2]; I. Morozova[3]; A. Naumov[1]; F. Isupov[1]; G. Pina Cipriano[2]; S. T. Amancio-Filho[2]; [1]Peter the Great St.Petersburg Polytechnic University (SPbPU); [2]Graz University of Technology; [3]Brandenburg University of Technology Cottbus-Senftenberg

10:30 AM
Heterogeneous Structure-induced Strength-ductility Synergy by Partial Recrystallization during Friction Stir Welding of a High-entropy Alloy: P. Lin[1]; *H. Liu*[1]; P. Hsieh[1]; C. Wei[1]; C. Tsai[1]; Y. Sato[2]; S. Chen[3]; H. Yen[3]; N. Lu[3]; C. Chen[3]; [1]National Tsing Hua University; [2]Tohoku University; [3]National Taiwan University

Frontiers in Solidification Science VIII — Dendritic Growth

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Frontiers in Solidification Science VIII: *D. Tourret*[1]; [1]IMDEA Materials

8:35 AM Invited
In-situ Measurement of Dendrite Tip Shape in a Metallic Alloy: *C. Beckermann*[1]; H. Neumann-Heyme[2]; N. Shevchenko[2]; J. Grenzer[2]; S. Eckert[2]; [1]University of Iowa; [2]Helmholtz-Zentrum Dresden-Rossendorf (HZDR)

9:05 AM
Microstructural Evolution in Metallic Alloys during Solidification: *T. Stan*[1]; P. Voorhees[1]; [1]Northwestern University

9:25 AM
Shapes of Dendritic Tips at Small and Large Undercoolings: *A. Kao*[1]; L. Toropova[2]; D. Alexandrov[2]; P. Galenko[3]; [1]University of Greenwich; [2]Ural Federation University; [3]Friedrich Schiller University Jena

9:45 AM
A Model for Dendrite Fragmentation in Alloy Solidification: *H. Neumann-Heyme*[1]; K. Eckert[1]; C. Beckermann[2]; [1]Helmholtz-Zentrum Dresden-Rossendorf (HZDR); [2]University of Iowa

10:05 AM
Dendritic Spacing Selection during Al-Cu Casting: Experiments and Multiscale Simulations: B. Bellon[1]; A. Boukellal[2]; T. Isensee[1]; J. Coleman[3]; M. Krane[3]; M. Titus[3]; D. Tourret[2]; *J. Llorca*[4]; [1]IMDEA Materials Institute & Polytechnic University of Madrid; [2]IMDEA Materials Institute; [3]Purdue University; [4]IMDEA Materials Institute & Technical University of Madrid

10:25 AM
Characterization of Dendritic Spatially Extended 3D Patterns in Directional Solidification: Microgravity Experiments in DECLIC-DSI Onboard ISS and 3D Phase-field Simulations: *K. Ji*[1]; F. Mota[2]; L. Strutzenberg[3]; R. Trivedi[4]; N. Bergeon[2]; A. Karma[1]; [1]Northeastern University; [2]Aix-Marseille Université; [3]NASA Marshall Space Flight Center; [4]Iowa State University

10:45 AM
Comparison of Solidification Characteristics of In-situ X-radiography Experiments and DNN Simulations: *M. Becker*[1]; L. Sturz[2]; D. Bräuer[1]; F. Kargl[1]; [1]German Aerospace Center (DLR); [2]Access e.V.

11:05 AM
Grain Competition in Polycrystalline Columnar Dendritic Solidification: Scale Bridging between Phase Field and Cellular Automaton Methods: *E. Dorari*[1]; K. Ji[1]; G. Guillemot[2]; C. Gandin[2]; A. Karma[1]; [1]Northeastern University; [2]MINES ParisTech

11:25 AM
Interaction of Hydrogen-bubbles with the Approaching Solidification Front in Al-Cu Melt - An In-situ Study: *T. Werner*[1]; J. Baumann[1]; M. Becker[1]; C. Pickmann[2]; L. Sturz[2]; F. Kargl[1]; [1]German Aerospace Center (DLR) - Institute of Materials Physics in Space; [2]ACCESS e.V.

Frontiers of Materials Award Symposium: 2021 Functional Nanomaterials: Translating Innovation into Pioneering Technologies — Session I

Program Organizer: Huanyu Cheng, Pennsylvania State University

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8:30 AM
Introductory Comments: Frontiers of Materials Award Symposium: 2021 Functional Nanomaterials: Translating Innovation into Pioneering Technologies: *H. Cheng*[1]; [1]Pennsylvania State University

8:35 AM Invited
Bio-inspired Artificial Vision and Wirelessly-integrated Wearable/Implantable Device: *D. Kim*[1]; [1]Seoul National University

9:15 AM Invited
Graphene and 2D Materials for Wearable Electronic Devices and Biosensors: *J. Ahn*[1]; [1]Yonsei University

9:55 AM Invited
The Science of Contact-electrification and the Technology of Triboelectric Nanogenerators: *Z. Wang*[1]; [1]Beijing Institute of Nanoenergy and Nanosystems; Georgia Institute of Technology

10:35 AM Invited
Conformal Bioelectronic Interfaces: *X. Chen*[1]; [1]Nanyang Technological University

11:15 AM Invited
Flash Joule Heating as a Rapid Solvent-free Scalable Route to New Materials: *J. Tour*[1]; [1]Rice University

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Heterostructured Materials I: Fundamentals

Sponsored by: TMS Structural Materials Division, 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; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Monday AM **March 15, 2021**

8:30 AM Invited
Gradients, Singularities and Interatomic Potentials: K. Parisis[1]; *E. Aifantis*[1]; [1]Aristotle University of Thessaloniki

8:55 AM Invited
Microstructure Dependence of Strain Partitioning and Localization in Heterostructured Metals: *C. Tasan*[1]; [1]Massachusetts Institute of Technology

9:20 AM Invited
Nanoscale Heterogeneity and Gradients Engineered by Compositional Defect Decoration and Manipulation: The Atomic Scale Basis of Segregation Engineering: *D. Raabe*[1]; [1]Max-Planck Institute

9:45 AM Invited
Cu-Fe Based Immiscible Medium-entropy Alloys with Excellent Tensile Properties: *J. Moon*[1]; J. Park[1]; J. Bae[1]; P. Liaw[2]; H. Kim[1]; [1]POSTECH; [2]The University of Tennessee

10:10 AM Invited
Thickness-dependent Shear Localization in Cu/Nb Metallic Nanolayered Composites: *C. Zhou*[1]; S. Dong[1]; [1]University of South Carolina

10:30 AM
Heterostructured Materials: An Emerging Materials Field with Great Potential: *Y. Zhu*[1]; X. Wu[2]; C. Huang[3]; [1]North Carolina State University; [2]Institute of Mechanics, CAS; [3]Sichuan University

High Entropy Alloys IX: Alloy Development and Properties — Alloy Development and Application I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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8:30 AM Keynote
Structures and Properties of High-entropy Intermetallic Alloys Doped with Boron Additions: T. Yang[1]; *C. Liu*[1]; [1]City University Of Hong Kong

9:00 AM Keynote
Nanostructured High Entropy Alloys: A Review: *C. Koch*[1]; [1]NCSU

9:30 AM Invited
Exploring Benefits of Metastability in High Entropy Alloys: *C. Tasan*[1]; S. Wei[1]; [1]Massachusetts Institute of Technology

9:55 AM Invited
Opportunities and Trends in High Entropy Alloys: A Materials Science Perspective from the National Science Foundation: *J. Yang*[1]; [1]National Science Foundation

10:20 AM Invited
Linking the Metallurgy of Multiple Principal Element Alloys to Properties: *D. Shifler*[1]; [1]Office of Naval Research

10:45 AM Invited
Order and Disorder in Amorphous and High-entropy Alloys: Y. Zhang[1]; *X. Yan*[2]; [1]University of Science and Technology Beijing; [2]University of Science and Technology Beijing

High Entropy Alloys IX: Structures and Modeling — Structures and Modeling I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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8:30 AM
Using Large Scale Ab Initio Computing to Predict and Understand High Entropy Alloys Formation: *G. Hautier*[1]; G. Bokas[1]; W. Chen[1]; S. Gorsse[2]; A. Hilhorst[1]; P. Jacques[1]; [1]Université catholique de Louvain; [2]Institut de Chimie de la Matière Condensée de Bordeaux

8:50 AM
Mobility of Dislocations in FeNiCrCoCu High Entropy Alloys via Molecular Dynamics Simulations: *Y. Shen*[1]; D. Spearot[1]; [1]University of Florida

9:10 AM
Screening of Generalized Stacking Fault Energies, Surface Energies and Intrinsic Ductile Potency of Refractory Multicomponent Alloys: *Y. Hu*[1]; L. Qi[1]; A. Sundar[1]; [1]University of Michigan

9:30 AM Invited
Efficient First-principles Methods of Calculating Stacking Fault Energies in High Entropy Alloys: Comparison of FCC and BCC Lattices: J. Strother[1]; A. Scheer[1]; *C. Hargather*[1]; [1]New Mexico Institute of Mining and Technology

9:55 AM
Physics-based and Data-driven Micromechanics for Metastable High Entropy Alloys: *A. Laukkanen*[1]; M. Lindroos[1]; T. Pinomaa[1]; T. Suhonen[1]; [1]VTT Technical Research Center of Finland

10:15 AM
Revisit the VEC Rule in High Entropy Alloys (HEAs) with High-throughput CALPHAD Approach and Its Applications for Material Design: A Case Study with Al-Co-Cr-Fe-Ni System: *S. Yang*[1]; J. Lu[1]; F. Xing[2]; L. Zhang[2]; Y. Zhong[1]; [1]Worcester Polytechnic Institute; [2]Central South University

Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery — Session I

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Wei Xiong, University of Pittsburgh; Shuanglin Chen, CompuTherm LLC; Wei Chen, Illinois Institute of Technology; James Saal, Citrine Informatics; Greta Lindwall, KTH Royal Institute of Technology

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8:30 AM
Introductory Comments: Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery: *W. Xiong*[1]; [1]University of Pittsburgh

8:35 AM Keynote
William Hume-rothery Award Lecture: High-throughput Measurements of Composition-dependent Properties of Alloy Phases for Accelerated Alloy Design: *J. Zhao*[1]; [1]University of Maryland

9:20 AM Invited
Combinatorial Design of High-entropy Alloys: *D. Raabe*[1]; Z. Li[2]; [1]Max-Planck Institute; [2]Central South University

10:00 AM Invited
Emerging Capabilities for the High-throughput Characterization of Structural Materials: *D. Miracle*[1]; [1]Air Force Research Laboratory

10:40 AM Invited
Genomic Materials Design: From CALPHAD Data to Flight: *G. Olson*[1]; [1]MIT

11:20 AM Invited
Design of Cobalt Base Superalloys for 3D Printing: S. Murray[1]; K. Pusch[1]; M. Kirka[2]; N. Zhou[3]; S. Forsik[3]; *T. Pollock*[1]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory; [3]Carpenter Technology Corp

Magnesium Technology 2021 — Keynote Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Petra Maier, University of Applied Sciences Stralsund; J. Brian Jordon, University of Alabama; Neale Neelameggham, IND LLC

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8:30 AM Keynote
Measurement of the Critical Resolved Shear Stress for Slip in Mg Alloys Using Instrumented Indentation: *W. Poole*[1]; S. Li[1]; G. Nayyeri[1]; [1]University of British Columbia

9:15 AM Invited
Development of a Low-cost and Room-temperature Formable Mg Alloy Sheet with In-plane Isotropic Tensile Properties: *T. Nakata*[1]; C. Xu[2]; H. Ohashi[1]; Y. Yoshida[3]; K. Yoshida[3]; S. Kamado[1]; [1]Nagaoka University of Technology; [2]Harbin Institute of Technology; [3]Sumitomo Electric Industries, Ltd.

9:45 AM Invited
Microstructure and Fracture Toughness of an Extruded Mg-Dy-Nd-Zn-Zr Alloy Influenced by Heat Treatment: *P. Maier*[1]; B. Clausius[1]; C. Joy[1]; R. Menze[2]; B. Bittner[2]; N. Hort[3]; [1]University of Applied Sciences Stralsund; [2]Meko Laser Material Processing; [3]Helmholtz-Zentrum Geesthacht

10:15 AM Invited
The High-solution Design of Magnesium Alloys: *Y. Yuan*[1]; J. Wang[1]; X. Cheng[1]; T. Chen[1]; B. Jiang[1]; T. Boll[2]; F. Pan[1]; [1]Chongqing University; [2]Karlsruhe Institute of Technology

Materials and Chemistry for Molten Salt Systems — Corrosion

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Stephen Raiman, Texas A&M University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Raluca Scarlat, University of California-Berkeley

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Materials and Chemistry for Molten Salt Systems: *S. Raiman*[1]; [1]Texas A&M University

8:35 AM
Assessment and Qualification of Austenitic Stainless Steel for Use in Molten Salts: *G. Young*[1]; M. Hackett[1]; [1]Kairos Power

9:05 AM
Corrosion Behavior of SS316, Hastelloy X, and Hastelloy N in FLiNaK: *A. Leong*[1]; H. Wu[1]; J. Zhang[1]; [1]Virginia Tech

9:25 AM
Corrosion of 316 Stainless Steel in Molten Chloride Salt Micro Convection Loop: *Y. Wang*[1]; [1]University of Wisconsin Madison

9:45 AM
Development of an In-situ Mechanical Test System for Molten Salts: *J. Quincey*[1]; P. Beck[1]; J. Parrington[2]; L. Parrington[2]; C. Lamb[2]; G. Young[1]; J. Tucker[1]; S. Briggs[1]; [1]Oregon State University; [2]Parrington Instruments

10:05 AM
High-throughput Electrochemical Methods Development to Accelerate Molten Salt Corrosion-resistant Alloy Design: *B. Goh*[1]; Y. Wang[1]; W. Doniger[1]; P. Nelaturu[1]; D. Papailiopoulos[1]; D. Thoma[1]; K. Sridharan[1]; A. Couet[1]; [1]University Of Wisconsin Madison

10:25 AM
Role of Alloy Chemistry in Governing Corrosion Rates of Candidate Materials for Molten Salt Reactors: *R. Pillai*[1]; C. Parker[1]; S. Raiman[1]; B. Pint[1]; [1]Oak Ridge National Laboratory

10:45 AM
Influence of Corrosion Product Solubility and Dissimilar Materials on Corrosion of Alloys in Molten Salt Environment: *C. Falconer*[1]; W. Doniger[1]; M. Weinstein[1]; M. Elbakhshwan[1]; K. Sridharan[1]; A. Couet[1]; [1]University of Wisconsin - Madison

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Superalloys: Alloy Development

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

Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Materials for High Temperature Applications-Next Generation Superalloys and Beyond: *G. Muralidharan*[1]; [1]Oak Ridge National Laboratory

8:35 AM Keynote
Next Generation Superalloys and beyond for Aircraft Engine Applications: *D. Whitis*[1]; [1]General Electric Co.

9:15 AM
Compositionally Graded Nanosize Precipitates at Grain Boundaries of Directionally Solidified Nickel Based (GTD444) Superalloy: *R. Gupta*[1]; M. Prasad[1]; P. Pant[1]; [1]IIT Bomaby

9:35 AM
TROPEA: A Platinum Containing New Generation Nickel-based Superalloy for Single Crystalline Applications: *J. Rame*[1]; S. Utada[2]; L. Bortoluci Ormastroni[2]; L. Mataveli Suave[3]; E. Menou[3]; L. Després[4]; P. Kontis[5]; J. Cormier[6]; [1]Safran Aircraft Engines; [2]Institut Pprime - ISAE-ENSMA / Safran Aicraft Engines; [3]Safran Tech; [4]Institut Pprime - ISAE-ENSMA / Safran Tech; [5]Max Planck Institut für Eisenforschung; [6]Institut Pprime - ISAE-ENSMA

9:55 AM
Enhancing the Creep Performance of a Corrosion Resistant Ni-based Superalloy through Grain Boundary Design: *M. Detrois*[1]; P. Jablonski[1]; J. Hawk[1]; [1]National Energy Technology Laboratory

10:15 AM
Segregation-assisted Climb of Frank Partial Dislocations: A Novel Planar Fault Formation Mechanism in L12-hardened Superalloys: *M. Lenz*[1]; E. Spiecker[1]; M. Wu[1]; [1]Institute of Micro- and Nanostructure Research

10:35 AM
Microstructural Evolution under Complex Stress States during Creep of Single Crystal Ni-base Superalloy CMSX-4: *N. Karpstein*[1]; M. Lenz[1]; J. Cormier[2]; E. Spiecker[1]; [1]Institute of Micro- and Nanostructure Research; [2]Institut Pprime, CNRS-Université de Poitiers-ISAE ENSMA

10:55 AM Invited
On the Crack Growth Retardation under Dwell-fatigue in Nickel Disc Alloys: *H. Li*[1]; [1]University of Birmingham

11:25 AM
Crack Initiation Anisotropy of Ni-based Single-crystal Superalloys in the VHCF Regime: *A. Cervellon*[1]; C. Torbet[1]; T. Pollock[1]; [1]University Of California Santa Barbara

Mechanical Behavior of Nuclear Reactor Components — Processing Effects

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

Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Monday AM **March 15, 2021**

8:30 AM Invited
Development of Modified 3Cr-3WVTa Base Bainitic Steels for Fusion Structural Applications: *Y. Yamamoto*[1]; R. Miller[1]; A. Rowcliffe[1]; [1]Oak Ridge National Laboratory

9:00 AM
Low Temperature Neutron Irradiation and Mechanical Properties of Welded AISI 347: *L. Garrison*[1]; N. Reid[1]; J. Echols[1]; K. Bawane[1]; [1]Oak Ridge National Laboratory

9:20 AM
Neutron Irradiation Response of SA508 Pressure Vessel Steel Prepared by Powder Metallurgy and Hot Isostatic Pressing: *Y. Zhao*[1]; C. Clement[1]; S. Wang[2]; Y. Wu[2]; K. Wheeler[3]; D. Guillen[3]; D. Gandy[4]; J. Wharry[1]; [1]Purdue University; [2]Boise State University, Center for Advanced Energy Studies; [3]Idaho National Laboratory; [4]Electric Power Research Institute

9:40 AM
Dose and Temperature Dependence of Microstructure and Mechanical Properties in Ion-Irradiated PM-HIP Inconel 625: *C. Clement*[1]; J. Wharry[1]; Y. Zhao[1]; D. Gandy[2]; S. Wang[3]; Y. Wu[3]; [1]Purdue University; [2]Electric Power Research Institute; [3]Boise State University, Center for Advanced Energy Studies

10:00 AM Invited
Mechanical Behavior and Radiation Effect in Additively Manufactured 316L Stainless Steel: *M. Li*[1]; X. Zhang[1]; W. Chen[1]; [1]Argonne National Laboratory

10:30 AM
Mechanical Properties of Additively Manufactured 316L Stainless Steel before and after Neutron Irradiation: *T. Byun*[1]; T. Lach[1]; M. Gussev[1]; K. Terrani[1]; [1]Oak Ridge National Laboratory

10:50 AM
Effects of Low-temperature Neutron Irradiation and Post-weld Heat Treatment on Tensile Properties of Welded Zircaloy-4: *J. Echols*[1]; N. Reid[1]; S. Wonner[1]; L. Garrison[1]; [1]Oak Ridge National Laboratory

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session I

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Monday AM **March 15, 2021**

8:30 AM
In-situ X-Ray Diffraction Investigation of High-strain Rate, High-temperature Deformation in Microalloyed Steel: *T. Wigger*[1]; R. Pineda[1]; S. Hunt[2]; D. Fenech[3]; B. Thomas[4]; T. Kwok[5]; D. Dye[5]; G. Plata[6]; J. Lozares[6]; I. Hurtado[6]; S. Michalik[7]; M. Preuss[2]; M. Azeem[8]; P. Lee[1]; [1]University College of London; [2]University of Manchester; [3]University of Cambridge; [4]University of Sheffield; [5]Imperial College London; [6]Mondragon Unibertsitatea; [7]Diamond Light Source; [8]University of Leicester

8:50 AM
In-situ Characterization of Material under Extreme Thermal Cycling Using High-speed Synchrotron X-ray Diffraction: *A. Chuang*[1]; P. Kenesei[1]; Y. Gao[2]; J. Almer[1]; J. Park[1]; [1]Argonne National Laboratory; [2]GE Global Research

9:10 AM
Mechanical Behavior and Microstructural Evolution of a Cu-0.7Cr-0.1Zr Alloy at Cryogenic Temperature: An In-situ Synchrotron X-ray Evaluation: *P. Oliveira*[1]; D. Magalhães[1]; M. Izumi[2]; O. Cintho[2]; A. Kliauga[1]; V. Sordi[1]; [1]Federal University Of São Carlos; [2]State University Of Ponta Grossa

9:30 AM
A Quantitative Assessment of Stress/Strain Partitioning in a Dual-phase Titanium Alloy: G. Zhu[1]; *S. Wei*; C. Tasan[1]; [1]Massachusetts Institute of Technology

9:50 AM
Dislocation Density Inference from XRD Simulations of In-situ Microstructure Evolution Using Discrete Dislocation Dynamics: *D. Madisetti*[1]; J. El Awady[1]; [1]Johns Hopkins University

10:10 AM
Microstructural Anisotropy and Its Influence on the Internal Stress Field within Grains: Experimental Confrontation with Full Field Crystal Plasticity Models: *K. Venkatraman*[1]; M. Ben Haj Slama[1]; V. Taupin[1]; N. Maloufi[1]; S. Berbenni[1]; A. Rollett[2]; M. Diehl[3]; A. Guitton[1]; [1]Université de Lorraine – CNRS; [2]Carnegie Mellon University; [3]Max-Planck-Institut für Eisenforschung GmbH

10:50 AM
Impact of Precipitate Size, Orientation, and Temperature on Strain Hardening Behavior in Al-Cu Alloys: *B. Milligan*[1]; D. Ma[2]; L. Allard[2]; A. Shyam[2]; A. Clarke[1]; [1]Colorado School of Mines; [2]Oak Ridge National Laboratory

Metal-Matrix Composites: Advances in Analysis, Measurement and Observations — Metal Matrix Composites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizers: Srivatsan Tirumalai, The University of Akron; William Harrigan, Gamma Alloys; Simona Hunyadi Murph, Savannah River National Laboratory

Monday AM **March 15, 2021**

8:30 AM Invited
The Mechanical Performance of an In Situ Processed Nickel-Titanium-Graphite Metal Matrix Composites: Influence of Processing: *A. Patil*[1]; T. Borkar[1]; [1]Cleveland State University

9:00 AM
Development of Ultra-high Conductivity Metal Composites: *K. Kappagantula*[1]; X. Li[1]; W. Choi[1]; G. Grant[1]; [1]Pacific Northwest National Laboratory

9:20 AM Invited
Role of Microstructure on the Potential of MAX and MAB Phases and Their Derivative-based Composites – A Review: *S. Gupta*[1]; [1]University of North Dakota

9:50 AM
Microstructure Evolution of Al/Ca Metal-Matrix Composite Conductor Wires by Thermal Aging: *D. Hickman*[1]; T. Riedemann[2]; I. Anderson[2]; [1]Iowa State University; [2]Ames Laboratory

10:10 AM
Understanding the Mechanical Response of Friction Stir Welded In-situ Processed Aluminum Alloy Metal Matrix Composite: Experimental and Statistical Modelling Approaches: J. Karloopia[1]; S. Mozammil[1]; P. Jha[1]; *S. Tirumalai*[2]; [1]Indian Institute of Technology; [2]University of Akron

10:40 AM
The Effect of Titanium Carbide and Spark Plasma Sintering Processing on Nickel-titanium Carbide Composites: *G. Walunj*[1]; T. Borkar[1]; [1]Cleveland State University

11:00 AM
The Tribological Behavior of an In-situ Processed Magnesium Alloy Based Metal Matrix Composite: *A. Meher*[1]; M. Mahapatra[1]; [1]Indian Institute of Technology Bhubaneswar

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Plenary

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt: *C. Anderson*[1]; [1]Colorado School of Mines

8:35 AM
Introductory Comments: EPD Distinguished Lecture: *C. Meskers*

8:40 AM Invited
EPD Distinguished Lecture: Ferronickel - Thermodynamics, Chemistry, and Economics: *R. Jones*[1]; [1]Mintek; University of the Witwatersrand; Pyro Consulting

9:10 AM Invited
"Around the Nickel World in Eighty Days" A Virtual Tour of World Nickel Sulphide and Laterite Operations and Technologies: *P. Mackey*[1]; A. Vahed[1]; T. Warner[1]; [1]Worley

9:40 AM Invited
A Review of Nickel Pyrometallurgy over the Past 50 Years with Special Reference to the Former INCO Ltd and Falconbridge Ltd.: A. Vahed[1]; P. Mackey[1]; *A. Warner*[1]; [1]Worley

10:10 AM Invited
Establishing a Domestic Cobalt Supply Chain: Unlocking Challenging Feedstocks: *F. Santaguida*[1]; [1]First Cobalt Corporation

10:30 AM Invited
Sustainable Developments in Nickel Recovery Process: J. Quinn[1]; D. Berger[1]; *S. Wang*[2]; [1]Freeport McMoRan Mining; [2]Rio Tinto Kennecott Utah Copper Corp

Phase Transformations and Microstructural Evolution — Modeling and Simulations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Monday AM **March 15, 2021**

8:30 AM
Burgers Circuit Analysis of Grain Boundary Junctions: *I. Winter*[1]; R. Rudd[1]; T. Oppelstrup[1]; T. Frolov[1]; [1]Lawrence Livermore National Laboratory

8:50 AM
Electron-hole Carriers Induced Microstructure Evolution in Inorganic Semiconductors: Y. Shen[1]; *Q. An*[1]; [1]University of Nevada, Reno

9:10 AM
Image-driven Discriminative and Generative Machine Learning Algorithms for Establishing Microstructure-processing Relationships: W. Ma[1]; *E. Kautz*[2]; A. Baskaran[3]; A. Chowdhury[4]; V. Joshi[2]; B. Yener[3]; D. Lewis[3]; [1]Purdue University; [2]Pacific Northwest National Laboratory; [3]Rensselaer Polytechnic Institute; [4]GE Research Center

9:30 AM
Structure and Local Environment of Intermetallic Precipitate Phase Nucleus: *D. Choudhuri*[1]; [1]New Mexico Institute of Mining and Technology

9:50 AM
The Origin and Stability of Nanostructural Hierarchy in Nickel-base Superalloys: *S. Meher*[1]; L. Aagesen[1]; T. Pollock[2]; [1]Idaho National Laboratory; [2]University of California Santa Barbara

10:10 AM
The Role of Grain Boundaries in Nanoscale Sintering: An Atomistic Simulation Study: O. Hussein[1]; M. Alghalayini[1]; *F. Abdeljawad*[1]; [1]Clemson University

10:30 AM
A Phase Field Modeling Study on Coupling of Compositional Patterning with Evolution of Grain Boundaries in Irradiated Binary Immiscible Alloys: *Q. Li*[1]; P. Bellon[1]; R. Averback[1]; [1]University Of Illinois Urbana-Champain

10:50 AM
Characterizing Evolution of Grain Boundary Network Structure during Anisotropic Grain Growth.: *J. Nino*[1]; O. Johnson[1]; [1]Brigham Young University

11:10 AM
Investigating the Microstructural Evolution of Cylindrical Interfaces: *A. Qiu*[1]; I. Chesser[1]; E. Holm[1]; [1]Carnegie Mellon University

Phonons, Electrons and Dislons: Exploring the Relationships Between Plastic Deformation and Heat — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Aashish Rohatgi, Pacific Northwest National Laboratory; Sean Agnew, University of Virginia; Thomas Bieler, Michigan State University

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Phonons, Electrons and Dislons: Exploring the Relationships between Plastic Deformation and Heat: *A. Rohatgi*[1]; [1]Pacific Northwest National Laboratory

8:35 AM Invited
Introduction to Dislons: A Quantized Description of Dislocations with Implications for Thermal and Electrical Transport: *M. Li*[1]; [1]Massachusetts Institute of Technology

8:55 AM
Inelastic Neutron Scattering Investigation of the Phonon Spectra of Dislocated Nb Crystals: *S. Agnew*[1]; T. Bieler[2]; M. Stone[3]; [1]University of Virginia; [2]Michigan State University; [3]Oak Ridge National Laboratory

9:15 AM Invited
Dislocation-limited Thermal Transport in III-Nitride Materials: *L. Lindsay*[1]; H. Li[2]; R. Hanus[1]; C. Polanco[1]; A. Zeidler[3]; G. Koblmuller[3]; Y. Koh[2]; [1]Oak Ridge National Laboratory; [2]National University of Singapore; [3]Technical University of Munich

9:35 AM
Role of Tantalum Concentration and Processing Temperature on High Strain Rate Phonon Behavior in Copper-tantalum Alloys: *S. Srinivasan*[1]; S. Turnage[2]; B. Hornbuckle[2]; C. Kale[1]; K. Darling[2]; K. Solanki[1]; [1]Arizona State University; [2]Army Research Laboratory

9:55 AM Invited
Dislocation Drag in Metals: Dependence on Velocity, Temperature, Density, and Crystal Geometry, and Its Effect on Material Response: *D. Blaschke*[1]; L. Burakovsky[1]; A. Hunter[1]; D. Luscher[1]; D. Preston[1]; [1]Los Alamos National Laboratory

10:15 AM
The Effects of Heating Rate on Defect Reduction by Recrystallization in Deformed Polycrystal Niobium: *E. Nicometo*[1]; Z. Thune[1]; C. Edge[1]; T. Bieler[1]; [1]Michigan State University

Plasmonics in Nanocomposite Materials — From Theory to Application Session I

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizers: Nasrin Hooshmand, Georgia Institute of Technology; Simona Hunyadi Murph, Savannah River National Laboratory; Mahmoud Abdelwahed, The University of Texas at San Antonio

Monday AM **March 15, 2021**

8:30 AM Keynote
Gold and Au/Ni and Other Plasmonic Nanoparticles: Using Theory to Understand Metal Recovery and Optical Properties: *G. Schatz*[1]; [1]Northwestern University

9:15 AM Invited
Anisotropic and Shape-selective Plasmonic Nanomaterials: Structure-property Relationships: *S. Hunyadi Murph*[1]; [1]Savannah River National Laboratory

9:45 AM Invited
Nanophotonics for Neural Engineering
: D. Garfield[1]; E. Chan[1]; P. Schuck[1]; M. Maharbiz[1]; *M. Chamanzar*[2]; [1]The Molecular Foundry, Lawrence Berkeley National Laboratory; [2]Carnegie Mellon University

10:05 AM Invited
Understanding Photocarrier and Gas Dynamics to Rationally Design Nano-heterostructured Photocatalysts for CO2 Conversion: *A. Thompson*[1]; [1]Savannah River National Laboratory

Powder Materials for Energy Applications — Metal Powder Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Idaho National Laboratory

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Powder Materials for Energy Applications: *K. Lu*[1]; [1]Virginia Polytechnic Institute and State University

8:35 AM
Development of Gas Atomization Processes for Production of Passivated Calcium Powders: *J. Tiarks*[1]; D. Hickman[2]; T. Riedemann[1]; I. Anderson[1]; [1]Ames Laboratory; [2]Iowa State University

8:55 AM
Utilizing Solid-state Grain Alignment to Bias Abnormal Grain Growth in Strategically Designed Alnico Alloys: *E. Rinko*[1]; T. Prost[2]; E. White[3]; I. Anderson[3]; [1]Iowa State University; [2]Ames Laboratory ; [3]Ames Laboratory

9:15 AM Invited
Wear Resistant Powder Materials for Energy Applications: *P. Prichard*[1]; M. Yao[1]; [1]Kennametal Inc.

9:45 AM
Conformal Coating of Powders by Physical Vapor Deposition: *J. Priedeman*[1]; G. Thompson[1]; [1]University of Alabama

Practical Tools for Integration and Analysis in Materials Engineering — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Titanium Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Michael Gram, Titanium Metals Corporation; William Joost, Pratt & Whitney; Raymundo Arroyave, Texas A&M University; Charles Ward, AFRL/RXM

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Practical Tools for Integration and Analysis in Materials Engineering: *A. Pilchak*[1]; [1]US Air Force Research Laboratory

8:35 AM Invited
Accelerated Tools for Disordered-materials Discovery: *S. Curtarolo*[1]; [1]Duke University

9:05 AM
Calculation of First Principles Based Thermodynamic and Kinetic Materials Properties Using CASM: *B. Puchala*[1]; J. Thomas[2]; J. Goiri[2]; A. Van der Ven[2]; [1]University of Michigan; [2]University of California, Santa Barbara

9:25 AM
A Framework for Closed-loop Materials Design Using Density Functional Theory: *V. Hegde*[1]; K. Williams[1]; T. Ludlum[1]; M. Hutchinson[1]; E. Lundberg[1]; B. Meredig[1]; [1]Citrine Informatics

9:45 AM
Batch Reification Fusion Optimization (BAREFOOT) Framework: *R. Couperthwaite*[1]; D. Khatamsaz[1]; A. Molkeri[1]; D. Allaire[1]; A. Srivastava[1]; R. Arroyave[1]; [1]Texas A&M University

10:05 AM Invited
Microstructural Modeling with FiPy: *J. Guyer*[1]; D. Wheeler[2]; J. Warren[2]; [1]National Institute of Standards & Technology; [2]National Institute of Standards and Technology

10:35 AM
A Private Ledger Architecture Tailored for Secure Workflow Management in Additive Manufacturing Facilities: *E. Diewald*[1]; J. Beuth[1]; [1]Carnegie Mellon University

10:55 AM Invited
LAMMPS as a Tool in Materials Modeling Workflows: *S. Plimpton*[1]; A. Thompson[2]; M. Wood[2]; [1]Sandia National Laboratories; [2]Sandia National Labs

11:25 AM
The Materials Commons 2.0: A Collaboration Platform and Information Repository for the Global Materials Community: *B. Puchala*[1]; G. Tarcea[1]; T. Berman[1]; J. Allison[1]; [1]University of Michigan

Rare Metal Extraction & Processing — Li, Co, Ni

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Rare Metal Extraction & Processing: *G. Azimi*[1]; [1]University of Toronto

8:35 AM Keynote
Scenarios of Future Lithium Use, 2021-2040: *R. Eggert*[1]; [1]Colorado School of Mines

8:55 AM Invited
The Importance of Spodumene Decrepitation on the Lithium Sulfate Extraction: C. Dessemond[1]; *G. Soucy*[1]; [1]Université de Sherbrooke

9:15 AM
Application of Eutectic Freeze Crystallization in Recycling of Li-ion Batteries: *Y. Ma*[1]; M. Svärd[1]; J. Gardner[1]; R. Olsson[1]; K. Forsberg[1]; [1]KTH - Royal Institute of Technology

9:35 AM Invited
Selective Separation of Co and Ni from REE in Recycling: *G. Seisenbaeva*[1]; A. Vardanyan[2]; [1] Swedish University of Agricultural Sciences; [2] Swedish University of Agricultural Sciences

9:55 AM
Recovery of Valuable Metals from End-of-life Lithium-ion Battery Using Electrodialysis: *K. Chan*[1]; M. Malik[1]; G. Azimi[1]; [1]University of Toronto

10:15 AM
Lithium Adsorption Mechanism for Li2TiO3: *R. Marthi*[1]; Y. Smith[1]; [1]University Of Utah

10:35 AM
Study on the Production of Lithium by Aluminothermic Reduction Method: *H. Lu*[1]; N. Neelameggham[2]; [1]Beihang University; [2]IND LLC

10:55 AM Invited
Effect of Synthesis Method on the Electrochemical Performance of LiNixMnCo1-x-yO2 (NMC) Cathode for Li-ion Batteries: A Review: *M. Malik*[1]; K. Chan[1]; G. Azimi[1]; [1]University of Toronto

Sustainability in the Aluminum Supply Chain: Joint Session — Keynote Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Les Edwards, Rain Carbon Inc.

Monday AM **March 15, 2021**

8:30 AM
Introductory Comments: Sustainability in the Aluminum Supply Chain: Joint Session: *L. Perander*; [1]

8:35 AM
Introductory Comments: Sustainability in the Aluminum Supply Chain: Joint Session: *L. Edwards*[1]; [1]Rain Carbon Inc.

8:40 AM Invited
Long Term Sustainability of the Aluminium Sector: *P. Nunez*[1]; [1]International Aluminium Association

9:05 AM Invited
Near Zero-waste and Near Break-even: A Path towards Sustainable Bauxite Processing: *E. Balomenos*[1]; [1]Mytilineos SA

9:30 AM Invited
Alumina in a More Sustainable World: *A. Furlong*[1]; [1]Worley

9:55 AM Invited
Review of Sustainability in the Carbon Supply Chain: *L. Edwards*[1]; [1]Rain Carbon Inc.

10:20 AM Invited
Hydro's Approach to Sustainability: *H. Vatne*[1]; [1]Hydro

10:45 AM Invited
Aluminium Production: A Pathway to Zero Carbon by 2050: *M. Dorreen*[1]; [1]EnPot Limited

11:10 AM Invited
The Aluminium Stewardship Initiative (ASI): Implementation and Impact: F. Solomon[1]; *M. van der Mijn*[1]; [1]Aluminium Stewardship Initiative

11:35 AM Question and Answer Period

100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture and Dislocations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniverstität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Monday PM **March 15, 2021**

2:00 PM Invited
The Role of Fracture in the Reduction of Iron Ore with Hydrogen: *D. Raabe*[1]; [1]Max-Planck Institute

2:40 PM Invited
Dislocation Pathways in Refractory Multi-principal Element Alloys: F. Wang[1]; G. Balbus[1]; S. Xu[1]; Y. Su[2]; J. Shin[1]; P. Rottmann[3]; K. Knipling[4]; J. Stinville[1]; L. Mills[1]; O. Senkov[5]; I. Beyerlein[1]; T. Pollock[1]; *D. Gianola*[1]; [1]University of California, Santa Barbara; [2]Utah State University; [3]University of Kentucky; [4]U. S. Naval Research Laboratory; [5]Air Force Research Laboratory

3:20 PM Invited
In Situ Observations and Measurements of Local Plastic Deformation and Fracture with 4D-STEM
: Y. Yang[1]; T. Pekin[2]; R. Zhang[3]; S. Zhao[3]; Q. Yu[1]; S. Yin[1]; C. Ophus[1]; M. Asta[3]; R. Ritchie[3]; *A. Minor*[3]; [1]Lawrence Berkeley National Laboratory; [2]Humbolt University, Berlin; [3]University of California, Berkeley and Lawrence Berkeley National Laboratory

4:00 PM
Dislocations Processes in Fracture and Toughening Mechanisms of UFG bcc Metals at Room Temperature: *I. Issa*[1]; A. Hohenwarter[2]; J. Zálešák[1]; D. Kiener[1]; [1]Montanuniversität Leoben, Austria; [2]Montanuniversität Leoben, Austria.

4:20 PM
Imaging the Chemo-mechanical Coupled Fracture in Metal Passivation Layer by In-situ TEM: *Y. Yang*[1]; A. Kushima[2]; H. Xin[3]; P. Hosemann[4]; J. Li[5]; [1]Lawrence Berkeley National Laboratory; [2]University of Central Florida; [3]University of California, Irvine; [4]University of California, Berkeley; [5]Massachusetts Institute of Technology

2021 TMS Special Lectures — SMD/FMD Awards Ceremony & Special Lecture

Monday PM **March 15, 2021**

12:00 PM
FMD Awards Ceremony: *P. Ohodnicki*[1]; [1]University of Pittsburgh

12:15 PM
SMD Awards Ceremony & Introduction of Special Lecturer: *D. Miracle*[1]; [1]Air Force Research Laboratory

12:35 PM
SMD Special Lecturer: Pushing Structural Performance of Materials by Combining Alloy Design with Disruptive Manufacturing Technologies: *R. Mishra*[1]; [1]University of North Texas

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Titanium and Steel

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Monday PM **March 15, 2021**

2:00 PM Invited
Strain Accumulation during Fatigue and Fracture of Additively Manufactured Ti6Al4V: Experiments and Simulations: R. Muro-Barrios[1]; R. VanSickle[1]; H. Chew[1]; *J. Lambros*[1]; [1]University of Illinois

2:30 PM
Effect of Defects on Stress State Dependent Fracture of Additively Manufactured Metals: *A. Beese*[1]; [1]Pennsylvania State University

2:50 PM
Structure-property Relationships to Explain the Elasto-plastic Anisotropy of Additively Manufactured Metal Alloys: *H. Macdonald*[1]; J. Battacharyya[1]; M. Shamsujjoha[1]; S. Agnew[1]; [1]University of Virginia

3:10 PM Invited
Design of Fatigue Resistant Additive Manufactured Austenitic Stainless Steels: *J. Pegues*[1]; S. Lee[2]; T. Rodgers[1]; D. Siaz[1]; S. Whetten[1]; A. Kustas[1]; M. Roach[3]; N. Shamsaei[2]; [1]Sandia National Laboratories; [2]Auburn University; [3]University of Mississippi Medical Center

3:40 PM
Progressive Amplitude Fatigue Performance of Additively Manufactured Stainless Steel Superalloy: *S. Siddiqui*[1]; K. Rivera[1]; I. Ruiz-Candelario[1]; A. Gordon[2]; [1]Florida Polytechnic University; [2]University of Central Florida

4:00 PM Invited
Tensile and Fatigue Behavior of Cold Sprayed Material Using Heat Treated Feedstock Powders: *L. Brewer*[1]; A. Webb[1]; N. Zhu[1]; J. Jordon[1]; [1]The University of Alabama

Additive Manufacturing for Energy Applications III — Additive Manufacturing Processing

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Nuclear Materials Committee
Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University

Monday PM **March 15, 2021**

2:00 PM Invited
Metal Additive Manufacturing for Energy Industries: *E. Herderick*[1]; [1]Ohio State University

2:20 PM Invited
Laser Powder Bed Fusion of Grade 300 Maraging Steel for Tooling Applications: *P. Nandwana*[1]; R. Kannan[1]; D. Leonard[1]; D. Siddel[1]; C. Joslin[1]; R. Dehoff[1]; [1]Oak Ridge National Laboratory

2:40 PM
Additive Manufacturing of Zr-modified Aluminum Alloy 6061 by Laser-powder Bed Fusion: *A. Mehta*[1]; L. Zhou[1]; H. Hyer[1]; T. Huynh[1]; S. Park[1]; D. Imholte[2]; N. Woolstenhulme[2]; D. Wachs[2]; Y. Sohn[1]; [1]University of Central Florida; [2]Idaho National Laboratory

3:00 PM
Harnessing a High Energy, Superconducting Electron Beam for Additive and Far-from-Equilibrium Manufacturing: *A. Duzik*[1]; J. Hill[1]; [1]Mainstream Engineering Corporation

3:20 PM Invited
Novel Aspects of multi-Wire Arc Additive Manufacturing for Large Component Fabrication for Extreme Environments and New Alloy Discovery: *T. Lillo*[1]; N. Huft[1]; D. Clark[2]; M. Glazoff[1]; J. Simpson[1]; [1]Idaho National Lab; [2]DEClark Welding Engineering, PLLC

3:40 PM
Efficient Production of a High-performance Dispersion Strengthened, Multi-principal Element Alloy: *T. Smith*[1]; A. Thompson[1]; T. Gabb[1]; C. Kantzos[1]; [1]NASA Glenn Research Center

4:00 PM
Investigation of the Effect of Laser Energy Density on Properties of Additively Manufactured Tungsten Lattices: *C. Romnes*[1]; O. Mireles[2]; J. Stubbins[1]; [1]University of Illinois at Urbana-Champaign; [2]NASA Marshall Space Flight Center

4:20 PM
Toward Part Qualification: Thermal Signature Analysis Using Wavelet Transform in Metal Additive Manufacturing: *S. Chandrasekar*[1]; J. Coble[1]; A. Godfrey[1]; S. Beauchamp[1]; F. List[2]; V. Paquit[2]; S. Babu[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

4:40 PM
Effective Thermal Conductivity of Additively Manufactured Metal Matrix Composite: *S. Mirzababaei*[1]; V. Doddapaneni[1]; K. Lee[1]; S. Manoharan[1]; C. Chang[1]; B. Paul[1]; S. Pasebani[1]; [1]Oregon State University

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Micro-scale Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Solidification Committee
Program Organizers: Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Kevin Chaput, Northrop Grumman; Mohsen Asle Zaeem, Colorado School of Mines; Wenda Tan, University of Utah; Lianyi Chen, University of Wisconsin-Madison

Monday PM **March 15, 2021**

2:00 PM
3D Analysis of Grain Morphologies and Solidification Texture in AM 316L: *D. Rowenhorst*[1]; [1]Naval Research Laboratory

2:20 PM
A Multi-scale Modeling Approach to Microstructure Prediction for Powder Bed Fusion Additive Manufacturing Processes Through Phase Field and Cellular Automata Methods: D. Dreelan[1]; A. Al Azad[1]; A. Ivankovic[1]; P. Cardiff[1]; *D. Browne*[1]; [1]University College Dublin

2:40 PM
CA Model Sensitivity to Material Parameters, Nucleation, and Thermal Conditions Across AM Process Space: *M. Rolchigo*[1]; A. Plotkowski[2]; J. Coleman[2]; J. Belak[1]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory

3:00 PM
Controlling Additive Manufacturing Processes with Magnetic Fields: *A. Kao*[1]; T. Gan[1]; X. Fan[2]; C. Tonry[1]; I. Krastins[3]; P. Lee[2]; K. Pericleous[1]; [1]University of Greenwich; [2]UCL; [3]University of Latvia

3:20 PM
Optimizing and Validating the Cellular Automata Finite Element Model for Additive Manufacturing: *K. Teferra*[1]; D. Rowenhorst[1]; [1]United States Naval Research Laboratory

3:40 PM
Prediction of Columnar-to-equiaxed Transition in Single Tracks during Laser Powder Bed Fusion Additive Manufacturing: *L. Yuan*[1]; A. Sabau[2]; D. StJohn[3]; A. Prasad[3]; P. Lee[4]; [1]University of South Carolina; [2]Oak Ridge National Laboratory; [3]The University of Queensland; [4]University College London

4:00 PM
Effect of Kinetic Anisotropy on Microstructure Development during Simulated Powder Bed Fusion of 316L Stainless Steel: *A. Chadwick*[1]; P. Voorhees[1]; [1]Northwestern University

4:20 PM
Microstructure Prediction Framework for Additively Manufactured Metals: *A. Polonsky*[1]; N. Raghavan[2]; M. Echlin[3]; M. Kirka[2]; R. Dehoff[2]; J. Madison[1]; T. Pollock[3]; [1]Sandia National Laboratories; [2]Oak Ridge National Laboratory; [3]University of California, Santa Barbara

4:40 PM
Solidification Cracking Model for High Strength Ni-based Superalloys by Selective Laser Melting: *M. Lam*[1]; [1]Monash University

Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments — Light Weight Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee
Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Monday PM **March 15, 2021**

2:00 PM Invited
Architectured Interpenetrating Structures with Tailorable Energy Absorption in Tension: *Z. Cordero*[1]; [1]Massachusetts Institute of Technology

2:30 PM
Al-Cu-Zn-Mg Alloy for Additive Manufacturing by Electron Beam Deposition: M. Domack[1]; *C. Mulvaney*[2]; C. Domack[3]; B. Bodily[4]; K. Taminger[1]; [1]NASA Langley Research Center; [2]University of Virginia; [3]Analytical Mechanical Associates; [4]Arconic Technology Center

2:50 PM
Development of High Strength and/or Corrosion-resistant Al Alloys with High Printability: *L. Zhou*[1]; H. Hyer[1]; A. Mehta[1]; S. Park[1]; T. Huynh[1]; B. McWilliams[2]; K. Cho[2]; Y. Sohn[1]; [1]University of Central Florida; [2]CCDC Army Research Laboratory

3:10 PM
Ability of Creation of Aluminium Alloys with High Heat Conductivity Suitable for 3D Printing: M. Viktor[1]; K. leksandr[1]; V. Roman[2]; *R. Dmitriy*[2]; M. Ivan[2]; K. Nyaza[2]; G. Mariya[2]; [1]RUSSIAN Aluminum Management; [2]Light Materials and Technologies Institute RUSAL Management

3:30 PM
High Strength WE43 Microlattices Manufactured by Laser Powder Bed Fusion: H. Hyer[1]; Q. Liu[1]; L. Zhou[1]; D. Wu[1]; S. Song[1]; Y. Bai[1]; B. McWilliams[2]; K. Cho[2]; *Y. Sohn*[1]; [1]University of Central Florida; [2]CCDC Army Research Laboratory

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session II

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara
; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Monday PM **March 15, 2021**

2:00 PM Invited
In-situ 4D-STEM Imaging to Develop a Fundamental Understanding of Coupled Transport of Vacancies: *S. Mills*[1]; Y. Yang[2]; S. Wang[1]; A. Minor[1]; [1]University of California Berkeley; [2]Lawrence Berkeley National Laboratory

2:30 PM
3D Maps of Geometrically Necessary Dislocations in Shock-loaded Polycrystalline Tantalum: *W. Witzen*[1]; T. Francis[1]; T. Pollock[1]; I. Beyerlein[1]; [1]University of California Santa Barbara

2:50 PM
Dislocation Imaging by Precession Electron Diffraction: *D. Zhao*[1]; K. Xie[1]; [1]Texas A&M University

3:10 PM
On the Mechanistic Origins of Maximum Strength in Nanocrystalline Materials: *A. Gupta*[1]; G. Thompson[2]; G. Tucker[1]; [1]Colorado School of Mines; [2]University of Alabama

3:30 PM
Grain Boundary Slip Transfer Classification and Metric Selection with Artificial Neural Networks: *Z. Zhao*[1]; T. Bieler[1]; J. LLorca[2]; P. Eisenlohr[1]; [1]Michigan State University; [2]IMDEA Materials Institute

3:50 PM
High Resolution Characterization of Dislocations Using Weak Beam Dark Field Scanning Transmission Electron Microscopy: *J. Miao*[1]; [1]Ohio State University

4:10 PM
Revisiting the Origin of Indentation Size Effect at Sub-micrometer Scales: *X. Ma*[1]; W. Higgins[2]; Z. Liang[2]; D. Zhao[2]; G. Pharr[2]; K. Xie[2]; [1]Pacific Northwest National Laboratory; [2]Texas A&M University

4:30 PM
Critical Resolved Shear Stresses (CRSS) of Hexagonal Titanium from Nanoindentation Optimization: *Z. Zhao*[1]; M. Ruiz[2]; J. Lu[1]; M. Monclus[2]; J. Molina-Aldareguia[2]; T. Bieler[1]; P. Eisenlohr[1]; [1]Michigan State University; [2]IMDEA Materials Institute

4:50 PM
Spatial Localization of Dislocation Avalanches in Microplasticity of a High-entropy Alloy: *Q. Rizzardi*[1]; R. Maass[1]; [1]University of Illinois at Urbana-Champaign

Advanced High Strength Steels V — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Steels Committee
Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; Louis Hector, General Motors Global Technical Center; Igor Vieira, Nucor Steel; Lijia Zhao, ArcelorMittal USA; Krista Limmer, CCDC Army Research Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Sebastien Allain, Institut Jean Lamour; MingXin Huang, University of Hong Kong

Monday PM **March 15, 2021**

5:30 PM
Effect of Rolling Conditions on Microstructure and Mechanical Properties of Medium Mn Steel: *P. Satyampet*[1]; S. Kundu[2]; P. Pant[1]; [1]IIT Bombay; [2]Tata Steels

Advanced High Strength Steels V — Session II

Sponsored by: TMS Structural Materials Division, TMS: Steels Committee
Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; Louis Hector, General Motors Global Technical Center; Igor Vieira, Nucor Steel; Lijia Zhao, ArcelorMittal USA; Krista Limmer, CCDC Army Research Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Sebastien Allain, Institut Jean Lamour; MingXin Huang, University of Hong Kong

Monday PM **March 15, 2021**

2:00 PM
Cryogenic Tensile and Microstructural Behaviors of High Manganese Steel Welds: *M. Choi*[1]; J. Lee[1]; H. Nam[1]; N. Kang[1]; M. Kim[1]; D. Cho[2]; [1]Pusan National University; [2]Korea Institute of Machinery and Materials

2:20 PM
Effects of V and Mo Additions on the Suppression of HAZ Softening of Friction Stir Welded Si-Mn Martensitic Steel: *Z. Wu*[1]; K. Ushioda[1]; H. Fujii[1]; [1]Joining and Welding Research Institute, Osaka University

2:40 PM
Microstructural Characterization of Fracture in Fe-10 pct Ni Gas Metal Arc Welds: *R. Baumer*[1]; D. Bechetti[2]; M. Sinfield[2]; [1]LeTourneau University; [2]Naval Surface Warfare Center, Carderock Division

3:00 PM
Use of Physical Simulations for Accelerated Welding Procedure Development in Supermartensitic Stainless Steels: R. Phillips[1]; *R. Baumer*[1]; [1]LeTourneau University

3:20 PM
Use of Thermo-mechanical Simulation to Assess Liquid Metal Embrittlement (LME) in Zinc Coated Advanced High Strength Steels: K. Ponder[1]; D. Sage[1]; C. Fink[1]; H. Ghassemi-Armaki[2]; M. Karagoulis[3]; *A. Ramirez*; [1]Ohio State University; [2]ArcelorMittal Global R&D - East Chicago, East Chicago, IN, USA; [3]Retired - General Motors

3:40 PM
Revisit the Slow Strain Rate Test for Hydrogen Embrittlement of Press-hardened Steel: Z. Cao[1]; *M. Huang*[1]; [1]University of Hong Kong

4:00 PM
Methods for Improving the Hydrogen Embrittlement Resistance in Press-hardened Steel: Z. Cao[1]; X. Xiong[2]; *M. Huang*[1]; [1]University of Hong Kong; [2]Ironovation (Suzhou) Materials Technology

Advanced Materials for Energy Conversion and Storage VII — Sustainability Materials

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Monday PM **March 15, 2021**

2:00 PM
Design of Novel Agriculture-based Materials by Using Principles of Circular Economy: *S. Gupta*[1]; [1]University of North Dakota

2:30 PM
Aluminum-ion Battery Made of $AlCl_3$-Trimethylamine Hydrochloride Ionic Liquid with Superior Performance: *K. Ng*[1]; T. Dong[1]; J. Anawati[1]; G. Azimi[1]; [1]University of Toronto

2:50 PM
High Performing Vertically Aligned Graphene/Metal Oxide on Carbon Fiber Composite Electrodes for Wearable Supercapacitors and Strength Applications: *D. Pandey*[1]; K. Sambath Kumar[1]; J. Thomas[1]; [1]University of Central Florida

3:10 PM
Investigation of Cost-effective AlCl3-urea Ionic Liquid Analog for Al-ion Batteries: *M. Malik*[1]; K. Ng[1]; G. Azimi[1]; [1]University of Toronto

3:30 PM
Morphology Evolution and Interface Instability of Sodium Metal Electrodes: *S. Sarkar*[1]; P. Mukherjee[1]; [1]Purdue University

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 Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, KTH Royal Institute of Technology; David Veysset, Stanford University

Monday PM **March 15, 2021**

2:00 PM
In-situ Real Time Observation of Austenite Formation in Duplex Stainless Steels during Different Cooling Conditions: *W. Mu*[1]; O. Rova[1]; S. Sukenaga[2]; H. Shibata[2]; [1]Kth Royal Institute of Technology; [2]IMRAM, Tohoku University

2:20 PM
Dissolution Mechanism of Oxide Particles in Silicate Melt: A Theoretical Study Supported by In-situ Observation Experiment: C. Xuan[1]; *W. Mu*[2]; [1]Sandvik Machining Solutions AB; [2]Kth Royal Institute of Technology

2:40 PM
Direct Observation of Boron Nitride Dissolution in a Heat Resistant Martensitic Steel Using Confocal Scanning Laser Microscopy: *A. Huck*[1]; B. Webler[1]; [1]Carnegie Mellon University

3:00 PM Invited
Observation of Surface and Interfacial Phenomena at High Temperature: *M. Nakamoto*[1]; [1]Osaka University

3:20 PM
Wetting and Spreading Kinetics between Liquid CaO-SiO2 Slags and a Solid SiO2: C. Yoo[1]; *J. Myung*[1]; Y. Chung[1]; [1]Korea Polytechnic University

3:40 PM
In-situ Quantitative Study of Heat Transfer Performance of Mold Flux by Using Double Hot Thermocouple Technology: *Z. Wang*[1]; G. Wen[1]; W. Jiang[1]; P. Tang[1]; S. Huang[1]; [1]Chongqing University

4:00 PM
In-situ Observation of Interfacial Phenomena between Magnetite and Matte at High Temperature by a Novel Optical Microscopic Technique: *S. Shin*[1]; S. Kawanishi[1]; S. Sukenaga[1]; J. Takahashi[2]; H. Shibata[1]; [1]Tohoku University; [2]Sumitomo Metal Mining

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

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

Monday PM **March 15, 2021**

2:00 PM
A Bilayered GelMA/PEGDA-based Nerve Conduit with Supportive Cells for Peripheral Nerve Regeneration: *J. Liu*[1]; Y. Yin[1]; [1]Zhejiang University

2:20 PM
A Novel Dual-layer Hydrogel/Cell Conduit Fabrication Method for Tissue Engineering: *X. Liu*[1]; J. Yin[1]; [1]Zhejiang University

2:40 PM
Design and Evaluations System for 3D-printed Dental Implants Based on Deep Neural Networks: *P. Kung*[1]; C. Hsu[1]; A. Yang[2]; N. Chen[2]; N. Tsou[1]; [1]National Chiao Tung University; [2]National Center for High-performance Computing

3:00 PM
Mechanical Properties and Biodegradability of Porous Mg and Zn Scaffolds Fabricated by Power Bed Laser Fusion for Biomedical Applications: M. Li[1]; F. Benn[2]; T. Derra[2]; A. Kopp[2]; J. Molina-Aldareguía[1]; *J. Llorca*[3]; [1]IMDEA Materials Institute; [2]Meotec; [3]IMDEA Materials Institute & Technical University of Madrid

3:20 PM
Mechanical Properties and Biodegradability of Porous PLA/Mg and PLA/Zn Scaffolds Fabricated by Fused Filament Deposition for Biomedical Applications: C. Pascual[1]; C. Thompson[1]; J. de la Vega[1]; D. Wang[1]; C. González[2]; *J. Llorca*[2]; [1]IMDEA Materials Institute; [2]IMDEA Materials Institute & Technical University of Madrid

3:40 PM
Laser-based Powder-bed Fusion Strategies for the Fabrication of Cellular Scaffolds with a Fine Resolution: *E. Asadi*[1]; [1]University of Memphis

Advances in Powder and Ceramic Materials Science — Advanced Ceramics and Processes

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Materials Characterization Committee, TMS: Powder Materials Committee
Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Kathy Lu, Virginia Polytechnic Institute and State University; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama; Eugene Olevsky, San Diego State University

Monday PM **March 15, 2021**

2:00 PM Invited
Effect of Diamond Content and Modality on the Densification of Diamond Particulate Ceramic Composites by Hot-pressing: *J. LaSalvia*[1]; A. DiGiovanni[1]; K. Behler[1]; [1]CCDC Army Research Laboratory

2:25 PM
An Analysis on the Factors Affecting Oxidation Resistance of Silicon Containing Ultra High Temperature Borides Ceramics: *G. Bianco Atria*[1]; A. Agarwal[1]; C. Zhang[1]; A. Nisar[1]; [1]Florida International University

2:45 PM
Low Toxicity Gelcasting of Zirconium Diboride: *A. Wat*[1]; L. Bekker[1]; S. Chandrasekaran[1]; A. Hall[1]; M. Worsley[1]; W. Du Frane[1]; J. Kuntz[1]; J. Cahill[1]; [1]Lawrence Livermore National Laboratory

AI/Data Informatics: Applications and Uncertainty Quantification at Atomistics and Mesoscales — Session II

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

Program Organizers: Kamal Choudhary, National Institute of Standards and Technology; Garvit Agarwal, Argonne National Laboratory; Wei Chen, Illinois Institute of Technology; Mitchell Wood, Sandia National Laboratories; Vahid Attari, Texas A&M University; Oliver Johnson, Brigham Young University; Richard Hennig, University of Florida

Monday PM **March 15, 2021**

2:00 PM
Uncertainty Quantification in Computational Thermodynamics - From the Atomistic to the Continuum Scale: *N. Paulson*[1]; J. Gabriel[1]; T. Duong[1]; M. Stan[1]; [1]Argonne National Laboratory

2:30 PM
Bayesian Inference and Uncertainty Quantification of Grain Boundary Properties: S. Baird[1]; B. Snow[1]; A. Bigelow[1]; D. Fullwood[1]; E. Homer[1]; *O. Johnson*[1]; [1]Brigham Young University

2:50 PM
A Bayesian Optimization Framework for Exploring the Grain Boundary Manifold: *L. Khalili*[1]; O. Rettenmaier[1]; S. Patala[1]; [1]North Carolina State University

3:10 PM
Machine Learning for Predicting Grain Boundary Properties: *L. Mu*[1]; E. Holm[1]; [1]Carnegie Mellon University

3:30 PM
Machine Learning Prediction of Defect Formation Energies: *V. Sharma*[1]; P. Kumar[2]; P. Dev[2]; G. Pilania[3]; [1]University of Tennessee Knoxville; [2]Howard University; [3]Los Alamos National Laboratory

3:50 PM
Accuracy, Uncertainty, Inspectability: The Benefits of Compositionally-restricted Attention-based Networks: *T. Sparks*[1]; S. Kauwe[1]; R. Murdock[1]; A. Wang[2]; [1]University of Utah; [2]Technische Universitat Berlin

4:10 PM
A Probabilistic Approach with Built-in Uncertainty Quantification for the Calibration of a Superelastic Constitutive Model from Full-field Strain Data: *H. Paranjape*[1]; K. Aycock[2]; C. Bonsignore[1]; J. Weaver[2]; B. Craven[2]; T. Duerig[1]; [1]Confluent Medical; [2]U.S. Food and Drug Administration

4:30 PM
Uncertainty Quantification of Microstructures with a New Technique: Shape Moment Invariants: *A. Senthilnathan*[1]; P. Acar[1]; [1]Virginia Tech

4:50 PM
Predicting Adsorption Energies and Surface Pourbaix Diagram of Metal NPs by GCNN Method: K. Bang[1]; Y. Park[1]; D. Kim[2]; S. Han[2]; *H. Lee*[1]; [1]KAIST; [2]KIST

Algorithm Development in Materials Science and Engineering — Machine Learning Algorithms and Computational Modeling for Study and Design Materials

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

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

Monday PM **March 15, 2021**

2:00 PM Invited
Multi-Information Source Bayesian Optimization Applied to Materials Design: *R. Arroyave*[1]; D. Khatamsaz[1]; R. Couperthwaite[1]; A. Molkeri[1]; D. Allaire[1]; A. Srivastava[1]; [1]Texas A&M University

2:30 PM
Understanding Grain Boundary Metastability Using the SOAP Descriptor and Unsupervised Machine Learning Techniques: *L. Serafin*[1]; D. Hensley[1]; J. Spendlove[1]; G. Hart[1]; E. Homer[1]; [1]Brigham Young University

2:50 PM
Grain Boundary Network Optimization through Human Computation and Machine Learning: *C. Adair*[1]; O. Johnson[1]; [1]Brigham Young University

3:10 PM Invited
Deep Learning for Characterization of Deformation Induced Damage: *U. Kerzel*[1]; S. Medghalchi[2]; C. Kusche[2]; T. Al-Samman[2]; S. Korte-Kerzel[2]; [1]IUBH; [2]RWTH Aachen University

3:40 PM
Automatic Segmentation of Microstructures in Steel Using Machine Learning Methods: *H. Kim*[1]; J. Inoue[1]; T. Kasuya[1]; [1]The University of Tokyo

4:00 PM
2D Microstructure Reconstruction for SEM via Non-local Patch-based Image Inpainting: *A. Tran*[1]; H. Tran[2]; [1]Sandia National Laboratories; [2]Oak Ridge National Laboratory

4:20 PM Invited
AI-assisted Analysis of Flame Stability: *M. Stan*[1]; J. Pan[2]; N. Paulson[1]; J. Libera[1]; [1]Argonne National Laboratory; [2]Princeton University

4:50 PM
Neural Network Model of He Diffusion in W-based High Entropy Alloys: G. Esteban-Manzanares[1]; E. Martínez[2]; D. Nguyen[2]; *J. Llorca*[3]; [1]IMDEA Materials Institute; [2]Los Alamos National Laboratory; [3]IMDEA Materials Institute & Technical University of Madrid

5:10 PM
Comparison of Correction Schemes for Charged Point Defects in 2D Materials: *P. Vargas*[1]; A. Tan[1]; B. Rijal[1]; R. Hennig[1]; [1]University of Florida

Alloys and Compounds for Thermoelectric and Solar Cell Applications IX — 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; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Tiejun Zhu, Zhejiang University; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology

Monday PM **March 15, 2021**

2:00 PM Invited
Challenges and Opportunities of Flexible Thermoelectric Devices Based on Printing Technology: *C. Liao*[1]; [1]National Tsing Hua University

2:20 PM Invited
Comparing Thermoelectricity of Bulk and Thin Film Heusler Alloys: *E. Bauer*[1]; B. Hinterleitner[1]; A. Riss[1]; M. Parzer[1]; F. Garmroudi[1]; T. Mori[2]; X. Chen[3]; [1]Technische Universität Wien; [2]NIMS; [3]Shenyang National Laboratory for Materials Science

2:40 PM
Optimizing Thermoelectric Properties of Few-layer Transition Metal Dichalcogenides: *T. Zhu*[1]; M. Zebarjadi[1]; [1]University of Virginia

3:00 PM
Solid-state thermionic Devices: Effect of Asymmetry on the Device Performance: *M. Rosul*[1]; M. Zebarjadi[1]; [1]University of Virginia

3:20 PM
Interfacial Reaction in Ag/Se, Ag/Te, Ag2Te/Se and Ag2Te/Se-30at.%Te Couples and Their Related Phase Diagram: *Y. Hutabalian*[1]; S. Chen[1]; [1]National Tsing Hua University

3:40 PM
Thermoelectric Cell Setup for Heat Recovery in Industrial Chimneys: M. Castañeda Montoya[1]; A. Amell Arrieta[1]; *H. Colorado*[1]; [1]Universidad de Antioquia

4:00 PM Invited
Impact of Surface Engineering in Silicon Film Thermoelectrics: *M. Nomura*[1]; [1]The University of Tokyo

4:20 PM Invited
Developing Thermoelectric Thin Films and Modules for IoT Energy Harvesting: *T. Mori*[1]; [1]National Institute for Materials Science

4:40 PM Invited
Thermomagnetic Transport in 2D Layered Topological Materials: *M. Zebarjadi*[1]; M. Akhanda[1]; E. Rezaei[1]; M. Rosul[1]; K. Esfarjani[1]; A. Davydov[2]; S. Krylyuk[2]; [1]University of Virginia; [2]NIST

5:00 PM Invited
Cu-Sn Based Thiospinel Compounds: Insight of Alternative Route for Developing Thermoelectrics Thiospinel Compounds?: *C. Bourgès*[1]; [1]Nims

5:20 PM
First-principles Calculation of Nernst Coefficient and Magneto-Seebeck: *E. Rezaei*[1]; M. Akhanda[1]; K. Esfarjani[1]; M. Zebarjadi[1]; [1]University of Virginia

Alumina and Bauxite — Process Optimization and Bauxite Enrichment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Anne Duncan, Hatch

Monday PM **March 15, 2021**

2:00 PM
Introductory Comments: Alumina and Bauxite: *A. Duncan*[1]; [1]Hatch

2:05 PM Invited
Implementation of Digital Technologies in Alumina Refining: A Producer Experience: *V. Golubev*[1]; D. Mayorov[1]; D. Chistyakov[1]; E. Fomichev[1]; I. Blednykh[1]; A. Panov[1]; [1]RUSAL Engineering and Technological Center

2:40 PM
The Application of Intelligent Control to Red Mud Settling and Washing in Alumina Refinery: *J. Tian*[1]; Y. Jiang[1]; Z. Zhang[1]; [1]Shenyang Aluminium and Magnesium Engineering and Research Institute Co., Ltd

3:00 PM
Alumina Refinery Volume Control: *T. Franco*[1]; [1]CBA

Aluminum Alloys, Processing and Characterization — Alloy and MMC Development

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Dimitry Sediako, University of British Columbia

Monday PM **March 15, 2021**

2:00 PM
Introductory Comments: Aluminum Alloys, Processing and Characterization: *D. Sediako*[1]; [1]University of British Columbia

2:05 PM Invited
Anodization Compatibility of Eutectic Aluminum-Cerium Alloys: *Z. Sims*[1]; D. Weiss[2]; H. Henderson[3]; O. Rios[4]; J. Jun[5]; S. Debashish[6]; M. Wiener[7]; R. Ott[8]; F. Meng[8]; [1]University of Tennessee; [2]Eck Industries; [3]Lawrence Livermore National Laboratory; [4]University of Tennessee Knoxville; [5]Oak Ridge National Laboratory; [6]University of Virginia; [7]Auto Anodics; [8]Ames Laboratory

2:35 PM
Al-Sm Alloys Under Far-from-Equilibrium Conditions: Y. Kalay[1]; *C. Okuyucu*[1]; B. Kaygusuz[1]; C. Isiksaçan[2]; O. Meydanoglu[2]; S. Özerinç[1]; A. Motallebzadeh[3]; [1]Middle East Technical University; [2]Assan; [3]Koç University

2:55 PM
Effect of Minor Additives to Al-Zn-Mg Alloys on Welding and Corrosion Performance for Building Constructions: *A. Gradoboev*[1]; D. Ryabov[1]; V. Mann[2]; A. Krokhin[2]; R. Vakhromov[1]; A. Ivanova[1]; A. Legkikh[1]; [1]Light Materials and Technology Institute LLC; [2]RUSAL Management JSC

3:15 PM
Mechanism Behind Al/Cu Interface Reaction: The Kinetics and Diffusion of Cu in Forming Different Intermetallic Compounds: Y. Ren[1]; J. Chen[1]; *B. Zhao*[2]; [1]Yonggu Group Corporation Co., Ltd.; [2]Shanghai University

3:35 PM
Phase Formation of Mo- and Cr-rich Compounds in an Al-Si Cast Alloy: *P. Decker*[1]; J. Steglich[1]; A. Kauws[1]; A. Kiefert[1]; L. Marzoli[1]; M. Rosefort[1]; [1]Trimet Aluminium SE

3:55 PM
Understanding the Effect of Quench Delay and Alloy Chemistry on Various 6000 Series Alloys Systems
: D. Shoemaker[1]; *R. Matuska*[1]; [1]Kaiser Aluminum

4:15 PM
Effect of Heat Treatment on the Microstructure and Mechanical Properties of LB-PBF AlSi10Mg and Scalmalloy: *S. Baig*[1]; S. Ghiaasiaan[1]; N. Shamsaei[1]; [1]Auburn University

4:35 PM
Thermal Properties of Hybrid al-cu-Components Produced by Combining Powder Pressing and Semi-solid Forming Strategies: *M. Speth*[1]; M. Liewald[1]; K. Riedmueller[1]; [1]Universtiy of Stuttgart, Institute for Metal Forming Technology

Aluminum Reduction Technology — Cell Modernization (Modelling and Energy Optimization)

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Nadia Ahli, Emirates Global Aluminium; Nancy Holt, Hydro Aluminium AS

Monday PM **March 15, 2021**

2:00 PM
Introductory Comments: Aluminum Reduction Technology: *N. Ahli*[1]; [1]Emirates Global Aluminium

2:05 PM
Mass Transport by Waves: Bath-metal Interface Deformation, Rafts Collision and Physical Model: *L. Rakotondramanan*[1]; L. Kiss[1]; S. Poncsák[1]; R. Santerre[1]; S. Guerard[2]; J. Bilodeau[2]; S. Richer[1]; [1]Grips Universite Du Quebec A Chicoutimi; [2]Rio Tinto

2:25 PM
Modeling Anode Current Pickup After Setting: *C. Wong*[1]; Y. Yao[1]; J. Bao[1]; M. Skyllas-Kazacos[1]; B. Welch[1]; A. Jassim[2]; [1]University of New South Wales; [2]Emirates Global Aluminum

2:45 PM
Superconductor Busbars – High Benefits for Aluminium Plants: *W. Reiser*[1]; T. Reek[2]; C. Räch[3]; D. Kreutzer[3]; [1]Vision Electric Super Conductors GmbH; [2]Martin Iffert Consulting; [3]University of Applied Sciences Kaiserslautern

3:05 PM
Coupled SPH-DEM to Simulate the Injection of a Powder into a Liquid with Heat Transfer and Phase Change: *T. Roger*[1]; L. Kiss[1]; K. Fraser[2]; S. Poncsak[3]; S. Guérard[3]; J. Bilodeau[3]; G. Bonneau[1]; [1]Universite Du Quebec A Chicoutimi; [2]National Research Council Canada; [3]Rio Tinto Aluminium

3:25 PM
Individual Anode Current Monitoring during Aluminum Reduction Cell Power Reduction: *Y. Yao*[1]; J. Bao[1]; M. Skyllas-Kazacos[1]; B. Welch[1]; A. Jassim[2]; [1]University of New South Wales; [2]Emirates Global Aluminum

Bio-Nano Interfaces and Engineering Applications — Bio-Nano II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Monday PM **March 15, 2021**

2:00 PM Invited
Flexible-glass Like Coating onto PTFE Vascular Graft Material via Nonthermal Plasma Process: V. Vijayan[1]; B. Tucker[1]; Y. Vohra[1]; *V. Thomas*[1]; [1]University of Alabama at Birmingham

2:30 PM
Detection of Limonene Using Graphene Field Effect Transistor Modified by Self-assembling Peptide: *H. Chishu*[1]; Y. Sugizaki[2]; A. Isobayashi[2]; Y. Hayamizu[1]; [1]Tokyo Tech; [2]Toshiba Corporation

2:50 PM Invited
The Mechanical Significance of Sublamellar Organization of Mineralized Collagen Fibrils: *S. Utku*[1]; [1]Yeditepe University Biomedical Engineering

3:20 PM
Developing Nanostructured Metals for Innovative Medical Implants with Improved Design and Biofunctionality: *R. Valiev*[1]; E. Parfenov[1]; O. Kulyasova[1]; [1]UFA State Aviation Technical University

Characterization of Minerals, Metals and Materials 2021 — Advanced Microstructure Characterization

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

Monday PM **March 15, 2021**

2:00 PM
Utilizing Advanced Manufacturing Techniques for Accumulative Roll Bonding Parameter Development: *D. Coughlin*[1]; C. Miller[1]; T. Nizolek[1]; R. McCabe[1]; J. Carpenter[1]; [1]Los Alamos National Laboratory

2:20 PM
A Comparison between ZnO Cauliflowers on Glass and Aluminum Substrates: *S. Ikhmayies*; [1]

2:40 PM
Plastic Behavior and Texture Anisotropy in Dynamically Loaded Tin: *V. Anghel*[1]; C. Trujillo[1]; R. Martinez[1]; G. Gray III[1]; [1]Los Alamos National Laboratory

3:00 PM
Effect of Misorientation Development Near Grain and Twin Boundaries in Pure Copper and Copper-aluminium Alloy: *S. Verma*[1]; P. Pant[1]; M. Gururajan[1]; [1]Indian Institute of Technology Bombay

3:20 PM
Rapid Irradiation and Characterization of HT9: *G. Bruno*[1]; K. Field[1]; L. He[2]; T. Green[1]; T. Allen[1]; [1]University of Michigan; [2]University of Wisconsin-Madison

3:40 PM
The Influence of Alloying in Stabilizing a Faceted Grain Boundary Structure: *J. Priedeman*[1]; G. Thompson[1]; [1]University of Alabama

4:00 PM
Crystal Mosaicity and Local Alloy Chemistry of Low Angle Grain Boundaries in Ni-based Superalloys: *F. Scholz*[1]; J. He[2]; O. Horst[1]; P. Thome[1]; G. Eggeler[1]; B. Gault[2]; J. Frenzel[1]; [1]Ruhr-Universitat Bochum; [2]Max-Planck-Institut für Eisenforschung GmbH

4:20 PM
Insights into the Formation of Al-Cu Intermetallic Compounds during the Solid-liquid Reaction by High-resolution Transmission Electron Microscopy: J. Chen[1]; Y. Ren[1]; *B. Zhao*[2]; [1]Yonggu Group Corporation Co., Ltd.; [2]Shanghai University

Characterization of Nuclear Materials and Fuels with Advanced X-ray and Neutron Techniques — X-ray Diffraction/Scattering II

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee
Program Organizers: Xuan Zhang, Argonne National Laboratory; Jonathan Almer, Argonne National Laboratory; Maria Okuniewski, Purdue University; Joshua Kane, Idaho National Laboratory; Donald Brown, Los Alamos National Laboratory; J. Kennedy, Idaho National Laboratory; Arthur Motta, Pennsylvania State University

Monday PM **March 15, 2021**

2:00 PM Invited
In-situ Investigation into The Stability of Hydride Phases in Zirconium: *F. Long*[1]; N. Badr[1]; M. Topping[1]; I. Cherubin[1]; J. Park[2]; M. Daymond[1]; [1]Queens University; [2]Advanced Photon Source

2:30 PM
In-situ Synchrotron X-ray Diffraction Study on Tensile Deformation of Neutron Irradiated Fe-Cr-C Alloys: *H. Lee*[1]; X. Liu[2]; M. Warren[3]; D. Piedmont[1]; X. Zhang[4]; M. Li[4]; J. Terry[3]; J. Almer[4]; J. Stubbins[1]; [1]University of Illinois at Urbana-Champaign; [2]Idaho National Laboratory; [3]Illinois Institute of Technology; [4]Argonne National Laboratory

2:50 PM
Microstructural Characterization of the Stress and Strain Deformation Partitioning Evolution in Tungsten Heavy Alloys: *D. Sprouster*[1]; M. Alam[2]; G. Odette[2]; L. Snead[1]; [1]Stony Brook University; [2]UCSB

3:10 PM
Creep Behavior of Advanced Austenitic (Fe-25Ni-20Cr) Alloy 709 through In-situ Neutron Diffraction Characterization and Transmission Electron Microscopy Characterization: Y. Zhao[1]; *R. Schoell*[1]; M. Frost[2]; D. Kaoumi[1]; [1]North Carolina State University; [2]Oak Ridge National Laboratory

3:30 PM
Using In-situ Synchrotron X-ray Scattering to Determine the TTT Diagram of U-6Nb: *N. Peterson*[1]; J. Zhang[2]; D. Brown[2]; B. Clausen[2]; E. Zepeda-Alarcon[2]; E. Watkins[2]; E. Garlea[3]; S. Agnew[1]; [1]University of Virginia; [2]Los Alamos National Laboratory; [3]Y-12 National Security Complex

Coatings and Surface Engineering for Environmental Protection III — Protection from Environmental Degradation, Session II

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Arif Mubarok, PPG; Tushar Borkar, Cleveland State University; Rajeev Gupta, North Carolina State University; Mary Lyn Lim, PPG Industries; Raul Rebak, GE Global Research; Brian Okerberg, PPG Industries

Monday PM **March 15, 2021**

2:00 PM
Designing Lubricant-impregnated Coatings to Reduce Corrosion and Hydrogen Embrittlement: *S. Khan*[1]; K. Varanasi[1]; [1]Massachusetts Institute of Technology

2:20 PM
Effects of Heat Treatments, Current Density, and Electroless Ni Layer Thickness on Corrosion Performance of Trivalent Chromium Passivations on ZnNi Coatings: *K. Foster*[1]; W. Fahrenholtz[2]; M. O'Keefe[2]; J. Claypool[2]; [1]Missouri University of Science & Technology; [2]Missouri University of Science & Technology

2:40 PM
Electronic Structure Mechanisms to Explain the Onset of Cl-induced Localised Corrosion in Al_2O_3: *A. Sundar*[1]; G. Chen[1]; L. Qi[1]; [1]University of Michigan

3:00 PM
Galvanic Corrosion Mitigation by Material and Coating Selection for AZ31B bolt-joined with CFRP: *Y. Lim*[1]; J. Jun[1]; C. Warren[1]; Z. Feng[1]; [1]Oak Ridge National Laboratory

3:20 PM
Using Mechanical and Ion Polishing to Identify Structural and Chemical Defects for the Pitting Corrosion of a Compositionally Complex Steel: *M. Wischhusen*[1]; C. Glover[1]; J. Scully[1]; S. Agnew[1]; [1]University of Virginia

Composite Materials for Nuclear Applications — Metal Based Composites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee, TMS: Nuclear Materials Committee
Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Oak Ridge National Laboratory; Peng Xu, Idaho National Laboratory; Johann (Hans) Riesch, Max Planck Institute for Plasma Physics

Monday PM **March 15, 2021**

2:00 PM
A Novel Processing Route for ODS Steel by Liquid Metallurgy: *S. Zheng*[1]; X. Li[1]; [1]UCLA

2:20 PM
Competition between Void Evolution and Amorphization In Radiation-tolerant Nanocrystalline Cu-10at%Ta Alloy: *P. Patki*[1]; W. Chen[2]; J. Wharry[1]; [1]Purdue University; [2]Argonne National Laboratory

2:40 PM
Enhanced Microstructural Stability of ARB-processed Cu/Nb Nanolayers Under Heavy Dose Ion Irradiation at Elevated Temperatures: *M. Radhakrishnan*[1]; T. Nizolek[2]; M. Bachhav[3]; Y. Wang[2]; N. Mara[4]; O. Anderoglu[1]; [1]University of New Mexico; [2]Los Alamos National Laboratory; [3]Idaho National Laboratory; [4]University of Minnesota

3:00 PM
Evaluation and Irradiation of 14YWT Capacitive Discharge Resistance Welds: *C. Lear*[1]; B. Eftink[1]; H. Kim[1]; T. Steckley[1]; T. Lienert[2]; S. Maloy[1]; [1]Los Alamos National Laboratory; [2]T.J. Lienert Consulting, LLC

3:20 PM
Irradiation Induced Forced Chemical Mixing and Local Hardening in Mechanically-processed Immiscible Zr/Nb Multilayers: *M. Radhakrishnan*[1]; T. Nizolek[2]; D. Savage[3]; M. Knezevic[3]; N. Li[2]; Y. Wang[2]; M. Bachhav[4]; B. Kombaiah[4]; N. Mara[5]; O. Anderoglu[1]; [1]University of New Mexico; [2]Los Alamos National Laboratory; [3]University of New Hampshire; [4]Idaho National Laboratory; [5]University of Minnesota

3:40 PM
Mechanical Strength of Explosion Welded Thin Stainless-steel Cladding on Carbon Steel: *N. Reid*[1]; L. Garrison[2]; J. Echols[2]; K. Bawane[3]; J. Allain[4]; [1]University of Illinois Urbana Champaign; [2]Oak Ridge National Laboratory; [3]Idaho National Laboratory; [4]Pennsylvania State University

4:00 PM
Radiation Tolerance and Microstructural Changes of Nanocrystalline Cu-Ta Alloy to High Dose Self-ion Irradiation: *S. Srinivasan*[1]; C. Kale[1]; B. Hornbuckle[2]; K. Darling[2]; M. Chancey[3]; E. Hernández-Rivera[2]; Y. Chen[4]; T. Koenig[5]; Y. Wang[3]; G. Thompson[5]; K. Solanki[1]; [1]Arizona State University; [2]Army Research Laboratory; [3]Los Alamos National Laboratory; [4]CAMECA Instruments Inc; [5]The University of Alabama

4:20 PM
Synthesis and Irradiation Response of Hetero FeCr - Fe_2O_3 Interfaces: *B. Derby*[1]; J. Baldwin[1]; D. Kaoumi[2]; D. Edwards[3]; D. Schreiber[3]; T. Lach[4]; B. Uberuaga[1]; N. Li[1]; [1]Los Alamos National Laboratory; [2]North Carolina State University; [3]Pacific Northwest National Laboratory; [4]Oak Ridge National Laboratory

4:40 PM
Understanding Defect Recovery and Accommodation and Their Implications on Mechanical Performance in Irradiated Nanocomposite Materials: *M. Wurmshuber*[1]; D. Frazer[2]; M. Balooch[3]; I. Issa[1]; A. Bachmaier[4]; P. Hosemann[3]; D. Kiener[1]; [1]Montanuniversitaet Leoben; [2]Los Alamos National Laboratory; [3]University of California, Berkeley; [4]Erich Schmid Institute of Materials Science

Computational and Modeling Challenges in Metals and Alloys for Extreme Environments — High Strain Rates and Irradiation Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jean-Briac le Graverend, Texas A&M University; Jaafar El-Awady, Johns Hopkins University; Giacomo Po, University of Miami; Beñat Gurrutxaga-Lerma, University of Birmingham

Monday PM **March 15, 2021**

2:00 PM
Investigation of Role of Interface Microstructure on the Shock Compression and Spall Failure Behavior of Nanoscale Cu/Ta Multiphase Metallic Materials: *M. Echeverria*[1]; A. Dongare[1]; [1]University of Connecticut

2:20 PM
Modeling of Laser Interactions with BCC Metals Using a Hybrid Atomistic-continuum Approach: *C. Chen*[1]; A. Mishra[1]; S. Galitskiy[1]; A. Dongare[1]; [1]University of Connecticut

2:40 PM
Large-scale Molecular Dynamics Simulations of Ejecta Jet Formation of Cu and Sn at High Strain Rates: *M. Echeverria*[1]; A. Saunders[2]; A. Dongare[1]; T. Haxhimali[2]; R. Rudd[2]; F. Najjar[2]; [1]University of Connecticut; [2]Lawrence Livermore National laboratory

3:00 PM
Mesoscale Modeling of Deformation Behavior of Fe-based Microstructures at High Strain Rates and under Shock Loading Conditions: *K. Ma*[1]; A. Dongare[1]; [1]University of Connecticut

3:20 PM
The Microscopic Structure of a Heavily Irradiated Metal: *P. Derlet*[1]; S. Dudarev[2]; [1]Paul Scherrer Insitute; [2]UKAEA CCFE

Computational Thermodynamics and Kinetics — Diffusion, Kinetics and Non-equilbrium Events

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

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2:00 PM
Hydrogen Diffusion and Trapping in Multiphase Materials: A Multiscale Model for Non-point Trapping: *F. León-Cázares*[1]; D. Dziedzic[1]; E. Galindo-Nava[1]; [1]University of Cambridge

2:20 PM
Kinetic Assessment of HCP Mg-Li-Al Alloys: *D. Christianson*[1]; L. Zhu[2]; M. Manuel[1]; [1]University of Florida; [2]Yantai University

2:40 PM
Quantitative Inference of the Mobility Coefficient in the Cahn-Hilliard Equation from a Model Experiment: *Z. Mao*[1]; M. Demkowicz[1]; [1]Texas A&M University

3:00 PM Invited
Defect Kinetics in Multi-component Oxides via Accelerated Molecular Dynamics: *B. Uberuaga*[1]; G. Pilania[1]; [1]Los Alamos National Laboratory

3:30 PM Invited
Predicting Non-equilibrium Patterns Beyond Thermodynamic Concepts: Application to Radiation Induced Microstructures: *D. Simeone*[1]; P. Garcia[1]; L. Luneville[1]; [1]CEA

4:00 PM
Quantitative Phase-field Modeling for Corrosion of Engine Materials at High Temperature: *X. Wu*[1]; M. Tonks[1]; [1]University of Florida

4:20 PM Invited
Molecular Dynamics Modeling of Embrittlement in Irradiated Nickel-base Alloys: *M. Demkowicz*[1]; [1]Texas A&M University

4:50 PM Invited
Modeling Delayed-onset Kinetics of Materials Used in Nuclear Power Applications Using Atomistic Simulations: *L. Béland*[1]; C. Dai[2]; P. Saidi[1]; E. Nicholson[3]; Y. Luo[1]; C. Singh[3]; M. Daymond[1]; Z. Yao[1]; [1]Queen's University; [2]Canadian Nuclear Laboratories; [3]University of Toronto

Continuous Phase Transformations — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee
Program Organizers: Jessica Krogstad, University of Illinois at Urbana-Champaign; Gregory Thompson, University of Alabama; Matthew Steiner, University of Cincinnati; Janelle Wharry, Purdue University

Monday PM **March 15, 2021**

2:00 PM Invited
Effect of Bulk and Local Phase Transformation on Deformation Mechanisms: *M. Ghazisaeidi*[1]; M. Shih[1]; E. Antillon[2]; [1]Ohio State University; [2]Naval Research Lab

2:30 PM
Cross-Slip and Work-Hardening in Short-Range Ordered FCC Alloys: *A. Abu-Odeh*[1]; M. Asta[1]; [1]University of California, Berkeley

2:50 PM Invited
Structural Transformations Driven by Irradiation in the High Defect Density Limit: *S. Dudarev*[1]; D. Mason[1]; P. Derlet[2]; [1]UK Atomic Energy Authority; [2]Paul Scherrer Institut

3:20 PM
Magnetically Driven Short-range Order in the CrCoNi System: *F. Walsh*[1]; R. Ritchie[1]; M. Asta[1]; [1]Lawrence Berkeley National Laboratory

3:40 PM
Short-range Clustering and Ordering Evolution of Ni-22Cr-13Mo Alloy: *P. Kung*[1]; J. Krogstad[1]; [1]University of Illinois at Urbana-Champaign

4:00 PM
Thermodynamics of the Invar Transition: Phonons vs. Magnetism: *S. Lohaus*[1]; P. Guzman[1]; B. Fultz[1]; [1]California Institute of Technology

4:20 PM Invited
Intrinsic Phase Stability and Continuous Phase Transformations in TiAlZrN Ultra-hard Nitride Coatings: *V. Attari*[1]; R. Arroyave[1]; [1]Texas A&M University

Corrosion in Heavy Liquid Metals for Energy Systems — Materials Compatibility with Liquid Metal Coolants II

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
Program Organizers: Osman Anderoglu, University of New Mexico; Alessandro Marino, SCK-CEN; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California; Mike Ickes, Westinghouse Electric Company

Monday PM **March 15, 2021**

2:00 PM
Numerical Modelling of Coolant Chemistry in Lead Bismuth Eutectic Cooled Nuclear Reactors: *A. Marino*[1]; K. Gladinez[1]; B. Gonzalez Prieto[1]; J. Lim[1]; K. Rosseel[1]; A. Aerts[1]; [1]SCK-CEN

2:20 PM Invited
Behaviour of Spallation, Activation and Fission Products in LBE: *A. Aerts*[1]; B. Gonzalez Prieto[1]; J. Neuhausen[2]; [1]SCK CEN; [2]Paul Scherrer Institut

2:45 PM
Engineering Model of the Kinetics of the Steel Oxide Layer in a Flow of a Heavy Liquid Metal Coolant Under Various Oxygen Conditions: A. Avdeenkov[1]; A. Orlov[2]; *N. Kabir*[3]; [1]«All-Russian Research Institute for Nuclear Power Plants Operation» JSC; [2]Proryv JSC; [3]MEPhI

3:05 PM Invited
Progress in LBE Chemistry Control and Measurement Techniques for MYRRHA: *J. Lim*[1]; K. Gladinez[1]; B. Gonzalez-Prieto[1]; A. Marino[1]; K. Rosseel[1]; A. Aerts[1]; [1]SCK CEN

3:30 PM
PILLAR: Pool-type Integral Leading Facility for Lead-alloy Cooled Advanced Small Modular Reactor, and Its Use for Natural Convection Study and Corrosion: *J. Choi*[1]; S. KIM[1]; K. Keum[1]; Y. Lee[1]; I. Hwang[2]; H. Lee[3]; [1]Seoul National University; [2]Ulsan National Institute of Science and Engineering (UNIST); [3]Moojin

3:50 PM
Materials Compatibility Testing with Molten Lead up to 700°C: *O. Anderoglu*[1]; C. Cakez[1]; S. Ghosh[1]; K. Talaat[1]; M. Radhakarishnan[1]; K. Woloshun[2]; C. Unal[2]; S. Maloy[2]; M. Ickes[3]; P. Ferroni[3]; [1]University of New Mexico; [2]Los Alamos National Laboratory; [3]Westinghouse Electric Company

4:10 PM
Anubis Multiphysics: A Neutronics-Thermal Hydraulics Coupling Platform for Flow Accelerated Corrosion Modeling in Reactor Conditions: *K. Talaat*[1]; O. Anderoglu[1]; [1]The University of New Mexico

4:30 PM
Performance of Candidate Alloys at 500°C in Flowing Lead: *C. Cakez*[1]; S. Ghosh[1]; K. Talaat[1]; K. Woloshun[1]; S. Maloy[2]; C. Unal[2]; M. Ickes[3]; P. Ferroni[4]; O. Anderoglu[1]; [1]University of New Mexico; [2]Los Alamos National Lab; [3]Westinghouse Electric Corporation ; [4]Westinghouse Electric Corporation

Data Science and Analytics for Materials Imaging and Quantification — Session II: Data-led Approaches for 3D Characterization & X-Ray Imaging

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Emine Gulsoy, Northwestern University; Charudatta Phatak, Argonne National Laboratory; Stephan Wagner-Conrad, Carl Zeiss Microscopy; Marcus Hanwell, Brookhaven National Laboratory; David Rowenhorst, Naval Research Laboratory; Tiberiu Stan, Northwestern University

Monday PM **March 15, 2021**

2:00 PM
Convolutional neural network-assisted recognition of nanoscale L12 ordered structures in face-centred cubic alloys: *Y. Li*[1]; L. Stephenson[1]; R. Dierk[1]; B. Gault[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

2:20 PM
Deep Neural Network Facilitated Complex Imaging of Phase Domains: *L. Wu*[1]; P. Juhas[1]; S. Yoo[1]; I. Robinsion[1]; [1]Brookhaven National Lab

2:40 PM
Quantitative X-ray Fluorescence Nanotomography: *M. Ge*[1]; X. Huang[1]; H. Yan[1]; W. Chiu[2]; K. Brinkman[3]; Y. Chu[1]; [1]Brookhaven National Laboratory; [2]University of Connecticut; [3]Clemson University

3:00 PM
Materials Characterization in 3D Using High Energy X-ray Diffraction Microscopy: Irradiated and Deformed Materials: *H. Sharma*[1]; P. Kenesei[1]; J. Park[1]; Z. Liu[1]; J. Almer[1]; [1]Argonne National Laboratory

3:20 PM
Understanding the Keyhole Dynamics in Laser Processing Using Time-resolved X-ray Imaging Coupled With Computer Vision and Data Analytics: *J. Pyeon*[1]; J. Aroh[1]; R. Jiang[1]; A. Ramlatchan[2]; B. Gould[3]; A. Rollett[1]; [1]Carnegie Mellon University; [2]NASA Langley Research Center; [3]Argonne National Laboratory

3:40 PM
Assimilation of High-volume XCT Scans for Simultaneous Feedstock and Assembly Uncertainty Quantification for Powderbed Laser Fusion Additive Manufacturing: *W. Rosenthal*[1]; [1]Pacific Northwest National Laboratory

4:00 PM Question and Answer Period

Deformation Induced Microstructural Modification — Session II: In Situ Interrogation of Microstructural Evolution During Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Suveen Mathaudhu, University of California-Riverside ; Kester Clarke, Colorado School of Mines; Bharat Gwalani, Pacific Northwest National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

Monday PM **March 15, 2021**

2:00 PM Invited
Probing Microstructural Evolution in Deformation with Electrons and X-rays: *A. Rollett*[1]; R. Suter[1]; R. Lim[1]; M. Wilkin[1]; Y. Zhang[1]; P. Promoppatum[2]; C. Cocke[3]; A. Spear[3]; R. Lebensohn[4]; J. Gordon[1]; [1]Carnegie Mellon University; [2]KMUTT; [3]University of Utah; [4]Los Alamos National Laboratory

2:30 PM
In Situ Analysis of Microstructural Evolution of Metallic Alloys under High Speed Rotational Shear Deformation: *A. Devaraj*[1]; T. Liu[1]; B. Gwalani[1]; M. Olszta[1]; c. Park[2]; S. Sinogeikin[3]; C. Powell[1]; S. Mathaudhu[4]; [1]Pacific Northwest National Laboratory; [2]High pressure collaborative access team; [3]DAC tools; [4]University of California Riverside

2:50 PM Invited
Deformation at a Single Precipitate Using a Nanocube Model System: *W. Gu*[1]; M. Kiani[1]; M. Murayama[2]; [1]Stanford University; [2]Virginia Tech

3:20 PM
In-situ Analysis of Microscale Deformation and Fracture in Severely Deformed Polycrystalline Tungsten: *L. Draelos*[1]; Z. Levin[1]; A. Srivastava[1]; [1]Texas A&M University

Design and Manufacturing Approaches for the Next Generation of Sustainable Materials: The 2021 Student-led Symposium — Materials for Energy Production and Storage

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Mary Dougherty, Colorado School of Mines; Christopher Finfrock, Colorado School of Mines; Brady McBride, Colorado School of Mines; Jaden Zymbaluk, Colorado School of Mines; Desmond Mills, Colorado School of Mines; Casey Gilliams, Colorado School Of Mines

Monday PM **March 15, 2021**

2:00 PM Invited
III-V Photovoltaic Substrate Reuse and Recycle Strategies for Reduced Cost and Improved Materials Utilization: *C. Packard*[1]; [1]Colorado School of Mines

2:20 PM Invited
Reducing CO2 Emissions Through Improvements in the Materials Science of Fossil Fuels: *J. Erlebacher*[1]; S. Lakshman[1]; G. Greenidge[1]; [1]Johns Hopkins University

2:40 PM Invited
Lithium-ion Battery Recycling Research at the ReCell Center: L. Gaines[1]; B. Polzin[1]; *J. Spangenberger*[1]; [1]Argonne National Laboratory

3:00 PM Invited
Stepwise Approach to Improving Lead Furnace Operation Through Pilot Scale Studies and Computational Modeling: *A. Anderson*[1]; J. Grogan[1]; J. Wagner[2]; S. Alavandi[3]; D. Cygan[3]; [1]Gopher Resource; [2]Gas Technology Institute ; [3]Gas Technology Institute

Electrode Technology for Aluminum Production — Carbon Anode Production – Where is the Cutting Edge? – A Focus on 4.0 and the Future

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Derek Santangelo, Hatch

Monday PM **March 15, 2021**

2:00 PM
Introductory Comments: Electrode Technology for Aluminum Production: *D. Santangelo*[1]; [1]Hatch

2:05 PM Invited
Digitalization in the Carbon Area as a Means to Improve Productivity: *A. Koulumies*[1]; P. Merlin[1]; A. Becerra[1]; [1]Metso Outotec

2:25 PM Invited
AMELIOS Suite or the Fives Digital Package for Carbon 4.0: *C. Bouche*[1]; X. Genin[1]; S. Georgel[1]; P. Mahieu[1]; [1]Fives

2:45 PM
Development and Applications of the Four Points Probe (4PP) Electrical Resistivity Measurements for Anode Process Optimization: *J. Lauzon-Gauthier*[1]; J. Secasan[1]; [1]Alcoa Corporation

3:05 PM Invited
The Readiness and Compatibility of a Modern Anode Handling and Cleaning System for Industry 4.0 Technologies: *K. Williams*[1]; [1]Advanced Dynamics Corporation Ltd.

3:25 PM Break

3:40 PM Panel Discussion

Electronic Packaging and Interconnections 2021 — 3D Microelectronic Packaging and Emerging Interconnects

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Mehran Maalekian, Mat-Tech; Christopher Gourlay, Imperial College London; Babak Arfaei, Ford Motor Company; Praveen Kumar, Indian Institute of Science; Sai Vadlamani, Intel Corporation; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University

Monday PM **March 15, 2021**

2:00 PM
Electromigration of Cu-Cu Bonds Fabricated by Instant Bonding Using <111>-oriented Nanotwinned Cu Microbumps: *K. Shie*[1]; P. Hsu[1]; Y. Li[1]; K. Tu[1]; C. Chen[1]; [1]National Chiao Tung University

2:20 PM
Enhancement on the Bonding Strength of Instantly-bonded Cu-Cu Joints by Post Annealing: *J. Ong*[1]; C. Chen[1]; K. Tu[1]; [1]National Chiao Tung University

2:40 PM
High Electromigration Resistance of Nanotwinned Cu Redistribution Lines for Fan-out Packaging: *I. Tseng*[1]; C. Chen[1]; B. Lin[2]; C. Chang[2]; [1]National Chiao Tung University; [2]MediaTek Inc

3:00 PM
Phase-field Modeling of Electromigration-mediated Void Migration and Coalescence in Interconnects: *W. Farmer*[1]; S. Vemulapalli[1]; K. Ankit[1]; [1]Arizona State University

3:20 PM
Investigation of Interdiffusion In Micro Solder Joint with a Fine Pitch Copper Pillar Subjected to Electromigration Stressing: *H. Madanipour*[1]; Y. Kim[1]; A. Osmanson[1]; M. Tajedini[1]; C. Kim[1]; [1]University of Texas at Arlington

3:40 PM
On the 3D Evolution of the Nanoporous Structure of Sintered Ag on a Cu Substrate During Isothermal Aging Observed by In-situ X-ray NanoTomography: *K. N'Tsouaglo*[1]; A. Nait-Ali[1]; M. Gueguen[1]; P. Gadaud[1]; L. Signor[1]; J. Creus[2]; M. Legros[3]; Y. Liu[4]; X. Milhet[1]; [1]Prime Institute CNRS ENSMA; [2]LASIE Université La Rochelle; [3]CEMES CNRS; [4]SLAC-SSRL

4:00 PM
Low Temperature Cu Direct Bonding with (111)-oriented Nanotwinned Copper Films on Metal Substrates: *H. Liu*[1]; C. Chen[1]; [1]National Chiao Tung Universality

4:20 PM
Effect of Annealing on Mechanical Properties of nt-Cu Lines in Fan-out Wafer Level Packaging: *W. Hsu*[1]; Y. Li[1]; I. Tseng[1]; B. Lin[2]; C. Chang[2]; C. Chen[1]; [1]National Chiao Tung University; [2]MediaTek Inc.

4:40 PM
Direct Bonding Process of (111) Nanotwinned Copper Thin Films: *J. Zhong*[1]; Y. Tai[1]; F. Ouyang[1]; [1]National Tsing Hua University

Energy Technologies and CO2 Management — Session II

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
Program Organizers: Alafara Baba, University of Ilorin; Lei Zhang, University of Alaska Fairbanks; Donna Guillen, Idaho National Laboratory; Xiaobo Chen, RMIT University; John Howarter, Purdue University; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology; Hong Peng, University of Queensland; Yu Lin Zhong, Griffith University

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2:00 PM
Low Energy Mesoporous Silica Recovery from a Nigerian Kaolinite Ore for Industrial Value Additions: *A. Baba*[1]; A. Ibrahim[1]; D. Fapojuwo[2]; K. Ayinla[1]; D. Olaoluwa[1]; S. Girigisu[3]; M. Raji[1]; F. Akanji[4]; A. Alabi[5]; [1]University of Ilorin; [2]University of Johannesburg; [3]University of Ilorin; Federal Polytechnic Offa; [4]SHEDA, Abuja; [5]Kwara State University

2:20 PM
Prediction Model of Converter Oxygen Consumption Based on Recursive Classification and Feature Selection: *L. Zhang*[1]; Z. Zheng[1]; K. Zhang[1]; X. Shen[1]; Y. Wang[1]; [1]Chongqing University

2:40 PM
Reduction Behaviors of Hematite to Metallic Iron by Hydrogen at Low Temperatures: *K. He*[1]; Z. Zheng[1]; H. Chen[1]; W. Hao[1]; [1]Chongqing University

3:00 PM
Simulation and Optimization of Defluorination and Desulfurization Processes of Aluminum Electrolysis Flue Gas: *X. Li*[1]; Y. Liu[1]; X. Li[1]; T. Zhang[1]; [1]Northeastern University

3:20 PM
The Influence of Hydrogen Injection on the Reduction Process in the Lower Part of Blast Furnace: A Thermodynamic Study: *Z. Tang*[1]; Z. Zheng[1]; H. Chen[1]; K. He[1]; [1]Chongqing University

3:40 PM
A Study of Numerical Modeling of Jet Heating Phenomenon in a Porous Media: Q. Luo[1]; *Y. Chen*[1]; A. Silaen[1]; C. Zhou[1]; [1]Purdue University Northwest

Friction Stir Welding and Processing XI — High Melting Temperature Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

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2:00 PM
Study of Residual Stress and Microstructure Changes in Friction Stir Processed Dual Phase 980 Grade Steel: *K. Taniguchi*[1]; Y. Lim[2]; J. Bunn[2]; Z. Feng[2]; [1]JFE Steel Corporation; [2]Oak Ridge National Laboratory

2:20 PM
Advances in High Temperature FSW: Single Use Tools: *J. Martin*[1]; [1]TWI Ltd.

2:40 PM
Phosphorus Segregation and Its Effect on Properties in Friction Stir Welded High Phosphorus Weathering Steel: *T. Kawakubo*[1]; K. Ushioda[1]; H. Fujii[1]; [1]Joining and Welding Research Institute Osaka University

3:00 PM
Friction Stir Welding of Armor Grade Steels: S. Hawkes[1]; R. Giorjao[1]; M. McDonnell[2]; *A. Ramirez*[1]; A. Thiel[3]; M. Eff[4]; [1]Ohio State University; [2]US Army; [3]Oshkosh Corp.; [4]EWI

3:20 PM
Friction Stir Welding of NiTi Shape Memory Alloy: P. West[1]; V. Shunmugasamy[2]; *B. Mansoor*; I. Karaman[1]; [1]Texas A&M University; [2]Texas A&M University at Qatar

3:40 PM
On the Development of Friction Stir Welding to Repair or Mitigate Chloride-induced Corrosion in 304L Austenitic Stainless Steel: *B. Sutton*[1]; G. Marino[1]; R. Giorjao[1]; J. Srinivasan[1]; A. Ramirez[1]; J. Locke[1]; [1]Ohio State University

4:00 PM
Low-force Friction Surfacing for Crack Repair in 304L Stainless Steel: *H. Agiwal*[1]; H. Yeom[1]; K. Sridharan[1]; K. Ross[2]; F. Pfefferkorn[1]; [1]University of Wisconsin-Madison; [2]Pacific Northwest National Laboratory

4:20 PM
Evaluation of Residual Stresses in Isothermal Friction Stir Welded 304L Stainless Steel Plates: M. Bhattacharyya[1]; T. Herold[2]; K. Raja[1]; J. Darsell[3]; S. Jana[3]; *I. Charit*[1]; [1]University of Idaho; [2]National Institute of Standards and Technology; [3]Pacific Northwest National Laboratory

Frontiers in Solidification Science VIII — Convection & Gravity

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Monday PM **March 15, 2021**

2:00 PM Invited
Permeability Prediction of Dendritic Mushy Zone by Phase-field and Lattice Boltzmann Simulations: *T. Takaki*[1]; [1]Kyoto Institute of Technology

2:30 PM
Multiscale Modeling of Alloy Dendritic Growth with Liquid Convection: *T. Isensee*[1]; D. Tourret[2]; [1]IMDEA Materials Institute & Polytechnic University of Madrid; [2]IMDEA Materials Institute

2:50 PM Invited
Coupling of Solidification Grain Structures with Heat and Mass Transfers: *C. Gandin*[1]; V. Maguin[1]; G. Guillemot[1]; C. Xue[1]; M. Bellet[1]; R. Fleurisson[1]; Y. Wu[1]; O. Senninger[1]; [1]MINES ParisTech CEMEF UMR CNRS 7635

3:20 PM
Understanding the Role of Magnetic Fields on Freckle Formation during Solidification through In Situ Imaging: *X. Fan*[1]; N. Shevchenko[2]; S. Clark[1]; S. Marussi[1]; S. Shah[1]; R. Atwood[3]; S. Eckert[2]; A. Kao[4]; P. Lee[1]; [1]University College London; [2]Helmholtz-Zentrum Dresden-Rossendorf; [3]Diamond Light Source; [4]University of Greenwich

3:40 PM Invited
Solidification and Fluid Convection - The Story of an Inseparable Couple: S. Anders[1]; N. Shevchenko[1]; A. Kao[2]; *S. Eckert*[1]; [1]Helmholtz-Zentrum Dresden-Rossendorf; [2]University of Greenwich

4:10 PM
Directional Solidification of Al-10wt.%Cu Alloy in Hypergravity: *A. Jafarizadeh Koohbanani*[1]; S. Steinbach[1]; F. Kargl[1]; [1]German Aerospace Center, Institute of Materials Physics in Space

4:30 PM
A Comparison of Terrestrial and Microgravity Isothermal Equiaxed Alloy Solidification through Machine Learning, Multi-stage Thresholding and Sub-dendrite-based In Situ X-ray Video Processing: *J. Mullen*[1]; M. Celikin[1]; P. Cunningham[1]; D. Browne[1]; [1]University College Dublin

Frontiers of Materials Award Symposium: 2021 Functional Nanomaterials: Translating Innovation into Pioneering Technologies — Session II

Program Organizer: Huanyu Cheng, Pennsylvania State University

Monday PM **March 15, 2021**

2:00 PM Invited
Becoming Sustainable, The New Frontier in Soft Electronics and Robotics: *M. Kaltenbrunner*[1]; [1]Johannes Kepler University Linz

2:40 PM Invited
Organic Bioelectronics for the Precise Sensing, Delivery and Processing of Bio-signals: *M. Berggren*[1]; [1]Linköping University

3:20 PM Invited
Nanomembrane Materials for Electronic "Soft-Wear" and Micro-Robotic "Hard-Ware": *O. Schmidt*[1]; [1]Leibniz IFW Dresden; TU Chemnitz

4:00 PM Invited
Electronics on the Brain: *G. Malliaras*[1]; [1]University of Cambridge

4:40 PM Invited
3D Printing Functional Materials & Devices: *M. McAlpine*[1]; [1]University of Minnesota

Greater Than the Sum of Its Parts — Concurrent Alloy Design and Processing Science: An LMD Symposium Honoring Raymond Decker — Session I

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Eric Nyberg, Tungsten Heavy Powder & Parts; J. Brian Jordon, University of Alabama; Wilhelmus Sillekens, European Space Agency; Neale Neelameggham, IND LLC; Vineet Joshi, Pacific Northwest National Laboratory

Monday PM **March 15, 2021**

2:00 PM Invited
Nickel-base Alloys Development:Then and Now: V. Miller[1]; *A. Asphahani*[2]; [1]University of Florida; [2]QuesTek

2:30 PM Invited
New Under the Sun: *R. Carnahan*[1]; V. Miller[2]; [1]Retired; [2]University of Florida

3:00 PM Invited
Development of Biomaterials at NanoMAG from a Historical and Commercial Perspective: V. Miller[1]; *S. LeBeau*[2]; [1]University of Florida; [2]nanoMAG LLC

3:30 PM
Enabling High Strength AA7xxx Sheet for Automotive Hot Stamping Applications: A Microstructural Perspective: *A. Ray*[1]; T. Piroteala[1]; R. Mohanty[1]; J. Carsley[1]; [1]Novelis Inc.

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Heterostructured Materials II: Mechanical Properties

Sponsored by: TMS Structural Materials Division, 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; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Monday PM **March 15, 2021**

2:00 PM Invited
Grain-boundary Delamination-induced Toughening in 2 GPa Deformed and Partitioned Steel: L. Liu[1]; *M. Huang*[1]; [1]University of Hong Kong

2:25 PM
Enhanced Mechanical Properties in 3D Interface Metallic Multilayers: *J. Cheng*[1]; J. Baldwin[2]; N. Li[2]; S. Xu[3]; I. Beyerlein[3]; N. Mara[1]; [1]University of Minnesota Twin Cities; [2]Los Alamos National Laboratory; [3]University of California, Santa Barbara

2:45 PM
Enhanced Mechanical Properties of Interface-strengthened UFG Tungsten and Tungsten-based Nanocomposites: *M. Wurmshuber*[1]; S. Doppermann[1]; M. Alfreider[1]; M. Burtscher[1]; D. Kiener[1]; [1]Montanuniversitaet Leoben

3:05 PM
Effect of Alloying Additions on the Strength of Confined Nanocrystalline Layers: S. Fathipour[1]; A. Motallebzadeh[2]; Ö. Duygulu[3]; *S. Ozerinc*[1]; [1]Middle East Technical University; [2]Koç University; [3]TÜBITAK Marmara Research Center

3:25 PM Invited
Heterostructured Ultrafine-grained Metallic Materials with Enhanced Superplasticity and Superior Strength: *R. Valiev*[1]; M. Murashkin[1]; N. Chinh[2]; [1]UFA State Aviation Technical University; [2]Eötvös Loránd University

3:50 PM Invited
Hierarchical 3D Nanolayered Duplex-phase Zr with High Strength, Strain Hardening, and Ductility: *W. Han*[1]; [1]Xi'an Jiaotong University

High Entropy Alloys IX: Alloy Development and Properties — Alloy Development and Application II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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2:00 PM Invited
Synthesis and Mechanical Properties of High Entropy Oxide Spinels: V. Keppens[1]; *B. Musico*[1]; K. Sickafus[1]; Q. Wright[1]; J. Smith[1]; [1]University of Tennessee

2:25 PM Invited
Phase Formation, Structure Modulation and Property Optimization of High Entropy Alloys, Composites and Glasses: *J. Eckert*[1]; [1]Erich Schmid Institute of Materials Science

2:50 PM Invited
High Etropy Alloy Design Aided by Neutron Scattering: *K. An*[1]; R. Feng[1]; S. Fu[1]; [1]Oak Ridge National Laboratory

3:15 PM Invited
Combining Elemental and Microstructure Heterogeneities in High-entropy Alloys to Enhance Radiation Resistance: *Y. Zhang*[1]; M. Crespillo[2]; W. Boldman[2]; P. Rack[2]; H. Bei[1]; Y. Chang[3]; L. Jiang[4]; L. Wang[4]; W. Weber[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]University of Science and Technology Beijing; [4]University of Michigan

3:40 PM
Distinctive Room Temperature Deformation Behavior in Plastic BCC Refractory High-entropy Alloys: C. Lee[1]; G. Song[2]; M. Gao[3]; W. Chen[4]; K. An[5]; *P. Liaw*[1]; [1]University of Tennessee; [2]Kongju National University; [3]National Energy Technology Laboratory/Leidos Research Support Team; [4]Illinois Institute of Technology; [5]Oak Ridge National Laboratory

4:00 PM
Metastability and Phase Selection in High Entropy Alloys: *S. Kube*[1]; P. Banner[1]; S. Sohn[1]; D. Uhl[2]; A. Datye[1]; S. Sarker[3]; A. Mehta[3]; J. Schroers[1]; [1]Yale University; [2]Southern Connecticut State University; [3]SLAC National Accelerator Laboratory

High Entropy Alloys IX: Structures and Modeling — Structures and Modeling II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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2:00 PM Invited
Mechanisms of Short-range Ordering and Cluster Formation and their Effects on Mechanical Properties of High-entropy Alloys: S. Chen[1]; Z. Aitken[1]; S. Pattamatta[2]; Z. Wu[2]; Z. Yu[1]; R. Banerjee[3]; D. Srolovitz[2]; P. Liaw[4]; *Y. Zhang*[1]; [1]Institute of High Performance Computing, A*STAR; [2]City University of Hong Kong; [3]University of North Texas; [4]University of Tennessee

2:25 PM Invited
Development of Interatomic Potentials to Model the Deformation Behaviors in Highly Concentrated/Entropy-stabilized Ni-base Superalloys: *R. Sakidja*[1]; A. Duff[2]; W. Ching[3]; C. Zhou[4]; [1]Missouri State University; [2]STFC; [3]University of Missouri-Kansas City; [4]University of South Carolina

2:50 PM Invited
Structural Essentiality for Plasticity of High-entropy Alloys Profiled by Data Mining: W. Chen[1]; *C. Tung*[2]; S. Chang[2]; Y. Fan[3]; Z. Bai[3]; C. Do[1]; [1]Oak Ridge National Laboratory; [2]National Tsing Hua University; [3]University of Michigan

3:15 PM Invited
Deformation Behavior of a Model High Entropy Alloy from Atomistic Simulations: *D. Farkas*[1]; [1]Virginia Polytechnic Institute

3:40 PM
Phase-Field Dislocation Dynamics Modeling of Refractory Multi-Principal Element Alloys: *L. Smith*[1]; A. Hunter[2]; I. Beyerlein[1]; [1]University Of California, Santa Barbara; [2]Los Alamos National Laboratory

4:00 PM
Statistics of the NiCoCr Medium-entropy Alloy: Novel Aspect of an Old Puzzle: *Z. Pei*[1]; R. Li[2]; G. Stocks[3]; M. Gao[1]; [1]National Energy Technology Laboratory; [2]University of Tennessee, Knoxville; [3]Oak Ridge National Laboratory

4:20 PM
Phase Stability of NbVZrMx (M = Ti, Mo; x = 0 – 1) Refractory Complex Concentrated Alloys: *Z. Zhang*[1]; M. Li[1]; G. Ren[1]; A. Thind[1]; K. Flores[1]; R. Mishra[1]; [1]Washington University in St.Louis

4:40 PM
EAM and RF-MEAM Potentials for Thermal Properties of Zirconium Diboride: *B. Timalsina*[1]; A. Niraula[1]; W. Fahrenholtz[2]; G. Hilmas[2]; A. Duff[3]; R. Sakidja[1]; [1]Missouri State University; [2]Missouri University of Science and Technology; [3]Science and Technology Facilities Council

High Temperature Electrochemistry IV — Session I

Sponsored by: TMS Extraction and Processing Division, TMS: Nuclear Materials Committee, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Monday PM **March 15, 2021**

2:00 PM
Selective Extraction of Gold from Gold-copper Alloy Using Anodic Electrochemical Deposition in Molten Salt Electrolyte: *T. Ouchi*[1]; S. Wu[1]; T. Okabe[1]; [1]The University of Tokyo

2:30 PM
High-speed Electrodeposition of Textured Monolithic Lithiated Transition Metal Oxide Cathodes for Low Cost, High Energy, and Fast Charging Li-ion Batteries.: *J. Cook*[1]; [1]Xerion Advanced Battery Corp

3:00 PM
Characterization of Uranium Electrodeposits Separated in Molten ClLiK Salt with Varied Applied Overpotentials and Uranium-cerium Compositions: *D. Killinger*[1]; S. Phongikaroon[1]; [1]Virginia Commonwealth University

3:30 PM
Molten Hydroxide Mediated Electrosynthesis of Layered Transition Metal Oxides for Electrochemical Energy Storage: *A. Patra*[1]; P. Braun[1]; [1]University of Illinois at Urbana-Champaign

Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery — Session II

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Wei Xiong, University of Pittsburgh; Shuanglin Chen, CompuTherm LLC; Wei Chen, Illinois Institute of Technology; James Saal, Citrine Informatics; Greta Lindwall, KTH Royal Institute of Technology

Monday PM **March 15, 2021**

2:00 PM Invited
An Atom-Probe Tomogaphy Study of the Temporal Evolution of Concentration Retention Excesses and Depletions at gamma-f.c.c/gamma-prime-L12 Interfaces in a Ni-Al-Cr-Re Superalloy: *D. Seidman*[1]; [1]Northwestern University

2:40 PM Invited
Extended Applications of the CALPHAD Simulations: *F. Zhang*[1]; D. Lv[1]; W. Cao[1]; S. Chen[1]; C. Zhang[1]; S. Liang[1]; [1]CompuTherm LLC

3:20 PM Invited
Computational Modeling-assisted Development of Cast Alumina-forming Austenitic Stainless Steels for High Temperature Corrosive Environments: *G. Muralidharan*[1]; Y. Yamamoto[1]; M. Brady[1]; S. Shukla[1]; T. Ros[2]; S. Fauske[3]; R. Pankiw[4]; J. Myers[5]; [1]Oak Ridge National Laboratory; [2]Arcelor Mittal Global R & D; [3]Arcelor Mittal Coatesville; [4]Duraloy Technologies; [5]Metaltek International

4:00 PM Invited
Visualizing and Rationalizing Synthesis Pathways in Oxides: *G. Ceder*[1]; [1]University of California, Berkeley

4:40 PM Invited
High-throughput Testing and Characterization of Novel Additive Manufactured Materials: M. Madrigal-Camacho[1]; A. Freund[1]; K. Mensink[1]; G. Aguilar[1]; *S. Mathaudhu*[1]; [1]University of California, Riverside

Materials and Chemistry for Molten Salt Systems — Corrosion & Chemistry

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Stephen Raiman, Texas A&M University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Raluca Scarlat, University of California-Berkeley

Monday PM **March 15, 2021**

2:00 PM
Corrosion Control of 316H Stainless Steel and Nickel-Based Alloys in Molten Chloride Salts: *K. Hanson*[1]; K. Moorthi Sankar[1]; R. Dingreville[2]; J. Sugar[2]; C. Deo[1]; P. Singh[1]; [1]Georgia Institute of Technology; [2]Sandia National Laboratories

2:20 PM
Analysis of Particulate Properties of Commercial FLiNaK in a 316 Stainless Steel System.: *T. Kennedy*[1]; T. Head[1]; N. Lab[2]; [1]Abilene Christian University; [2]NEXT Lab

2:40 PM
Chemical Interaction Between Molten Flibe and Nitrate Solar Salt: *M. Hanson*[1]; M. Zupan[1]; A. Merwin[1]; F. Carotti[1]; A. Kruizenga[1]; [1]Kairos Power

3:00 PM
Mechanistic Understanding of 3D Morphological Evolution of Metals in Molten Salts by *In Situ* X-ray Nano-tomography: X. Liu[1]; A. Ronne[1]; L. Yu[1]; M. Ge[2]; L. He[3]; P. Halstenberg[4]; C. Lin[1]; B. Layne[2]; S. Dai[4]; W. Lee[2]; S. Mahurin[4]; J. Wishart[2]; X. Xiao[2]; *Y. Chen-Wiegart*[5]; [1]Stony Brook University; [2]Brookhaven National Laboratory; [3]Idaho National Laboratory; [4]Oak Ridge National Laboratory; [5]Stony Brook University / Brookhaven National Laboratory

3:20 PM
Effect of Impurities on Corrosion and Its Control in Molten FLiNaK: *K. Sankar*[1]; P. Singh[1]; [1]Georgia Institute of Technology

3:40 PM
Complex Structure of Molten NaCl-CrCl2 and NaCl-CrCl3: Cr-Cl Octahedra Network and Intermediate-range Order: *B. Khaykovich*[1]; Q. Li[1]; D. Sprouster[2]; G. Zheng[1]; J. Neuefeind[3]; A. Braatz[3]; J. McFarlane[3]; S. Lam[1]; D. Olds[4]; M. Marshall[5]; J. Li[1]; [1]Massachusetts Institute of Technology; [2]Stony Brook University; [3]Oak Ridge National Laboratory; [4]Brookhaven National Laboratory; [5]Radiation Monitoring Devices

4:10 PM
Electrochemistry and Corrosion Studies for Alloy Development for Molten Salt Reactors (MSRs): *W. Doniger*[1]; C. Falconer[1]; M. Weinstein[1]; M. Elbakshwan[1]; G. Muralidharan[2]; A. Couet[3]; K. Sridharan[3]; [1]University Of Wisconsin Madison; [2]Oak Ridge National Laboratory; [3]University of Wisconsin Madison

Materials Engineering -- From Ideas to Practice: An EPD Symposium in Honor of Jiann-Yang Hwang — Mineral and Material Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee, TMS: Pyrometallurgy Committee
Program Organizers: Bowen Li, Michigan Technological University; Baojun Zhao, University of Queensland; Jian Li, CanmetMATERIALS; Sergio Monteiro, Instituto Militar de Engenharia; Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita; Tao Jiang, Central South University; Yong Shi, Futianbao Environment Technologies; Cuiping Huang, FuTianBao Environment Protection Technology Company Ltd.; Shadia Ikhmayies

Monday PM **March 15, 2021**

2:00 PM Keynote
Materials Processing: From Ideas to Practice: *J. Hwang*[1]; [1]Michigan Technological University

2:30 PM Invited
Recent Progress in Microwave-assisted Pyrometallurgy at CSU: L. Wang[1]; *Z. Peng*[1]; J. Wang[1]; W. Shang[1]; Q. Zhong[1]; M. Rao[1]; G. Li[1]; T. Jiang[1]; [1]Central South University

2:50 PM Keynote
Production and High Ratio Application of Iron Ore Pellets in Shougang: *G. Qing*[1]; M. Zhao[1]; G. An[1]; K. Wang[1]; x. Wu[1]; z. Zhao[1]; [1]Shougang Group

3:10 PM
Comparison between Compression Strength of Two Castor Oil Polyurethane Resin Matrix Composites Reinforced with Coconut or Piassava Fiber: J. Carvalho[1]; J. Azevedo[1]; N. Simonassi[2]; *F. Lopes*[3]; C. Vieira[1]; [1]Universidade Estadual do Norte Fluminense; [2]State University of Northern Rio de Janeiro; [3]UENF

3:30 PM
Characterization of Mortars Incorporated with Natural Açai Fiber: *A. Azevedo*; M. Barbosa[1]; H. Rocha[2]; M. Marvila[2]; S. Monteiro[3]; [1]Fluminense Federal University; [2]Universidade Estadual do Norte Fluminense; [3]Military Institute of Engineering

3:50 PM Invited
Renewable Energy for Sustainable Mining: *T. Xu*[1]; J. Hwang[2]; [1]AGreatE Inc; [2]Michigan Technological University

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Superalloys: Mechanical Behavior

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Monday PM **March 15, 2021**

2:00 PM
Damage Mechanisms Involved during Very High Cycle Fatigue of a Coated and Grit-blasted Ni-based Single-crystal Superalloy: *A. Cervellon*[1]; L. Bortoluci Ormastroni[2]; T. Pollock[1]; F. Pedraza[3]; J. Cormier[2]; [1]University Of California Santa Barbara; [2]Institut Pprime; [3]LaSIE

2:20 PM Invited
Enhancing the Creep Strength of Next Generation Disk Superalloys via Local Phase Transformation Strengthening: *T. Smith*[1]; T. Gabb[1]; K. Wertz[2]; J. Stuckner[1]; L. Evans[1]; A. Egan[3]; M. Mills[3]; [1]NASA Glenn Research Center; [2]AFRL; [3]Ohio State University

2:50 PM
Quantifying Deformation Processes Resulting in Local Phase Transformation Strengthening: *A. Egan*[1]; V. Mazanova[1]; T. Smith[2]; T. Gabb[2]; T. Hanlon[3]; M. Mills[1]; [1]Ohio State University; [2]NASA Glenn Research Center; [3]GE Research

3:10 PM
Creep Properties of and Segregation at Planar Defects in Cr-free NiCo-based Superalloys: *S. Matsunaga*[1]; D. Wen[1]; M. Titus[1]; [1]Purdue University

3:30 PM
Solute Segregation at Intrinsic Stacking Faults in Disordered Face-centered Cubic Ni-Co Solid Solution: First-principles and Thermodynamic Modeling: *D. Wen*; L. Feng[1]; Y. Wang[1]; M. Titus[2]; [1]The Ohio State University; [2]Purdue University

3:50 PM
Partitioning of Cu and Si Contaminants in a Ni-based Superalloy and their Effect on Creep Properties: *M. Detrois*[1]; Z. Pei[1]; K. Rozman[1]; M. Gao[1]; J. Poplawsky[2]; P. Jablonski[1]; J. Hawk[1]; [1]National Energy Technology Laboratory; [2]Oak Ridge National Laboratory

4:10 PM
Deformation of the '''-Ni2(Cr, Mo, W) Phase during Mechanical Testing: *T. Mann*[1]; M. Fahrmann[2]; M. Titus[1]; [1]Purdue University; [2]Haynes International

4:30 PM
Mechanical Properties and Microstructural Characterization of Cast Haynes 282 for Advanced Ultra-supercritical (A-USC) Applications: *L. Wang*[1]; K. Unocic[1]; P. Tortorelli[1]; X. Chen[1]; [1]Oak Ridge National Laboratory

4:50 PM
Microstructure and Mechanical Properties of a Centrifugal Cast Ni-Based Alloy: *G. Muralidharan*[1]; S. Shukla[1]; J. Myers[2]; [1]Oak Ridge National Laboratory; [2]Metaltek International

Mechanical Behavior of Nuclear Reactor Components — Defect Evolution

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee
Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Monday PM **March 15, 2021**

2:00 PM Invited
Simulation of Intergranular Void Growth under the Combined Effects of Surface Diffusion, Grain Boundary Diffusion, and Bulk Creep: *J. Sanders*[1]; N. Jamshidi[1]; N. Jamshidi[1]; M. Dadfarnia[2]; S. Subramanian[3]; J. Stubbins[4]; [1]California State University, Fullerton; [2]Seattle University; [3]PhotoGAUGE; [4]University of Illinois at Urbana-Champaign

2:30 PM
A Novel Displacement Cascade Driven Irradiation Creep Mechanism in Pure Copper: *N. Khiara*[1]; F. Onimus[1]; L. Dupuy[1]; J. Crocombette[1]; S. Jublot-Leclerc[2]; T. Jourdan[1]; T. Pardoen[3]; J. Raskin[4]; Y. Bréchet[5]; [1]CEA Saclay; [2]Université Paris–Saclay; [3]Ecole Polytechnique de Louvain, Institute of Mechanics, Materials and Civil Engineering (IMMC), Materials and process engineering, Belgium; [4]Ecole Polytechnique de Louvain; [5]SIMAP - Science et Ingénierie des MAtériaux et Procédés, Grenoble-INP, France

2:50 PM
Controlling Helium Morphology in Pure Metals: Dislocation-helium Interactions: *C. Lear*[1]; J. Gigax[1]; N. Li[1]; S. Fensin[1]; [1]Los Alamos National Laboratory

3:10 PM
Correlating the Neutron-irradiation Induced Hardening and Solute Nano-clustering in Oxide Dispersion Strengthened Alloys: *S. Levine*[1]; A. Bhattacharya[2]; A. Lupini[2]; D. Hoelzer[2]; Y. Katoh[2]; S. Zinkle[1]; [1]Oak Ridge National Laboratory, University of Tennessee; [2]Oak Ridge National Laboratory

3:30 PM Invited
Effect of Cr Concentration On <111> and <100> Dislocation Loop Formation in Fe-Cr Alloys: Y. Zhang[1]; Z. Xiao[1]; *X. Bai*[1]; [1]Virginia Polytechnic Institute and State University

4:00 PM
Void Swelling and Transmutation in Tungsten Metals and Alloys after Fusion Relevant Neutron Irradiation: *D. Morrall*[1]; J. Echols[1]; J. Geringer[1]; L. Garrison[1]; C. Parish[1]; [1]Oak Ridge National Lab

4:20 PM
Irradiation Resistance in Several Multi-principal Element Alloys: *Y. Su*[1]; [1]Utah State University

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session II

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Monday PM **March 15, 2021**

2:00 PM
Low Temperature Failure Mechanism of [001] Niobium Micropillars under Uniaxial Tension: *S. Lee*[1]; G. Song[1]; N. Aragon[2]; I. Ryu[2]; [1]University Of Connecticut; [2]University of Texas at Dallas

2:20 PM
Quantifying Electron Beam Effects during In-situ TEM Nanomechanical Tensile Testing on Aluminum Thin Films: *S. Stangebye*[1]; O. Pierron[1]; J. Kacher[1]; [1]Georgia Institute of Technology

2:40 PM
Deformation Tests of Al Thin Films Using In-situ TEM and Molecular Dynamics Simulations: *L. Bajtošová*[1]; R. Králík[1]; B. Krivská[1]; J. Veselý[1]; J. Fikar[2]; M. Cieslar[1]; [1]Charles University; [2]Ústav fyziky materiálu AV CR, v.v.i.

3:00 PM
In-situ TEM Investigation of the Electroplasticity Phenomenon in Ti-6Al: *X. Li*[1]; S. Zhao[2]; J. Turner[2]; K. Bustillo[2]; R. Dhall[2]; A. Minor[1]; [1]University of California, Berkeley; [2]Lawrence Berkeley National Laboratory

3:20 PM
Giant Superelasticity in $SrNi_2P_2$ Micropillars via Lattice Collapse and Expansion: *S. Xiao*[1]; V. Borisov[2]; G. Gorgen-Lesseux[3]; G. Song[1]; R. Valentí[2]; P. Canfield[3]; S. Lee[1]; [1]University Of Connecticut; [2]Goethe University; [3]Iowa State University

Metal-Matrix Composites: Advances in Analysis, Measurement and Observations — NanoComposites [Nanoscale + Nanoreinforcements]

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizers: Srivatsan Tirumalai, The University of Akron; William Harrigan, Gamma Alloys; Simona Hunyadi Murph, Savannah River National Laboratory

Monday PM **March 15, 2021**

2:00 PM Keynote
A Study Aimed at Understanding the Use of Nanomaterial-treated Filters for the Uptake of Heavy Metals from Water Sources: *S. Hunyadi Murph*[1]; [1]Savannah River National Laboratory

2:40 PM Invited
Strengthening Effects of Multi-walled Carbon Nanotubes and Graphene Nanoplatelets Reinforced in Nickel Matrix Nanocomposites: *A. Patil*[1]; T. Borkar[1]; [1]Cleveland State University

3:10 PM
Influence of Tungsten Nanopowders on Enhancing the Aging Behavior of a Copper-chromium Alloy: *G. Yao*[1]; S. Pan[1]; X. Li[1]; [1]University of California Los Angeles

3:30 PM Invited
In situ Atomic Study of Spontaneous Nanocrystallization of Intermetallic for Interconnection of High-power and Flexible Electronics: *Y. Zhong*[1]; C. Wang[2]; S. Jin[3]; [1]University of South Florida; [2]Harbin Institute of Technology; [3]University of California at San Diego

4:00 PM Invited
Correlation of Fine Scale Microstructure and Mechanical Properties of Copper-alumina Nanocomposites: *R. Goswami*[1]; [1]Naval Research Laboratory

4:30 PM
Influence of Sintering on the Development of Alumina Toughened Nanocomposites: Conventional Versus Microwave: K. Meena[1]; *S. Tirumalai*[2]; [1]Indian Institute of Technology Roorkee; [2]University of Akron

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Batteries

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Monday PM **March 15, 2021**

2:00 PM
BATCircle – Towards CO2 Low Battery Recycling: *M. Lundstrom*[1]; A. Porvali[1]; H. Elomaa[2]; P. Hannula[1]; P. Kauranen[1]; [1]Aalto University; [2]Outotec Reserach Center (Finland) Oy

2:20 PM
Selective Sulfidation and Electrowinning of Nickel and Cobalt for Lithium Ion Battery Recycling: *C. Stinn*[1]; A. Allanore[1]; [1]Massachusetts Institute of Technology

2:40 PM
Additive Manufacturing of 3D Microlattice Lithium-ion Battery Electrodes: A Review: *M. Dada*[1]; P. Popoola[1]; [1]Tshwane University of Technology

3:00 PM
A Strategy for Acid-free Waste Lithium Battery Processing: *M. Strauss*[1]; L. Diaz Aldana[1]; M. Case[1]; T. Lister[1]; [1]Idaho National Laboratory

3:20 PM
The Role of Nickel in Batteries: *K. Rudisuela*[1]; [1]Nickel Institute

3:40 PM
The Effect of Cu, Al and Fe Impurities on Leaching Efficiency of Two Lithium-ion Battery Waste Fractions: A. Chernyaev[1]; *J. Partinen*[1]; M. Lundström[1]; [1]Aalto University

4:00 PM
A Sustainable Oxalate Process for Recovery of Metals from $LiCoO_2$: Experimental and Modeling Study: *A. Verma*[1]; D. Corbin[1]; M. Shiflett[1]; [1]University of Kansas

Phase Transformations and Microstructural Evolution — Martensitic Transformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Monday PM **March 15, 2021**

2:00 PM
Monte Carlo Simulation and Three-dimensional Diffuse Scattering Study of Martensitic Transformation: X. Guo[1]; *Y. Jin*[1]; Y. Wang[1]; Y. Ren[2]; [1]Michigan Technological University; [2]Argonne National Laboratory

2:20 PM
Size Effects and Microstructural Evolution of Shape Memory Ceramics during Cyclic Phase Transformations: *I. Crystal*[1]; C. Schuh[1]; [1]Massachusetts Institute Of Technology

2:40 PM
Super-critical Elasticity: A Challenge to Martensitic Transformation Theory: H. Chen[1]; Y. Wang[1]; *Y. Ren*[2]; [1]University of Science and Technology Beijing; [2]Argonne National Laboratory

3:00 PM
The Effect of Low-temperature Aging on the Microstructure and Mechanical Behavior of Martensitic Ti-Nb Alloy: *M. Linne*[1]; R. Sankaran[1]; S. Torres[1]; G. Campbell[1]; J. McKeown[1]; A. Wu[1]; [1]Lawrence Livermore National Laboratory

3:20 PM
A Strain Induced Austenite to Martensite Transformation Kinetics Law Implemented in Crystal Plasticity: Application to Modeling Tension, Compression, and Impact of Additively Manufactured 304L: *Z. Feng*[1]; R. Pokharel[2]; S. Vogel[2]; M. Knezevic[1]; [1]University of New Hampshire; [2]Los Alamos National Laboratory

3:40 PM
Uncovering the Role of Nanoscale Precipitates on Martensitic Transformation and Superelasticity: *S. Tripathi*[1]; K. Guda Vishnu[1]; M. Titus[1]; A. Strachan[1]; [1]Purdue University

Phonons, Electrons and Dislons: Exploring the Relationships Between Plastic Deformation and Heat — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Aashish Rohatgi, Pacific Northwest National Laboratory; Sean Agnew, University of Virginia; Thomas Bieler, Michigan State University

Monday PM **March 15, 2021**

2:00 PM Invited
Do Moving Dislocations Induce Lattice Instabilities?: *B. Gurrutxaga-Lerma*[1]; [1]University of Birmingham

2:20 PM Invited
Thermal and Strain Rate Effects on Plasticity and Fracture of Gen 3 Steels: *L. Hector*[1]; [1]General Motors Global Technical Center

2:40 PM Invited
Thermo-mechanics of Large Deformation Shear Banding: *C. Bronkhorst*[1]; C. Lieou[2]; H. Mourad[2]; V. Anghel[2]; [1]University of Wisconsin, Madison; [2]Los Alamos National Laboratory

3:00 PM
Thermomechanical Conversion in Metals: Dislocation Plasticity Model Evaluation of the Taylor-quinney Coefficient: *C. Lieou*[1]; C. Bronkhorst[2]; [1]Los Alamos National Laboratory; [2]University of Wisconsin-Madison

3:20 PM
Unified Analysis of Temperature Fields Arising from Large Strain Deformation and Friction in Manufacturing Processes: H. Dhami[1]; P. Panda[1]; D. Mohanty[2]; A. Udupa[2]; J. Mann[3]; *K. Viswanathan*[1]; S. Chandrasekar[2]; [1]Indian Institute of Science; [2]Purdue University; [3]M4 Sciences Corporation

3:40 PM
Shear Bands, Thermal Profiles and Microstructure Stability in Large-strain Deformation of High Entropy Alloys: S. Yadav[1]; D. Shah[1]; A. Kustas[2]; N. Argibay[2]; P. Lu[2]; *D. Sagapuram*[1]; [1]Texas A&M University; [2]Sandia National Laboratories

Plasmonics in Nanocomposite Materials — From Theory to Application Session II

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizers: Nasrin Hooshmand, Georgia Institute of Technology; Simona Hunyadi Murph, Savannah River National Laboratory; Mahmoud Abdelwahed, The University of Texas at San Antonio

Monday PM **March 15, 2021**

2:00 PM Invited
Emerging Anisotropic 2D Layered Materials for Plasmonics and Polaritonics: *K. Aydin*[1]; [1]Northwestern University

2:30 PM Invited
Plasmonic Compound Nanohole Arrays: *Y. Zhao*[1]; [1]University Of Georgia

3:00 PM Invited
Electron Transfer and Catalysis in Plasmonic Nanocomposite Systems: *P. Ward*[1]; S. Murph[1]; [1]Savannah River National Laboratory

Powder Materials for Energy Applications — Ceramic Powder Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Idaho National Laboratory

Monday PM **March 15, 2021**

2:00 PM Invited
Deformation and Energy Absorbing Mechanism of Expanded Vermiculite Particles: *B. Li*[1]; H. Zou[2]; J. Seeterlin[1]; [1]Michigan Technological University; [2]Runway Safe Group

2:30 PM
Electric Current Effects in Spark Plasma Sintering: Heating Pathway Analysis: *E. Olevsky*[1]; G. Lee[1]; C. Maniere[1]; E. Torresani[1]; [1]San Diego State University

2:50 PM
Electrochemical Deposition Synthesis of CeO2 Nanoarrays: *R. Wang*[1]; Y. Wang[1]; [1]The University of Alabama

3:10 PM Invited
High Temperature Corrosion and Irradiation Behavior of Silicon Carbide and Nanostructured Ferritic Alloy Composites: *K. Bawane*[1]; K. Lu[2]; X. Bai[2]; K. Ning[2]; W. Chen[3]; M. Li[3]; [1]Idaho National Laboratory; [2]Virginia Tech; [3]Argonne National Laboratory

3:40 PM
Oxidation Behaviors of Matrix-grade Graphite in Water Vapor Ingress Accidents for High Temperature Gas-cooled Reactors: *Y. Cho*[1]; K. Lu[1]; [1]Virginia Polytechnic Institute and State University

4:00 PM
Simulation of C-SiOC Coatings on Yttria Stabilized Zirconia Microspheres in a Fluidized Bed Coater Based on Multiphase Flow with Interface Exchange: K. Lu[1]; *S. Kumar*[1]; [1]Virginia Polytechnic Institute and State University

Practical Tools for Integration and Analysis in Materials Engineering — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Titanium Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Michael Gram, Titanium Metals Corporation; William Joost, Pratt & Whitney; Raymundo Arroyave, Texas A&M University; Charles Ward, AFRL/RXM

Monday PM **March 15, 2021**

2:00 PM Invited
Foundations and Applications of DAMASK: *P. Eisenlohr*[1]; M. Diehl[2]; P. Shanthraj[3]; F. Roters[4]; D. Raabe[4]; [1]Michigan State University; [2]KU Leuven; [3]The University of Manchester; [4]Max-Planck-Institut für Eisenforschung

2:40 PM
Prisms-plasticity: An Open Source Crystal Plasticity Finite Element Software: *M. Yaghoobi*[1]; S. Ganesan[1]; A. Lakshmanan[1]; S. Sundar[1]; D. Greeley[1]; S. Rudraraju[2]; J. Allison[1]; V. Sundararaghavan[1]; [1]University of Michigan, Ann Arbor; [2]University of Michigan; University of Wisconsin-Madison

3:00 PM
A Fast Fourier Transform Based Crystal Plasticity Constitutive Model for Predicting Creep and Rupture Lifetime in Metallic Systems: *N. Beets*[1]; L. Capolungo[1]; A. Mariyappan[1]; R. Lebensohn[1]; [1]Los Alamos National Laboratory

3:20 PM
PRISMS-PF: A High Performance Phase-field Modeling Framework to Simulate Microstructure Evolution: *D. Montiel*[1]; S. DeWitt[1]; Y. Lyu[1]; K. Thornton[1]; J. Allison[1]; [1]University of Michigan

3:40 PM Invited
Tools for Microstructural Analysis Using Computer Vision and Machine Learning: *E. Holm*[1]; B. Lei[1]; A. Kitahara[1]; N. Gao[1]; R. Cohn[1]; [1]Carnegie Mellon University

4:20 PM
AMPIS: Automated Materials Particle Instance Segmentation: *R. Cohn*[1]; T. Prost[2]; I. Anderson[2]; E. White[2]; J. Tiarks[2]; E. Holm[1]; [1]Carnegie Mellon University; [2]Ames Laboratory

4:40 PM
A Method to Reconstruct Prior Beta Grain Orientations from Measured Alpha-phase Electron Backscatter Diffraction Data: *A. Pilchak*[1]; [1]US Air Force Research Laboratory

Rare Metal Extraction & Processing — Li, Co, Au, Ag, PGMs, Te, Na, W, In

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Monday PM **March 15, 2021**

2:00 PM Invited
Environmental Aspects of the Electrochemical Recovery of Tellurium by Electrochemical Deposition-redox Replacement (EDRR): P. Halli[1]; M. Rinne[1]; B. Wilson[1]; K. Yliniemi[1]; *M. Lundstrom*[1]; [1]Aalto University

2:20 PM
Sodium Metal from Sulfate: J. Checketts[1]; *N. Neelameggham*[2]; [1]Powerball Industries; [2]IND LLC

2:40 PM
Preparation of High-grade Ammonium Metatungstate (AMT) as Precursor for Industrial Tungsten Catalyst: *A. Baba*[1]; S. Girigisu[1]; M. Raji[1]; A. Ibrahim[1]; D. Olaoluwa[1]; K. Ayinla[1]; C. Adeyemi[1]; A. Abdulkareem[1]; A. Alabi[2]; M. Abdul[3]; [1]University of Ilorin; [2]Kwara State University, Malete; [3]Federal Polytechnic, Offa

3:00 PM Invited
Extraction of Platinum Group Metals from Spent Catalyst Material by a Novel Pyro-metallurgical Process: *A. Martinez*[1]; K. Tang[1]; C. Sommerseth[1]; K. Osen[1]; [1]SINTEF

3:20 PM
Developed Commercial Processes to Recover Au, Ag, Pt and Pd from E-waste.: *R. Panda*[1]; M. Jha[1]; J. Lee[2]; D. Pathak[3]; [1]CSIR-National Metallurgical Laboratory; [2]Korea Institute of Geosciences and Mineral Resources (KIGAM); [3]Indian Institute of Technology (ISM) Dhanbad

3:40 PM Panel Discussion

100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture of Thin Films

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniverstität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Tuesday AM **March 16, 2021**

8:30 AM Invited
Leveraging Griffith's Energy Balance in Extreme Environments: *T. Weihs*[1]; [1]Johns Hopkins University

9:10 AM
Fracture-based Reuse of Single Crystal Wafers for High-Efficiency Photovoltaics: *J. Chen*[1]; C. Packard[1]; [1]Colorado School of Mines

9:30 AM
Modeling Insights into Micro Single-Edge Bend Fracture Toughness Testing of Multilayered Metal-ceramic Cu/TiN and Al/TiN Nanocomposite Thin Films: *D. Savage*[1]; S. Bhowmik[2]; C. Harvey[3]; A. Misra[4]; N. Mara[5]; J. Wheeler[6]; J. Michler[7]; S. Pathak[8]; M. Knezevic[2]; [1]University of New Hampshire/Los Alamos National Lab; [2]University of New Hampshire; [3]University of Nevada; [4]University of Michigan; [5]University of Minnesota; [6]ETH Zürich; [7]Empa, Swiss Federal Laboratories for Materials Science and Technology; [8]University of Nevada/Iowa State University

9:50 AM Invited
Fracture and Adhesion in Small Scale Devices– Microswitches, Microcantilevers and Micron-thick Films: *M. De Boer*[1]; [1]Carnegie Mellon University

10:30 AM
Improving Metal-polymer Adhesion through Alloy Development: *M. Cordill*[1]; P. Krieml[1]; [1]Erich Schmid Institute

10:50 AM
Domain Nucleation in Ferroelastic Microcrystals: Competition between Twinning, Slip and Fracture: *J. Krogstad*[1]; C. Smith[1]; [1]University of Illinois at Urbana-Champaign

2021 Young Innovator in the Materials Science of Additive Manufacturing Award Lecture — 2021 Young Innovator in the Materials Science of Additive Manufacturing Award Lecture

Tuesday AM **March 16, 2021**

11:00 AM
Introduction of Award Recipient: 2021 Young Innovator in the Materials Science of Additive Manufacturing Award Lecture: *A. Beese*[1]; [1]Pennsylvania State University

11:05 AM Invited
Additive Manufacturing of High Temperature Metals: Present and Future Opportunities: *M. Kirka*[1]; [1]Oak Ridge National Laboratory

11:35 AM Question and Answer Period: Morderator: Allison Beese, Pennsylvania State University

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

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University; Amber Shrivastava, Indian Institute of Technology Bombay

Tuesday AM **March 16, 2021**

8:30 AM Invited
Pressure-induced Formation and Mechanical Properties of 2D Diamond Boron Nitride: *E. Riedo*[1]; [1]New York University

8:55 AM Keynote
Direct Conversion of Carbon into Graphene, Diamond or Q-carbon: A New Frontier in Materials Science and Applications: *J. Narayan*[1]; [1]North Carolina State University

9:25 AM
Anisotropic Thermal Conductivity and Associated Heat Transport Mechanism in Roll-to-Roll Graphene Reinforced Copper Matrix Composites: *K. Yang*[1]; Y. Ma[1]; Z. Zhang[2]; J. Zhu[2]; Y. Liu[1]; T. Fan[1]; [1]Shanghai Jiao Tong University; [2]Dalian University of Technology

9:45 AM Invited
Controlled Synthesis of Reduced Graphene Oxide-carbon Nanotube Hybrids and Their Applications in The Fabrication of Membranes for Water Purification: S. Azizighannad[1]; O. Gupta[1]; *S. Mitra*[1]; [1]New Jersey Institute of Technology

10:10 AM
Black Phosphorus Ink Formulation for Aerosol Jet Printing of Optoelectronics: *F. Muramutsa*[1]; S. Pedersen[1]; J. Wood[2]; C. Husko[3]; B. Jaques[1]; D. Estrada[1]; [1]Boise State University; [2]Promethean Consulting, LLC; [3]Iris Light Technologies

10:30 AM
High Volume Mechanochemical Synthesis of Black Phosphorus for Optoelectronic Applications: *S. Pedersen*[1]; F. Muramutsa[1]; C. Husko[2]; J. Wood[3]; D. Estrada[1]; B. Jaques[1]; [1]Boise State University; [2]Iris Light Technologies; [3]Promethean Consulting

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — Challenges and Recent Progresses and in Nuclear Fuels and Materials Development

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Materials Selection in Nuclear Applications a Challenge and an Opportunity for Advanced Material Design, Fabrication and Testing: *P. Hosemann*[1]; B. Gludovatz[2]; E. Obbard[2]; M. Moschetti[2]; A. Reichardt[1]; S. Maloy[3]; [1]University of California Berkeley; [2]UNSW Sydney; [3]Los Alamos National Laboratory

9:00 AM
High power irradiation testing of TRISO MiniFuel-Compacts in HFIR: *T. Gerczak*[1]; C. Petrie[1]; J. Harp[1]; G. Helmreich[1]; J. Hunn[1]; A. Kercher[1]; Z. Wallen[1]; R. Gallagher[1]; K. Linton[1]; A. Le Coq[1]; R. Latta[2]; B. Collin[2]; N. Brown[3]; [1]Oak Ridge National Laboratory; [2]Kairos Power; [3]University of Tennessee

9:20 AM Invited
Qualification of 316L Stainless Steel Components for ASME Pressure Retaining Applications: *D. Gandy*[1]; M. Albert[1]; S. Tate[1]; C. Armstrong[2]; W. Cleary[2]; [1]Electric Power Research Institute; [2]Westinghouse Electric Corporation

9:50 AM Invited
Overview of Nuclear Materials Discovery and Qualification Initiative (NMDQi): *R. Roach*[1]; [1]Idaho National Laboratory

10:20 AM
Development and Qualification of Ultrafine-grained and Nanocrystalline Steels for Nuclear Applications: *H. Wen*[1]; A. Hoffman[1]; M. Arivu[1]; R. Islamgaliev[2]; [1]Missouri University of Science and Technology; [2]Ufa State Aviation Technical University

10:40 AM
Development of Assembly Technique for Fuel Specimens for the MARCH-SERTTA TREAT Irradiation Testing Platform: *C. Woolum*[1]; L. Hone[1]; K. Tritthart[1]; [1]Idaho National Laboratory

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Titanium

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Tuesday AM **March 16, 2021**

8:30 AM Invited
Implementing Processing Strategies and Unique Hot Isostatic Pressing Treatments to Control Microstructure, Defect Content, and Mechanical Properties of Electron Beam Melted Ti-6Al-4V: *J. Benzing*[1]; N. Hrabe[1]; E. Lucon[1]; T. Quinn[1]; J. Bonini[2]; M. Ahlfors[3]; [1]National Institute of Standards and Technology; [2]Lucideon M+P; [3]Quintus Technologies

9:00 AM
Effect of Oxide and Hydroxide on Cold Spray of Titanium Particles: *M. Vandadi*[1]; A. Navabi[1]; T. Bond[1]; N. Rahbar[1]; W. Soboyejo[1]; [1]Worcester Polytechnic Institute

9:20 AM
The Inhomogeneous Microstructure and Properties of Ti-6Al-4V Additively Manufactured with Electron Beam Freeform Fabrication: *S. Present*[1]; K. Taminger[2]; C. Domack[2]; K. Hemker[1]; [1]Johns Hopkins University; [2]NASA Langley Research Center

9:40 AM
Quantifying Layer Uniformity in Ti6Al4V Hybrid Additively Manufactured Samples Using Ultrasound: *L. Sotelo*[1]; C. Pratt[1]; R. Karunakaran[1]; C. Kanger[1]; M. Sealy[1]; J. Turner[1]; [1]University of Nebraska Lincoln

Additive Manufacturing for Energy Applications III — Additive Manufacturing Applications in Nuclear

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Nuclear Materials Committee
Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Tailored Radiation Responses of 9-12 wt.% Cr Steels Through Additive Manufacturing: *K. Field*[1]; T. Green[1]; W. Zhong[2]; P. Xiu[1]; G. Bruno[1]; N. Sridharan[3]; L. Tan[2]; M. Gussev[2]; Y. Yang[2]; [1]University of Michigan; [2]Oak Ridge National Laboratory; [3]Lincoln Electric

8:50 AM
Functional Advanced Printings for Nuclear In-pile Sensing: *K. Mondal*[1]; M. McMurtrey[1]; [1]Idaho National Laboratory

9:10 AM
Cold Spray Stainless Steel Deposition to Mitigate CISCC in Canisters for Used Nuclear Fuel Storage: *N. Pocquette*[1]; H. Yeom[1]; H. Agiwal[1]; K. Ross[2]; J. Kessler[3]; G. Cannell[4]; F. Pfefferkorn[1]; K. Sridharan[1]; [1]University of Wisconsin Madison; [2]Pacific Northwest Research Laboratory; [3]J Kessler and Associates LLC; [4]Fluor Corporation

9:30 AM
A Review of Solution Based Processing Routes for Advanced Nuclear Fuel Materials: *E. Zell*[1]; M. Gill[2]; Y. Alfayez[2]; C. Jiang[1]; E. Herderick[2]; I. Van Rooyen[1]; [1]Idaho National Laboratory; [2]The Ohio State University

9:50 AM
Cold Spray Mitigation of Chloride-induced Stress Corrosion Cracking in Austenitic Stainless Steel Welds: *H. Qu*[1]; T. Montoya[2]; R. Schaller[2]; E. Schindelholz[3]; K. Johnson[4]; J. Wharry[1]; [1]Purdue University; [2]Sandia National Laboratories; [3]The Ohio State University; [4]VRC Metal Systems

10:10 AM Invited
From Flight to Fission: Additive Manufacturing Advances at GE in Nuclear Energy: V. Gupta[1]; *A. Hoffman*[1]; X. Lou[2]; R. Rebak[1]; [1]GE Research; [2]Auburn University

10:30 AM
Laser Additive Manufacturing of Grade 91 Steel for Affordable Nuclear Reactor Components with Improved Radiation Tolerance: *S. Maloy*[1]; C. Lear[1]; O. El-Atwani[1]; P. Hosemann[2]; J. Bickel[2]; T. Lienert[3]; T. DebRoy[4]; T. Mukherjee[4]; [1]Los Alamos National Laboratory; [2]University of California Berkeley; [3]Optomec Inc.; [4]Penn State University.

10:50 AM
Cold Spray Chromium Deposition for Accident Tolerant Fuel Cladding: *T. Dabney*[1]; H. Yeom[1]; K. Quillin[1]; N. Pocquette[1]; Y. Miao[2]; K. Mo[2]; L. Jamison[2]; K. Sridharan[1]; [1]University of Wisconsin Madison; [2]Argonne National Laboratory

11:10 AM
Evaluation of Oxide Dispersion Strengthened (ODS) Steel Fuel Cladding Tubes Manufactured by Cold Spray Technology: H. Yeom[1]; V. Ramasawmy[1]; M. Lenling[1]; P. Hosemann[2]; D. Hoelzer[3]; S. Maloy[4]; *K. Sridharan*[1]; [1]University of Wisconsin Madison; [2]University of California-Berkeley; [3]Oak Ridge National Laboratory; [4]Los Alamos National Laboratory

11:30 AM
Densification of Binder Jetted Tungsten through Chemical Vapor Infiltration for Fusion Energy Application: *J. Echols*[1]; A. Elliot[1]; Y. Katoh[1]; L. Garrison[1]; [1]Oak Ridge National Laboratory

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — In Situ Characterization

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Solidification Committee
Program Organizers: Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Kevin Chaput, Northrop Grumman; Mohsen Asle Zaeem, Colorado School of Mines; Wenda Tan, University of Utah; Lianyi Chen, University of Wisconsin-Madison

Tuesday AM **March 16, 2021**

8:30 AM Invited
Characterization of Material Solidification Behaviors in Laser Powder Bed Fusion Using Operando Synchrotron X-ray Imaging: *T. Sun*[1]; L. Chen[2]; [1]University of Virginia; [2]University of Wisconsin-Madison

9:00 AM
In-situ High-speed X-ray Diffraction Study of Phase Transformation in a Laser-Processed 420 Stainless Steel: *X. Zhang*[1]; A. Chuang[1]; M. Li[1]; [1]Argonne National Laboratory

9:20 AM
In-situ Observation of Ferritic vs Austenitic Solidification Mode Competition in 316L Laser Powder Bed Fusion Welds with Synchrotron X-ray Diffraction: *J. Aroh*[1]; S. Oh[1]; R. Lim[1]; B. Gould[2]; A. Chuang[2]; P. Pistorius[1]; A. Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory

9:40 AM
In-situ X-ray Imaging of Melt Flow Dynamics in Laser Metal Additive Manufacturing: *Q. Guo*[1]; C. Zhao[2]; M. Qu[1]; L. Xiong[3]; S. Hojjatzadeh[1]; L. Escano[1]; N. Parab[2]; K. Fezzaa[2]; T. Sun[2]; L. Chen[1]; [1]University of Wisconsin-Madison; [2]Argonne National Laboratory; [3]Missouri University of Science and Technology

10:00 AM
In Situ Imaging of the Effect of Gas Flowrates on Directed Energy Deposition: *L. Sinclair*[1]; Y. Chen[1]; S. Clark[1]; O. Hatt[2]; S. Marussi[1]; S. Shah[1]; R. Atwood[3]; M. Jones[4]; G. Baxter[4]; C. Leung[1]; I. Todd[2]; P. Lee[1]; [1]University College London; [2]University of Sheffield; [3]Diamond Light Source Ltd; [4]Rolls-Royce plc

10:20 AM
Microstructure Evolution and Nanoindentation Measurements after Laser Re-solidification of Hypo-eutectic Al-10 at %Cu: *M. Alamoudi*[1]; V. Bathula[1]; J. Wiezorek[1]; [1]University of Pittsburgh

10:40 AM
Simultaneous, In-situ Synchrotron X-ray Radiography and Thermal Imaging of Liquid-to-solid Phase Transformation during Laser Fusion Processing of Ti- and Ni-alloys: *R. Kamath*[1]; R. Heldt[1]; L. White[1]; D. Garcia[2]; R. Wang[2]; Z. Kong[2]; K. Fezzaa[3]; T. Sun[4]; H. Choo[1]; [1]University of Tennessee Knoxville; [2]Virginia Polytechnic Institute and State University; [3]Argonne National Laboratory; [4]University of Virginia

11:00 AM
Ultrafast Dynamics of Solidification and Thermal Strain Evolution in Laser Powder Bed Additive Manufacturing Using High Energy X-ray Diffraction: *A. Dass*[1]; C. Tian[1]; S. Bhattacharya[1]; D. Pagan[2]; A. Moridi[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron Source

11:20 AM
In-situ X-ray Imaging of Multi-material Directed Energy Deposition: *S. Wolff*[1]; B. Gould[2]; A. Greco[2]; T. Sun[3]; [1]Texas A&M University; [2]Argonne National Laboratory; [3]University of Virginia

11:40 AM
Undercooling in Laser Powder Bed Fusion Metal Additive Manufacturing: M. Coday[1]; M. Qu[1]; Q. Guo[1]; *L. Chen*[1]; [1]University of Wisconsin-Madison

Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments — Microstructural Aspects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee
Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Tuesday AM **March 16, 2021**

8:30 AM Invited
Microstructure Evolution of Metallic Alloys under Additive Manufacturing Conditions: *A. Clarke*[1]; J. Klemm-Toole[1]; B. Aminahmadi[1]; C. Johnson[1]; A. Saville[1]; B. Rodgers[1]; J. Shin[1]; K. Fezzaa[2]; S. Vogel[3]; J. McKeown[4]; T. Pollock[5]; A. Karma[6]; [1]Colorado School of Mines; [2]Advanced Photon Source, Argonne National Laboratory; [3]Los Alamos National Laboratory; [4]Lawrence Livermore National Laboratory; [5]University of California Santa Barbara; [6]Northeastern University

9:00 AM Invited
Solidification Condition and Its Effects on Microstructure in Metal-power Bed Fusion Processes: *Y. Koizumi*[1]; [1]Osaka University

9:30 AM
Exploring the Structure-property Relationships of the Compositionally Graded WxCoCrFeMnNi High-entropy Alloy: *J. Pegues*[1]; M. Melia[1]; B. Gould[2]; R. Puckett[1]; S. Whetten[1]; N. Argibay[1]; T. Babuska[1]; A. Kustas[1]; [1]Sandia National Laboratories; [2]Argonne National Laboratory

9:50 AM
Structure-property Relationships of Additively Manufactured Ni-Nb Binary Alloys: *A. Kustas*[1]; J. Pegues[1]; N. Bobbitt[1]; R. Puckett[1]; M. Jones[1]; M. Chandross[1]; N. Argibay[1]; [1]Sandia National Laboratories

10:10 AM
Microstructural and Mechanical Characterization of Additively Manufactured Al-Fe-V-Si: *P. Wilson*[1]; C. Meyer[1]; F. Barrie[1]; [1]The Boeing Company

10:30 AM
Bulk Single Crystals in Cubic Systems Produced via Electron Beam Melting Additive Manufacturing: *P. Fernandez-Zelai*[1]; M. Kirka[1]; S. Dryepondt[1]; Y. Lee[1]; C. Ledford[1]; [1]Oak Ridge National Laboratory

10:50 AM
A Comparison between In-situ and Ex-situ Mixing of Nanoparticles with a Matrix in Additive Manufacturing of Metal Matrix Composite: *S. Pasebani*[1]; M. Ghayoor[1]; K. Lee[1]; Y. He[1]; C. Chang[1]; B. Paul[1]; [1]Oregon State University

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — Simulation and Modelling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee
Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM Invited
Fundamental Investigation of Multi-Principal Element Alloy (MPEA) Design and Processing Research to Explore Additive Manufacturing (AM) Effects: *I. Anderson*[1]; E. White[1]; D. Johnson[1]; T. Prost[1]; R. Napolitano[1]; A. Kustas[2]; N. Argibay[2]; [1]Iowa State University / Ames Laboratory; [2]Sandia National Lab-NM

9:00 AM
CALPHAD Based Thermo Kinetic Modeling for Additive Manufacturing (AM): A Case Study for Fusion Based and Supersolidus Liquid Phase Sintering During Binder Jet: *R. Kannan*[1]; P. Nandwana[1]; [1]Oak Ridge National Laboratory

9:20 AM
Phase Field Modeling of Powder Densification in Sintering: R. Dong[1]; *W. Tan*[1]; [1]University of Utah

9:40 AM Invited
Probabilistic Machine Learning Assisted Study of Directed Energy Deposited Alloys: *S. Nag*[1]; Y. Zhang[1]; S. Karnati[1]; L. Kerwin[2]; E. MacDonald[3]; N. Johnson[1]; S. Raghavan[1]; D. Cheung[2]; A. Kitt[2]; C. Sun[1]; G. Khan[1]; C. Williams[4]; T. Broderick[5]; M. Benedict[5]; B. Ribic[6]; [1]GE Research; [2]EWI - Buffalo Manufacturing Works; [3]Youngstown State University; [4]GE Aviation; [5]Air Force Research Laboratory; [6]America Makes

10:10 AM
Prediction of Microstructure and Phase Evolution during Multi-track, Multi-layer Directed Energy Deposition of H13: N. Bailey[1]; C. Katinas[1]; *Y. Shin*[1]; [1]Purdue University

10:30 AM
New Insights on Cellular Structures Strengthening Mechanisms and Thermal Stability of L-PBF Stainless Steel 316L: *T. Voisin*[1]; J. Forien[1]; A. Perron[1]; S. Aubry[1]; N. Bertin[1]; A. Samanta[1]; A. Baker[1]; Y. Wang[1]; [1]Lawrence Livermore National Laboratory

10:50 AM
Process Dependent Nanoscale Vanadium Clustering within Martensite Laths in Laser Powder Bed Fused Additively Manufactured Ti6Al4V: *M. Pantawane*[1]; S. Dasari[1]; S. Mantri[1]; R. Banerjee[1]; N. Dahotre[1]; [1]University of North Texas

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session III

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

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

Tuesday AM **March 16, 2021**

8:30 AM
Characterization and Modeling of Deformation Twinning in Mg during Compression and Tension: *Z. Chen*[1]; M. Yaghoobi[1]; V. Sundararaghavan[1]; J. Allison[1]; S. Daly[2]; [1]University of Michigan; [2]University of California, Santa Barbara

8:50 AM
Recent Advances in Applying In-situ Electron Microscopy for Local Determination of Crack Processes: *D. Kiener*[1]; M. Alfreider[1]; I. Issa[1]; M. Wurmshuber[1]; M. Burtscher[1]; K. Schmuck[1]; [1]University of Leoben

9:10 AM Invited
Materials Science Applications of Four Dimensional–scanning Transmission Electron Microscopy (4D-STEM): *C. Ophus*[1]; [1]Lawrence Berkeley National Laboratory

9:40 AM
Study of Slip Transmissibility and Its Correlation to Local Geometrically Necessary Dislocation Content in Grade 1 Pure Titanium: *H. Phukan*[1]; T. Bieler[1]; R. Xu[2]; P. Eisenlohr[1]; M. Crimp[1]; C. Boehlert[1]; [1]Michigan State University; [2]Argonne National Laboratory

10:00 AM
Study of the Effect of Grain Boundary Parameters on the Micro Hall-Petch Slope in Mg Alloys: *M. Taheri Andani*[1]; A. Lakshmanan[1]; V. Sundararaghavan[1]; J. Allison[1]; A. Misra[1]; [1]University of Michigan

10:20 AM
Recent Advances in Bragg Coherent Diffraction for Nanoscale Imaging of Strain: *R. Harder*[1]; [1]Argonne National Laboratory

10:40 AM
Towards Accurate Absolute Stress and Orientation Measurement by Electron Backscatter Diffraction: *T. Vermeij*[1]; J. Hoefnagels[1]; [1]Eindhoven University of Technology

Advanced High Strength Steels V — Session III

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

Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; Louis Hector, General Motors Global Technical Center; Igor Vieira, Nucor Steel; Lijia Zhao, ArcelorMittal USA; Krista Limmer, CCDC Army Research Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Sebastien Allain, Institut Jean Lamour; MingXin Huang, University of Hong Kong

Tuesday AM **March 16, 2021**

8:30 AM
A Spatial Spin Average Approach to Model Austenitic Steels Using First Principle Calculations: *E. Antillon*[1]; M. Johannes[1]; N. Bernstein[1]; [1]Naval Research Lab

8:50 AM
Phase Evolution of Triple Nano-precipitate Strengthened Mn-stabilized Austenitic Steel: *C. Stewart*[1]; R. Fonda[2]; K. Knipling[2]; P. Callahan[2]; [1]National Research Council Associate at the U.S. Naval Research Laboratory; [2]U.S. Naval Research Laboratory

9:10 AM
Microstructural Refinement and Homogenization of High Strength Austenitic Steels for Lightweighting Using Equal Channel Angular Pressing: I. Karaman[1]; M. Vaughan[1]; *S. Picak*[1]; [1]Texas A&M University

9:30 AM
Role of Metal Carbides in the Formation of Austenite in a High-Ni Martensitic Steel: *C. Lee*[1]; A. Farkoosh[1]; P. Lambert[2]; D. Seidman[1]; [1]Northwestern University; [2]Carderock Division, Naval Surface Warfare Center

9:50 AM
Effects of Cold Rolling on Austenite Formation in a QLT-Treated High-Ni Martensitic Steel: *C. Lee*[1]; A. Farkoosh[1]; P. Lambert[2]; D. Seidman[1]; [1]Northwestern University; [2]Carderock Division, Naval Surface Warfare Center

10:10 AM
Twinning-induced Plasticity of Austenitic Lightweight High-entropy Steel: *H. Yen*[1]; Z. Lai[1]; Y. Sun[1]; Y. Lin[1]; J. Tu[2]; [1]National Taiwan University; [2]China Steel Corporation

Advanced Magnetic Materials for Energy and Power Conversion Applications — Developments in Magnetic Materials for Sensors and Data Storage

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

Program Organizers: Richard Beddingfield, North Carolina State University; Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Huseyin Ucar, California Polytechnic University; Yongmei Jin, Michigan Technological University; Arcady Zhukov, University of the Basque Country

Tuesday AM **March 16, 2021**

8:30 AM
Engineering of Magnetic Properties and Magnetoimpedance Effect of Fe-rich Microwires by Reversible and Irreversible Stress-annealing Anisotropy: *P. Corte-Leon*; V. Zhukova[1]; J. Blanco[2]; M. Ipatov[1]; A. Zhukov[3]; [1]Dept. Phys. Mater., Upv/Ehu; [2]Dept. Appl. Phys., Univ. Basque Country; [3]Dept. Phys. Mater., Upv/Ehu and Ikerbasque

8:50 AM
Engineering of Magnetic Properties of Co- -rich Microwires by Post-processing
: L. Gonzalez-Legarreta[1]; V. Zhukova[1]; M. Ipatov[1]; *P. Corte-Leon*; J. Blanco[2]; A. Zhukov[3]; [1]Dept. Phys. Mater., Upv/Ehu; [2]Dept. Appl. Phys., Univ. Basque Country; [3]Dept. Phys. Mater., Upv/Ehu and Ikerbasque

9:10 AM
In Pursuit of Antiskyrmions for Energy-Efficient Spintronics: Structural and Magnetic Characterization of Uniaxial [Pt/Co]-based C_{2v} Thin Films: *M. Kitcher*[1]; M. De Graef[2]; V. Sokalski[2]; [1] Carnegie Mellon University; [2]Carnegie Mellon University

9:30 AM Invited
Kondo-like Behaviour and GMR Effect in Co-Cu Granular Alloys and Multilayers: *R. Lopez Anton*[1]; M. Ipatov[2]; J. Gonzalez[1]; J. Andres[1]; J. Gonzalez[2]; V. Zhukova[2]; J. Mino[2]; A. Zhukov[2]; [1]Universidad de Castilla-La Mancha; [2]University of the Basque Country

9:50 AM Invited
Magnetic Real-time Tracking of Coronavirus Progress: A New Approach Utilizing Magnetic Sensor and Machine Learning: *M. Phan*[1]; [1]University of South Florida

10:10 AM Invited
Oxide Thin-film Electronics for the Front-end Conditioning of Flexible Magnetic Field Sensors: *N. Münzenrieder*[1]; [1]Free University of Bozen-Bolzano

10:30 AM
The Development of On-chip-coil Type GSR Sensor: Y. Honkura[1]; S. Honkura[1]; *M. Uemura*[1]; [1]Magnedesign Corp.

Advanced Materials for Energy Conversion and Storage VII — Energy Conversion with Emphasis on SOFC

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Tuesday AM **March 16, 2021**

8:30 AM
Experimental and Computational Investigations of the Multiple Impurities Effect on the SOFC Cathode Materials: R. Wang[1]; H. Sabarou[1]; *Y. Zhong*[1]; [1]Worcester Polytechnic Institute

8:50 AM
Characteristics of Advanced Protective Layer for SOFC Stacks: *J. Choi*[1]; J. Hardy[1]; [1]Pacific Northwest National Laboratory

9:20 AM Invited
Compositionally-stabilized Nickelate-Ceria Composite Oxygen Electrodes for Reversible Solid Oxide Fuel Cells and Electrolyzers: *S. Gopalan*[1]; J. Banner[1]; A. Aktar[1]; [1]Boston University

9:50 AM
Computational Guided Investigations on LSM/YSZ Triple-phase Boundaries: *R. Wang*[1]; Y. Zhong[1]; [1]Worcester Polytechnic Institute

10:10 AM
In-situ Cathode Cleaning for Chromium Poisoning Recovery in Solid Oxide Fuel Cells: Z. Zhu[1]; M. Sugimoto[1]; S. Gopalan[1]; S. Basu[1]; *U. Pal*[1]; [1]Boston University

10:40 AM
Three-dimensional Simulation of Electrochemical Impedance in Solid Oxide Fuel Cell (SOFC) Cathodes and Its Application in Cathode Characterization: *V. Goel*[1]; D. Cox[2]; S. Barnett[2]; K. Thornton[1]; [1]University of Michigan; [2]Northwestern University

Advanced Real Time Imaging — Alloys

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 Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, KTH Royal Institute of Technology; David Veysset, Stanford University

Tuesday AM **March 16, 2021**

8:30 AM Invited
In Situ Thermoelastic Property Evolution of Ni-based Concentrated Solid Solution Alloys under Extremes: *C. Dennett*[1]; [1]Idaho National Laboratory

8:50 AM
Atomic Scale Processes of Initial Oxidation of Cu and Cu-Ni Alloy Revealed by In Situ Environmental TEM: *M. Li*[1]; M. Curnan[1]; R. Garza[1]; S. House[1]; W. Saidi[1]; J. Yang[1]; [1]University of Pittsburgh

9:10 AM
In Situ Investigation of the Effect of Ion Irradiation and Carbon Addition in GST on Crystallization and Amorphization Thresholds: *T. Clark*[1]; D. Adams[1]; K. Hattar[1]; [1]Sandia National Laboratories

9:30 AM
High-velocity Microparticle Impact Modes for Mismatched Metals: *D. Veysset*[1]; M. Hassani[2]; Y. Sun[1]; K. Nelson[1]; C. Schuh[1]; [1]Massachusetts Institute of Technology; [2]Cornell University

9:50 AM
Dynamics of Abnormal Grain Growth in a Particle-containing System Uncovered by Multimodal Three-dimensional X-ray Imaging: *J. Kang*[1]; N. Lu[1]; N. Senabulya[1]; N. Gueninchault[2]; A. Shahani[1]; [1]University of Michigan; [2]Carl Zeiss X-ray Microscopy, Inc.

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

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Materials Characterization Committee, TMS: Powder Materials Committee
Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Kathy Lu, Virginia Polytechnic Institute and State University; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama; Eugene Olevsky, San Diego State University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Understanding the Role of Electric Field in the Manipulation of Particles in Aqueous Media and Fabrication of Ice-templated Ceramics: *D. Ghosh*[1]; S. Akurati[1]; S. Qian[1]; D. Terrones[1]; B. Gundrati[1]; [1]Old Dominion University

8:50 AM
Chemical Etch/Modification Effect on CO Oxidation Performance of Ceria Supported Catalysts: *R. Wang*[1]; Y. Wang[1]; [1]The University of Alabama

9:10 AM
Layered Ceramic Structures In1+x(Ti1/2Zn1/2)1-xO3(ZnO)m (m = 2, 4, and 6; x = 0.5): Synthesis, Phase Stability and Dielectric Properties: *V. Alvarez Montano*[1]; S. Sharma[2]; F. Brown[1]; A. Durán[3]; [1]Universidad De Sonora; [2]Catedra CONACYT CNyN-UNAM; [3]Universidad Nacional Autonoma de Mexico CNyN-UNAM

9:30 AM
Mineralogical Characteristics of Sepiolite under Thermal Treatment: H. Wang[1]; *B. Li*; [1]Michigan Technological University

9:50 AM
Dielectrophoretic Control of Ceramic Particles for Fabrication of Ice-templated Structures: *B. Gundrati*[1]; S. Akurati[1]; S. Qian[1]; D. Ghosh[1]; [1]Old Dominion University

AI/Data Informatics: Applications and Uncertainty Quantification at Atomistics and Mesoscales — Session III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Kamal Choudhary, National Institute of Standards and Technology; Garvit Agarwal, Argonne National Laboratory; Wei Chen, Illinois Institute of Technology; Mitchell Wood, Sandia National Laboratories; Vahid Attari, Texas A&M University; Oliver Johnson, Brigham Young University; Richard Hennig, University of Florida

Tuesday AM **March 16, 2021**

8:30 AM
AI Guided High-throughput Exploration of Potential Energy Surfaces: *S. Sankaranarayanan*[1]; [1]University of Illinois Chicago

9:00 AM
Decision Trees in Continuous Action Space for High-throughput Exploration of Potential Energy Surfaces: *S. Manna*[1]; T. Loeffler[1]; R. Batra[1]; S. Banik[1]; H. Chan[1]; S. Sankaranarayanan[1]; [1]Argonne National Laboratory

9:20 AM
Building a Better Database to Learn From; Application to Interatomic Potentials: *M. Wood*[1]; N. Lubbers[2]; D. Perez[2]; C. Sievers[1]; [1]Sandia National Laboratories; [2]Los Alamos National Lab

9:40 AM
Neural Network Reactive Force Field for C, H, N, O Systems: *P. Yoo*[1]; M. Sakano[1]; S. Desai[1]; M. Islam[2]; P. Liao[1]; A. Strachan[1]; [1]Purdue University; [2]Wayne State University

10:00 AM
Accelerating Phase-field Predictions via Machine Learning Trained Surrogate Models: D. Montes de Oca Zapiain[1]; J. Stewart[1]; *R. Dingreville*[1]; [1]Sandia National Laboratories

10:20 AM
Simultaneous Development and Robust Optimization of a Microstructure Dependent Material Model: Leveraging Sequential Monte-Carlo Methods to Enhance Symbolic Regression Analysis: *K. Garbrecht*[1]; N. Strauss[1]; G. Bomarito[2]; P. Leser[2]; J. Hochhalter[1]; [1]University of Utah; [2]NASA

10:40 AM
Exploring Metastability and Mapping Metastable Phase Diagrams Using Machine Learning: *S. Srinivasan*[1]; R. Batra[1]; D. Luo[1]; T. Loeffler[1]; S. Manna[1]; H. Chan[1]; L. Yang[2]; W. Yang[2]; J. Wen[1]; P. Darancet[1]; S. Sankaranarayanan[1]; [1]Argonne National Laboratory; [2]Center for High Pressure Science and Technology Advanced Research

11:00 AM
Machine Learning Guided Discovery of Novel Oxide Perovskites for Scintillator Applications: *A. Talapatra*[1]; B. Uberuaga[1]; C. Stanek[1]; G. Pilania[1]; [1]Los Alamos National Laboratory

Algorithm Development in Materials Science and Engineering — Large Scale Computational Simulations and Microscale Algorithms for Study Structure-Processing Relations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Bryan Wong, University of California, Riverside; Ebrahim Asadi, University of Memphis; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryce Meredig, Citrine Informatics

Tuesday AM **March 16, 2021**

8:30 AM
Exascale-motivated Algorithm Development for Nano and Mesoscale Materials Methods: *S. Reeve*[1]; M. Rolchigo[1]; J. Belak[1]; [1]Lawrence Livermore National Laboratory

8:50 AM
Preparing for Exascale Phase-field Simulations: Scalable, Performance-portable Precipitation Simulations: *S. DeWitt*[1]; P. Fackler[1]; Y. Song[1]; B. Radhakrishnan[1]; J. Turner[1]; [1]Oak Ridge National Laboratory

9:10 AM
Tusas: A Modern Computational Approach for Microstructure Evolution Toward Exascale: *S. Ghosh*[1]; C. Newman[1]; M. Francois[1]; [1]Los Alamos National Laboratory

9:30 AM
Bayesian Data Assimilation for Phase-field Simulation of Solid-state Sintering: *A. Ishii*[1]; A. Yamanaka[1]; Y. Okada[1]; A. Yamamoto[1]; [1]Tokyo University of Agriculture and Technology

9:50 AM
Phase Field Dislocation Dynamics (PFDD) Modeling of Non-Schmid Effects in BCC Metals: *H. Kim*[1]; N. Mathew[1]; D. Luscher[1]; A. Hunter[1]; [1]Los Alamos National Laboratory

10:10 AM
A Quantitative Phase-field Model for Study of Shape Memory Behavior and Elastocaloric Effect in CuAlBe: *C. Cissé*[1]; M. Asle Zaeem[1]; [1]Colorado School of Mines

10:30 AM
A Data-driven Simulator for High-throughput Prediction of Electromigration-mediated Damage in Polycrystalline Interconnects: *P. Wu*[1]; W. Farmer[1]; K. Ankit[1]; [1]Arizona State University

Alloys and Compounds for Thermoelectric and Solar Cell Applications IX — 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; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Tiejun Zhu, Zhejiang University; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology

Tuesday AM **March 16, 2021**

8:30 AM Invited
Mg3(Sb,Bi)2 Thermoelectric Single Crystals: From p-type to n-type: *C. Fu*[1]; Y. Pan[2]; K. Imasato[3]; M. Yao[2]; T. Zhu[1]; G. Snyder[3]; C. Felser[2]; [1]Zhejiang University; [2]Max Planck Institute for Chemical Physics of Solids; [3]Northwestern University

8:50 AM Invited
Optimization of n- and p-type Mg2X (X: Si, Ge, Sn): Understanding the Impact of Mg on the Thermoelectric Performance and the Change of the Valence Bands Under Solid Solution Formation: *J. De Boor*[1]; H. Kamila[1]; M. Yasseri[1]; A. Sankhla[1]; E. Müller[1]; [1]German Aerospace Center

9:10 AM Invited
Phase Interface Formation Induced by Phase Separation Process in Thermoelectric Mg_2(Si, Sn) Alloys and (Zr, Ti)NiSn Alloys: *Y. Kimura*[1]; Y. Chai[1]; M. Watanabe[1]; Y. Lee[2]; [1]Tokyo Institute of Technology; [2]KELK Ltd.

9:30 AM
Microstructure and Band Engineering for the High Performance of n-type Mg3Sb2-Mg3Bi2 Alloy: *K. Imasato*[1]; G. Snyder[1]; [1]Northwestern University

9:50 AM Invited
Self-tuning of Carrier Type and Improved Thermoelectric Performance in Skutterudite CoM1.5Te1.5 (M = Sn or Ge): *L. Chen*[1]; S. MV[2]; T. Chou[2]; K. Chen[2]; [1]National Taiwan University; [2]Academia Sinica

10:10 AM Invited
The Doping Effects on the Thermal Conductivity of GeTe: *J. Ma*[1]; J. Yang[2]; Y. Pei[3]; S. Lin[3]; [1]Shanghai Jiao Tong University; [2]Shanghai University; [3]Tongji University

10:30 AM
High-performance GeTe-based Thermoelectric Materials via Carrier Optimization: *Y. Tsai*[1]; H. Wu[1]; [1]National Chiao Tung University

10:50 AM
Phase Transition Behavior and Thermoelectric Property of Te doped Cu2Se: *W. Yen*[1]; H. Wu[1]; [1]National Chiao Tung University

11:10 AM Invited
Functionalization of the Conductive Network and Structural Disorder Engineering: Two Strategies to Reach High ZT in Ternary and Quaternary Sulfides: *E. Guilmeau*[1]; [1]Laboratoire CRISMAT

11:30 AM
Order Parameter from the Seebeck Coefficient in Thermoelectric Kesterite Cu_2ZnSnS_4: *E. Isotta*[1]; B. Mukherjee[1]; C. Fanciulli[2]; N. Pugno[1]; P. Scardi[1]; [1]University of Trento; [2]CNR-ICMATE, Lecco Unit

Alumina and Bauxite — Novel Processes and Bauxite Residue

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Anne Duncan, Hatch

Tuesday AM **March 16, 2021**

8:30 AM Invited
Revisiting Alternative Smelter Grade Alumina Production Processes: *A. Panov*[1]; A. Senyuta[1]; A. Smirnov[1]; [1]RUSAL Engineering and Technological Center

9:05 AM
Silicon Rich Iron Alloy from Bauxite Residue: *H. Dalaker*[1]; C. van der Eijk[1]; [1]Sintef

9:25 AM
Bauxite Residue Neutralization Potential Using Biogenic Sulfuric and Citric Acids: P. Silva[1]; R. Holanda[1]; A. Carmo[1]; F. Gomes[1]; R. Costa[2]; C. Melo[2]; *A. Lucheta*[1]; M. Montini[2]; [1]SENAI Innovation Institute for Mineral Technologies; [2]Norsk Hydro Brasil

9:45 AM
Gravity Methods Applied to Bauxite Residue for Mineral Pre-concentration: P. Araújo[1]; P. Silva[1]; A. Carmo[1]; M. Gonçalves[2]; R. Costa[3]; C. Melo[3]; *A. Lucheta*[1]; M. Montini[3]; [1]SENAI Innovation Institute for Mineral Technologies; [2]SENAI Innvation Institute for Mineral Processing; [3]Norsk Hydro Brasil

Aluminum Alloys, Processing and Characterization — Material Processing and Modeling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Dimitry Sediako, University of British Columbia

Tuesday AM **March 16, 2021**

8:30 AM
Simulations of Wear-induced Microstructural Evolution in Nanocrystalline Aluminum: *Y. Shi*[1]; I. Szlufarska[1]; [1]University of Wisconsin-Madison

8:50 AM
High-throughput Aluminum Alloy Discovery Using Laser Additive Manufacturing: *Q. Pan*[1]; M. Kapoor[2]; S. Mileski[2]; J. Carsley[2]; X. Lou[1]; [1]Aubrun University; [2]Novelis Global Research and Technology Center

9:10 AM
Manufacturing A206 Aluminum Alloy by Step Sand Casting: Effect of Solidification Time on Mechanical and Surface Properties of the Cast Samples Using Experimental and Simulation Results: *A. Kordijazi*[1]; P. Rohatgi[1]; [1]University of Wisconsin Milwaukee

9:30 AM
Experimental and Numerical Examinations Regarding the Material Flow of Combined Rolling Extrusion Process: *C. Heinzel*[1]; A. Salnikov[2]; S. Müller[3]; [1]SMS Group GmbH; [2]RUSAL; [3]FZS - TU Berlin

9:50 AM
Comparison of Simulation and Real Life to Set Up Holistic Approach for Extrusion Process: *Z. Ozen*[1]; M. Güner[1]; O. Çelik[1]; G. Özçelik[1]; M. Konar[1]; T. Güler[1]; C. Mehmetalioglu[1]; M. Özcan[1]; T. Demirkiran[1]; [1]ASAS

10:10 AM
Computational Simulation of Nanoparticle Distributions in Metal Matrix Composite Casting Processes: *G. Zheng*[1]; J. Jakumeit[1]; T. Pabel[2]; C. Kneissl[2]; L. Magagnin[3]; [1]ACCESS e. V.; [2]Austrian Foundry Research Institute (OGI); [3]Politecnico di Milano

10:30 AM
Effect of Thermomechanical Processing on Strengthening of the 5181 Alloy (with 0.03 %Sc) Sheets for Preservation of 40 % Improved Strength Compared with 5083: *D. Fokin*[1]; A. Alabin[2]; S. Valchuk[2]; V. Mann[2]; A. Krokhin[2]; [1]Light Materials and Technologies Institute UC RUSAL; [2]JSC RUSAL Management

Aluminum Reduction Technology — Cell Operation (Performance and Operating Advances)

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Nadia Ahli, Emirates Global Aluminium; Nancy Holt, Hydro Aluminium AS

Tuesday AM **March 16, 2021**

8:30 AM
Carbon Dust - Its Shortterm Influence on Potroom Operations: *M. Dechent*[1]; [1]Trimet Aluminium SE

8:50 AM
Experience with Lengthy Pot Hibernation at Alcoa Baie-Comeau: *X. Wang*[1]; M. Laframboise[1]; P. Gagnon[1]; G. Proulx[1]; [1]Alcoa Corp

9:10 AM
Improvement to Alpsys Instability and Alumina Feeding Control: *A. Gosselin*[1]; [1]Rio Tinto

9:30 AM
Hydro's New Karmøy Technology Pilot: Start-up and Early Operation: *P. Reny*[1]; M. Segatz[1]; H. Haakonsen[1]; H. Gikling[1]; M. Assadian[1]; J. Høines[1]; E. Kvilhaug[1]; A. Bardal[1]; E. Solbu[1]; [1]Hydro

9:50 AM
AP12 Low Energy Technology at ALRO Smelter: *M. Cilianu*[1]; B. Allano[2]; G. Dobra[1]; I. Mihaescu[1]; C. Ritter[2]; A. Auge[2]; Y. Caratini[2]; [1]Vimetco alro; [2]Rio Tinto

Bio-Nano Interfaces and Engineering Applications — Bio-Nano III

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota State University; Hendrik Heinz, University of Colorado Boulder; Terry Lowe, Colorado School of Mines; Po-Yu Chen, National Tsing Hua University

Tuesday AM **March 16, 2021**

8:30 AM
Enhancing Electrochemical Detection of Choline Using Molecularly Imprinted Polymer Electrode: *S. Utku*[1]; S. Bakay[2]; A. Denizli[3]; I. Cilesiz[4]; [1]Yeditepe University Biomedical Engineering; [2]Duzce University; [3]Hacettepe University; [4]Istanbul Technical University

Bulk Metallic Glasses XVIII — Alloy Development and Application I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday AM **March 16, 2021**

8:30 AM Invited
Overview on Additive Manufacturing Techniques for Bulk Metallic Glasses: *D. Hofmann*[1]; P. Bordeenithikasem[1]; S. Firdosy[1]; A. Pate[1]; D. East[2]; [1]NASA JPL/Caltech; [2]CSIRO

8:55 AM
Demisability of Bulk Metallic Glasses for Potential Satellite Applications: *P. Bordeenithikasem*[1]; S. Roberts[1]; D. Hofmann[1]; J. Ratliff[1]; B. Greene[2]; J. Bacon[2]; S. Sohn[3]; J. Schroers[3]; [1]NASA Jet Propulsion Laboratory; [2]NASA Johnson Space Center; [3]Yale University

9:15 AM
Nanomolding Far and Close to Equilibrium: *N. Liu*[1]; G. Liu[1]; A. Raj[1]; S. Sohn[1]; J. Schroers[1]; [1]Yale University

Characterization of Minerals, Metals and Materials 2021 — Advanced Characterization Methods II

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

Tuesday AM **March 16, 2021**

8:30 AM
On the Origins of the Discrepancies between Optical, SEM, and EBSD-based Grain Size Measurements: *E. Payton*[1]; K. Evans[1]; [1]Air Force Research Laboratory

8:50 AM
A Correlative Approach for Distinguishing Multiple BCC Phases in Thick-Section High Strength Steels: *V. Bertolo*[1]; Q. Jiang[1]; C. Walters[2]; J. Sietsma[1]; V. Popovich[1]; [1]Delft University of Technology; [2]TNO

9:10 AM
Ultrasonic Scattering in Two-phase Polycrystalline Materials: *S. Islam*[1]; M. Norouzian[1]; J. Turner[1]; [1]University of Nebraska-Lincoln

9:30 AM
Effects of Microstructural Features on the Crack Initiation Mechanism in AA6451 during Three-point Bending: *Y. Yoo*[1]; S. Das[2]; R. Hamerton[2]; J. Kacher[1]; [1]Georgia Institute of Technology; [2]Novelis Inc.

9:50 AM
Applying Stereological Characterisation to the Solidification Structure of Single Crystal Alloys to Deduce the 3D Macroscopic Solid/Liquid Interface Shape: *J. Strickland*[1]; B. Nenchev[1]; K. Tassenberg[1]; S. Perry[1]; G. Sheppard[1]; H. Dong[1]; [1]University of Leicester

10:10 AM
Development of Onboard Temperature Monitoring System for Axlebox in Railway Bogie: *J. Kim*[1]; [1]Korea Railroad Research Institute

10:30 AM
Influence of Morphology on Ultrasonic Scattering: A Theoretical Study: *S. Islam*[1]; M. Norouzian[1]; J. Turner[1]; [1]University of Nebraska-Lincoln

10:50 AM
In Situ Study of High Temperature Oxidation of Alloys Using Ambient Pressure X-ray Photoelectron Spectroscopy: *R. Oleksak*[1]; J. Baltrus[1]; T. Liu[1]; R. Addou[2]; J. Diulus[2]; G. Herman[2]; B. Gwalani[3]; A. Devaraj[3]; Ö. Dogan[1]; [1]National Energy Technology Laboratory; [2]Oregon State University; [3]Pacific Northwest National Laboratory

11:10 AM
Characterization of Reactive Metallic Nanolayers through High-speed Imaging: A. Behboud[1]; F. Kazanc[1]; *S. Ozerinc*[1]; [1]Middle East Technical University

Characterization of Nuclear Materials and Fuels with Advanced X-ray and Neutron Techniques — Neutron Diffraction and Imaging

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee
Program Organizers: Xuan Zhang, Argonne National Laboratory; Jonathan Almer, Argonne National Laboratory; Maria Okuniewski, Purdue University; Joshua Kane, Idaho National Laboratory; Donald Brown, Los Alamos National Laboratory; J. Kennedy, Idaho National Laboratory; Arthur Motta, Pennsylvania State University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Advanced Characterization of Nuclear Fuel Using Neutron Imaging: *Y. Zhang*[1]; H. Bilheux[1]; K. Myhre[1]; J. Bilheux[1]; J. Lin[2]; J. Johnson[1]; A. Miskowiec[1]; R. Hunt[1]; L. Santodonato[3]; J. Molaison[1]; P. Cornwell[1]; E. Stringfellow[1]; [1]Oak Ridge National Laboratory; [2]Satelytics; [3]Advanced Research Systems, Inc.

8:55 AM Invited
Neutron Imaging at LANSCE: Characterizing Nuclear Materials for Next Generation Reactor Designs.: *A. Long*[1]; S. Vogel[1]; [1]Los Alamos National Laboratory

9:20 AM
Characterization of Irradiated Nuclear Fuels with Pulsed Neutrons: *S. Vogel*[1]; K. McClellan[1]; L. Capriotti[2]; J. Harp[3]; A. Long[1]; D. Schaper[1]; E. Larson[1]; D. Carver[1]; J. Lin[4]; P. Hosemann[4]; T. Balke[5]; [1]Los Alamos National Laboratory; [2]Idaho National Laboratory; [3]Oak Ridge National Laboratory; [4]UC Berkeley; [5]LANL/Purdue University

9:40 AM
Characterization of the Crystal Structure Evolution of U-Zr Alloys Utilizing Time-of-Flight Neutron Diffraction with In-situ-heating: *W. Williams*[1]; S. Vogel[2]; J. Zhang[2]; M. Okuniewski[3]; [1]Idaho National Laboratory; [2]Los Alamos National Laboratory; [3]Purdue University

10:00 AM
Microstructure and Crystal Structure Studies in the U-Zr System: *S. Vogel*[1]; Y. Xie[2]; L. Capriotti[3]; M. Benson[3]; J. Harp[4]; [1]Los Alamos National Laboratory; [2]Purdue University; [3]Idaho National Laboratory; [4]Oak Ridge National Laboratory

10:20 AM
Non-destructive Characterization of Nuclear Materials using Neutron Imaging Techniques: *H. Bilheux*[1]; Y. Zhang[1]; J. Bilheux[1]; E. Stringfellow[1]; K. Myhre[1]; B. Beers[1]; B. Heuser[1]; T. Thomasson[1]; A. Jones[1]; R. Ibberson[1]; [1]Oak Ridge National Laboratory

10:40 AM
Neutron Radiography Capabilities at LANSCE: Completing LANSCE's Cold/Thermal/Epithermal Imaging Suite With Fast-neutron Radiography: *D. Schaper*[1]; J. Bundgaard[2]; C. Carlson[2]; P. Feng[3]; D. Gautier[1]; A. Long[1]; D. Newmark[1]; S. Vogel[1]; [1]Los Alamos National Laboratory; [2]Nevada National Security Site; [3]Sandia National Laboratory

11:00 AM
Transmission Spectrum Estimation and Material Decomposition with Energy Resolved Neutron Imaging: *T. Balke*[1]; A. Long[1]; S. Vogel[1]; B. Wohlberg[1]; C. Bouman[1]; [1]Los Alamos National Laboratory

Composite Materials for Nuclear Applications — Ceramic Composites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee, TMS: Nuclear Materials Committee
Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Oak Ridge National Laboratory; Peng Xu, Idaho National Laboratory; Johann (Hans) Riesch, Max Planck Institute for Plasma Physics

Tuesday AM **March 16, 2021**

8:30 AM
Development of PVD Cr Coatings for Hydrothermal Corrosion Mitigation of SiC-SiC$_f$ Fuel Cladding in LWRs: *K. Quillin*[1]; H. Yeom[1]; T. Dabney[1]; J. Lacy[1]; T. Kim[1]; S. Chemerisov[2]; A. Couet[1]; K. Sridharan[1]; [1]University of Wisconsin, Madison; [2]Argonne National Laboratory

8:50 AM
Corrosion and TEM Analysis of CVD and PVD Coatings for BWR Accident Tolerant Fuel Cladding: *R. Schoell*[1]; J. Kabel[2]; S. Lam[3]; K. Shapovalov[4]; P. Hosemann[3]; D. Kaoumi[1]; [1]North Carolina State University; [2]University of California Berkeley ; [3]University of California Berkeley; [4]General Atomics

9:10 AM
Novel Fiber Fretting Technique for Tribological Properties of Composite Interphases: *J. Kabel*[1]; T. Edwards[2]; C. Hain[2]; T. Kochetkova[2]; J. Michler[2]; P. Hosemann[1]; [1]University of California, Berkeley; [2]EMPA

Computational Thermodynamics and Kinetics — Software Tools and Material Prediction / Thermodynamics and Phase Selection

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Tuesday AM **March 16, 2021**

8:30 AM Invited
Application of CALPHAD-based Tools for Optimizing AM Microstructures and Properties: *C. Campbell*[1]; M. Stoudt[1]; J. Zuback[1]; S. Hammadi[2]; [1]National Institute of Standards and Technology; [2]Royal Institute of Technology (KTH)

9:00 AM
Predicting the IMC Growth Kinetics in Sn-based Solder Joints Using Simplistic CALPHAD Approaches: *A. Roy*[1]; K. Ankit[1]; [1]Arizona State University

9:20 AM
Ga-Sn-Zn Alloys – Thermophysical Properties of Novel Liquid Metals: *A. Dobosz*[1]; T. Gancarz[1]; [1]Institute of Metallurgy and Materials Science Polish Academy of Sciences

9:40 AM Invited
Understanding Phase Stability and Diffusion Kinetics in Structurally Unstable Phases from First-principles: *S. Kadkhodaei*[1]; [1]University of Illinois at Chicago

10:10 AM
First Principles Thermodynamics of Fe-Cr-Mn Carbides in High-Mn Steels: *L. Sreekala*[1]; T. Hickel[1]; J. Neugebauer[1]; [1]Max-Planck-Institute For Iron Research

10:30 AM
Interplay between Chemical Interactions and Constituent Strain Energy during the Early Stages of Precipitations: *K. Wang*[1]; D. Cheng[1]; B. Zhou[1]; [1]University of Virginia

Corrosion in Heavy Liquid Metals for Energy Systems — Materials Compatibility with Liquid Metal Coolants III

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
Program Organizers: Osman Anderoglu, University of New Mexico; Alessandro Marino, SCK-CEN; Michael Short, Massachusetts Institute of Technology; Peter Hosemann, University of California; Mike Ickes, Westinghouse Electric Company

Tuesday AM **March 16, 2021**

8:30 AM
Electromagnetic Flow Sensor for Heavy Liquid Metals for Energy Systems: *H. Ban*[1]; O. Anderoglu[2]; C. Unal[3]; [1]University of Pittsburgh; [2]University of New Mexico; [3]Los Alamos National Lab

8:50 AM
Review of Liquid Metal Corrosion Under Irradiation and Progress Report on the LBE-Irradiation-Corrosion Experiment (ICE): *F. Schmidt*[1]; P. Hosemann[1]; [1]University of California, Berkeley

9:10 AM
Preliminary Results on the Compatibility of Fe-Cr-Al and Fe-Cr-Al-Mo Steels with Liquid Sodium at 700 °C.
: *M. Romedenne*[1]; R. Pillai[1]; B. Pint[1]; [1]ORNL

9:30 AM
Investigation on the Evaporation Rate of Liquid Lead and Radioisotope Retention Capability of Molten Lead as Coolant: *S. Ghosh*[1]; O. Anderoglu[1]; C. Cakez[1]; K. Talaat[1]; K. Woloshun[2]; M. Epstein[3]; S. Lee[4]; P. Ferroni[3]; E. Tatli[3]; M. Memmott[5]; [1]University of New Mexico; [2]Los Alamos National Laboratory; [3]Westinghouse Electric Company, LLC; [4]Fauske & Associates, LLC; [5]Brigham Young University

Defect and Phase Transformation Pathway Engineering for Desired Microstructures — Invited Presentations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Yufeng Zheng, University of Nevada-Reno ; Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Timofey Frolov, Lawrence Livermore National Laboratory; Stoichko Antonov, Max-Planck-Institut für Eisenforschung GmbH; Jessica Krogstad, University of Illinois at Urbana-Champaign; Bin Li, University of Nevada, Reno

Tuesday AM **March 16, 2021**

8:30 AM Invited
New Insights on Deformation Twinning- Mechanisms and Modeling: *H. Sehitoglu*[1]; A. Mohammed[1]; O. Celebi[1]; G. Gengor[1]; J. Krogstad[1]; [1]University of Illinois

8:50 AM Invited
Phase Transformation Pathways in High Entropy Alloys or Complex Concentrated Alloys mediated by Defects: *S. Dasari*[1]; B. Gwalani[1]; Y. Chang[2]; D. Choudhuri[1]; S. Gorsse[3]; A. Yeh[2]; R. Banerjee[1]; [1]University of North Texas; [2]National Tsing Hua University; [3]University of Bordeaux, France

9:10 AM Invited
Microstructure and Tensile Behavior of Nanostructured Gradient TWIP Steel: J. Ding[1]; Z. Shang[1]; J. Li[1]; H. Wang[1]; *X. Zhang*[1]; [1]Purdue University

9:30 AM Invited
Kinetic Monte Carlo Simulations of Solute Clustering in Multicomponent Al Alloys: M. Zhang[1]; Z. Xi[1]; L. Hector Jr.[1]; C. Yang[1]; *L. Qi*[1]; [1]University of Michigan

9:50 AM Invited
Grain Boundary Segregation in Immiscible Alloys: Anisotropy and Trijunction Effects: A. Barnett[1]; M. Cox[1]; D. Moore[1]; M. Alghalayini[1]; C. Barr[2]; K. Hattar[2]; B. Boyce[2]; *F. Abdeljawad*[1]; [1]Clemson University; [2]Sandia National Laboratories

10:10 AM Invited
Development of Superalloys Driven by Atomic-scale Interactions of Solutes with Crystal Defects: *P. Kontis*[1]; S. Antonov[1]; P. Kürnsteiner[1]; S. Katnagallu[2]; J. Mianroodi[1]; L. Lilensten[3]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Karlsruhe Institute of Technology; [3]CNRS - Institut de Recherche de Chimie Paris

10:30 AM Invited
Evolution of Metastable Grain Boundaries and Its Implications on Nanocrystals' Hardness Variation: Z. Bai[1]; G. Balbus[2]; D. Gianola[2]; *Y. Fan*[1]; [1]University of Michigan; [2]UCSB

Deformation Induced Microstructural Modification — Session III: Computational Studies of Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Suveen Mathaudhu, University of California-Riverside ; Kester Clarke, Colorado School of Mines; Bharat Gwalani, Pacific Northwest National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM Invited
Grain Boundary Segregation in Nanocrystalline Alloys: Multicomponent, Anisotropy, and Stress Effects: M. Alkayyali[1]; Y. Mahmood[1]; J. Arrington[1]; *F. Abdeljawad*[1]; [1]Clemson University

9:00 AM
Effect of Loading Path on Grain Misorientation Evolution in Polycrystalline Al under Large Deformation: *W. Fu*[1]; Y. Li[1]; S. Hu[1]; P. Sushko[1]; S. Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]Pacific Northwest National Laboratory & University of California, Riverside

9:20 AM
A First Principles Criterion for Microstructure Evolution in Deformation Twinned FCC Materials: *M. Daly*[1]; R. Jagatramka[1]; J. Ahmed[1]; [1]University of Illinois at Chicago

9:40 AM Invited
Microstructure-based Modeling of Impact-Induced Plastic Deformation: Q. Tang[1]; *M. Hassani*[1]; [1]Cornell University

10:10 AM
Molecular Dynamics Simulations of Defect Structure Evolution under Shear Deformation in Polycrystalline Al: *N. Chen*[1]; S. Hu[1]; W. Setyawan[1]; P. Sushko[1]; S. Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California, Riverside

10:30 AM
Modeling the Bonding and Structure of Non-metallic Inclusions within a Nickel Matrix during Forging: *B. Mackey*[1]; T. Siegmund[1]; M. Sangid[1]; [1]Purdue University

Electronic Packaging and Interconnections 2021 — Solder Joint Intermetallics

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Mehran Maalekian, Mat-Tech; Christopher Gourlay, Imperial College London; Babak Arfaei, Ford Motor Company; Praveen Kumar, Indian Institute of Science; Sai Vadlamani, Intel Corporation; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University

Tuesday AM **March 16, 2021**

8:30 AM
On Interface Formation in Zr-based BMG /6061 Al Interconnects Joined by µFSSW: *D. Yan*[1]; L. Vahlstrom[1]; [1]San Jose State University

8:50 AM
Real-time Observation of the Accelerated Growth of $(Cu,Ni)_6Sn_5$ on Cu-xNi: *X. Tan*[1]; S. Belyakov[2]; T. Su[2]; S. McDonald[1]; C. Gourlay[2]; H. Yasuda[3]; S. Matsumura[4]; K. Nogita[1]; [1]University of Queensland; [2]Imperial College London; [3]Kyoto University; [4]Kyushu University

9:10 AM
Influence of Indium on the Microstructure and Properties of Interfacial IMC in Sn-rich Solder Joints: Experiments and First Principle Calculations: *A. Luktuke*[1]; A. Sundar[1]; N. Chawla[1]; [1]Purdue University

9:30 AM
Atomic Insights into the Role of Dopants in -Cu6Sn5 toward Its Structural Stability: *W. Yang*[1]; X. Quy Tran[1]; T. Yamamoto[1]; K. Nogita[2]; S. Matsumura[1]; [1]Kyushu University; [2]University of Queensland

9:50 AM Invited
Reducing Cracking in BGA Solder Joint Cu6Sn5 by Controlling the Reflow Profile: *K. Nogita*[1]; F. Somidin[2]; K. Sweatman[3]; T. Akaiwa[3]; T. Nishimura[3]; S. Matsumura[4]; X. Ye[1]; S. McDonald[1]; [1]University of Queensland; [2]Universiti Malaysia Perlis (UniMAP); [3]Nihon Superior Co. Ltd.; [4]Kyushu University

10:10 AM
The Formation and Growth Kinetics of a Peculiar Cu_6Sn_5/Ag_3Sn Composite Intermetallic Layer at the Cu50Ag/Sn Interface during Solid-state Aging: *C. Liang*[1]; T. Chiu[2]; K. Lin[1]; [1]National Cheng Kung University; [2]Conquer Electronics

10:30 AM
Reconciling Phase Equilibria and Crystal Structures for the Cu_6Sn_5 Intermetallic in the Cu-Sn System: *A. Leineweber*[1]; [1]Technical University Bergakademie Freiberg

10:50 AM
Interfacial Reaction of Ni-In System and Mechanical Properties of Ni3In7: *J. Liao*[1]; C. Kao[1]; H. Hung[1]; [1]National Taiwan University

11:10 AM
Microalloying Effects on Intermetallic Compound Growth and Mechanical Reliability of Sn-Bi Solder Joints: *Y. Fan*[1]; Y. Wu[1]; T. Dale[1]; S. Achar[1]; H. Fowler[1]; N. Badwe[2]; R. Aspandiar[2]; J. Blendell[1]; G. Subbarayan[1]; C. Handwerker[1]; [1]Purdue University; [2]Intel Corporation

Energy Technologies and CO2 Management — Session III

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
Program Organizers: Alafara Baba, University of Ilorin; Lei Zhang, University of Alaska Fairbanks; Donna Guillen, Idaho National Laboratory; Xiaobo Chen, RMIT University; John Howarter, Purdue University; Neale Neelameggham, IND LLC; Cong Wang, Northeastern University; Ziqi Sun, Queensland University of Technology; Hong Peng, University of Queensland; Yu Lin Zhong, Griffith University

Tuesday AM **March 16, 2021**

8:30 AM
Characterization of Substituted PAH from Industrial Samples: *K. Arnesen*[1]; A. Brunsvik[2]; T. Aarhaug[2]; K. Einarsrud[1]; G. Tranell[1]; [1]Norwegian University of Science and Technology; [2]SINTEF Industry

8:50 AM
Effects on Operational Capabilities and Lifecycle of Commercially Available Li-ion Batteries Due to Partial Nail Penetration from Drop Hammer Impact Test: *C. Jones*[1]; B. Li[1]; V. Tomar[1]; [1]Purdue University

9:10 AM
Excitonic Effects in Absorption Spectra of Carbon Dioxide Reduction Photocatalysts: *T. Biswas*[1]; A. Singh[1]; [1]Arizona State University

9:30 AM
Experimental Study and Numerical Modeling of Nanoparticle Injection Technology for Remediating Leaks of CO2 Storage: *L. Li*[1]; Y. Zhang[1]; M. Hubler[1]; Y. Xi[1]; P. Newell[2]; [1]University of Colorado Boulder; [2]University of Utah

9:50 AM
High Temperature Properties in Ferritic Heat Resistant Steels with Intermetallic Precipitates for High Efficient Heat Recovery Systems: A. Mitani[1]; M. Miyoseta[1]; *Y. Tachi*[1]; [1]Sanyo Special Steel Co., Ltd.

Environmentally Assisted Cracking: Theory and Practice — Hydrogen Embrittlement

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Hydrogen Embrittlement – A Retrospective Opinion: *I. Robertson*[1]; [1]University of Wisconsin-Madison

9:15 AM
Discrepancy Between Hydrogen-modified Dislocation Structures in the Surface and Interior Grain: *S. Wang*[1]; Q. Sun[1]; [1]Southern University of Science and Technology

9:35 AM
Macroscale-based Approaches for Assessing the Influence of Hydrogen on the Deformation Behavior of Polycrystalline Ni: *Z. Harris*[1]; S. Agnew[1]; J. Burns[1]; [1]University of Virginia

9:55 AM
Assessing the Susceptibility of Existing Pipelines to Hydrogen Embrittlement: *T. Boot*[1]; T. Riemslag[1]; E. Reinton[1]; C. Walters[1]; P. Liu[2]; V. Popovich[1]; [1]TU Delft; [2]INTECSEA BV

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multi-mechanical Interactions during Extreme Environment Fatigue Loading

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Jean-Charles Stinville, University of California-Santa Barbara

Tuesday AM **March 16, 2021**

8:30 AM
Additively Manufactured Haynes 282 Superalloy Using L-PBF: Heat Treatment Effect on Mechanical Properties at Room and Elevated Temperatures: S. Ghiaasiaan[1]; *N. Ahmad*[1]; P. Gradl[1]; S. Cordner[1]; C. Katsarelis[1]; W. Tilson[1]; S. Shao[1]; N. Shasaei[1]; [1]Auburn University

8:50 AM
Quantification of Fatigue Crack Growth Rates and Fatigue-creep Load Interaction Effects of Heterogeneous Fiber Networks via Thresholded Strain Fields: *S. Paluskiewicz*[1]; Y. Na[1]; C. Muhlstein[1]; [1]Georgia Institute of Technology

9:10 AM
Rapid Characterization of Cyclic Response of Small-volume Metal Samples Using Spherical Microindentation Stress-strain: *C. Johnson*[1]; S. Mohan[1]; R. John[2]; A. Pilchak[2]; S. Kalidindi[1]; [1]Georgia Institute of Technology; [2]Air Force Research Laboratory

9:30 AM
Fatigue Crack Growth in a Ni-rich NiTiHf High Temperature Shape Memory Alloy under Thermomechanical Loading: *B. Haghgouyan*[1]; B. Young[1]; I. Karaman[1]; D. Lagoudas[1]; [1]Texas A&M University

Friction Stir Welding and Processing XI — Friction Stir Technologies

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

Tuesday AM **March 16, 2021**

8:30 AM
Effect of Die Geometry on Rate-controlled Friction Extrusion: *X. Li*[1]; M. Reza-E-Rabby[1]; L. Li[1]; A. Soulami[1]; G. Grant[1]; A. Reynolds[2]; [1]Pacific Northwest National Laboratory; [2]University of South Carolina

8:50 AM
Engineered Metal Matrix Composites Produced Via Co-extrusion for High-temperature Friction Stir Welding: *P. Brune*[1]; G. Hilmas[1]; J. Watts[1]; [1]Missouri University of Science and Technology

9:10 AM
Residual Stresses and Nanoscale Evolution in AA6061 Produced by Additive Friction Stir-deposition: *L. Brewer*[1]; N. Zhu[1]; D. Avery[1]; P. Allison[1]; J. Jordon[1]; Y. Chen[2]; K. An[2]; [1]University of Alabama; [2]Oak Ridge National Laboratory

9:30 AM
Additive Friction Stir Deposition for Repair and Cladding Applications: *H. Yu*[1]; [1]Virginia Polytechnic Institute and State University

Frontiers in Solidification Science VIII — Eutectic Growth

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Coupled and Decoupled Eutectic Growth in a Transparent Irregular Eutectic Alloy: *S. Bottin-Rousseau*[1]; S. Mohagheghi[2]; S. Akamatsu[1]; M. Serefoglu[2]; [1]Sorbonne University; [2]Koç University

9:00 AM
Crystal-orientation Maps of Lamellar Eutectic Growth Microstructures in Thin Al-Al2Cu Films Obtained by Laue Microdiffraction: *M. Medjkoune*[1]; S. Akamatsu[1]; G. Prévot[1]; J. Micha[2]; S. Bottin-Rousseau[1]; [1]Nanoscience institute of Paris; [2]European Synchrotron ESRF, CRG IF Beamline BM32

9:20 AM
Coexistence of Rod-like and Lamellar Eutectic Growth Patterns: In Situ Experiments in Microgravity: *S. Akamatsu*[1]; S. Bottin-Rousseau[2]; M. Plapp[3]; V. Witusiewicz[4]; U. Hecht[4]; [1]Cnrs; [2]Sorbonne University; [3]Ecole Polytechnique; [4]Access eV

9:40 AM
Phase-field Simulations of the Lamella-to-rod Transition in Eutectic Solidification: *M. Plapp*[1]; S. Bottin-Rousseau[2]; S. Akamatsu[2]; [1]Ecole Polytechnique, CNRS; [2]Sorbonne Université, CNRS

10:00 AM
Orientation Relationships and Pattern Evolution In Directionally Solidified Al-Cu-Mg Ternary Eutectic
: *D. Ezemenaka*[1]; A. Genau[1]; [1]University of Alabama at Birmingham

10:20 AM Invited
Phase Field Modeling of Solidification with Application to Template-directed Solidification: E. Hanson[1]; M. Zhang[1]; Y. Lyu[1]; D. Montiel[1]; *K. Thornton*[1]; [1]University of Michigan

10:50 AM
Probing the Growth Dynamics of Eutectic Colonies in Zn-Al via X-ray Video Microscopy: Y. Wang[1]; J. Gao[2]; *A. Shahani*[1]; [1]University of Michigan; [2]Northeastern University

11:10 AM
Lamellar Spacing Selection during Oscillatory Eutectic Solidification: *P. Chao*[1]; A. Shahani[1]; [1]University of Michigan

11:30 AM
Phase Field Modeling of Biomineralization? Microstructure Evolution in Mollusk Shells: *L. Granasy*[1]; L. Ratkai[1]; T. Pusztai[1]; [1]Wigner Research Centre for Physics

11:50 AM
In Memoriam: Gabriel Faivre: *D. Tourret*[1]; A. Clarke[2]; U. Hecht[3]; N. Ofori-Opoku[4]; M. Serefoglu[5]; T. Stan[6]; [1]IMDEA Materials; [2]Colorado School of Mines; [3]Access e.V.; [4]Canadian Nuclear Laboratories; [5]Koc University; [6]Northwestern University

Frontiers of Materials Award Symposium: 2021 Functional Nanomaterials: Translating Innovation into Pioneering Technologies — Session III

Program Organizer: Huanyu Cheng, Pennsylvania State University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Programmable Gold Nanowire Electronic Skins and Tattoos: *W. Cheng*[1]; [1]Monash University

9:10 AM Invited
Wearable Gas Sensors with Wireless Communication and RF Energy Harvesting Capabilities: *H. Cheng*[1]; [1]Pennsylvania State University

9:50 AM Invited
Engineering Self-folding and Shape Morphing in Patterned Materials: *D. Gracias*[1]; [1]Johns Hopkins University

10:30 AM Invited
Flexible Printable Bioelectronics Devices: Wearable Biosensors and Bioenergy Harvesters: *J. Wang*[1]; [1]University California, San Diego

Frontiers of Materials Award Symposium: Low-Dimensional Materials and Interfaces for Next Generation Computing — Session I

Program Organizer: Deep Jariwala, University of Pennsylvania

Tuesday AM **March 16, 2021**

8:30 AM
Introductory Comments: Frontiers of Materials Award Symposium: Low-dimensional Materials and Interfaces for Next Generation Computing: *D. Jariwala*[1]; [1]University of Pennsylvania

8:35 AM Invited
Gate-tunable Neuromorphic Devices Enabled by Low-dimensional Materials: *M. Hersam*[1]; [1]Northwestern University

9:15 AM Invited
2D/3D Heterostructures for Low-power Logic and Memory Devices: *D. Jariwala*[1]; [1]University of Pennsylvania

9:55 AM Invited
Ferroelectrics: From Memory to Computing: *S. Datta*[1]; [1]University of Notre Dame

Greater Than the Sum of Its Parts — Concurrent Alloy Design and Processing Science: An LMD Symposium Honoring Raymond Decker — Session II

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Eric Nyberg, Tungsten Heavy Powder & Parts; J. Brian Jordon, University of Alabama; Wilhelmus Sillekens, European Space Agency; Neale Neelameggham, IND LLC; Vineet Joshi, Pacific Northwest National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM Invited
Thixomolded Magnesium: Quick, Light, and Mighty: *T. Berman*[1]; [1]University of Michigan

9:00 AM Invited
Magnesium Sheet Alloy Development for Room Temperature Forming: *A. Luo*[1]; R. Shi[1]; J. Miao[1]; T. Avey[1]; [1]Ohio State University

9:30 AM
Impacts of Grain Boundary Particle Characteristics on Twin Transmission: *B. Anthony*[1]; B. Leu[2]; I. Beyerlein[2]; V. Miller[1]; [1]University Of Florida; [2]University of California Santa Barbara

9:50 AM Keynote
Evolution of Alloy Design, It's Science/Instruments Base, Tech Transfer
Routes and Market Pull, 1921-2021
: *R. Decker*[1]; [1]University of Michigan

10:35 AM Break

10:55 AM Panel Discussion

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Heterostructured Materials III: Processing and Properties

Sponsored by: TMS Structural Materials Division, 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; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Tuesday AM **March 16, 2021**

8:30 AM Invited
Heterogenous Nanostructured Nickel Superalloy: *A. Hodge*[1]; [1]University of Southern California

8:55 AM
Interface Affected Plasticity in Accumulative Roll Bonded FCC/BCC Metallic Laminates
: *R. McCabe*[1]; M. Schneider[1]; J. Gigax[1]; N. Li[1]; T. Nizolek[1]; J. Carpenter[1]; [1]Los Alamos National Laboratory

9:15 AM
Mechanical Properties and Structural Stability of a Bulk Nanostructured Metastable Aluminum-magnesium: *M. Kawasaki*[1]; [1]Oregon State University

9:35 AM Invited
Nucleation of New Deformation Modes in Nanostructured Metals: *N. Tsuji*[1]; [1]Kyoto University

10:00 AM Invited
Solid-tsate Additive Manufacturing of Heterostructured Materials via Additive Friction Stir Deposition: *H. Yu*[1]; [1]Virginia Polytechnic Institute and State University

10:25 AM
Optimizing Wear and Corrosion Resistance of Metallic Multilayers through Atomic-scale Design: *W. Wang*[1]; W. Cai[1]; [1]Virginia Polytechnic Institute and State University

High Entropy Alloys IX: Alloy Development and Properties — Structures and Mechanical Properties I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday AM **March 16, 2021**

8:30 AM Keynote
Current Perspectives in High Entropy Alloys: *D. Apelian*[1]; B. Macdonald[1]; C. Zhang[1]; E. Lavernia[1]; [1]University of California, Irvine

9:00 AM Invited
FCC-HCP Transformation in Cr-Mn-Fe-Co-Ni High Entropy Alloys:-Mechanical Property and Nanograin Formation: *K. Tsuchiya*[1]; J. Yi[1]; B. Jiang[1]; J. Lee[2]; [1]National Institute for Materials Science; [2]Pusan National University

9:25 AM
Low Cycle Fatigue Behavior and Cyclic Plastic Response of Equiatomic CrCoNi Medium-entropy Alloy: *M. Heczko*[1]; V. Mazanova[1]; C. Slone[1]; I. Kubena[2]; J. Tobias[2]; T. Kruml[2]; E. George[3]; M. Ghazisaeidi[1]; J. Polak[2]; M. Mills[1]; [1]The Ohio State University; [2]Institute of Physics of Materials CAS; [3]Oak Ridge National Laboratory

9:45 AM Invited
Deformation Twinning in FCC High- and Medium-entropy Alloys: *H. Inui*[1]; K. Niitsu[1]; K. Kishida[1]; [1]Kyoto University

10:10 AM Invited
High-strain-rate 2000% Superplasticity in A nanostructured High-entropy Alloy: *H. Kim*[1]; N. Nguyen[1]; P. Asghari-Rad[1]; P. Sathiyamoorthi[1]; A. Zargaran[1]; C. Lee[1]; [1]Pohang University of Science and Technology

10:35 AM
Intermediate Temperature Precipitation in the HfNbTaTiZr Multi-principal Element Alloy: *M. Emigh*[1]; N. Phillips[2]; L. Mills[2]; S. Murray[2]; T. Pollock[1]; [1]University of California, Santa Barbara; [2]ATI Specialty Alloys and Components

High Entropy Alloys IX: Structures and Modeling — Structures and Modeling III

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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8:30 AM Invited
Phase Stability of High Entropy Alloys: Effects of Pressure and Temperature: *M. Gao*[1]; X. Fan[2]; S. Aryal[3]; L. Ouyang[3]; P. Liaw[2]; J. Hawk[1]; D. Alman[1]; [1]National Energy Technology Laboratory; [2]University of Tennessee; [3]Tennessee State University

8:55 AM Invited
Monte Carlo Study of the Entropy Hypothesis Associated with High-entropy Alloys: L. Santodonato[1]; *P. Liaw*[2]; [1]Advanced Research Systems; [2]University of Tennessee

9:20 AM Invited
Core Effect of Local Atomic Configuration and Design Principles in AlxCoCrFeNi High-entropy Alloys: Y. Yang[1]; *Z. Xia*[1]; [1]University of North Texas

9:45 AM
Atomistic Modeling of Screw Dislocations in Body-centered Cubic High-entropy Alloys: *S. Yin*[1]; J. Ding[1]; M. Asta[1]; R. Ritchie[1]; [1]Lawrence Berkeley National Laboratory

10:05 AM
Can We Control Lattice Distortions in Entropy-stabilized Oxides?: *K. Esfarjani*[1]; J. Kaufman[1]; [1]University of Virginia

High Temperature Electrochemistry IV — Session II

Sponsored by: TMS Extraction and Processing Division, TMS: Nuclear Materials Committee, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM
Electrochemical Reactions of Oxide Ions with Tungsten in Molten $CaCl_2$: C. Zhang[1]; D. Rappleye[1]; *M. Simpson*[2]; [1]Lawrence Livermore National Laboratory; [2]University of Utah

9:00 AM
Optimizing Reaction Selectivity in High Temperature Molten Electrolytes: *M. Wagner*[1]; A. Allanore[1]; [1]Massachusetts Institute of Technology

9:30 AM
Fundamental Challenges for the Development of Electrolytic Reduction of Uranium Oxide in Molten LiCl-Li2O: *J. Chamberlain*[1]; A. Burak[1]; M. Gonzalez[1]; M. Simpson[1]; [1]University of Utah

10:00 AM
New Electrochemical Deoxidation Method of Ti Metal in Molten Salts Containing YCl_3: *A. Iizuka*[1]; T. Ouchi[1]; T. Okabe[1]; [1]The University of Tokyo

Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery — Session III

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Wei Xiong, University of Pittsburgh; Shuanglin Chen, CompuTherm LLC; Wei Chen, Illinois Institute of Technology; James Saal, Citrine Informatics; Greta Lindwall, KTH Royal Institute of Technology

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8:30 AM Invited
Unexpected Phenomena Observed in Metallurgical Studies: *S. Chen*[1]; [1]National Tsing Hua University

9:10 AM Invited
High-throughput Hot-isostatic-pressing Micro-synthesis for Accelerated Studies of High Entropy Alloys: L. Zhao[1]; S. Chen[2]; Z. Wang[3]; L. Yang[1]; H. Wang[1]; H. Wang[1]; *L. Jiang*[2]; [1]Central Iron & Steel Research Institute, China; [2]Yantai University; [3]Central South University

9:50 AM Invited
Integration of Computational Tools and Advanced Characterization Methods to Understand Phase Transformations in Additively Manufactured Steels: *G. Lindwall*[1]; N. Holländer Pettersson[1]; C. Chou[1]; D. Ananthanarayanan[1]; B. Neding[1]; P. Hedström[1]; F. Zhang[2]; [1]KTH Royal Institute of Technology; [2]NIST

10:30 AM Invited
Computational Thermodynamics and Its Applications: *Z. Liu*[1]; [1]Pennsylvania State University

11:10 AM Invited
High-throughput Experiments and Machine Learning Modeling for Designing Next Generation Superalloys: *A. Suzuki*[1]; C. Shen[1]; [1]GE Research

Materials and Chemistry for Molten Salt Systems — Loops and Irradiation Effects

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Stephen Raiman, Texas A&M University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Raluca Scarlat, University of California-Berkeley

Tuesday AM **March 16, 2021**

8:30 AM
Corrosion and Mass Transfer of 316H Stainless Steel in Flowing FliNaK Salt: *S. Raiman*[1]; M. Kurley[2]; D. Sulejmanovic[2]; S. Nelson[2]; J. Keiser[2]; B. Pint[2]; [1]Texas A&M University; [2]Oak Ridge National Laboratory

8:50 AM
Dutch Molten Salt Irradiation Program: *R. Hania*[1]; U. Bezerra de Oliveira[1]; [1]NRG

9:10 AM
Design of Molten Salt Static Corrosion Experiments to Predict Phenomena Relevant to Corrosion in Non-isothermal Nuclear Reactor Salt Loops: *R. Scarlat*[1]; [1]University of California, Berkeley

9:30 AM
Structural Health Impacts Due to Exposure of Irradiated Molten Chloride Salts: N. Ezell[1]; *S. Raiman*[2]; J. McDuffee[1]; M.[1]; [1]Oak Ridge National Laboratory; [2]ORNL

9:50 AM
Alloy Compatibility in Flowing Cl and F Salts: *B. Pint*[1]; D. Sulejmanovic[1]; J. Kurley[1]; S. Raiman[1]; [1]Oak Ridge National Laboratory

10:10 AM
Chemical Effects of Ionizing Radiation on Molten Salt Systems: *S. Pimblott*[1]; R. Gakhar[1]; G. Horne[1]; K. Iwamatsu[2]; A. Ramos[3]; J. LaVerne[3]; J. Wishart[2]; [1]Idaho National Laboratory; [2]Brookhaven National Laboratory; [3]University of Notre Dame

10:40 AM
Microstructural Characterization of Grain Boundaries in Hastelloy N Corroded in Molten FLiBe Salt under Neutron Irradiation: *G. Zheng*[1]; D. Carpenter[1]; [1]Massachusetts Institute of Technology

11:00 AM
Exploration of the Corrosion Morphologies of Ni-Cr Alloys in Molten Fluoride Salts with/without Radiation: *W. Zhou*[1]; Y. Yang[2]; M. Jin[3]; A. Minor[2]; M. Short[1]; [1]Massachusetts Institute of Technology; [2]Lawrence Berkeley National Laboratory; [3]Idaho National Laboratory

11:20 AM
Release Behavior of Tritium Generated inside FLiNaBe by Thermal Neutron: *K. Katayama*[1]; [1]Kyushu University

Materials Engineering -- From Ideas to Practice: An EPD Symposium in Honor of Jiann-Yang Hwang — Polymer Materials and Processes

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee, TMS: Pyrometallurgy Committee
Program Organizers: Bowen Li, Michigan Technological University; Baojun Zhao, University of Queensland; Jian Li, CanmetMATERIALS; Sergio Monteiro, Instituto Militar de Engenharia; Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita; Tao Jiang, Central South University; Yong Shi, Futianbao Environment Technologies; Cuiping Huang, FuTianBao Environment Protection Technology Company Ltd.; Shadia Ikhmayies

Tuesday AM **March 16, 2021**

8:30 AM Keynote
Improved Ballistic Armor with Composites Reinforced with Natural Fibers Functionalized with Graphene Oxide: *S. Monteiro*[1]; F. da Luz[1]; F. Garcia Filho[1]; [1]Military Institute of Engineering

8:50 AM Invited
Tensile Properties of Epoxy Matrix Reinforced with Fique Fabric: *M. Oliveira*; F. Garcia Filho[1]; F. da Luz[1]; A. Pereira[1]; L. Demosthenes[1]; L. Nascimento[1]; S. Monteiro[1]; [1]Military Institute of Engineering

9:10 AM Invited
Blending of Polystyrene-block-poly(ethylene-ran-butylene)-block-polystyrene with Polyethylene-graft-polystyrene for Cation Exchange Membrane Preparation with Enhanced Properties: *Z. Chen*[1]; J. Hwang[2]; Y. Shi[3]; D. Huang[2]; W. Zhao[3]; [1]Futianbao Environmental Protection Technology Ltd; [2]Michigan Technological University; [3]Futianbao Environmental protection technology

9:30 AM
Novel Route of Polymerization for Engineering Thermorrigid Biopolymer Based on Soybean Oil: J. Rodrigues[1]; K. Monsores[1]; S. Oliveira[1]; *S. Monteiro*[1]; R. Weber[1]; [1]Military Institute of Engineering

9:50 AM
Novel Ballistic Composites: Performance Evaluation of Epoxy Composite Reinforced with Buriti Fabric as Component of a Multilayer Armor System: *L. Demosthenes*[1]; L. Nascimento[1]; M. Oliveira[1]; F. Garcia Filho[1]; F. da Luz[1]; U. Costa[1]; S. Monteiro[1]; A. Pereira[1]; F. Braga[2]; [1]Military Institute of Engineering; [2]Fluminense Federal University

10:10 AM
Barcol Hardness of Green Composites for Cold Repair in Industrial Piping: *F. Lopes*[1]; N. Tonini Simonassi[1]; C. Fontes Vieira[1]; S. Neves Monteiro[1]; [1]Universidade Estadual do Norte Fluminense

10:30 AM Invited
Comparison of Mechanical Properties of Banana Fibers Reinforcement in Different Thermoset Matrix Composites: *F. Garcia Filho*; M. Oliveira[1]; F. de Assis[1]; A. Pereira[1]; F. da Luz[1]; L. Demosthenes[1]; S. Monteiro[1]; [1]Military Institute of Engineering

10:50 AM
Tensile Strength of Synthetic and Green Composites Used as Wrapping Cold Repair in Piping: *F. Lopes*[1]; N. Tonini Simonassi[1]; C. Fontes Vieira[1]; S. Neves Monteiro[1]; [1]Universidade Estadual do Norte Fluminense

11:10 AM
Influence of Mercerization Process on the Surface of Coconut Fiber for Composite Reinforcement: G. Nicolau[1]; R. Weber[1]; *S. Monteiro*[1]; G. Loureiro[1]; A. Lavinsky[1]; L. da Fonseca[1]; E. da Silva[1]; P. dos Santos[1]; R. Abranches[1]; V. Machado[1]; [1]Military Institute of Engineering

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Superalloys: Beyond Nickel-based Superalloys

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Tuesday AM **March 16, 2021**

8:30 AM Invited
Accelerated Design of '-strengthened Co-base Superalloys with Improved Comprehensive Performances: *Q. Feng*[1]; L. Li[1]; W. Li[1]; M. Zou[1]; X. Zhuang[1]; J. Zhao[2]; [1]University of Science & Technology Beijing (USTB); [2]University of Maryland

9:00 AM
Effects of Key Elements Ni, Cr and W on High-temperature Microstructural Stability of Multicomponent Co-base Superalloys: *L. Li*[1]; W. Li[1]; M. Zou[1]; Q. Feng[1]; J. Zhao[2]; [1]University of Science & Technology Beijing (USTB); [2]University of Maryland

9:20 AM Invited
Experimentally Determined Creep Properties of Various Alloys and Conclusions for Beyond Nickel-based Superalloys: *U. Glatzel*[1]; [1]University Bayreuth

9:50 AM Keynote
Metallic Materials Beyond Nickel-base Superalloys: The Challenges and Potential: *T. Pollock*[1]; [1]University of California, Santa Barbara

10:30 AM
Modeling Planar Fault Energies in Ordered D022 Structures: *K. Vamsi*[1]; T. Pollock[1]; [1]University of California Santa Barbara

10:50 AM
Inverse Design of Chemistry of High Temperature Ni-base Superalloys Using CALPHAD and Machine Learning: *R. Jha*; G. Dulikravich[1]; [1]Florida International University

11:10 AM
Direct Production of Complex Metallic Alloys: *J. Haidar*[1]; [1]Kinaltek Pty Ltd.

Materials Processing Fundamentals — Molten Metal Processing and Modeling

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee
Program Organizers: Jonghyun Lee, Iowa State University; Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Fiseha Tesfaye, Abo Akademi University; Guillaume Lambotte, Boston Metal; Antoine Allanore, Massachusetts Institute of Technology

Tuesday AM **March 16, 2021**

8:30 AM
Contactless Inductive Flow Tomography for Control of Liquid Metal Flow with Electromagnetic Actuators: *I. Glavinic*[1]; M. Ratajczak[1]; F. Stefani[1]; S. Eckert[1]; T. Wondrak[1]; [1]Helmholtz-Zentrum Dresden-Rossendorf

8:50 AM
X-ray and Neutron Radiographic Experiments on Particle-laden Molten Metal Flows: *T. Lappan*[1]; M. Sarma[1]; S. Heitkam[2]; D. Mannes[3]; P. Trtik[3]; N. Shevchenko[1]; K. Eckert[2]; S. Eckert[1]; [1]Helmholtz-Zentrum Dresden-Rossendorf; [2]Technische Universität Dresden; [3]Paul Scherrer Institut

9:10 AM
Computational Fluid Dynamics Modeling of Damped Oscillations of Molten Metal Droplets: *A. Rabeh*[1]; M. Khanwale[1]; B. Ganapathysubramian[1]; M. SanSoucie[2]; J. Lee[1]; [1]Iowa State University; [2]NASA MSFC

9:30 AM
Numerical Simulation of the Influence of Particle Physical Properties on Flow Field during the Aeration Leaching Process: *M. Zheng*[1]; Q. Zhao[1]; Z. Zhang[1]; L. Zhou[1]; T. Zhang[1]; [1]Northeastern University

Mechanical Behavior of Nuclear Reactor Components — Small Scale Testing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee
Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM Invited
In-situ Micro-tensile Studies on the Effects of Ion Irradiation on the Mechanical Properties of Small-grained Alloys: *D. Bhattacharyya*[1]; A. Xu[1]; M. Ionescu[1]; T. Wei[1]; M. Saleh[1]; [1]Australian Nuclear Science and Technology Organization

9:00 AM
Bridging the Length Scales via Femtosecond Laser Machining of Micro-mesoscale Tensile Specimens: *A. Dong*[1]; H. Vo[1]; P. Hosemann[1]; S. Maloy[2]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory

9:20 AM
a' Precipitation and Hardness Change in Ion Irradiated High Purity FeCr Alloys: *Y. Zhao*[1]; A. Bhattacharya[2]; C. Pareige[3]; P. Zhu[1]; C. Massey[2]; P. Edmondson[2]; J. Henry[4]; S. Zinkle[1]; [1]The University of Tennessee; [2]Oak Ridge National Laboratory; [3]GPM, Université et INSA de Rouen; [4]CEA, DEN, Service de Recherches Métallurgiques Appliquées, Laboratoire d'Analyse Microstructurale des Matériaux, Université Paris-Saclay

9:40 AM Invited
Nanomechanical Assessment of a Neutron Irradiated U-10Zr Fuel: *M. Okuniewski*[1]; J. Thomas[1]; A. Figueroa[1]; F. Tang[2]; D. Murray[2]; X. Liu[2]; [1]Purdue University; [2]Idaho National Laboratory

10:10 AM
Challenges to Accurate Evaluation of Bulk Hardness with Nanoindentation Testing at Low Indent Depths: *P. Zhu*[1]; Y. Zhao[1]; S. Agarwal[1]; S. Zinkle[1]; [1]University of Tennessee

10:30 AM
High Throughput Assessment of Creep Behavior of Advanced Alloys for Model Development and Validation: *M. Sau*[1]; Z. Li[1]; E. Hintsala[2]; D. Stauffer[2]; L. Capolungo[3]; N. Mara[1]; [1]University of Minnesota; [2]Bruker Corporation; [3]Los Alamos National Labs

10:50 AM
Creep Behavior of Helium Implanted Submicron Films under Irradiation: *N. Khiara*[1]; M. Coulombier[2]; F. Onimus[1]; J. Raskin[2]; T. Pardoen[2]; Y. Bréchet[3]; [1]CEA Saclay; [2]Ecole Polytechnique de Louvain; [3]Science et Ingénierie des MAtériaux et Procédés

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session III

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

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8:30 AM
Observation of Microstructure Evolution in Pure Copper and Copper-8 wt. % Aluminium Alloy during Deformation: *S. Verma*[1]; P. Pant[1]; M. Gururajan[1]; [1]Indian Institute of Technology Bombay

9:10 AM
Sub-surface Microtensile Testing in Oxidized Equiatomic Alloy NbTiCr: *R. Wheeler*[1]; T. Butler[2]; M. Doran[3]; S. Apt[3]; M. Ostendorf[3]; [1]Microtesting Solutions LLC; [2]Air Force Research Laboratory; [3]UES, Inc.

9:30 AM
In-situ Micro-tensile Testing of Proton-irradiated HT-9 Steels: *T. Ajantiwalay*[1]; S. Maloy[2]; K. Hattar[3]; A. Aitkaliyeva[1]; [1]University of Florida; [2]Los Alamos National Laboratory; [3]Sandia National Laboratory

9:50 AM
Dislocation Structure in FeCrAl Alloys through Advanced In-situ Microscopy Experiments: *K. Mao*[1]; M. Gussev[1]; C. Massey[1]; K. Unocic[1]; Y. Yamamoto[1]; K. Field[2]; P. Edmondson[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan

10:10 AM
In-situ Nanomechanics of Ni-based Superalloys and Bond Coating at Room Temperature to 1000C: *S. Bhowmick*[1]; E. Hintsala[1]; P. Manimunda[1]; D. Stauffer[1]; [1]Bruker

10:30 AM
Analysis of Deformation Mechanisms in Advanced FeCrAl Alloy via SEM-EBSD In-situ Testing: *N. Bibhanshu*[1]; M. Gussev[1]; C. Massey[1]; K. Field[2]; [1]Oak Ridge National Laboratory; [2]University of Michigan

10:50 AM
MEMS-based In-situ Tensile Experiments Designed to Arrest Catastrophic Failure in Brittle Nanomaterials: *D. Ahn*[1]; D. Jang[2]; [1]Korea Advanced Institute of Science & Technology; [2]Korea Advanced Institute of Science & Technology

11:10 AM
In-situ Characterization of the Damage Initiation and Evolution in Sustainable Cellulose-based Cottonid: *R. Scholz*[1]; A. Delp[1]; F. Walther[1]; [1]TU Dortmund University

Metal-Matrix Composites: Advances in Analysis, Measurement and Observations — Novel Composites and Coatings

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizers: Srivatsan Tirumalai, The University of Akron; William Harrigan, Gamma Alloys; Simona Hunyadi Murph, Savannah River National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM Invited
Use of an Infrared Spectroscopic Method for Isotopic Analysis of Gaseous Uranium Hexafluoride: *K. Strange Fessler*[1]; P. O'Rourke[1]; N. DeRoller[1]; D. Simmons[2]; S. Serkiz[3]; [1]Savannah River National Laboratory; [2]Oak Ridge National Laboratory; [3]Clemson University

9:00 AM
Recent Advances in Analysis, Measurement and Properties of Composite Metal Foams: *A. Rabiei*[1]; B. Lattimer[2]; E. Bearinger[2]; [1]North Carolina State University; [2]Virginia Tec

9:20 AM Invited
Effect of Heat Treatment on the Mechanical Properties of an Aluminum Alloy and Aluminum Alloy Composite: A Comparative Study: S. Mozammil[1]; J. Karloopia[1]; P. Jha[1]; *S. Tirumalai*[2]; [1]Indian Institute of Technology Roorkee; [2]University of Akron

9:50 AM Invited
2D Interlayer Enabled Electrical Ductility for Flexible Electronics: *P. Kang*[1]; C. Cho[2]; A. Taqieddin[2]; Y. Jing[2]; K. Yong[2]; J. Kim[2]; M. Haque[2]; N. Aluru[2]; S. Nam[2]; [1]George Mason University; [2]University of Illinois at Urbana-Champaign

10:20 AM
A Method for Measuring Total Protium and Total Deuterium in a Gas Mixture Containing Hydrogen, Deuterium and Hydrogen Deuterium Mixture Using Gas Chromatography: *H. Sessions, Jr.*[1]; S. Hunyadi Murph[2]; [1]University of Georgia; [2]Savannah River National Laboratory; University of Georgia

10:40 AM
Iron Oxide - Gold Composite Nanoparticles and Nanogap Junctions for Sensing Applications Using Surface Enhanced Raman Scattering: *S. Hunyadi Murph*[1]; E. Searles[2]; [1]Savannah River National Laboratory; University of Georgia; [2]Savannah River National Laboratory

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Hydrometallurgy I

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Tuesday AM **March 16, 2021**

8:30 AM
Alkaline Leaching of Nickel from Electric Arc Furnace Dust Using Ammonia-ammonium Glutamate as Lixiviant: *E. Prasetyo*[1]; [1]Indonesian Institute of Sciences

8:50 AM
Chemical Leaching of Inactive Gold Mine Tailings as Secondary Source of Cobalt and Nickel – A Preliminary Case Study: M. Jouini[1]; *L. Coudert*[1]; M. Perrin[2]; [1]UQAT; [2]Université de Lorraine

9:10 AM
Microbial Leaching for Recovery of Nickel & Cobalt from Lateritic Ore, A Review: *L. Sukla*[1]; A. Pattanaik[1]; D. Samal[1]; D. Pradhan; [1]Siksha 'O' Anusandhan

9:30 AM
Sulfuric Acid Leaching for Low-nickel Matte under Atmospheric Pressure: W. Xiao[1]; *F. Sun*[1]; X. Liu[1]; Z. Zhao[1]; [1]Central South University

Phase Transformations and Microstructural Evolution — Microstructure and Precipitation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM
Chemistry Effects on a' Precipitation in FeCrAl Alloys: *A. Hoffman*[1]; S. Nag[1]; C. Shen[1]; C. Jiang[2]; Y. Zhang[3]; R. Rebak[1]; [1]GE Research; [2]Idaho National Lab; [3]University of Wisconsin-Madison

8:50 AM
Effect of Slip and Twinning Microstructure on High Pressure Phase Transformation in Zirconium: *M. Arul Kumar*[1]; Y. Wang[2]; R. McCabe[1]; L. Capolungo[1]; C. Tome[1]; [1]Los Alamos National Laboratory; [2]Argonne National Laboratory

9:10 AM
Probing the Plasticity and Microstructure Evolution of an Icosahedral Quasicrystal i-Al-Pd-Mn at Elevated Temperatures: *Y. Zou*[1]; [1]University of Toronto

9:30 AM
Spinodal Decomposition in a Nanostructured Cu-Ti Alloy: *J. Rosalie*[1]; O. Renk[2]; [1]University of Leoben, Austria; [2]Erich Schmid Institute, Austrian Academy of Sciences

9:50 AM
The Synergistic Role of Mn and Zr/Ti in Producing '/L1$_2$ Co-precipitates in Al-Cu Alloys: *J. Poplawsky*[1]; B. Milligan[2]; P. Shower[3]; L. Allard[1]; M. Chisholm[1]; D. Shin[1]; A. Shyam[1]; [1]Oak Ridge National Laboratory; [2]Colorado School of Mines; [3]GE Global Research

10:10 AM
Understanding the Influence of Thermal Gyrations on Solid-solid Interfaces in Ti-6Al-4V during EBM PBF Process Using In Situ TEM: *S. Vijayan*[1]; M. Shao[1]; J. Jinschek[1]; [1]The Ohio State University

10:30 AM
Variability of Grain Boundary Migration Behaviors among the Metastable Grain Boundary Structures: *E. Homer*[1]; D. Britton[1]; R. Sheffield[1]; L. Serafin[1]; G. Hart[1]; [1]Brigham Young University

Plasmonics in Nanocomposite Materials — From Theory to Application Session III

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizers: Nasrin Hooshmand, Georgia Institute of Technology; Simona Hunyadi Murph, Savannah River National Laboratory; Mahmoud Abdelwahed, The University of Texas at San Antonio

Tuesday AM **March 16, 2021**

8:30 AM Keynote
Nanoplasmonics and Iits Applications in Nanomedicine: *M. El-Sayed*[1]; [1]Georgia Institute of Technology

9:15 AM Invited
Fin p-n Heterojunctions for High Brightness Light Emitting Diodes and Lasers at Sub-micron Scale: *B. Nikoobakht*[1]; R. Hansen[2]; Y. Zong[2]; A. Agrawal[2]; M. Shur[3]; J. Tersoff[4]; [1]National Institute of Standards and Technology; [2]NIST; [3]Rensselaer Polytechnic Institute; [4]IBM T. J. Watson Research Center

9:45 AM Invited
Spectral Enhancement of Dye Molecules Adsorbed on Titania Prepared on Gold Nanoparticles: *H. Nishikiori*[1]; Y. Kageshima[1]; K. Teshima[1]; [1]Shinshu University

10:05 AM Invited
Engineered Plasmonic Nanoparticle Based Detection: Advanced Sensitivity and Selectivity: *N. Hooshmand*[1]; [1]Georgia Institute of Technology

Powder Materials for Energy Applications — Novel Powder Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
Program Organizers: Kathy Lu, Virginia Polytechnic Institute and State University; Eugene Olevsky, San Diego State University; Hang Yu, Virginia Polytechnic Institute and State University; Ruigang Wang, The University of Alabama; Isabella Van Rooyen, Idaho National Laboratory

Tuesday AM **March 16, 2021**

8:30 AM
Synthesis of Chicken Feather Fiber Bio-waste Derived Sustainable Nitrogen Doped-carbon Material: V. Rangari[1]; *Z. Mohammed*[1]; Z. Duncan[1]; S. Jeelani[1]; [1]Tuskegee University

8:50 AM Invited
Mechanical Activation Enhanced Solid-state Synthesis of NaCrO2 Cathode Material for Na-ion Batteries: *L. Shaw*[1]; M. Luo[1]; A. Ortiz[2]; [1]Illinois Institute of Technology; [2]Universidad de Extremadura

9:20 AM Invited
Powder to Energy Application: *J. Choi*[1]; J. Hardy[1]; [1]Pacific Northwest National Laboratory

9:50 AM Invited
Powder Characteristics of Perovskite Anodes on the Electrochemical Performance of Solid Oxide Fuel Cell: A Perspective: *M. Mahapatra*[1]; [1]University of Alabama at Birmingham

10:20 AM
Structural Evolution and Electrical Conductivity of Ti3C2-SiOC Systems: K. Lu[1]; *S. Kumar*[1]; [1]Virginia Polytechnic Institute and State University

Rare Metal Extraction & Processing — REEs

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Tuesday AM **March 16, 2021**

8:30 AM Keynote
Innovative Reactors for Recovery of Rare Earth Elements (REE): *A. Lewis*[1]; J. Chivavava[1]; J. DuPlessis[1]; D. Smith[1]; J. Smith[1]; [1]University of Cape Town

8:50 AM Invited
Study of the Recovery of Rare Earth Elements from Ion Adsorption Clays through Perolation Leaching Processes: *J. Petersen*[1]; M. Becker[2]; C. Naude[2]; [1]University of Cape Town; [2]Univ of Cape Town

9:10 AM
Recovery of Rare Earth Elements from Recycled Hard Disk Drive Mixed Steel and Magnet Scrap: T. Lister[1]; M. Meagher[2]; *M. Strauss*[1]; L. Aldana[1]; H. Rollins[1]; [1]Idaho National Laboratory; [2]Colorado School of Mines

9:30 AM Invited
Extraction Chromatography for Separation of Rare Earth Elements: *M. Sanku*[1]; K. Forsberg[1]; M. Svärd[1]; [1]KTH Royal Institute of Technology

9:50 AM Invited
Tool and Workflow for Systematic Design of Reactive Extraction for Separation and Purification of Valuable Components: H. Benkoussas[1]; D. Leleu[1]; S. Satpathy[1]; Z. Shariff[1]; *A. Pfennig*[1]; [1]University of Liège

10:10 AM Invited
Rethinking Mineral Processing and Extractive Metallurgy Approaches to Ensure a Sustainable Supply of High-tech and Critical Raw Materials: *Y. Ghorbani*[1]; G. Nwaila[2]; S. Zhang[3]; J. Rosenkranz[1]; [1]Luleå University of Technology; [2]University of the Witwatersrand; [3]PG Techno Wox, 43 Patrys Avenue, Helikon Park

10:30 AM Invited
Extraction of Rare Earth Metals: The New Thermodynamic Considerations towards Process Hydrometallurgy: *A. Patil*[1]; R. Struis[1]; A. Testino[2]; C. Ludwig[1]; [1]Paul Scherrer Institut and École Polytechnique Fédérale de Lausanne; [2]Paul Scherrer Institut

100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture in Complex Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniverstität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Tuesday PM **March 16, 2021**

2:00 PM Invited
Fracture Resistance of Hierarchical Metallic Nanocomposite Thin Films: *A. Misra*[1]; Y. Cui[1]; B. Derby[1]; N. Li[2]; [1]University of Michigan; [2]LANL

2:40 PM
In-situ Fracture along Distinct Interface Types: *M. Burtscher*[1]; M. Alfreider[1]; M. Wurmshuber[2]; K. Schmuck[1]; H. Clemens[3]; S. Mayer[1]; D. Kiener[1]; [1]Montanuniversität Leoben, Austria; [2]Department Materials Science, Chair of Materials Physics, Montanuniversität Leoben, Austria; [3]Department Materials Science, Chair of Physical Metallurgy and Metallic Materials, Montanuniversität Leoben, Austria

3:00 PM
The Clamped Beam Bending as a Length Scale Compatible Fracture Test Geometry: *B. Jaya*[1]; A. Mishra[1]; H. Sahasrabuddhe[1]; N. Kumari[1]; D. Yadav[1]; T. More[1]; T. Chaudhari[1]; [1]Indian Institute of Technology Bombay

3:20 PM
A Griffith's Theory-based Model for Strength of Silicon Nitride Nanoporous Membranes from Atomistic Simulation Perspective: *A. Khourshaei Shargh*[1]; G. Madejski[1]; J. McGrath[1]; N. Abdolrahim[1]; [1]University of Rochester

3:40 PM Invited
Transformation-induced Cracking in ZrO_2 Shape-memory Ceramics: towards Cyclic Stability in Polycrystals: *E. Pang*[1]; I. Crystal[1]; C. Schuh[1]; [1]Massachusetts Institute of Technology

2021 Institute of Metals Lecture/Robert Franklin Mehl Award — 2021 Institute of Metals Lecture/ Robert Franklin Mehl Award

Tuesday PM **March 16, 2021**

12:00 PM
Introduction of Award Recipient: 2021 Institute of Metals Lecture/Robert Franklin Mehl Award: *J. Williams*[1]; [1]The Ohio State University

12:05 PM Keynote
New Superalloys in the Co-Ni Design Space: *T. Pollock*[1]; [1]University of California, Santa Barbara

12:45 PM Question and Answer Period Moderator: Jim Williams, The Ohio State University

2021 TMS Special Lectures — EPD/MPMD Awards Ceremony & Special Lecture

Tuesday PM **March 16, 2021**

12:00 PM
EPD Awards Ceremony: *C. Meskers*

12:30 PM
MPMD Awards Ceremony & Introduction of Special Lecturer: *M. Stoudt*[1]; [1]National Institute of Standards and Technology

12:45 PM
MPMD Special Lecturer: Qualification and Certification Strategies for Additive Manufactured Parts for Manned Spaceflight: *R. Russell*[1]; [1]NASA Kennedy Space Center

2021 TMS Special Lectures — LMD Awards Ceremony & Special Lecture

Tuesday PM **March 16, 2021**

12:00 PM
LMD Awards Ceremony: *E. Nyberg*[1]; [1]Tungsten Heavy Powder & Parts

12:30 PM
LMD Scholarship Lecturer: *Z. Wolff*[1]; [1]University of Nevada Reno

12:40 PM
LMD Special Lecturer Introduction: *E. Nyberg*[1]; [1]Tungsten Heavy Powder & Parts

12:45 PM
LMD Special Lecturer: Near Net Manufacturing of Light Metal Alloys: *M. Easton*[1]; [1]RMIT University

2021 TMS Special Lectures — Young Professional Tutorial Lecture

Tuesday PM **March 16, 2021**

12:00 PM
Young Professional Tutorial Lecture Introduction: *A. Cisko*[1]; [1]US Army ERDC

12:05 PM
Early Career Faculty Fellow Recipient: Electrochemical Healing of Metals: A New Way to Repair Additive and Cellular Metals at Room Temperature: *J. Pikul*[1]; [1]University of Pennsylvania

12:35 PM
Early Career Faculty Fellow Recipient: Integrated Computational Materials Design for Alloy Additive Manufacturing: *W. Xiong*[1]; [1]University of Pittsburgh

2D Materials – Preparation, Properties & Applications — Modeling & Simulations I

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University; Amber Shrivastava, Indian Institute of Technology Bombay

Tuesday PM **March 16, 2021**

2:00 PM
Computational Synthesis of 2D Materials: A High-throughput Approach to Materials Design: *T. Boland*[1]; A. Singh[1]; [1]Arizona State University

2:20 PM Invited
Assessment of Gas Sensing Properties of 2D Materials by Comprehensive Density Functional Theory Calculations: S. Thomas[1]; *M. Asle Zaeem*[1]; [1]Colorado School of Mines

2:45 PM Invited
Computational Modeling of Two-Dimensional Materials for Sustainable Energy Storage: *D. Datta*[1]; [1]New Jersey Institute of Technology

3:10 PM Invited
Thermal Laser Assisted Manufacturing of Two-dimensional Atomic Layers Heterostructures: Y. Wang[1]; *X. Zhang*[1]; [1]Stevens Institute of Technology

3:35 PM Invited
Energetics and Electronic Properties of Dopants and Defect Complexes in 2D Transition Metal Dichalcogenides from First-principles: A. Tan[1]; C. Freysoldt[2]; *R. Hennig*[1]; [1]University of Florida; [2]Max-Planck-Institut f ¨ur Eisenforschung GmbH

4:00 PM Invited
Stabilization of a Ferroelectric Phase in Two Dimensional MXene Monolayers: *J. Young*[1]; M. Li[1]; O. Omisakin[1]; [1]New Jersey Institute of Technology

4:25 PM Invited
Tracking Structural Flexibility and Dynamics in 2D Metal-Organic Frameworks and their Effects on Electrical Conductivity and Catalytic Activity: *F. Shakib*[1]; M. Momeni[1]; [1]New Jersey Institute of Technology

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — High Throughput Testing, Advanced Characterization and Property Measurement

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Tuesday PM **March 16, 2021**

2:00 PM Invited
A Standards Perspective on Nanomechanical Testing to Accelerate Nuclear Materials Development & Qualification: *J. Wharry*[1]; P. Patki[1]; G. Warren[1]; P. Warren[1]; J. Hall[2]; [1]Purdue University; [2]Westinghouse Electric Company, LLC

2:30 PM
A Rapid Turnaround Approach Studying Helium Effects in Materials: *P. Hosemann*[1]; A. Scott[1]; S. Stevenson[1]; M. Balooch[1]; [1]University of California Berkeley

2:50 PM
High-throughput Heavy Ion Irradiation of CrFeMnNi Magnetron-sputtered Combinatorial Thin Film: *C. Parkin*[1]; M. Moorehead[1]; M. Elbakhshwan[1]; K. Sridharan[1]; C. Zhang[2]; A. Savan[3]; A. Ludwig[3]; A. Couet[1]; [1]University of Wisconsin Madison; [2]Computherm, LLC; [3]Ruhr-Universität Bochum

3:10 PM
Accelerated Study of Thermal and Irradiation Creep in Fe-based Multi-principal Element Alloys: *M. Parry*[1]; C. Judge[2]; C. Sun[2]; W. Jiang[2]; B. Kombaiah[2]; G. Was[3]; M. Daymond[4]; J. Aguiar[2]; T. Sparks[1]; [1]University of Utah; [2]Idaho National Laboratory; [3]University of Michigan; [4]Queen's University

3:30 PM
High-temperature, High-throughput Ion Irradiation Enabled by Additive Technologies: *M. Moorehead*[1]; C. Parkin[1]; P. Nelaturu[1]; M. Niezgoda[1]; M. Elbakhshwan[1]; K. Sridharan[1]; D. Thoma[1]; A. Couet[1]; [1]University of Wisconsin - Madison

3:50 PM
In-situ TEM Heating Chip Experiments to Study Thermal Behavior of U-Zr Metallic Fuel: *T. Yao*[1]; F. Teng[1]; D. Murray[1]; J. Gan[1]; M. Benson[1]; L. He[1]; [1]Idaho National Laboratory

4:10 PM
Multiscale Characterization of Defects in Ion Irradiated Ceramics for Validation of Atomistic Models: *M. Khafizov*[1]; V. Chauhan[1]; L. He[2]; J. Pakarinen[3]; D. Hurley[2]; [1]Ohio State University; [2]Idaho National Laboratory; [3]Studsvik

4:30 PM
In-situ Thermal Conductivity Measurement of SiC Composite: *D. Chen*[1]; W. Chu[1]; P. Sabharwall[2]; [1]University of Houston; [2]Idaho National Laboratory

Acta Materialia Symposium — Acta Materialia Award Session

Program Organizer: Carolyn Hansson, University of Waterloo

Tuesday PM **March 16, 2021**

2:00 PM
Introductory Comments: Acta Materialia Symposium: *C. Hansson*[1]; [1]University of Waterloo

2:05 PM Invited
Acta Materialia Gold Medal Lecture: Modeling Microstructure Complexity for Better Property Predictions: *G. Gottstein*[1]; [1]RWTH Aachen University

2:25 PM Invited
Acta Materialia Silver Medal Lecture: Measuring Hydrogen in Steels by using Atom Probe Tomography: *J. Cairney*[1]; [1]The University of Sydney

2:45 PM Invited
Acta Materialia Hollomon Materials and Society Award: Global Energy Challenges and Development of Thermoelectric Materials and Systems in China: *Q. Zhang*[1]; [1]Wuhan University of Technology

3:05 PM Invited
Acta Materialia Mary Fortune Global Diversity Lecture: STEM Mentor Programs and New Opportunities for Women and Other Under- Represented Groups in the Materials Science: *K. Balazsi*[1]; .; [1]Centre for Energy Research

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Inconel, New Alloys, and Functional Gradients

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Tuesday PM **March 16, 2021**

2:00 PM Invited
Laser Powder Bed Fusion of TiTa Alloys: Process Optimisation and Fatigue Properties: *A. Molotnikov*[1]; E. Brodie[2]; T. Niendorf[3]; [1]RMIT University, Centre for Additive Manufacturing; [2]Monash University; [3]University of Kassel

2:30 PM
Synchrotron Imaging of the Influence of TiB2 in Suppressing Hot Cracking during Laser Powder Bed Fusion of Al-2139: *D. Rees*[1]; C. Leung[1]; J. Elambasseril[2]; S. Marussi[1]; S. Shah[1]; S. Marathe[3]; M. Brandt[2]; M. Easton[2]; P. Lee[1]; [1]University College London; [2]RMIT University; [3]Diamond Light Source Ltd

2:50 PM
Microstructural Heterogeneity and Mechanical Anisotropy of 18Ni-330 Maraging Steel Fabricated by Selective Laser Melting: The Effect of Build Orientation and Height: Y. Yi[1]; K. Wang[2]; *X. Wang*[3]; L. Li[1]; W. Cai[2]; S. Kelly[3]; N. Esparragoza[3]; M. Rosser[3]; F. Yan[1]; [1]The University of Alabama; [2]Virginia Polytechnic Institute and State University; [3]Jacksonville State University

3:10 PM
Characterization of 3D-printed Metals with Ultrasonic Technique: *T. Costigan*[1]; P. Wang[1]; R. Van Pelt[2]; A. Nelson[1]; [1]SUNY New Paltz; [2]Sono-Tek Corporation

Additive Manufacturing for Energy Applications III — Modeling and Non-destructiveTesting in Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Nuclear Materials Committee
Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University

Tuesday PM **March 16, 2021**

2:00 PM Invited
Porosity in Metal Additive Manufacturing: X-ray Tomography Insights: *A. du Plessis*[1]; [1]Research Group 3D Innovation, Stellenbosch University

2:20 PM
Effects of Void Configuration on the Overall Thermal and Mechanical Behavior of Porous Materials: A Numerical Modeling Approach: *Y. Shen*[1]; M. Abdo[2]; B. Pham[2]; I. Van Rooyen[2]; [1]University of New Mexico; [2]Idaho National Laboratory

2:40 PM
Experimental and Numerical Investigation of Single Clads Generated by Directed Energy Deposition Additive Manufacturing Processes: *L. Nunez*; J. Shelton[1]; K. Cho[1]; [1]Northern Illinois University

3:00 PM
Multi-scale Multi-fidelity Metamodeling for Advanced Materials: *M. Abdo*[1]; Y. Shen[2]; C. Pham[1]; I. Von Rooyen[1]; [1]Idaho National Laboratory; [2]University of New Mexico

3:20 PM
Detection of Defects in Additively Manufactured Metals Using Thermal Tomography: *A. Heifetz*[1]; D. Shribak[1]; Z. Fisher[1]; W. Cleary[2]; [1]Argonne National Laboratory; [2]Westinghouse Electric Company

3:40 PM
Real Time Non-destructive Evaluation during 3D Manufacturing of Metal Parts: *A. Yacoubian*[1]; [1]LER Technologies, Inc.

4:00 PM
Combining Modelling and Microstructural Studies in Explaining the Laser Parameter Effect on Superalloy Cracking during Selective Laser Melting: *M. Lam*[1]; [1]Monash University

4:20 PM
Simulation of Part Printability in Electron Beam Melting Additive Manufacturing: *Y. Lee*[1]; P. Fernandez-Zelaia[1]; S. Simunovic[1]; M. Kirka[1]; [1]Oak Ridge National Laboratory

4:40 PM
Defect Analysis in Selectively Laser Melted Parts via Surface Topography Characterization: *Q. Lu*[1]; M. Seita[1]; [1]Nanyang Technological University

Additive Manufacturing of Metals: Applications of Solidification Fundamentals — Solidification Structure and Defects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Solidification Committee
Program Organizers: Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Kevin Chaput, Northrop Grumman; Mohsen Asle Zaeem, Colorado School of Mines; Wenda Tan, University of Utah; Lianyi Chen, University of Wisconsin-Madison

Tuesday PM **March 16, 2021**

2:00 PM
A Phase-field Study of Epitaxial Effect on Solidification Microstructure in Metal Additive Manufacturing: *J. Park*[1]; J. Kang[1]; C. Oh[1]; [1]Korea Institute of Materials Science

2:20 PM
Composition and Equilibrium Phase Diagram Feature Effects on the Printability of Alloys: *R. Seede*[1]; X. Huang[1]; B. Zhang[1]; A. Whitt[1]; A. Elwany[1]; R. Arroyave[1]; I. Karaman[1]; [1]Texas A&M University

2:40 PM
Influence of Process Parameters on the Microstructure Evolution and Mechanical Properties of Additively Manufactured 316L Stainless Steel: *A. Agrawal*[1]; D. Thoma[1]; [1]University of Wisconsin Madison

3:00 PM
LPBF Processing of the Al-Ni Eutectic Alloy: Experiments and Phase Field Simulations: *G. Boussinot*[1]; M. Apel[1]; M. Döring[2]; [1]Access e.V.; [2]LPT University Erlangen

3:20 PM
Modeling Grain Refinement for Metallic Additive Manufacturing: *Y. Gu*[1]; [1]Missouri University of Science and Technology

3:40 PM
New Composition Based Index for Solidification Cracking Resistance: *R. Giorjao*[1]; B. Sutton[1]; A. Ramirez[1]; [1]The Ohio State University

4:00 PM
Phase-Field Modeling of CET During Alloy Solidification: An Insight for Additive Manufacturing: *N. Najafizadeh*[1]; Y. Gu[1]; [1]University of Missouri Science and Technology

4:20 PM
Quantifying the Influence of Local Layer Thickness on Pore Evolution during Laser Powder Fusion Using High-speed X-ray Imaging: *C. Leung*[1]; Y. Huang[1]; S. Clark[1]; Y. Chen[1]; S. Marussi[1]; L. Sinclair[1]; I. Todd[2]; M. Olbinado[3]; E. Boller[4]; A. Rack[4]; P. Lee[1]; [1]University College London; [2]University of Sheffield; [3]Paul Scherrer Institute; [4]European Synchrotron Radiation Facility

Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments — High Temperature and Heavy Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee
Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Tuesday PM **March 16, 2021**

2:00 PM
Process Development for the Selective Laser Melting of Tungsten Carbide-nickel Matrix Composites: *E. Mendoza Jimenez*[1]; B. Reeja-Jayan[1]; J. Beuth[1]; [1]Carnegie Mellon University

2:20 PM
Laser Powder-bed Fusion Austenitic Steels with Superior Creep Resistance: *S. Dryepondt*[1]; P. Nandwana[1]; K. Unocic[1]; P. Fernandez-Zelaia[1]; Y. Yang[1]; R. Kannan[1]; Y. Lee[1]; F. List[1]; [1]Oak Ridge National Laboratory

2:40 PM
Development of Multi-principle Element Alloys for Oxidation Resistant Coatings Applied with Additive Manufacturing: *J. Loli*[1]; Y. He[1]; A. Chovatiya[1]; Z. Ulissi[1]; B. Webler[1]; M. De Boer[1]; J. Beuth[1]; [1]Carnegie Mellon University

3:00 PM
Reactive Selective Laser Synthesis and Additive Manufacturing of Ultra-high Temperature Ceramics: *A. Peters*[1]; D. Zhang[2]; A. Hernandez[1]; M. Brupbacher[2]; D. Nagle[1]; T. Mueller[1]; J. Spicer[1]; [1]Johns Hopkins University; [2]The Johns Hopkins Applied Physics Laboratory

3:20 PM
The Mechanisms Behind the Effect of Oxygen on DED AM Ti Alloy Build: *C. Iantaffi*[1]; Y. Chen[1]; S. Clark[1]; R. Atwood[2]; E. Bele[1]; M. Meisnar[3]; T. Rohr[4]; L. Jedsada[5]; M. Pham[5]; P. Lee[1]; [1]UCL Mechanical Engineering; [2]Diamond Light Source Ltd; [3]ESA-RAL Advanced Manufacturing Laboratory; [4]ESA-ESTEC; [5]Imperial College London

3:40 PM
A Novel Heat Treatment Design to Overcome Inferior Creep Behaviour of SLM Processed IN738LC Alloy: *H. Song*[1]; [1]MCAM, Monash University

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — Ni-based Superalloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee
Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

Tuesday PM **March 16, 2021**

2:00 PM Invited
Impact of Post-processing on the Performances of Laser Additively Manufactured High-γ' Ni Superalloys: *N. Zhou*[1]; A. Dicus[1]; S. Forsik[1]; T. Wang[1]; G. Colombo[1]; M. Epler[1]; [1]Carpenter Technology

2:30 PM
Improving the Creep Properties on ã'-strengthened Nickel-based Superalloy by Selective Laser Melting: *M. Lam*[1]; [1]Monash University

2:50 PM
New Superalloy ABD-900AM for Additive Manufacturing: The Role of Heat Treatment on Mechanical Properties: *Y. Tang*[1]; J. Ghoussoub[1]; J. Clark[2]; A. Nemeth[2]; R. Reed[1]; [1]University of Oxford; [2]OxMet Technologies

3:10 PM
Microstructure and Texture Evolution During Printing and Post Processing of Ni-based Superalloy: *C. Hilla*[1]; W. Zhang[1]; M. Mills[1]; A. Sadek[2]; H. Song[3]; [1]The Ohio State University; [2]Edison Welding Institute ; [3]Edison Welding Institute

3:30 PM Invited
Applying Additive Manufacturing Itself as a High-throughput Tool to Accelerate Heat Treatment Design of Additively Manufactured Alloys: Y. Zhao[1]; N. Sargent[1]; K. Li[1]; *W. Xiong*[1]; [1]University of Pittsburgh

4:00 PM
Simulation of Solid State Precipitation during Post Process Annealing of Additively Manufactured alloy 625: *B. Radhakrishnan*[1]; Y. Song[1]; J. Turner[1]; [1]Oak Ridge National Laboratory

4:20 PM
Assessing Compositional Gradients in DED Inconel 718 Builds via Directional Reflectance Microscopy: *E. Jain*[1]; Y. Yong Chen[1]; B. Gaskey[1]; G. Macchi[2]; A. Grande[2]; M. Seita[1]; [1]NTU Singapore; [2]Politecnico di Milano, Italy

4:40 PM
Effect of Stress-relief Treatments on The Microstructure and Mechanical Response of Additively Manufactured IN625 Thin-walled Elements: *A. Banerjee*[1]; M. He[1]; W. Musinski[2]; P. Shade[2]; M. Cox[2]; E. Schwalbach[2]; K. Hemker[1]; [1]Johns Hopkins University; [2]Air Force Research Laboratory

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Tuesday PM **March 16, 2021**

5:30 PM
Magnetic Anisotropy and Stacking Faults in Ag/Pt/Co/Pt Multilayer Thin Films: *Y. Liu*[1]; M. Kitcher[1]; M. De Graef[1]; V. Sokalski[1]; [1]Carnegie Mellon University

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session IV

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara
; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Tuesday PM **March 16, 2021**

2:00 PM Invited
A Framework for Quantitative Measurement of Plastic Deformation in Relation to 3D Microstructure: *J. Stinville*[1]; M. Charpagne[1]; A. Cervellon[1]; J. Hestroffer[1]; M. Echlin[1]; V. Valle[2]; D. Texier[3]; I. Beyerlein[1]; T. Pollock[1]; [1]University of California, Santa Barbara; [2]Institut P' - UPR 3346, CNRS - Université de Poitiers - ENSMA; [3]Institut Clément Ader - UMR CNRS 5312

2:30 PM
Characterization and Modelling of Twin Evolution and Cyclic Deformation in Magnesium Alloys by High Energy X-ray Diffraction Microscopy: *D. Greeley*[1]; M. Yaghoobi[1]; D. Pagan[2]; V. Sundararaghavan[1]; J. Allison[1]; [1]University of Michigan; [2]Cornell High Energy Synchrotron Source

2:50 PM
Elastoplastic Transition in a Metastable ß-titanium Alloy, Timetal 18 by In-situ High Energy X-ray Diffraction: *J. Bhattacharyya*[1]; S. Nair[2]; D. Pagan[3]; V. Tari[4]; R. Lebensohn[5]; A. Rollett[6]; S. Agnew[1]; [1]University of Virginia; [2]Cornell University; [3]Cornell High Energy Synchrotron Source, Cornell University; [4]Eaton Corporate Research and Technology; [5]Los Alamos National Laboratory; [6]Carnegie Mellon University

3:10 PM
A Strain Gradient Crystal Plasticity Constitutive Model for Hexagonal Close-packed Polycrystals: O. Sedaghat[1]; *H. Abdolvand*[1]; [1]Western University

3:30 PM
Estimating Stress on the Microstructural Length Scale Using the Measured Strain Field: *B. Cameron*[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

3:50 PM Invited
FFT-based Modeling of Strain Localization in Nano-metallic Laminates: *M. Zecevic*[1]; R. Lebensohn[1]; T. Nizolek[1]; R. McCabe[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

4:20 PM
Dynamic Recovery Observed in Distinct Grains Within A Polycrystalline Nickel-based Superalloy During Cyclic High Temperature Loading via High Energy X-ray Diffraction Microscopy: *S. Gustafson*[1]; D. Pagan[2]; P. Shade[3]; M. Sangid[1]; [1]Purdue University; [2]Cornell High Energy Synchrotron Source; [3]Air Force Research Laboratory

4:40 PM
Statistical Assessment of Strain Localization in Inconel 718 Informed by Digital Image Correlation Coupled with 3D EBSD: *M. Charpagne*[1]; J. Stinville[1]; A. Polonsky[1]; M. Echlin[1]; V. Valle[2]; T. Pollock[1]; [1]University of California, Santa Barbara; [2]P' Institute ENSMA Poitiers

5:00 PM
Analysis of Slip Transfer in Ti-5al-2.5 (Wt. %) at Two Temperatures in Comparison to Pure Aluminum: *C. Edge*[1]; T. Bieler[1]; [1]Michigan State University

5:20 PM
Orientation, Pattern Center Refinement and Deformation State Extraction through Global Optimization Algorithms: *C. Zhu*[1]; C. Kurniawan[1]; M. Ochsendorf[1]; M. De Graef[1]; [1]Carnegie Mellon University

Advanced Functional and Structural Thin Films and Coatings — Coating Technologies and Surface Structuring for Tools I

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Tuesday PM **March 16, 2021**

2:00 PM Invited
Investigations on the Process Stability of Dry Deep Drawing with Volatile Lubricants Injected through Laser-drilled Microholes: *G. Reichardt*[1]; M. Henn[2]; K. Riedmüller[1]; R. Weber[2]; T. Graf[2]; M. Liewald[1]; D. Hemming[3]; G. Umlauf[4]; P. Reichle[3]; J. Barz[4]; G. Tovar[3]; [1]Institute for Metal Forming Technology; [2]Institut für Strahlwerkzeuge; [3]Institute of Interfacial Process Engineering and Plasma Technology; [4]Fraunhofer Institute for Interfacial Engineering and Biotechnology

2:30 PM
Laboratory-on-a Crystal for Multifunctional, Multiscale Testing of Thin Films: *I. Ivanov*[1]; [1]Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

2:50 PM Keynote
Nanomanipulation and Nanolithography Experiments on Mono- and Multilayer MoS2 Surfaces: *E. Gnecco*[1]; A. Özogul[1]; F. Cassin[1]; R. Guerra[2]; A. Turchanin[1]; F. Krok[3]; [1]Friedrich Schiller University Jena; [2]University of Milan; [3]Jagiellonian University Krakow

3:30 PM
Development of a Laboratory Test to Identify Permanent PVD Coatings to Minimize Lubricant Use during Forging: *K. Clarke*; T. Kehe[1]; S. Randell[1]; S. Midson[1]; [1]Colorado School of Mines

3:50 PM
Molten Aluminum Test for the Identification of PVD Coating Candidates for Lube-free Aluminum Die Casting: *N. Delfino de Campos Neto*[1]; A. Korenyi-Both[1]; S. Midson[1]; M. Kaufman[1]; [1]Colorado School of Mines

Advanced High Strength Steels V — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Steels Committee
Program Organizers: Ana Luiza Araujo, CBMM North America Inc.; Louis Hector, General Motors Global Technical Center; Igor Vieira, Nucor Steel; Lijia Zhao, ArcelorMittal USA; Krista Limmer, CCDC Army Research Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Sebastien Allain, Institut Jean Lamour; MingXin Huang, University of Hong Kong

Tuesday PM **March 16, 2021**

2:00 PM
A Novel Study on Plasticity Mechanisms during Yield Point Elongation in Medium Manganese Steels: *P. Satyampet*[1]; S. Kundu[2]; P. Pant[1]; [1]Indian Institute of Technology Bomaby, Mumbai.; [2]Tata Steels

2:20 PM
Strain Path Effect on Martensitic Transformation in Medium Mn Steels: *P. Satyampet*[1]; S. Kundu[2]; P. Pant[3]; [1]Indian Institute of Technology Bomaby, Mumbai.; [2]Tata Steels; [3]Indian Institute of technology Bomaby, Mumbai.

2:40 PM
Static Recrystallization during Hot Deformation of HSLA Nb-Bearing Steels: *R. Almatani*[1]; J. Uusitalo[2]; A. Deardo[1]; [1]University of Pittsburgh; [2]University of Oulu

3:00 PM
Correlation of Rolling Schedules, Mechanical Properties, and SCC Susceptibility of API X70 Steel: A. Roccisano[1]; *S. Nafisi*[1]; D. Stalheim[2]; R. Ghomashchi[1]; [1]University of Adelaide; [2]DGS Metallurgical Solutions, Inc.

3:20 PM
High-resolution Digital Image Correlation Study of Plasticity and Damage at Lamellar Scales in Ferrite -- Pearlite Steel: *T. Vermeij*[1]; J. Hoefnagels[1]; [1]Eindhoven University of Technology

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

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Richard Beddingfield, North Carolina State University; Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Huseyin Ucar, California Polytechnic University; Yongmei Jin, Michigan Technological University; Arcady Zhukov, University of the Basque Country

Tuesday PM **March 16, 2021**

2:00 PM
Advances in Amorphous Core Technology for Loss Reduction in Distribution Transformers: *E. Theisen*[1]; [1]Metglas Inc.

2:20 PM
Magnetic Augmented Rotation System (MARS) – An Update: *N. Ravindra*[1]; C. Ibeh[1]; T. Brunstein[1]; B. Adra[1]; B. Mani[1]; T. Chow[2]; [1]New Jersey Institute of Technology; [2]ETD Inc.

2:40 PM
Overview of Magnetic Component Design for Power Converters: *R. Beddingfield*[1]; P. Ohodnicki[2]; [1]North Carolina State University; [2]University of Pittsburgh

3:00 PM Invited
Permanent Magnet Biased Inductors for Power Systems Applications: *M. Nations*[1]; [1]North Carolina State University

3:20 PM
The Effects of Stack Manufacturing Processes on the Magnetic Properties of Iron-Cobalt Alloys: *N. Aronhime*[1]; [1]Carpenter Technology

Advanced Materials for Energy Conversion and Storage VII — Functional Materials for Energy I

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Tuesday PM **March 16, 2021**

2:00 PM
Assessment of Grain Boundary Composition on the Thermodynamics Structural Properties in Concentrated Ceramic Oxides: *T. Boland*[1]; A. Singh[1]; P. Rez[1]; P. Crozier[1]; [1]Arizona State University

2:20 PM
A Novel and Practical Water-reactive Aluminum Fuel from Scrap: *P. Godart*[1]; D. Hart[1]; [1]MIT

2:50 PM
Aging Behavior of Advanced Martensitic Steels for Next Generation Diesel Engine Pistons: *D. Pierce*[1]; G. Muralidharan[1]; L. Allard[1]; J. Poplawsky[1]; E. Cakmak[1]; A. Trofimov[1]; H. Wang[1]; A. Haynes[1]; [1]Oak Ridge National Laboratory

3:10 PM
Breaking Atomic-level Ordering via Biaxial Strain in Functional Oxides: A DFT Study: *K. Rawat*[1]; D. Aidhy[1]; D. Fong[2]; [1]University of Wyoming; [2]Argonne National Laboratory

3:30 PM
Direct Correlation of Anion Conductivity with Grain Boundary Defect Chemistry in Concentrated Oxide Solid Solutions: H. Vahidi[1]; S. Xuan[1]; *W. Bowman*[1]; [1]University of California, Irvine

3:50 PM
Effect of Alloying Elements (Ni, Co) on Low Pt-transition Metals Nanowires for Oxygen Reduction Electrocatalysts: J. Yoo[1]; Y. Park[1]; C. Lee[2]; *H. Lee*[1]; [1]KAIST; [2]KIER

4:10 PM
Electrochemical Behavior of Palladium in 1-Ethyl-3-Methylimidazolium Chloride Ionic Liquid: *W. Zhang*[1]; B. Pesic[2]; [1]Shenyang Ligong University; [2]University of Idaho

Advanced Real Time Imaging — Energy & Biomaterials

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 Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, KTH Royal Institute of Technology; David Veysset, Stanford University

Tuesday PM **March 16, 2021**

2:00 PM Invited
Ultrafast Synchrotron X-ray Imaging and Modelling of Multiphase Flow in Ultrasound Based Materials Processing: L. Qin[1]; *J. Mi*[1]; [1]University of Hull, UK

2:20 PM Invited
In-operando Non-invasive Optical Visualization of Battery Reactions and Processes: *N. Liu*[1]; [1]Georgia Institute of Technology

2:40 PM
In-operando Investigations of Refractory Materials Interacting with Ash/Slag from Mixed Feedstock Gasification: *J. Nakano*[1]; A. Nakano[1]; Ö. Dogan[1]; M. Lambert[2]; D. Goski[2]; [1]U.S. Department of Energy National Energy Technology Laboratory; [2]Allied Mineral Products, LLC

3:00 PM
Evaluating Amplitude Variation of Frequency Spectrum in Ultrasound Imaging by Through Transmission Method: *K. Paul*[1]; L. Ladani[1]; [1]Arizona State University

3:20 PM
In-situ Analysis of Select Oxygen Carrier Materials under Chemical Looping Combustion Conditions: *A. Nakano*[1]; J. Nakano[2]; Ö. Dogan[3]; [1]U.S. Department of Energy National Energy Technology Laboratory/ Leidos Research Support Team; [2]U.S. Department of Energy National Energy Technology Laboratory/ Leidos Research Support Team ; [3]U.S. Department of Energy National Energy Technology Laboratory

3:40 PM Invited
Synchronized High-speed Microscopy and Thermo-analytical Measurement for sub-mm/sub-ms-scale Cathodic Behavior in Molten Salt Electrolysis: *S. Natsui*[1]; R. Shibuya[2]; H. Nogami[1]; T. Kikuchi[2]; R. Suzuki[2]; [1]Tohoku University; [2]Hokkaido University

4:00 PM Break

4:20 PM Panel Discussion

Advances in Powder and Ceramic Materials Science — Ceramic-based Composites

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Materials Characterization Committee, TMS: Powder Materials Committee
Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Kathy Lu, Virginia Polytechnic Institute and State University; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama; Eugene Olevsky, San Diego State University

Tuesday PM **March 16, 2021**

2:00 PM
Low-cost Forming and Reactive Melt Infiltration Processing of High-temperature, Thermally-cyclable Carbide/Metal Composites in Complex, Near Net Shapes for Renewable Energy Applications: *Y. Wang*[1]; P. Tumurugoti[1]; Z. Chen[1]; A. Strayer[1]; A. Caldwell[1]; S. Bagherzadeh[1]; G. Itskos[1]; K. Trumble[1]; M. Caccia[1]; K. Sandhage[1]; [1]Purdue University

2:20 PM
Diamond Graphitization and Its Effect on Hardness of Diamond Particulate Ceramic Composites: *J. LaSalvia*[1]; A. DiGiovanni[1]; K. Behler[1]; W. Shoulders[1]; S. Walck[1]; [1]CCDC Army Research Laboratory

2:40 PM
Bulk High-entropy Nitrides and Carbonitrides: *O. Dippo*[1]; N. Mesgarzadeh[1]; T. Harrington[1]; G. Schrader[1]; K. Vecchio[1]; [1]University of California San Diego

AI/Data Informatics: Applications and Uncertainty Quantification at Atomistics and Mesoscales — Session IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Kamal Choudhary, National Institute of Standards and Technology; Garvit Agarwal, Argonne National Laboratory; Wei Chen, Illinois Institute of Technology; Mitchell Wood, Sandia National Laboratories; Vahid Attari, Texas A&M University; Oliver Johnson, Brigham Young University; Richard Hennig, University of Florida

Tuesday PM **March 16, 2021**

2:00 PM
Fast Crystal Structure Reconstruction and Prediction Method: Based on X-ray Diffraction Dataset and Neural Network: *C. Tung*[1]; Y. Chen[1]; Y. Lin[2]; N. Chen[3]; A. Yang[3]; P. Chen[1]; [1]National Tsing Hua University; [2]National Chiao Tung University; [3]National Center for High-Performance Computing

2:20 PM
Finding and Sharing Atomistic Materials Data and Software with the NIST Materials Resource Registry: *C. Becker*[1]; R. Plante[1]; L. Bartolo[2]; R. Hanisch[1]; J. Warren[1]; G. Greene[1]; [1]Material Measurement Laboratory, National Institute of Standards and Technology; [2]Center for Hierarchical Materials Design, Northwestern University

2:40 PM
Accelerating High Throughput Materials Simulation Studies Using Machine Learning Based Application Programming Interface (API): *J. Gibson*[1]; S. Xie[1]; R. Hennig[1]; [1]University of Florida

3:00 PM
Coupling Machine Learning and Global Structure Optimization in GASP 2.0: *S. Xie*[1]; S. Honrao[1]; V. Kolloru[1]; R. Hennig[1]; [1]University of Florida

3:20 PM
Harnessing Materials Data and Simulation Capabilities for the Accelerated Discovery of Photocathode Materials: *E. Antoniuk*[1]; Y. Yue[1]; Y. Zhou[1]; P. Schindler[1]; W. Schroeder[2]; T. Vecchione[3]; B. Dunham[4]; P. Pianetta[3]; E. Reed[1]; [1]Stanford University; [2]University of Illinois at Chicago; [3]SLAC; [4]SLAC

3:40 PM
De Novo Design of Therapeutic Agents Against COVID-19 Using Artificial Intelligence: *S. Srinivasan*[1]; R. Batra[1]; H. Chan[1]; G. Kamath[2]; M. Cherukara[1]; S. Sankaranarayanan[1]; [1]Argonne National Laboratory; [2]Dalzielfiver LLC

4:00 PM
AI Guided Discovery of Self-assembly Peptide Sequences using Monte Carlo Tree Search and Coarse-grained Simulations: *R. Batra*[1]; T. Loeffler[1]; H. Chan[1]; S. Srinivasan[1]; C. Fry[1]; S. Sankaranarayanan[1]; [1]Argonne National Lab

AI/Data informatics: Design of Structural Materials — AI/ML for Design of Structural Alloys & Additively Manufactured Materials

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
Program Organizers: Jennifer Carter, Case Western Reserve University; Amit Verma, Carnegie Mellon University; Natasha Vermaak, Lehigh University; Jonathan Zimmerman, Sandia National Laboratories; Darren Pagan, Pennsylvania State University; Chris Haines, Ccdc Army Research Laboratory; Judith Brown, Sandia National Laboratories

Tuesday PM **March 16, 2021**

2:00 PM Invited
Zoning Processing Spaces for Additive Manufacturing: Applications for Inverse Design: *S. Donegan*[1]; E. Schwalbach[1]; M. Krug[1]; [1]Air Force Research Laboratory

2:30 PM
High-throughput Alloy Design via Additive Manufacturing: *O. Dippo*[1]; K. Kaufmann[1]; G. Schrader[1]; K. Vecchio[1]; [1]University of California San Diego

2:50 PM
Alloy Design for Additive Manufacturing: *M. Assi*[1]; J. Favre[1]; A. Fraczkiewicz[1]; F. Tancret[2]; [1]Mines Saint-Etienne, Univ Lyon, LGF - UMR 5307 CNRS/ Centre SMS; [2]Université de Nantes, Institut des Matériaux Jean Rouxel (IMN), Polytech Nantes, BP 50609

3:10 PM Invited
Multi-objective Lattice Optimization Using an Efficient Neural Network Approach: *A. Garland*[1]; B. White[1]; B. Boyce[1]; R. Alberdi[1]; [1]Sandia National Labs

3:40 PM
Design of Ti-Al-Cr-V Alloys for Maximum Thermodynamic Stability: *R. Jha*; G. Dulikravich[1]; [1]Florida International University

4:00 PM
Prediction of the Mechanical Properties of Aluminum Alloy Using Bayesian Learning for Neural Networks: *S. Takemoto*[1]; K. Nagata[2]; T. Kaneshita[1]; Y. Okuno[1]; K. Okuno[1]; M. Kitano[1]; J. Inoue[3]; M. Enoki[3]; [1]Showa Denko K.K.; [2]National Institute for Materials Science; [3]The University of Tokyo

4:20 PM
Machine Learning Assisted Exploration of FeCoCrNi Based Nanocrystal-amorphous Dual-phase Alloys: *Y. Yao*[1]; X. Hu[2]; X. Yu[2]; J. Gong[1]; F. Yan[1]; L. Li[1]; [1]The University of Alabama; [2]Northwestern University

4:40 PM
Topology Optimization for Design of Stress-dependent Material Properties: *J. Unger*[1]; M. Vaughn[1]; A. Gaynor[2]; B. McWilliams[2]; J. Guest[1]; K. Hemker[1]; [1]Johns Hopkins University; [2]CCDC U.S. Army Research Laboratory

Algorithm Development in Materials Science and Engineering — Computational Models and Algorithms in Atomistic Scale

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Bryan Wong, University of California, Riverside; Ebrahim Asadi, University of Memphis; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryce Meredig, Citrine Informatics

Tuesday PM **March 16, 2021**

2:00 PM
Characterizing Atomistic Geometries and Potential Functions Using Strain Functionals: *E. Kober*[1]; C. Adams[1]; J. Tavenner[2]; N. Mathew[1]; [1]Los Alamos National Laboratory; [2]Colorado School of Mines

2:20 PM
Modeling Static Recrystallization within the SPParKS Kinetic Monte Carlo Framework for Polycrystalline Materials: *A. Gerlt*[1]; D. Newell[2]; A. Pilchak[2]; E. Payton[2]; [1]The Ohio State University; [2]Air Force Research Lab

2:40 PM Invited
Characterizing the Length Dependence of High-Peierls-Stress Dislocations' Mobility in BCC Crystals under Deformation at Finite Temperature from the Atomistic to the Mesoscale: *L. Xiong*[1]; [1]Iowa State University

3:10 PM
Dislocation Dipole Study on Material Hardening/Softening: *A. Siddique*[1]; T. Khraishi[1]; H. Lim[2]; [1]University of New Mexico; [2]Sandia National Laboratories

3:30 PM
Continuum Dislocation Dynamics with Junction Reactions: Computational Modeling and Preliminary Results: *K. Starkey*[1]; A. El-Azab[1]; [1]Purdue University

3:50 PM
Advancements in Discrete Dislocation Modeling of Slip Transmission through Equilibrium and Non-equilibrium Grain Boundaries: *D. Bamney*[1]; L. Capolungo[2]; D. Spearot[1]; [1]University of Florida; [2]Los Alamos National Laboratory

Alloys and Compounds for Thermoelectric and Solar Cell Applications IX — 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; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Tiejun Zhu, Zhejiang University; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology

Tuesday PM **March 16, 2021**

2:00 PM Invited
Structure and Physical Properties of Complex Chalcogenides: Fundamental Research with an "Eye" Towards Lower Temperature Applications: *G. Nolas*[1]; [1]University of South Florida

2:20 PM
Phase Boundary Mapping to Improve Na solubility, Band Convergence, and Thermoelectric Properties in p-type PbTe: *J. Male*[1]; P. Jood[2]; S. Anand[1]; G. Snyder[1]; [1]Northwestern University; [2]National Institute of Advanced Industrial Science and Technology

2:40 PM
Defect Evolution Enabling Low Thermal Conductivity and High Thermoelectric Performance for n-type PbTe
: *P. Deng*[1]; K. Wang[2]; J. Du[3]; H. Wu[1]; [1]National Chiao Tung University; [2]National Sun Yat-sen University; [3]National Tsing Hua University

3:00 PM Invited
Thermal and Electrical Transport in Zintl Thermoelectrics: From Ab Initio Understanding to Materials Discovery: *G. Hautier*[1]; [1]Université catholique de Louvain

3:20 PM Invited
The "Grand Challenge" of Thermoelectric Materials: *D. Parker*[1]; [1]ORNL

3:40 PM Invited
The Origin of Low Thermal Conductivity in Tetrahedrites: A Jahn-Teller Electronic Instability: *P. Vaqueiro*[1]; [1]University of Reading

4:00 PM Invited
Effect of Phonon Drag on Seebeck Coefficient Based on Linear Response Theory: *M. Ogata*[1]; J. Endo[1]; H. Matsuura[1]; H. Maebashi[1]; H. Fukuyama[2]; [1]University of Tokyo; [2]Tokyo University of Science

4:20 PM Invited
Strategies for the Balance of Oxide/Metal Composites Towards the Applications of Flexible Solar Energy Harvesters: *W. Chiu*[1]; C. Tso-Fu Mark[1]; M. Sone[1]; A. TIXIER-MITA[2]; H. Toshiyoshi[2]; H. Hosoda[1]; [1]Tokyo Institute of Technology; [2]The University of Tokyo

4:40 PM
Effect of Zn and Cr Co-doping on the Thermoelectric Properties of Colusite Cu26V2M6S32 (M=Ge,Sn): *P. Kaminska*[1]; C. Bourgès[2]; P. Spiewak[1]; T. Mori[2]; [1]Warsaw University of Technology; [2]National Institute for Materials Science

Aluminum Alloys, Processing and Characterization — Mechanical Properties, Applications, and Fitness for Service Testing

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Dimitry Sediako, University of British Columbia

Tuesday PM **March 16, 2021**

2:00 PM
The Effect of Rare Earth Mischmetal on the High Temperature Tensile Properties of an A356 Aluminum Alloy: *J. Stroh*[1]; D. Sediako[1]; D. Weiss[2]; [1]University of British Columbia Okanagan; [2]Eck Industries

2:20 PM
Effects of Ultrasonic Melt Processing on Microstructure, Mechanical Properties and Electrical Conductivity of Hypereutectic Al-Si, Al-Fe and Al-Ni Alloys with Zr Additions: *S. Chankitmunkong*[1]; D. Eskin[2]; C. limmaneevichitr[1]; [1]King Mongkut's University of Technology Thonburi; [2]Brunel University London

2:40 PM
The Corrosion Behavior of 5xxx and 6xxx Aluminum Alloys with Trace Calcium: S. Singh[1]; *K. Sundaram*[2]; B. Pesic[1]; [1]University of Idaho; [2]Novelis Molten Metal Processing, Novelis Corporation

3:00 PM
Review of Retrogression Forming and Reaging for AA7075-T6 Sheet: *K. Rader*[1]; J. Carter[2]; L. Hector[2]; E. Taleff[1]; [1]University of Texas at Austin; [2]General Motors

3:20 PM
Fatigue and Failure Analysis of an Additively Manufactured Contemporary Aluminum Alloy: *P. Nezhadfar*[1]; S. Thompson[2]; A. Saharan[2]; N. Phan[3]; N. Shamsaei[1]; [1]Auburn University; [2]EOS North America; [3]Structures Division, Naval Air Systems Command (NAVAIR)

3:40 PM
Investigation of Weld Quality for Friction Stir Welding of Extrued 6XXX Series Aluminium Alloys: M. Guner[1]; *M. Konar*; A. Yigit[1]; G. Özçelik[1]; T. Demirkiran[1]; [1]Asas Aluminium

4:00 PM
The Effect of Al3Er Particles on the Structure and Mechanical Properties of an Al-Mg Alloy: *A. Khrustalev*[1]; I. Zhukov[1]; V. Platov[1]; A. Vorozhtsov[1]; [1]Tomsk State University

Aluminum Reduction Technology Across the Decades: An LMD Symposium Honoring Alton T. Tabereaux, Halvor Kvande and Harald A. Øye — Alton Tabereaux Honorary Session: Reduction Cell Operation and Process Control - Joint session with Aluminum Reduction Technology

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Arne Ratvik, SINTEF; Marc Dupuis, GeniSim Inc.; Kristian Etienne Einarsrud, Norwegian University of Science and Technology

Tuesday PM **March 16, 2021**

2:00 PM
Introductory Comments: Aluminum Reduction Technology Across the Decades: An LMD Symposium Honoring Alton T. Tabereaux, Halvor Kvande and Harald A. Øye: *M. Dupuis*[1]; [1]GeniSim Inc.

2:05 PM
Alton Tabereaux: A Humble Individual Who Dedicates His Lifetime to Aluminum - An Aluminum Legend of Our Time: *X. Wang*[1]; [1]Alcoa Corp

2:45 PM
Awakening of the Aluminum Industry to PFC Emissions and Global Warming: *A. Tabereaux*[1]; D. Wong[1]; [1]Consultant

3:05 PM
Application and Adaptability of MHD Stability Computation for Modern Aluminium Reduction Cells at Extreme Conditions of Low ACD and Low Liquid Aluminium Level: V. Bojarevics[1]; *M. Dupuis*[2]; [1]University of Greenwich; [2]GeniSim Inc.

3:25 PM
Investigation of Cyclic Process Variations within Hall-Héroult Reduction Cells: *J. Tessier*[1]; S. Duplessis[1]; [1]Alcoa

3:45 PM
In Line Cell Position and Anode Change Effects on the Alumina Dissolution: *V. Bojarevics*[1]; [1]University of Greenwich

4:05 PM
History of Computer Control of Aluminum Reduction Cells: *V. Potocnik*[1]; M. Reverdy[1]; [1]Vinko Potocnik Consulting

4:25 PM Question and Answer Period

Bulk Metallic Glasses XVIII — Alloy Development and Application II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM **March 16, 2021**

2:00 PM
Fabrication of Fe-based Metallic Glassy Microparts Through Unprecedented Processes: *R. Yamada*[1]; N. Yodoshi[1]; N. Nomura[1]; J. Saida[1]; A. Kawasaki[1]; [1]Tohoku University

2:20 PM Invited
Selection and Testing of Bulk Metallic Glass Alloys for Space-based Mechanisms: *A. Murphy*[1]; A. Norman[2]; D. Browne[1]; [1]University College Dublin; [2]European Space Agency

2:45 PM
Measuring Metallic Glass Viscosities Over Wide Composition Ranges: *S. Kube*[1]; T. Evers[1]; W. Polsky[1]; R. Ojeda Mota[1]; K. Ryan[1]; J. Schroers[1]; [1]Yale University

3:05 PM
Machine Learning from Elemental and Simulation Features for Predicting Glass Forming Ability: *D. Morgan*[1]; B. Afflerbach[1]; L. Schultz[1]; J. Erickson[1]; D. Thoma[1]; J. Perepezko[1]; C. Francis[1]; P. Voyles[1]; G. Bokas[2]; J. Xi[1]; I. Szlufarska[1]; [1]University of Wisconsin-Madison; [2]Siemens Industry Software

3:25 PM
Application of High-Throughput Calculation in Finding the Compositions with Optimal GFA in Zr-Cu-Al Based Complex System: J. Lu[1]; J. Zhang[1]; X. Hui[2]; *Y. Zhong*[1]; [1]Worcester Polytechnic Institute; [2]University of Science and Technology Beijing

Cast Shop Technology — Recycling and Furnace Operations

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Samuel Wagstaff, Oculatus

Tuesday PM **March 16, 2021**

2:00 PM
Introductory Comments: Cast Shop Technology: *S. Wagstaff*[1]; [1]Oculatus

2:05 PM
Impact of COVID-19 on the British Foundries: *P. Saxena*[1]; P. Murrell[2]; T. Sivarupan[3]; K. Salonitis[1]; M. Jolly[1]; [1]Cranfield University; [2]Cast Metals Federation; [3]The University of Queensland

2:25 PM
Effect of Steam on Aluminium Packaging Multilayers: *M. Syvertsen*[1]; A. Kvithyld[1]; B. Vågenes[1]; S. Kubowicz[1]; R. Gaarder[1]; [1]SINTEF Industry

2:45 PM
Compaction of Aluminium Foil and Its Effect on Oxidation and Recycling Yield: *A. Vallejo Olivares*[1]; H. Philipson[1]; M. Gökelma[2]; H. Roven[1]; T. Furu[3]; A. Kvithyld[4]; G. Tranell[1]; [1]Norwegian University of Science and Technology; [2]Izmir Institute of Technology; [3]Norsk Hydro; [4]SINTEF

3:05 PM
Influence of Mg Concentration on the Inhibiting Effect of CO_2 on the Oxidation Rate of Aluminum Alloys 5182 and 6016: *C. Solem*[1]; E. Solberg[2]; G. Tranell[1]; R. Aune[1]; [1]Norwegian University of Science and Technology (NTNU); [2]Alcoa Norway ANS

3:25 PM
Automated Chemical Analysis of Liquid Aluminum for Process Control: S. Gudmundsson[1]; H. Gudmundsson[2]; *K. Leosson*[1]; [1]DT Equipment; [2]Nordural ehf.

3:45 PM
Characteristic Impurities of Silicon Metal SI-441 as Additive Material to Produce Aluminium Foundry Alloy A356.2: *R. Zurcher*[1]; R. Harahap[1]; E. Mugiono[1]; M. Parapat[1]; M. Ponirin[1]; [1]PT Indonesia Asahan Aluminium

4:05 PM
Molten Aluminium Transfer: Review and Comparison of Different Technologies: *O. Dion-Martin*[1]; R. Dumont[1]; J. Desmeules[1]; [1]Dynamic Concept

Characterization of Minerals, Metals and Materials 2021 — Characterization of Composite Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

Tuesday PM **March 16, 2021**

2:00 PM
Composite Binder and Particle Size Effects on Mechanical Properties of Non-hazardous High Explosive Surrogates: *M. Herman*[1]; C. Woznick[1]; A. Duque[1]; J. Yeager[1]; [1]Los Alamos National Laboratory

2:20 PM
Mechanical Testing and Microstructural Investigation into the Effects of Heat Treatment on Additively Manufactured TiC Reinforced Ti-Ni Matrix Composites (TNMCs): A. Dodd[1]; J. Wang[1]; D. East[2]; E. Morozov[1]; *J. Escobedo-Diaz*[1]; [1]University of New South Wales; [2]CSIRO Manufacturing

2:40 PM
Influence of Graphene Oxide Fuctionalization Strategy on the Dynamic Mechanical Response of Natural Fiber Reinforced Polymer Matrix Composites: *F. Garcia Filho*[1]; M. Oliveira[1]; F. Luz[1]; S. Monteiro[1]; [1]Military Institute of Engineering

3:00 PM
Charpy Impact Tests of Castor Oil Derived Polyurethane Matrix Composites Reinforced by Wood Industry Waste: J. de Faria[1]; N. Simonassi[1]; C. Vieira[1]; *F. Lopes*[2]; [1]State University of Northern Rio de Janeiro; [2]UENF

3:20 PM
Flexural Strength of Castor Oil Derived Polyurethane Matrix Composite Reinforced with Luffa Fibers: A. Cerqueira Neves[1]; N. Simonassi[2]; *F. Lopes*[1]; C. Vieira[1]; [1]UENF; [2]State University of Northern Rio de Janeiro

3:40 PM
Spall Damage Characterization of Additively Manufactured Ti-Ni-C Composites: W. Absolon[1]; J. Wang[1]; D. East[2]; A. Ameri[1]; H. Wang[1]; E. Morozov[1]; P. Hazell[1]; *J. Escobedo-Diaz*[1]; [1]University of New South Wales; [2]CSIRO Manufaturing

4:00 PM
Characterization of Equimolar Zinc Ferrite - ZF: *M. Gomez-Marroquin*[1]; J. D´Abreu[2]; H. Colorado[3]; A. Terrones - Ramírez[4]; K. Phatti - Satto[4]; N. Cárdenas-Falcón[5]; [1]APMMM/UNI; [2]DEQM PUC-Rio; [3]University of Antioquia - UDEA; [4]FIGMM UNI; [5]PUCP

4:20 PM
Characterization of Ultra-hard Ceramic AlMgB14-based Materials Obtained by Self-propagating High-temperature Synthesis and Spark Plasma Sintering: I. Zhukov[1]; *P. Nikitin*[1]; A. Vorozhtsov[1]; [1]Tomsk State University

4:40 PM
Preparation of Ceramic Coating on Copper Substrate with Transitional Layer by Low-temperature Slurry Method: *Z. Zhang*[1]; H. Bai[1]; L. Li[2]; M. Zhong[2]; [1]University of Science and Technology Beijing; [2]Shantou Huaxing Metallurgical Equipment Co., Ltd.

Characterization of Nuclear Materials and Fuels with Advanced X-ray and Neutron Techniques — X-ray Tomography and Microscopy

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee
Program Organizers: Xuan Zhang, Argonne National Laboratory; Jonathan Almer, Argonne National Laboratory; Maria Okuniewski, Purdue University; Joshua Kane, Idaho National Laboratory; Donald Brown, Los Alamos National Laboratory; J. Kennedy, Idaho National Laboratory; Arthur Motta, Pennsylvania State University

Tuesday PM **March 16, 2021**

2:00 PM
Characterization of Nuclear Energy Materials in 2D and 3D using Laboratory-based X-ray Microscopy: *N. Cordes*[1]; J. Kane[1]; A. Craft[1]; [1]Idaho National Laboratory

2:20 PM
Non-destructive Correlative 3D Characterization of Nuclear Graphite: From the Microscale to the Nanoscale: S. Kelly[1]; *R. White*[1]; W. Harris[1]; T. Volkenandt[1]; B. Tordoff[1]; G. Laudone[2]; K. Jones[2]; B. Veater[2]; [1]Carl Zeiss X-ray Microscopy; [2]University of Plymouth

2:40 PM
Irradiation Effects on Precipitate Distributions in High-temperature Ultrafine-precipitate-strengthened Steel Characterized by Synchrotron Micro-computed Tomography: *A. Figueroa*[1]; S. Nori[1]; P. Kenesei[2]; J. Almer[2]; M. Okuniewski[1]; [1]Purdue University; [2]Argonne National Laboratory

3:00 PM
Identifying the Microstructural Origins of Creep Damage in Alloy 617: *M. Messner*[1]; X. Zhang[1]; M. Li[1]; M. McMurtrey[2]; [1]Argonne National Laboratory; [2]Idaho National Laboratory

3:20 PM
Getting "Around" the High Mass Attenuation Issue for µX-ray Computed Tomography of Nuclear Fuels: *J. Kane*[1]; N. Cordes[1]; A. Craft[1]; D. Marshall[1]; J. Stempien[1]; [1]Idaho National Laboratory

Composite Materials for Nuclear Applications — Composite Fuels/Graphite Carbon

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee, TMS: Nuclear Materials Committee
Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Oak Ridge National Laboratory; Peng Xu, Idaho National Laboratory; Johann (Hans) Riesch, Max Planck Institute for Plasma Physics

Tuesday PM **March 16, 2021**

2:00 PM Invited
Improved Techniques for Determining Local Thermal Transport in Composite Nuclear Fuels: *S. Middlemas*[1]; J. Kane[1]; T. Pavlov[1]; B. Kombaiah[1]; D. LaBrier[2]; Y. Shen[3]; I. Van Rooyen[1]; [1]Idaho National Laboratory; [2]Idaho State University; [3]University of New Mexico

2:30 PM Invited
Overview of the Westinghouse Accident Tolerant and High Burnup Fuel Program: *E. Lahoda*[1]; Z. Karoutas[1]; L. Olson[1]; L. Hallman[1]; K. Metzger[1]; J. Walters[1]; M. Sivack[1]; J. Lyons[1]; L. Czerniak[1]; A. Jaworski[1]; B. Maier[1]; R. Terry[1]; Z. McDaniel[1]; F. Boylan[1]; J. Kobelak[1]; M. Shockling[1]; M. Limback[1]; A. Claisse[1]; J. Wright[1]; J. Ghergurovich[1]; [1]Westinghouse Electric

3:00 PM
Development of UN/UO2 Composite Fuels for LWR Applications: *P. Xu*[1]; L. He[1]; B. Jaques[2]; K. Sridharan[3]; D. Butt[4]; [1]Idaho National Laboratory; [2]Boise State University; [3]University of Wisconsin; [4]University of Utah

3:20 PM
Uranium Nitride Advanced Fuel: An Evaluation of the Oxidation Resistance of Coated and Doped Grains: *Y. Mishchenko*[1]; D. Adorno Lopes[2]; K. Johnson[3]; J. Wallenius[1]; [1]KTH; [2]Westinghouse Electric Company; [3]Studsvik Nuclear AB

3:40 PM
Fabrication, Characterisation and Oxidation Resistance of an Innovative Composite Fuel: UN Microspheres Embedded in UO_2 Matrix: *D. Costa*[1]; M. Hedberg[2]; S. Middleburgh[3]; J. Wallenius[4]; P. Olsson[4]; D. Lopes[5]; [1]KTH Royal Institute of Technology, Westinghouse Electric Sweden AB; [2]Chalmers University of Technology; [3]Bangor University; [4]KTH Royal Institute of Technology; [5]Westinghouse Electric Sweden AB

4:00 PM Invited
Use of Carbon Fibre-reinforced Carbon in Wendelstein 7-X: *J. Boscary*[1]; H. Greuner[1]; B. Mendelevitch[1]; G. Ehrke[1]; P. Junghanns[1]; R. Stadler[1]; [1]Max-Planck-Institut für Plasmaphysik

4:30 PM
Sub-critical Crack Initiation, Coalescence and Propagation in Nuclear Graphite Studied by High-speed Pink Beam Synchrotron Tomography: *T. Zillhardt*[1]; D. Liu[2]; J. Marrow[1]; [1]University of Oxford; [2]University of Bristol

4:50 PM
Irradiation Effects in the Composite Phases of Graphite and Carbon-based Materials: *A. Campbell*[1]; J. Arregui-Mena[1]; [1]Oak Ridge National Laboratory

Computational Thermodynamics and Kinetics — Phase Stability I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Tuesday PM **March 16, 2021**

2:00 PM Invited
Integrated Models for the Design of Precipitation Hardenable Mg and Al Alloys: *H. Liu*[1]; I. Papadimitriou[2]; F. Lin[3]; J. Llorca[4]; J. Nie[5]; M. Nele[1]; [1]KU Leuven; [2]IMDEA Materials ; [3]UC Louvain ; [4]IMDEA Materials; [5]Monash University

2:30 PM
Competing and Collaborating Phase Transitions Studied within Cluster Variation Method: *T. Mohri*[1]; [1]Tohoku University

2:50 PM
First principles Study of Precipitation in Al-Cu, Al-Li and Al-Cu-Li Alloys: S. Liu[1]; *J. Llorca*[2]; [1]IMDEA Materials Institute; [2]IMDEA Materials Institute & Technical University of Madrid

3:10 PM Invited
Insights into Processes at Electrochemical Solid/Liquid Interfaces from Ab Initio Molecular Dynamics Simulations: *M. Todorova*[1]; S. Surendralal[1]; S. Wippermann[1]; F. Deissenbeck[1]; C. Freysoldt[1]; J. Neugebauer[1]; [1]Max Planck Institut fur Eisenforschung

3:40 PM
Effect of Oxygen on Joining Magnesium and Iron: Insights from Ab Initio Simulations: *P. Sushko*[1]; Y. Du[1]; H. Das[1]; P. Upadhyay[1]; [1]Pacific Northwest National Laboratory

4:00 PM
A First-principles Analysis of the Temperature Dependence of Stacking Fault Energies in Mg and Ti: *J. Brodie*[1]; M. Ghazisaeidi[1]; [1]Ohio State University

4:20 PM Invited
Vacancy-mediated Phase Selection in High-entropy Alloys: *P. Singh*[1]; S. Gupta[1]; A. Smirnov[1]; M. Kramer[1]; D. Johnson[1]; [1]Ames Laboratory

Defect and Phase Transformation Pathway Engineering for Desired Microstructures — Simulation and Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Yufeng Zheng, University of Nevada-Reno ; Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Timofey Frolov, Lawrence Livermore National Laboratory; Stoichko Antonov, Max-Planck-Institut für Eisenforschung GmbH; Jessica Krogstad, University of Illinois at Urbana-Champaign; Bin Li, University of Nevada, Reno

Tuesday PM **March 16, 2021**

2:00 PM
Interactions between Lattice Dislocations and 3D Metallic Interfaces: *S. Xu*[1]; J. Cheng[2]; N. Mara[2]; I. Beyerlein[1]; [1]University of California, Santa Barbara; [2]University of Minnesota, Twin Cities

2:20 PM
Interfacial Segregation and Segregation-induced Transitions in a Polycrystalline Grain Boundary Network: *P. Garg*[1]; Z. Pang[2]; V. Turlo[3]; T. Rupert[4]; [1]Arizona State University; [2]Guilin University of Electronic Technology; [3]Swiss Federal Laboratories for Materials Science and Technology (Empa); [4]University of California, Irvine

2:40 PM
Twin Boundaries Continue to Surprise Us: Understanding Type II Twin in NiTi and {1012} Twin in HCP Materials: *A. Mohammed*[1]; H. Sehitoglu[1]; [1]University of Illinois Urbana-Champaign

3:00 PM
New Insights into The Effect of Solutes on Twinning in Ti Alloys: *M. Hooshmand*[1]; Y. Chong[1]; R. Zhang[1]; A. Minor[1]; M. Asta[1]; [1]University of California, Berkeley

3:20 PM
Evolving Core Structures in Dislocation-twin Boundary Interactions: *O. Celebi*[1]; A. Mohammed[1]; F. Andrade Chávez[1]; J. Krogstad[1]; H. Sehitoglu[1]; [1]University of Illinois Urbana Champaign

3:40 PM
Characterizing and Modeling Collective Atomic Displacements during Grain Boundary Migration: *I. Chesser*[1]; A. Qiu[1]; A. Gupta[2]; G. Tucker[2]; B. Runnels[3]; E. Holm[1]; [1]Carnegie Mellon University; [2]Colorado School of Mines; [3]University of Colorado Colorado Springs

4:00 PM
Assessment and Design of Complex Microstructural Features in Zirconia Shape Memory Ceramics via Elasto-Plastic Phase-field Modeling: *C. Cissé*[1]; M. Asle Zaeem[1]; [1]Colorado School of Mines

4:20 PM
Pseudoelastic Response of Ion-implanted Nickel-titanium Shape Memory Alloy: Combining Experimentation and Forward Modeling: *D. Hong*[1]; H. Paranjape[2]; P. Anderson[1]; A. Hinojos[1]; M. Mills[1]; K. Hattar[3]; N. Li[4]; J. Schaffer[5]; [1]The Ohio State University; [2]Confluent Medical; [3]CINT Sandia National Laboratories; [4]CINT Los Alamos National Laboratories; [5]Fort Wayne Metals

4:40 PM
Investigation of Nucleation Mechanisms Associated with Formation of Co-precipitates in Ni-based Superalloys: *H. Sriram*[1]; S. Mukhopadhyay[1]; R. Shi[2]; M. Mills[1]; Y. Wang[1]; [1]The Ohio State University; [2]Lawrence Livermore National Laboratory

Deformation Induced Microstructural Modification — Session IV: Deformation of Alloys I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Suveen Mathaudhu, University of California-Riverside ; Kester Clarke, Colorado School of Mines; Bharat Gwalani, Pacific Northwest National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

Tuesday PM **March 16, 2021**

2:00 PM Invited
Deformation Induced Precipitation (DIP) in Light Alloys: Theory and Experiments: S. Eswarappa Prameela[1]; P. Yi[1]; Y. Hollenweger[2]; L. Kecskes[1]; D. Kochmann[2]; M. Falk[1]; *T. Weihs*[1]; [1]Johns Hopkins University; [2]ETH Zurich

2:30 PM
Cyclic Deformation and Fatigue Behavior of 316L Stainless Steel Processed by Surface Mechanical Rolling Treatment: *L. Carneiro*[1]; X. Wang[2]; Y. Jiang[1]; [1]University of Nevada, Reno; [2]Zhejiang University of Technology

2:50 PM
High Pressure Torsion Processed Maraging Steels: Microstructure and Mechanical Behaviour: *K. Jacob*[1]; D. Yadav[1]; S. Dixit[2]; A. Hohenwarter[3]; B. Jaya[1]; [1]IIT Bombay; [2]Mishra Dhatu Nigam Ltd. (Midhani); [3]Montanuniversität Leoben

3:10 PM Invited
Fabrication of Ultrafine Grained Ferritic Steels by Combining Dynamic Transformation and Dynamic Recrystallization: *N. Tsuji*[1]; L. Zhao[2]; N. Park[3]; Y. Tian[4]; A. Shibata[5]; [1]Kyoto University; [2]ArcelorMittal; [3]Yeungnam University; [4]Northeastern University; [5]National Institute for Materials Science

3:40 PM Invited
Microstructural Evolution and Deformation Mechanisms in Segregation-Engineered Nanocrystalline Al Alloys: G. Balbus[1]; J. Kappacher[2]; D. Sprouster[3]; J. Shin[4]; F. Wang[4]; J. Trelewicz[3]; D. Kiener[2]; V. Maier-Kiener[2]; *D. Gianola*[4]; [1]UCSB; [2]Montanuniversität Leoben; [3]Stony Brook University; [4]University of California, Santa Barbara

4:10 PM
The Effect of Processing Parameters on the Microstructure and Performance of Ni-Mn-Ga Alloys: *P. Ari-Gur*[1]; P. Bhale[1]; I. Musabirov[2]; R. Noebe [3]; V. Shavrov[4]; V. Koledov[4]; [1]Western Michigan University; [2]Russian Academy of Sciences, Ufa; [3]NASA Glenn Research Center; [4]Russian Academy of Sciences, Moscow

4:30 PM
Thermomechanical Processing of Dilute Mg-Zn-Ca Alloys: *J. Krynicki*[1]; L. Kecskes[1]; J. Gibbins[1]; Z. Xu[2]; T. Weihs[1]; [1]Johns Hopkins University; [2]North Carolina A&T State University

Electronic Packaging and Interconnections 2021 — Pb-free Solder Alloys II

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Mehran Maalekian, Mat-Tech; Christopher Gourlay, Imperial College London; Babak Arfaei, Ford Motor Company; Praveen Kumar, Indian Institute of Science; Sai Vadlamani, Intel Corporation; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University

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2:00 PM Invited
Effect of Current Stress on the Microstructure of SnBiAg-SAC Mixed Solder Joints: *E. Cotts*[1]; F. Hadian[1]; R. Owen[1]; [1]Binghamton University

2:20 PM
Effects of Antimony on the Microstructure and Reliability of Sn-Ag-Cu-based Solder Joints: S. Belyakov[1]; R. Coyle[2]; B. Arfaei[3]; *C. Gourlay*[1]; [1]Imperial College London; [2]Nokia Bell Laboratories; [3]Ford Motor Company

2:40 PM Invited
Sn-Ag-Cu and Sn-Bi Solder Powders for Fine Pitch Printing: *A. Nobari*[1]; A. Bouchemit[2]; G. L'Espérance[2]; [1]5N Plus Inc - Micro Powders; [2]École Polytechnique de Montréal

3:00 PM Invited
Single Solder Joint Shear with In-situ Current Stressing: K. Young[1]; C. Kim[2]; *T. Lee*[1]; [1]Portland State University; [2]University of Texas, Arlington

3:20 PM
Solderability Assessment of Lead-free Alloys: *M. Maalekian*[1]; [1]Mat-Tech

3:40 PM
Finite Element Analysis Modeling of Stress Evolution and Whisker Growth Under Applied Pressure: *N. Jain*[1]; P. Jagtap[1]; A. Bower[1]; E. Chason[1]; [1]Brown University

4:00 PM
Corrosion Behavior of Co-based Surface Finishes in Sulfur-containing Gas: *S. Lin*[1]; A. Wu[1]; [1]National Central University

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

Tuesday PM **March 16, 2021**

2:00 PM
Finite Element Modeling and Uncertainty Quantification of Stressed Corrosion Behavior in Aluminum Alloys: *K. Wang*[1]; Y. Wang[1]; X. Yue[1]; W. Cai[1]; [1]Virginia Polytechnic Institute and State University

2:20 PM
Understanding the Effects of ß-phase Precipitation on the Stress Corrosion Cracking Performance of Thin Plate 5xxx Alloys: *W. Golumbfskie*[1]; M. McMahon[1]; E. Holcombe[1]; M. Taheri[2]; [1]Naval Surface Warfare Center, Carderock Division; [2]Johns Hopkins University

2:40 PM Invited
Stress Corrosion Cracking Behavior of the Addictively Manufactured 316L Stainless Steel: *Y. Yang*[1]; [1]University of Florida

3:20 PM
SCC Performance of Repaired 304L: *G. Marino*[1]; J. Srinivasan[1]; B. Sutton[1]; J. Li[1]; G. Daehn[1]; A. Vivek[1]; R. Thodla[2]; A. Shapiro[3]; A. Ramirez[1]; J. Locke[1]; [1]The Ohio State University; [2]DNV GL; [3]The Ohio State University, Titanium Brazing Inc.

3:40 PM
Irradiation-assisted Stress Corrosion Cracking (IASCC) of Austenitic Stainless Steels with Oversized Solutes in High-temperature Water: *J. Yang*[1]; X. Liu[2]; M. Song[3]; L. He[2]; Y. Zhang[4]; X. Lou[1]; [1]Auburn University; [2]Idaho National Laboratory; [3]University of Michigan; [4]University of Wisconsin

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Advanced Experimental Characterization of Microstructurally Driven Fatigue Behavior

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Jean-Charles Stinville, University of California-Santa Barbara

Tuesday PM **March 16, 2021**

2:00 PM Invited
Microstructure and Fatigue Damage Evolution in Additive-manufactured Metals Using Enhanced Measurement Techniques and Modeling Approaches: *M. Awd*[1]; F. Walther[1]; A. Fatemi[2]; [1]TU Dortmund University; [2]University of Memphis

2:20 PM
Low Cycle Fatigue Behavior of an Optimally Produced Additive Manufactured Aluminum Alloy: *E. Tekerek*[1]; V. Perumal[1]; D. Beckett[2]; S. Halliday[3]; A. Kontsos[1]; [1]Drexel University; [2]Sigma Labs; [3]Navajo Technical University

2:40 PM
Investigation of the Fatigue Crack Behavior of 304 Stainless Steels Using Synchrotron X-ray Tomography: *R. Schoell*[1]; L. Xi[1]; H. West[1]; Z. Shayer[2]; D. Kaoumi[1]; [1]North Carolina State University; [2]Colorado School of Mines

3:00 PM
Long Range Internal Stress Assessment Using Convergent Beam Electron Diffraction and Dislocation Dipole Height in Cyclically Deformed Copper Single Crystals: *R. Ermagan*[1]; M. Sauzay[2]; M. Kassner[1]; [1]University of Southern California; [2]CEA Paris-Saclay

3:20 PM
Correlation between Cyclic Plastic Deformations and Strength Mismatches in Ni-Steel Dissimilar Joints under Isothermal Low-cycle Fatigue Tests: *S. Zhang*[1]; S. Romo[1]; R. Giorjao[1]; A. Ramirez[1]; [1]Ohio State University

3:40 PM
High and Very High Cycle Fatigue Behavior of Additively Manufactured 17-4 PH Stainless Steel: The Effect of Shielding Gas: *P. Nezhadfar*[1]; J. Welsh[2]; J. Simsiriwong[2]; S. Shao[1]; N. Shamsaei[1]; [1]Auburn University; [2]University of North Florida

4:00 PM
An In-situ Analysis on the Impact of Residual Stresses on the Fatigue Damage in Martensitic Spring Steel: *A. Wildeis*[1]; M. Thimm[1]; R. Brandt[1]; H. Christ[1]; C. Fritzen[1]; [1]University of Siegen

4:20 PM
Post-fatigue Study of SLM Ti64 Medical Implant by 3D Correlative Microscopy: *B. Winiarski*[1]; M. Benedetti[2]; P. Withers[3]; [1]Thermo Fisher Scientific; [2]University of Trento; [3]The University of Manchester

Friction Stir Welding and Processing XI — Control & Non-Destructive Examination

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

Tuesday PM **March 16, 2021**

2:00 PM
Real-time Measurement of Friction Stir Tool Motion during Defect Interaction in Aluminum Alloy 6061-T6: *D. Franke*[1]; F. Pfefferkorn[1]; S. Rudraraju[1]; M. Zinn[1]; [1]University of Wisconsin Madison

2:20 PM
Development of Automatic Quality Control Techniques for Friction Stir Welding Processes: *E. Aldanondo*[1]; [1]LORTEK

2:40 PM
Preliminary Investigation of the Effect of Temperature Control in Friction Stir Welding: *J. Hunt*[1]; D. Pearl[2]; C. Hamilton[2]; Y. Hovanski[1]; [1]Brigham Young University; [2]Miami University

3:00 PM
Transitioning FSW to a Controlled Production Process: *A. Wright*[1]; D. Smith[1]; B. Taysom[2]; Y. Hovanski[1]; [1]Brigham Young University; [2]Pacific Northwest National Laboratory

3:20 PM
Removing Rotational Variations from Shoulder Thermocouples in Friction Stir Welding: *B. Taysom*[1]; K. Ross[1]; W. Choi[1]; [1]Pacific Northwest National Laboratory

Frontiers in Solidification Science VIII — Faceted Growth / Solid-Liquid Interfaces

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Tuesday PM **March 16, 2021**

2:00 PM Invited
3D Phase-field Simulations of Pattern Formation during Freeze Casting: K. Ji[1]; K. Yin[1]; L. Strutzenberg[2]; R. Trivedi[3]; U. Wegst[1]; *A. Karma*[1]; [1]Northeastern University; [2]NASA Marshall Space Flight Center; [3]Iowa State University

2:30 PM
Experimental Observations of Mechanisms of Pattern Formation during Freeze Casting: *K. Yin*[1]; K. Ji[1]; L. Strutzenberg[2]; R. Trivedi[3]; A. Karma[1]; U. Wegst[1]; [1]Northeastern University; [2]NASA Marshall Space Flight Center; [3]Iowa State University

2:50 PM Invited
Combination of X-ray Topography and Radiography for In Situ and Time Resolved Investigation of the Solidification of Silicon: H. Ouaddah[1]; G. Regula[1]; G. Reinhart[1]; *N. Mangelinck-Noël*[1]; [1]IM2NP CNRS UMR 7334, Aix Marseille University

3:20 PM
Facetted Growth in Isothermal Solidification of Silicon: 3D Phase-field Simulations of Growth and Equilibrium Shapes
: *A. Boukellal*[1]; A. Sidi Elvalli[2]; J. Debierre[3]; [1]Aix-Marseille University (IM2NP) and IMDEA Materials; [2]Aix-Marseille University (IM2NP) and Spintec; [3]Aix-Marseille University (IM2NP)

3:40 PM Invited
Bridging Multiscale Models for Predicting Nano and Microstructures in Rapid Solidification of Metals and Alloys: *M. Asle Zaeem*[1]; [1]Colorado School of Mines

4:10 PM
A Method of Estimation of Solid-liquid Interface Anisotropy Based on Machine Learning Combined with Phase-field Simulations: *G. Kim*[1]; T. Takaki[2]; Y. Shibuta[3]; M. Ohno[1]; [1]Hokkaido University; [2]Kyoto Institute of Technology; [3]The University of Tokyo

4:30 PM
Structural Changes during Crystallization and Vitrification of Dilute FCC-based Binary Alloys: *D. Choudhuri*[1]; B. Majumdar[1]; [1]New Mexico Institute of Mining and Technology

4:50 PM
Unraveling the Effect of Solid-liquid Interfacial Anisotropy on Pattern Formation in Rapid Directional Solidification of Binary Alloys: *G. Azizi*[1]; M. Asle Zaeem[1]; [1]Colorado School of Mines

Frontiers of Materials Award Symposium: 2021 Functional Nanomaterials: Translating Innovation into Pioneering Technologies — Session IV

Program Organizer: Huanyu Cheng, Pennsylvania State University

Tuesday PM **March 16, 2021**

2:00 PM Invited
Intelligent Materials at the AI-robotics-medicine Nexus: *X. Zhao*[1]; [1]Massachusetts Institute of Technology

2:40 PM Invited
Expansile Kirigami Wrapping Designs for Breast Reconstruction: Y. Lee[1]; H. Cho[1]; J. Jolly[1]; E. Jablonka[1]; M. Tanis[1]; R. Kamien[1]; S. Kanchwala[1]; *S. Yang*[1]; [1]University of Pennsylvania

3:20 PM Invited
Liquid Metals and Hydrogels: Inherently Stetchable Materials for Wearables: *M. Dickey*[1]; [1]North Carolina Stste University

4:00 PM Invited
Semiconductor Nanomaterials for Neural Interfaces: *J. Rogers*[1]; [1]Northwestern University

4:40 PM Invited
Skin-inspired Organic Electronics: *Z. Bao*[1]; [1]Stanford University

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Gradient Materials

Sponsored by: TMS Structural Materials Division, 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
; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Tuesday PM **March 16, 2021**

2:00 PM Invited
Chemical Gradients to Control Stability and Mechanical Behavior in Nanostructured Pt-Au: *B. Boyce*[1]; D. Adams[1]; K. Hattar[1]; R. Dingreville[1]; R. Parrish[1]; F. Abdeljawad[2]; [1]Sandia National Laboratories; [2]Clemson University

2:25 PM
Multi-layered Gradient Structure by Single-roll Angular-rolling and Ultrasonic Nanocrystalline Surface Modification: *H. Kim*[1]; H. Lee[1]; H. Park[1]; J. Jung[2]; A. Amanov[3]; [1]Pohang University of Science and Technology; [2]KIMS; [3]Sun Moon University

2:45 PM
Mechanical Enhancement of Graded Nanoporous Structure: *L. He*[1]; N. Abdolrahim[1]; [1]University of Rochester

3:05 PM
Tuning the Strongest Size by Tailoring Grain Size Gradient in Metals: *P. Cao*[1]; [1]University of California Irvine

3:25 PM Invited
Exploring the Grain Size Stability of Heterogeneous Copper in Thermal, Mechanical and Radiation Environments: H. Salvador[1]; E. Ramos[1]; S. Shahrezaei[2]; T. Clark[3]; K. Hattar[3]; *S. Mathaudhu*[1]; [1]University of California, Riverside; [2]Pacific Northwest National Laboratory; [3]Sandia National Laboratories

3:50 PM
Site-specific Texture Control for Functionally Graded Structures of Stainless Steel 316L Manufactured by Selective Laser Melting: *K. Sofinowski*[1]; R. Sudharshan[1]; A. Nair[1]; M. Seita[1]; [1]Nanyang Technological University

High Entropy Alloys IX: Alloy Development and Properties — Alloy Development and Application III

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM **March 16, 2021**

2:00 PM Invited
High-Entropy Alloys Containing Cu: Effects on Microstructure and Liquid Phase: R. Abbaschian[1]; *N. Derimow*[2]; R. Jaime[1]; B. Le[1]; [1]University of California, Riverside; [2]National Institute of Standards and Technology

2:25 PM Invited
Accelerated Design of High-entropy Alloys for Gas-Turbine Blade Components: B. Steingrimsson[1]; J. Poon[2]; M. Widom[3]; A. Kulkarni[4]; X. Fan[5]; C. Lee[5]; C. Zhang[6]; M. Kirka[7]; J. El-Awady[8]; *P. Liaw*[5]; [1]Imagars LLC; Portland State University; [2]University of Virginia; [3]Carnegie Mellon University; [4]Siemens Corporation; [5]University of Tennessee; [6]CompuTherm LLC; [7]Oak Ridge National Laboratory; [8]John Hopkins University

2:50 PM Invited
Effect of Process Parameters on the Microstructure and Mechanical Properties of Wire+Arc Additively Manufactured AlCoCrFeNi High Entropy Alloy: R. Ahsan[1]; X. Fan[2]; G. Seo[1]; P. Liaw[2]; *D. Kim*[1]; [1]Tennessee Technological University; [2]The University of Tennessee, Knoxville

3:15 PM Invited
Welding Metallurgy and Weld Properties of High Entropy Alloys: *C. Fink*[1]; A. Martin[1]; [1]Ohio State University

3:40 PM Invited
Fabrication of Medium- and High-entropy Alloys Using Electroplating and Radio Frequency Plasma: *Y. Zou*[1]; [1]University of Toronto

4:05 PM
Friction Stir Gradient Alloying: A Novel High-throughput Screening Technique to Explore HCP to BCC Transformation in a γ-FCC Dominated High Entropy Alloy by V Addition: *P. Agrawal*[1]; S. Shukla[1]; S. Gupta[1]; P. Agrawal[1]; R. Mishra[1]; [1]University of North Texas

4:25 PM
Exploring the Structure-property Relationships of (Ti, TiAl6V4) xCoCrFeMnNi Graded High Entropy Alloy: *M. Melia*[1]; J. Pegues[1]; M. Rodriguez[1]; R. Puckett[1]; S. Whetten[1]; N. Argibay[1]; A. Kustas[1]; [1]Sandia National Laboratories

High Entropy Alloys IX: Structures and Modeling — Structures and Characterization I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Tuesday PM **March 16, 2021**

2:00 PM Invited
Electronic Effects on the Mechanical Properties of HEA: *T. Egami*[1]; [1]University of Tennessee

2:25 PM Invited
An Averaged Cluster Approach to Include Chemical Short Range Order in First Principles Calculations with Application to High Entropy Alloys: V. Raghuraman[1]; Y. Wang[1]; *M. Widom*[1]; [1]Carnegie Mellon University

2:50 PM
Faulting-mediated Plasticity in a CoCrNiW Complex Concentrated Alloy: *S. Wei*[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

3:10 PM Invited
Unique Deformation Behavior in the NbTaTiV Refractory High-entropy Alloy: *C. Lee*[1]; G. Kim[2]; Y. Chou[3]; B. Musicó[1]; M. Gao[4]; K. An[5]; G. Song[6]; Y. Chou[3]; V. Keppens[1]; W. Chen[2]; P. Liaw[1]; [1]University of Tennessee; [2]Illinois Institute of Technology; [3]National Chiao Tung University; [4]National Energy Technology Laboratory/Leidos Research Support Team; [5]Oak Ridge National Laboratory; [6]Kongju National University

3:35 PM Invited
Unprecedented Supercritical Elasticity in NiCoFeGa Multi-principal-element Alloys: H. Chen[1]; Y. Wang[1]; *Y. Ren*[2]; [1]University of Science and Technology Beijing; [2]Argonne National Laboratory

4:00 PM Invited
Influence of Ductile Multicomponent Intermetallic Phase on Mechanical Behavior in High-entropy Alloys: *R. Feng*[1]; Y. Rao[2]; H. Wang[3]; Y. Chen[1]; C. Zhang[4]; M. Ghazisaeidi[2]; K. An[1]; P. Liaw[5]; [1]Oak Ridge National Laboratory; [2]The Ohio State University; [3]Shanghai Jiao Tong University; [4]Computherm, LLC; [5]The University of Tennessee, Knoxville

High Temperature Electrochemistry IV — Session III

Sponsored by: TMS Extraction and Processing Division, TMS: Nuclear Materials Committee, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Tuesday PM **March 16, 2021**

2:00 PM
Validated Modeling of Quartzite Reduction to Solar Silicon by Molten Salt Electrolysis: *A. Moudgal*[1]; M. Asadikiya[1]; J. Hazerjian[1]; V. Luu[1]; A. Ly[1]; A. Powell[1]; U. Pal[2]; Y. Zhong[1]; [1]Worcester Polytechnic Institute; [2]Boston University

2:30 PM
A Comparative Study of Working Electrode Materials for Voltammetry Measurements in LiCl–Li2O Salts: *G. Cao*[1]; A. Williams[1]; M. Shaltry[1]; [1]Idaho National Laboratory

3:00 PM
Liquid Bipolar Electrode for Extraction of Aluminium and PGM Concentrate from Spent Catalysts: *A. Yasinskiy*[1]; P. Polyakov[1]; D. Varyukhin[1]; S. Padamata[1]; [1]Siberian Federal University

Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Wei Xiong, University of Pittsburgh; Shuanglin Chen, CompuTherm LLC; Wei Chen, Illinois Institute of Technology; James Saal, Citrine Informatics; Greta Lindwall, KTH Royal Institute of Technology

Tuesday PM **March 16, 2021**

2:00 PM Invited
High-throughput Synthesis, Characterization and Prediction of Metallic Glass Formation: *J. Perepezko*[1]; J. Erickson[1]; D. Thoma[1]; C. Francis[1]; P. Voyles[1]; B. Afflerbach[1]; D. Morgan[1]; [1]University of Wisconsin-Madison

2:40 PM Invited
A Thermodynamic and Molar Volume Database for Co-base Superalloys: *U. Kattner*[1]; P. Wang[2]; [1]National Institute of Standards and Technology; [2]Central South University

3:20 PM Invited
Phase Stability and Kinetic Considerations in Materials Processing and Performance: *S. Zinkle*[1]; Y. Zhao[1]; T. Austin[1]; Y. Yang[1]; [1]University of Tennessee

4:00 PM Invited
Machine Learning-assisted ICME Approaches to Explore the Alloy and Process Space in Metals Additive Manufacturing: *R. Arroyave*[1]; [1]Texas A&M University

4:40 PM Invited
Printability and Properties of Metallic Alloys for Laser Powder Bed Fusion Additive Manufacturing: *Y. Sohn*[1]; L. Zhou[1]; H. Hyer[1]; A. Mehta[1]; [1]University of Central Florida

Magnesium Technology 2021 — Fundamentals of Plastic Deformation

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Petra Maier, University of Applied Sciences Stralsund; J. Brian Jordon, University of Alabama; Neale Neelameggham, IND LLC

Tuesday PM **March 16, 2021**

2:00 PM Invited
Accounting for the Effects of Dislocation Climb Mediated Flow in Mg alloy ZK10 Sheet: M. Ritzo[1]; *S. Agnew*[1]; [1]University of Virginia

2:30 PM
Three Dimensional Interaction of {101 ¯2} Twins with Tilt Boundaries in Mg: Twin and Dislocation Transmission: K. Dang[1]; J. Graham[1]; C. Tome[1]; V. Taupin[2]; *L. Capolungo*[1]; [1]Los Alamos National Laboratory; [2]LEM3

2:50 PM Invited
Revisiting <c+a> Pyramidal Slip in Magnesium: *J. El-Awady*[1]; [1]Johns Hopkins University

3:20 PM
Thermally Activated Nature of Basal and Prismatic Slip in Mg and Its Alloys: *M. Shabana*[1]; J. Bhattacharyya[1]; M. Niewczas[2]; S. Agnew[1]; [1]University of Virginia; [2]McMaster University

3:40 PM
Mechanisms and Machine Learning for Magnesium Alloys Design: *Z. Pei*[1]; [1]National Energy Technology Laboratory

4:00 PM
Three Dimensional Atomistic Simulations of {101 ¯2} Non-cozone Twin -- Twin Interaction in Mg – Role of Twin Stability and Mobility: *K. Dang*[1]; C. Tomé[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

Materials and Chemistry for Molten Salt Systems — Electrochemistry

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Stephen Raiman, Texas A&M University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Raluca Scarlat, University of California-Berkeley

Tuesday PM **March 16, 2021**

2:00 PM
Research Paths on Spectroelectrochemistry for Molten Salt Chemistry in the U.S with Respect to Other Nations: *S. Phongikaroon*[1]; [1]Virginia Commonwealth University

2:30 PM
Materials Compatibility and Potential Stability of Reference Electrodes for Molten FLiBe: *F. Carotti*[1]; R. Scarlat[2]; [1]University of Wisconsin, Madison; [2]University of California, Berkeley

2:50 PM
Redox Measurement and Control in Molten Chloride Fast Reactor Fuel Salt: *M. Newton*[1]; D. Hamilton[1]; M. Simpson[1]; [1]Univ of Utah

3:10 PM
Oxidation Potential of Molten Halide Salts: A First Principles Study: *J. Yu*[1]; G. Cao[1]; [1]Idaho National Lab

3:30 PM
High-throughput Electrochemical Characterization and Screening of CSP-relevant Alloys: *N. Hoyt*[1]; J. Guo[1]; M. Williamson[1]; [1]Argonne National Laboratory

3:50 PM
Corrosion of Zircaloy-2 in Molten LiCl-xLi2O at 650 °C: *V. Gattu*[1]; E. Wu[1]; W. Ebert[1]; [1]Argonne National Laboratory

4:10 PM
Development of an Electrochemical Phase Field Model for the Corrosion of Ni-Cr Alloys by Molten Fluoride Salts: *C. Bhave*[1]; M. Tonks[1]; D. Andersson[2]; J. McMurray[3]; [1]University of Florida; [2]Los Alamos National Laboratory; [3]Oak Ridge National Lab

Materials Engineering -- From Ideas to Practice: An EPD Symposium in Honor of Jiann-Yang Hwang — Metallurgy

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee, TMS: Pyrometallurgy Committee
Program Organizers: Bowen Li, Michigan Technological University; Baojun Zhao, University of Queensland; Jian Li, CanmetMATERIALS; Sergio Monteiro, Instituto Militar de Engenharia; Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita; Tao Jiang, Central South University; Yong Shi, Futianbao Environment Technologies; Cuiping Huang, FuTianBao Environment Protection Technology Company Ltd.; Shadia Ikhmayies

Tuesday PM **March 16, 2021**

2:00 PM Invited
Effect of Boron Iron Concentrate on the Strength of Preheated Iron Ore Pellets: L. Ma[1]; *G. Qing*; Z. Zhao[1]; B. Zhao[2]; [1]Shougang Research Institute of Technology; [2]University of Queensland

2:20 PM
Metallography of a Nickel-based Superalloy in Fluoride Electrolyte Melt: *B. Li*[1]; X. Huang[1]; J. Hwang[1]; [1]Michigan Technological University

2:40 PM Invited
Phase Diagram and Thermodynamic Properties of Cu-O Binary System: *S. Ikhmayies*; [1]

3:00 PM
Characterization of Mixing Conditions of Different Nozzle and Porous Plugs Setups in Non-ferrous Refining Furnaces: *A. Ishmurzin*[1]; D. Kreuzer[1]; G. Vukovic[1]; [1]RHI Magnesita

3:20 PM Invited
The Formation Mechanism of the Third Phase in Nickel Electrolyte: *A. Chen*[1]; J. Mao[1]; G. Luo[1]; S. Lu[2]; P. Zhang[3]; Y. Ma[3]; S. Chen[2]; Z. Du[1]; J. Qiao[1]; B. Li[4]; [1]Central South University; [2]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization, Jinchang; [3]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization, Jinchang ; [4]Michigan Technological University

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Refractory Alloys: Design and Mechanical Properties

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Tuesday PM **March 16, 2021**

2:00 PM Invited
Rapid Screening, Machine Learning, and Multi-objective Optimization for Refractory Alloy Development: *A. Detor*[1]; M. Sellmann[1]; S. Oppenheimer[1]; E. Cheng[1]; J. Ruud[1]; [1]GE Research

2:30 PM
Rapid Design of Refractory Multi-principal Element Alloys for High-T Structural Applications: Theory-guided Combinatorial Synthesis and Characterization Approach: *G. Ouyang*[1]; P. Singh[1]; R. Su[2]; S. Gupta[1]; J. Perepezko[2]; J. Cui[1]; M. Kramer[1]; D. Johnson[1]; [1]Ames Laboratory (US DOE); [2]University of Wisconsin – Madison

2:50 PM
New Tools for Analysis of Microplasticity in BCC Refractory Metals: *L. Mills*[1]; J. Stinville[1]; M. Charpagne[1]; J. Wendorf[1]; M. Echlin[1]; V. Valle[2]; P. Dawson[3]; D. Gianola[1]; T. Pollock[1]; [1]University of California Santa Barbara; [2]Pprime Institut; [3]Cornell University

3:10 PM
The Creep Performance of Pesting-Resistant Mo-Si-Ti Alloys: *S. Obert*[1]; A. Kauffmann[1]; M. Heilmaier[1]; [1]Karlsruhe Institute for Technology

3:30 PM
Effect of Processing Parameters on Molybdenum Weld Microstructures: *N. Kohlhorst*[1]; G. Muralidharan[2]; R. Miller[2]; K. Faraone[2]; J. Zhao[3]; [1]Ohio State Univerity; [2]Oak Ridge National Laboratory (ORNL); [3]University of Maryland, Department of Materials Science and Engineering

3:50 PM
Creep Testing of Molybdenum: B. Kenny[1]; J. Foradora[2]; A. Xie[3]; *G. Rozak*[2]; [1]Miami University; [2]H.C. Starck Solutions Euclid; [3]H.C. Starck Solutions Taicang

Materials Processing Fundamentals — Steel Casting

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee
Program Organizers: Jonghyun Lee, Iowa State University; Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Fiseha Tesfaye, Abo Akademi University; Guillaume Lambotte, Boston Metal; Antoine Allanore, Massachusetts Institute of Technology

Tuesday PM **March 16, 2021**

2:00 PM
The $CuCl_2$-$CuSO_4$-$ZnSO_4$ System at Elevated Temperatures: *F. Tesfaye*[1]; D. Lindberg[2]; M. Moroz[3]; L. Hupa[1]; [1]Abo Akademi University; [2]Aalto University; [3]Ivan Franko National University of Lviv

2:20 PM
Stress Development Simulation in Continuously Cast Steel Slabs during Cooling Process: *D. Huang*[1]; [1]Purdue University

Mechanical Behavior of Nuclear Reactor Components — Microstructure Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee
Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Tuesday PM **March 16, 2021**

2:00 PM
He Ion Irradiation Response of a Gradient T91 Steel: *Z. Shang*[1]; J. Ding[1]; C. Fan[2]; D. Chen[3]; J. Li[1]; Y. Zhang[1]; Y. Wang[4]; H. Wang[1]; X. Zhang[1]; [1]Purdue University; [2]Oak Ridge National Laboratory; [3]University of Houston; [4]Los Alamos National Laboratory

2:20 PM
High Temperature Strength of Additively Manufactured Gr91 Steel: *B. Eftink*[1]; D. Vega[2]; O. El Atwani[1]; D. Sprouster[3]; C. Cady[1]; M. Al-Sheikhly[4]; T. Lienert[5]; S. Maloy[1]; [1]Los Alamos National Laboratory; [2]DOE; [3]Stony Brook University; [4]University of Maryland; [5]T.J. Lienert Consulting, LLC

2:40 PM Invited
Wear Behavior of Incoloy™ 800HT and Inconel™ 617 for High-Temperature Gas-cooled Reactor (HTGR) Applications: V. Pauly[1]; J. Kern[1]; M. Clark[1]; D. Grierson[1]; *K. Sridharan*[1]; [1]University of Wisconsin-Madison

3:10 PM
Modeling the Effect of Helium Bubbles, Rigid Inclusions, and Grain Boundaries on Crack Initiation in Nickel: *T. Liu*[1]; M. Demkowicz[1]; [1]Texas A&M University

3:30 PM
Quantifying Zirconium Embrittlement Due to Hydride Microstructure Using Image Analysis: *P. Simon*[1]; C. Frank[1]; L. Chen[1]; M. Daymond[2]; M. Tonks[3]; A. Motta[1]; [1]The Pennsylvania State University; [2]Queen's University; [3]University of Florida

3:50 PM
In-situ Observations of the Failure Mechanisms of Hydrided Zircaloy-4 under Different Stress-States: *B. Cockeram*[1]; K. Chan[2]; [1]Naval Nuclear Laboratory-Bettis Laboratory; [2]Southwest Research Institute

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Tuesday PM **March 16, 2021**

2:00 PM
Quantifying the Long-range Stress ahead of the Tip of a Dislocation Pileup at a Grain Boundary and Its Contribution to the Subsequent Structure Changes in Ti-alloys from the Atomistic to the Mesoscale: *L. Xiong*[1]; [1]Iowa State University

2:20 PM
Modeling the Mechanical Behavior of Single Crystals Using the Multiscale Discrete Defect Element Method: *N. Aragon*[1]; P. Nguyen[1]; I. Ryu[1]; [1]The University of Texas at Dallas

2:40 PM
Dislocation Pileup Induced Transmission across Grain Boundaries in Aluminum via Molecular Dynamics Simulations: *R. Reyes*[1]; D. Spearot[1]; [1]University of Florida

3:00 PM
Decoupling the Effect of Nanoscale Geometry and Internal Microstructure on the Mechanics of Nanoporous Pt: A. Gupta[1]; T. Ibru[2]; A. Antoniou[2]; *G. Tucker*[1]; [1]Colorado School Of Mines; [2]Georgia Institute of Technology

3:20 PM
Constitutive Model Materials Parameter Determination Using Cyclic Tension-compression Test Data: *D. Banerjee*[1]; W. Luecke[1]; M. Iadicola[1]; E. Rust[1]; [1]National Institute of Standards and Technology

3:40 PM
Multiphysics Modeling of Coupled Chemical-Thermal-mechanical Phenomena in Chemically Blown Polyurethane Foams during Manufacturing: K. Long[1]; *J. Brown*[1]; R. Rao[1]; C. Roberts[1]; [1]Sandia National Laboratories

4:00 PM
Effects of Phase Purity and Pore-reinforcement on the Mechanical Behavior of Metal–organic Frameworks: *K. Schmalbach*[1]; Z. Wang[1]; R. Combs[1]; Y. Chen[2]; R. Penn[1]; A. Stein[1]; N. Mara[1]; [1]University of Minnesota; [2]University of North Carolina at Charlotte

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Hydrometallurgy II

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Tuesday PM **March 16, 2021**

2:00 PM
Effective Treatment of Domestic US Cobalt Ores and Concentrates: A. Tomaka[1]; *C. Anderson*[1]; [1]Colorado School of Mines

2:20 PM
Separating and Recovering Cobalt and Iron from Co, Fe-bearing Metallurgical Slag via Acid Leaching Process: *Y. Zhang*[1]; Y. Tu[1]; Z. Su[1]; T. Jiang[1]; [1]Central South University

2:40 PM
High-value Nickel, Copper and Cobalt Products from Bulk Sulfide Concentrates Using Albion Process™ Atmospheric Leaching: *D. Mallah*[1]; P. Voigt[1]; M. Hourn[1]; G. Stieper[1]; [1]Glencore Technology

3:00 PM
Starved Acid Leaching Technology for Nickel and Cobalt Recovery from Lean Resources: *D. Dreisinger*[1]; [1]University of British Columbia

Phase Transformations and Microstructural Evolution — Ferrous Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Tuesday PM **March 16, 2021**

2:00 PM
Solute Partitioning during the Double Soaking Heat Treatment of Medium Manganese Steels: *A. Glover*[1]; E. De Moor[2]; J. Speer[2]; [1]Los Alamos National Laboratory; [2]Colorado School of Mines

2:20 PM
Cementite Formation in Ferritic Steels:Ffirst-principles Based AtomisticSsimulations.: *O. Buggenhoudt*[1]; C. Fu[1]; T. Schuler[1]; J. Béchade[1]; [1]CEA, Université Paris Saclay

2:40 PM
Effect of Cold Rolling on PhaseTtransformations in 2202 Lean Duplex Stainless Steel: *F. Danoix*[1]; S. Cazottes[2]; R. Danoix[3]; D. Rolland[2]; S. Cissé[4]; V. Massardier[2]; [1]CNRS; [2]INSA Lyon; [3]CNRS - Univ Rouen Normandie; [4]INDUSTEEL

3:00 PM
Phase Instability and Formation of Radiation-induced BCC-phases in Austenitic Stainless Steel after Long Term Neutron Exposure: D. Merezhko[1]; *M. Merezhko*[1]; M. Gussev[2]; T. Rosseel[2]; O. Maksimkin[1]; F. Garner[3]; [1]Institute of Nuclear Physics; [2]Oak Ridge National Laboratory; [3]Radiation Effects Consulting

3:20 PM
Applicability of Deep Cryogenic Treatment in Emerging Industries: *P. Jovicevic-Klug*[1]; M. Jovicevic-Klug[1]; B. Podgornik[1]; [1]Institute of Metals and Technology

3:40 PM
Austempered Microstructures for Bearing Applications: *S. Hyde*[1]; [1]The Timken Company

Rare Metal Extraction & Processing — REEs, Sc

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Tuesday PM **March 16, 2021**

2:00 PM Keynote
Understanding the Feasibility for Secondary and by Product Sources to Supply Rare Earth Metals: *G. Gaustad*[1]; E. Williams[2]; A. Leader[2]; A. Gupta[2]; S. Das[2]; [1]Alfred University; [2]Rochester Institute of Technology

2:20 PM Invited
Uranium and Thorium Removal from Rare Earth Sulfate Solutions by Ion Exchange and Solvent Extraction: *D. Dreisinger*[1]; M. Johnson[2]; N. Verbaan[2]; G. Andrews[2]; [1]University of British Columbia; [2]SGS Minerals

2:40 PM Invited
Rare Earth Elements Extraction from Coal Waste Using Biooxidation Approach: *P. Sarswat*[1]; M. Free[1]; [1]University of Utah

3:00 PM Invited
Supercritical Extraction of Neodymium from NdFeB Magnet Using Organophosphorus Ligands: N. Kunanusont[1]; J. Zhang[2]; K. Watada[2]; Y. Shimoyama[1]; *G. Azimi*[2]; [1]Tokyo Institute of Technology; [2]University of Toronto

3:20 PM Invited
Scandium Extraction from Bauxite Residue Using Sulfuric Acid and a Composite Extractant-enhanced Ion-exchange Polymer Resin: *E. Balomenos*[1]; G. Nazari[2]; P. Davris[1]; G. Abrenica[2]; A. Pilichou[3]; E. Mikeli[3]; D. Panias[3]; S. Patkar[2]; W. Xu[2]; [1]Mytilineos Metallurgy Buisness Unit; [2]II-VI; [3]NTUA

3:40 PM Invited
Scandium: Leaching and Extraction Chemistry: *D. Eriksen*[1]; [1]Primus.Inter.Pares As

4:00 PM Invited
Environmentally Friendly Solid Phase Extraction of Critical Materials and REE from Unconventional Sources: *A. Karamalidis*[1]; J. Callura[2]; M. Patel[1]; [1]Pennsylvania State University; [2]Carnegie Mellon University

Recycling and Sustainability for Emerging Technologies and Strategic Materials — E-Waste & Value Recovery

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: John Howarter, Purdue University; Mingming Zhang, ArcelorMittal Global R&D; Elsa Olivetti, Massachusetts Institute of Technology; Hong Peng, University of Queensland

Tuesday PM **March 16, 2021**

2:00 PM Invited
Characterisation and Techno-economics of a Process to Recover Value from E-waste Materials: *K. Islam*[1]; M. Somerville[2]; N. Haque[2]; [1]RMIT University; [2]CSIRO

2:30 PM
Recycling of Spent SCR Catalyst to Recover Vanadium and Tungsten by Hydrometallurgical Routes: *A. Cueva-Sola*[1]; J. Lee[2]; R. Jyothi[2]; [1]Korea University of Science and Technology (UST), Daejeon 34113, South Korea; [2]Korea Inst of Geoscience & Mineral Resources

2:50 PM
The Separation of Nickel and Cobalt from Lithium-ion Battery Leachate: *M. Strauss*[1]; J. McNally[1]; L. Aldana[1]; J. Klaehn[1]; T. Lister[1]; [1]Idaho National Laboratory

3:10 PM
Rare Earth Magnet or Ferroalloy? What Steel Processing Can Teach Us about Magnet Sludge Recycling.: *M. Wagner*[1]; A. Allanore[1]; [1]Massachusetts Institute of Technology

100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture and Cracks

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniversität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Wednesday AM **March 17, 2021**

8:30 AM
High Throughput, Experimentally-informed Prediction of Fracture Behavior of Single Crystal Tungsten: *K. Schmalbach*[1]; R. Ramachandramoorthy[2]; M. Jain[2]; J. Michler[2]; W. Gerberich[1]; N. Mara[1]; [1]University of Minnesota; [2]Empa-Thun

8:50 AM Invited
Modeling Mechanics of Nanoparticles: Everything but Size: *J. Amodeo*[1]; L. Pizzagalli[2]; [1]MATEIS lab, INSA-Lyon Univ. Lyon CNRS; [2]P' institute, Univ. Poitiers CNRS

9:30 AM
The Curious Phenomenon of Prince Rupert's Drops: K. Viswanathan[1]; H. Aben[2]; M. Chaudhri[3]; *S. Chandrasekar*[4]; [1]Indian Institute of Science; [2]Tallinn University of Technology; [3]University of Cambridge; [4]Purdue University

9:50 AM
Effect of Aspect Ratio on Stress Intensity Factor Solutions for Single Edge Notch Wire Fracture Test Specimen under Tensile and Clamped Bend Loading Conditions: *H. Sahasrabuddhe*[1]; A. Mishra[1]; N. Balila[1]; [1]India Institute of Technology Bombay

2D Materials – Preparation, Properties & Applications — Case Studies & Applications

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University; Amber Shrivastava, Indian Institute of Technology Bombay

Wednesday AM **March 17, 2021**

8:30 AM Invited
Formation of h-BN Ultrathin Films and Heterojunction MIS Diodes by Pulsed Laser Annealing: *S. Gupta*[1]; R. Sachan[2]; J. Narayan[1]; [1]North Carolina State University; [2]Oklahoma State University

8:55 AM Invited
Graphene and Carbon Nanotubes: Key Materials for Electrochemical Energy Materials and Nano Biosensors: *E. Lee*[1]; [1]New Jersey Institute of Technology

9:20 AM Invited
hBN for Quantum Information Sciences: *R. Sachan*[1]; [1]Oklahoma State University

9:45 AM
The Growth of $NbSe_2$ by Molecular Beam Epitaxy for Thermomagnetic Energy Conversion: *P. Litwin*[1]; S. Akhanda[1]; M. Zebrajadi[1]; S. McDonnell[1]; [1]University of Virginia

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — Data Analytics and Machine Learning in Nuclear Energy Applications

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Wednesday AM **March 17, 2021**

8:30 AM Invited
Machine Learning for Accelerating Property Prediction and Materials Characterization in Irradiated Materials: *D. Morgan*[1]; M. Shen[1]; R. Jacobs[1]; G. Odette[2]; K. Field[3]; [1]University of Wisconsin-Madison; [2]University of California, Santa Barbara; [3]University of Michigan

9:00 AM
A Computer Vision Application for Materials Production Quality Control Screening: *A. Kitahara*[1]; A. Hutt[2]; S. Sweet[2]; J. Ferrero[2]; N. Eisinger[2]; Z. Dragan[2]; Z. Koscho[2]; E. Holm[1]; [1]Carnegie Mellon University; [2]Perryman Company

9:20 AM
Characterization of As-Fabricated Additively Manufactured Alloy 718 Enhanced by Modern Tools and Machine Learning: *S. Taller*[1]; L. Scime[1]; K. Terrani[1]; [1]UT-Battelle

9:40 AM Invited
Machine Learning and Atomistic Modeling of Defect Diffusion in Concentrated Ni-Fe Alloys: W. Huang[1]; *X. Bai*[1]; [1]Virginia Polytechnic Institute and State University

10:10 AM
Point Defect Energies in Concentrated Alloys Using Ab Initio Calculations and Machine Learning: *A. Manzoor*[1]; G. Arora[1]; D. Aidhy[1]; [1]University of Wyoming

10:30 AM Invited
Machine Learning Perovskites in the Quest for Improved Scintillators: A. Talapatra[1]; C. Stanek[1]; B. Uberuaga[1]; *G. Pilania*[1]; [1]Los Alamos National Laboratory

11:00 AM
An Integrated Approach for Coupling Experimental Data, Physics-based Models, and Machine Learning Algorithms for Predicting the Effective Thermal Conductivity of U-based Fuels: *K. Ahmed*[1]; F. Badry[1]; [1]Texas A&M University

11:20 AM
Deep Learning for Automated Analysis of Cavities in Transmission Electron Microscopy Images: *C. Wong*[1]; X. Wang[2]; Z. Fan[3]; K. More[3]; S. Kalinin[3]; M. Ziatdinov[3]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; Pennsylvania State University; [3]Oak Ridge National Laboratory

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Fatigue Modeling and Prediction

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Wednesday AM **March 17, 2021**

8:30 AM Invited
Damage Tolerant Approach in Additively Manufactured Metallic Materials: *M. Madia*[1]; U. Zerbst[1]; T. Werner[1]; [1]Bundesanstalt fuer Materialforschung und -pruefung (BAM)

9:00 AM
Defect-based Fatigue Model for AlSi10Mg Produced by Laser Powder Bed Fusion Process: *A. Ojha*[1]; W. Lai[1]; Z. Li[1]; C. Engler-Pinto Jr.[1]; X. Su[1]; [1]Ford Motor Company

9:20 AM
State-of-the-Art in Predicting Fatigue Life for Applications in Metal-based Additive Manufacturing: *N. Moser*[1]; O. Kafka[1]; J. Benzing[1]; N. Derimow[1]; N. Hrabe[1]; E. Garboczi[1]; [1]National Institute of Standards and Technology

9:40 AM Invited
Synergistic Effects of Defects and Microstructure on Fatigue Behavior of LB-PBF Metallic Materials: *S. Shao*[1]; N. Shamsaei[1]; [1]Auburn University

10:10 AM
Microstructure-based Model Validation and Predictions of Single-build-plate Fatigue Strength Sensitivity for Additively Manufactured Ti-6Al-4V: *O. Kafka*[1]; N. Moser[1]; J. Benzing[1]; N. Derimow[1]; N. Hrabe[1]; E. Garboczi[1]; [1]NIST

10:30 AM
3-D Convolutional Neural Networks for Pore Analysis in Metal Additive Manufacturing Builds: *A. Kitahara*[1]; Z. Wu[1]; S. Yarasi[1]; N. Sivakumar[1]; A. Rollett[1]; E. Holm[1]; [1]Carnegie Mellon University

10:50 AM
Bayesian Inference of Elastic Constants and Texture Coefficients in Additively Manufactured Alloys Using Resonant Ultrasound Spectroscopy: *J. Rossin*[1]; P. Leser[2]; C. Torbet[1]; S. Smith[2]; S. Daly[1]; T. Pollock[1]; [1]University of California, Santa Barbara; [2]NASA Langley Research Center

Additive Manufacturing: Beyond the Beam II — Binder Jetting

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Paul Prichard, Kennametal Inc.; James Paramore, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal

Wednesday AM **March 17, 2021**

8:30 AM
Introductory Comments: Additive Manufacturing: Beyond the Beam II: *P. Prichard*[1]; [1]Kennametal Inc.

8:35 AM
A Look into Solid-state Metal AM Techniques from Metallurgical Bonding Perspective: *N. Tuncer*[1]; A. Bose[1]; [1]Desktop Metal

8:55 AM
Development, Characterization, and Modeling of a 3D Binder-jet Printed N95 Metal Filter for COVID-19: *A. Acierno*[1]; K. Kimes[1]; E. Stevens[1]; P. Rodriguez[1]; S. Pilz[2]; K. Myers[3]; P. Dougherty[3]; K. Svihla[2]; T. Spirka[4]; M. Chmielus[1]; [1]University of Pittsburgh; [2]ANSYS; [3]ExOne; [4]Synopsys

9:15 AM
Effect of Processing Defects on Properties of Binderjet WC-Co: *P. Prichard*[1]; H. Miyanaji[1]; Z. Wang[1]; [1]Kennametal Inc.

9:35 AM
Droplet Powder Interactions in Binder Jet Additive Manufacturing: T. Colton[1]; *N. Crane*[1]; [1]Brigham Young University

9:55 AM
Fluid and Particle Dynamics Simulation in Binder Jetting Process: F. Li[1]; *W. Tan*[1]; [1]University of Utah

10:15 AM
Gravity Influence on Sintering of Binder Jetted Components: *E. Torresani*[1]; E. Olevsky[1]; R. German[1]; [1]San Diego State University

10:35 AM
Distortion Modeling of Sintering Process in Binder Jet Printed Parts: *B. Paudel*[1]; D. Conover[2]; A. To[1]; [1]University of Pittsburgh; [2]ANSYS Inc.

Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments — Other Materials and Aspects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee
Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Wednesday AM **March 17, 2021**

8:30 AM Invited
Design of Novel Fe-based Bulk Metallic Glasses Enabled by Additive Manufacturing: *M. Walbrühl*[1]; J. Yan[1]; I. Berglund[1]; Z. Mahbooba[2]; A. Saboo[2]; [1]QuesTek Europe AB; [2]QuesTek Innovations

9:00 AM
Understanding the Corrosion Mechanism of an Equimolar AlCoCrFeNi High-entropy Alloy Additively Manufactured by Electron Beam Melting: *K. Yamanaka*[1]; H. Shiratori[2]; M. Mori[3]; K. Omura[1]; T. Fujieda[2]; K. Kuwabara[2]; A. Chiba[1]; [1]Tohoku University; [2]Hitachi, Ltd.; [3]National Institute of Technology, Sendai College

9:20 AM
Design and Additive Manufacturing of Hastelloy C22 for Corrosive Environment: *S. Pasebani*[1]; D. Yan[1]; A. Torbati-Sarraf[2]; B. Poorganji[3]; O. Ertorer[4]; O. Isgor[1]; [1]Oregon State University; [2]LAM Research Corporation and University of Southern California; [3]University of Waterloo; [4]Oryx Advanced Materials, Inc

9:40 AM
Catalytic Inhibition of Metal Dusting by Cu – The Difference of Cast and AM Alloys: *A. Ulrich*[1]; C. Schlereth[1]; K. Jahns[2]; U. Krupp[3]; M. Galetz[1]; [1]DECHEMA-Forschungsinstitut; [2]University of Applied Sciences Osnabrück; [3]RWTH Aachen University

10:00 AM
Correlating Data from Digital and Virtual Twins of Component Manufacturing via DED: M. Salgueiro[1]; C. Gonzalez[1]; C. Prieto[1]; B. Freire[2]; M. Babcinschi[2]; J. Willem[3]; *M. Megahed*[3]; [1]AIMEN; [2]University of Coimbra; [3]ESI Group

10:20 AM
Material Development Using RF Plasma: *N. Gobeil*[1]; [1]Tekna

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — Steels

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee
Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM
The Crystallography and Orientation of Cellular Features in Additively Manufactured 316L: *R. Fonda*[1]; J. Aroh[2]; J. Feng[1]; D. Rowenhorst[1]; [1]Naval Research Laboratory; [2]Carnegie Mellon University

8:50 AM
The Dislocation and Composition Microstructure Evolution and Mechanical Properties of Selective Laser Melted Stainless Steels: *M. Sudmanns*[1]; Y. Gu[1]; J. El-Awady[1]; [1]Johns Hopkins University

9:10 AM
Microstructural Characterization of Maraging 300 Steel Fabricated by Select Laser Melting: *J. Rodriguez*[1]; E. Hoyos[1]; F. Conde[2]; A. Jardini Munhoz[3]; J. Avila[4]; [1]EIA University; [2]University of Sao Paolo; [3]BIOFABRIS - National Institute of Science and Technology in Biomanufacturing; [4]UNESP – São Paulo State University

9:30 AM
Recrystallization-based Grain Boundary Engineering of 316L Stainless Steel Produced via Selective Laser Melting: *S. Gao*[1]; Z. Hu[2]; S. Tekumalla[1]; M. Seita[1]; [1]Nanyang Technological University; [2]Singapore Institute of Manufacturing Technology

9:50 AM Invited
Grain Orientation Analysis of Additively Manufactured 316L Stainless Steel: *A. Rollett*[1]; [1]Carnegie Mellon University

10:20 AM
Phase Transformation Modeling of Functionally Graded Materials Made by Direct Energy Deposition: *N. Sargent*[1]; W. Xiong[1]; R. Otis[2]; [1]University of Pittsburgh; [2]Jet Propulsion Laboratory

10:40 AM
Effect of Low-temperature Plasma Nitriding on the Wear and Corrosion Resistance of Additive-manufactured Stainless and Maraging Steels: *M. Godec*[1]; C. Donik[1]; A. Kocijan[1]; B. Podgornik[1]; D. Skobir Balantic[1]; [1]Institute of Metals and Technology

11:00 AM
Section Thickness Dependent Behavior in Additively Manufactured Stainless Steel: *T. Slagle*[1]; A. Vyatskikh[1]; U. Bertoli[1]; J. Schoenung[1]; [1]University of California Irvine

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session V

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara ; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Wednesday AM **March 17, 2021**

8:30 AM Invited
Combining Advanced Characterization Techniques to Rationalize the Multiple Mechanical Behaviors Observed in TRIP/TWIP Ti-alloys: *L. Lilensten*[1]; Y. Danard[2]; I. Danard[1]; R. Guillou[3]; N. Bozzolo[4]; D. Thiaudière[5]; F. Prima[1]; [1]CNRS - IRCP; [2]ICMPE ; [3]CEA; [4]Mines ParisTech - CEMEF ; [5]Synchotron Soleil

9:00 AM
A Study on Migrating Boundary Induced Plasticity Using Atomistic Simulation: *S. Sung*[1]; J. Jang[2]; H. Hwang[3]; Y. Kim[4]; H. Han[1]; [1]Seoul National University; [2]Korea Institute of Materials Science; [3]Harvard University; [4]Korea Institute of Industrial Technology

9:20 AM
Deformation Behavior and Phase Transformation of Nanotwinned Al/Ti Multilayers: *Y. Zhang*[1]; Q. Li[1]; M. Gong[2]; S. Xue[1]; J. Ding[1]; J. Cho[1]; T. Niu[1]; R. Su[1]; N. Richter[1]; H. Wang[1]; J. Wang[2]; X. Zhang[1]; [1]Purdue University; [2]University of Nebraska-Lincoln

9:40 AM
Fingerprinting Shock-induced Deformations via Virtual Diffraction: *A. Mishra*[1]; C. Kunka[2]; M. Echeverria[1]; R. Dingreville[2]; A. Dongare[1]; [1]University of Connecticut; [2]Sandia National Laboratories

10:00 AM Invited
Deformation Behaviour of High-alloy Twinning-induced Plasticity Steels Unravelled by Complementary Local and Integral Methods: *S. Martin*[1]; C. Ullrich[1]; C. Schimpf[1]; M. Motylenko[1]; A. Weidner[1]; H. Biermann[1]; D. Rafaja[1]; A. Vinogradov[2]; Y. Estrin[3]; [1]Tu Bergakademie Freiberg; [2]NTNU; [3]Monash University

10:30 AM
Ultrasonic Effects on Plastic Deformation Behavior of TRIP 780 Steel: *J. Kang*[1]; X. Liu[1]; [1]The Ohio State University

10:50 AM
In-situ Shock Stress Field Detection Using Laser Array Raman Spectroscopy: *A. Dhiman*[1]; A. Olokun[1]; N. Lewis[1]; V. Tomar[1]; [1]Purdue University

11:10 AM
Inference of Metal Plasticity Parameters Using Full-field Measurements of Cutting and Indentation: *H. Chawla*[1]; S. Yadav[1]; G. Feng[1]; D. Sagapuram[1]; [1]Texas A&M University

11:30 AM
Experimental Characterization and FFT-based Modeling of Heterogeneous Deformation in Commercially Pure Titanium: *B. Ahmadikia*[1]; L. Wang[2]; I. Beyerlein[1]; [1]University of California, Santa Barbara; [2]Shanghai Jiao Tong University

Advanced Functional and Structural Thin Films and Coatings — Multifunctional Biomaterials, Innovative Approaches to New Concepts and Applications I

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Wednesday AM **March 17, 2021**

8:30 AM Keynote
Bio-inspired Nano- and Microstructured Surfaces: *H. Hoelscher*[1]; [1]Karlsruhe Institute of Technology

9:10 AM Invited
TiN and DLC Coated Medical Grade Polyurethane (PUR) for Controlled Surface Degradation and Improved Mechanical Properties: *M. Fossum*[1]; M. Ibrahim[1]; J. Sanchez[2]; C. Burgstaller[3]; E. Strömberg[4]; G. Björling[5]; R. Aune[1]; [1]Norwegian University of Science and Technology; [2]Danderyd Hospital at Karolinska Institute ; [3]TCKT - Transfercenter für Kunststofftechnik GmbH; [4]KTH Royal Institute of Technology; [5]The Swedish Red Cross University College

9:40 AM Invited
Multimodal Flexible Optoelectronic Devices for Colocalized Electrophysiology and Optophysiology: *L. Lu*[1]; [1]George Washington University

10:10 AM Invited
Structural and Biological Properties of Silicon-incorporated Diamond-like Carbon Coatings: *R. Narayan*[1]; [1]University of North Carolina

10:40 AM
Silicone Breast Implants: Grafting of a Bioactive Polymer to Improve the Bio-integration: *M. Lam*[1]; V. Moris[1]; V. Humblot[2]; V. Migonney[1]; C. Falentin-Daudré[1]; [1]Université Sorbonne Paris Nord; [2]Université Bourgogne Franche-Comté

11:00 AM Keynote
Determining the Interaction between Porous Titanium and Adhesion of a Bioactive Coating: *H. Martin*[1]; P. McWhorter[1]; A. Kasson[1]; S. Balaz[1]; [1]Youngstown State University

Advanced Magnetic Materials for Energy and Power Conversion Applications — Structures and Modelling of Soft Magnetic Materials

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Richard Beddingfield, North Carolina State University; Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Huseyin Ucar, California Polytechnic University; Yongmei Jin, Michigan Technological University; Arcady Zhukov, University of the Basque Country

Wednesday AM **March 17, 2021**

8:30 AM Invited
Advanced Magnetics for Power and Energy Development (AMPED) : A New Consortium Model for US Power Magnetics Research and Workforce Development: *P. Ohodnicki*[1]; B. Grainger[1]; M. McHenry[2]; M. DeBoer[2]; S. Bhattacharya[3]; R. Beddingfield[3]; [1]University of Pittsburgh; [2]Carnegie Mellon University; [3]North Carolina State University

9:00 AM
Radio Frequency Rapid Thermal Processing of Nanocrystalline Soft Magnetic Alloys: A. Talaat[1]; D. Greve[2]; *P. Ohodnicki*[1]; [1]University of Pittsburgh; [2]DWGreve Consulting

9:20 AM
Soft Magnetic Fe-Co-Cu Supersaturated Solid Solutions by Severe Plastic Deformation: *M. Stückler*[1]; H. Krenn[2]; L. Weissitsch[1]; S. Wurster[1]; A. Bachmaier[1]; [1]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences; [2]Institute of Physics, University of Graz

9:40 AM
Accurate Modelling of Soft Magnetic Materials for Power Applications Using Finite Element Methods: *A. Leary*[1]; B. Beddingfield[2]; R. Bowman[1]; [1]Nasa Glenn Research Center; [2]North Carolina State University

10:00 AM
Regression Modelling of the High-frequency Inductors Used for Power Electronic Applications: S. Parashar[1]; *R. Beddingfield*; S. Bhattacharya[1]; [1]North Carolina State University

Advanced Materials for Energy Conversion and Storage VII — Functional Materials for Energy II

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Wednesday AM **March 17, 2021**

8:30 AM
Integrated $Mo_{1-x}Co_xS_2$/Carbon Nanotubes for Water Splitting Applications: *L. Kendall*[1]; A. Chamaani[1]; S. McDonnell[1]; G. Zangari[1]; [1]University of Virginia

8:50 AM
Heterogeneous Metal/Oxide Nanostructure Integration for Catalytic Chemical Transformation: from HCs Oxidation, CO2 Conversion, to H2 Production: *P. Gao*[1]; [1]University of Connecticut

9:10 AM
High-efficiency High Power Density Direct Carbon Fuel Cell: *C. Faria*[1]; J. Lu[1]; A. Powell[1]; B. Davis[2]; Y. Zhong[1]; U. Pal[3]; [1]Worcester Polytechnic Institute; [2]Kingston Process Metallurgy; [3]Boston University

9:40 AM
Magnesium as a Zero- or Negative-Emissions Fuel for Shipping and Aerospace: *H. Sun*[1]; Y. Wu[1]; J. Scarponi[1]; A. Powell[1]; J. Jayachandran[1]; [1]Worcester Polytechnic Institute

10:00 AM
Metal Dichalcogenide Based Planner Thermoelectric Generator for Efficient Waste Heat Harvesting: *S. Pradhan*[1]; G. Kogo[1]; M. Bahoura[1]; [1]Norfolk State University

Advances in Surface Engineering III — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
Program Organizers: Tushar Borkar, Cleveland State University; Arif Mubarok, PPG; Rajeev Gupta, North Carolina State University; Sandip Harimkar, Oklahoma State University; Bharat Jasthi, South Dakota School of Mines & Tech

Wednesday AM **March 17, 2021**

8:30 AM
Surface Modification by In-situ Grown VC Reinforced Composite Layer on Steel Substrate Using TIG Arcing Process: *N. Kumar*[1]; P. Ghosh[1]; S. Das[1]; [1]Indian Institute of Technology Roorkee

8:50 AM
Effect of Potassium Hydroxide (KOH) Additives on Corrosion Behavior of Coatings Formed by Plasma Electrolytic Oxidation (PEO) Method on the Titanium Substrate: *N. Attarzadeh*[1]; M. Molaei[2]; K. Babaei[2]; A. Fattah-alhosseini[2]; [1]University of Texas at El Paso; [2]Bu-Ali Sina University

9:10 AM
Electroplated Powder to Improve Particle Adhesion in Cold Spray Applications: *G. Bracker*[1]; E. Hodges[1]; M. Scott[1]; V. Champagne[2]; R. Hyers[2]; [1]University of Massachusetts; [2]Cold Spray Innovations International

Advances in Titanium Technology — Invited Presentations

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Don Li, Howmet Engineered Products; Yufeng Zheng, University of Nevada-Reno
; Peeyush Nandwana, Oak Ridge National Laboratory; Matthew Dunstan, US Army Research Laboratory

Wednesday AM **March 17, 2021**

8:30 AM Invited
Titanium Mill Product Yield Enhancement via Electrochemical Conditioning: *K. Faller*[1]; [1]MetCon

8:50 AM Invited
Optimizing Microstructure and Properties of Additively Manufactured Titanium Alloys Using Alloying and Post-AM Heat-treatment: B. Welk[1]; N. Taylor[1]; G. Viswanathan[1]; *H. Fraser*[1]; [1]Ohio State University

9:10 AM Invited
Multiscale Characterization of Titanium Alloy Microstructures and Links to Processing and Properties: *A. Clarke*[1]; B. Ellyson[1]; A. Saville[1]; J. Klemm-Toole[1]; B. Aminahmadi[1]; J. Benzing[2]; A. Creuziger[2]; S. Vogel[3]; K. Fezzaa[4]; W. Chen[5]; A. Pilchak[6]; [1]Colorado School of Mines; [2]National Institute of Standards and Technology; [3]Los Alamos National Laboratory; [4]Advanced Photon Source, Argonne National Laboratory; [5]Purdue University; [6]Air Force Research Laboratory

9:30 AM
Atom Probe Tomographic Study of Precursor Metastable Phases and Their Influence on a Precipitation in the Metastable ß-titanium Alloy, Ti-5Al-5Mo-5V-3Cr: *S. Antonov*[1]; Y. Zheng[2]; H. Fraser[3]; B. Gault[1]; [1]Max Planck Insitut fur Eisenforschung GmbH; [2]University of Nevada, Reno; [3]The Ohio State University

9:50 AM
An In-situ Deformation Micro-mechanisms Study of a Ti-Al-V-Fe (a+ß) Alloy: *S. Wei*[1]; G. Zhu[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

10:10 AM
Enhanced Work-hardening from Oxygen-stabilized Omega Precipitation in Aged Metastable Beta Ti Alloys: *K. Chou*[1]; E. Marquis[1]; [1]University of Michigan

AI/Data informatics: Design of Structural Materials — AI/ML for Integrating Experiments and Simulations; Steels

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
Program Organizers: Jennifer Carter, Case Western Reserve University; Amit Verma, Carnegie Mellon University; Natasha Vermaak, Lehigh University; Jonathan Zimmerman, Sandia National Laboratories; Darren Pagan, Pennsylvania State University; Chris Haines, Ccdc Army Research Laboratory; Judith Brown, Sandia National Laboratories

Wednesday AM **March 17, 2021**

8:30 AM Invited
A Physics-informed Bayesian Experimental Autonomous Researcher for Structural Design: *K. Brown*[1]; [1]Boston University

8:50 AM
Solving Inverse Problems for Process-structure Linkages Using Asynchronous Parallel Bayesian Optimization: *A. Tran*[1]; T. Wildey[1]; [1]Sandia National Laboratories

9:10 AM
Model Reification with Batch Bayesian Optimization: *R. Couperthwaite*[1]; D. Khatamsaz[1]; A. Molkeri[1]; D. Allaire[1]; A. Srivastava[1]; R. Arroyave[1]; [1]Texas A&M University

9:30 AM Invited
Structural Response Statistics of Deformed Polycrystals Leading to Rare Events: *C. Bronkhorst*[1]; P. Marcy[2]; H. Cho[3]; S. Vander Wiel[2]; S. Gupta[1]; V. Anghel[2]; G. Gray[2]; [1]University of Wisconsin, Madison; [2]Los Alamos National Laboratory; [3]Korea Advanced Institute of Science and Technology

10:00 AM Invited
Data-driven Approaches for Automated Analysis of Non-metallic Inclusions that Form during Steel Processing: M. Abdulsalam[1]; N. Gao[1]; E. Holm[1]; *B. Webler*[1]; [1]Carnegie Mellon University

10:30 AM
Incorporating Historical Data & Past Analyses for Improved Tensile Property Prediction of 9% Cr Steel: *M. Wenzlick*[1]; R. Devanathan[2]; O. Mamun[2]; K. Rose[3]; J. Hawk[3]; [1]Leidos Research Support Team for the National Energy Technology Laboratory; [2]Pacific Northwest National Laboratory; [3]National Energy Technology Laboratory

AI/Data informatics: Tools for Accelerated Design of High-temperature Alloys — Uncertainty Quantification, AI Tools, and Environmental Degradation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Michael Titus, Purdue University; Pinar Acar, Virginia Tech; Andrew Detor, GE Research; James Saal, Citrine Informatics; Dongwon Shin, Oak Ridge National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM Invited
Domain and Uncertainty Quantification in Machine Learning Models of Alloy Properties: *D. Morgan*[1]; R. Jacobs[1]; B. Blaiszik[2]; [1]University of Wisconsin-Madison; [2]University of Chicago

9:00 AM
Domain Knowledge-informed, Process-mapping AI Graph for Designing Fe-based Alloys: *V. Romanov*[1]; [1]National Energy Technology Laboratory

9:20 AM
Curation of Database for High Temperature Materials Using Natural Language Processing Tools: *A. Verma*[1]; S. Min[1]; H. Wang[1]; M. Simko[1]; A. Rollett[1]; [1]Carnegie Mellon University

9:40 AM Invited
Toward High Throughput Design and Development of Multi-principal Element Alloys for Corrosion and Oxidation Resistance (MPEAs): *M. Taheri*[1]; T. Hufnagel[1]; C. Wolverton[2]; J. Rondinelli[2]; J. Hattrick-Simpers[3]; B. DeCost[3]; E. Opila[4]; J. Scully[4]; J. Couzinie[5]; N. Birbilis[6]; [1]Johns Hopkins University; [2]Northwestern University; [3]NIST; [4]University of Virginia; [5]University Paris-Est Créteil (UPEC); [6]Australian National University

10:10 AM
Advanced Data SCiENce Toolkit for Non-data Scientists (ASCENDS)
- A Case Study of the Oxidation Kinetics of NiCr-based Alloys: *J. Peng*[1]; R. Pillai[1]; M. Romedenne[1]; S. Lee[1]; G. Muralidharan[1]; B. Pint[1]; J. Haynes[1]; D. Shin[1]; [1]Oak Ridge National Laboratory

10:30 AM
Expanding Materials Selection via Transfer Learning for High-temperature Oxide Selection: *Z. Mcclure*[1]; A. Strachan[1]; [1]Purdue University

10:50 AM Invited
Optimal Design of High-temperature, Oxidation-resistant Complex Concentrated Alloys: *A. Strachan*[1]; [1]Purdue University

Algorithm Development in Materials Science and Engineering — Models and Algorithms for Study Microstructures and Mechanical Properties of Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Bryan Wong, University of California, Riverside; Ebrahim Asadi, University of Memphis; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryce Meredig, Citrine Informatics

Wednesday AM **March 17, 2021**

8:30 AM
Mechanistic Modeling of Point Diffusion in Polycrystals to Capture Different Diffusion-deformation Mechanisms: *A. Chakraborty*[1]; V. Prithivirajan[1]; N. Beets[1]; A. Mariyappan[1]; R. Lebensohn[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

8:50 AM
Role of Voids on Yielding of Hexagonal Metals as Revealed by Crystal Plasticity Simulations: *I. Riyad*[1]; D. Savage[1]; W. Feather[1]; N. Kljestan[1]; M. Knezevic[1]; [1]University of New Hampshire

9:10 AM
Quantitative Phase-field Model for Void Nucleation and Growth Under Ion Irradiation: *R. Annadanam*[1]; A. El-Azab[1]; [1]Purdue University

9:30 AM
Low Dimensional Polynomial Chaos Expansion Performance at Assessing Uncertainty in Creep Life Prediction of Grade 91 Steel: *T. Truster*[1]; A. Behnam[1]; V. Gupta[2]; R. Tipireddy[2]; [1]University of Tennessee; [2]Pacific Northwest National Laboratory

9:50 AM
Full-field Stress Computation from Measured Deformation Fields: A Hyperbolic Formulation: *B. Cameron*[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

10:10 AM
A Simulation Survey of Recrystallization Behavior in Al-xSi Microstructures Under Shear Loading Conditions: *W. Frazier*[1]; B. Gwalani[1]; L. Li[1]; A. Soulami[1]; A. Devaraj[1]; P. Sushko[1]; [1]Pacific Northwest National Laboratory

10:30 AM
Predicting Mechanical Property Parameters from Load-displacement Curve of Nanoindentation Test by Using Machine Learning Model: *J. Jeon*[1]; J. Cho[1]; K. Hwang[1]; [1]GIFT, POSTECH

Aluminum Alloys, Processing and Characterization — Microstructure Evolution and Characterization

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Dimitry Sediako, University of British Columbia

Wednesday AM **March 17, 2021**

8:30 AM Invited
Microstructure Evolution of an Al-Fe-Ni Alloy with Zr and Sc Additions Upon Different Cooling Rates during Solidification for Improving the Mechanical and Electrical Conductivity Properties: S. Chankitmunkong[1]; D. Eskin[2]; *C. Limmaneevichitr*[1]; [1]King Mongkut's University of Technology Thonburi; [2]Brunel University London

8:50 AM
Microstructure and Mechanical Properties of a Precipitation-hardened Al-Mn-Zr-Er Alloy: *A. Farkoosh*[1]; D. Seidman[1]; D. Dunand[1]; [1]Northwestern University

9:10 AM
Characterization of the Microstructure of Al-Mg Alloy Matrix Syntactic Foam by Three-dimensional Analysis: *J. Jung*[1]; S. Kim[1]; W. Kim[1]; C. Lim[1]; Y. Park[2]; [1]Korea Institute of Materials Science; [2]Pusan National University/Department of Materials Science and Engineering

9:30 AM
Thermal Analysis of the Solidification Behavior of AA7075 Containing Nanoparticles: *M. Sokoluk*[1]; I. De Rosa[1]; S. Pan[1]; X. Li[1]; [1]University of California Los Angeles

9:50 AM
Microstructural Evolution of Ultra-fine Grained (UFGs) Aluminum in Tribological Contacts: *S. Wei*[1]; C. Tangpatjaroen[1]; H. Zhang[1]; I. Szlufarska[1]; [1]University of Wisconsin Madison

10:10 AM
Microchemistry Evolution for 8xxx Alloys by Homogenization: *E. Santora*[1]; R. Morak[1]; [1]Amag

Biological Materials Science — Biological Materials Science I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama

Wednesday AM **March 17, 2021**

8:30 AM Invited
Understanding the Role of Ridged Geometries in the Telson of the Mantis Shrimp: A. Trikanad[1]; W. Huang[2]; J. Rivera[3]; D. Kisailus[2]; *P. Zavattieri*[1]; [1]Purdue University; [2]University of California, Irvine; [3]University of California, Riverside

9:00 AM Invited
Bioinspired Design of Fracture Resistant Layer-by-Layer Composite Structure: *X. Niu*[1]; [1] City University of Hong Kong

9:30 AM
Assessing the Role of Loading Direction on the Compressive Response and Deformation Mechanism in Bioinspired Multilayered Composites: *S. Akurati*[1]; J. Marin[1]; B. Gundrati[1]; D. Ghosh[1]; [1]Old Dominion University

9:50 AM Invited
Bamboo Fibre-reinforced Mycelium Composites for Sustainable Structures: *H. Le Ferrand*[1]; [1]Nanyang Technological University

Bulk Metallic Glasses XVIII — Structures and Characterization

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM **March 17, 2021**

8:30 AM Invited
Ultrafast-calorimetry Experiments to Study Multistep Crystallization and Melting Pathways in Metals: *J. Loeffler*[1]; [1]ETH Zurich

8:55 AM Invited
Tracing Structural Dynamics in Metallic Glasses during Cryogenic Cycling: A. Das[1]; E. Dufresne[2]; *R. Maass*[3]; [1]University of Illinois at Urbana-Champaign; [2]Argonne National Laboratory; [3]Federal Institute for Materials Research and Testing (BAM)

9:20 AM
The Secondary Phase of Bulk Metallic Glass: *S. Corona*[1]; S. Lee[1]; C. Chari[1]; J. Na[2]; K. Samwer[3]; W. Johnson[1]; [1]California Institute of Technology; [2]Glassimetal Technologies; [3]University of Göttingen

9:40 AM
Fragility, Medium Range Order and Boson Peak in Liquids: *C. Ryu*[1]; T. Egami[1]; [1]University of Tennessee

10:00 AM
Non-destructive Probing of Internal Damage Processes in a Metallic Glass: *A. Das*[1]; R. Maass[2]; [1]University of Illinois; [2]Federal Institute for Materials Research and Testing

Cast Shop Technology — Metal Cleanliness

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Samuel Wagstaff, Oculatus

Wednesday AM **March 17, 2021**

8:30 AM
Automated Metal Cleanliness Analyzer (AMCA) – An Alternative Assessment of Metal Cleanliness in Aluminum Melts: *H. Zedel*[1]; R. Fritzsch[1]; R. Aune[1]; S. Akhtar[2]; [1]NTNU; [2]Norsk Hydro

8:50 AM
Overview on the Possibilities and Limitations of the Characterization of Ceramic Foam Filters for Metal Melt Filtration: *C. Voigt*[1]; J. Hubálková[1]; A. Bergin[2]; R. Fritzsch[2]; R. Aune[2]; C. Aneziris[1]; [1]Institute of Ceramic, Glass and Construction Materials; [2]Norwegian University of Science and Technology

9:10 AM
Compression Testing of Ceramic Foam Filters (CFFs) Submerged in Aluminium at Operating Temperature: *A. Bergin*[1]; R. Fritzsch[2]; S. Akhtar[3]; L. Arnberg[2]; R. Aune[2]; [1]Norwegian University of Science and Technology & Hydro Aluminium AS; [2]Norwegian University of Science and Technology; [3]Hydro Aluminium AS

9:30 AM
The Effect of Grain Refiner on Aluminium Filtration: *S. Bao*[1]; J. Yang[2]; S. Akhtar[3]; S. Tjøtta[3]; U. Tundal[3]; T. Pettersen[4]; Y. Li[2]; [1]SINTEF Materials & Chemistry; [2]Norwegian University of Science and Technology; [3]Norsk Hydro; [4]SINTEF Manufacturing

9:50 AM
Next-generation Electric Preheating System for Filter Boxes: *J. Schnelle*[1]; M. Byczek[1]; [1]Drache Umwelttechnik GmbH

10:10 AM
Reduction of Impurity Elements by Applying Electromagnetic Stirring in Fractional Crystallization: *Y. Murakami*[1]; N. Omura[1]; [1]National Institute of Advanced Industrial Science and Technology

10:30 AM
NatureAlu: Manufacturing High Purity Aluminum from the Concept Idea to the Production Plant: J. Desmeules[1]; *D. Mazerolle*[2]; [1]Dynamic Concept; [2]NatureAlu

Ceramic Materials for Nuclear Energy Research and Applications — High Burnup Oxide Fuels

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nuclear Materials Committee
Program Organizers: Xian-Ming Bai, Virginia Polytechnic Institute and State University; Yongfeng Zhang, University of Wisconsin-Madison; Larry Aagesen, Idaho National Laboratory; Vincenzo Rondinella, Jrc-Ec

Wednesday AM **March 17, 2021**

8:30 AM Invited
Modeling of Pressure-driven Inter-granular Fracture in High Burnup Structure UO2 during LOCA Using A Phase-field Approach: *W. Jiang*[1]; L. Aagesen[1]; K. Gamble[1]; [1]Idaho National Laboratory

9:00 AM
Multiscale Modeling of High Burn-up Structure (HBS) Formation and Evolution in UO2: *K. Ahmed*[1]; M. Abdoelatef[1]; S. Biswas[2]; L. Aagesen[2]; D. Andersson[3]; [1]Texas A&M University; [2]INL; [3]LANL

9:20 AM
A Thermo-mechanical Coupled Phase Field Dynamic Fracture Model and Its Application in UO2: *S. Zhang*[1]; W. Jiang[2]; M. Tonks[1]; [1]University of Florida; [2]Idaho National Laboratory

9:40 AM Invited
Phase-field Modeling of Bubble Growth During High Burn-up Structure Formation in UO2: *S. Biswas*[1]; A. Jokisaari[1]; L. Aagesen[1]; [1]Idaho National Laboratory

10:10 AM Invited
Electron Microscopy Characterization of the Fuel-cladding Interaction in Annular Fast Reactor MOX: *F. Cappia*[1]; A. Winston[1]; B. Miller[1]; J. Aguiar[1]; B. Kombaiah[1]; F. Teng[1]; D. Murray[1]; J. Harp[1]; [1]Idaho National Laboratory

10:40 AM
Microstructural and Fission Products Analysis from Irradiated UO2 Fuel Using Atom Probe Tomography: *M. Bachhav*[1]; L. He[1]; B. Miller[1]; X. Liu[1]; F. Cappia[1]; J. Gan[1]; [1]Idaho National Laboratory

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

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation 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 Institut; Mathew Cherukara, Argonne National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM Invited
Investigating the Early Life on Earth with Nanoscale X-ray Coherent Imaging: *L. Maldanis*[1]; D. Galante[2]; [1]Université Grenoble Alpes; [2]Brazilian Synchrotron Light Laboratory

9:00 AM
Confocal Bragg Ptychography for 3D Mapping of Bulk Specimens: *H. Friis Poulsen*[1]; [1]DTU

9:20 AM
Improve Phase Retrieval Performance in Bragg CDI by Simultaneous Reconstruction of Multiple Diffraction Peaks: *Y. Gao*[1]; G. Williams[1]; [1]Brookhaven National Laboratory

9:40 AM
Near-surface Optical Characterisation of Ion Implantation in Titanium Oxide Thin Films: E. Balaur[1]; *B. Abbey*[1]; [1]La Trobe University

10:00 AM Invited
ID01 in Light of the ESRF-EBS: *S. Leake*[1]; P. Boesecke[1]; T. Schulli[1]; [1]ESRF - The European Synchrotron

10:30 AM
Retrieving the Full 3D Strain Tensor for Nanoscale Materials Science Applications at 34-ID-C: A. Pateras[1]; R. Harder[2]; W. Cha[2]; J. Gigax[1]; J. Baldwin[1]; J. Tischler[2]; R. Xu[2]; W. Liu[2]; M. Erdmann[2]; R. Kalt[2]; *R. Sandberg*[3]; S. Fensin[1]; R. Pokharel[1]; [1]Los Alamos National Laboratory; [2]Argonne National Laboratory; [3]Bringham Young University

10:50 AM
Multi-peak Phase Retrieval for Coherent X-ray Diffraction Imaging at High Energies: *M. Wilkin*[1]; A. Rollett[1]; [1]Carnegie Mellon University

Characterization of Minerals, Metals and Materials 2021 — Characterization of Mechanical Properties

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

Wednesday AM **March 17, 2021**

8:30 AM
Effect of Specimen Dimension on Plasticity Behaviour Below Submillimetre Scale: *A. Lodh*[1]; G. Castelluccio[1]; [1]Cranfield University

8:50 AM
Significant Disparity of Non-basal Dislocation Activities in Hot-rolled Mg and AZ31 Alloy Under Tension: *D. Zhao*[1]; X. Ma[1]; A. Srivastavaa[1]; G. Turner[1]; I. Karaman[1]; K. Xie[1]; [1]Texas A&M University

9:10 AM
Analysis of Wear Issues in the Rotary Shear Biomass Comminution System: *K. Lee*[1]; L. Lin[2]; D. Lanning[3]; E. Cakmak[2]; J. Keiser[2]; J. Qu[2]; [1]11612 Lanesborough Way; [2]ORNL; [3]Forest concepts

9:30 AM
Characterization of Solidification Structure Morphology in High-carbon Steel Billet by Fractal Dimension: *J. Cao*[1]; Z. Hou[1]; Z. Peng[1]; D. Guo[1]; P. Tang[1]; [1]Chongqing University

9:50 AM
Dislocation Creep at Low Stresses and High Temperature: Harper-Dorn Creep Revisited: *S. Singh*[1]; M. Kassner[2]; P. Kumar[1]; [1]Indian Institute of Science, Bangalore; [2]University of Southern California

10:10 AM
The Study of Structure-mechanical Properties Relationship in Different Cross-linked SU-8 Thermoset Polymers: *P. Sarkar*[1]; P. Pant[1]; H. Nanavati[1]; [1]Indian Institute of Technology Bombay

Composite Materials for Nuclear Applications — Tungsten

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee, TMS: Nuclear Materials Committee
Program Organizers: Anne Campbell, Oak Ridge National Laboratory; Dong Liu, University of Bristol; Rick Ubic, Boise State University; Lauren Garrison, Oak Ridge National Laboratory; Peng Xu, Idaho National Laboratory; Johann (Hans) Riesch, Max Planck Institute for Plasma Physics

Wednesday AM **March 17, 2021**

8:30 AM Invited
Tungsten-based High and Medium Entropy Alloys and Composites for Nuclear Applications: O. Waseem[1]; *H. Ryu*[2]; [1]MIT PSFC; [2]KAIST, Korea

9:00 AM Invited
Tungsten Fibre-reinforced Copper – A High-Conductivity, High-Strength Composite Material for Plasma-facing Component Applications: *A. von Müller*[1]; B. Böswirth[1]; H. Greuner[1]; R. Neu[1]; U. Siefken[2]; E. Visca[3]; J. You[1]; [1]Max-Planck-Institut für Plasmaphysik; [2]Louis Renner GmbH; [3]ENEA Frascati

9:30 AM Invited
W_2C-reinforced Tungsten: A Promising Candidate for DEMO Divertor Material: P. Jenus[1]; *A. Ivekovic*[1]; M. Kocen[1]; A. Abram[1]; A. Sestan[1]; A. Galatanu[2]; M. Galatanu[2]; S. Tarancón[3]; E. Tejado[3]; J. Pastor[3]; M. Wirtz[4]; G. Pintsuk[5]; S. Novak[1]; [1]Jožef Stefan Institute; [2]National Institute of Materials Physics; [3]Universidad Politécnica de Madrid; [4]Institute for Energy and Climate Reseach, Forschungszentrum Juelich GmbH, ; [5]Institute for Energy and Climate Reseach, Forschungszentrum Juelich GmbH,

10:00 AM
Solving the Brittleness Problem of Tungsten - Tungsten Fibre-reinforced Tungsten Composites: *J. Riesch*[1]; J. Coenen[2]; B. Curzadd[1]; M. Fuhr[1]; L. Garisson[3]; H. Gietl[3]; H. Greuner[1]; T. Höschen[1]; Y. Mao[2]; W. Pantleon[4]; L. Raumann[2]; D. Schwalenberg[2]; T. Schwarz-Selinger[1]; D. Terentyev[5]; R. Neu[1]; [1]Max Planck Institute für Plasma Physics; [2]Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung – Plasmaphysik, Partner of the Trilateral Euregio Cluster (TEC); [3]Oak Ridge National Laboratory; [4]Technical University of Denmark; [5]Belgian Nuclear Research

10:20 AM
Opportunities for Nanostructured Tungsten Alloys in Composite Fusion Materials: *J. Trelewicz*[1]; N. Olynik[1]; W. Wang[1]; D. Sprouster[1]; C. Parish[2]; [1]Stony Brook University; [2]Oak Ridge National Laboratory

10:40 AM
Conformal Tungsten Coatings for Cermet Nuclear Fuel Elements: *J. Johnson*[1]; R. Wilkerson[2]; S. DiPietro[3]; S. O'Dell[4]; G. Thompson[1]; [1]University of Alabama; [2]NASA Marshall Space Flight Center; [3]Exothermics Inc; [4]Plasma Processes LLC

11:00 AM
Coupled Primary and Secondary Recrystallization in Single Tungsten Fiber-reinforced Tungsten Composites: U. Ciucani[1]; L. Haus[1]; M. Fuhr[2]; H. Gietl[3]; J. Riesch[2]; *W. Pantleon*[1]; [1]Technical University of Denmark; [2]Max-Planck-Institute for Plasma Physics; [3]Oak Ridge National Laboratory

Computational Techniques for Multi-Scale Modeling in Advanced Manufacturing — Multiscale Computational Techniques

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Anthony Rollett, Carnegie Mellon University; Laurentiu Nastac, University of Alabama; Mei Li, Ford Motor Company; Alexandra Anderson, Gopher Resource; Srujan Rokkam, Advanced Cooling Technologies Inc

Wednesday AM **March 17, 2021**

8:30 AM
Machine-learning Informed Design of High-strength Gradient Metals for Additive Manufacturing: *S. Taheri-Mousavi*[1]; A. Hart[1]; [1]MIT

8:55 AM
A Hybrid Approach to Connecting a Low Fidelity Model to a High Fidelity Model for Efficient and Accurate Prediction of Thermal History of Large Domains in Additive Manufacturing: C. Katinas[1]; C. Grohol[1]; *Y. Shin*[1]; [1]Purdue University

9:20 AM Invited
Predicting Mechanical Performance in Additive Manufacturing Components Using Deep Learning: *K. Johnson*[1]; J. Emery[1]; D. Maestas[1]; M. Smith[1]; C. Martinez[1]; M. Grigoriu[2]; [1]Sandia National Laboratories; [2]Cornell University

10:00 AM
Smoothed Particle Hydrodynamics based approach for 3D Modeling of Linear Friction Welding Process: *S. Rokkam*[1]; Q. Truong[1]; [1]Advanced Cooling Technologies Inc

10:25 AM
Synchrotron Calibrated Lagrangian Particle Tracking of Melt-pool Ejections during Laser Powder Bed Fusion: *S. Clark*[1]; G. Zeng[2]; J. Jakumeit[2]; C. Leung[1]; Y. Chen[1]; S. Marussi[1]; L. Sinclair[1]; M. Olbinado[3]; A. Rack[4]; P. Lee[1]; [1]University College London; [2]Access e.V.; [3]Paul Scherrer Institute; [4]European Synchrotron Radiation Facility

Computational Thermodynamics and Kinetics — Solidification, Additive Manufacturing / Ordering, Coarsening and Patterning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Wednesday AM **March 17, 2021**

8:30 AM Invited
Influence of Interphase Boundary Anisotropy on the Formation of Lamellar Eutectic Solidification Patterns: *M. Plapp*[1]; S. Ghosh[2]; S. Bottin-Rousseau[3]; S. Akamatsu[3]; [1]Ecole Polytechnique, CNRS; [2]Los Alamos National Laboratory; [3]Sorbonne Université, CNRS

9:00 AM
Thermokinetics and Associated Microstructural Evolution of Laser Powder Bed Fused Additively Manufactured Ti6Al4V: *M. Pantawane*[1]; N. Dahotre[1]; [1]University of North Texas

9:20 AM Invited
Inhomogeneous Free Energies Beyond the Cahn-Hilliard Model: Interface Anisotropy and Equilibrium Patterning: *P. Bellon*[1]; Q. Li[1]; R. Averback[1]; [1]University of Illinois at Urbana-Champaign

9:50 AM
Topological Transitions during Coarsening in Nanoporous Metals: *K. Elder*[1]; W. Andrews[2]; M. Ziehmer[3]; A. Chadwick[1]; E. Lilleodden[3]; K. Thornton[2]; P. Voorhees[1]; [1]Northwestern University; [2]University of Michigan; [3]Helmholtz-Zentrum Geesthacht

Defect and Phase Transformation Pathway Engineering for Desired Microstructures — Experiment and Characterization

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Yufeng Zheng, University of Nevada-Reno ; Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Timofey Frolov, Lawrence Livermore National Laboratory; Stoichko Antonov, Max-Planck-Institut für Eisenforschung GmbH; Jessica Krogstad, University of Illinois at Urbana-Champaign; Bin Li, University of Nevada, Reno

Wednesday AM **March 17, 2021**

8:30 AM
Grain Boundary Segregation for Thermal Stability in Ternary Nanocrystalline Alloys: *S. Kube*[1]; W. Xing[2]; A. Kalidindi[2]; S. Sohn[1]; A. Datye[1]; D. Amram[2]; C. Schuh[2]; J. Schroers[1]; [1]Yale University; [2]Massachusetts Institute of Technology

8:50 AM
Tuning Fine-scale Alpha Microstructures via Nano-scale Structural and Compositional Non-uniformities in Beta Titanium Alloys: D. Li[1]; R. Shi[2]; R. Banerjee[3]; Y. Wang[4]; H. Fraser[4]; *Y. Zheng*[1]; [1]University of Nevada, Reno; [2]Lawrence Livermore National Laboratory; [3]University of North Texas; [4]Ohio State University

9:10 AM
Exploring the Microstructure of Sputtered Nanotwinned Alloys and Its Role in the Study of Dislocation-Twin Interactions: *F. Andrade Chávez*[1]; O. Calebi[1]; A. Mohammed[1]; H. Sehitoglu[1]; J. Krogstad[1]; [1]University of Illinois at Urbana-Champaign

9:30 AM
Pseudo-in situ Characterization of Phase Transformation in an Al-Cu-Mn-Zr Alloy Using Atom Probe Tomography: *B. Gwalani*[1]; J. Liu[1]; J. Poplawsky[2]; A. Shyam[2]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Oak Ridge National Lab

9:50 AM
High-temperature Bulk Dislocation Dynamics in Aluminum: *L. Dresselhaus-Marais*[1]; [1]Lawrence Livermore National Laboratory

10:10 AM
Interaction between Martensite Transformation and Ion-induced Damage in Shape Memory Alloys: *A. Hinojos*[1]; D. Hong[1]; N. Li[2]; K. Hattar[3]; P. Anderson[1]; M. Mills[1]; [1]The Ohio State University; [2]Los Alamos National Labs; [3]Sandia National Labs

10:30 AM
Microstructural Evolution of Nanotwinned Al-Zr Alloy with Significant 9R Phase Stabilization: *N. Richter*[1]; Y. Zhang[1]; R. Su[1]; T. Niu[1]; Q. Li[1]; S. Xue[1]; H. Wang[1]; X. Zhang[1]; [1]Purdue University

Deformation Induced Microstructural Modification — Session V: Deformation of Alloys II and Composites

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Suveen Mathaudhu, University of California-Riverside ; Kester Clarke, Colorado School of Mines; Bharat Gwalani, Pacific Northwest National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM
Grain Refinement and Bimodal Distribution of Precipitates in Al 6xxx and 7xxx Alloys during ShAPE (Shear Assisted Processing and Extrusion): *X. Ma*[1]; R. Kalsar[1]; J. Darsell[1]; M. Song[1]; N. Overman[1]; K. Kappagantula[1]; V. Joshi[1]; [1]Pacific Northwest National Laboratory

8:50 AM
Influence of Shear Rolling on Microstructure and Properties of Low-density Steels: *D. Pierce*[1]; T. Scuseria[1]; K. Garza[1]; A. Gill[1]; J. Arnold[1]; A. Clarke[1]; K. Clarke[1]; E. Cakmak[1]; A. Trofimov[1]; H. Wang[1]; G. Muralidharan[1]; T. Muth[1]; [1]Oak Ridge National Laboratory

9:10 AM
Investigation of Path Dependent Microstructural Evolution in Cu-Nb System Processed via Friction Consolidation: *M. Komarasamy*[1]; X. Li[1]; S. Whalen[1]; X. Ma[1]; N. Canfield[1]; M. Olszta[1]; T. Varga[1]; G. Grant[1]; S. Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California, Riverside and Pacific Northwest National Laboratory

9:30 AM
Low Temperature Superplasticity in Al 5083 Produced by Accumulative Roll Bonding: *B. McBride*[1]; K. Clarke[1]; A. Clakre[1]; [1]Colorado School of Mines

9:50 AM
Tailoring the Mechanical Performance in Novel Zn-Ag-Mg Alloy Processed by Cold Plastic Deformation Processes: *M. Watroba*[1]; W. Bednarczyk[1]; J. Kawalko[1]; T. Langdon[2]; P. Bala[1]; [1]AGH University of Science and Technology; [2]University of Southampton

10:10 AM
The Unusual Effect of HPT Processing on Microstructure and Mechanical Properties in Zn-alloys: *W. Bednarczyk*[1]; M. Watroba[1]; J. Kawalko[1]; P. Bala[1]; T. Langdon[2]; [1]AGH University of Science and Technology in Krakow; [2]University of Southampton

10:30 AM
Mg-Fe Bonded Interface Using FaST: *H. Das*[1]; T. Wang[1]; P. Upadhyay[1]; B. Gwalani[1]; X. Ma[1]; D. Zhang[1]; [1]Pacific Northwest National Laboratory

10:50 AM
Harnessing Thermomechanical Processing to Influence Texture in ARB Cu/Nb Composites: *J. Cheng*[1]; S. Vogel[2]; C. Miller[2]; R. Mier[2]; C. Osborn[2]; J. Carpenter[2]; M. Radhakrishnan[3]; O. Anderoglu[3]; N. Mara[1]; [1]University of Minnesota Twin Cities; [2]Los Alamos National Laboratory; [3]University of New Mexico

11:10 AM
Evolution of Mechanical Properties and Microstructure in Accumulative Roll Bonded FCC/BCC Metallic Composites: *T. Nizolek*[1]; D. Coughlin[1]; C. Miller[1]; N. Li[1]; R. McCabe[1]; J. Carpenter[1]; [1]Los Alamos National Laboratory

11:30 AM
Analysis of Al 6061 and Mild Steel Joints from Rotary Friction Welding: *N. Gotawala*[1]; A. Shrivastava[1]; [1]Indian Institute of Technology Bombay

Electrode Technology for Aluminum Production — Anode Production - Green & Baked Anode Production/Modelling and Performance

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Derek Santangelo, Hatch

Wednesday AM **March 17, 2021**

8:30 AM
Start-up of a New "Smart & Green" Anode Plant: *C. Bouche*[1]; X. Genin[1]; V. Philippaux[1]; J. Morfoise[1]; [1]Fives

8:50 AM
The Steps to Optimize and Implement an Anode Stub Hole Cleaning Machine Modification: *V. Langelier*[1]; D. Santangelo[1]; [1]Hatch

9:10 AM
Biocarbon in the Aluminium Industry: A Review: *S. Senanu*[1]; A. Solheim[1]; [1]SINTEF

9:30 AM
Anode to Cathode Electrical Current Modelling for Cell Retrofit Application of Conductive Nails Technology: *W. Berends*[1]; [1]Alucelltech Inc.

9:50 AM
Managing Anode Performance with a Versatile Reactivity Analysis Method: *L. Lossius*[1]; J. Chmelar[1]; V. Tomkute[1]; [1]Hydro Aluminium AS

Electronic Packaging and Interconnections 2021 — Advanced Microelectronic Packaging Materials

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Mehran Maalekian, Mat-Tech; Christopher Gourlay, Imperial College London; Babak Arfaei, Ford Motor Company; Praveen Kumar, Indian Institute of Science; Sai Vadlamani, Intel Corporation; Kazuhiro Nogita, University of Queensland; David Yan, San Jose State University

Wednesday AM **March 17, 2021**

8:30 AM Invited
Advances in Low Temperature/Low Pressure Ag Sinter Joining and Its Thermal Performance: *K. Suganuma*[1]; C. Chen[1]; Z. Zhang[1]; A. Suetake[1]; A. Iwaki[1]; M. Hsieh[1]; N. Sato[1]; [1]Osaka University

8:50 AM
Electric-enhanced Sintering of Copper Interconnects: *T. Shen*[1]; A. Wu[1]; [1]National Central University

9:10 AM
Modeling and Simulation of Stress Gradient Driven Migration: *Z. Morgan*[1]; Y. Jin[1]; V. Attari[2]; R. Arroyave[2]; [1]Michigan Technological University; [2]Texas A&M University

9:30 AM
Plasticity and Contact Resistance Behavior in Wirebond Packaging: *A. Osmanson*[1]; M. Tajedini[1]; H. Madanipour[1]; Y. Kim[1]; C. Kim[1]; [1]University of Texas at Arlington

9:50 AM
The Effects of DC, Pulsed DC, and AC Load Conditions on Electromigration Failure Mechanism in Solder Interconnects: *Y. Kim*[1]; H. Madanipour[1]; A. Osmanson[1]; M. Tajedini[1]; C. Kim[1]; P. Thompson[2]; Q. Chen[2]; [1]University of Texas at Arlington; [2]Texas Instruments, Inc.

10:10 AM
Sintered Micro-silver Joints with the Addition of Indium Applied to Power IC Packaging: *C. Tsai*[1]; W. Huang[1]; L. Chew[2]; W. Schmitt[2]; H. Nishikawa[3]; C. Kao[1]; [1]National Taiwan University; [2]Heraeus Deutschland GmbH & Co. KG; [3]Joining and Welding Research Institute, Osaka University

10:30 AM
Low-Temperature and Pressureless Cu-to-Cu Bonding by Electroless Pd Plating Using Microfluidic System: *P. Shih*[1]; Z. Ma[1]; H. Hung[1]; J. Huang[1]; C. Kao[1]; [1]National Taiwan University

Environmental Degradation of Additively Manufactured Alloys — High Temperature Oxidation and Corrosion, High Temperature Alloys

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; Michael Kirka, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Brendy Rincon Troconis, University of Texas at San Antonio; Luke Brewer, University of Alabama

Wednesday AM **March 17, 2021**

8:30 AM Invited
High Temperature Air Oxidation Behavior of Ni-based Superalloys Processed by Electron Beam Melting (EBM) and Selective Laser Melting (SLM): *M. Romedenne*[1]; R. Pillai[1]; S. Dryepondt[1]; [1]ORNL

9:00 AM
An Investigation on the Anisotropic Incipient Oxidation Behavior of Pure Nickel Processed by Laser Powder Bed Fusion Manufacturing: *H. T-Sarraf*[1]; A. Sarraf[2]; B. Poorganji[3]; [1]Arizona State University; [2]University of Southern California; [3]University of Watreloo

9:20 AM Invited
Effect of High-temperature Oxidation on the Fatigue Properties of Inconel 625 Fabricated by Laser Additive Manufacturing: *G. De Leon Nope*[1]; J. Alvarado-Orozco[2]; G. Wang[1]; B. Gleeson[1]; [1]University of Pittsburgh; [2]CIDESI

9:50 AM Invited
High Temperature Oxidation of Additively Manufactured FeCrAl and Ni-based Alloys: *M. Sattari*[1]; I. Fedorova[1]; A. Visibile[1]; K. Gündüz[1]; J. Froitzheim[1]; K. Stiller[1]; M. Halvarsson[1]; [1]Chalmers University of Technology

10:20 AM
Hydrogen Trapping at Grain Boundaries and Dislocation Structures in Additively-manufactured 316L Austenitic Stainless Steels with Hierarchical Microstructures: *K. Bertsch*[1]; T. Voisin[1]; P. Weber[1]; S. Sen-Britain[1]; C. San Marchi[2]; M. Wang[1]; B. Wood[1]; [1]Lawrence Livermore National Laboratory; [2]Sandia National Laboratory

10:40 AM
Microstructural Evolution and Oxidation Behavior of Fe-25Cr-20Ni-1.4Nb-0.2C Steel Fabricated by Laser Powder-bed Fusion: *K. Unocic*[1]; M. Romedenne[1]; P. Nandwana[1]; S. Dryepondt[1]; [1]Oak Ridge National Laboratory

11:00 AM Invited
High Temperature Oxidation and Corrosion of LBM and EBM Ni-base Superalloys and Ti Alloys: *D. Monceau*[1]; [1]CIRIMAT Lab

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

Wednesday AM **March 17, 2021**

8:30 AM Invited
Deconvoluting Mechanism in Complex Environments via In-situ Electron Microscopy: *K. Hattar*[1]; [1]Sandia National Laboratories

9:10 AM Invited
Elucidation of Corrosion Mechanisms in Light Alloys by In situ X-ray Micro and Nanotomography: *N. Chawla*[1]; [1]Purdue University

9:50 AM Invited
Controlling the Corrosion Behavior of Bioresorbable Magnesium Implants: *M. Manuel*[1]; [1]University of Florida

10:30 AM Invited
Understanding General Grain Boundaries: The Weak Link for Mechanical and Chemical Degradation: *J. Luo*[1]; [1]University of California, San Diego

11:10 AM
Classifying Liquid-solid Metal Interactions: Separation of the Multiple Mechanisms of Liquid Metal Embrittlement: J. Norkett[1]; C. Frampton[1]; *V. Miller*[1]; [1]University of Florida

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

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Jean-Charles Stinville, University of California-Santa Barbara

Wednesday AM **March 17, 2021**

8:30 AM
Fatigue and Dwell-fatigue Crack Initiation at (0001) Twist Boundaries in Ti Alloys
: C. Lavogiez[1]; J. Stinville[2]; T. Pollock[2]; P. Kontis[3]; V. Valle[4]; P. Villechaise[1]; *S. Hemery*[5]; [1]ISAE-ENSMA; [2]University of California Santa Barbara; [3]MPIE; [4]Université de Poitiers; [5]Institute Prime - Ensma

8:50 AM
Multi-scale Analysis of Fatigue Damage in Welded Lean Duplex Stainless Steel Components: *A. Elmoutaouakkil*[1]; A. Fraczkiewicz[1]; A. Gay[2]; J. Stolarz[1]; [1]Emse; [2]e.l.m. Leblanc

9:10 AM Invited
Tracking Crystal-scale Cyclic Plasticity in Inconel 718 Using High Energy X-rays: D. Shadle[1]; K. Nygren[2]; *M. Miller*[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron Source

9:30 AM
Plastic Localization in Solid Solution and Precipitation Strengthened Inconel 718 and Its Effect on VHCF Properties: *A. Cervellon*[1]; D. Texier[2]; M. Charpagne[1]; C. Torbet[1]; V. Valle[3]; J. Stinville[1]; T. Pollock[1]; [1]University of California Santa Barbara; [2]Institut Clément Ader; [3]Institut Pprime

9:50 AM
Microstructural and Mechanical Evolution of Aluminum 7075-T6 during Non-reversible Fatigue Loading: *J. Indeck*[1]; G. Demeneghi[1]; J. Mayeur[1]; C. Williams[2]; K. Hazeli[1]; [1]The University of Alabama in Huntsville; [2]U.S. Army Research Laboratory

10:10 AM
Effect of Microtexture on Minimum Dwell Fatigue Life of Ti-6Al-4V: *S. Jha*[1]; D. Sparkman[2]; J. Larsen[2]; R. John[2]; A. Pilchak[2]; [1]University of Dayton Research Institute; [2]US Air Force Research Laboratory

10:30 AM
On the Role of Annealing Twin Boundaries in the Cyclic Plastic Strain Localization and the Fatigue Crack Initiation in Equiatomic CrCoNi Medium-entropy Alloy: *V. Mazánová*[1]; M. Heczko[1]; C. Slone[1]; I. Kubena[2]; E. George[3]; M. Ghazisaeidi[1]; T. Kruml[2]; J. Polak[2]; M. Mills[1]; [1]The Ohio State University; [2]Institute of Physics of Materials CAS; [3]Oak Ridge National Laboratory

Friction Stir Welding and Processing XI — Dissimilar

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

Wednesday AM **March 17, 2021**

8:30 AM Invited
Friction Stir Welding of Metal and Carbon Fiber Reinforced Plastic: *H. Fujii*[1]; J. Choi[1]; Y. Morisada[1]; K. Nagatsuka[1]; K. Nakata[1]; [1]Osaka University

8:50 AM
Friction Stir Welding of Metal Matrix Composites to Dissimilar Aluminum Alloys: Optimization of Weld Quality and Tool Life
: *M. Eff*[1]; S. Rose[2]; K. Chung[3]; D. Hashiguchi[3]; D. Shipley[1]; E. Burns[2]; [1]EWI; [2]Boeing; [3]Materion

9:10 AM
Dissimilar Joining of ZEK100 and AA6022 for Automotive Application: *H. Das*[1]; P. Upadhyay[1]; W. Choi[1]; S. Kulkarni[1]; [1]Pacific Northwest National Laboratory

9:30 AM
Fracture Mechanics Approach to Improve Fatigue Strength of a Dissimilar Metal T-Lap Joint by Friction Stir Welding: *M. Okazaki*[1]; H. Duong[1]; S. Hirano[2]; [1]Nagaoka University of Technology; [2]Hitachi Research Laboratory

9:50 AM
Effect of Diffusion on Intermetallics at Interface during Friction Stir Welding of Stainless Steel and Pure Titanium: *N. Gotawala*[1]; A. Shrivastava[1]; [1]Indian Institute of Technology Bombay

10:10 AM
Microstructural and Mechanical Characterization of Titanium/Steel Joints Produced by Ultrasound Enhanced Friction Stir Welding: *A. Gester*[1]; M. Thomae[1]; G. Wagner[1]; [1]Chemnitz University of Technology

Frontiers in Solidification Science VIII — Melting, Nucleation & Laser Processing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Wednesday AM **March 17, 2021**

8:30 AM Invited
Melting of Metastable Solid-states in Au-Si Eutectic Alloy: *G. Kurtuldu*[1]; [1]ETH Zürich

9:00 AM Invited
Microstructure Evolution during Melting: *G. Boussinot*[1]; M. Torabi Rad[1]; M. Apel[1]; A. Viardin[1]; [1]Access e.V.

9:30 AM Invited
ISRO-mediated Nucleation in Fcc Alloys during Rapid Melting and Solidification Processes: *J. Zollinger*[1]; I. Cazic[2]; M. Rappaz[3]; B. Appolaire[1]; [1]Institut Jean Lamour; [2]Institut Jean Lamour / Institut de Soudure; [3]EPFL

10:00 AM
Orientation Relationships between Al3Ti and TiB2 due to Nucleation and Pushing/Engulfment: Y. Cui[1]; A. Horsfield[1]; *C. Gourlay*[1]; [1]Imperial College London

10:20 AM
Model the Initiation of Hot Cracking in Aluminum 6061 during the Processes of Laser Welding: *G. Tang*[1]; A. Rollett[1]; [1]Carnegie Mellon University

10:40 AM
Using Composition and Patterning to Induce Solidification Instabilities in Al-Cu Eutectic Thin Films: *E. Sullivan*[1]; J. Tomko[1]; J. Skelton[1]; J. Fitz-Gerald[1]; P. Hopkins[1]; J. Floro[1]; [1]University of Virginia

Frontiers of Materials Award Symposium: Low-Dimensional Materials and Interfaces for Next Generation Computing — Session II

Program Organizer: Deep Jariwala, University of Pennsylvania

Wednesday AM **March 17, 2021**

8:30 AM Invited
Designing Solid-state Materials from Quantum Dots for Next-generation Electronic Devices: *C. Kagan*[1]; [1]University of Pennsylvania

9:10 AM Invited
vdW Contacts on 2D Semiconductors: *M. Chhowalla*[1]; [1]Cambridge University

9:50 AM Panel Discussion Moderator: Deep Jariwala; Panelists: Mark C. Hersam,Suman Datta,Cherie Kagan, and Manish Chhowalla

Functional Nanomaterials: Functional Low-dimensional Materials (0D, 1D, 2D) Driving Innovations in Electronics, Energy, Sensors, and Environmental Engineering and Science 2021 — Nanomanufacturing & Sensors

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee
Program Organizers: Jiyoung Chang, University of Utah; Michael Cai Wang, University of South Florida; Sarah Zhong, University of South Florida; Sun Choi, Korea Institute of Science and Technology; Pei Dong, George Mason University

Wednesday AM **March 17, 2021**

8:30 AM Invited
In-situ Production of Metal Nanoparticles on Polymer Derived Ceramic Fibers for Catalysis and Sensing: S. Afrin[1]; J. Calderon[1]; *L. Zhai*[1]; [1]University of Central Florida

8:55 AM
Suspended Graphene H2 Sensors With Enhanced Sensitivity Fabricated Using Direct-write Functional Fibers: *A. Regmi*[1]; D. Shin[1]; N. Na[1]; J. Chang[1]; [1]University of Utah

9:15 AM Invited
Laser Digital Patterning for Nickel-based Flexible Electrodes and Its Applications for Electronics and Sensors: *D. Lee*[1]; [1]Gachon University

9:40 AM Invited
Redesigning Batteries via Additive Manufacturing: *C. Cobb*[1]; [1]University of Washington

10:05 AM Invited
Ultra-fast Nanomaterial Assembly and R2R Printing for High-performance Skin Sensors: *Y. Zhong*[1]; L. Wang[2]; R. Kou[2]; [1]University of South Florida; [2]University of California at San Diego

10:30 AM
Transparent and Flexible Nanoelectrodes for Wearable Electronics by Direct-writing of PEDOT:PSS-nanofiber: *D. Shin*[1]; A. Regmi[1]; J. Chang[1]; [1]University of Utah

10:50 AM
Wireless Strain Field Mapping of Metallic Surfaces through THz Time Domain Spectroscopy of Electrostrictive Coating Acting as Passive Sensor: *L. Reig Buades*[1]; A. Dhiman[1]; V. Tomar[1]; [1]Purdue University

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Harmonic Structure, Composites and Films

Sponsored by: TMS Structural Materials Division, 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
; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Wednesday AM **March 17, 2021**

8:30 AM
Unique Hall-petch Relation in Harmonic Structure Materials: *K. Ameyama*[1]; [1]Ritsumeikan University

8:50 AM Invited
Size Effect Issue on the Fatigue Properties of Ti-6Al-4V Designed in Heterogeneous Harmonic Structure: *B. Guennec*[1]; T. Ishiguri[2]; M. Ota Kawabata[3]; S. Kikuchi[4]; A. Ueno[3]; K. Ameyama[3]; [1]Toyama Prefectural University; [2]Mitsui High-tec; [3]Ritsumeikan University; [4]Shizuoka University

9:15 AM
Yielding in a Metallic Nanocomposite at the Nanoscale: *K. So*[1]; M. Stapelberg[1]; Y. Zhou[1]; H. Mori[2]; S. Ogata[2]; M. Short[1]; J. Li[2]; S. Yip[1]; [1]Massachusetts Institute Of Technology; [2]College of Industrial Technology

9:35 AM Invited
Lattice Defect Development in Harmonic Metals through Atomic Simulations: *T. Shimokawa*[1]; T. Hasegawa[1]; T. Niiyama[1]; [1]Kanazawa University

10:00 AM Invited
Backstress Development and Strain Partitioning in Harmonic-structure Materials: *D. Orlov*[1]; R. Kulagin[2]; Y. Beygelzimer[3]; [1]Lund University; [2]Karlsruhe Institute of Technology; [3]Donetsk Institute for Physics and Engineering

10:25 AM Invited
Outstanding Mechanical Properties in a Harmonic Structure Designed Titanium Due to Preferential Recrystallization: *B. Sharma*[1]; M. Miyakoshi[1]; M. Kawabata[1]; K. Ameyama[1]; [1]Ritsumeikan University

10:50 AM
High Strength and Tensile Ductility in Bicrystalline Nickel Thin Films with Incoherent Twin Boundaries: R. Berlia[1]; *J. Rajagopalan*; [1]Arizona State University

11:10 AM
Effect of Rolling on Fatigue Crack Propagation in Harmonic Structured Commercially Pure Titanium: *Y. Nakai*[1]; S. Kikuchi[2]; K. Osaki[1]; M. Kawabata[3]; K. Ameyama[3]; [1]Kobe Univ; [2]Shizuoka University; [3]Ritsumeikan University

11:30 AM
Synthesis and Mechanical Characterization of Metallic Films with Precisely Defined Heterogeneous Microstructures: R. Berlia[1]; *J. Rajagopalan*; [1]Arizona State University

High Entropy Alloys IX: Alloy Development and Properties — Joint Session with Materials for High Temperature Applications: Next Generation Superalloys and Beyond

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM **March 17, 2021**

8:30 AM Invited
Temperature Dependent Deformation Behavior and Strengthening Mechanisms in a Two-phase BCC+B2 Refractory High Entropy Alloy: *O. Senkov*[1]; J. Couzinie[2]; S. Rao[1]; V. Soni[3]; R. Banerjee[3]; [1]Air Force Research Laboratory; [2]Université Paris Est Creteil; [3]University of North Texas

8:55 AM Invited
Mechanical Properties of Precipitation Strengthened Refractory High Entropy Alloys at Elevated Temperatures: *S. Laube*[1]; S. Schellert[2]; D. Schliephake[1]; A. Kauffmann[1]; B. Gorr[2]; H. Christ[2]; M. Heilmaier[1]; [1]Karlsruher Institut für Technologie (KIT); [2]Universität Siegen

9:20 AM
Transport Properties of Binary and Entropy-stabilized Diborides: *A. Niraula*[1]; B. Timalsina[1]; G. Hilmas[2]; W. Fahrenholtz[2]; R. Sakidja[1]; [1]Missouri state university; [2]Missouri university of Science and technology

9:40 AM Invited
The Design and Characterization of High Entropy Alloys for High Temperature Applications: *K. Garber*[1]; B. Majumdar[1]; [1]New Mexico Institute of Mining and Technology

10:05 AM Invited
Unique Microstructural Evolution and Deformation Behavior of HfNbTaTiZr BCC High Entropy Alloy at Elevated Temperatures: *N. Tsuji*[1]; R. Eleti[1]; A. Chokshi[2]; A. Shibata[3]; [1]Kyoto University; [2]Indian Institute of Science; [3]National Institute for Materials Science (NIMS)

10:30 AM Invited
Design of Corrosion and Irradiation Resistant Compositionally Complex Alloys Using a High-throughput Platform for Applications in Extreme Environments: *A. Couet*[1]; M. Moorehead[1]; M. Niezgoda[1]; P. Nelaturu[1]; B. Goh[1]; Y. Wang[1]; M. Karatas[1]; C. Zhang[2]; F. Zhang[2]; T. Duong[3]; S. Chaudhuri[3]; K. Sridharan[1]; D. Thoma[1]; [1]University of Wisconsin-Madison; [2]Computherm LLC; [3]Argonne National Laboratory

10:55 AM
Microstructure and Mechanical Properties of High-entropy Superalloy HESA-3 at Intermediate Temperature: *T. Saito*[1]; A. Ishida[2]; M. Yuyama[2]; Y. Takata[2]; K. Kawagishi[1]; H. Murakami[1]; [1]National Institute for Materials Science / Waseda University; [2]National Institute for Materials Science

High Entropy Alloys IX: Structures and Modeling — Structures and Characterization II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday AM **March 17, 2021**

8:30 AM Invited
Predicting High Entropy Alloy Behavior: What We Can Learn from Non-empirical Approaches: *J. Morris*[1]; [1]Ames Laboratory

8:50 AM Invited
Role of Local Chemical Order in Orientation Relationship Determination in an Al0.3CoCrFeNi High Entropy Alloys: *E. Anber*[1]; D. Foley[1]; D. Farkas[2]; P. Liaw[3]; M. Taheri[1]; [1]Johns Hopkins University; [2]Virginia Tech; [3]The University of Tennessee

9:10 AM
Microstructure and Mechanical Properties of a Dual Phase Transformation Induced Plasticity Fe-Mn-Co-Cr High Entropy Alloy: *A. Hossain*[1]; R. Mishra[2]; N. Kumar[1]; [1]University of Alabama Tuscaloosa; [2]University of North Texas

High Temperature Electrochemistry IV — Session IV

Sponsored by: TMS Extraction and Processing Division, TMS: Nuclear Materials Committee, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM
Interaction between Solute Species and Metallic Alloying Elements in Molten Chloride Systems: *W. Phillips*[1]; R. Gakhar[1]; [1]Idaho National Laboratory

9:00 AM
Effect of Hydroxide and Oxide Impurities in Electrochemical Processes Using Molten LiCl and $CaCl_2$: *M. Gonzalez*[1]; E. Faulkner[1]; M. Simpson[1]; [1]University of Utah

Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery — Session V

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Wei Xiong, University of Pittsburgh; Shuanglin Chen, CompuTherm LLC; Wei Chen, Illinois Institute of Technology; James Saal, Citrine Informatics; Greta Lindwall, KTH Royal Institute of Technology

Wednesday AM **March 17, 2021**

8:30 AM Invited
Some Properties if the Multicomponent Diffusivity Matrix: *J. Agren*[1]; [1]Royal Institute of Technology

9:10 AM Invited
A Tale of Two Approaches: From Phase Equilibria to Materials Properties: *Q. Chen*[1]; [1]Thermo-Calc Software AB

9:50 AM Invited
A Diffusion Mobility Database for γ⁄ γ' Co-Superalloys: *C. Campbell*[1]; K. Moon[1]; M. Williams[1]; G. Lindwall[2]; [1]National Institute of Standards and Technology; [2]Royal Institute of Technology (KTH)

10:30 AM Invited
Modeling of Diffusion and Intermetallic Phase Formation in Al-Mg Bimetallic Structures: *A. Luo*[1]; [1]Ohio State University

11:10 AM Invited
An Integrated Computational Materials Engineering (ICME) Framework for Additive Manufacturing (AM) of Ni-based Superalloys: *Q. Zhang*[1]; A. Saboo[1]; J. Gong[1]; G. Olson[1]; [1]QuesTek Innovations LLC

Magnesium Technology 2021 — Mechanical Behavior

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Petra Maier, University of Applied Sciences Stralsund; J. Brian Jordon, University of Alabama; Neale Neelameggham, IND LLC

Wednesday AM **March 17, 2021**

8:30 AM Invited
Quasi-static and Dynamic Rate Mechanical Behavior and Microstructural Investigation of High-purity Mg and AZ31B Alloy: *B. Morrow*[1]; E. Cerreta[1]; S. Fensin[1]; S. Perez-Bergquist[1]; C. Trujillo[1]; S. Mathaudhu[2]; V. Anghel[1]; R. McCabe[1]; G. Gray[1]; [1]Los Alamos National Laboratory; [2]University of California - Riverside

9:00 AM Invited
Understanding Twinning: Detwinning Behavior of Unalloyed Mg during Low-cycle Fatigue Using High Energy X-ray Diffraction: *A. Murphy-Leonard*[1]; J. Allison[2]; [1]Naval Research Laboratory; [2]University of Michigan

9:30 AM
The Effects of Basal and Prismatic Precipitates on Deformation Twinning in AZ91 Magnesium Alloy: *B. Leu*[1]; M. Arul Kumar[2]; I. Beyerlein[1]; [1]University of California Santa Barbara; [2]Los Alamos National Laboratory

9:50 AM
On the Role of Crystallographic Anisotropy and Texture in Damage Tolerance of Magnesium and its Alloys: *S. Baweja*[1]; P. Indurkar[2]; S. Joshi[1]; [1]University of Houston; [2]National University of Singapore

10:10 AM Invited
Achieving Excellent Room Temperature Formability and High Strength in Wrought Magnesium Alloy Sheets: *T. Sasaki*[1]; Z. Li[1]; K. Hono[1]; [1]NIMS

10:40 AM Invited
Texture and Microstructure Evolution in Thermomechanically Processed Mg-Ca and Mg-Zn-Ca Alloys: *T. Berman*[1]; J. Allison[1]; [1]University of Michigan

11:10 AM
Eliminating Yield Anisotropy and Enhancing Ductility in Mg Alloys by Shear Assisted Processing and Extrusion: D. Zhang[1]; *J. Darsell*[1]; N. Overman[1]; D. Herling[1]; V. Joshi[1]; [1]Pacific Northwest National Laboratory

11:30 AM
Numerical Study of Multi-axial Loading Behavior of Mg Alloy AZ31 Extruded Bar: *H. Wang*[1]; X. Zhang[1]; [1]Shanghai Jiao Tong University

Materials and Chemistry for Molten Salt Systems — Salt Structure and Properties

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Stephen Raiman, Texas A&M University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Raluca Scarlat, University of California-Berkeley

Wednesday AM **March 17, 2021**

8:30 AM
Development of Higher Order Systems for the Molten Salt Thermodynamic Database and their Application: *T. Besmann*[1]; K. Johnson[1]; J. Ard[1]; J. Yingling[1]; M. Christian[1]; J. Schorne-Pinto[1]; M. Aslani[1]; J. McMurray[2]; M. Poschmann[3]; M. Piro[3]; [1]University of South Carolina; [2]Oak Ridge National Laboratory; [3]Ontario Tech

8:50 AM
Ab Initio Molecular Dynamics Simulations of Actinide Molten Chloride Salts: *D. Andersson*[1]; [1]Los Alamos National Laboratory

9:10 AM
Extracting Salt Properties from Visualization of Molten Salt Sessile Droplets: S. Mastromarino[1]; M. Nelson[1]; R. Scarlat[1]; *R. Hayes*[2]; [1]University of California Berkeley; [2]University of California, Berkeley

9:30 AM
Liquid-vapor Equilibrium and Transport Phenomena in Molten Salt Systems: *J. Mcmurray*[1]; J. McFarlane[1]; S. Greenwood[1]; A. McAlister[1]; M. Kurley[1]; [1]Oak Ridge National Laboratory

9:50 AM
Optimization of the Phase Equilibria and Thermodynamics for Rare-earth Fluoride Systems Relevant to Molten Salt Reactors: *K. Johnson*[1]; J. Schorne Pinto[1]; T. Besmann[1]; [1]University Of South Carolina

10:10 AM
Molten Salt Reactor: Fluoride/Chloride Salt Comparison: *S. Delpech*[1]; C. Cannes[1]; D. Rodrigues[1]; [1]IJCLAB-CNRS

10:40 AM
X-ray Absorption Studies Investigating Solute-solvent Interactions in Molten Salt Environments: E. Dias[1]; *S. Gill*[1]; R. Gakhar[2]; S. Roy[3]; M. Topsakal[1]; W. Phillips[2]; B. Layne[1]; S. Mahurin[3]; P. Halstenberg[3]; J. Wishart[1]; V. Bryantsev[3]; A. Frenkel[1]; [1]Brookhaven National Laboratory; [2]Idaho National Laboratory; [3]Oak Ridge National Laboratory

11:00 AM
Imaging Nanostructural Heterogeneities Induced by Molten Salt Corrosion in Ni-Cr Alloy: *Y. Yang*[1]; W. Zhou[2]; S. Yin[1]; S. Wang[3]; Q. Yu[1]; R. Ritchie[1]; M. Asta[1]; J. Li[2]; M. Short[2]; A. Minor[1]; [1]Lawrence Berkeley National Laboratory; [2]Massachusetts Institute of Technology; [3]University of California, Berkeley

Materials Engineering -- From Ideas to Practice: An EPD Symposium in Honor of Jiann-Yang Hwang — Material Processing and Recycling

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee, TMS: Pyrometallurgy Committee
Program Organizers: Bowen Li, Michigan Technological University; Baojun Zhao, University of Queensland; Jian Li, CanmetMATERIALS; Sergio Monteiro, Instituto Militar de Engenharia; Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita; Tao Jiang, Central South University; Yong Shi, Futianbao Environment Technologies; Cuiping Huang, FuTianBao Environment Protection Technology Company Ltd.; Shadia Ikhmayies

Wednesday AM **March 17, 2021**

8:30 AM
Investigation of Nickel Laterite Smelting Slags: *E. Keskinkilic*[1]; [1]Atilim University

8:50 AM
Recycled Common Glass Bottle Used in Composite Repair for Industrial Piping: *F. Lopes*[1]; N. Tonini Simonassi[1]; C. Fontes Vieira[1]; S. Neves Monteiro[1]; [1]Universidade Estadual do Norte Fluminense

9:10 AM
The Effect of the Diameter on the Specific Mass of UBIM: *B. MARCHI*[1]; V. Cândido2[2]; A. da Silva[2]; R. Reis[2]; S. Monteiro[2]; [1]Instituto Militar de Engenharia; [2]Instituto Militar de Engenharia

9:30 AM Invited
Effect of Temperature on the Leachability of Chromium in EAF Slag: *Y. Wang*[1]; J. Li[1]; Y. Zeng[1]; Z. Gao[2]; [1]North China University of Science and Technology; [2]Tangshan research academy of environmental planning

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Superalloys: Processing

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Wednesday AM **March 17, 2021**

8:30 AM Keynote
Considerations for Manufacturability and Repairability of Next Generation High Temperature Alloys: *R. Proctor*[1]; [1]Rolls-Royce Corporation

9:10 AM
Observation of Multiply Coherent Grains in Ni-Based Superalloy LSHR: *C. Hale*[1]; B. Dowdell[2]; V. Miller[1]; [1]University of Florida; [2]North Carolina State University

9:30 AM
Feasibility of Near-net-shape HIP Fabrication and PM/Wrought Weld in Alloy IN740H for AUSC Components: *S. Huang*[1]; V. Samarov[2]; J. deBarbadillo[3]; T. Hanlon[1]; B. Lewis[4]; R. Gollihue[3]; J. Shingledecker[5]; J. Mortzheim[1]; [1]GE Research; [2]Synertech PM Inc.; [3]Special Metals; [4]Wyman-Gordon; [5]Electric Power Research Institute

9:50 AM Invited
Understanding the Effects of Alloy Chemistry and Microstructure on the Stress Relaxation Behavior of High Strength Ni-base Superalloys: *S. Tin*[1]; [1]Illinois Institute of Technology

10:20 AM
Synchrotron X-Ray Scattering Characterization of Strengthening Precipitates in a Model Ni-based Alloy: *M. Frith*[1]; J. Chiles[2]; J. Poplawsky[2]; J. Ilavsky[1]; G. Muralidharan[2]; [1]Argonne National Laboratory; [2]Oak Ridge National Laboratory

10:40 AM
On the Early Stages of Gamma' Evolution in a Model Ni-based Alloy: *G. Muralidharan*[1]; S. Shukla[1]; J. Chiles[1]; D. Pierce[1]; L. Allard[1]; B. Radhakrishnan[1]; J. Poplawsky[1]; [1]Oak Ridge National Laboratory

Materials Processing Fundamentals — Thermodynamics on Metals and Slags Processing

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee
Program Organizers: Jonghyun Lee, Iowa State University; Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Fiseha Tesfaye, Abo Akademi University; Guillaume Lambotte, Boston Metal; Antoine Allanore, Massachusetts Institute of Technology

Wednesday AM **March 17, 2021**

8:30 AM
Effect of Slag Conductivity on Decarburisation Reaction Kinetics: *J. Biswas*[1]; K. Coley[2]; [1]McMaster University; [2]Western University

8:50 AM
Experimental Characterization of Liquid Metal Bubble-driven Flows Modeling the Situation in a Steel Ladle
: T. Wondrak[1]; C. Bruch[2]; *S. Eckert*[1]; P. Gardin[3]; G. Hackl[4]; H. Lachmund[5]; H. Lüngen[6]; H. Odenthal[7]; K. Timmel[1]; B. Willers[1]; [1]Helmholtz-Zentrum Dresden-Rossendorf; [2]Saarstahl AG; [3]ArcelorMittal; [4]RHI-Magnesita; [5]Dillinger Hüttenwerke; [6]Steel Institute VDEh; [7]SMS group GmbH

9:10 AM
Influence of Slab Transportation and Handling Practice on Crack Sensitivity of Micro-alloyed Steels: *H. Shafy*[1]; H. Palkowski[1]; [1]Clausthal University of Technology

9:30 AM
Low Temperature Aluminothermic Reduction of Metal Oxides: *J. Haidar*[1]; [1]Kinaltek Pty Ltd.

9:50 AM
Modelling of Metal Loss in Ferromanganese Furnace Tapping Operations: *Q. Reynolds*[1]; J. Olsen[2]; [1]Mintek; [2]SINTEF Industry

10:10 AM
Carbothermal Reduction of Brazilian Linz Donawitz-LD Steel Sludges: *M. Gomez-Marroquin*[1]; J. D´Abreu[2]; E. Dionisio-Calderón[2]; N. Cárdenas-Falcón[3]; A. Terrones - Ramirez[4]; J. Huarcaya-Nina[5]; K. Phatti - Satto[4]; F. Huaman-Perez[6]; [1]APMMM/Universidad Nacional de Ingeniería; [2]Pontifícia Universidade Católica do Rio de Janeiro ; [3]Pontificia Universidad Católica del Perú ; [4]FIGMM Universidad Nacional de Ingeniería; [5]FIA Universidad Nacional de Ingeniería; [6]FIQT Universidad Nacional de Ingeniería

10:30 AM
Liquid-liquid Extraction Thermodynamic Parameter Estimator (LLEPE) for Multicomponent Separation Systems: *T. Quah*[1]; C. Iloeje[1]; [1]Argonne National Laboratory

10:50 AM
Thermodynamic Modeling of Iron-copper-sulfuric Acid Solutions during Solvent Extraction and Electrowinning for Copper Production: *J. Xu*[1]; G. Yue[1]; [1]University of Texas El Paso

Mechanical Behavior of Nuclear Reactor Components — Early Career

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee
Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM Invited
On the Role of Material Pedigree to Predict Engineering Material Properties: *A. Rovinelli*[1]; M. Messner[1]; T. Sham[1]; [1]Argonne National Laboratory

8:50 AM Invited
A Model for Dislocation Climb and Precipitate Interactions Applied to Creep in Ferritic Steel: *A. Kohnert*[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

9:10 AM Invited
Atom-probe Study of Nano-hardening Features in Neutron Irradiated RAFM Steels: *A. Bhattacharya*[1]; P. Edmondson[1]; H. Tanigawa[2]; T. Nozawa[2]; J. Geringer[1]; Y. Katoh[1]; M. Rieth[3]; [1]Oak Ridge National Laboratory; [2]National Institutes for Quantum and Radiological Science and Technology; [3]Karlsruhe Institute of Technology

9:30 AM Invited
Microstructural Effects on the Mechanical Behavior of FeCrAl Alloys: *A. Hoffman*[1]; S. Huang[1]; S. Buresh[1]; M. Schuster[1]; E. Dolley[1]; R. Rebak[1]; [1]GE Research

9:50 AM Invited
Novel Small Scale Mechanical Testing Techniques for Nuclear Materials: *J. Gigax*[1]; H. Kim[1]; C. Lear[1]; M. Chancey[1]; P. Hosemann[2]; Y. Wang[1]; S. Maloy[1]; N. Li[1]; [1]Los Alamos National Lab; [2]University of California-Berkeley

10:10 AM Invited
Probing the Mechanical Behavior of Irradiated Materials through Micromechanical Testing: *S. Ozerinc*[1]; [1]Middle East Technical University

10:30 AM Invited
Small Scale Mechanical Testing of Nuclear Fuel and Cladding: *D. Frazer*[1]; J. White[2]; T. Saleh[2]; F. Cappia[1]; F. Teng[1]; D. Murray[1]; C. Howard[1]; C. Judge[1]; [1]Idaho National Lab; [2]LANL

10:50 AM Invited
Atomistic Simulations and Theoretical Modelling of the Yield Behavior of Industrial Tantalum Alloys: *D. Singh*[1]; S. Rao[2]; J. El-Awady[1]; [1]Johns Hopkins University; [2]UES Inc.

11:10 AM Invited
The Merit of In-situ Environmental TEM for the Study of Tungsten under Fusion-relevant Conditions: M. Togaru[1]; R. Sainju[1]; *Y. Zhu*[1]; [1]University of Connecticut

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session V

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Wednesday AM **March 17, 2021**

8:30 AM
Complementary In-situ Methods for Crack Evaluation within High-temperature Materials at Ambient Conditions
: *M. Burtscher*[1]; M. Alfreider[1]; M. Wurmshuber[1]; K. Schmuck[1]; H. Clemens[2]; S. Mayer[1]; D. Kiener[1]; [1]Montanuniversität Leoben; [2] Montanuniversität Leoben

9:10 AM
In-situ Experimental Evaluation of Residual Stresses in Composites during Autoclave Manufacturing: *S. Chava*[1]; S. Namilae[1]; M. Al-Haik[1]; [1]Embry-Riddle Aeronautical University

9:30 AM
In-situ Investigation of Intergranular Crack Initiation in Hydrogen Embrittled Inconel 725: *M. Liu*[1]; L. Jiang[1]; E. Sheu[1]; M. Demkowicz[1]; [1]Texas A&M University

9:50 AM
Advanced In-situ Electrochemical Nanoindentation Testing for Understanding Hydrogen-materials Interactions: *V. Maier-Kiener*[1]; A. Ebner[1]; H. Clemens[1]; R. Pippan[2]; [1]Montanuniversitaet Leoben; [2]Austrian Academy of Sciences

10:10 AM
Size Effects in Barium Titanate: *N. Mathews*[1]; A. Saxena[2]; C. Kirchlechner[2]; N. Venkataramani[1]; G. Dehm[2]; B. Nagamani Jaya[1]; [1]Indian Institute of Technology Bombay; [2]Max-Planck-Institut für Eisenforschung GmbH

10:30 AM
Size Effect, Friction and Adhesion in Small-scale Cutting of Metals: *G. Feng*[1]; P. Dave[1]; D. Sagapuram[1]; [1]Texas A&M University

10:50 AM
The Effect of Material Volume on Impact Energy Absorption for Protective Equipment Applications: *K. Hartley*[1]; P. Tennakoon[2]; J. Nychka[1]; [1]University of Alberta; [2]Superior Glove Works, Ltd.

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Pyrometallurgy I

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Wednesday AM **March 17, 2021**

8:30 AM
One-step Extraction of Nickel from Nickel Sulfide Concentrates by Iron Addition: *F. Wang*[1]; S. Marcuson[1]; L. Khajavi[2]; M. Barati[1]; [1]University of Toronto; [2]University of British Columbia

8:50 AM
Continuous Improvement of Process Advisor Optimizing Furnace Model: *P. Björklund*[1]; D. Grimsey[2]; M. Korpi[1]; M. Marjakoski[3]; [1]Outotec; [2]BHP; [3]Boliden

9:10 AM
Fluxing Optimisation and Control Improvements at the Kalgoorlie Nickel Smelter: *D. Grimsey*; E. Grimsey[1]; P. Björklund[2]; [1]Curtin University; [2]Outotec

9:30 AM
Preparation of Refractory Materials by Co-sintering of Ferronickel Slag and Ferrochromium Slag: Thermodynamic Analysis: F. Gu[1]; *Y. Zhang*[1]; Z. Peng[1]; H. Tang[1]; Z. Su[1]; T. Jiang[1]; [1]Central South University

9:50 AM
PGM Furnace Design, Construction, Improvement and Performance Optimisation: I. McDougall[1]; G. de Villiers[1]; *H. Joubert*[1]; B. van Beek[2]; J. Davis[2]; T. Goff[2]; [1]Tenova Pyromet; [2]Sibanye-Stillwater

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

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University

Wednesday AM **March 17, 2021**

8:30 AM
Introductory Comments: Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XX: *S. Chen*[1]; [1]National Tsinghua University

8:35 AM Keynote
Interfacial Reactions in the Bi2Te3 Thermoelectric Modules: *S. Chen*[1]; Y. Hsu[1]; H. Shih[1]; [1]National Tsing Hua University

9:15 AM Invited
Review of X-ray Microbeam Study of Electromigration: *P. Wang*[1]; [1]SUNY New Paltz

9:45 AM
Effects of Bromide and Adipic Acid on Electrochemical Migration of Tin: *A. Haseeb*[1]; E. Lee[1]; Y. Goh[1]; Y. Wong[1]; M. Sabri[1]; B. Low[2]; [1]University of Malaya; [2]NXP Semiconductor Sdn Bhd

10:05 AM
The Microstructure and Properties Variations of Sn-coated Cu Wires Induced by Electromigration: *H. Liu*[1]; C. Liang[1]; T. Chiu[2]; K. Lin[1]; [1]National Cheng Kung University; [2]Conquer Electronics

10:25 AM
Thermomigration Failure Induced by Surface Diffusion of Sn on Ni/Cu Metallization in Microbumps for 2.5-dimensional Integrated Circuits Packaging: *W. Tsai*[1]; C. Lee[1]; F. Ouyang[1]; [1]National Tsing Hua University

10:45 AM
Synchrotron White Laue Nanodiffraction Characterization of Allotropic Phase Transformation of Hexagonal- into Monoclinic-Cu_6Sn_5: *P. Lee*[1]; W. Hsieh[2]; C. Lee[3]; Y. Huang[3]; C. Chiang[2]; C. Ku[2]; C. Kao[1]; C. Ho[3]; [1]National Taiwan University; [2]National Synchrotron Radiation Research Center; [3]Yuan Ze University

11:05 AM
Electroplating of NiP for the Low Residual and High Strength MEMS Probe Tip: N. Kang[1]; *J. Lee*[1]; [1]Hongik University

Phase Transformations and Microstructural Evolution — Non-Ferrous Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Wednesday AM **March 17, 2021**

8:30 AM
Effect of Zirconium Addition to Wrought Al-Mg-Si Alloys on Microstructure: *F. Schmid*[1]; I. Weißensteiner[2]; M. Tunes[2]; T. Kremmer[2]; T. Ebner[3]; P. Uggowitzer[2]; S. Pogatscher[2]; [1]Christian Doppler Laboratory for Advanced Aluminum Alloys; [2]Montanuniversitaet Leoben; [3]AMAG rolling GmbH

8:50 AM
Phase Transitions in Beta Ti and Beta Zr Alloys: J. Strasky[1]; *A. Veverková*[1]; [1]Charles University

9:10 AM
Local Phase Transformation Strengthening in Ni-based Superalloys: *A. Egan*[1]; T. Smith[2]; Y. Rao[1]; L. Feng[1]; E. Marquis[3]; M. Ghazisaeidi[1]; Y. Wang[1]; S. Niezgoda[1]; M. Mills[1]; [1]Ohio State University; [2]NASA Glenn Research Center; [3]University of Michigan

9:30 AM
On the Application Potential of Aluminum Crossover Alloys: *L. Stemper*[1]; M. Tunes[1]; R. Tosone[2]; P. Uggowitzer[1]; S. Pogatscher[1]; [1]Montanuniversitaet Leoben; [2]AMAG rolling GmbH

9:50 AM
Thermal Behavior and Decomposition of Quasicrystalline Dispersoids in Powder-processed Aluminum Alloys: *H. Leonard*[1]; S. Rommel[1]; M. Li[1]; T. Watson[2]; T. Policandriotes[3]; M. Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

Rare Metal Extraction & Processing — Recycling, Co, REE

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Wednesday AM **March 17, 2021**

8:30 AM
Recycling of Rare Earths from Neodymium Magnets Using Focused Infrared and Solid Phase Extraction: *M. Bonin*[1]; D. Larivière[1]; [1]Université Laval

8:50 AM Invited
The Italian National Research Council Operations within the EIT Raw Materials Framework: *P. Dambruoso*[1]; S. Siano[2]; A. Torreggiani[1]; O. Russo[3]; V. Dal Santo[4]; S. Marzocchi[5]; [1]ISOF-CNR; [2]IFAC-CNR; [3]Library of the Bologna CNR Research Area ; [4]SCITEC-CNR; [5]Library of the Bologna CNR Research Area

9:10 AM
Experimental Determination of Liquidus Temperature and Phase Equilibria of the CaO-Al_2O_3-SiO_2-Na_2O Slag System Relevant to E-waste Smelting: *M. Islam*[1]; M. Somerville[2]; M. Pownceby[2]; J. Tardio[1]; N. Haque[2]; S. Bhargava[1]; [1]RMIT University; [2]CSIRO

9:30 AM Invited
How to Prepare Future Generations for the Challenges in the Raw Materials Sector: *A. Torreggiani*[1]; A. Zanelli[2]; A. Degli Esposti[2]; E. Polo[2]; P. Dambruoso[2]; R. Lapiska-Viola[2]; K. Forsberg[3]; E. Benvenuti[4]; [1]National Research Council of Italy-CNR; [2]ISOF- CNR; [3]KTH - Royal Institute of Technology; [4]National Research Council of Italy (CNR)

9:50 AM Invited
Circular Economy for Rare Earths: What are the Different Strategies, Challenges, and Opportunities?: *K. Habib*[1]; [1]University of Waterloo

Recycling and Sustainability for Emerging Technologies and Strategic Materials — Recycling and Process Optimization I

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: John Howarter, Purdue University; Mingming Zhang, ArcelorMittal Global R&D; Elsa Olivetti, Massachusetts Institute of Technology; Hong Peng, University of Queensland

Wednesday AM **March 17, 2021**

8:30 AM
Copper Separation from Steel Scrap: *H. Jin*[1]; B. Mishra[1]; [1]Worcester Polytechnic Institute

8:50 AM
Improvement of Steel Scrap Recycling: Optical Recognition of Cu Impurities Using Machine Learning: *Z. Gao*[1]; [1]Colorado School of Mines

9:10 AM
Copper Supply for Electric Vehicles and Impacts on the Recycling Sector: *A. Arowosola*[1]; G. Gaustad[2]; [1]Rochester Institute of Technology; [2]Alfred University

9:30 AM
Development and Impact of High-performance Al Alloys Alloyed with Rare Earth Co-products: *H. Henderson*[1]; Z. Sims[2]; D. Weiss[3]; T. Fishman[4]; R. Ott[5]; O. Rios[2]; S. McCall[1]; [1]Lawrence Livermore National Laboratory; [2]University of Tennessee-Knoxville; [3]Eck Industries, Inc.; [4]IDC Herzliya; [5]Ames Laboratory

9:50 AM
Electrochemical Separation of Aluminum from Mixed Scrap Using Ionic Liquids: *A. Ahmed*[1]; R. Reddy[1]; [1]The University of Alabama

10:10 AM
High-temperature Oxidation of Explosion Welded Tantalum-tungsten Alloy on Steel Substrate as a Potential Technique for Recycling: *A. Gupta*[1]; B. Mishra[1]; [1]Worcester Polytechnic Institute

Thermal Property Characterization, Modeling, and Theory in Extreme Environments — Early Career Scholars in Thermal Properties

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee
Program Organizers: Janelle Wharry, Purdue University; Mukesh Bachhav, Idaho National Laboratory; Marat Khafizov, Ohio State University; Eric Lass, University of Tennessee-Knoxville; Vikas Tomar, Purdue University; Tiankai Yao, Idaho National Laboratory; Cody Dennett, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Wednesday AM **March 17, 2021**

8:30 AM Invited
A Thermodynamically-consistent Model for Heat Transport in Heterogeneous Solids: *K. Ahmed*[1]; F. Badry[1]; [1]Texas A&M University

8:55 AM Invited
Defect Density and Annealing Kinetics Estimation Using Thermal Diffusivity Measurements from Transient Grating Spectroscopy: *M. Reza*[1]; H. Yu[1]; K. Mizohata[2]; F. Hofmann[1]; [1]University Of Oxford; [2]University of Helsinki

9:20 AM Invited
Thermal Behaviors of Correlated Insulators ThO2 and SmB6: *N. Poudel*[1]; D. Murray[1]; M. Mann[2]; J. Jeffries[3]; K. Gofryk[1]; [1]Idaho National Laboratory; [2]Air Force Research Laboratory; [3]Lawrence Livermore National Laboratory

9:45 AM Invited
Thermal Conductivity Degradation from Irradiation-induced Microstructural Defects in Single Crystal Thorium Dioxide: *A. Khanolkar*[1]; Z. Hua[1]; C. Dennett[1]; M. Khafizov[2]; T. Yao[1]; K. Bawane[1]; L. He[1]; J. Mann[3]; A. El-Azab[4]; J. Gan[1]; D. Hurley[1]; [1]Idaho National Laboratory; [2]Ohio State University; [3]Air Force Research Laboratory; [4]Purdue University

10:10 AM Invited
Phase-dictated Thermal Conductivity Response in Carbon Systems Exposed to Ion Irradiation: *E. Scott*[1]; K. Hattar[2]; J. Braun[1]; S. King[3]; M. Goorsky[4]; P. Hopkins[1]; [1]University of Virginia; [2]Sandia National Laboratories; [3]Intel Corporation ; [4]University of California Los Angeles

10:35 AM Invited
Thermal Transport Behavior of U-50Zr at the Mesoscale: Before and After Irradiation: *Z. Hua*[1]; T. Yao[1]; A. Khanolkar[1]; C. Dennett[1]; X. Ding[1]; K. Gofryk[1]; M. Benson[1]; L. He[1]; J. Gan[1]; D. Hurley[1]; [1]Idaho National Laboratory

11:00 AM Invited
Non-magnetic Kondo Effect in Eelta-UZr2: *X. Ding*[1]; K. Wei[2]; T. Yao[1]; R. Baumbach[2]; K. Gofryk[1]; [1]Idaho National Laboratory; [2]National High Magnetic Field Laboratory

TMS-DGM Symposium: A Joint US-European Symposium on Linking Basic Science to Advances in Manufacturing of Lightweight Metals — Session I

Sponsored by: Deutsche Gesellschaft für Materialkunde e.V. (DGM): German Materials Society , TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: William Joost, Pratt & Whitney; Norbert Hort, Helmholtz-Zentrum Geesthacht

Wednesday AM **March 17, 2021**

8:30 AM
Stacking-fault Mediated Plasticity and Strengthening in Lean, Rare-earth Free Magnesium Alloys: *I. Basu*[1]; J. Löffler[1]; [1]ETH Zurich

8:50 AM
High-throughput Evaluation of Hardening Potency and Solubility of Eight Alloying Elements in Magnesium: *C. Wang*[1]; W. Zhong[1]; J. Zhao[1]; [1]University Of Maryland

9:10 AM
High-throughput Experimental Techniques to Measure the CRSS for Slip and Twinning in Mg and Mg Alloys: J. Wang[1]; R. Alizadeh[2]; *J. Llorca*[3]; [1]Shanghai Jiao Tong University and IMDEA Materials Institute; [2]Sharif University of Technology and IMDEA Materials Institute; [3]IMDEA Materials Institute & Technical University of Madrid

9:30 AM
Study of the Solidification Pathways of Hypo/hyper-eutectic Al-Ce over a Wide Range of Thermal Histories: *A. Sahoo*[1]; A. Bogno[1]; H. Henein[1]; [1]University of Alberta

9:50 AM
Solute-vacancy Clustering in Aluminum: *D. Shin*[1]; J. Peng[1]; S. Bahl[1]; A. Shyam[1]; J. Haynes[1]; [1]Oak Ridge National Laboratory

10:10 AM
Fracture Mechanisms under Monotonic Tensile, Fatigue, and Creep Deformation of Cast Al-Cu-Mn-Zr Alloys: Impact of Brittle Intermetallic Grain Boundary Particles: *S. Bahl*[1]; X. Hu[1]; J. Cheng[1]; E. Hoar[2]; K. Sisco[3]; R. Michi[1]; J. Haynes[1]; A. Shyam[1]; [1]Oak Ridge National Laboratory; [2]Georgia Institute of Technology; [3]University of Tennessee-Knoxville

10:30 AM
Al-Fe-Si Phase Stabilization Using Experimentally Validated Computational Thermodynamics: *S. Soto-Medina*[1]; B. Rijal[1]; L. Zhu[2]; R. Hennig[1]; M. Manuel[1]; [1]University of Florida; [2]Yantai University

10:50 AM
Spatial Correlations between Strengthening Particles in Multi-phase Hardenable Aluminum Alloys: *V. Wessely*[1]; R. Schäubin[1]; S. Gerstl[1]; S. Pogatscher[2]; P. Uggowitzer[1]; J. Löffler[1]; [1]Laboratory of Metal Physics and Technology; [2]Montanuniversitaet Leoben,

TMS2021 Virtual All-Conference Plenary

Wednesday PM **March 17, 2021**

12:00 PM
Introductory Comments: TMS2021 Virtual All-Conference Plenary: T. *Battle*

12:05 PM Plenary
New Methodologies: Producing High-Quality Metal from Low-Grade Ores: *A. Lauvergeon*[1]; [1]Founder/CEO of ALP; Chair, École des Mines de Nancy; former CEO of Areva S.A

12:45 PM
Questions and Answer Period

100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture and Modeling100 Years and Still Cracking: A Griffith Fracture Symposium — Fracture and Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniverstität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Wednesday PM **March 17, 2021**

2:00 PM
Characterization of a Novel Crack Growth Mechanism in Ti-6Al-4V Subjected to Dwell Fatigue at Elevated Temperature: *A. Pilchak*; J. Rotella[1]; N. Levkulich[2]; S. Jha[3]; R. John[4]; J. Larsen[4]; [1]Purdue University and Air Force Research Lab; [2]UES Inc.; [3]University of Dayton Research Institute; [4]Air Force Research Lab

2:20 PM
The Maximum Limit of Compressive Strength and Hardness of Nanocrystalline $MgAl_2O_4$ Spinel: *J. Maita*[1]; J. Davis[2]; J. Wollmershauser[3]; E. Gorzkowski[3]; B. Feigelson[3]; S. Lee[1]; [1]University of Connecticut; [2]University of Massachusetts Amherst; [3]U.S. Naval Research Laboratory

2:40 PM
Reversing Griffith after 100 Years: Mechanics of the Solid-state Bonding: *Y. Gao*[1]; Z. Feng[2]; [1]University of Tennessee - Knoxville; [2]Oak Ridge National Laboratory

3:00 PM
High-strength and Thermal Stability of Nanotwinned Al Alloys: Q. Li[1]; S. Xue[1]; Y. Zhang[1]; H. Wang[1]; J. Wang[2]; *X. Zhang*[1]; [1]Purdue University; [2]University of Nebraska-Lincoln

3:20 PM
Nanomechanics of Amorphous Silica: From Mechanical to Fracture Properties: *P. Newell*[1]; T. Vo[1]; B. He[1]; M. Blum[1]; A. Damone[2]; [1]The University of Utah; [2]University of Brescia

2D Materials – Preparation, Properties & Applications — Synthesis, Properties & Applications

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University; Amber Shrivastava, Indian Institute of Technology Bombay

Wednesday PM **March 17, 2021**

2:00 PM Invited
Magnetic and Transport Properties of 2D Layered Chiral Magnets: *J. Yang*[1]; [1]New Jersey Institute of Technology

2:25 PM Invited
Elaboration and Characterization of Thin Films of SiP Lamellar Alloys: A First Step towards 2D-SiP: *M. Stoffel*[1]; A. Valdenaire[1]; S. Geiskopf[1]; X. Devaux[1]; E. André[1]; C. Carteret[1]; A. Bouché[1]; M. Vergnat[1]; H. Rinnert[1]; [1]Universite De Lorraine

2:50 PM Invited
Polymer Composites Reinforced with 3D Foam of 2D Materials: *T. Thomas*[1]; K. Lopez[1]; A. Agarwal[1]; [1]Florida International University

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — Multiscale, Physics Based Modeling of Nuclear Materials

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Wednesday PM **March 17, 2021**

2:00 PM Invited
Overview of Advanced Fuels and Materials R&D within the US DOE-NE NEAMS Program: *C. Stanek*[1]; [1]Los Alamos National Laboratory

2:30 PM
Understanding the Mechanisms of Porosity Development in α-uranium for Metallic Fuel Applications: *A. Jokisaari*[1]; A. Rezwan[2]; K. Mahbuba[3]; Y. Wang[4]; M. Tonks[5]; B. Beeler[3]; A. Smolinski[1]; [1]Idaho National Laboratory; [2]University of Wisconsin; [3]North Carolina State University; [4]University of Michigan; [5]University of Florida

2:50 PM
Constructing Multi-component Diffusion under Irradiation in U-Mo Alloys: *B. Beeler*[1]; B. Ye[2]; Y. Gao[3]; S. Hu[4]; [1]North Carolina State University; [2]Argonne National Laboratory; [3]Idaho National Laboratory; [4]Pacific Northwest National Laboratory

3:10 PM
Effective Bias for Interstitial Clusters to Cavities in BCC Fe: *Y. Wang*[1]; F. Gao[1]; B. Wirth[2]; [1]University of Michigan - Ann Arbor; [2]University of Tennessee, Knoxville

3:30 PM
Microscale Measurement of Elastic Constants in Ceramics Using Picosecond Ultrasonics for High Throughput Characterization and Atomic Model Validations: *Y. Wang*[1]; D. Hurley[2]; Z. Hua[2]; A. Khanolkar[2]; C. Dennett[2]; M. Khafizov[1]; [1]Ohio State University; [2]Idaho National Laboratory

3:50 PM
Effect of Distributed Gas Bubbles on Elastic-plastic Deformation Behavior in Polycrystalline UMo: *S. Hu*[1]; B. Beeler[2]; D. Burkes[1]; [1]Pacific Northwest National Laboratory; [2]North Carolina State University

4:10 PM
Molecular Dynamics Study of Cascade Overlap Effects in FCC Ni: *S. Morris*[1]; B. Wirth[1]; [1]University of Tennessee-Knoxville

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Microstructure-based Fatigue Studies on Additive-Manufactured Materials (Jointly Organized with Fatigue in Materials Symposium)

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

Wednesday PM **March 17, 2021**

2:00 PM
Fatigue Crack Growth and Fracture Toughness Behavior of Laser Powder Bed Fusion Titanium Alloys: *J. Kruzic*[1]; T. Hasib[1]; X. Li[1]; [1]University of New South Wales

2:20 PM
Fatigue Crack Growth Rate of Electron Beam Melted (EBM) Titanium Alloy (Ti-6Al-4V): Effect of Crystallographic Texture and Internal Porosity: *N. Hrabe*[1]; J. Benzing[1]; N. Derimow[1]; T. Quinn[1]; J. Splett[1]; L. Koepke[1]; [1]National Institute of Standards and Technology

2:40 PM Invited
Automotive-specific Requirements for Additive Manufacturing of Metal Materials: *T. Brown*[1]; W. Poling[1]; [1]General Motors

3:10 PM
Laser Powder Bed Fusion of Hydride-dehydride Ti-6Al-4V Powders: Effect of Hot Isostatic Pressing on Microstructure and Mechanical Properties: *M. Asherloo*[1]; Z. Wu[2]; S. Yarasi[2]; M. Paliwal[3]; M. Marucci[3]; J. Capone[4]; A. Rollett[2]; A. Mostafaei[1]; [1]Illinois Institute of Technology; [2]Carnegie Mellon University; [3]Kymera International - Reading Alloys; [4]Ametek Inc.

3:30 PM
Towards Validation for Computed Tomography Processes for Additive Manufacturing: G. Jones[1]; J. Keist[1]; R. Reed[2]; *V. Sundar*[2]; [1]The Pennsylvania State University; [2]UES Inc.

Additive Manufacturing of Functional, Energy, and Magnetic Materials — Advanced Manufacturing of Magnetic Materials

Sponsored by: TMS Functional Materials Division, TMS: Additive Manufacturing Committee, TMS: Magnetic Materials Committee
Program Organizers: Markus Chmielus, University of Pittsburgh; Sneha Prabha Narra, Worcester Polytechnic Institute; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University; Iver Anderson, Iowa State University Ames Laboratory

Wednesday PM **March 17, 2021**

2:00 PM Invited
Development of High-temperature Permanent Magnet Alloys for Additive Manufacturing: *R. Ott*[1]; E. Simsek[1]; R. Chaudhary[1]; S. McCall[2]; A. Baker[2]; [1]Ames Laboratory/Cmi; [2]Lawrence Livermore National Laboratory

2:20 PM
Advanced Design for Lightweighting Wind Power Generators Using Additively Manufactured Hard and Soft Magnets: *L. Sethuraman*[1]; G. Vijayakumar[1]; S. Ananthan[1]; J. Keller[1]; M. Paranthaman[2]; [1]National Renewable Energy Laboratory; [2]Oak Ridge National Laboratory

2:40 PM
An Additive Manufacturing Design Approach to Achieving High Strength and Ductility in Traditionally Brittle Alloys via Laser Powder Bed Fusion: *A. Kustas*[1]; T. Babuska[1]; K. Johnson[1]; T. Verdonik[2]; S. Subia[1]; B. Krick[3]; D. Susan[1]; [1]Sandia National Laboratories; [2]Lehigh University; [3]Florida State University

3:00 PM
Cold Spray of Permanent Magnets: *A. Baker*[1]; R. Thuss[2]; N. Woollett[1]; E. Stavrou[1]; S. McCall[1]; H. Radousky[1]; [1]Lawrence Livermore National Laboratory; [2]TTEC LLC

3:20 PM
Establishing Fundamentals for Laser Metal Deposition of Functional Ni-Mn-Ga Alloys: Effect of Rapid Solidification on Microstructure and Phase Transformation Characteristics: *E. Flitcraft*[1]; J. Toman[2]; M. Chmielus[2]; C. Fink[1]; [1]Ohio State University; [2]University of Pittsburgh

Additive Manufacturing: Beyond the Beam II — Material Deposition for Sinter Densification

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Paul Prichard, Kennametal Inc.; James Paramore, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal

Wednesday PM **March 17, 2021**

2:00 PM
Wall Thickness Effects on Dimensional Variation, Microstructure, and Mechanical Properties in Stainless Steel Samples Manufactured Using a Bound Metal Deposition (BMD) Sintering Process: *J. Forsmark*[1]; E. Wolbeck[1]; I. Arretche[1]; E. Poczatek[1]; Y. Bai[1]; H. Ohtani[1]; S. Chowdhury[1]; [1]Ford Motor Company

2:20 PM
Bi-metal Composite Material for Plastic Injection Molding Tooling Applications via Fused Filament Fabrication Process
: *M. Seleznev*[1]; J. Roy-Mayhew[1]; [1]Markforged Inc.

2:40 PM
Direct Ink Writing of Ceramic Architected Materials: *R. Thiraux*[1]; L. Valdevit[1]; [1]University of California, Irvine

3:00 PM
Beyond the Beam Additive Manufacturing of Titanium Alloys: *J. Paramore*[1]; B. Butler[1]; M. Dunstan[1]; D. Lewis[1]; M. Hurst[1]; L. Moody[1]; [1]U.S. Army Research Laboratory

3:20 PM
Spatial Architecture of Copper Fillers in Additively Manufactured PLA-matrix Composite: *N. Haque*[1]; H. Noori[1]; [1]Oklahoma State University

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — Titanium Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee
Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

Wednesday PM **March 17, 2021**

2:00 PM Invited
Prediction of Large Regions of Microstructure and Phase Distributions for Additive Manufactured Alloys Prediction of the Microstructure, Resultant Phases and Hardness of Additively Manufactured Ti6Al4V: S. Liu[1]; K. Hong[1]; *Y. Shin*[1]; [1]Purdue University

2:30 PM
Designing Duplex Microstructures in Additive Manufactured Ti Alloys: An Avenue to Achieve High Strength and Ductility: *J. Bustillos*[1]; A. Moridi[1]; [1]Cornell University

2:50 PM
Controlled Thermal Post-processing of Additively Manufactured Ti-6Al-4V Parts in Order to Enhance their Mechanical Performance: *F. Rossi Kaschel*[1]; R. Vijayaraghavan[1]; P. McNally[1]; M. Celikin[1]; D. Dowling[1]; [1]I-Form Advanced Manufacturing Centre

3:10 PM
Recyclability of Ti-6Al-4V Powders Used in Additive Manufacturing: Perspectives and Outlooks: *N. Derimow*[1]; N. Hrabe[1]; [1]National Institute of Standards and Technology

3:30 PM
Microstructure Control in a Beta Titanium Alloy via Selective Laser Melting: *S. Tekumalla*[1]; A. Tan Sui Wei[2]; K. Manickavasagam[2]; M. Seita[1]; [1]Nanyang Technological University; [2]Advanced Remanufacturing Technology Centre

3:50 PM
Second Phase Precipitation during AM Processing of Metastable Beta Ti Alloys
: *M. Nartu*[1]; S. Mantri[1]; A. Sharma[1]; E. Ivanov[2]; K. Cho[3]; B. McWilliams[3]; N. Dahotre[1]; R. Banerjee[1]; [1]University of North Texas; [2]Tosoh SMD; [3]CCDC, US Army Research Laboratory

4:10 PM
Main Microstructural Characteristics of Ti-6Al-4V Components Produced via Electron Beam Additive Manufacturing (EBAM): *S. Lopez-Castaño*[1]; P. Emile[2]; C. Archambeau[2]; F. Pettinari-Sturmel[3]; J. Douin[3]; [1]CEMES-CNRS / Airbus Operations S.A.S.; [2]Airbus Operations S.A.S.; [3]CEMES-CNRS

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session VI

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara
; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Wednesday PM **March 17, 2021**

2:00 PM Invited
Dominant Microstructural Features for Structural Properties in Additively Manufactured AlSi10Mg: *J. Carroll*[1]; C. Laursen[1]; P. Noell[1]; J. Emery[1]; D. Moore[1]; G. Pataky[2]; [1]Sandia National Laboratories; [2]Clemson University

2:30 PM Invited
Investigation of Porosity, Texture, and Damage Evolution of Additively Manufactured 316L Stainless Steel during In-situ Tensile Loading Using High Energy X-rays: *A. Murphy-Leonard*[1]; D. Rowenhorst[1]; [1]Naval Research Laboratory

3:00 PM
Temperature-dependent Intermittent Microplasticity: Q. Rizzardi[1]; C. McElfresh[2]; J. Marian[2]; D. Stauffer[3]; *R. Maass*[4]; [1]University of Illinois Urbana Champaign; [2]University of California Los Angeles; [3]Bruker Nano Surfaces; [4]Federal Institute for Materials Research and Testing (BAM)

3:20 PM
Characterization and Modeling of Fatigue-induced Grain Growth in Ultrafine Grained Ni: *A. Barrios*[1]; E. Kakandar[2]; X. Maeder[3]; G. Castelluccio[2]; O. Pierron[1]; [1]Georgia Institute of Technology; [2]Cranfield University; [3]Empa, Swiss Federal Laboratories for Materials Science and Technology

3:40 PM Invited
Microstructure Evolution of a Stainless Steel Produced via Laser Powder Bed Fusion Subjected to Post-Fabrication Treatments: *G. Proust*[1]; W. Kan[2]; Q. Portella[3]; M. Chemkhi[4]; M. Garbrecht[1]; D. Retraint[3]; [1]University of Sydney; [2]Monash University; [3]University of Technology of Troyes; [4]EPF

4:10 PM
Informing Mechanical Model Development Using Lower-dimensional Descriptions of Microstructural Evolution: *D. Pagan*[1]; G. Schmidt[2]; A. Borum[2]; T. Long[2]; M. Miller[2]; A. Beaudoin[3]; [1]Pennsylvania State University; [2]Cornell University; [3]Cornell High Energy Synchrotron Source

4:30 PM
Effects of Room Temperature Interface Sliding in TIMETAL-407 (Ti-407): *Z. Kloenne*[1]; G. Viswanathan[1]; S. Antonov[2]; S. Fox[3]; M. Loretto[4]; H. Fraser[1]; [1]Ohio State University; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]TIMET; [4]University of Birmingham

4:50 PM
Combined In-situ Neutron and Synchrotron X-ray Diffraction Study of Tensile Deformation and Texture Evolution in a Magnesium Alloy: *T. Liu*[1]; A. Rohatgi[1]; K. An[2]; Y. Ren[3]; B. Ghaffari[4]; E. Barker[1]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Oak Ridge National Laboratory; [3]Argonne National Laboratory; [4]Ford Motor Company

5:10 PM
Modeling the Effects of Free Surfaces on Twinning Behavior: *B. Leu*[1]; M. Arul Kumar[2]; I. Beyerlein[1]; [1]University of California Santa Barbara; [2]Los Alamos National Laboratory

Advanced Functional and Structural Thin Films and Coatings — Thin Films and Nanostructures for Optoelectronics I

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Wednesday PM **March 17, 2021**

2:00 PM Keynote
Multi-photon Microfabrication: from Direct Laser Writing to 4D Microprinting: *A. Spangenberg*[1]; [1]IS2M

2:45 PM
Facile Synthesis of 3D Dendritic Gold Nanostructures Assisted by a Templated Growth Process: Application at the Detection of Traces of Molecules: *K. Mougin*[1]; P. Bauer[1]; [1]Is2m Cnrs

3:10 PM Keynote
Highly Doped Si Metasurfaces Obtained by Coupling Top Down and Out of Equilibrium Approaches: J. Poumirol[1]; C. Majorel[1]; N. Chery[1]; M. Zhang[1]; C. Girard[1]; N. Mallet[2]; F. Cristiano[2]; P. Wiecha[2]; G. Larrieu[2]; S. Kerdiles[3]; A. Royet[3]; P. Acosta[3]; V. Paillard[1]; *C. Bonafos*[1]; [1]Cemes Cnrs; [2]LAAS-CNRS; [3]CEA-LETI

3:55 PM
Key Mechanical Test Methods to Characterize Optically Clear Adhesives: *M. Yahyazadehfar*[1]; A. Samadi[1]; L. Carbajal[1]; M. Lamontia[1]; [1]DuPont

4:15 PM
Spin Coating of Doped-silica on Czochralski-Silicon for Enhanced Radiative Properties: *S. Abedrabbo*[1]; E. Benchafia[1]; A. Fiory[2]; N. Ravindra[2]; [1]Khalifa University; [2]New Jersey Institute of Technology

Advanced Magnetic Materials for Energy and Power Conversion Applications — Magnetocaloric and Energy Harvesting

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Richard Beddingfield, North Carolina State University; Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Huseyin Ucar, California Polytechnic University; Yongmei Jin, Michigan Technological University; Arcady Zhukov, University of the Basque Country

Wednesday PM **March 17, 2021**

2:00 PM
Bulk-Nano Spark Plasma Sintered Fe-Si-B-Cu-Nb Based Magnetic Alloys: *T. Larimian*; T. Borkar[1]; V. Chaudhary[2]; R. Ramanujan[2]; r. Gupta[3]; J. Christudasjustus[3]; [1]Cleveland State University; [2]Nanyang Technological University; [3]University of Akron

2:20 PM Invited
Characterization of Binder Jet 3D Printed and Direct Laser Deposited Functional Magnetic Materials: *M. Chmielus*[1]; J. Toman[1]; P. Rodriguez de Vecchis[1]; T. Paplham[1]; A. Acierno[1]; K. Kimes[1]; E. Stevens[1]; [1]University of Pittsburgh

2:40 PM
Magnetics and Magnetoelastics of Ce-doped Cobalt Ferrite Processed under the Influence of Magnetic Field: M. Reddy[1]; *T. Jayaraman*[2]; N. Patil[2]; D. Das[1]; [1]University of Hyderabad; [2]University of Michigan-Dearborn

3:00 PM
Magnetoelasic Domains in Fe-Ga Alloys: M. Tianen[1]; *Y. Jin*[1]; [1]Michigan Technological University

3:20 PM
Overview of Material Thermal Properties for the Advancement of Machine Learning Based Magnetic Design: *Z. Miller*[1]; [1]North Carolina State University

3:40 PM Invited
Spin Crossover Complexes as Multicaloric Materials: *S. Vallone*[1]; K. Sandeman[1]; [1]The City University of New York

Advanced Materials for Energy Conversion and Storage VII — Energy Storage with Emphasis on Batteries I

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Wednesday PM **March 17, 2021**

2:00 PM
Lithium Solid State Batteries as Next Generation Energy Storage Devices: *P. Barai*[1]; A. Ngo[1]; L. Curtiss[1]; V. Srinivasan[1]; [1]Argonne National Laboratory

2:30 PM
A Simple Method to Fabricate Cu6Sn5 Anodes for Lithium-ion Batteries: *X. Tan*[1]; Q. Gu[2]; S. McDonald[1]; K. Nogita[1]; [1]University of Queensland; [2]Australian Synchrotron, ANSTO

2:50 PM
Bio-inspired, Machine Learning-enabled Vascular Structures for Fast-Charging Lithium-ion Batteries: *P. Hsu*[1]; [1]Duke University

3:10 PM
Coating Yeast-derived Carbon Nanotubes on Separators to Suppress Li-S Battery Shuttle Effect: J. He[1]; Z. Gao[1]; *X. Li*[1]; [1]University of Virginia

3:30 PM
Electrochemically Grown Energy Dense Cathodes for Li and Na Ion Battery: *A. Patra*[1]; O. Kazi[1]; J. Davis[1]; B. Zahiri[1]; P. Braun[1]; [1]University of Illinois at Urbana-Champaign

3:50 PM
Lithium-sulfur Batteries Featuring High Sulfur Loading and Low Electrolyte: S. Chung[1]; *Y. Ho*[1]; [1]National Cheng Kung University

4:10 PM
Mesoscale Origin of Morphological Instability in All-Solid-State Lithium Batteries: *B. Vishnugopi*[1]; P. Mukherjee[1]; [1]Purdue University

Advanced Real Time Imaging — Mechanical (Joint session with Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling Symposium)

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 Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, KTH Royal Institute of Technology; David Veysset, Stanford University

Wednesday PM **March 17, 2021**

2:00 PM Invited
Real Time Studies of the Mechanics of Spherical Microparticles: L. He[1]; X. Wang[1]; D. Veysset[2]; *M. Hassani*[1]; [1]Cornell University; [2]MIT

2:20 PM
Determination of Uranium Oxidation Kinetics Through White-Light Interferometry: *Y. Idell*[1]; W. Siekhaus[1]; K. Blobaum[1]; W. McLean[1]; [1]Lawrence Livermore National Laboratory

2:40 PM
The Accurate Measurement of Elastic Modulus and Hardness of Different Cross-linked SU-8 Polymer: *P. Sarkar*[1]; P. Pant[1]; H. Nanavati[1]; [1]Indian Institute of Technology Bombay

3:00 PM
Lubrication Mechanism of Phosphonium Phosphate Ionic Liquid: a Combined In Situ Atomic Force Microscopy and Ex Situ Surface Spectroscopic Study: *F. Mangolini*[1]; Z. Li[1]; O. Morales-Collazo[1]; J. Sadowski[2]; H. Celio[1]; A. Dolocan[1]; J. Brennecke[1]; [1]University of Texas at Austin; [2]Brookhaven National Laboratory

3:20 PM Invited
Mapping Local Strains during *In Situ* SEM Deformation of Nanoporous Materials: K. Schmalbach[1]; *N. Mara*[1]; A. Antoniou[2]; [1]University of Minnesota; [2]Georgia Institute of Technology

3:40 PM
Local Shock Viscosity Measurement in Composites Using In-situ Time-Gated Raman Spectroscopy: *A. Dhiman*[1]; A. Olokun[1]; N. Lewis[1]; V. Tomar[1]; [1]Purdue University

Advanced Real Time Imaging — Mechanical (Joint session with the 'Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling' Symposium)

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 Energy Technology Laboratory; David Alman, National Energy Technology Laboratory; Il Sohn, Yonsei University; Hiroyuki Shibata, Imram, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology; Noritaka Saito, Kyushu University; Anna Nakano, US Department of Energy National Energy Technology Laboratory; Zuotai Zhang, Southern University of Science and Technology; Candan Tamerler, University of Kansas; Bryan Webler, Carnegie Mellon University; Wangzhong Mu, KTH Royal Institute of Technology; David Veysset, Stanford University

Wednesday PM **March 17, 2021**

2:00 PM Invited
Real Time Studies of the Mechanics of Spherical Microparticles: L. He[1]; X. Wang[1]; D. Veysset[2]; *M. Hassani*[1]; [1]Cornell University; [2]MIT

2:20 PM
Determination of Uranium Oxidation Kinetics Through White-Light Interferometry: *Y. Idell*[1]; W. Siekhaus[1]; K. Blobaum[1]; W. McLean[1]; [1]Lawrence Livermore National Laboratory

2:40 PM
The Accurate Measurement of Elastic Modulus and Hardness of Different Cross-linked SU-8 Polymer: *P. Sarkar*[1]; P. Pant[1]; H. Nanavati[1]; [1]Indian Institute of Technology Bombay

3:00 PM
Lubrication Mechanism of Phosphonium Phosphate Ionic Liquid: a Combined In Situ Atomic Force Microscopy and Ex Situ Surface Spectroscopic Study: *F. Mangolini*[1]; Z. Li[1]; O. Morales-Collazo[1]; J. Sadowski[2]; H. Celio[1]; A. Dolocan[1]; J. Brennecke[1]; [1]University of Texas at Austin; [2]Brookhaven National Laboratory

3:20 PM Invited
Mapping Local Strains during *In Situ* SEM Deformation of Nanoporous Materials: K. Schmalbach[1]; *N. Mara*[1]; A. Antoniou[2]; [1]University of Minnesota; [2]Georgia Institute of Technology

3:40 PM
Local Shock Viscosity Measurement in Composites Using In-situ Time-Gated Raman Spectroscopy: *A. Dhiman*[1]; A. Olokun[1]; N. Lewis[1]; V. Tomar[1]; [1]Purdue University

Advances in Surface Engineering III — Session II

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

Program Organizers: Tushar Borkar, Cleveland State University; Arif Mubarok, PPG; Rajeev Gupta, North Carolina State University; Sandip Harimkar, Oklahoma State University; Bharat Jasthi, South Dakota School of Mines & Tech

Wednesday PM **March 17, 2021**

2:00 PM
Electropolishing of Bronze in Concentrated H3PO4: *G. Ni*[1]; C. Kim[1]; [1]University of Texas at Arlington

2:20 PM
Enhancement of Liquid Metal Wetting by Patterning Particles on Oxide Surfaces: *J. Park*[1]; J. Nicholas[2]; Y. Qi[1]; [1]Brown University; [2]Michigan State University

2:40 PM
Magnetron Sputtered Micro-lattice Structures: Expanding the Materials Working Space of Lattice Materials: *A. Garcia Taormina*[1]; C. Kurpiers[2]; A. Hodge[1]; R. Schwaiger[3]; [1]University of Southern California; [2]Karlsruhe Institute of Technology; [3]Karlsruhe Institute of Technology, Forschungszentrum Juelich GmbH

3:00 PM
Modifying Corrosion Performance of Plasma Electrolytic Oxidation (PEO) Coatings using Potassium Hydroxide (KOH) and Potassium Fluoride (KF) Additives: *N. Attarzadeh*[1]; M. Molaei[2]; A. Fattah-alhosseini[2]; [1]University of Texas at El Paso; [2]Bu-Ali Sina University

3:20 PM
Nitriding-assisted Surface Enhancement of Multi-principal Element Alloys: *Y. Lin*[1]; D. Poerschke[1]; [1]University of Minnesota

3:40 PM
Phase-field Approach on Modeling Wetting of Rough Surfaces: *D. Kim*[1]; M. Tonks[1]; [1]University of Florida

4:00 PM
The Role of Particle Passivation Layers in the Critical Adhesion Velocity of Cold Sprayed Powders: *C. Crook*[1]; L. Valdevit[1]; D. Mumm[1]; D. Apelian[1]; [1]University of California, Irvine

4:20 PM
Trace Element Distributions in Al-Zn Based Coating Alloys on Steel Substrates: *D. Qu*[1]; M. Gear[1]; N. Setargew[2]; W. Renshaw[2]; S. McDonald[1]; D. StJohn[1]; D. Paterson[3]; K. Nogita[1]; [1]The University of Queensland; [2]BlueScope Steel Ltd; [3]Australian Synchrotron

Advances in Titanium Technology — Phase Transformation and Deformation in Titanium Alloys

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

Program Organizers: Don Li, Howmet Engineered Products; Yufeng Zheng, University of Nevada-Reno
; Peeyush Nandwana, Oak Ridge National Laboratory; Matthew Dunstan, US Army Research Laboratory

Wednesday PM **March 17, 2021**

2:00 PM
Hierarchical Twinning Microstructure in Beta Titanium Alloys: D. Li[1]; W. Zhao[1]; Z. Kloenne[2]; S. Antonov[3]; D. Wang[4]; Y. Gao[2]; Y. Wang[2]; H. Fraser[2]; *Y. Zheng*[1]; [1]University of Nevada, Reno; [2]Ohio State University; [3]Max-Planck-Institut für Eisenforschung; [4]Xi'an Jiaotong University

2:20 PM
How Microtextured Regions Influence the Early Slip Activity in Ti Alloys: *S. Hemery*[1]; A. Naït-Ali[1]; L. Signor[1]; P. Villechaise[1]; M. Echlin[2]; J. Wendorf[2]; J. Stinville[2]; T. Pollock[2]; M. Gueguen[1]; [1]ISAE-ENSMA; [2]UCSB

2:40 PM
Influence of Microtextured Regions on Early Plasticity in Ti64: *J. Wendorf*[1]; J. Stinville[1]; M. Charpagne[1]; M. Echlin[1]; A. Polonsky[1]; P. Dawson[2]; T. Pollock[1]; [1]University of California Santa Barbara; [2]Cornell University

3:00 PM
Localization of Plastic Strain in Microtextured Regions of Ti-6Al-4V: *J. Cappola*[1]; J. Stinville[2]; M. Charpagne[2]; P. Callahan[3]; M. Echlin[2]; T. Pollock[2]; A. Pilchak[4]; M. Kasemer[1]; [1]University of Alabama; [2]University of California, Santa Barbara; [3]US Naval Research Laboratory; [4]Air Force Research Laboratory

3:20 PM
Anomalous c+a Dislocation Activity in TIMETAL-407 (Ti-407): *Z. Kloenne*[1]; G. Viswanathan[1]; B. Pang[2]; S. Fox[3]; M. Loretto[2]; H. Fraser[1]; [1]Ohio State University; [2]University of Birmingham; [3]TIMET

3:40 PM
Colony Orientation Dependence in the Deformation and Spheroidization of Two-Phase Titanium Alloys: *B. Begley*[1]; C. Frampton[1]; T. Spradley[1]; J. Perez[1]; A. Pilchak[2]; V. Miller[1]; [1]University of Florida; [2]Air Force Research Laboratory

4:00 PM
Effect of Grain Orientation on Slip Transmission in Titanium: An Analysis of Strain Localization within Slip Bands: *B. Ahmadikia*[1]; I. Beyerlein[1]; [1]University of California, Santa Barbara

AI/Data informatics: Design of Structural Materials — AI/ML Frameworks; Grain Growth and Simulation Integration

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
Program Organizers: Jennifer Carter, Case Western Reserve University; Amit Verma, Carnegie Mellon University; Natasha Vermaak, Lehigh University; Jonathan Zimmerman, Sandia National Laboratories; Darren Pagan, Pennsylvania State University; Chris Haines, Ccdc Army Research Laboratory; Judith Brown, Sandia National Laboratories

Wednesday PM **March 17, 2021**

2:00 PM Invited
Data Science Approaches for Microstructure-property Connections in Structural Materials: *E. Holm*[1]; b. Lei[1]; K. Jones[1]; R. Cohn[1]; N. Gao[1]; [1]Carnegie Mellon University

2:30 PM Invited
Physics-informed Data-driven Machine Learning Approach for Mesoscale Materials Science: *R. Pokharel*[1]; A. Pandey[1]; A. Scheinker[1]; [1]Los Alamos National Laboratory

3:00 PM Invited
Combined Statistical and Energetic Approach to Understand Grain Boundary Embrittlement for Segregation Engineering: D. Aksoy[1]; R. Dingreville[2]; *D. Spearot*[1]; [1]University of Florida; [2]Sandia National Laboratories

3:30 PM
Machine Learning Approach to Understanding Abnormal Grain Growth: *R. Cohn*[1]; M. Shah[2]; A. Pilchak[2]; E. Payton[2]; A. Rollett[1]; E. Holm[1]; [1]Carnegie Mellon University; [2]Air Force Research Laboratory

3:50 PM
Machine Learning for the Recognition and Synthesis of Polycrystalline Metal Microstructures: *N. Brodnik*[1]; D. Jangid[1]; A. Khan[1]; M. Goebel[1]; M. Echlin[1]; B. Manjunath[1]; S. Daly[1]; T. Pollock[1]; [1]University of California Santa Barbara

4:10 PM Invited
Using Machine Learning for Targeted Alloy Design in High Entropy Composition Spaces: *T. Kirk*[1]; R. Couperthwaite[1]; G. Vazquez[1]; D. Sauceda[1]; P. Honarmandi[1]; P. Singh[2]; R. Arroyave[1]; [1]Texas A&M University; [2]Ames Laboratory

4:30 PM
Unsupervised ML to Bridge Molecular Dynamics and Phase field Simulations: *S. Manna*[1]; H. Chan[1]; S. Sankaranarayanan[1]; [1]Argonne National Laboratory

AI/Data informatics: Tools for Accelerated Design of High-temperature Alloys — High Temperature Mechanical Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Michael Titus, Purdue University; Pinar Acar, Virginia Tech; Andrew Detor, GE Research; James Saal, Citrine Informatics; Dongwon Shin, Oak Ridge National Laboratory

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2:00 PM
Elastic Properties Machine-learning-based Descriptor for a Refractory High Entropy Alloy: *G. Vazquez*[1]; P. Singh[2]; D. Sauceda[1]; R. Arroyave[1]; [1]Texas A&M University; [2]AMES Laboratory

2:20 PM
Predicting Yield Stress of High Temperature Alloys via Computer Vision and Machine Learning: *N. Gao*[1]; Z. Pei[2]; Y. Wen[2]; M. Gao[2]; E. Holm[1]; [1]Carnegie Mellon University; [2]National Energy Technology Laboratory

2:40 PM
Revealing Nanoscale Features Controlling Diffusion Within Multi-component Alloys through Machine Learning: *S. Taheri-Mousavi*[1]; S. Moeini-Ardakani[1]; R. Penny[1]; J. Li[1]; A. Hart[1]; [1]MIT

3:00 PM
Uncertainty Quantification for Thermo-mechanical Behavior of Aircraft Engine Materials in Elevated Temperatures: *A. Senthilnathan*[1]; P. Acar[1]; [1]Virginia Tech

3:20 PM Invited
Coupling of Data Mining, Thermodynamics and Multi-objective Genetic Algorithms for the Design of High-temperature Alloys: *F. Tancret*[1]; E. Menou[2]; G. Ramstein[1]; [1]University of Nantes; [2]Safran

3:50 PM
Leveraging eXtremeMAT's Data-driven Framework for Prediction of Creep Life for High-temperature Alloys: *M. Wenzlick*[1]; R. Devanathan[2]; O. Mamun[2]; K. Rose[3]; J. Hawk[3]; [1]Leidos Research Support Team for the National Energy Technology Laboratory; [2]Pacific Northwest National Laboratory; [3]National Energy Technology Laboratory

4:10 PM
Determining Solute Site Preference and Correlations to Antiphase Boundary Energy in Ni-based Superalloys: *E. Chen*[1]; T. Wang[2]; M. Epler[2]; T. Frolov[3]; M. Asta[1]; [1]University of California, Berkeley; [2]Carpenter Technology Corporation; [3]Lawrence Livermore National Laboratory

Algorithm Development in Materials Science and Engineering — Computational Simulations and Algorithms for Study Structure-Processing Relations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Bryan Wong, University of California, Riverside; Ebrahim Asadi, University of Memphis; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryce Meredig, Citrine Informatics

Wednesday PM **March 17, 2021**

2:00 PM
Real Time Boundary Condition Acquisition and Integration of Heats of Fusion and Phase Transformation Using an Implicit Finite Element Newton Raphson Based Approach for Thermal Behavior Prediction in Additively Manufactured Parts: *D. Pal*[1]; M. Keshavamurty[1]; G. Bhashyam[1]; [1]Ansys

2:20 PM
Integrating Computational Modeling in Machine Learning for Process Optimization in Additive Manufacturing Processes: *F. Ahsan*[1]; J. Razmi[1]; L. Ladani[1]; [1]Arizona State University

2:40 PM
Multi-scale Modeling of Hierarchical Microstructure in Ceramic Composites: *M. Guziewski*[1]; D. Montes de Oca Zapiain[2]; J. Synowczynski-Dunn[1]; R. Dingreville[2]; S. Coleman[1]; [1]Army Research Laboratory; [2]Sandia National Laboratory

3:00 PM
Analysis of Dendrite Growth and Microstructure Evolution during Solidification of Al 6061 via 2D and 3D Phase Field Models: N. Bailey[1]; *Y. Shin*[1]; [1]Purdue University

3:20 PM
A Machine Learning Approach for Predicting Melt Pool Size in Wire-feed DED Process: A. Verma[1]; *Z. Yang*[1]; A. Gruzel[1]; A. Rollett[1]; [1]Carnegie Mellon University

Aluminum Alloys, Processing and Characterization — Processing Innovation, New Applications and Products

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Dimitry Sediako, University of British Columbia

Wednesday PM **March 17, 2021**

2:00 PM
Shear Assisted Processing and Extrusion of Aluminum Alloy 7075 Tubing at High Speed: *S. Whalen*[1]; M. Reza-E-Rabby[1]; T. Wang[1]; X. Ma[1]; T. Roosendaal[1]; D. Herling[1]; N. Overman[1]; B. Taysom[1]; [1]Pacific Northwest National Laboratory

2:20 PM
Shear Assisted Processing and Extrusion of Thin-walled AA 6063 Tubing: *B. Taysom*[1]; S. Whalen[1]; M. Reza-E-Rabby[1]; T. Skszek[2]; M. DiCiano[2]; [1]Pacific Northwest National Laboratory; [2]Magna International

2:40 PM
Influence of the Quench Rate and Trace Elements on 6XXX Alloys: *A. Wimmer*[1]; A. Haemmerle[1]; [1]Neuman Aluminium

3:00 PM
The Combined Method for Producing Long Products from Aluminium and Aluminium Alloys: *A. Salnikov*[1]; C. Heinzel[1]; [1]RUSAL ETC

3:20 PM
Effect of Extrusion Process on Mechanical, Welding and Corrosion Behaviour of 6XXX Series of Aluminium Alloys: *M. Guner*[1]; M. Konar[1]; G. Özçelik[1]; T. Demirkiran[1]; [1]Asas Aluminium

3:40 PM
TIG Welding of Dissimilar High-Strength Aluminum Alloys 6061 and 7075 with Nano-treated Filler Wires: *N. Murali*[1]; X. Li[1]; [1]UCLA Department of Materials Science and Engineering

Aluminum Reduction Technology Across the Decades: An LMD Symposium Honoring Alton T. Tabereaux, Halvor Kvande and Harald A. Øye — Harald Øye Honorary Session: Fundamentals in Anode and Cathode Technology - Joint Session with Electrode Technology

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Arne Ratvik, SINTEF; Marc Dupuis, GeniSim Inc.; Kristian Etienne Einarsrud, Norwegian University of Science and Technology

Wednesday PM **March 17, 2021**

2:00 PM
Introductory Comments: Aluminum Reduction Technology Across the Decades: An LMD Symposium Honoring Alton T. Tabereaux, Halvor Kvande and Harald A. Øye: *K. Einarsrud*[1]; [1]Norwegian University of Science and Technology

2:05 PM
Forty Years of Trondheim International Course on Process Metallurgy of Aluminium: *M. Reverdy*[1]; V. Potocnik[2]; [1]Emirates Global Aluminium; [2]Vinko Potocnik Consultant Inc

2:45 PM
Establishing a Chemical Model of the Melt in the Cathode: *L. Lossius*[1]; H. Øye[2]; [1]Hydro Aluminium AS; [2]NTNU

3:05 PM
Heating New Anodes Using the Waste Heat of Anode Butts: Establishing the Interface Thermal Contact Resistance: *M. Dupuis*[1]; K. Einarsrud[2]; H. Gudbrandsen[2]; [1]GeniSim Inc.; [2]Norwegian University of Science and Technology (NTNU)

3:25 PM
Forty Years of Cathode Block Evolution at EGA: M. Reverdy[1]; *M. Mustafa*[1]; M. Boraie[1]; [1]Emirates Global Aluminium

3:45 PM
Wetting of Carbon Cathodes by Molten Electrolyte and Aluminium: *S. Senanu*[1]; A. Ratvik[1]; Z. Wang[1]; T. Grande[2]; [1]SINTEF; [2]NTNU Norwegian University of Science and Technology

4:05 PM Question and Answer Period

Biological Materials Science — Biological Materials Science II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama

Wednesday PM **March 17, 2021**

2:00 PM Invited
Cancer Testbed for Breast and Prostate Cancer Bone Metastasis: *K. Katti*[1]; H. Jasuja[1]; S. Kar[1]; D. Katti[1]; [1]North Dakota State University

2:30 PM
Conformational Transition of G-Actin Subunits Controls the Deformation Behavior of Actin Filament: *S. Jaswandkar*[1]; K. Kattti[1]; D. Katti[1]; [1]North Dakota State University

2:50 PM
Nanotechnology Enhanced Novel Bioresorbable Zn Alloy Implant for Short Bowel Syndrome Treatment: *J. Liu*[1]; Z. Guan[1]; Y. Zeng[1]; C. Linsley[1]; J. Dunn[2]; B. Wu[1]; X. Li[1]; [1]University of California, Los Angeles; [2]Stanford University School of Medicine

3:10 PM
Novel Zn-Fe-Si Alloy as Biodegradable Stent Material: *Y. Zeng*[1]; Z. Guan[1]; J. Liu[1]; X. Li[1]; [1]UCLA

3:30 PM Invited
Investigating the Remodeling of the Cellular and Collagen Tissue Structures of the Optic Nerve Head in Mouse Models of Glaucoma: *T. Nguyen*[1]; [1]Johns Hopkins University

4:00 PM Invited
Biomineralized Low-density Structural Materials: *L. Li*[1]; [1]Virginia Polytechnic Institute

4:30 PM
Euplectella Aspergillum: Multiscale Structural Characterization, Quantification and Micromechanical Properties: *S. Morankar*[1]; A. Singaravelu[1]; S. Niverty[1]; J. Williams[2]; Y. Mistry[2]; C. Penick[3]; D. Bhate[2]; N. Chawla[1]; [1]Purdue University; [2]Arizona State University; [3]Kennesaw State University

4:50 PM
Freeze Casting of Bioinspired Materials with Extrinsic Control Techniques: *S. Naleway*[1]; I. Nelson[2]; T. Yin[1]; D. Porter[1]; J. Fernquist[1]; J. Alexander[1]; M. Mroz[1]; P. Wadsworth[1]; [1]University of Utah; [2]Sandia National Lab

5:10 PM
Employing Electric Field in the Fabrication of Directionally Porous Ice-templated Ceramics: *D. Ghosh*[1]; S. Akurati[1]; D. Terrones[1]; S. Qian[1]; B. Gundrati[1]; [1]Old Dominion University

Bulk Metallic Glasses XVIII — Structures and Modeling

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Wednesday PM **March 17, 2021**

2:00 PM Invited
Brittle-to-Ductile Transition in Metallic Glasses: *J. Eckert*[1]; [1]Erich Schmid Institute of Materials Science

2:25 PM Invited
Correlated Disorder Order in a Model Binary Glass: *P. Derlet*[1]; [1]Paul Scherrer Insitute

2:50 PM
Effect of Porosity on Fracture Behavior of Porous Bulk Metallic Glasses: *D. Rajpoot*[1]; P. Tandaiya[1]; [1]Indian Institute of Technology Bombay

3:10 PM
Effective Quantification of Liquid Structure in Metallic Alloys and its Relation to Glass-Forming Ability: *P. Weeks*[1]; K. Flores[1]; [1]Washington University in St Louis, Institute of Materials Science and Engineering

3:30 PM Invited
Structural Relaxation and Mechanical Properties of Model Glass Systems at the Micro-second Timescale: *P. Derlet*[1]; R. Maass[2]; [1]Paul Scherrer Insitute; [2]University of Illinois at Urbana Champaign

3:55 PM
Emerging Fractal Potential Energy Landscape as the Origin of Activation Volume in Metallic Glasses: C. Liu[1]; *Y. Fan*[1]; [1]University of Michigan

4:15 PM
Glass Forming Ability of the Cu-Zr Alloys: What Do We Learn from Molecular Dynamics Simulation?: *M. Mendelev*[1]; Y. Sun[2]; F. Zhang[1]; C. Wang[1]; K. Ho[1]; [1]Ames Laboratory; [2]Columbia University

4:35 PM
Stress Breaks Universal Aging Behavior in a Metallic Glass: *A. Das*[1]; P. Derlet[2]; C. Liu[1]; E. Dufresne[3]; R. Maass[1]; [1]University of Illinois at Urbana Champaign; [2]Paul Scherrer Institute; [3]Argonne National Laboratory

4:55 PM
Local Structure of the Al-RE Marginal Metallic Glasses Studied by Molecular Dynamics Simulation: *D. Sariturk*[1]; T. Ulucan[1]; Y. Kalay[1]; [1]Middle East Technical University

Cast Shop Technology — Metal Treatment and Shape Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Samuel Wagstaff, Oculatus

Wednesday PM **March 17, 2021**

2:00 PM
Grain Refinement Efficiency: *R. Vainik*[1]; J. Courtenay[1]; F. Lien[1]; [1]MQP Ltd

2:20 PM
A Comparison of AA6060 Grain Structures Achieved Using AMG's TiBAl Advance™ and Alternative Al-Ti-B Grain Refiners via a 1D Upward Solidification Device: *M. Piper*[1]; S. Akhtar[2]; P. Enright[3]; [1]AMG Aluminum UK Limited; [2]Hydro Aluminium Reseach Centre; [3]NTec

2:40 PM
Mechanism of High Grain Refinement Effectiveness on New Grain Refiner "TiBAl Advance": *A. Minagawa*[1]; M. Piper[2]; [1]Uacj Corporation; [2]AMG Aluminum

3:00 PM
Resonance for Contactless Ultrasonic Treatment in Direct Chill Casting: *C. Tonry*[1]; V. Bojarevics[1]; G. Djambazov[1]; K. Pericleous[1]; [1]Unviersity of Greenwich

3:20 PM
Ultrasonic Melt Treatment in a DC Casting Launder: The Role of Melt Processing Temperature: C. Beckwith[1]; *T. Subroto*[2]; K. Pericleous[1]; G. Djambazov[1]; D. Eskin[2]; I. Tzanakis[3]; [1]University of Greenwich; [2]Brunel University London; [3]Oxford Brookes University

3:40 PM
Residual Stress Prediction in the Casting Process of Automotive Powertrain Components: *S. Kianfar*[1]; J. Stroh[1]; N. Bahramian[1]; D. Sediako[1]; A. Lombardi[2]; G. Byczynski[2]; P. Mayr[3]; M. Reid[4]; A. Paradowska[4]; [1]University of British Columbia; [2]Nemak Canada; [3]Nemak Global; [4]ANSTO

4:00 PM
Coupled Simulation of Misrun, Could Shut, Air Entrainment and Porosity for High Pressure Die Casting Applications: *J. Jakumeit*[1]; H. Behnken[1]; R. Laqua[1]; S. Mbewou[2]; M. Fehlbier[2]; J. Gänz[3]; L. Becker[3]; [1]Access E.V.; [2]Foundry technic, University Kassel; [3]Siemens Industry Software GmbH, DI SW STS CCM TO

4:20 PM
Study on the Mechanical Properties Commercially Vehicle's Wheel Through the Molten-Forged on the A356 Alloy' with a Multi-cavity Fabrication Process: *M. Moon*[1]; M. Yoo[1]; K. Kim[2]; J. Song[1]; J. Oh[1]; [1]Korea Institute of Carbon Convergence Technology; [2]Rheoforge Co., Ltd.

Ceramic Materials for Nuclear Energy Research and Applications — Microstructure and Properties - Experiments and Modeling

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nuclear Materials Committee
Program Organizers: Xian-Ming Bai, Virginia Polytechnic Institute and State University; Yongfeng Zhang, University of Wisconsin-Madison; Larry Aagesen, Idaho National Laboratory; Vincenzo Rondinella, Jrc-Ec

Wednesday PM **March 17, 2021**

2:00 PM Invited
Exotic Magneto-elastic Properties in Uranium Dioxide: *K. Gofryk*[1]; [1]Idaho National Laboratory

2:30 PM Invited
Towards a Model of Coupled Irradiation and Corrosion: A. Banerjee[1]; A. Kohnert[1]; E. Holby[1]; L. Capolungo[1]; *B. Uberuaga*[1]; [1]Los Alamos National Laboratory

3:00 PM
Impact of Dislocation Loops on Thermal Conductivity of CeO2: *M. Khafizov*[1]; L. He[2]; M. Jin[2]; D. Hurley[2]; [1]Ohio State University; [2]Idaho National Laboratory

3:20 PM
Microstructural Analysis and Micro-mechanical Testing on Xenon-irradiated Uranium Dioxide: *M. Cullison*[1]; F. Teng[2]; D. Fraser[2]; B. Kombaiah[2]; K. Mo[3]; J. Lian[4]; T. Chen[1]; F. Cappia[2]; [1]Oregon State University; [2]Idaho National Laboratory; [3]Argonne National Laboratory; [4]Rensselaer Polytechnic Institute

3:40 PM Invited
Comprehensive Treatment of Thermal Transport Under Irradiation in ThO2: *D. Hurley*[1]; M. Khafizov[2]; C. Dennett[1]; A. Khanolkar[1]; Z. Hua[1]; L. He[1]; J. Gan[1]; A. ElAzab[3]; M. Salaken[3]; C. Jiang[1]; M. Jin[1]; R. Deskins[3]; B. Kausubh[1]; C. Marianettii[4]; M. Mann[5]; [1]Idaho National Laboratory; [2]Ohio State University; [3]Purdue University; [4]Columbia University; [5]AFRL

4:10 PM
TEM Characterization of Dislocation Loops in Ion-irradiated Single Crystal ThO_2: *K. Bawane*[1]; X. Liu[1]; T. Yao[1]; M. Khafizov[2]; A. French[3]; M. Mann[4]; L. Shao[3]; J. Gan[1]; D. Hurley[1]; L. He[1]; [1]Idaho National Laboratory; [2]Ohio State University; [3]Texas A&M University; [4]Air Force Research Laboratory

4:30 PM
Hydrothermal Corrosion of Silicon Carbide: *J. Xi*[1]; D. Morgan[1]; I. Szlufarska[1]; [1]University of Wisconsin-Madison

4:50 PM
TMIST-3A Post-irradiation Examination: *M. Lanza*[1]; W. Luscher[1]; D. Senor[1]; G. Hoggard[2]; [1]Pacific Northwest National Laboratory; [2]Idaho National Laboratory

Characterization of Materials through High Resolution Imaging — High Resolution Characterization of Materials with General Coherent Imaging Techniques

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation 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 Institut; Mathew Cherukara, Argonne National Laboratory

Wednesday PM **March 17, 2021**

2:00 PM Keynote
The Fourth is Strong in These Ones!: *I. McNulty*[1]; [1]MAX IV Laboratory

2:30 PM
X-ray Based Nanodiffraction to Study Strain in Materials for Nuclear Energy: *E. Jossou*[1]; M. Topsakal[1]; X. Huang[1]; K. Hattar[2]; H. Yan[1]; Y. Chu[1]; C. Sun[3]; L. He[3]; J. Gan[3]; L. Ecker[1]; S. Gill[1]; [1]Brookhaven National Laboratory; [2]Sandia National Laboratories; [3]Idaho National Laboratory

2:50 PM Invited
Imaging Phase Transitions of Quantum Materials with Bragg Coherent X-ray Diffraction: *T. Assefa*[1]; Y. Cao[2]; J. Diao[3]; W. Cha[2]; R. Hardar[2]; K. Kisslinger[1]; M. Dean[1]; G. Gu[1]; J. Tranquada[1]; I. Robinson[1]; [1]Brookhaven National Laboratory; [2]Argonne National Laboratory; [3]University College London

3:20 PM
Mesoscale Defect Dynamics in the Bulk with Time-resolved Dark-field X-ray Microscopy: *L. Dresselhaus-Marais*[1]; [1]Lawrence Livermore National Laboratory

3:40 PM Invited
Laboratory and Synchrotron-based X-ray Tomographic Imaging during In Situ Loading of Materials: *B. Patterson*[1]; L. Kuettner[1]; C. Welch[1]; P. Welch[1]; A. Ionita[1]; N. Chawla[2]; X. Xiao[3]; [1]Los Alamos National Laboratory; [2]Arizona State University; [3]Brookhaven National Laboratory

4:10 PM
Magnetic Correlations and Time Fluctuations in Assemblies of Fe3O4 Nanoparticles Probed via X-rays: *K. Chesnel*[1]; [1]Brigham Young University

4:30 PM
Using the Rotation Vector Base Line Electron Back Scatter Diffraction (RVB-EBSD) Method to Characterize Single Crystal Cast Microstructures: *P. Thome*[1]; F. Scholz[1]; J. Frenzel[1]; G. Eggeler[1]; [1]Ruhr-University Bochum

Characterization of Minerals, Metals and Materials 2021 — Advanced Characterization Methods III

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

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2:00 PM
Nanotwinned Ni-Mo-W Alloys with Ultrahigh Strength and Localized Plasticity: *G. Valentino*[1]; J. Krogstad[2]; T. Weihs[1]; K. Hemker[1]; [1]Johns Hopkins University; [2]University of Illinois Urbana-Champaign

2:20 PM
FIB-SIMS in a Multi-Ion Source Plasma FIB: *D. Murray*[1]; X. Pu[1]; [1]Idaho National Lab

2:40 PM
In-situ Nanoscale Characterization of Phase Transformations in Materials Undergoing Ultra-fast Heating and Cooling: *A. Akbari*[1]; J. Ranney[1]; [1]ThermoFisherScientific

3:00 PM
A Study of the Absorption Edge of ZnO Thin Films Prepared by the Spray Pyrolysis Method: *S. Ikhmayies*; [1]

3:20 PM
Modeling Empirical Estimators for the 3D Particle Size, Distribution, and Expected Error from 2D Cross Sections of a Lognormal Distribution of Spherical Particles: *A. Gerlt*[1]; A. Criner[2]; L. Semiatin[2]; K. Wertz[2]; E. Payton[2]; [1]The Ohio State University; [2]Air Force Research Lab

3:40 PM
Imaging Materials and their Evolution with High-Energy X-rays: *J. Almer*[1]; P. Kenesei[1]; J. Park[1]; M. Li[1]; P. Shade[2]; [1]Argonne National Laboratory; [2]Air Force Research Laboratory

4:00 PM
General Guideline of FIB Milling of Metal Alloys: *J. Li*[1]; [1]CanmetMATERIALS

4:20 PM
Integrated, Table-top Instrumentation for High-temperature Thermal Property Measurements of Molten Salts: *H. Yan*[1]; F. Coppo[1]; U. Pal[1]; [1]Boston University

Computational Techniques for Multi-Scale Modeling in Advanced Manufacturing — Modeling of Microstructural Evolution

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Anthony Rollett, Carnegie Mellon University; Laurentiu Nastac, University of Alabama; Mei Li, Ford Motor Company; Alexandra Anderson, Gopher Resource; Srujan Rokkam, Advanced Cooling Technologies Inc

Wednesday PM **March 17, 2021**

2:00 PM Invited
In Situ and Operando Synchrotron Experiments for Additive Manufacturing Model Validation: *P. Lee*[1]; C. Leung[1]; Y. Chen[1]; S. Clark[1]; S. Marussi[1]; R. Atwood[2]; M. Jones[3]; G. Baxter[3]; [1]University College London; [2]Diamond Light Source; [3]Rolls-Royce plc

2:40 PM
Investigation of Powder Spattering in Laser Powder Bed Fusion through Multi-physics Modeling and High-speed Synchrotron X-ray Imaging: *X. Li*[1]; Q. Guo[2]; Z. Young[3]; F. Li[1]; L. Chen[2]; W. Tan[1]; [1]University of Utah; [2]University of Wisconsin-Madison; [3]Missouri University of Science and Technology

3:05 PM
Particle Resolved Simulation of Laser Powder-bed Fusion Including Metal Evaporation and Vapor Plume Dynamics: *J. Jakumeit*[1]; R. Laqua[1]; G. Zheng[1]; Y. Huang[2]; S. Clark[2]; P. Lee[2]; [1]Access E.V.; [2]University College London

3:30 PM
Phase-field Modeling of The Evolution Kinetics of Porous Structure During Dealloying of Binary Alloys: *j. li*[1]; [1]The Hong Kong Polytechnic University

3:55 PM
Fluid Dynamics Effects on Microstructure Prediction in Single-Laser Tracks for Additive Manufacturing: *A. Sabau*[1]; L. Yuan[2]; N. Raghavan[1]; M. Bement[1]; J. Turner[1]; [1]Oak Ridge National Laboratory; [2]University of South Carolina

Computational Thermodynamics and Kinetics — Phase Stability II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

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2:00 PM
Thermodynamic Stability of the Light Elements Doping in $Sm(Fe,Co)_{12}$ Compounds: *A. Saengdeejing*[1]; Y. Chen[1]; [1]Tohoku University

2:20 PM
First-principles Investigation of the Phase Structures and Stabilities in Mg-Zn Alloys: *D. Cheng*[1]; K. Wang[1]; B. Zhou[1]; [1]University of Virginia

2:40 PM
Stability and Phase Transition of Cristobalite in SiO_2: *Y. Chen*[1]; N. Tran[1]; H. Wang[2]; M. Kohyama[3]; S. Kitaoka[4]; T. Mohri[1]; [1]Tohoku University; [2]Shanghai University; [3]AIST; [4]Japan Fine Ceramics Center (JFCC)

3:00 PM
Phase stability and Atomic Diffusion in fcc Fe-Ni Alloys: Interplay between Magnetic and Chemical Degrees of Freedom: *K. LI*[1]; C. Fu[1]; M. Nastar[1]; [1]DEN-Service de Recherches de Métallurgie Physique, CEA, Université Paris-Saclay

3:20 PM
Dislocation Formation Mechanism in Polycrystalline HCP Zr and Zr-2.5wt.%Nb Alloy: *C. Dai*[1]; N. Ofori-Opoku[1]; [1]Canadian Nuclear Laboratories

Environmental Degradation of Additively Manufactured Alloys — AM Materials and Aqueous Corrosion - Part 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; Michael Kirka, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Brendy Rincon Troconis, University of Texas at San Antonio; Luke Brewer, University of Alabama

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2:00 PM
Comparing Corrosion of Alloys Made by Additive Manufacturing and Traditional Methods: *V. Gattu*[1]; S. Ghiasi[2]; W. Ebert[1]; J. Indacochea[2]; [1]Argonne National Laboratory; [2]University of Illinois at Chicago

2:20 PM
Anisotropic Electrochemical Response of Laser Powder Bed Additively Fused Ti6Al4V in Chloride Medium: *S. Mazumder*[1]; M. Pantawane[1]; Y. Ho[1]; N. Dahotre[1]; [1]University of North Texas

2:40 PM
Simulation of the Effect of Corrosion on the Mechanical Properties of Porous Mg Scaffolds Fabricated by Power Bed Laser Fusion for Biomedical Applications: M. Marvi-Mashhadi[1]; M. Li[2]; W. Ali[2]; C. González[3]; *J. Llorca*[3]; [1]Carlos III University; [2]IMDEA Materials Institute; [3]IMDEA Materials Institute & Technical University of Madrid

3:00 PM
Characterization of Corrosion Behavior in Additively Manufactured Al-6061 RAM Processed by Laser Powder Bed Fusion (L-PBF): *H. T-Sarraf*[1]; N. Chawla[1]; [1]Arizona State University

3:20 PM
Effect of Heat Treatment on the Stress Corrosion Cracking Behavior of an Additively Manufactured 7050 Aluminum Alloy Produced by Selective Laser Melting (SLM): *K. Chasse*[1]; C. Owens[1]; R. Rajendran[2]; P. Singh[2]; [1]Northrop Grumman Corporation; [2]Georgia Institute of Technology

3:40 PM
Influence of Cold Spray Deposition Parameters on Pitting of AA2024: *O. Agar*[1]; L. Brewer[1]; [1]University of Alabama

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 17, 2021**

2:00 PM Invited
Cracking Growth Behavior of Irradiated Stainless Steels in Light Water Reactors: *Y. Chen*[1]; B. Alexanderanu[1]; A. Rao[2]; [1]Argonne National Laboratory; [2]Nuclear Regulatory Commission

2:40 PM
Stress Corrosion Cracking of TRIP Fe39Mn20Co20Cr15Si5Al1 (at.%) High Entropy Alloy: *P. Varshney*[1]; R. Mishra[2]; N. Kumar[1]; [1]University of Alabama Tusaloosa; [2]University of North Texas

3:00 PM
An Alternate Approach to DCB Specimens for Determining Sulfide Stress Cracking Thresholds: Constant or Increasing Driving Force Specimens: *C. Popelar*[1]; W. Hickey[1]; J. Sobotka[1]; J. Hallai[2]; Y. Zeng[2]; [1]Southwest Research Institute; [2]ExxonMobil Upstream Research Co

3:20 PM
The Use of Stress Modelling to Understand Possible Effects of Atmospheric Pit Morphology on Stress Corrosion Cracking Initiation in Austenitic Stainless Steels: *A. Parey*[1]; J. Srinivasan[2]; P. Noell[3]; R. Schaller[3]; E. Schindelholz[2]; J. Locke[2]; [1]Sandia National Laboratories and The Ohio State University; [2]The Ohio State University; [3]Sandia National Laboratories

3:40 PM Invited
The Effect of Loading Rate on Environment-assisted Cracking Behavior in Ti, Fe, Al, and Ni-based Structural Alloys: *J. Burns*[1]; Z. Harris[1]; [1]University of Virginia

4:20 PM
Comparison of Surface Treatment Technologies for the Mitigation of Stress Corrosion Cracking in Al-Mg: *M. McMahon*[1]; W. Golumbfskie[1]; E. Dau[2]; [1]Naval Surface Warfare Center, Carderock Division; [2]Vision Point Systems

4:40 PM
Understanding the Effect of Polarization on SCC Resistance and Crack Tip pH of AA6111-T8: *K. Catledge*[1]; M. Nichols[2]; G. Frankel[1]; J. Locke[1]; [1]The Ohio State University; [2]Ford Research and Advanced Engineering, Ford Motor Company

Friction Stir Welding and Processing XI — Derivative Technologies for Dissimilar

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

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2:00 PM
An Analysis of Joint between AZ31 and DP590 Steel Created Using Friction-stir Assisted Scribe Technique: Metallurgical vs Mechanical Bonding: *S. Kulkarni*[1]; H. Das[1]; D. Tamayo[1]; P. Upadhyay[1]; K. Choi[1]; A. Soulami[1]; [1]Pacific Northwest National Laboratory

2:20 PM
Oscillation Behavior of Dissimilar Aluminum/Steel Joints Realized by Ultrasound Enhanced Friction Stir Welding (USE-FSW): *M. Thoma*[1]; A. Gester[1]; G. Wagner[1]; [1]Chemnitz University of Technology

2:40 PM
Process Robustness of Friction Stir Dovetailing of AA7099 to Steel with In Situ AA6061 Interlayer Linking: *M. Reza-E-Rabby*[1]; T. Roosendaal[1]; P. Upadhyay[1]; N. Overman[1]; J. Silverstein[1]; M. McDonnell[1]; S. Whalen[1]; [1]Pacific Northwest National Laboratory

Frontiers in Solidification Science VIII — Additive Manufacturing / Rapid Solidification

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

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2:00 PM Invited
Morphological Evolution during Solidification: T. Stan[1]; A. Chadwick[1]; K. Elder[1]; X. Xiao[2]; *P. Voorhees*[1]; [1]Northwestern University; [2]Brookhaven National Laboratory

2:30 PM
Quantification of the Extent of Disequilibrium at the Solid-liquid Interface during Additive Manufacturing: *P. Pal*[1]; A. Phillion[1]; [1]McMaster University

2:50 PM
Grain Refinement Mechanisms of A6061-RAM2 Metal Matrix Composite Alloys during Laser Powder Bed-fusion (LPB-F): *C. Johnson*[1]; G. Becker[1]; K. Fezzaa[2]; J. Klemm-Toole[1]; J. Iten[3]; A. Clarke[1]; [1]Colorado School of Mines; [2]Argonne National Laboratory; [3]Elementum 3D

3:10 PM Invited
In Situ Studies of Alloy Solidification Using Dynamic TEM: *J. McKeown*[1]; [1]Lawrence Livermore National Laboratory

3:40 PM
Rapid Solidification of Polycrystalline Al-Cu with a Quantitative Phase Field Model and In-situ Imaging: *T. Pinomaa*[1]; J. McKeown[2]; A. Laukkanen[1]; J. Wiezorek[3]; N. Provatas[4]; [1]VTT Technical Research Centre of Finland; [2]Lawrence Livermore National Laboratory; [3]University of Pittsburgh; [4]McGill University

4:00 PM
Numerical Model of Al-33wt%Cu Eutectic Growth during Impulse Atomization: *J. Valloton*[1]; A. Bogno[1]; M. Rappaz[2]; H. Henein[1]; [1]University of Alberta; [2]Ecole Polytechnique Fédérale de Lausanne

Functional Nanomaterials: Functional Low-dimensional Materials (0D, 1D, 2D) Driving Innovations in Electronics, Energy, Sensors, and Environmental Engineering and Science 2021 — 2D Materials & Nanostructures

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee
Program Organizers: Jiyoung Chang, University of Utah; Michael Cai Wang, University of South Florida; Sarah Zhong, University of South Florida; Sun Choi, Korea Institute of Science and Technology; Pei Dong, George Mason University

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2:00 PM Invited
2D Thermoelectric Devices: *X. Zhang*[1]; [1]Stevens Institute of Technology

2:25 PM Invited
Intrinsic and Interfacial Fatigue of Graphene: *T. Filleter*[1]; [1]University of Toronto

2:50 PM Invited
Janus Monolayer-Induced Abnormal Mechanical and Optical Properties in 2D Heterostructures: *S. Huang*[1]; [1]The Pennsylvania State University

3:15 PM
Photoresponse Characterization of Au Nanorods Coated $PtSe_2$: *T. Nakazawa*[1]; S. Kato[2]; D. Kim[1]; J. Nam[2]; H. Kim[1]; [1]Yonsei University; [2]Seoul National University

3:35 PM Invited
Rapid Water Harvesting and Non-thermal Drying in Humid Air by N-doped Graphene Micro-Pads: Y. Wan[1]; Y. Gao[2]; *Z. Xia*[1]; [1]University of North Texas; [2]Northewstern Polytechnical University

4:00 PM
Scalable Fabrication of Freestanding 2D Metallic Nanosheets (2DMNSs) via Top-down Roll-to-roll Processing towards Ångström-scale Thinness: *M. Tanjil*[1]; K. Suero[1]; A. Anderson[1]; O. Douglas[1]; Y. Jeong[1]; Z. Yin[1]; U. Misra[1]; M. Wang[1]; [1]University of South Florida

4:20 PM Invited
Two-dimensional Transition Metal Dichalcogenides for Optoelectronics and Chemiresistive Applications: *J. Choi*[1]; [1]Yeungnam University

4:45 PM
WSe_2 Growth on Hafnium Zirconium Oxide by Molecular Beam Deposition: The Effect of Growth Conditions on the Substrate Properties: *M. Sales*[1]; S. Fields[2]; S. Jaszewski[2]; S. Smith[3]; R. Christopher[4]; N. Shukla[4]; J. Ihlefeld[2]; S. McDonnell[2]; [1]University of Virginia; [2]Department of Materials Science and Engineering, University of Virginia; [3]Materials Science and Engineering Center, Sandia National Laboratories; [4]Department of Electrical and Computer Engineering, University of Virginia

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Functional Heterostructured Materials

Sponsored by: TMS Structural Materials Division, 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
; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Wednesday PM **March 17, 2021**

2:00 PM Invited
Shape Memory Alloys: Using Heterostructure-induced Defects to Train Thermo-mechanical Response: *P. Anderson*[1]; H. Paranjape[2]; S. Manchiraju[3]; M. Mills[1]; [1]Ohio State University; [2]Confluent Medical Technologies; [3]Ansys, Inc.

2:25 PM
Synthesis and Mechanical Characterization of Gradient Nanostructured NiTi Films: P. Rasmussen[1]; *J. Rajagopalan*; [1]Arizona State University

2:45 PM
High Strength and Low Coercivity Cobalt with Three-dimensional Planar Defects Introduced by Heterogeneous Coherent Interface: *J. Song*[1]; G. Liu[1]; Y. Liu[1]; J. Wang[2]; X. Zhang[3]; [1]Shanghai Jiao Tong University; [2]University of Nebraska-Lincoln; [3]Purdue University

3:05 PM
Analysis of Inertially Dampened Structure in High Strain Rate Impacts: *T. Bayless*[1]; J. Downey[1]; [1]Montana Technological University

3:25 PM
Interface Engineered Tungsten Based Nanocomposites and Nanofoams for Harsh Environments: *D. Kiener*[1]; M. Zhao[1]; I. Issa[1]; M. Wurmshuber[1]; [1]University of Leoben

3:45 PM
Hydrogen Charging Behavior of Gradient Structured High-Mn Steels: *J. Kim*[1]; H. Seo[2]; J. Park[2]; S. Baek[2]; A. Amanov[3]; C. Lee[2]; H. Kim[2]; [1]Gyeongsang National University; [2]Pohang Univerisity of Science and Technology; [3]Sun Moon University

4:05 PM
Effects of Constituent Properties on Propagating Stress Waves in Multiphase Composites: *A. Samuel*[1]; I. Beyerlein[1]; F. Zok[1]; [1]University Of California, Santa Barbara

High Entropy Alloys IX: Alloy Development and Properties — Structures and Mechanical Properties II

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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2:00 PM Invited
Dynamic Properties of a High Entropy Alloy -- FeCrMnNi: M. Hawkins[1]; R. Hixson[2]; J. Gigax[2]; N. Li[2]; S. Thomas[1]; *S. Fensin*[2]; [1]Mission Support and Test Services, LLC; [2]Los Alamos National Laboratory

2:20 PM
Effect of Cooling Rate on the High Strain Rate Deformation of Dual-phase High Entropy Alloy: *S. Tamuly*[1]; S. Dixit[1]; V. Parameswaran[1]; P. Khanikar[1]; [1]Indian Institute of Technology Guwahati

2:40 PM
Mechanical and Elastic Behavior as Well as Microstructural Response of NbTaTiV and NbTaTiVZr as a Function of Strain Rate: *M. Hayne*[1]; S. Fensin[1]; T. Saleh[1]; C. Lee[2]; P. Liaw[2]; [1]Los Alamos National Laboratory; [2]The University of Tennessee

3:00 PM
Deformation Mechanism and Microstructural Evolution in $Al_{0.4}$CoCrFeNi High Entropy Alloy: *A. Sittiho*[1]; J. Graves[1]; S. Bhowmick[2]; I. Charit[1]; R. Mishra[3]; [1]University of Idaho; [2]Bruker; [3]University of North Texas

3:20 PM
On the Phase Stability, Mechanical Properties, and Deformation Mechanisms of the Equiatomic CrFeNi Medium-entropy Alloy: *M. Schneider*[1]; G. Laplanche[1]; [1]Ruhr-Universitat Bochum

High Entropy Alloys IX: Structures and Modeling — Modeling and Machine Learning

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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2:00 PM Invited
The Application of High-throughput Calculations in High Entropy Alloys: *Y. Zhong*[1]; [1]Worcester Polytechnic Institute

2:25 PM Invited
Extrapolation of Machine Learning Models for Designing Multi-principal Element Alloys: *J. Saal*[1]; C. Borg[1]; C. Nyby[1]; B. Meredig[1]; [1]Citrine Informatics

2:50 PM
Machine Learning Enabled Prediction of Stacking Fault Energies in Concentrated Alloys: *G. Arora*[1]; A. Manzoor[1]; D. Aidhy[1]; [1]University of Wyoming

3:10 PM Invited
Optimalizing Properties of High Entropy Alloy by Machine Learning and Multiscale Simulations: *J. Li*[1]; Y. Chen[1]; Q. Fang[1]; [1]Hunan University

3:35 PM
Accelerated Exploration of Refractory Multi-principal Element Alloys by Machine Learning: *C. Frey*[1]; C. Borg[2]; J. Saal[3]; B. Meredig[3]; D. Miracle[4]; T. Pollock[1]; [1]University of California, Santa Barbara; [2]Citrine Informatics ; [3]Citrine Informatics; [4]Air Force Research Laboratory

3:55 PM
Ab Initio Modeling on the Elastic Properties of Al-Co-Cr-Fe-Ni High Entropy Alloys: A Case Study with FCC Phase: *S. Yang*[1]; J. Zhang[1]; Y. Zhong[1]; [1]Worcester Polytechnic Institute

High Temperature Electrochemistry IV — Session V

Sponsored by: TMS Extraction and Processing Division, TMS: Nuclear Materials Committee, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

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2:00 PM
Advances in Solid Oxide Membrane Based Electrolysis for Solar-grade Silicon Deposition
: *M. Sugimoto*[1]; H. Yan[1]; F. Coppo[1]; A. Powell[2]; U. Pal[1]; [1]Boston University; [2]Worchester Polytechnic Institute

2:30 PM
Feasibility of Potentiometry for Monitoring Activity of GdCl3 in Molten LiCl-KCl Salt: *G. Cao*[1]; S. Herrmann[1]; G. Fredrickson[1]; R. Hoover[1]; K. Tolman[1]; [1]Idaho National Laboratory

3:00 PM
First-principles Molecular Dynamics and CALPHAD Modeling of the CaF2-MgF2-SiO2 Molten Salt System: *Y. Zhang*[1]; U. Pal[2]; A. Powell[1]; M. Gao[3]; Y. Zhong[1]; [1]Worcester Polytechnic Institute; [2]Boston University; [3]National Energy Technology Laboratory

Hume-Rothery Symposium: Accelerated Measurements and Predictions of Thermodynamics and Kinetics for Materials Design and Discovery — Session VI

Sponsored by: TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Wei Xiong, University of Pittsburgh; Shuanglin Chen, CompuTherm LLC; Wei Chen, Illinois Institute of Technology; James Saal, Citrine Informatics; Greta Lindwall, KTH Royal Institute of Technology

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2:00 PM Invited
Integrated Predictive Materials Science: Filling the ICME Pipeline: *J. Allison*[1]; [1]University of Michigan

2:40 PM Invited
Phonon Anharmonicity Causes the Large Thermal Expansion of NaBr: *B. Fultz*[1]; Y. Shen[1]; C. Saunders[1]; C. Bernal[1]; M. Manley[2]; [1]California Institute of Technology; [2]Oak Ridge National Laboratory

3:20 PM Invited
Multi-cell Monte Carlo Method for Phase Prediction: *M. Ghazisaeidi*[1]; Y. Rao[1]; E. Antillon[2]; c. Niu[3]; W. Windl[1]; [1]Ohio State University; [2]Naval Research Lab; [3]QuesTek Innovations LLC

4:00 PM Invited
Insights from a Comprehensive Assessment of Diffusion Coefficients of 20 Binary Systems and a Comprehensive Diffusion Mobility Database for Magnesium Alloys: *W. Zhong*[1]; Q. Zhang[2]; J. Zhao[1]; [1]University of Maryland; [2]QuesTek Innovations LLC

Magnesium Technology 2021 — Alloying & Processing / Primary Production

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Petra Maier, University of Applied Sciences Stralsund; J. Brian Jordon, University of Alabama; Neale Neelameggham, IND LLC

Wednesday PM **March 17, 2021**

2:00 PM
Absorbable Wire Radiopacity: Influence of Composition and Size on X-ray Visibility: *A. Griebel*[1]; A. Ehle[2]; J. Schaffer[1]; [1]Fort Wayne Metals; [2]Indiana University School of Medicine

2:20 PM
Magnesium and Magnesium Alloy Powder Processing Towards the Development of Near Shape Structural Materials: *S. Johnson*[1]; D. Goncalves[1]; [1]Central Connecticut State University

2:40 PM
Effect of Processing Parameters on the Microstructure and Mechanical Behavior of Additively Manufactured WE43 Mg Alloy: *L. Sorkhi*[1]; J. Hammell[1]; G. Crawford[1]; [1]South Dakota School of Mines & Tecchnogy

3:00 PM
Effect of Sintering Temperature on the Properties of AZ91 Foamed Magnesium Alloy: *H. Zhou*[1]; G. Qiu[1]; Z. Tian[1]; Q. Li[1]; [1]Chongqing University

3:20 PM
Effects of Hot Isostatic Pressing on the Microstructure and Properties of Mg-Gd-Y-Zn Alloys: *J. Meier*[1]; J. Caris[2]; A. Luo[1]; [1]Ohio State University; [2]Terves LLC

3:40 PM
Low-cost Magnesium Primary Production Using Gravity-driven Multiple Effect Thermal System (G-METS) Distillation: *M. Rutherford*[1]; A. Telgerafchi[1]; G. Espinosa[1]; A. Powell[1]; D. Dussault[2]; [1]Worcester Polytechnic Institute; [2]Elemental Beverage

4:00 PM
Efficient Low-cost Gravity-driven Multiple Effect Thermal System (G-METS) Distillation of Magnesium: *A. Telgerafchi*[1]; G. Espinosa[1]; M. Rutherford[1]; A. Powell[1]; D. Dussault[2]; [1]Worcester Polytechnic Institute; [2]Elemental Beverage Company

4:20 PM
Industrial Practice of Extracting Magnesium from Serpentine: *H. Lu*[1]; N. Neelameggham[2]; [1]Beijing Ofikintai Technology Co., Ltd.; [2]IND LLC

Materials Engineering -- From Ideas to Practice: An EPD Symposium in Honor of Jiann-Yang Hwang — Wastewater Treatment

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

Program Organizers: Bowen Li, Michigan Technological University; Baojun Zhao, University of Queensland; Jian Li, CanmetMATERIALS; Sergio Monteiro, Instituto Militar de Engenharia; Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita; Tao Jiang, Central South University; Yong Shi, Futianbao Environment Technologies; Cuiping Huang, FuTianBao Environment Protection Technology Company Ltd.; Shadia Ikhmayies

Wednesday PM **March 17, 2021**

2:00 PM Invited
Mercury Removal by Bio-chars with Plasma Surface Modification: *J. Luo*[1]; [1]Xiamen University

2:20 PM Invited
Electroplating Wastewater Treatment in China: *Z. Huang*[1]; J. Hwang[2]; C. Huang[1]; Y. Shi[1]; [1]Futianbo Environment Protection Technology, Ltd; [2]Michigan Technological University

2:40 PM Invited
Effects of Ozone on COD Reduction in Electroplating Wastewater: *Y. Sun*[1]; J. Hwang[2]; L. Xi[1]; Z. Fu[1]; F. Nian[1]; Y. Yang[1]; X. Chen[1]; [1]Futianbo Environment Protection Technology, Ltd; [2]Michigan Technological University

3:00 PM
Extraction of Cerium from Catalyst of Waste Automobile Exhaust Gas Purifier: C. Ailiang[1]; *G. Luo*[1]; M. Jiale[1]; L. Sujun[2]; M. Yutian[2]; D. Zuojuan[1]; C. Shengli[2]; P. Yujun[1]; Q. Jinxi[1]; B. Li[3]; [1]Central South University; [2]State Key Laboratory of Nickel and Cobalt Resources Comprehensive Utilization; [3]Michigan Technological University

3:20 PM Invited
A New Electroplating Wastewater Treatment Process Using Electric Lime and Vacuum Filtration: *Z. Fu*[1]; J. Hwang[2]; Y. Sun[1]; Y. Yang[1]; F. Nian[1]; L. Xi[1]; Z. Huang[1]; [1]Futianbo Environment Protection Technology, Ltd; [2]Michigan Technological University

3:40 PM
COD Removal from Electroplating Degreasing Wastewater by UV/H2O2 Process: J. Liu[1]; *Z. Chen*[1]; L. Xi[1]; J. Hwang[2]; Y. Shi[1]; [1]Futianbao Environmental protection technology; [2]Michigan Technological University

4:00 PM Invited
Oxidation of Cyanide and Simultaneous Copper Electrodeposition from Electroplating Wastewater in an Electrochemical Reactor: Y. Yang[1]; F. Nian[1]; D. Xu[1]; *Y. Sun*[1]; J. Hwang[2]; P. Qiao[1]; Z. Fu[1]; L. Xi[1]; [1]Futianbo Environment Protection Technology, Ltd; [2]Michigan Technological University

4:20 PM Invited
Treatment of Electroless Nickel Plating Wastewater by Ozone Oxidation: L. Xi[1]; *Y. Sun*[1]; J. Hwang[2]; F. Nian[1]; Z. Fu[1]; Y. Yang[1]; C. Huang[1]; [1]Futianbo Environment Protection Technology, Ltd; [2]Michigan Technological University

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Refractory Alloys: Processing and Properties of Novel Materials

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

Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

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2:00 PM Invited
High-temperature, Thermally-cyclable, Reaction-formed, Co-continuous Refractory Metal/Ceramic Composites for Extreme Environments: *K. Sandhage*[1]; Y. Wang[1]; P. Tumurugoti[1]; C. McCormack[1]; A. Strayer[1]; A. Caldwell[1]; G. Scofield[1]; Z. Chen[1]; R. Rahimi[1]; T. Nguyen[1]; S. Bagherzadeh[1]; K. Trumble[1]; M. Sangid[1]; G. Itskos[1]; M. Caccia[1]; [1]Purdue University

2:30 PM
ICME-guided Design of Novel Metal Matrix Composites for Extreme Environments: D. Linder[1]; *M. Walbrühl*[1]; Q. Zhang[2]; [1]QuesTek Europe AB; [2]QuesTek Innovations

2:50 PM Invited
Ultrahigh Temperature Materials for Improving Turbine Efficiency - The Synopsis of an ARPA-E Program: *Z. Fang*[1]; [1]Advance Research Project Agency-Energy/DOE

3:20 PM Invited
Advanced Refractory Alloys for Use at Temperatures above 1273K: *O. Senkov*[1]; S. Rao[1]; T. Butler[1]; T. Daboiku[1]; E. Payton[1]; [1]Air Force Research Laboratory

3:50 PM
A Powder Metallurgical Route to Fine-grained Refractory Complex Concentrated Alloys: *S. Avetian*[1]; M. Caccia[1]; M. Titus[1]; K. Sandhage[1]; [1]Purdue University

4:10 PM
Hot Isostatic Pressing of Niobium-based Refractory Alloy Powders: *C. Mikler*[1]; B. Welk[1]; B. Georgin[1]; T. Butler[2]; N. Philips[3]; H. Fraser[1]; [1]The Ohio State University; [2]Air Force Research Laboratory; [3]ATI Specialty Alloys and Components

4:30 PM
A Review of Plastic Flow and Microstructure Evolution at Elevated-temperatures in Unalloyed Niobium: *E. Brady*[1]; E. Taleff[1]; [1]University of Texas at Austin

4:50 PM
Effect of Alloy Composition on the Microstructure of Developmental Iridium Alloys: *N. Kohlhorst*[1]; G. Romanoski[2]; G. Muralidharan[2]; R. Miller[2]; J. Zhao[3]; [1]Ohio State Univerity; [2]Oak Ridge National Laboratory (ORNL); [3]University of Maryland, Department of Materials Science and Engineering

5:10 PM
Kinetics of Grain Boundary Segregation in an Ir Alloy*: *D. Pierce*[1]; G. Muralidharan[1]; J. Poplawsky[1]; G. Ulrich[1]; [1]Oak Ridge National Laboratory

Materials Processing Fundamentals — Metal Processing and Manufacturing

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee
Program Organizers: Jonghyun Lee, Iowa State University; Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Fiseha Tesfaye, Abo Akademi University; Guillaume Lambotte, Boston Metal; Antoine Allanore, Massachusetts Institute of Technology

Wednesday PM **March 17, 2021**

2:00 PM
Effect of Dissolution of Titanium Ions on Ti Alloys Electrodeposition from EMIC-$AlCl_3$ Ionic Liquid at Low Temperature: *P. Shinde*[1]; R. Reddy[1]; [1]The University Of Alabama

2:20 PM
Cylindrical and Planar Magnetron Sputtering for Microstructural Control: *A. Alwen*[1]; A. Garcia Taormina[1]; A. Hodge[1]; [1]University of Southern California

Mechanical Behavior of Nuclear Reactor Components — Creep, Fatigue, and Fracture

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee
Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Wednesday PM **March 17, 2021**

2:00 PM Invited
Multiscale Modeling of Creep and Transient Conditions in Steels: Application to HT9 Steel Alloy: *M. Arul Kumar*[1]; A. Tallman[1]; C. Matthews[1]; L. Capolungo[1]; [1]Los Alamos National Laboratory

2:30 PM
Creep Crack Growth Behaviour of Austenitic Stainless Steels Alloy 709 and 316H: *S. Yu*[1]; J. Yan[1]; H. Li[1]; A. Rabiei[2]; P. Bowen[1]; [1]University of Birmingham; [2]North Carolina State University

2:50 PM
Stress Corrosion Cracking Resistance of FeCrAl Alloys in Light Water Reactor Environments: *R. Rebak*[1]; L. Yin[1]; A. Hoffman[1]; [1]GE Global Research

3:10 PM
Enabling In-situ Crack Growth Testing and Monitoring in VTR Cartridge Loop Environments: *S. Briggs*[1]; P. Beck[1]; D. Mangus[1]; J. Quincey[1]; A. Brittan[1]; G. Young[1]; G. Mignot[1]; J. Tucker[1]; [1]Oregon State University

3:30 PM Invited
In-situ Scanning Electron Microscopic Observation of Creep and Creep-fatigue of Alloy 709: A. Lall[1]; R. Ding[2]; P. Bowen[2]; *A. Rabiei*[1]; [1]North Carolina State University; [2]University of Birmingham

4:00 PM
Mechanical Characterization of Neutron Irradiated HT-9 Heats (ORNL, LANL and EBR II) at LWR and Fast Reactor Relevant Temperatures: *R. Prabhakaran*[1]; M. Toloczko[1]; K. Sridharan[2]; [1]Pacific Northwest National Laboratory; [2]University of Wisconsin-Madison

4:20 PM
Burst Behavior of Accident Tolerant Fuel Cladding Concepts under Simulated Loss-of-coolant Conditions: *S. Bell*[1]; B. Pint[1]; K. Kane[1]; [1]Oak Ridge National Laboratory

4:40 PM
C-ring Compression of SiC-SiC Cladding at 1200°C with In-situ X-ray Computed Micro-tomography: *D. Liu*[1]; J. Ell[2]; G. Yuan[1]; P. Xu[3]; R. Lu[4]; E. Lahoda[4]; H. Barnard[2]; D. Parkinson[2]; R. Ritchie[2]; [1]University of Bristol; [2]Lawrence Berkeley National Laboratory; [3]Idaho National Laboratory; [4]Westinghouse Electric Company

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session VI

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Wednesday PM **March 17, 2021**

2:00 PM
Synchrotron X-ray Studies of Deformation and Failure in Cold Spray Composites: L. He[1]; D. Pagan[1]; Q. An[1]; A. Nardi[2]; *M. Hassani*[1]; [1]Cornell University; [2]U.S. Army Research Laboratory

2:40 PM
Metal Foams: Linking Dynamic CT Results to Simulation and Modeling: *L. Hunter*[1]; W. De Boever[2]; M. Humbert[3]; A. Griesser[3]; [1]Tescan USA, Inc; [2]TESCAN XRE; [3]Math2Market

3:00 PM
Non-destructive Inspection of Contaminated Epoxy Plates Using Propagating Acoustic Waves: *I. McBrayer*[1]; F. Barsoum[2]; [1]Embry-Riddle Aeronautical University; [2]Embry-Riddle Aeronautical University

3:20 PM
Rhodium and Cobalt Oxidation: A Nanoscale Study by In-situ and in Operando Atom Probe Tomography: *S. LAMBEETS*[1]; N. Kruse[2]; D. Perea[1]; [1]Pacific Northwest National Laboratory; [2]Washington State University

4:00 PM
Experimental Measurements of Anisotropic Mechanical Behavior of -HMX Crystals: A. Olokun1; A. Dhiman1; V. Tomar1; 1Purdue University

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Pyrometallurgy II

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Wednesday PM **March 17, 2021**

2:00 PM
A Novel Process to Reduce SO_2 Emissions during Electric Furnace Smelting of Sulphides: *D. Tisdale*[1]; S. Muinonen[1]; M. Molinski[1]; A. Stokreef[1]; [1]Glencore Sudbury Integrated Nickel Operations

2:20 PM
Influence of the Cemented Carbides Composition on the Disintegration in Liquid Zinc: *T. Ebner*[1]; S. Luidold[1]; C. Czettl[2]; C. Storf[2]; [1]Montanuniversitaet Leoben; [2]CERATIZIT Austria GmbH

2:40 PM
Study on CFD and Oxygen Lance Injection Technology of High Nickel Ternary Cathode Material Roasting Process in Roller Hearth Furnace: *Z. Wei*[1]; G. Zhang[2]; X. Qian[2]; H. Zhu[1]; [1]Linde Technology Center Shanghai; [2]Zhongtian Energy Materials Co., Ltd.

3:00 PM
Real-time Fe End-point Determination at Sudbury INO Smelter Finishing Converter Using Thermodynamic Process Simulation: *T. Marin-Alvarado*[1]; B. MacKinnon[1]; A. Moraes[1]; K. Westhaver[1]; P. Nelson[1]; N. Lazare[1]; V. McIver[2]; S. Muinonen[2]; [1]XPS Expert Process Solutions; [2]Sudbury Integrated Nickel Operations

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XX — Properties and Microstructures of Electronic Materials

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University

Wednesday PM **March 17, 2021**

2:00 PM Keynote
Effect of Initial Volume Ratio and Reflow Temperature on the Microstructure of SnBiAg-SAC Mixed Solder Joints: *E. Cotts*[1]; F. Hadian[1]; R. Owen[1]; M. Genanu[1]; [1]Binghamton University

2:40 PM
Effect of Low Bi Content on Mechanical Property of Sn-Bi-Zn Alloy before and after Thermal Aging: *H. Nishikawa*[1]; S. Zhou[1]; C. Yang[2]; Y. Shen[2]; S. Lin[2]; [1]Osaka University; [2]National Cheng Kung University

3:00 PM
High-throughput Calculations for Sn-Bi-Ag and Sn-Bi-Ag-In Low-temperature Lead-free Solders: *C. Yang*[1]; Y. Hirata[2]; H. Nishikawa[2]; S. Lin[1]; [1]National Cheng Kung University; [2]Osaka University

3:20 PM
Solid-liquid Interfacial Reaction between Cu and In-48Sn Alloy: *F. Chang*[1]; C. Kao[1]; H. Hung[1]; S. Lin[1]; [1]National Taiwan University

3:40 PM
Using Machine Learning to Predict Hardness of Sn-based Alloys: *Y. Liu*[1]; C. Yang[1]; H. Carillo[1]; C. Lin[1]; S. Lin[1]; [1]National Cheng Kung University

Phase Transformations and Microstructural Evolution — High Entropy Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Wednesday PM **March 17, 2021**

2:00 PM
Microstructutal Evolution of Metals at High Temperature Revealed by In-situ Neutron and Synchrotron X-ray Diffraction: *K. Liss*[1]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT)

2:20 PM
Atomistic Modeling of the Effects of Precipitates in Phase Stability of Fe-Ni Based Alloys: *E. Zarkadoula*[1]; Y. Yang[1]; A. Borisevic[1]; E. George[1]; [1]Oak Ridge National Laboratory

2:40 PM
Microstructural Characterization of As-cast $Al_{2.7}CrFeMnV$, $Al_{2.7}CrFeTiV$, and $Al_{2.7}CrMnTiV$ High Entropy Alloys: *K. Knipling*[1]; P. Callahan[1]; D. Beaudry[2]; R. Michi[3]; [1]U.S. Naval Research Laboratory; [2]Johns Hopkins University; [3]Oak Ridge National Laboratory

3:00 PM
Comparison of Low Temperature Oxidation Behavior of Pure W and MoNbTaW Thin Films: *R. Quammen*[1]; P. Rottmann[1]; [1]University of Kentucky

3:20 PM
Hydrogen-induced Microstructural Transformations in an FeMnCoCr High-entropy Alloy: *M. Ronchi*[1]; H. Yan[1]; S. Wei[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

3:40 PM
Stacking Fault Energy in Metastable Alloys: *M. Shih*[1]; M. Ghazisaeidi[1]; [1]Ohio State University

Rare Metal Extraction & Processing — V, Ce, Mo, Cr, Fe

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Wednesday PM **March 17, 2021**

2:00 PM
Study on the Enhancement of Iron Removal in the Becher Aeration by a Novel Tubular Reactor: *L. Zhou*[1]; Q. Zhao[1]; M. Zheng[1]; Z. Zhang[1]; G. Lv[1]; T. Zhang[1]; [1]Northeastern University

Recent Advances in Functional Materials and 2D/3D Processing for Sensors, Energy Storage, and Electronic Applications — Functional Materials and Printed Electronic Devices

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Ravindra Nuggehalli, New Jersey Institute of Technology; Tolga Aytug, Oak Ridge National Laboratory; Yong Lin Kong, University of Utah; Konstantinos Sierros, West Virginia University

Wednesday PM **March 17, 2021**

2:00 PM Invited
3D Printed Passive Sensors: An Overview: *V. Mehta*[1]; N. Ravindra[2]; [1]Ohio Northern University; [2]New Jersey Institute of Technology

2:25 PM Invited
Direct Metal Contacts Printing on 4H-SiC for Radiation Detection: *N. Taylor*[1]; Y. Yu[2]; M. Ji[2]; N. Ezell[2]; P. Joshi[2]; L. Cao[3]; [1]Oak Ridge National Laboratory; The Ohio State University; [2]Oak Ridge National Laboratory; [3]The Ohio State University

2:50 PM
Modeling of Rheological Properties of Metal Nanoparticle Conductive Inks for Printed Electronics: *P. Dzisah*[1]; N. Ravindra[1]; [1]New Jersey Institute of Technology

3:10 PM
High Strength Nanotwinned Copper Foils for Current Collectors in Lithium Ion Battery: *F. Chen*[1]; C. Chih[1]; [1]National Chiao Tung University

3:30 PM Invited
Advancing Multiscale 3D Printing of Bioelectronics with Soft Matter Physics: *Y. Kong*[1]; [1]University of Utah

3:55 PM Invited
Nanostructured Thin Film Enabled Thermal Emission Based Passive Sensing for Extreme Environment Applications with Optical Fibers: *P. Ohodnicki*[1]; S. Shen[2]; H. Du[3]; [1]University of Pittsburgh; [2]Carnegie Mellon University; [3]Stevens Institute of Technology

Recycling and Sustainability for Emerging Technologies and Strategic Materials — Recycling & Process Optimization II

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: John Howarter, Purdue University; Mingming Zhang, ArcelorMittal Global R&D; Elsa Olivetti, Massachusetts Institute of Technology; Hong Peng, University of Queensland

Wednesday PM **March 17, 2021**

2:00 PM
Ecodesign and Strategic Design of Alloys by Combinatorial Optimisation: *F. Tancret*[1]; M. Bignon[1]; E. Menou[2]; G. Ramstein[1]; E. Bertrand[1]; P. Rivera-Diaz-Del-Castillo[3]; [1]University Of Nantes; [2]Safran; [3]Lancaster University

2:20 PM
Hydrometallurgical Recycling of Bauxite Residue: *H. Tanvar*[1]; B. Mishra; [1]Worcester Polytechnic Institute

2:40 PM
Investigation of Ionic Liquids Isolated Iron for Ductile Iron Castings: *B. Stewart*[1]; H. Doude[1]; M. Abney[2]; E. Fox[2]; J. Edmunson[2]; H. Rhee[1]; [1]Mississippi State University; [2]National Aeronautics and Space Administration

3:00 PM
Uncertainty Analysis and Reduction for Environmental Impact Modeling of Emerging Manufacturing Technologies: *J. Liao*[1]; D. Cooper[1]; [1]University of Michigan

Thermal Property Characterization, Modeling, and Theory in Extreme Environments — Thermal Transport Theory & Mechanisms

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee
Program Organizers: Janelle Wharry, Purdue University; Mukesh Bachhav, Idaho National Laboratory; Marat Khafizov, Ohio State University; Eric Lass, University of Tennessee-Knoxville; Vikas Tomar, Purdue University; Tiankai Yao, Idaho National Laboratory; Cody Dennett, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Wednesday PM **March 17, 2021**

2:00 PM Invited
Thermal Transport in Irradiated ThO2: A Combined Experimental and Phonon Level Investigation: A. El-Azab[1]; *W. Deskins*[1]; M. Singh[1]; S. Mazumder[1]; K. Tomohisa[1]; J. Peng[1]; M. Khafizov[2]; Z. Hua[3]; L. He[3]; D. Hurley[3]; [1]Purdue University; [2]Ohio State University; [3]Idaho National Laboratory

2:30 PM Invited
Thermal Conductivity and Heat Transport Processes of Ion Irradiated and Laser Heated Solids: *P. Hopkins*[1]; T. Pfeifer[1]; E. Scott[1]; J. Gaskins[1]; D. Olson[1]; K. Hattar[2]; M. Goorsky[3]; [1]University of Virginia; [2]Sandia National Labs; [3]UCLA

3:00 PM
Thermal Gradient Effect on the Transport Properties of Helium and Intrinsic Defects in Tungsten: *E. Martinez Saez*[1]; N. Mathew[1]; D. Perez[1]; D. Maroudas[2]; B. Wirth[3]; [1]Los Alamos National Laboratory; [2]University of Massachusetts; [3]University of Tennessee

3:20 PM Invited
Phonon Transport in ThO2 from Neutron Scattering and First-principles Computation: *M. Manley*[1]; M. Bryan[1]; C. Marianetti[2]; L. Fu[2]; K. Gofryk[3]; [1]Oak Ridge National Laboratory; [2]Columbia University; [3]Idaho National Laboratory

3:50 PM Invited
Theory of Non-equilibrium Thermal Transport at High Temperatures from First-principles: *K. Esfarjani*[1]; [1]University of Virginia

2D Materials – Preparation, Properties & Applications — Modeling & Simulations II

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Sufian Abedrabbo, Khalifa University; Amber Shrivastava, Indian Institute of Technology Bombay

Thursday AM **March 18, 2021**

8:30 AM
Cesium Lead Bromides - Structural, Electronic & Optical Properties: *A. Lamichhane*[1]; N. Ravindra[1]; [1]New Jersey Institute of Technology

8:50 AM
Thermoelectric Properties of 2-D B_4C Nanosheets: *A. Gupta*[1]; A. Singh[1]; [1]Arizona State University

9:10 AM
Low Temperature Phonon Anharmonicity in Tungsten Diselenide: *Q. Cai*[1]; [1]University of California, Riverside

9:30 AM
Mechanism of Strain Transfer in Transition Metal Dichalcogenides for Phase Change Transistors: *S. Chowdhury*[1]; T. Peña[1]; S. Wu[1]; H. Askari[1]; [1]University of Rochester

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — Innovative Design and Development of Nuclear Materials

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Thursday AM **March 18, 2021**

8:30 AM
Compositionally Graded Bulk Specimen: A High-throughput Approach for Nuclear Alloy Development and Qualification: *X. Lou*[1]; J. Yang[1]; X. Liu[2]; M. Song[3]; L. He[2]; Y. Zhang[4]; D. Schwen[2]; [1]Auburn University; [2]Idaho National Lab; [3]University of Michigan; [4]University of Wisconsin-Madison

8:50 AM
A Superb Void Swelling Resistant Type 316L Stainless Steel Developed by Additive Manufacturing Enabled High Throughput Microalloying: *M. Song*[1]; J. Yang[2]; X. Liu[3]; X. Lou[2]; Y. Zhang[4]; L. He[3]; D. Schwen[3]; [1]University of Michigan; [2]Auburn University; [3]Idaho National Laboratory; [4]University of Wiscousin

9:10 AM
Improving Irradiation Resistance of Alloys by Controlling Defect Diffusion: A Modeling Perspective: *Y. Zhang*[1]; M. Song[2]; X. Liu[3]; L. He[4]; D. Schwen[4]; X. Lou[5]; [1]University of Wisconsin-Madison; [2]University of Michigan ; [3]Idaho National Laboratory ; [4]Idaho National Laboratory; [5]Auburn University

9:30 AM Invited
Role of Composition and Thermal Aging on Corrosion Behavior of Duplex Stainless Steels in Pressurized Water Reactors: *J. Tucker*[1]; P. Murkute[1]; K. Oware Sarfo[1]; I. McGieson[1]; M. Santala[1]; Y. Zhang[2]; L. Arnadottir[1]; B. Isgor[1]; [1]Oregon State University; [2]University of Wisconsin - Madison

10:00 AM
Development of Sintered High Strength and Thermal Conductivity Cu-Cr-Nb-Zr Alloy for Fusion Components: *B. Cheng*[1]; L. Wang[2]; D. Sprouster[1]; J. Trelewicz[1]; W. Zhong[3]; Y. Yang[3]; S. Zinkle[2]; L. Snead[1]; [1]Stony Brook University; [2]University of Tennessee, Knoxville; [3]Oak Ridge National Laboratory

10:20 AM
Evaluation of Creep Deformation of Ferritic/Martensitic (FM) Grade 91 Steel Fabricated Using Wire Arc Additive Manufacturing (WAAM): *M. Hawary*[1]; K. Murty[1]; [1]North Carolina State University

Additive Manufacturing of Functional, Energy, and Magnetic Materials — Additive Manufacturing of NiTi

Sponsored by: TMS Functional Materials Division, TMS: Additive Manufacturing Committee, TMS: Magnetic Materials Committee
Program Organizers: Markus Chmielus, University of Pittsburgh; Sneha Prabha Narra, Worcester Polytechnic Institute; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University; Iver Anderson, Iowa State University Ames Laboratory

Thursday AM **March 18, 2021**

8:30 AM
Composition Control in Laser Powder Bed Fusion Additive Manufacturing Through Differential Evaporation: *M. Ranaiefar*[1]; I. Karaman[1]; A. Elwany[1]; R. Arroyave[1]; [1]Texas A&M University

8:50 AM
Toward Understanding the Effect of Selective Laser Re-melting on the Mechanical Properties of the SLM Fabricated Nitinol: *P. Bayati*[1]; K. Safaei[1]; M. Nematollahi[1]; A. Jahadakbar[2]; M. Mahtabi[3]; M. Elahinia[1]; [1]The University of Toledo; [2]Thermomorph LLC; [3]The University of Tennessee at Chattanooga

9:10 AM
Selective Laser Melting of Defect-free NiTi SMA Parts Using a Process Optimization Framework: *L. Xue*[1]; C. Zhang[1]; K. Atli[1]; B. Zhang[1]; A. Elwany[1]; R. Arroyave[1]; I. Karaman[1]; [1]TAMU

Additive Manufacturing: Beyond the Beam II — Deformation Based Processing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Paul Prichard, Kennametal Inc.; James Paramore, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal

Thursday AM **March 18, 2021**

8:30 AM
In Situ Monitoring of Additive Friction Stir Deposition: An Overview: *H. Yu*[1]; [1]Virginia Polytechnic Institute and State University

8:50 AM
Texture Development and Influence in Solid-state Additive Manufacturing: *R. Griffiths*[1]; M. Perry[1]; D. Garcia[1]; H. Yu[1]; [1]Virginia Polytechnic Institute

9:10 AM
Complex Material Deformation and Flow Phenomena during Additive Friction Stir Deposition of Dissimilar Aluminum Alloys: *M. Perry*[1]; H. Rauch[1]; R. Griffiths[1]; J. Sietins[2]; Y. Zhu[1]; D. Garcia[1]; H. Yu[1]; [1]Virginia Tech; [2]CCDC Army Research Laboratory

9:30 AM
Friction Stir Additive Manufacturing of Al 6061-T6: Modeling and Experimental Analysis: N. Rohatgi[1]; *Y. Shin*[1]; [1]Purdue University

9:50 AM
Finite Element Analysis of High-strain-rate Deformation: *E. Hodges*[1]; V. Champagne[2]; R. Hyers[1]; [1]University of Massachusetts Amherst; [2]Cold Spray Innovations International

10:10 AM
Cold Spray Processing of Soft Metals and Hard Tool Steels: *Y. Zou*[1]; [1]University of Toronto

10:30 AM
Heat Treatment of Recycled Battlefield Stainless-Steel Scrap for Cold Spray Applications: *C. Massar*[1]; K. Tsaknopoulos[1]; B. Sousa[1]; J. Grubbs[1]; D. Cote[1]; [1]Worcester Polytechnic Institute

10:50 AM
Understanding the Effects of Repeated Environmental Exposure on Powder Properties for Additive Manufacturing Applications: *J. Grubbs*[1]; A. Birt[2]; A. Nardi[3]; D. Cote[1]; [1]Worcester Polytechnic Institute; [2]Solvus Global; [3]Army Research Lab

11:10 AM
Aluminum Alloy Powders for Solid State Additive Manufacturing Processing: *K. Tsaknopoulos*[1]; J. Grubbs[1]; D. Cote[1]; [1]Worcester Polytechnic Institute

11:30 AM
Linear Friction Welding: a Solid-state Joining Process for the Manufacturing of Aerospace Titanium Parts: *N. Piolle*[1]; [1]ACB

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — Aluminium Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee
Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

Thursday AM **March 18, 2021**

8:30 AM Invited
Connecting Microstructure Evolution to Mechanical Behavior of an Al-Mn-Sc Alloy Designed for Selective Laser Melting: *F. Zhang*[1]; Q. Jia[2]; X. Wu[2]; [1]National Institute of Standards and Technology; [2]Monash University

9:00 AM
Characterization and Simulation of Eta and Eta-prime Precipitates Evolution in Laser Heat Treated Cold Spray of AA7050: *N. Zhu*[1]; L. Brewer[1]; [1]University of Alabama

9:20 AM
Possibilities for Replacing Scandium in High Strength Al-Mg Alloys for 3D Printing by Transition Metal Alloying: V. Mann[1]; R. Vakhromov[2]; D. Ryabov[2]; V. Korolev[2]; D. Daubarayte[2]; M. Grol[2]; A. Seferyan[2]; *K. Nyaza*[2]; [1]RUSAL Management; [2]Light Materials and Technologies Institute

9:40 AM
Solidification Structure Characterization of an AlCuMnZr Alloy with respect to geometric features and Multiple Parameters: *K. Sisco*[1]; S. Bahl[2]; M. Chisholm[2]; R. Michi[2]; J. Poplawsky[2]; A. Shyam[2]; R. Dehoff[2]; A. Plotkowski[2]; S. Babu[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

10:00 AM
Effects of Thermal Processing on the Microstructure and Mechanical Properties of Additively Manufactured AlSi10Mg Parts: *J. Fite*[1]; S. Prameela[2]; J. Slotwinski[1]; T. Weihs[2]; [1]Jhu Applied Physics Lab; [2]Johns Hopkins University

10:20 AM
Evolution of Microstructure and Dispersoids in Al-Mg 5xxx Alloys Under Wire + Arc Additive Manufacturing and Permanent Mold Casting: K. Liu[1]; *A. Algendy*[1]; J. Gu[2]; X. Chen[1]; [1]University of Quebec at Chicoutimi; [2]Yanshan University

10:40 AM
Effect of Laser Glazing on Powder-Processed Icosahedral-Phase-Strengthened Aluminum Alloys: From Single Track to Overlapping Tracks: *M. Li*[1]; H. Leonard[1]; S. Rommel[1]; C. Hung[1]; T. Watson[2]; T. Policandriotes[3]; R. Hebert[1]; M. Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session VII

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee
Program Organizers: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California-Santa Barbara
; Wolfgang Pantleon, Technical University of Denmark; C. Tasan, Massachusetts Institute of Technology; Arul Kumar Mariyappan, Los Alamos National Laboratory; Olivia Underwood, Sandia National Laboratories

Thursday AM **March 18, 2021**

8:30 AM
Materials Processing in a Synchrotron Beam: *K. Liss*[1]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT)

8:50 AM
On the Coupled Effects of Hydrogen Diffusion and Hydride Precipitation in Zirconium Alloys: *A. Tondro*[1]; H. Abdolvand[1]; [1]Western University

9:10 AM
Crystal Plasticity-based Modelling of Taylor Impact Test of Single Crystal Tantalum: *Z. Feng*[1]; M. Zecevic[2]; R. Lebensohn[2]; M. Knezevic[1]; [1]University of New Hampshire; [2]Los Alamos National Laboratory

9:30 AM
Slip-twin Transfer Across Phase Boundaries: An In-situ Investigation of a Ti-Al-V-Fe (a+ß) Alloy: *S. Wei*[1]; G. Zhu[1]; C. Tasan[1]; [1]Massachusetts Institute of Technology

9:50 AM
Variability in Mechanical Properties Related to Porosity in LMD Waspaloy: *N. Azdine*[1]; R. Bordas[1]; R. Fortunier[1]; P. Villechaise[1]; L. Rat[2]; S. Rix[2]; S. Hemery[1]; J. Cormier[1]; [1]Isae Ensma; [2]Safran Aircraft Engines

Advanced Functional and Structural Thin Films and Coatings — Coating Technologies and Surface Structuring for Tools II

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Thursday AM **March 18, 2021**

8:30 AM Invited
Nanoengineered Coating; Lotus Effect, Morphology, Wettability and Contact Angle: N. Singh[1]; L. Kelly[1]; N. Prasad[1]; *B. Setera*[1]; S. Sova[1]; D. Sachs[1]; B. Arnold[1]; F. Choa[1]; C. Cooper[1]; [1]University of Maryland, Baltimore County

9:00 AM
High-quality Diamond Films on Q-carbon Coated Austenitic Stainless Steels 304 and 316: *P. Joshi*[1]; S. Gupta[2]; A. Haque[2]; J. Narayan[2]; [1]NC State University; [2]Intel Corporation

9:20 AM
Ni-Zn-Al2O3 Cermet Nanocomposite Coatings by High-pressure Cold Spraying: *J. Sripada*[1]; G. Saha[1]; [1]University of New Brunswick

9:40 AM Invited
Manipulating Polyolefin Performance by Control of Morphology through Processing: *M. Jaffe*[1]; [1]New Jersey Innovation institute

Advanced Functional and Structural Thin Films and Coatings — Multifunctional Biomaterials, Innovative Approaches to New Concepts and Applications II

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Thursday AM **March 18, 2021**

8:30 AM Keynote
Diamond-like Coatings: A Flexible Platform for Multifunctional Antibacterial Coatings for Health: L. Bonilla[1]; P. Chevallier[1]; *D. Mantovani*[1]; [1]Laval University

9:10 AM Invited
Grafting of Bioactive Polymers with Various Architectures for Preparing Antibacterial and Biocompatible Surfaces: *C. Falentin-Daudre*[1]; V. Migonney[1]; [1]LBPS-CSPBAT

9:40 AM
On the Controlled Antibacterial Activity of a Silver Oxide Doped Diamond-like Carbon Nanocoating With a Semi-permeable Polymeric Top Layer for Long-term Stability: *L. Bonilla-Gameros*[1]; P. Chevallier[1]; D. Mantovani[1]; [1]Laboratory for Biomaterials and Bioengineering, Laval University

10:00 AM Keynote
Biomimetic Calcium-deficient Hydroxyapatite Coating on Activated Carbon Fiber Cloth: A Dual Drug Delivery System: *S. Bonnamy*[1]; [1]CNRS

10:40 AM
Design of Ti-copolymer Sandwiches for Biomedical Implant to Improve Formability: *F. Mouillard*; P. Masson[1]; G. Pourroy[1]; A. Carrado[1]; [1]IPCMS - CNRS

11:00 AM
Design of Innovative Hybrid Structures Using Grafting of Architecture-controlled Polymers for Biomedical Applications: *C. Pereira*[1]; J. Baumann[1]; P. Masson[2]; G. Pourroy[2]; H. Palkowsky[3]; A. Carradò[2]; V. Migonney[1]; C. Falentin-Daudré[1]; [1]LBPS/CSPBAT, UMR CNRS 7244, Institut Galilée, Université Sorbonne Paris Nord; [2]Institut de Physique et Chimie des Matériaux de Strasbourg (IPCMS), UMR 7504 CNRS, Université de Strasbourg; [3]Clausthal University of Technology (TUC), IMET Institute of Metallurgy

11:20 AM
Forming Limits and Shaping of Ti-PMMA-Ti Sandwiches for Biomedical Applications: *G. Nayak*[1]; H. Palkowski[1]; [1]TU Clausthal

Advanced Magnetic Materials for Energy and Power Conversion Applications — Developments in Emerging Permanent Magnets

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Richard Beddingfield, North Carolina State University; Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Huseyin Ucar, California Polytechnic University; Yongmei Jin, Michigan Technological University; Arcady Zhukov, University of the Basque Country

Thursday AM **March 18, 2021**

8:30 AM
Atomic Cooperation in Enhancing Magnetism: (Fe, Cu)-doped CeCo5: *D. Paudyal*[1]; R. Choudhary[1]; [1]Ames Laboratory

8:50 AM
Computational Modeling of Fracture in Sm-Co Magnet: *I. Nlebedim*[1]; X. Liu[1]; B. Cui[1]; J. Cui[1]; [1]Ames Laboratory

9:10 AM
Effects of Lattice Distortions on Magnetic Properties of Fe16N2: First-principles Study: *Y. Asari*[1]; T. Tabata[1]; S. Tamura[1]; M. Komuro[1]; S. Terada[1]; [1]Hitachi, Ltd.

9:30 AM
Heterogeneous Sm-Co Sintered Magnets with Enhanced Mechanical Properties: *B. Cui*[1]; X. Liu[1]; G. Ouyang[1]; C. Nlebedim[1]; J. Cui[1]; [1]Ames Laboratory

9:50 AM Invited
MnBi Thin Film Micromagnets with Tunable Anisotropy for High Temperature Applications: M. Villanueva[1]; E. Sánchez[2]; P. Pedraz[1]; P. Olleros[1]; P. Perna[1]; P. Normile[2]; C. Navío[1]; J. Camarero[1]; *J. De Toro*[2]; A. Bollero[1]; [1]IMDEA Nanoscience, Madrid, Spain; [2]IRICA & Applied Physics Dept, University of Castilla-La Mancha, Spain

10:10 AM
Role of Fe in Stabilizing Ce(Co, Fe, Cu)$_5$ and Enhancing Its Magnetic Properties: *M. Kramer*[1]; O. Palasyuk[1]; T. Kim[1]; L. Zhou[1]; S. Budko[1]; P. Canfield[1]; A. Palasyuk[1]; [1]Ames Laboratory

10:30 AM
Evaluation of Medium-entropy FexCoyNiz Alloys as Precursors for FeCoNi-based High Entropy Magnetic Alloys: A. Paul[1]; *T. Jayaraman*[1]; [1]University of Michigan-Dearborn

10:50 AM
Substitutional and Interstitial Doping in 1-5 and Its Derivative Structures for the Development of Hard Magnetic Properties: A First Principles Study: *H. Ucar*[1]; D. Paudyal[2]; [1]California Polytechnic University, Pomona; [2]Ames Laboratory

Advanced Materials for Energy Conversion and Storage VII — Energy Storage with Emphasis on Batteries II

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Thursday AM **March 18, 2021**

8:30 AM
Mesoscale Mechanics: Simulating the Role of Stress on Electrode Electrochemical Performance: *S. Roberts*[1]; M. Ferraro[1]; J. Horner[1]; J. Meyer[2]; B. Ng[1]; [1]Sandia National Laboratories; [2]Purdue University

9:00 AM
Metal-sulfur nanocomposite for developing high-loading electrochemical cathode: S. Chung[1]; *C. Cheng*[1]; [1]National Cheng Kung University

9:20 AM
Molecular-level Characterization of the Electrode-electrolyte Interfaces in Li Batteries: *L. Marbella*[1]; [1]Columbia University

9:50 AM
New Insights Linking Material Properties and Performance of the Lithium SEI: *B. Gallant*[1]; [1]MIT

10:20 AM
Simulations of Phase Transformation in Complex Graphite Electrode Microstructures: *A. Malik*[1]; K. Snyder[2]; M. Liu[2]; H. Yu[1]; [1]Michigan State University; [2]Ford Auto Company

Advances in Titanium Technology — Powder Metallurgy and Additive Manufacturing of Ti and Ti Alloys

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Don Li, Howmet Engineered Products; Yufeng Zheng, University of Nevada-Reno
; Peeyush Nandwana, Oak Ridge National Laboratory; Matthew Dunstan, US Army Research Laboratory

Thursday AM **March 18, 2021**

8:30 AM
Development of Cold Spray Additive Technology for Manufacturing Titanium Mill Products: *S. Gulizia*[1]; L. Prentice[1]; P. King[1]; S. Zahiri[1]; A. Vargas Uscategui[1]; C. Doblin[1]; [1]CSIRO Manufacturing

8:50 AM
Investigation to Hole Surface Microstructure Evolution in Drilling of Aerospace Alloys: Ti-5553: *D. Yan*[1]; [1]San Jose State University

9:10 AM
Process Design for Laser Hot Wire Additive Manufacturing of Ti-6Al-4V: *B. Abranovic*[1]; E. Chang-Davidson[1]; J. Beuth[1]; [1]Carnegie Mellon University

9:30 AM
Opportunities to Develop Superior Titanium Alloys by Laser Powder Bed Fusion: *M. Simonelli*[1]; G. McCartney[1]; Z. Zhiyi[1]; N. Aboulkhair[1]; Y. Tse[1]; A. Clare[1]; R. Hague[1]; [1]University of Nottingham

9:50 AM
Towards an ICME Framework of Designing Post-process for Additively Manufactured Ti-6Al-4V: *S. Li*[1]; K. Matthew[1]; J. Sobotka[1]; [1]Southwest Research Institute

10:10 AM
A Novel Densification Method for Powder Metallurgy Titanium though Constrained Hydrogenation Process: *C. Zhou*[1]; [1]Central South University

AI/Data informatics: Tools for Accelerated Design of High-temperature Alloys — AI Design and Thermodynamics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Michael Titus, Purdue University; Pinar Acar, Virginia Tech; Andrew Detor, GE Research; James Saal, Citrine Informatics; Dongwon Shin, Oak Ridge National Laboratory

Thursday AM **March 18, 2021**

8:30 AM Invited
Knowledge-driven Platform for Federated Multimodal Big Data Storage & Analytics: *K. Aggour*[1]; V. Gupta[1]; A. Detor[1]; S. Oppenheimer[1]; J. Vinciquerra[1]; [1]GE Research

9:00 AM
Exploring the Compositional Space of High Entropy Alloys via Sequential Learning: *J. Verduzco*[1]; Z. McClure[1]; D. Farache[1]; S. Desai[1]; A. Strachan[1]; [1]Purdue University

9:20 AM
Uncertainty Reduction for Calculated Phase Equilibria: *R. Otis*[1]; B. Bocklund[2]; Z. Liu[2]; [1]Jet Propulsion Laboratory; [2]Pennsylvania State University

9:40 AM
Predicting Vibrational Entropy of FCC Solids Uniquely from Bond Chemistry Using Machine Learning: *A. Manzoor*[1]; D. Aidhy[1]; [1]University of Wyoming

Aluminum Reduction Technology — Environment (Material and Equipment)

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Nadia Ahli, Emirates Global Aluminium; Nancy Holt, Hydro Aluminium AS

Thursday AM **March 18, 2021**

8:30 AM
Low and High Voltage PFC Slope Coefficient Monitoring during Pot Start-up: *C. Dubois*[1]; L. Espinoza-Nava[1]; [1]Alcoa

8:50 AM
Latest Developments in GTC Design to Reduce Fluoride Emissions: *P. Martineau*[1]; Y. Joumani[1]; B. Hureiki[1]; J. Neveu[1]; F. Virieux[1]; [1]Fives

9:10 AM
Process and Environmental Aspects of Applying Unshaped Carbon Materials for Cell Lining Purposes: *A. Proshkin*[1]; V. Pingin[1]; V. Mann[1]; A. Zherdev[1]; A. Sbitnev[1]; Y. Shtefanyuk[1]; [1]RUSAL

9:30 AM
Characterisation of Powders-precondition for Plant Engineering: P. Hilgraf[1]; A. Hilck[2]; *J. Paepcke*[2]; [1]HAW, Hamburg, University of Applied Science; [2]Claudius Peters Projects GmbH

9:50 AM
Gas Treatment in the GE Pot Integrated ABART Modules (PIA): *A. Sorhuus*[1]; H. Olsen[1]; E. Holmefjord[1]; R. Theodorsen[1]; M. Sørum[1]; [1]GE Power

10:10 AM
New Phase in Upgrade of Søderberg Technology at RUSAL's Smelters: *V. Buzunov*[1]; V. Mann[2]; V. Pingin[1]; A. Zherdev[1]; M. Kazantsev[1]; A. Pinaev[1]; Y. Bogdanov[1]; [1]Rusal Etc; [2]UC RUSAL

Biological Materials Science — Biological Materials Science III

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama

Thursday AM **March 18, 2021**

8:30 AM Invited
Microstructural Variations in Mammalian Enamel: An Exploration of Decussation from the Micro- to the Macro-scale: C. Renteria[1]; J. Fernández-Arteaga[2]; A. Ossa[2]; *D. Arola*[1]; [1]University of Washington; [2]Universidad EAFIT

9:00 AM
On the Structure and Mechanical Properties of Aprismatic Enamel in Crocodilian Teeth: *J. Grimm*[1]; C. Renteria[1]; S. Camacho[1]; X. Sanchez-Martinez[1]; D. Arola[1]; [1]University of Washington

9:20 AM
Tough Enlightenments From the Prayer Bead: Fracture-tolerant Endocarp of *Elaeocarpus Ganitrus* Seed (Rudraksha): *A. Ghimire*[1]; P. Chen[1]; [1]National Tsing Hua University

9:40 AM Invited
Bioinspired Graphene Nanocomposites with Exceptionally High Mechanical Performance: *X. Li*[1]; [1]University of Virginia

10:10 AM Invited
Tapes: An Overlooked Biological Material Archetype: *H. Schniepp*[1]; [1]College of William & Mary

10:40 AM Invited
Mechanical Properties of Tough, Mechanochemically Active Hydrogels and Hydrogel-based Composites: *J. Kruzic*[1]; Y. Huang[1]; B. Jayathilaka[1]; S. Islam[1]; M. Silberstein[2]; K. Kilian[1]; [1]University of New South Wales; [2]Cornell University

Bulk Metallic Glasses XVIII — Structures and Mechanical Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM **March 18, 2021**

8:30 AM Invited
Microstructure - Fracture Toughness Relationships in Bulk Metallic Glasses: *J. Kruzic*[1]; B. Li[1]; B. Gludovatz[1]; A. Ceguerra[2]; K. Nomoto[1]; S. Ringer[2]; S. Xie[3]; S. Scudino[4]; [1]University of New South Wales; [2]The University of Sydney; [3]Shenzhen University; [4]IFW Dresden

8:55 AM Invited
Structural Heterogeneities Dictate Strength and Fracture Toughness in a Zr-based Metallic Glass: *B. Gludovatz*[1]; L. Krämer[2]; B. Li[1]; A. Hohenwarter[3]; J. Kruzic[1]; [1]UNSW Sydney; [2]ESI-Leoben; [3]Montanuniversität Leoben

9:20 AM Invited
Mechanical Behavior and Phase Stability of Ductile Metallic Glass Nanoparticles: *W. Gu*[1]; M. Kiani[1]; A. Parakh[1]; [1]Stanford University

9:45 AM Invited
Microscopic Description of Plasticity, Relaxation and Rejuvenation Using Anelastic Relaxation Spectra: *M. Atzmon*[1]; T. Lei[2]; L. Rangel DaCosta[3]; [1]University of Michigan; [2]University of California, Irvine; [3]University of California, Berkeley

10:10 AM
Competing Effects of Topology and Chemical Bonding on Mechanical Properties of Metallic Glasses: *V. Jambur*[1]; C. Tangpatjaroen[1]; J. Xi[1]; M. Gao[1]; J. Perepezko[1]; I. Szlufarska[1]; [1]University of Wisconsin - Madison

Cast Shop Technology — DC Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Samuel Wagstaff, Oculatus

Thursday AM **March 18, 2021**

8:30 AM
Simulation-based Analysis for Optimization of Casting Process in AA7075: S. Rafiezadeh[1]; *P. Pucher*[1]; S. Neubert[1]; W. Ivanov[1]; [1]AMAG

8:50 AM
Characterization of Ingots Cast with the APEX™ Casting System: *C. Cordill*[1]; G. Castro[1]; B. Zhang[1]; [1]Wagstaff

9:10 AM
Effect of Ultrasonic Melt Treatment on the Sump Profile and Microstructure of a Direct-chill Cast AA6008 Aluminum Alloy: *T. Subroto*[1]; G. Bruno Lebon[1]; D. Eskin[1]; I. Skalicky[2]; D. Roberts[2]; I. Tzanakis[3]; K. Pericleous[4]; [1]Brunel University London; [2]Constellium UTC; [3]Oxford Brookes University; [4]University of Greenwich

9:30 AM
The Influence of the Casting Speed in Horizontal Continuous Casting of Aluminium Alloy EN AW 6082: *A. Obali*[1]; K. Dilek[1]; M. Gokelma[2]; S. Akdi[3]; D. Kavrar Ürk[1]; [1]Sistem Teknik Industrial Furnaces Ltd.; [2]Izmir Institute of Technology; [3]Akdi Engineering and Consultancy

9:50 AM
The Impact of Casting Conditions on Edge Cracking of AA5182 Ingots during Hot Rolling: *S. Wagstaff*[1]; [1]Oculatus

10:10 AM
Reducing Gas Shrinkage Porosity in AlMg Alloy Slabs: *I. Kostin*[1]; A. Sidorov[1]; A. Startsev[1]; A. Krechetov[1]; A. Krokhin[1]; S. Belyaev[2]; [1]UC RUSAL; [2]SFU

10:30 AM
Molecular Dynamics Simulations of the Evolution of Residual Stresses during Rapid Solidification of Aluminium: *M. Papanikolaou*[1]; K. Salonitis[1]; M. Jolly[1]; [1]Cranfield University

Ceramic Materials for Nuclear Energy Research and Applications — Radiation Effects and Mass Transport

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nuclear Materials Committee
Program Organizers: Xian-Ming Bai, Virginia Polytechnic Institute and State University; Yongfeng Zhang, University of Wisconsin-Madison; Larry Aagesen, Idaho National Laboratory; Vincenzo Rondinella, Jrc-Ec

Thursday AM **March 18, 2021**

8:30 AM Invited
Irradiation Effects on Zirconium Alloy Oxides and Their Impacts on In-reactor Corrosion Rates: *A. Couet*[1]; Z. Yu[1]; T. Kim[1]; H. Zhang[1]; M. Bachhav[2]; L. He[2]; [1]University of Wisconsin-Madison; [2]Idaho National Laboratory

9:00 AM
Effect of UV and Gamma Irradiation on the Hydrothermal Corrosion of Ion-irradiated SiC: *A. Seshadri*[1]; K. Shirvan[1]; T. Kim[2]; A. Couet[2]; [1]Massachusetts Institute of Technology; [2]University of Wisconsin-Madison

9:20 AM Invited
In-situ Measurement of Tritium Release from Lithium Aluminate Under Neutron Irradiation: *W. Luscher*[1]; D. Senor[1]; G. Hoggard[2]; [1]Pacific Northwest National Laboratory; [2]Idaho National Laboratory

9:50 AM
Influence of Dose Rate and Temperature on Mass Transport in Hematite: *K. Yano*[1]; S. Taylor[1]; T. Kaspar[1]; D. Edwards[1]; D. Schreiber[1]; [1]Pacific Northwest National Laboratory

10:10 AM
Radiation Tolerance of Nanoporous Gadolinium Titanate: *N. Madden*[1]; M. Janish[2]; J. Valdez[2]; B. Uberuaga[2]; J. Krogstad[1]; [1]University of Illinois at Urbana-Champaign; [2]Los Alamos National Laboratory

10:30 AM
Radiolytic Damage and Hydrogen Generation at Carbide – Water Interfaces: *S. Pimblott*[1]; J. LaVerne[2]; [1]Idaho National Laboratory; [2]University of Notre Dame

10:50 AM
Molecular Dynamics Investigations of AlN-based Piezoelectric Ceramics under Irradiation: *M. Kempner*[1]; J. Sestito[1]; E. Zarkadoula[2]; Y. Wang[1]; [1]Georgia Institute of Technology; [2]Oak Ridge National Laboratory

11:10 AM
Irradiation Damage in High-entropy Carbide Ceramics: F. Wang[1]; X. Yan[1]; T. Wang[2]; Y. Wu[3]; L. Shao[2]; M. Nastasi[2]; Y. Lu[1]; *B. Cui*[1]; [1]University of Nebraska-Lincoln; [2]Texas A&M University; [3]Boise State University

Characterization of Materials through High Resolution Imaging — High Resolution Characterization of Materials with Phase Contrast Imaging

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation 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 Institut; Mathew Cherukara, Argonne National Laboratory

Thursday AM **March 18, 2021**

8:30 AM Invited
In Situ and Operando 3D Nano-imaging for Materials Science at the ESRF: *J. Villanova*[1]; R. Kumar[1]; V. Vanpeene[1]; J. Segura-Ruiz[1]; R. Tucoulou[1]; P. Lhuissier[2]; L. Salvo[2]; [1]ESRF; [2]SIMAP/UGA

9:00 AM
Evaluation of TATB Crystal Morphology for Predicting Sensitivity Using X-ray Computed Tomography: *L. Kuettner*[1]; B. Patterson[1]; J. Yeager[1]; L. Hill[1]; [1]Los Alamos National Laboratory

9:20 AM
Megahertz X-ray Microscopy for Imaging High-speed Phenomena in Opaque Materials: *V. Bellucci*[1]; T. Sato[1]; P. Villanueva Perez[2]; J. Ulicny[3]; W. Yashiro[4]; H. Chapman[5]; A. Mancuso[1]; P. Vagovic[5]; [1]European XFEL GmbH; [2]Lund University; [3]Pavol Jozef Šafárik University; [4]Tohoku University; [5]Center for Free-Electron Laser Science

9:40 AM
Microstructural Characterization and Mechanical Behavior of a Meteorite Using Correlative Microscopy: *T. Huang*[1]; S. Niverty[1]; A. Sundar[1]; M. Rabbi[2]; L. Garvie[2]; A. Chattopadhyay[2]; D. Cotto-Figueroa[3]; N. Chawla[1]; [1]Purdue University; [2]Arizona State University; [3]University of Puerto Rico at Humacao

10:00 AM Invited
Imaging Materials on the Run: Shedding Light on Fast Structural Processes Using Time-resolved Synchrotron X-ray Tomographic Microscopy: *C. Schlepütz*[1]; F. Marone[1]; A. Bonnin[1]; M. Stampanoni[1]; [1]Paul Scherrer Institute

10:30 AM
Quantitative Data Analysis of Dynamic Tomography Data with Motion Artifacts: *X. Xiao*[1]; Y. Yang[1]; Z. Xu[2]; J. Steiner[2]; Y. Liu[3]; F. Lin[2]; [1]Brookhaven National Laboratory; [2]Virginia Tech; [3]SLAC National Accelerator Laboratory

10:50 AM Invited
High Speed, High Resolution, High Temperature 3D Imaging of Spacecraft Materials during Atmospheric Entry Conditions: *D. Parkinson*[1]; H. Barnard[1]; A. MacDowell[1]; S. Schickler[1]; S. Shacterman[1]; T. Benioff-White[1]; K. Levy[1]; F. Panerai[2]; C. Foster[2]; B. Ringel[2]; C. Schlepuetz[3]; [1]Lawrence Berkeley National Laboratory; [2]University of Illinois, Urbana-Champaign; [3]Paul Scherrer Institute

11:20 AM
Study of Structure of Beam-sensitive Supported Nanoparticle Catalysts by Low-dose High Resolution Phase Contrast Imaging: *C. Li*[1]; J. Jinschek[1]; [1]The Ohio State University

11:40 AM
Indexing Grains: A Comparison between Three-dimensional Synchrotron X-ray Diffraction and Electron Backscatter Diffraction Techniques: *K. Louca*[1]; H. Abdolvand[1]; [1]Western University

Computational Techniques for Multi-Scale Modeling in Advanced Manufacturing — Multiscale Solidification Models

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Anthony Rollett, Carnegie Mellon University; Laurentiu Nastac, University of Alabama; Mei Li, Ford Motor Company; Alexandra Anderson, Gopher Resource; Srujan Rokkam, Advanced Cooling Technologies Inc

Thursday AM **March 18, 2021**

8:30 AM
Computational Multi-Scale Modeling of Segregation and Microstructure Evolution during the Solidification of A356 Ingots Processed via a 2-Zone Induction Melting Furnace: A. Dong[1]; *L. Nastac*[1]; [1]University of Alabama

8:55 AM
Microstructural Evolution and Defect Formation During Pulsed and Continuous Selective Laser Melting: *I. Mccue*[1]; S. Storck[1]; J. Mastandrea[1]; M. Trexler[1]; [1]Johns Hopkins Applied Physics Laboratory

9:20 AM
Computational Modeling of Nanoparticles Dispersion in Hybrid Process of Ink Jetting and Laser Powder Bed Fusion: *M. Ghayoor*[1]; B. Cox[1]; J. Gess[1]; S. Pasebani[1]; [1]Oregon State University

9:45 AM
Multi-scale, Multi-physics Modeling of Additive Manufacturing: Challenges and Potential Solutions: *D. Gunasegaram*[1]; A. Murphy[1]; [1]CSIRO

10:10 AM
Multiphysics Simulation of Microstructure Evolution in Selective Laser Melting of AlSi10Mg: *D. Liu*[1]; Y. Wang[1]; [1]Georgia Institute of Technology

Computational Thermodynamics and Kinetics — Data Methods, Tools and High Throughput

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Thursday AM **March 18, 2021**

8:30 AM Invited
Data-driven Discovery of Materials for Photocatalytic Energy Conversion: *A. Singh*[1]; [1]Arizona State University

9:00 AM
High-throughput Density-functional Theory Methods for Discovery of Actinide Materials: *M. Christian*[1]; E. Johnson[2]; T. Besmann[1]; [1]University of South Carolina; [2]Dalhousie University

9:20 AM Invited
The High Entropy Alloy Space is Not as Big as We Think It is: *R. Arroyave*[1]; T. Kirk[1]; [1]Texas A&M University

9:50 AM Invited
Uncovering Atomistic Mechanisms of Crystallization Using Machine Learning: *R. Freitas*[1]; E. Reed[2]; [1]Massachusetts Institute of Technology; [2]Stanford University

10:20 AM Invited
Dendritic Growth Prediction in Metal Additive Manufacturing with Physics-constrained Neural Networks: *D. Liu*[1]; Y. Wang[1]; [1]Georgia Institute of Technology

10:50 AM
Machine Learning of Surrogate Models to Accelerate Multi-cell Monte Carlo Simulations of Phase Boundaries: *A. Hire*[1]; R. Hennig[1]; [1]University of Florida

11:10 AM Invited
A Data-driven Approach to Long-Time Molecular Dynamics: *D. Perez*[1]; N. Mathew[1]; E. Martinez[1]; [1]Los Alamos National Laboratory

Environmental Degradation of Additively Manufactured Alloys — AM Materials and Aqueous Corrosion - Part II: Stainless Steel, Inconel 718 and Coatings

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; Michael Kirka, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Brendy Rincon Troconis, University of Texas at San Antonio; Luke Brewer, University of Alabama

Thursday AM **March 18, 2021**

8:30 AM
Localized Corrosion of Additively Manufactured Stainless Steels: *M. Melia*[1]; J. Duran[1]; R. Marshall[2]; R. Katona[2]; R. Schaller[1]; J. Rodelas[1]; M. Heiden[1]; B. Jared[1]; R. Kelly[2]; E. Schindelholz[3]; [1]Sandia National Laboratories; [2]University of Virginia; [3]The Ohio State University

8:50 AM Invited
Melt Pool Boundaries and the Corrosion of Laser Powder Fusion Stainless Steels: *E. Schindelholz*[1]; M. Melia[2]; C. Barr[3]; B. Jared[3]; J. rodelas[3]; P. Kotula[3]; [1]Ohio State University; [2]Sandia National Laboratories ; [3]Sandia National Laboratories

9:20 AM Invited
Selective Corrosion and Sensitization Behavior in Laser Powder Bed Fusion 316L: *R. Kelly*[1]; D. Macatangay[1]; J. Conrades[1]; K. Brunner[1]; [1]University of Virginia

9:50 AM
High Performance AM Stainless Steel 316L Under Corrosive Environment: *T. Voisin*[1]; Z. Qi[1]; Y. Zhang[1]; R. Shi[1]; J. Kacher[2]; M. Matthews[1]; B. Wood[1]; Y. Wang[1]; [1]Lawrence Livermore National Laboratory; [2]Georgia Tech

10:10 AM
Improving the Corrosion Performance of Additively Manufactured 316L via Chemically-modified Feedstock: *J. Sopcisak*[1]; S. Storck[1]; R. Srinivasan[1]; J. Trelewicz[2]; D. Sprouster[2]; K. Hemker[3]; M. He[3]; T. Montalbano[1]; [1]Johns Hopkins University Applied Physics Laboratory; [2]Stony Brook University; [3]Johns Hopkins University

10:30 AM
Electrochemical Response of Additively Printed Inconel 718 by Laser-based Direct Energy Deposition: *S. Mazumder*[1]; M. Pantawane[1]; Y. Ho[1]; N. Dahotre[1]; [1]University of North Texas

10:50 AM
Corrosion Behavior of Functionally Graded Inconel 718 Produced by Additive Manufacturing: *Y. Gonzalez-Garcia*[1]; L. Devignes[2]; A. Yilmaz[1]; A. de Groot[1]; E. Borisov[3]; V. Popovich[1]; [1]Delft University of Technology; [2]SIGMA Clermont; [3]Peter de Great Saint-Petersburg Polytechni University

11:10 AM
Nano-crystalline Cold Spray Coatings for Repair and Retrofit of Existing Large-Scale Structures: *R. Roy*[1]; B. Haddad[1]; K. Klus[1]; C. Widener[1]; [1]VRC Metal Systems

11:30 AM Invited
Tailoring Microstructure in Additively Manufactured Stainless Steels for Enhanced Corrosion Performance: *J. Trelewicz*[1]; D. Sprouster[1]; G. Halada[1]; J. Sopcisak[2]; S. Storck[2]; [1]Stony Brook University; [2]The Johns Hopkins University Applied Physics Laboratory

Environmentally Assisted Cracking: Theory and Practice — Environmental Embrittlement, Fracture, and Fatigue

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Thursday AM **March 18, 2021**

8:30 AM Invited
Corrosion, Irradiation, and Cracking Studies in Support of Coating Development for SiC-based Accident Tolerant Fuel Cladding: *S. Raiman*[1]; P. Doyle[2]; P. Mouche[3]; Y. Katoh[3]; [1]Texas A&M University; [2]University of Tennessee; [3]Oak Ridge National Laboratory

9:10 AM
Modeling of Corrosion Crack Dynamics and Fracture Using a Physics-based Meshless Peridynamics Approach: *S. Rokkam*[1]; M. Behzadinasab[2]; M. Gunzburger[3]; S. Shanbhag[3]; N. Phan[4]; [1]Advanced Cooling Technologies Inc; [2]Brown University; [3]Florida State University; [4]Naval Air Systems Command

9:30 AM
Humidity and Chemistry Dependent Embrittlement in the Al-Ga-In Liquid Metal Embrittlement System
: *J. Norkett*[1]; C. Frampton[1]; V. Miller[1]; [1]University of Florida

9:50 AM
The Effect of Additive Manufacturing Process Parameters on the Fatigue Crack Growth Rates of Alloy 718 in Elevated-pressure and Elevated temperature Hydrogen Gas: *W. Hickey*[1]; J. Macha[1]; V. Ynciarte[2]; B. Rincon Troconis[2]; [1]Southwest Research Institute; [2]University of Texas at San Antonio

10:10 AM
Influence of Hydrogen on Softened HAZ during In-situ Slow Strain Rate Testing in YS 550 MPa Grade Steel Welds: *N. Kang*[1]; H. Park[1]; C. Park[2]; J. Lee[2]; S. Liu[3]; D. Nam[4]; [1]Pusan National University; [2]Chosun University; [3]Colorado School of Mines; [4]Korea Institute of Industrial Technology

10:30 AM
Hydrogen Permeability for Determining Hydrogen Embrittlement Susceptibility of High Hardness Steels: *W. Williams*[1]; D. Salley[1]; H. Doude[1]; D. Wipf[1]; D. Field[2]; K. Limmer[2]; K. Doherty[2]; H. Rhee[1]; [1]Mississippi State University, CAVS; [2]CCDC Army Research Laboratory

10:50 AM
Characterization of Hydrogen Embrittlement Sensitivity of Various High Hardness Steels: D. Salley[1]; W. Williams[1]; H. Doude[1]; W. Whittington[1]; D. Field[2]; K. Limmer[2]; K. Doherty[2]; H. Rhee[1]; *S. Mujahid*[3]; [1]Center for Advanced Vehicular Systems, Mississippi State University; [2]Metals Branch, US CCDC Army Research Laboratory; [3]Mississippi State University

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Multiscale Modeling Approaches to Improve Fatigue Predictions

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Jean-Charles Stinville, University of California-Santa Barbara

Thursday AM **March 18, 2021**

8:30 AM
Experimental Analysis and Numerical Simulation of Cyclic Deformation and Fatigue Behavior of AZ31 Mg Alloy: A. Jamali[1]; M. Zhang[2]; A. Ma[2]; *J. Llorca*[1]; [1]IMDEA Materials Institute & Technical University of Madrid; [2]IMDEA Materials Institute

8:50 AM
PRISMS-fatigue: A General Framework for Fatigue Analysis in Polycrystalline Metals and Alloys Using the Crystal Plasticity Finite Element Method: *M. Yaghoobi*[1]; K. Stopka[2]; A. Lakshmanan[1]; J. Allison[1]; V. Sundararaghavan[1]; D. McDowell[2]; [1]University of Michigan; [2]Georgia Institute of Technology

9:10 AM
Propagation of Microstructure-induced Fatigue Variability onto Stress Concentrations: *G. Castelluccio*[1]; F. Ashraf[1]; [1]Cranfield University

9:30 AM
Origin of Long-range Internal Stress with Heterogeneous Dislocation Distributions: *Y. Gu*[1]; J. El-Awady[1]; [1]Johns Hopkins University

9:50 AM
Dislocation Microstructure Evolution during Cyclic Deformation in Single-slip and Multi-slip Cases: A Continuum Dislocation Dynamics Study: *V. Vivekanandan*[1]; P. Lin[1]; G. Winther[2]; A. El-Azab[1]; [1]Purdue University; [2]Technical University of Denmark

10:10 AM
A Simplified Formula to Estimate the Size of the Cyclic Plastic Zone in Metals Containing Elastic Particles: *T. Andriollo*[1]; V. Kouznetsova[2]; [1]Technical University of Denmark; [2]Eindhoven University of Technology

Friction Stir Welding and Processing XI — Modeling: Process & Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

Thursday AM **March 18, 2021**

8:30 AM
Application of Machine Learning for Prediction of Microstructure and Mechanical Performances in Solid-state Joining Processes: B. Klusemann[1]; F. Bock[1]; U. Suhuddin[1]; L. Blaga[1]; *J. dos Santos*[1]; [1]Helmholtz-Zentrum Geesthacht

8:50 AM
Friction Stir Welding Defect Prediction Using Computational Solid Mechanic's Modeling: *R. Giorjao*[1]; J. Avila[2]; E. Monlevade[3]; A. Ramirez[1]; A. Tschiptschin[3]; [1]The Ohio State University; [2]UNESP; [3]USP

9:10 AM
The Development of FSW Process Modelling for Use by Process Engineers: *M. Lewis*[1]; S. Smith[2]; [1]FTS Engineering Answers Ltd.; [2]Transforming Stress Ltd.

9:30 AM
Effect of Tool Geometries on "Heat-input" during Friction Stir Welding of Aluminum Alloys: *Y. Sato*[1]; Y. Tanai[1]; T. Zhao[1]; D. Yi[2]; [1]Tohoku University; [2]Tsinghua University/Tohoku Univdersity

9:50 AM
Experimental and Numerical Investigations of High Strain Rate Torsion Tests of Al-based Alloys at Elevated Temperatures: *A. Naumov*[1]; A. Borisov[1]; A. Borisova[1]; [1]Peter the Great St. Petersburg Polytechnic University

10:10 AM
Numerical Simulation and Analysis of Solid Phase Processing: A Validated Friction Extrusion Smoothed Particle Hydrodynamics Model: L. Li[1]; X. Li[1]; A. Reynolds[2]; G. Grant[1]; *A. Soulami*[1]; [1]Pacific Northwest National Laboratory; [2]University of South Carolina

10:30 AM
Effect of Temperature and Strain Parameters of High Strain Rate Torsion Tests on the Microstructure Evolution of Al-based Alloys: A. Borisova[1]; E. Anhimova[1]; O. Zotov[1]; *A. Naumov*[1]; A. Borisov[1]; [1]Peter the Great St. Petersburg Polytechnic University

Frontiers in Solidification Science VIII — Processing, Defects & Segregation / Steel & Cast Iron

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Thursday AM **March 18, 2021**

8:30 AM
Cellular Automaton Modeling of Solidification Microstructure and Microporosity in Multi-component Aluminum Alloys: C. Gu[1]; M. Moodispaw[1]; C. Ridgeway[1]; *A. Luo*[1]; [1]Ohio State University

8:50 AM
Effects of Process Conditions and Morphology Evolution on Microsegregation During Solidification: A Combined Phase-field and Experimental Study: *Z. Yao*[1]; D. Montiel[1]; M. Li[2]; K. Thornton[1]; J. Allison[1]; [1]University of Michigan; [2]Ford Motor Company

9:10 AM
Effect of Vacuum during Flow in High-pressure Die Casting: Water Analog Experiments: *N. Trometer*[1]; X. Huang[1]; E. Cinkilic[1]; A. Luo[1]; [1]The Ohio State University

9:30 AM Invited
Grain Selection after a Massive-like Transformation from Ferrite to Austenite during Solidification in Fe-based Alloys: *H. Yasuda*[1]; T. Narumi[1]; T. Suga[1]; Y. Nanri[1]; [1]Kyoto University

10:00 AM
Synchrotron Examination of Nucleation and Growth of Nodular and Compacted Graphite Particles during Cyclic Solidification of Ductile Cast Iron: *C. Xu*[1]; T. Wigger[2]; M. Azeem[3]; T. Andriollo[1]; S. Clark[2]; R. Atwood[4]; J. Hattel[1]; P. Lee[2]; N. Tiedje[1]; [1]Technical University of Denmark; [2]University College London, Mechanical Engineering; [3]University of Leicester; [4]Diamond Light Source

10:20 AM
In Situ Quantification of Degenerate Graphite Nodule Formation during the Solidification of Ductile Cast Iron: *T. Wigger*[1]; T. Andriollo[2]; M. Azeem[3]; C. Xu[2]; S. Clark[1]; R. Atwood[4]; N. Tiedje[2]; P. Lee[1]; [1]UCL; [2]DTU; [3]University of Leicester; [4]Diamond Light Source

Frontiers of Materials Award Symposium: Radiation Processing of Materials — Session I: Radiation Synthesis and Processing of Materials

Program Organizer: Jessika Rojas, Virginia Commonwealth University

Thursday AM **March 18, 2021**

8:30 AM
Introductory Comments: Frontiers of Materials Award Symposium: Radiation Processing of Materials: *J. Rojas*[1]; [1]Virginia Commonwealth University

8:35 AM Invited
Ionizing Radiation in the Synthesis and Processing of Nanocomposites for Medical and Environmental Applications: *J. Rojas*[1]; [1]Virginia Commonwealth University

9:05 AM Invited
Radiation-grafting of Smart Polymers for Potential Biomedical Applications: *E. Bucio*[1]; [1]Nuclear Science Institute at National University of Mexico

9:35 AM Invited
Direct Prompt Synthesis of Radioactive Nanoparticles (Prompt Nano Radioisotopes): *C. Castano*[1]; [1]Missouri University of Science and Technology

10:05 AM Invited
Probing and Processing Nanomaterials and Devices with Radiation: *C. Cress*[1]; [1]U.S. Naval Research Laboratory

10:35 AM Invited
Nanochannels, Nanowires, and Nanotubes Fabricated by Ion-track Nanotechnology: *M. Toimil-Molares*[1]; [1]GSI Helmholtz Center

11:05 AM Invited
Ionizing Radiation Synthesis of Novel Fabrics for Extraction of Uranium from Seawater: *M. Al-Sheikhly*[1]; [1]University of Maryland

11:35 AM Live Question and Answer

Functional Nanomaterials: Functional Low-dimensional Materials (0D, 1D, 2D) Driving Innovations in Electronics, Energy, Sensors, and Environmental Engineering and Science 2021 — 1D Materials & Nanostructures

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee
Program Organizers: Jiyoung Chang, University of Utah; Michael Cai Wang, University of South Florida; Sarah Zhong, University of South Florida; Sun Choi, Korea Institute of Science and Technology; Pei Dong, George Mason University

Thursday AM **March 18, 2021**

8:30 AM Invited
3D Assembled Functional Structures from Crumpled 2D Nanomaterials: *B. Xu*[1]; [1]University of Virginia

8:55 AM
Facile Green Synthesis of ZnInS Quantum Dots: Temporal Evolution of Its Optical Properties and Cell Viability against Normal and Cancerous Cells: *S. Oluwafemi*[1]; N. Zikalala[1]; S. Parani[1]; [1]University of Johannesburg

9:15 AM Invited
Scalable Synthesis of Nanofibers for Energy Storage and Filtration Applications: *Y. Zhang*[1]; D. Powers[1]; B. Lee[1]; E. Dahl[1]; S. Tepavcevic[1]; P. Zapol[1]; H. Seong[1]; A. Simmons[1]; M. Koziel[1]; M. LeResche[1]; K. Pupek[1]; G. Krumdick[1]; [1]Argonne National Laboratory

9:40 AM
Growth Mechanism Study of Boron Carbide Nanowires: *M. Akter*[1]; T. Xu[2]; [1]University of North Carolina, Charlotte; [2]UNCC

10:00 AM
Unveiling the Origin of Morphological Instability in Topologically Complex Electrocatalytic Nanostructures: *I. Mccue*[1]; Y. Li[2]; Z. Xia[1]; J. Snyder[3]; [1]Johns Hopkins Applied Physics Laboratory; [2]National Renewable Energy Laboratory; [3]Drexel University

High Entropy Alloys IX: Alloy Development and Properties — Alloy Development and Application IV

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM **March 18, 2021**

8:30 AM Invited
From High-entropy Ceramics (HECs) to Compositionally Complex Ceramics (CCCs): *J. Luo*[1]; [1]University of California, San Diego

8:55 AM
Direct Production of High Entropy Alloy Powders: *J. Haidar*[1]; [1]Kinaltek Pty Ltd.

9:15 AM
Hierarchical Eutectoid Nano-lamellar Decomposition in an Al0.3CoFeNi Complex Concentrated Alloy: *S. Dasari*[1]; B. Gwalani[1]; A. Sharma[1]; V. Soni[1]; A. Jagetia[1]; S. Gorsse[2]; R. Banerjee[1]; [1]University of North Texas; [2]University of Bordeaux, France

9:35 AM Invited
Data-driven Design of Refractory High-entropy Alloys: *W. Chen*[1]; G. Kim[1]; C. Lee[2]; P. Liaw[2]; [1]Illinois Institute of Technology; [2]University of Tennessee

10:00 AM
Accelerated Alloy Development and Characterization of Compositionally Complex Alloys via High-throughput Methods: *P. Nelaturu*[1]; M. Moorehead[1]; T. Duong[2]; M. Niezgoda[1]; A. Couet[1]; K. Sridharan[1]; S. Chaudhuri[2]; D. Thoma[1]; [1]University of Wisconsin; [2]Argonne National Laboratory

10:20 AM
Nanostructured Oxide-dispersion-strengthened High-entropy Alloys: X. Zhang[1]; F. Wang[1]; X. Yan[1]; X. Li[1]; K. Hattar[2]; *B. Cui*[1]; [1]University of Nebraska-Lincoln; [2]Sandia National Laboratories

10:40 AM
A High-throughput Strategy to Study Phase Stability and Mechanical Properties in Nb-Ti-V-Zr: *M. Li*[1]; Z. Zhang[1]; A. Thind[1]; G. Ren[1]; R. Mishra[1]; K. Flores[1]; [1]Washington University in St. Louis

High Entropy Alloys IX: Structures and Modeling — Structures and Characterization III

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday AM **March 18, 2021**

8:30 AM
Analysis of Multi-hit Events in Atom Probe Tomography of Refractory High Entropy Alloys: *P. Callahan*[1]; K. Knipling[1]; [1]US Naval Research Laboratory

8:50 AM Invited
Heavy Ion Irradiation Response of AlxFeCrNiMn High Entropy Alloys: *N. Li*[1]; D. Chen[2]; Y. Chen[3]; J. Weaver[4]; Y. Wang[1]; S. Fensin[1]; S. Maloy[1]; A. Misra[5]; [1]Los Alamos National Laboratory; [2]University of Houston; [3]University of North Carolina; [4]National Institute of Standards and Technology; [5]University of Michigan

9:15 AM Invited
Understanding Radiation Resistance in High Entropy Alloys Through Atom Probe Tomography: *J. Poplawsky*[1]; X. Wang[1]; W. Chen[2]; T. Yang[3]; W. Weber[1]; Y. Zhang[1]; [1]Oak Ridge National Laboratory; [2]Argonne National Laboratory; [3]Hunan University

9:40 AM
Grain-scale Plastic Response of Equiatomic CoCrFeMnNi High-entropy Alloy Using High Energy Diffraction Microscopy: *J. Gordon*[1]; R. Lim[1]; T. Rollett[1]; D. Pagan[2]; [1]Carnegie Mellon University; [2]Cornell High Energy Sychrotron Source

10:00 AM
Characteristics of Dislocation Slip in Refractory Multi-principal Element Alloys: *F. Wang*[1]; J. Stinville[1]; M. Charpagne[1]; G. Balbus[1]; L. Mills[1]; T. Pollock[1]; D. Gianola[1]; [1]University Of California, Santa Barbara

10:20 AM
Nitrogen-induced Solid Solution Hardening of an Austenitic (CrFeMnNi) HEA: *M. Traversier*[1]; P. Rinn[1]; E. Rigal[2]; A. Fraczkiewicz[1]; [1]École des mines de Saint-Étienne; [2]CEA LITEN

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Superalloys and Beyond: Oxidation and Mechanical Behavior I

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Thursday AM **March 18, 2021**

8:30 AM
Early Stage Oxidation of Ni- and Co-based Superalloys: Novel Insights from Rapid Thermal Annealing (RTA) Experiments: *D. Kubacka*[1]; E. Spiecker[1]; [1]FAU Erlangen-Nuremberg

8:50 AM
Residual Stress with High Temperature Oxidation of Ni-based Haynes 282 Superalloy: *K. Lan*[1]; H. Tung[2]; [1]National Tsing Hua University; [2]Institute of Nuclear Energy Research

9:10 AM
Understanding the High-temperature Fatigue Properties of the Novel Fe-Ni-Cr Based Superalloy: *S. Shukla*[1]; G. Muralidharan[2]; L. Allard[2]; J. Poplawsky[2]; [1]Oak Ridge National Laboratory; [2]ORNL

9:30 AM
Low Cycle Fatigue of Single Crystal Co- and CoNi-base Superalloys: The Role of Oxidation Resistance: *S. Murray*[1]; A. Cervellon[1]; J. Stinville[1]; J. Cormier[2]; T. Pollock[1]; [1]University Of California, Santa Barbara; [2]ISAE-ENSMA & Institut Pprime

9:50 AM
Concomitant Oxidation-diffusion-creep Processes for Stress Generation and Its Effects in Cyclic Oxidation Behavior: *Y. Gao*[1]; [1]University of Tennessee - Knoxville

10:10 AM
Effect of Water Species on Formation of Cationic Defects in Yttria-stabilized-Zirconia (YSZ): *A. Saeidi*[1]; D. Mumm[1]; [1]University of California, Irvine

10:30 AM
Paving the Way Beyond Ni-based Superalloys: Role of Coupled Thermodynamic-kinetic Models: *R. Pillai*[1]; B. Pint[1]; [1]Oak Ridge National Laboratory

10:50 AM Invited
Development of Refractory Metal 'BCC-superalloys' Reinforced by Ordered-BCC Intermetallic Precipitates: *A. Knowles*[1]; [1]University of Birmingham

11:20 AM Invited
Beyond Superalloys: An Efficient Strategy for Assessing Environmental Resistance: *B. Pint*[1]; [1]Oak Ridge National Laboratory

Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling — Session VII

Sponsored by: TMS Structural Materials Division, TMS: Thin Films and Interfaces Committee, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Saurabh Puri, Microstructure Engineering; Amit Pandey, Lockheed Martin Space; Dhriti Bhattacharyya, Australian Nuclear Science and Technology Organization; Dongchan Jang, KAIST; Jagannathan Rajagopalan, Arizona State University; Josh Kacher, Georgia Institute of Technology; Minh-Son Pham, Imperial College London; Robert Wheeler, Microtesting Solutions LLC; Shailendra Joshi, University of Houston

Thursday AM **March 18, 2021**

8:30 AM
Microstructural Influences on Grain Boundary Sliding in High Purity Aluminum
: *M. Linne*[1]; T. Bieler[2]; S. Daly[3]; [1]University of Michigan; Lawrence Livermore National Laboratory; [2]Michigan State University; [3]University of California at Santa Barbara

9:10 AM
In-situ Analysis of Powder Bed Quality during Selective Laser Melting: *T. Le*[1]; M. Seita[1]; [1]Nanyang Technological University

9:30 AM
Non-linear Reversible Behaviour of Metallic Alloys at Low Stresses: *J. Chamakura*[1]; V. Popovich[1]; J. Sietsma[1]; [1]TU Delft

9:50 AM
Creation of Strength Diagrams of Aluminum Flat Products, Dependent on the Different Thermomechanical Processes: *K. Ipek*[1]; E. Çaliskan[2]; D. Dispinar[3]; [1]Teknik Aluminyum San. A.S.; [2]Istanbul University; [3]Istanbul Teknik University

10:10 AM
Microscale Insight into the Effect of Twinning on Fracture in a Manganese Steel: *X. Zheng*[1]; A. Srivastava[1]; [1]Texas A&M University

10:30 AM
Surface Erosion of Spacecraft by High-velocity Regolith Impacts to Simulate Wind Storms on Martian Surfaces: *N. Bacca*[1]; C. Zhang[1]; A. Agarwal[1]; [1]Florida International University

Ni-Co 2021: The 5th International Symposium on Nickel and Cobalt — Market, Materials and Mineral Processing

Sponsored by: The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Corby Anderson, Colorado School of Mines; Dean Gregurek, RHI Magnesita; Mari Lundström, Aalto University; Christina Meskers; Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Fiseha Tesfaye, Abo Akademi University; Yuanbo Zhang, Central South University; Sari Muinonen, Glencore; Graeme Goodall, XPS- Glencore; Shijie Wang, Rio Tinto Kennecott Utah Copper Corp (Retired)

Thursday AM **March 18, 2021**

8:30 AM
Global Electrification of Electric Vehicles and Intertwined Material Supply Chains of Cobalt, Copper and Nickel: R. Nguyen[1]; R. Eggert[2]; *C. Anderson*[2]; M. Severson[3]; [1]Idaho National Laboratory; [2]Colorado School of Mines; [3]Miami University of Ohio

8:50 AM
An Innovative Beneficiation Process Developed for Jinchuan Nickel Ore Resources: *S. Wang*[1]; [1]Rio Tinto Kennecott Utah Copper Corp

9:10 AM
Effect of Fluorine on the High Temperature Oxidation Behavior of Nickel-based Alloys: *A. Donchev*[1]; M. Galetz[1]; [1]DECHEMA-Forschungsinstitut

9:30 AM
The Increasing Use of Nickel in the 21st Century: *G. Coates*[1]; [1]Nickel Institute

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

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University

Thursday AM **March 18, 2021**

8:30 AM Keynote
Solid-Liquid Interdiffusion (SLID) Bonding; For Thermal Challenges in Microsystem Bonding: *K. Aasmundtveit*[1]; H. Nguyen[1]; [1]University of South-Eastern Norway

9:10 AM Invited
Change in Electric Resistance of Conductive Pastes Including Ag Particles Coated with Various Higher Fatty Acids during Curing Process: *S. Fukumoto*[1]; K. Makimoto[1]; K. Ohta[1]; Y. Kashiba[1]; M. Matsushima[2]; K. Fujimoto[1]; [1]Osaka University; [2]Osaka Universty

9:40 AM
IMC-free Low-temperature TLP Cu-to-Cu Interconnection with Excellent Thermal Stability: *S. Lin*[1]; Y. Liu[1]; C. Yang[1]; Y. Hsieh[1]; C. Huang[1]; C. Lin[1]; [1]National Cheng Kung University

10:00 AM
Intermetallic Reactions and Interfacial Stability in Cu-Co-Sn System: *F. Emadi*[1]; V. Vuorinen[1]; H. Dong[1]; M. Paulasto-Kröckel[1]; [1]Aalto University

10:20 AM
Synthesis and Characterization of Silver Tin Alloy Powders by High Energy Ball Milling: *W. Huang*[1]; C. Tsai[1]; C. Kao[1]; [1]National Taiwan University

10:40 AM
Interfacial Microstructure Evolution of Ag/ENIG and Ag/Cu Joint under Thermal Aging: *M. Kim*[1]; S. Yoo[1]; H. Nishikawa[2]; [1]Korea Institute of Industrial Technology; [2]Osaka University

Phase Transformations and Microstructural Evolution — General Topic I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Thursday AM **March 18, 2021**

8:30 AM
About the Plasticity of Cobalt upon Phase Transformation: A High Temperature Nanoindentation Study: *V. Maier-Kiener*[1]; J. Kappacher[1]; H. Clemens[1]; [1]Montanuniversitaet Leoben

8:50 AM
Atomistic Modeling of the Twinning fcc/bcc Phase Transformation in Binary Systems: Quasi-particle Approach and Experiment: *G. Demange*[1]; H. Zapolsky[2]; K. Chen[3]; R. Patte[1]; Z. Wang[3]; P. Korzhavyi[4]; [1]CNRS-University Of Rouen Normandy; [2]Cnrs-University Of Rouen Normandy; [3]University of Science and Technology Beijing; [4] KTH - Royal Institute of Technology

9:10 AM
Data Assimilation-based Approach to Estimate Grain Boundary Properties Using Phase-field Grain Growth Simulations: *E. Miyoshi*[1]; T. Takaki[1]; Y. Shibuta[2]; M. Ohno[3]; [1]Kyoto Institute of Technology; [2]The University of Tokyo; [3]Hokkaido University

9:30 AM
Effects of Oxygen Interstitials on Phase Transformation Paths in Nb-Ti Alloys: *R. Silverstein*[1]; R. Clément[1]; C. Levi[1]; [1]University of California, Santa Barbara

9:50 AM
In Situ Transformations during Heating of Copper-intercalated Bismuth Telluride: *P. Shetty*[1]; M. McDowell[1]; [1]Georgia Institute of Technology

10:10 AM
Intrinsic Coupling between Phase Transformation and Deformation Twinning: *Y. Gao*[1]; [1]The Ohio State University

Recent Advances in Functional Materials and 2D/3D Processing for Sensors, Energy Storage, and Electronic Applications — Functional Materials and 2D/3D Devices

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Pooran Joshi, Oak Ridge National Laboratory; Rahul Panat, Carnegie Mellon University; Ravindra Nuggehalli, New Jersey Institute of Technology; Tolga Aytug, Oak Ridge National Laboratory; Yong Lin Kong, University of Utah; Konstantinos Sierros, West Virginia University

Thursday AM **March 18, 2021**

8:30 AM Invited
Additive Manufacturing of NdFeB Bonded Permanent Magnets: Prospects and Challenges: *M. Paranthaman*[1]; [1]Oak Ridge National Laboratory

8:55 AM Invited
Copper-carbon Nanotube Composites Enabled by Electrospinning for Advanced Conductors: *K. Li*[1]; M. McGuire[1]; A. Lupini[1]; L. Skolrood[1]; F. List[1]; B. Ozpineci[1]; S. Ozcan[1]; T. Aytug[1]; [1]Oak Ridge National Laboratory

9:20 AM
Performance of Chromium Doped Zinc Selenide Nanocrystals: Morphological and Fluorescence Characteristics: *N. Singh*[1]; C. Su[1]; B. Arnold[1]; F. Choa[1]; D. Sachs[1]; B. Setera[1]; C. Cooper[1]; B. Cullum[1]; K. Mandal[1]; [1]University of Maryland, Baltimore County

9:40 AM Invited
Revealing Meso-structure Dynamics in Additive Manufacturing of Energy Storage via Operando Coherent X-ray Scattering: C. Lin[1]; K. Dyro[1]; O. Chen[1]; D. Yen[1]; B. Zheng[1]; S. Bhatia[1]; K. Sun[1]; Q. Meng[2]; L. Wiegart[3]; *Y. Chen-Wiegart*[4]; [1]Stony Brook University; [2]China University of Mining and Technology; Stony Brook University; [3]Brookhaven National Laboratory; [4]Stony Brook University; Brookhaven National Laboratory

10:05 AM Invited
Sterilize and Recharge Masks Simultaneously for Safe Reuse: *Y. Zhong*[1]; S. Krishnamoorthy[1]; V. Paley[1]; X. Wang[1]; L. Ye[1]; [1]University of South Florida

Thermal Property Characterization, Modeling, and Theory in Extreme Environments — Nuclear Fuel Performance & Advanced Thermal Analysis

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee
Program Organizers: Janelle Wharry, Purdue University; Mukesh Bachhav, Idaho National Laboratory; Marat Khafizov, Ohio State University; Eric Lass, University of Tennessee-Knoxville; Vikas Tomar, Purdue University; Tiankai Yao, Idaho National Laboratory; Cody Dennett, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Thursday AM **March 18, 2021**

8:30 AM
Ultra-high Lattice Thermal Conductivity and the Effect of Pressure in Superhard Hexagonal BC2N: S. Nayeb Sadeghi[1]; S. Vaez Allaei[2]; M. Zebarjadi[1]; *K. Esfarjani*[1]; [1]University of Virginia; [2]University of Tehran

8:50 AM Invited
Performance of UO2 Reactor Fuel with High Thermal Conductivity Additives: *M. Tonks*[1]; F. Hilty[1]; [1]University of Florida

9:20 AM Invited
Atmosphere Controlled Thermogravimetric Analysis as a Tool to Screen, Test and Qualify Advanced Fuels under Extreme Conditions: *E. Sooby*[1]; [1]University of Texas at San Antonio

9:50 AM
Thermal Stability of Metallic Multilayers with TripleJjunctions: *T. Niu*[1]; Y. Zhang[1]; J. Cho[1]; J. Li[1]; H. Wang[1]; X. Zhang[1]; [1]Purdue University

10:10 AM
Energy Balance Investigation of Close-coupled Optimized-pressure Gas Atomization Pour-tube Design Geometry to Prevent Melt Freeze-off: *F. Hernandez*[1]; E. Deaton[1]; I. Anderson[1]; [1]Ames Laboratory of US DOE

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — Irradiation Effect in Nuclear Fuels and Materials

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Thursday PM **March 18, 2021**

2:00 PM
Point Defect Capture Characteristics and Stress States of Dislocation Loops in α-zirconium: *J. March-Rico*[1]; B. Wirth[1]; [1]University of Tennessee Knoxville

2:20 PM
Comparison of Void Swelling in Conventional and Novel HT9 Alloys after High Damage Level Ion Irradiation: *H. Kim*[1]; J. Gigax[1]; O. Atwani[1]; S. Maloy[1]; Y. Wang[1]; M. Chancey[1]; J. Baldwin[1]; [1]Los Alamos National Laboratory

2:40 PM
Dislocation Loop Formation in Self-ion Irradiated Ultra-high Purity FeCr Alloys: *Y. Li*[1]; Y. Zhao[1]; A. Bhattacharya[2]; J. Henry[3]; S. Zinkle[1]; [1]The University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory; [3]The French Alternative Energies and Atomic Energy Commission

3:00 PM
Effect of Microstructure and Rolling Treatment on Static Recrystallization Behavior in Monolithic U-10Mo Fuel Foils: *W. Frazier*[1]; K. Choi[1]; L. Li[1]; Z. Xu[1]; V. Joshi[1]; A. Soulami[1]; [1]Pacific Northwest National Laboratory

3:20 PM
Properties of a Helium Ion Beam Degrader for Implanting SSJ2 Tensile Specimens at the LBL 88-Inch Cyclotron: *S. Stevenson*[1]; A. Ben-Artzy[1]; L. Bernstien[2]; P. Hosemann[1]; [1]University of California, Berkeley; [2]LBL

3:40 PM
Proton Irradiation Induced Microstructural Evolution in Compositionally Graded Type 316L Stainless Steel: *X. Liu*[1]; J. Yang[2]; M. Song[3]; X. Lou[2]; Y. Zhang[4]; L. He[1]; D. Schwen[1]; [1]Idaho National Laboratory; [2]Auburn University; [3]University of Michigan; [4]University of Wisconsin-Madison

4:00 PM
Sink Strength Effect on Bubble Formation in Helium-implanted Nanostructured Ferritic Alloys: *Y. Lin*[1]; Z. Yan[2]; D. Hoelzer[3]; L. Tan[3]; S. Zinkle[1]; [1]University of Tennessee; [2]Peking University; [3]Oak Ridge National Laboratory

4:20 PM
Synergistic Irradiation and Ageing Effect on Microstructure and Mechanical Properties of Grade 92 at ~700C: *W. Zhong*[1]; L. Tan[1]; [1]Oak Ridge National Laboratory

4:40 PM
Dislocation Loop Characterization Using STEM-Contrast Techniques in an Irradiated FCC Alloy: *P. Xiu*[1]; L. Wang[1]; K. Field[1]; [1]University of Michigan

Additive Manufacturing of Functional, Energy, and Magnetic Materials — Advanced Manufacturing of Other Functional Materials

Sponsored by: TMS Functional Materials Division, TMS: Additive Manufacturing Committee, TMS: Magnetic Materials Committee
Program Organizers: Markus Chmielus, University of Pittsburgh; Sneha Prabha Narra, Worcester Polytechnic Institute; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University; Iver Anderson, Iowa State University Ames Laboratory

Thursday PM **March 18, 2021**

2:00 PM
Inconel-steel Multi-metal-material by Liquid dispersed Metal Powder Bed Fusion: Microstructure, Stress and Property Gradients: *S. Bodner*[1]; L. van de Vorst[2]; J. Zalesak[3]; J. Todt[3]; J. Keckes[3]; V. Maier-Kiener[1]; B. Sartory[4]; N. Schell[5]; J. Hooijmans[6]; J. Saurwalt[6]; J. Keckes[1]; [1]Montanuniversität Leoben; [2]TNO; [3]Austrian Academy of Sciences; [4]Materials Center Leoben GmbH; [5]Helmholtz-Zentrum Geesthacht ; [6]Admatec Europe BV

2:20 PM
Meltpool Oxidation and Reduction and Inclusion Evolution during the PBF Type Additive Manufacturing: D. Eo[1]; S. Chung[1]; *J. Cho*[1]; [1]Pohang University of Science and Technology

2:40 PM
Engineered Interconnected Porosity for Enhanced Functional Devices: *S. Roberts*[1]; B. Furst[1]; E. Sunada[1]; [1]Jet Propulsion Laboratory

Additive Manufacturing: Beyond the Beam II — Novel Solid State Processing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Paul Prichard, Kennametal Inc.; James Paramore, US Army Research Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Nihan Tuncer, Desktop Metal

Thursday PM **March 18, 2021**

2:00 PM
Control of High-temperature Drop-on-demand Metal Jetting Through Numerical Modelling and Experimentation: *N. Gilani*[1]; N. Aboulkhair[1]; M. Simonelli[1]; I. Ashcroft[1]; R. Hague[1]; [1]University of Nottingham

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — In Situ Characterisation and Material Response to Build Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee
Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

Thursday PM **March 18, 2021**

2:00 PM
In Situ Synchrotron Observation of Directed Energy Deposition Additive Manufacturing Process: *Y. Chen*[1]; S. Clark[1]; D. Collins[2]; S. Marussi[1]; T. Connolley[3]; R. Atwood[3]; O. Magdysyuk[3]; G. Baxter[4]; M. Jones[4]; C. Leung[1]; P. Lee[1]; [1]University College London; [2]The University of Birmingham; [3]Diamond Light Source; [4]Rolls-Royce plc

2:20 PM
In-situ TEM Solid-state Thermal Cycling of a Stainless Steel Fabricated via AM: *M. Upadhyay*[1]; L. Yedra-Cardona[2]; E. Héripré[3]; S. Hallais[1]; A. Tanguy[1]; [1]LMS, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris; [2]MSSMat and SPMS, CNRS, CentraleSupeléc, Université Paris-Saclay; [3]MSSMat, CNRS, CentraleSupeléc, Université Paris-Saclay

2:40 PM
Time-resolved Synchrotron X-ray Diffraction Studies of Phase Evolution in Ni alloy 718 during Laser Melting: *S. Oh*[1]; R. Lim[1]; J. Aroh[1]; J. Pauza[1]; A. Chuang[2]; B. Gould[2]; J. Bernier[3]; T. Sun[4]; R. Suter[1]; A. Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory; [3]Lawrence Livermore National Laboratory; [4]University of Virginia

3:00 PM
The Effects of Scanning Strategy on Cracking and Grain Structure of the IN738LC Superalloy Produced by Selective Laser Melting: *M. Lam*[1]; [1]Monash University

3:20 PM
Aging Effects on Phase Transformation and Microstructure Evolution in Selective Laser Melted NiTi Shape Memory Alloy: *M. Radhakrishnan*[1]; S. Saghaian[2]; M. Nematollahi[3]; K. Safaei[3]; O. Anderoglu[1]; M. Elahinia[3]; H. Karaca[2]; [1]University of New Mexico; [2]University of Kentucky; [3]University of Toledo

3:40 PM
Study of the Role of Beam Scan Strategies on the Microstructure and Mechanical Properties of EBM Additively Manufactured Ti-6Al-4V Builds: *M. Shao*[1]; S. Vijayan[1]; S. Kumar[2]; S. Babu[2]; J. Jinschek[1]; [1]The Ohio State University; [2]University of Tennessee

4:00 PM
Microstructural Control and Refinement in DMLS Ti-6Al-4V: *M. Vaughn*[1]; J. Unger[1]; M. Dunstan[2]; A. Gaynor[2]; B. Mcwilliams[2]; J. Guest[1]; K. Hemker[1]; [1]Johns Hopkins University; [2]Army Research Laboratory

Advanced Functional and Structural Thin Films and Coatings — Thin Films and Nanostructures for Optoelectronics II

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Thursday PM **March 18, 2021**

2:00 PM Keynote
Metamaterial Coatings for Tuning Optical and Fluid Wetting Behavior: *S. Putnam*[1]; [1]University of Central Florida

2:45 PM
Simulation of Optical Properties for Multilayers from Extreme Ultraviolet to Far Infrared: *L. Lin*[1]; N. Ravindra[1]; [1]New Jersey Institute of Technology

3:05 PM Invited
Localization of Dopants and Optical Properties of Phosphorus Doped Silicon Nanocrystals: *H. Rinnert*[1]; A. Giba[1]; F. Trad[1]; M. Stoffel[1]; X. Devaux[1]; A. Bouché[1]; M. Vergnat[1]; R. Demoulin[2]; E. Talbot[2]; A. Royet[3]; P. Acosta Alba[3]; S. Kerdiles[3]; [1]University of Lorraine, IJL; [2]Université de Rouen, GPM; [3]Université Grenoble Alpes, CEA

3:40 PM
Interface Characteristics in Transparent Optical Nanomultilayers: *D. White*[1]; C. Appleget[1]; A. Hodge[1]; [1]University of Southern California

4:00 PM
Pulsed-laser Deposition and Optical Characterization of Gallium Oxide (Ga_2O_3) Thin Films: *V. Zade*[1]; N. Makeswaran[1]; R. Chintalapalle[1]; [1]UTEP

Advanced Magnetic Materials for Energy and Power Conversion Applications — Advances in Characterization, Processing, and Design of Magnetic Materials

Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Richard Beddingfield, North Carolina State University; Daniel Salazar, BCMaterials; Alex Leary, NASA Glenn Research Center; Huseyin Ucar, California Polytechnic University; Yongmei Jin, Michigan Technological University; Arcady Zhukov, University of the Basque Country

Thursday PM **March 18, 2021**

2:00 PM Invited
Magnetic Domain Tomography: *R. Schaefer*[1]; [1]Ifw Dresden

2:30 PM
A Refinement Program to Characterize Single Crystal Magnetic Diffuse Scattering from Neutron Diffraction Experiments: *Z. Morgan*[1]; F. Ye[2]; [1]Michigan Technological University; [2]Oak Ridge National Laboratory

2:50 PM
Scale-up Production on MnBi Magnet with High Performance: *W. Tang*[1]; G. Ouyang[1]; X. Liu[1]; B. Cui[1]; K. Dennis[1]; J. Cui[2]; [1]Ames Laboratories; [2]Iowa State University

3:10 PM Invited
Exchange-coupled Ferromagnetism in Self-assembled Co-Pt Nanochessboards: *J. Floro*[1]; [1]University of Virginia

3:40 PM Invited
Neutron Diffraction: A Key Tool to Unravel the Magnetic Behaviour in Heusler Alloys: *J. Porro*[1]; [1]BCMaterials & Ikerbasque

4:10 PM
Magnetic Field-assisted HDDR Processing of NdFeB Powders: *M. Kesler*[1]; X. Lui[2]; I. Nlebedim[2]; M. Kramer[2]; M. McGuire[1]; [1]Oak Ridge National Laboratory; [2]Ames Laboratory

4:30 PM
A Novel Permanent Magnet Selection Methodology for Electric Vehicle Traction Motors: A. Paul[1]; *T. Jayaraman*[1]; [1]University of Michigan-Dearborn

4:50 PM
Magnetic Domain Observation by Soft X-ray Magnetic Circular Dichroism Microscopy of Nd-Fe-B-Ga Sintered Magnets Under High Magnetic Field and High Temperature: *A. Martin-Cid*[1]; S. Kobayashi[2]; D. Billington[2]; K. Toyoki[2]; Y. Kotani[2]; Y. Takada[3]; T. Sato[3]; Y. Kaneko[3]; A. Kato[4]; T. Sasaki[5]; T. Ohkubo[5]; K. Hono[5]; S. Hirosawa[5]; M. Suzuki[2]; T. Nakamura[6]; [1]Japan Synchrotron Radiation Research Institute (JASRI), SPring-8; [2]Japan Synchrotron Radiation Research Institute (JASRI), SPring-8; [3]Toyota Central R&D Labs, Inc; [4]Advanced Material Engineering Division, Toyota Motor Corporation; [5]National Institute for Materials Science; [6]Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University

Advanced Materials for Energy Conversion and Storage VII — Energy Conversion and Storage II

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Thursday PM **March 18, 2021**

2:00 PM Invited
Designing Earth-abundant Boron-based Electrocatalysts for Hydrogen Production: E. Lee[1]; H. Park[1]; P. Jothi[1]; Y. Zhang[1]; *B. Fokwa*[1]; [1]University of California, Riverside

2:30 PM
Morphology Study of Palladium Produced by Electrodeposition from EMIM-Cl Ionic Liquid: *W. Zhang*[1]; B. Pesic[2]; [1]Shenyang Ligong University; [2]University of Idaho

2:50 PM
Synthetic Control of Nanostructured Bilayered Vanadium Oxides for Intercalation Batteries: *E. Pomerantseva*[1]; [1]Drexel University

3:20 PM
Understanding the Role of Water-soluble Additive and pH in the Fabrication of Directionally Porous Electrodes for Lithium-Ion Batteries: *R. Parai*[1]; J. Marin[1]; D. Ghosh[1]; Z. Nie[2]; G. Koenig[2]; [1]Old Dominion University; [2]University of Virginia

Advances in Titanium Technology — General Topic of Ti and Ti Alloys

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Don Li, Howmet Engineered Products; Yufeng Zheng, University of Nevada-Reno; Peeyush Nandwana, Oak Ridge National Laboratory; Matthew Dunstan, US Army Research Laboratory

Thursday PM **March 18, 2021**

2:00 PM
The Effect of Process Parameters on Abnormal Grain Growth during Beta Annealing of Hot-Forged Ti-6Al-4V: *N. Levkulich*[1]; L. Semiatin[2]; A. Pilchak[2]; E. Payton[2]; [1]Ues Inc.; [2]Air Force Research Laboratory

Aluminum Reduction Technology — Continue Environment (Material and Equipment) & Fundamental Studies (Alumina Dissolution and Bath)

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Nadia Ahli, Emirates Global Aluminium; Nancy Holt, Hydro Aluminium AS

Thursday PM **March 18, 2021**

2:00 PM
Instant Monitoring of Aluminum Chemistry in Cells Using a Portable Liquid-metal Analyzer: S. Gudmundsson[1]; B. Björnsdóttir[2]; *K. Leosson*[1]; [1]DT Equipment; [2]Nordural ehf

2:20 PM
Dissolution Characteristics and Concentration Measurements of Alumina in Cryolite Melts: *L. Bracamonte*[1]; V. Aulie[1]; C. Rosenkilde[2]; K. Einarsrud[1]; E. Sandnes[1]; [1]Ntnu University; [2]Hydro Aluminium

2:40 PM
On Gaseous Emissions during Alumina Feeding: *S. Gylver*[1]; Å. Follo[2]; V. Aulie[1]; E. Sandnes[1]; H. Granlund[3]; A. Sørhuus[4]; K. Einarsrud[1]; [1]Norwegian University of Science and Technology; [2]Elkem; [3]Alcoa Mosjøen; [4]GE Power

3:00 PM
On the Feasibility of Using Low-melting Bath to Accommodate Inert Anodes in Aluminium Electrolysis Cells: *A. Solheim*[1]; [1]SINTEF Industry

3:20 PM
Electrochemical Reduction and Dissolution of Aluminium in a Thin-layer Refinery Process: *A. Yasinskiy*[1]; P. Polyakov[1]; I. Moiseenko[1]; S. Padamata[1]; [1]Siberian Federal University

3:40 PM
Influence of Additives on Alumina Dissolution in Superheated Cryolite Melts: *J. Alarie*[1]; L. Kiss[1]; S. Poncsák[1]; R. Santerre[2]; S. Guérard[3]; J. Bilodeau[3]; [1]University of Quebec at Chicoutimi; [2]Technical Advisor, Retired from Rio Tinto; [3]Arvida Research and Development Centre, Rio Tinto

Biological Materials Science — Biological Materials Science IV

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama

Thursday PM **March 18, 2021**

2:00 PM Invited
Understanding Heterogeneity in Bone Adaptation Following Exercise: *M. Kersh*[1]; S. Manandhar[1]; H. Song[1]; J. Polk[1]; [1]University of Illinois at Urbana-Champaign

2:30 PM
Internal Strain Mapping for Native and Implanted Glenoids: Y. Zhou[1]; G. Lewis[1]; A. Armstrong[1]; *J. Du*[1]; [1]Penn State University

2:50 PM
Negative Compressibility Architected Materials for Novel Cardiac Patches: *J. Rincon Tabares*[1]; D. Restrepo[1]; J. Velasquez[1]; H. Han[1]; [1]University of Texas at San Antonio

3:10 PM
Investigating the Effect of Morphological Parameters on the Sound-Induced Mechanical Response of Mosquito Antennae: *A. Trikanad*[1]; H. Pantoja-Sánchez[1]; X. Bernal[2]; P. Zavattieri[1]; [1]Purdue University; [2]Purdue University, Smithsonian Tropical Research Institute

Bulk Metallic Glasses XVIII — Alloy Design and Development

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM **March 18, 2021**

2:00 PM
Atomistic Characterization and Modeling of Corrosion in Al-based Amorphous Metals: *J. Chen*[1]; W. Cai[1]; [1]Virginia Polytechnic Institute and State University

2:20 PM
Synthesis of Bulk Metallic Glass-alumina Composites with Intertwined Dendritic Structure: *J. Lee*[1]; A. Wat[2]; C. Ryu[3]; J. Kim[3]; E. Park[3]; R. Ritchie[2]; [1]Pusan National University; [2]University of California, Berkeley; [3]Seoul National University

Ceramic Materials for Nuclear Energy Research and Applications — Advanced Ceramics Concepts

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nuclear Materials Committee
Program Organizers: Xian-Ming Bai, Virginia Polytechnic Institute and State University; Yongfeng Zhang, University of Wisconsin-Madison; Larry Aagesen, Idaho National Laboratory; Vincenzo Rondinella, Jrc-Ec

Thursday PM **March 18, 2021**

2:00 PM Invited
Development of Yttrium Hydride for High Temperature Moderator Application: *X. Hu*[1]; K. Terrani[1]; [1]Oak Ridge National Laboratory

2:30 PM
Ionization Effects on Damage Accumulation Behavior in SiC: *L. Nuckols*[1]; M. Crespillo[1]; Y. Zhang[2]; W. Weber[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

2:50 PM
Microstructural Characterization of Radiation Effects in 3D printed SiC: *T. Lach*[1]; T. Koyanagi[1]; C. Parish[1]; T. Byun[1]; K. Terrani[1]; [1]Oak Ridge National Laboratory

3:10 PM Invited
Microstructure and Chemical States of Fission Products in Irradiated AGR-1 and AGR-2 TRISO Particle UCO Fuel Kernels: *Y. Yang*[1]; I. van Rooyen[2]; Z. Fu[1]; B. Kombaiah[2]; [1]University of Florida; [2]Idaho National Laboratory

3:40 PM Invited
Oxidation Behavior of TRISO Fuel Materials: *H. Wen*[1]; A. Bratten[1]; V. Jalan[1]; [1]Missouri University of Science and Technology

4:10 PM
Evolution of Ion Irradiated Nitride Ceramics Properties for Coated Particle Fuel Systems: *A. Terricabras*[1]; A. Raftery[2]; A. Nelson[2]; S. Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

4:30 PM
On the Role of Neutron Irradiation Damages on Fission Products Transport in the SiC Layer of TRISO Fuel Particles: *S. Meher*[1]; I. van Rooyen[1]; C. Jiang[1]; [1]Idaho National Laboratory

Characterization of Materials through High Resolution Imaging — Algorithms for High Resolution Coherent Imaging of Materials

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation 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 Institut; Mathew Cherukara, Argonne National Laboratory

Thursday PM **March 18, 2021**

2:00 PM Invited
Optimization Based Approach for 3D Alignment in X-ray Nano-tomography: *K. Pande*[1]; [1]Lawrence Berkeley National Laboratory

2:30 PM
Adaptive Machine for 3D Bragg Coherent Diffraction Imaging Reconstructions: *A. Scheinker*[1]; R. Pokharel[1]; [1]Los Alamos National Laboratory

2:50 PM Invited
Exploiting Machine Learning Techniques in X-ray Ptychography: *P. Enfedaque*[1]; [1]LBNL

3:20 PM
Ptychographic Inversion with Deep Learning Network and Automatic Differentiation: *T. Zhou*[1]; M. Cherukara[1]; S. Kandel[1]; S. Hruszkewycz[1]; A. Hexemer[1]; R. Harder[1]; P. Enfedaque[1]; M. Holt[1]; [1]Argonne National Laboratory

3:40 PM
Image-based Simulation of Permeability and Image-to-Mesh Conversion of X-ray Tomographic Images of a Nickel Foam: *S. Shojaee*[1]; A. Zolfaghari[1]; [1]Thermo Fisher Scientific

4:00 PM Invited
Using Phase Field Simulations to Train Convolutional Neural Networks for Segmentation of Experimental Materials Imaging Datasets: *T. Stan*[1]; J. Yeom[2]; S. Hong[2]; P. Voorhees[1]; [1]Northwestern University; [2]Korea Advanced Institute of Science and Technology

Characterization of Minerals, Metals and Materials 2021 — Metallurgical Process Optimization

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

Thursday PM **March 18, 2021**

2:00 PM
Structure and Magnetic Properties of Gas-atomized Maraging Steel Powders for Additive Manufacturing: G. Thotakura[1]; A. Paul[1]; R. Goswami[2]; *T. Jayaraman*[1]; [1]University of Michigan-Dearborn; [2]Naval Research Laboratory

2:20 PM
Effects of Sinter Feed Size on Productivity and Quality of Iron Ore Sinter: *M. Zhang*[1]; M. Andrade[1]; [1]ArcelorMittal Global R&D

2:40 PM
Characterization of Brazilian Linz Donawitz-LD Steel Sludges: *M. Gomez-Marroquin*[1]; R. de Avillez[2]; S. Letichevsky[2]; D. Carbonel-Ramos[3]; A. Quintanilla-Balbuena[4]; K. Salazar-Yantas[4]; [1]APMMM/UNI; [2]DEQM PUC-Rio; [3]FIA UNI; [4]FIGMM UNI

3:00 PM
Manufacture of Porous Frit Vents using Space Holder Methodology for Radioisotopic Space Power Systems: *G. Sheppard*[1]; K. Tassenburg[1]; R. Mesalam[1]; B. Nenchev[1]; J. Strickland[1]; H. Williams[1]; [1]University of Leicester

Computational Techniques for Multi-Scale Modeling in Advanced Manufacturing — Multiscale Solid-state Models

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Anthony Rollett, Carnegie Mellon University; Laurentiu Nastac, University of Alabama; Mei Li, Ford Motor Company; Alexandra Anderson, Gopher Resource; Srujan Rokkam, Advanced Cooling Technologies Inc

Thursday PM **March 18, 2021**

2:00 PM Invited
Multiscale Crystal Plasticity in Integrated Computational Materials Engineering: *D. Pal*[1]; J. Akram[1]; T. Song[1]; J. Gerken[1]; D. Conover[1]; [1]Ansys

2:40 PM
Microstructure Based Modeling of Friction Stir Welded Joint between Dissimilar Metals Using Crystal Plasticity: *S. Kulkarni*[1]; K. Choi[1]; P. Upadhyay[1]; A. Soulami[1]; [1]Pacific Northwest National Laboratory

3:05 PM
Modeling Material Behavior during Continuous Bending Under Tension for Inferring the Post-necking Strain Hardening Response of Ductile Sheet Metals: Application to Dual-phase Steels: *M. Knezevic*[1]; R. Marki[1]; [1]University of New Hampshire

3:30 PM
Modeling the Role of Local Crystallographic Correlations in Microstructures of Ti-6Al-4V Using a Lamellar Visco-plastic Self-consistent Polycrystal Plasticity Formulation: *I. Riyad*[1]; R. Lebensohn[2]; B. McWilliams[3]; A. Pilchak[4]; M. Knezevic[1]; [1]University of New Hampshire; [2]Los Alamos National Laboratory; [3]CCDC Army Research Laboratory; [4]Air Force Research Laboratory

Computational Thermodynamics and Kinetics — Phonons, Magnons and Other Excitations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Thursday PM **March 18, 2021**

2:00 PM Invited
Phonons and Transition-induced Plasticity of bcc Refractory High-entropy Alloys from First Principles: *Y. Ikeda*[1]; P. Srinivasan[2]; B. Grabowski[1]; F. Körmann[3]; [1]University of Stuttgart; [2]TU Delft; [3]Max-Planck-Institut für Eisenforschung GmbH; TU Delft

2:30 PM
Contributions of Atom Vibrations to the Heat of Fusion of Germanium: *C. Bernal*[1]; C. Saunders[1]; S. H. Lohaus[1]; D. Abernathy[2]; B. Fultz[1]; [1]California Institute of Technology; [2]Oak Ridge National Laboratory

2:50 PM
A Computational and Experimental Study of Phonon Anharmonicity and Thermal Expansion of Cuprous Oxide: *C. Saunders*[1]; D. Kim[2]; H. Smith[3]; B. Fultz[1]; [1]California Institute of Technology; [2]Massachusetts Institute of Technology; [3]Swarthmore College

3:10 PM Invited
Development of New Ab-initio Non-adiabatic Excited-state Molecular Dynamics Method in NWChem: *H. Song*[1]; S. Fischer[2]; V. Freixas[3]; N. Govind[4]; S. Tretiak[1]; [1]Physics and Chemistry of Materials, Los Alamos National Lab; [2]U.S. Naval Research Laboratory; [3]Universidad Nacional de Quilmes; [4]Pacific Northwest National Laboratory

3:40 PM
First Principle Studies of Charged Point Defect in Phosphorene: *B. Rijal*[1]; A. Tan[1]; C. Freysoldt[2]; R. Hennig[1]; [1]University of Florida; [2]Max Planck Institute

4:00 PM
Negative Grüneisen Parameters in Nonmagnetic bcc-based Intermetallic FeTi at High Pressure: *B. Khamala*[1]; J. Munoz[2]; [1]University of Texas El Paso; [2]University of Texas El Paso

4:20 PM Invited
Anomalous Magnon-phonon Dynamics in Antiferromagnets: *C. Li*[1]; [1]University of California Riverside

Environmental Degradation of Additively Manufactured Alloys — Material Degradation in Irradiated Environments, Environmental Assisted Cracking

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; Michael Kirka, Oak Ridge National Laboratory; Xiaoyuan Lou, Auburn University; Brendy Rincon Troconis, University of Texas at San Antonio; Luke Brewer, University of Alabama

Thursday PM **March 18, 2021**

2:00 PM Invited
Additively Manufactured 316L Stainless Steel for Nuclear Applications: G. Was[1]; *M. Song*[1]; [1]University of Michigan

2:30 PM
Comparison of Oxidation Behavior of Ultrasonic Additively Manufactured and Conventional Zircaloy-4: *C. Parker*[1]; K. Kane[1]; S. Raiman[1]; B. Pint[1]; C. Massey[1]; A. Nelson[1]; [1]Oak Ridge National Laboratory

2:50 PM
Performance of Additively Manufactured FeCrAl Alloy Accident Tolerant Fuel Cladding in Nuclear Power Reactor Environments: V. Gupta[1]; *A. Hoffman*[1]; R. Rebak[1]; [1]GE Research

3:10 PM
Sensitization and Stress Corrosion Cracking of Alloy 800H by Laser Powder Bed Fusion: *J. Yang*[1]; X. Liu[2]; M. Song[3]; L. He[2]; X. Lou[1]; [1]Auburn University; [2]Idaho National Laboratory; [3]University of Michigan

Environmentally Assisted Cracking: Theory and Practice — Corrosion and Fracture in Harsh Environments

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Thursday PM **March 18, 2021**

2:00 PM Invited
Spectroelectrochemical Evaluation of Carbon Steel in Slightly Sour Environments Under the Presence of H_2S/CO_2 and Triazine-Based H_2S Scavenger: V. Ynciarte[1]; L. Caseres[2]; J. Dante[2]; *B. Rincon Troconis*[1]; [1]University of Texas at San Antonio; [2]Southwest Research Institute

2:40 PM
A Multiphysics Model of Synergistic Environmental Exposure Assisted Damage of Composite using Homogenization-based Degradation Variables: *Z. Li*[1]; M. Lepech[1]; [1]Stanford University

3:00 PM
Combined Ab-initio and Experimental Study of Hydrogen Sorption in Dual Phase Steels: *S. Sagar*[1]; V. Popovich[1]; P. Kömmelt[2]; P. Dey[1]; [1]Delft University of Technology; [2]Research and Development, Forming Technology, Tata Steel Ijmuiden BV

3:20 PM
Fatigue Crack Propagation in AA7085-T7451 Exposed to Complex Atmospheric Environments: *B. Free*[1]; S. Galyon Dorman[2]; J. Niebuhr[2]; J. Locke[1]; [1]The Ohio State Uniersity; [2]SAFE Inc.

3:40 PM
On the Stress Corrosion Cracking Behavior of 7xxx-series Al Alloys in Humid Environments: *Z. Harris*[1]; J. Schulte[1]; J. Burns[1]; [1]University of Virginia

4:00 PM
Phase-field Modeling of Galvanic Corrosion in Magnesium-Aluminum Joints: *K. Karayagiz*[1]; A. Powell[1]; Q. Ding[1]; B. Mishra[1]; [1]Worcester Polytechnic Institute

4:20 PM
Understanding Pitting Corrosion in a High-performance Aluminum Alloy by Four-dimensional (4D) X-ray Microtomography: *D. Sinclair*[1]; S. Niverty[1]; N. Chawla[1]; [1]Purdue University

4:40 PM
Formation of Ni-O-H-S Surface Phases on Cathodically Charged Ni: *L. Jiang*[1]; S. Verkhoturov[1]; E. Schweikert[1]; M. Demkowicz[1]; [1]Texas A&M University

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Data-Driven Investigations of Fatigue

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Jean-Charles Stinville, University of California-Santa Barbara

Thursday PM **March 18, 2021**

2:00 PM
Discovering the Structural Signature of Fatigue Crack Growth Rate Using Computer Vision and Machine Learning: *K. Jones*[1]; W. Musinski[2]; A. Pilchak[2]; R. John[2]; P. Shade[2]; A. Rollett[1]; E. Holm[1]; [1]Carnegie Mellon University; [2]Air Force Research Laboratory

2:20 PM
A Microstructural Model for Fatigue in NiTi Shape Memory Alloy Based on Information Fusion from Advanced Experiments and Simulation: *H. Paranjape*[1]; D. Pagan[2]; S. Manchiraju[3]; P. Anderson[4]; C. Bonsignore[1]; J. Gilbert[1]; I. Ong[1]; L. Vien[1]; [1]Confluent Medical; [2]Pennsylvania State University; [3]Ansys, Inc.; [4]The Ohio State University

2:40 PM
In-situ Diffraction and Cohesive-zone Studies of the Fatigue-crack-growth Behavior in the ZK60 Mg Alloy: *D. Xie*[1]; P. Liaw[1]; Y. Ren[2]; Y. Gao[1]; [1]University of Tennessee; [2]Argonne National Laboratory

Friction Stir Welding and Processing XI — Spot Technologies

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Yuri Hovanski, Brigham Young University; Piyush Upadhyay, Pacific Northwest National Laboratory; Yutaka Sato, Tohoku University; Nilesh Kumar, University of Alabama, Tuscaloosa; Anton Naumov, Peter the Great St. Petersburg Polytechnic University

Thursday PM **March 18, 2021**

2:00 PM
Advances in Refill Spot Welding Productivity: *Y. Hovanski*[1]; A. Curtis[1]; S. Michaelis[1]; P. Blackhurst[1]; B. Larsen[1]; [1]Brigham Young University

2:20 PM
Finite Element Analysis and Failure Mechanisms of Refill Friction Stir Spot Welding: *E. Boldsaikhan*[1]; S. Fukada[2]; M. Fujimoto[2]; K. Kamimuki[2]; [1]Wichita State University; [2]Kawasaki Heavy Industries, Inc.

2:40 PM
Characterization of Intermetallics Formation in μFSSW of Dissimilar Al/Cu Alloy Sheets: *D. Yan*[1]; L. Vahlstrom[1]; [1]San Jose State University

3:00 PM
Dissimilar Friction Stir Spot Welding of Low Carbon Steel and Aluminum Alloy by Double Side Adjustable Tools: *X. Wang*[1]; Y. Morisada[1]; H. Fujii[1]; [1]Osaka University

3:20 PM
Microstructural Characterization of Lap-jointed Ti-6Al-4V Plates by Pin-less Friction Stir Spot Welding: *H. Park*[1]; Y. Lim[2]; S. Rose[3]; Z. Feng[2]; H. Choo[1]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory; [3]Boeing

3:40 PM
Temperature Distribution during Friction Stir Spot Welding of Thin AA 6082-T6 and AA 5082-O Sheets: *M. Ozhegov*[1]; F. Isupov[1]; R. Smelianskii[1]; [1]St. Petersburg Polytechnic University of Peter the Great

Functional Nanomaterials: Functional Low-dimensional Materials (0D, 1D, 2D) Driving Innovations in Electronics, Energy, Sensors, and Environmental Engineering and Science 2021 — Functional Nanomaterials

Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee
Program Organizers: Jiyoung Chang, University of Utah; Michael Cai Wang, University of South Florida; Sarah Zhong, University of South Florida; Sun Choi, Korea Institute of Science and Technology; Pei Dong, George Mason University

Thursday PM **March 18, 2021**

2:00 PM Invited
Direct Backbone Attachment of Polyesters on Grain Boundaries Enhances Chemical Stability and Suppressing Ion Migration in $CH_3NH_3PbI_3$ Hybrid Perovskite Solar Cells: *C. Nam*[1]; [1]Brookhaven National Laboratory

2:25 PM
Antireflective Hybrid Nanocoatings Derived via Heated Liquid-phase Infiltration in Hierarchically Self-Assembled Block Copolymer Thin Film Templates: *A. Subramanian*[1]; N. Tiwale[2]; G. Doerk[2]; K. Kisslinger[2]; C. Nam[2]; [1]Stony Brook University; [2]Brookhaven National Laboratory

2:45 PM
Giant Low-temperature Anharmonicity in Silicon Nanocrystals: *S. Chen*[1]; D. Coleman[1]; D. Abernathy[2]; A. Banerjee[2]; L. Daemen[2]; L. Mangolini[1]; C. Li[1]; [1]University of California, Riverside; [2]Oak Ridge National Laboratory

3:05 PM
In-situ Chemical Analysis of the Nb-Si and NbOx-Si Interface as it Relates to their Electronic Properties: *G. Abad*[1]; S. McDonnell[2]; [1]University of Virginia; [2]Department of Materials Science and Engineering, University of Virginia

3:25 PM Invited
Nanomaterials for Multispectral Adaptive Radiative Heating and Cooling: *P. Hsu*[1]; [1]Duke University

3:50 PM Invited
Silicon Carbide Biotechnology: Carbon-based Neural Interfaces: C. Feng[1]; M. Beygi[1]; C. Frewin[1]; M. Rubayat-E Tanjil[2]; A. Kumar[2]; M. Wang[2]; *S. Saddow*[1]; [1]University of South Florida; [2]USF ME

4:15 PM
Substituent Effects on Electronic Properties of Cy5: Density Functional and Time-Dependent Density Functional Calculations: *A. Biaggne*[1]; L. Li[1]; B. Yurke[1]; [1]Boise State University

High Entropy Alloys IX: Alloy Development and Properties — Thermal and Other Properties

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM **March 18, 2021**

2:00 PM Invited
Controlling the Corrosion Resistance of Multi-principal Element Alloys: *J. Scully*[1]; S. Inman[1]; A. Gerard[1]; C. Taylor[2]; W. Windl[2]; D. Schreiber[3]; P. Lu[4]; J. Saal[5]; G. Frankel[2]; [1]University of Virginia; [2]The Ohio State University; [3]Pacific Northwest National Laboratory; [4]Questek Innovations LLC; [5]Citrine Informatics

2:25 PM
Tracer Diffusion in Single Crystalline CoCrFeNi and CoCrFeMnNiHigh-entropy Alloys: Kinetic Hints towards a Low-temperature PhaseInstability of the Solid-solution?: *D. Gaertner*[1]; J. Kottke[1]; Y. Chumlyakov[1]; F. Hergemöller[1]; G. Wilde[1]; S. Divinski[1]; [1]Institute of Materials Physics, University of Münster

2:45 PM
Electron and Phonon Thermal Conductivity in High Entropy Carbides with Variable Carbon Content: *P. Hopkins*[1]; C. Rost[2]; T. Borman[3]; M. Hossain[3]; M. Lim[4]; K. Quiambao-Tomko[1]; J. Tomko[1]; D. Brenner[4]; J. Maria[3]; [1]University of Virginia; [2]James Madison University; [3]Pennsylvania State University; [4]North Carolina State University

3:05 PM
Hyperbaric Laser Chemical Vapor Deposition of High-strength Aluminium-Silicon Carbide Nanocomposite Fibers: *J. Maxwell*[1]; A. Baji[1]; B. Mahler[1]; [1]La Trobe University, EMC² Centre, Engineering Dept.

High Entropy Alloys IX: Structures and Modeling — Structures and Characterization IV

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Thursday PM **March 18, 2021**

2:00 PM Invited
Rational Use of Entropy Unavoidability in High-entropy Ceramics: *S. Curtarolo*[1]; [1]Duke University

2:20 PM
Examination of the Bulk Metal-oxide Layer Interface of a Cr-Nb-Ta-V-W High Entropy Alloy at 700 and 800oC: *R. Romero*[1]; S. Varma[1]; N. Makeswaran[1]; R. Naraparaju[1]; C. Ramana[1]; [1]The University of Texas at El Paso

2:40 PM
Ex-situ and In-situ Characterization of Early Stage Oxidation Mechanism of High Entropy Alloys: *B. Gwalani*[1]; S. Lambeets[1]; M. Olszta[1]; D. Perea[1]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory

3:00 PM
On Sluggish Diffusion in Random, Equimolar FCC Alloys: *M. Daw*[1]; M. Chandross[2]; [1]Clemson University; [2]Sandia National Laboratories

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Superalloys and Beyond: Oxidation and Mechanical Behavior II

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

Thursday PM **March 18, 2021**

2:00 PM Invited
Understanding the Oxidation Mechanisms of Complex Concentrated Refractory-based Alloys: *T. Butler*[1]; T. Daboiku[1]; J. Gild[1]; O. Senkov[1]; [1]Wright Patterson Air Force Base

2:30 PM Invited
Effect of Al Addition on the Oxidation Behavior of a Mo-Si-B Alloy: *J. Perepezko*[1]; L. Lu[1]; [1]University of Wisconsin-Madison

3:00 PM
Oxidation Behavior of Nb-Si Based Ultrahigh Temperature Alloy at 600-1350: *X. Guo*[1]; X. Luo[1]; Y. Qiao[1]; P. Guan[1]; [1]Northwestern Polytechnical University

3:20 PM
Oxidation of TiAl Alloys GE 4822 and TNM-B1 between 600°C and 900°C and Impact on Mechanical Properties: *M. Galetz*[1]; L. Mengis[1]; A. Ulrich[1]; [1]DECHEMA-Forschungsinstitut

3:40 PM
On the High-temperature Air Oxidation Behavior of Ti3Al0.6Ga0.4C2 MAX Phase Solid-solution in the 1000 to 1300 °C Temperature Range: *T. Elmeligy*[1]; E. Epifano[2]; M. Sokol[1]; M. Barsoum[1]; [1]Drexel University, Department of Materials Science & Engineering, Philadelphia, PA, USA; [2]Laboratoire d'Etudes des Microstructures, CNRS-ONERA, Boite Postale 72, 92322 Châtillon Cedex, France

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XX — Phase Stability of Energy Materials

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Hiroshi Nishikawa, Osaka University; Shih-kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jaeho Lee, Hongik University; Zhi-Quan Liu, Shenzhen Institutes of Advanced Technology; Ming-Tzer Lin, National Chung Hsing University; Dajian Li, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Yee-wen Yen, National Taiwan University of Science and Technology; A.S.Md Abdul Haseeb, University of Malaya; Ligang Zhang, Central South University; Sehoon Yoo, KITECH; Vesa Vuorinen, Aalto University; Yu-chen Liu, National Cheng Kung University

Thursday PM **March 18, 2021**

2:00 PM Invited
Towards Predictive Solid-state Synthesis: Understanding Phase Evolution during the Formation of YBCO: *C. Bartel*[1]; [1]University of California, Berkeley

2:30 PM
Machine Learning for Perovskite Phase Stability: *D. Morgan*[1]; W. Li[2]; R. Jacobs[1]; [1]University of Wisconsin-Madison; [2]Google

2:50 PM
Vertically Stacked 2H-1T Dual-phase TMD Microstructures during Lithium Intercalation: A First Principles Study: *S. Parida*[1]; A. Mishra[1]; J. Chen[1]; J. Wang[1]; A. Dobley[2]; B. Carter[3]; A. Dongare[1]; [1]University Of Connecticut; [2]EaglePicher Technologies LLC; [3]Sandia National Laboratories

3:10 PM
Study on the Phase Diagrams of Bi-Te-RE (Yb, La, Ce, Nd, Sm, Tb, Er) Systems: *L. Zhang*[1]; M. Tan[1]; C. Mao[1]; L. Liu[1]; [1]Central South University

3:30 PM
The Significance of Transport Electronic Entropy in VO_2: *J. Paras*[1]; A. Allanore[1]; [1]Massachusetts Institute of Technology

3:50 PM
Electric Current Effect on the High-strain-rate Deformation of AA7075-T6 Al-alloy: *Y. Chen*[1]; K. Lin[1]; Y. Liu[1]; T. Chen[1]; T. Chen[1]; W. Lee[1]; S. Lin[1]; [1]National Cheng Kung University

Phase Transformations and Microstructural Evolution — General Topic II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

Thursday PM **March 18, 2021**

2:00 PM
Microstructural Evolution and Deformation Behavior during Uniaxial Compression of Al-Si Alloys: *T. Liu*[1]; M. Olszta[1]; B. Gwalani[1]; C. Park[2]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Argonne National Laboratory

2:20 PM
Suppression of Samson Phase Formation in Al-Mg Alloys by Boron Addition: *R. Goswami*[1]; [1]Naval Research Laboratory

2:40 PM
Transformations in Amorphous Environments near "Critical" Temperatures: *D. Choudhuri*[1]; [1]New Mexico Institute of Mining and Technology

3:00 PM
Crystallographic Transitions in Compositionally Complex Alloy Thin Films: *D. Goodelman*[1]; A. Hodge[1]; [1]University of Southern California

3:20 PM
Porous Graphite Fabricated by Liquid Metal Dealloying of Silicon Carbide: *G. Greenidge*[1]; J. Erlebacher[1]; [1]Johns Hopkins University

3:40 PM
Analysis of Dendrite Fragmentation from Microgravity Solidification Experiments: *Z. Thompson*[1]; T. Stan[1]; Y. Li[2]; P. Voorhees[1]; N. Mangelinck-Nol[2]; H. Nguyen-Thi[2]; [1]Northwestern University; [2]Aix Marseille Univ, Université de Toulon, CNRS, IM2NP, Marseille, France

Thermal Property Characterization, Modeling, and Theory in Extreme Environments — Structure - Thermal Property Relationships

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee
Program Organizers: Janelle Wharry, Purdue University; Mukesh Bachhav, Idaho National Laboratory; Marat Khafizov, Ohio State University; Eric Lass, University of Tennessee-Knoxville; Vikas Tomar, Purdue University; Tiankai Yao, Idaho National Laboratory; Cody Dennett, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Thursday PM **March 18, 2021**

2:00 PM
Mesoscale Modeling of the Effective Thermal Conductivity of a UO2-Mo Composite Nuclear Fuel: *K. Ahmed*[1]; F. Badry[1]; [1]Texas A&M University

2:20 PM Invited
Connection between Thermal Conductivity Degradation and Microstructural Changes in Graphite Due to Neutron Irradiation: *A. Campbell*[1]; [1]Oak Ridge National Laboratory

2:50 PM
Thermal and Mechanical Properties of Hafnon (HfSiO4), Theory and Experiments: Z. Ding[1]; M. Ridley[1]; J. Deijkers[1]; N. Liu[1]; M. Hoque[1]; J. Gaskins[1]; M. Zebarjadi[1]; P. Hopkins[1]; H. Wadley[1]; E. Opila[1]; *K. Esfarjani*[1]; [1]University of Virginia

3:10 PM Invited
First-principles Modeling of High Temperature Irradiation Resistant Thermocouple (HTIR-TC) Performance and Oxidation: L. Li[1]; *E. Sikorski*[1]; R. Skifton[2]; B. Jaques[1]; [1]Boise State University; [2]Idaho National Laboratory

3:40 PM
Multiphysics Mesoscale Modeling of Ablative Thermal Protection Systems: *M. Sessim*[1]; L. Shi[1]; S. Phillpot[1]; M. Tonks[1]; [1]University of Florida

4:00 PM
An Experimentally Validated Mesoscale Model for the Effective Thermal Conductivity of U-Zr Fuels: *K. Ahmed*[1]; F. Badry[1]; S. McDeavitt[1]; [1]Texas A&M University

2021 Technical Division Student Poster Contest — FMD 20201 Technical Division Undergraduate Student Poster Contest

Monday PM **March 15, 2021**

Batteries Made with Calcium Could Be Better for Electric Cars or Storing Renewable Energy: *C. Gerber*[1]; M. Woodcox[1]; M. Smeu[1]; [1]Binghamton University

2021 Technical Division Student Poster Contest — FMD 2021 Technical Division Graduate Student Poster Contest

Monday PM **March 15, 2021**

A Flexible Aqueous Rechargeable Battery Operating Over an Extended Temperature Range: *Y. Chen*[1]; Y. Wang[1]; [1]LSU

Degradation Characterization in Low Cobalt Lithium-ion Intercalation Cathodes: *H. Gonzalez Malabet*[1]; A. Gabhart[1]; M. Flannagin[1]; A. L'Antigua[1]; G. Nelson[1]; [1]The University of Alabama in Huntsville

Using Distribution of Relaxation Times Analysis and Microstructural Characterization to Quantify the Effects of Nanoparticle Infiltrants on the Catalytic Activity of Solid Oxide Fuel Cell Anodes: *J. Rix*[1]; B. Mo[1]; U. Pal[1]; S. Gopalan[1]; S. Basu[1]; [1]Boston University

Utilizing Advanced Manufacturing for the Development of Advanced In-pile Sensors and Instrumentation: *K. Fujimoto*[1]; T. Holschuh[1]; L. Hone[1]; M. McMurtrey[1]; P. Moo[1]; T. Unruh[1]; D. Estrada[2]; [1]Idaho National Laboratory; [2]Boise State University

2021 Technical Division Student Poster Contest — MPMD 2021 Technical Division Graduate Student Poster Contest

Monday PM **March 15, 2021**

Comparison of Laser Diffraction and Image Analysis Techniques for Particle Size-Shape Characterization in Additive Manufacturing Applications: *J. Grubbs*[1]; K. Tsaknopoulos[1]; C. Massar[1]; C. Walde[2]; A. Birt[2]; D. Cote[1]; [1]Worcester Polytechnic Institute; [2]Solvus Global

Investigation of Mechanical Properties and Microstructure in Additively Manufactured Austenitic 316L Stainless Steel: *H. Ali*[1]; N. Brubaker[1]; N. Van Rooyen[1]; I. Charit[1]; M. Maughan[1]; M. Jaster[2]; [1]University of Idaho; [2]Premier Technology

Mechanical and Microstructural Properties of FeCrAl Accident Tolerant Fuels Cladding Subjected to Flow Boiling CHF Testing: *R. Umretiya*[1]; D. Lee[2]; M. Anderson[2]; R. Rebak[3]; J. Rojas[1]; [1]Virginia Commonwealth University; [2]Universty of Wisconsin-Madison; [3]GE Global Research

Micro-structure Dependent Nano-scratch Behavior in Additively Manufactured Inconel 718: *M. Rifat*[1]; S. Basu[1]; [1]Penn State University

2021 Technical Division Student Poster Contest — SMD 2021 Technical Division Graduate Student Poster Contest

Monday PM **March 15, 2021**

Mechanical Behavior of Thermally Stable, Hierarchical Ni-Y Alloys: *S. Sharma*[1]; S. Moehring[1]; S. Sharma[1]; K. Solanki[1]; P. Peralta[1]; [1]Arizona State University

Nano-mechanical Behavior of Advanced Structural Alloys: *N. Ghodki*[1]; S. Mukherjee[1]; [1]University of North Texas

Prediction and Testing of Hot Cracking Susceptibility during Local Melting in Binary and Multi Component Aluminum Alloys: *S. Jain*[1]; [1]Iowa State University

Solidification and Defects Structure Evolution in Metal Additive Manufacturing via Molecular Dynamics Simulations: *G. Singh*[1]; V. Sundararaghavan[1]; [1]University of Michigan

2021 Technical Division Student Poster Contest — SMD 2021 Technical Division Undergraduate Student Poster Contest

Monday PM **March 15, 2021**

First Principles Investigation into Ductility of High Entropy B2-like Alloys: *E. Cuddy*[1]; E. Hwang[1]; J. Kaufman[2]; A. Shaw[3]; K. Laws[4]; A. Pribram-Jones[5]; L. Bassman[1]; [1]Harvey Mudd College; [2]UC Santa Barbara; [3]Calilfornia Institute of Technology; [4]University of New South Wales; [5]UC Merced

First Principles Study of Sigma Phase Destabilization in Compositionally-complex Stainless Steel Alloys: *A. Soper*[1]; S. Diaz[1]; H. Frank[1]; J. Kaufman[2]; A. Shaw[3]; K. Laws[4]; A. Pribram-Jones[5]; L. Bassman[1]; [1]Harvey Mudd College; [2]UC Santa Barbara; [3] California Institute of Technology; [4]University of New South Wales; [5]UC Merced

Utilizing CALPHAD Methods to Determine Phases in a Compositionally Complex Fe-Cr-based Alloy: *K. Paulsen*[1]; A. Loumidis[1]; P. Conway[2]; K. Privat[3]; K. Laws[3]; L. Bassman[1]; [1]Harvey Mudd College; [2]Jönköping University; [3]University of New South Wales

Advanced Materials for Energy Conversion and Storage VII — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Jung Pyung Choi, Pacific Northwest National Laboratory; Soumendra Basu, Boston University; Amit Pandey, Lockheed Martin Space; Paul Ohodnicki, University of Pittsburgh; Kyle Brinkman, Clemson University; Partha Mukherjee, Purdue University; Surojit Gupta, University of North Dakota

Monday PM **March 15, 2021**

A First-principles Study of Silver/Lanthanum Strontium Ferrite Interfacial Adhesion: *J. Park*[1]; Y. Qi[1]; [1]Brown University

AgCl-decorated Ag Nanowire Catalysts to Maximize the Surface Effect in the Oxygen Reduction Reaction: *S. Choi*[1]; Y. Park[1]; C. Lee[2]; H. Lee[1]; [1]Korea Advanced Institute of Science and Technology, Korea; [2]Korea Institute of Energy Research

Liquid Enhanced Ga-Sn Alloy Anode for RMBs: *J. Liu*[1]; C. Song[1]; Y. Yuan[1]; D. Li[1]; F. Pan[1]; [1]Chongqing University

MOF-derived Carbon Nanocomposites as a Novel Cathode for Lithium Air Batteries: *H. Pham*[1]; J. Lee[2]; M. Park[1]; [1]Kyung Hee University; [2]Daegu Gyeongbuk Institute of Science & Technology

Probing Structural Changes of 2D Supercapacitor Electrode by Kelvin Probe Force Microscopy: *K. Sambath Kumar*[1]; N. Choudhary[1]; D. Pandey[1]; Y. Ding[1]; L. Hurtado[1]; H. Chung[2]; L. Tetard[1]; Y. Jung[1]; J. Thomas[1]; [1]University of Central Florida; [2]Analytical Research Division, Korea Basic Science Institute

Synthesis and Electrochemical Performance of Nano Spinel Lithium Manganese Oxide (LiMn2O4) Composite with Functionalized Carbon Nanostructures (CNTs, GNPs & Graphene) by Microwave-Assisted Chemical Coprecipitation Method: *H. Tariq*[1]; A. Shakoor[1]; J. James[1]; [1]Center for Advanced Materials, Qatar University

Temperature-induced Successive Martensitic and Inter-martensitic Phase Transformations of $Ni_{2.15}Mn_{0.85}Ga$ Heusler Alloy: A. Madiligama[1]; *P. Ari-Gur*; Y. Ren[2]; V. Shavrov[3]; V. Koledov[3]; Y. Ge[4]; J. George[5]; [1]Penn State DuBois; [2]Argonne National Laboratory; [3]Russian Academy of Sciences; [4]Aalto University; [5]Western Michigan University

Advances in Powder and Ceramic Materials Science — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Materials Characterization Committee, TMS: Powder Materials Committee
Program Organizers: Bowen Li, Michigan Technological University; Shefford Baker, Cornell University; Huazhang Zhai, Beijing Institute of Technology; Kathy Lu, Virginia Polytechnic Institute and State University; Rajiv Soman, Eurofins EAG Materials Science LLC; Faqin Dong, Southwest University of Science and Technology; Jinhong Li, China University of Geosciences (Beijing); Ruigang Wang, The University of Alabama; Eugene Olevsky, San Diego State University

Monday PM **March 15, 2021**

Biodegradability and Bioactivity of Porous Hydroxyapatite-PCL-hardystonite for Using in Bone Tissue Engineering Application: *F. Tavangarian*[1]; S. Sadeghzade[1]; R. Emadi[2]; [1]Pennsylvania State University, Harrisburg; [2]Isfahan University of Technology

Apatite Formation Ability of Ca2MgSi2O7 Bioceramic: *F. Tavangarian*[1]; S. Sadeghzade[2]; C. Zolko[1]; R. Emadi[2]; [1]Pennsylvania State University, Harrisburg; [2]Isfahan University of Technology

Synthesis of Willemite Bioceramic by Mechanochemical Procedure: S. Sadeghzade[1]; R. Emadi[2]; *F. Tavangarian*[1]; [1]Pennsylvania State University, Harrisburg; [2]Isfahan University of Technology

Alloys and Compounds for Thermoelectric and Solar Cell Applications IX — 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; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science; Tiejun Zhu, Zhejiang University; Alexandra Zevalkink, Michigan State University; Wan-Ting Chiu, Tokyo Institute of Technology

Monday PM **March 15, 2021**

A Synergistic Approach to Boost the Thermoelectric Performance and Reduce the Thermal Conductivity in n-type PbTe : Carrier Optimization and Phase Diagram Engineering: *P. Deng*[1]; K. Wang[2]; J. Du[3]; H. Wu[1]; [1]National Chiao Tung University; [2]National Sun Yat-sen University; [3]National Tsing Hua University

Co-P Diffusion Barrier for Lead Telluride-based Thermoelectric Joints: *K. Cheng*[1]; H. Hsieh[1]; A. Wu[1]; [1]National Central University

Ni/Pb-Te and Ni/Se-Sn Interfacial Reactions and Their Related Phase Diagrams: *Y. Hutabalian*[1]; Z. Hu[1]; X. Chen[1]; S. Chen[1]; [1]National Tsing Hua University

Ultra-low Thermal Conductivity for High-Performance GeTe-based Thermoelectric Materials: *Y. Tsai*[1]; H. Wu[1]; [1]National Chiao Tung University

Using Neutrons to Probe the Influence of Processing on Temperature-dependent Strain in PbTe: *J. Male*[1]; R. Hanus[1]; G. Snyder[1]; R. Hermann[2]; [1]Northwestern University; [2]Oak Ridge National Laboratory

Bulk Metallic Glasses XVIII — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Yanfei Gao, University of Tennessee-Knoxville; Hahn Choo, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Maass, Federal Institute for Materials Research and Testing (BAM); Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

Monday PM **March 15, 2021**

Effect of Porosity Level on the Mechanical Properties of Bicontinuous Nanoporous Metallic Glasses: *C. Liu*[1]; P. Branicio[1]; [1]University of Southern California

Characterization of Nuclear Materials and Fuels with Advanced X-ray and Neutron Techniques — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee
Program Organizers: Xuan Zhang, Argonne National Laboratory; Jonathan Almer, Argonne National Laboratory; Maria Okuniewski, Purdue University; Joshua Kane, Idaho National Laboratory; Donald Brown, Los Alamos National Laboratory; J. Kennedy, Idaho National Laboratory; Arthur Motta, Pennsylvania State University

Monday PM **March 15, 2021**

Characterization of Microstructure, Texture, And Residual Stress in a Neutron Irradiated CANDU Pressure Tube: A. Alawadi[1]; *H. Abdolvand*[1]; M. Bach[2]; S. St Lawrence[2]; [1]Western University; [2]Canadian Nuclear Laboratories

Synchrotron Microdiffraction Study of Cracks and Indentation on UO2 Material: K. Mo[1]; *Y. Miao*[1]; R. Xu[1]; T. Yao[2]; J. Lian[3]; L. Jamison[1]; A. Yacout[1]; [1]Argonne National Laboratory; [2]Idaho National Laboratory; [3]Rensselaer Polytechnic Institute

X-ray Based Nanodiffraction to Study Strain in Materials for Nuclear Energy: *E. Jossou*[1]; M. Topsakal[1]; X. Huang[1]; K. Hattar[2]; H. Yan[1]; Y. Chu[1]; C. Sun[3]; L. He[3]; J. Gan[3]; L. Ecker[1]; S. Gill[1]; [1]Brookhaven National Laboratory; [2]Sandia National Laboratories; [3]Idaho National Laboratory

Coatings and Surface Engineering for Environmental Protection III — Poster Session

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Arif Mubarok, PPG; Tushar Borkar, Cleveland State University; Rajeev Gupta, North Carolina State University; Mary Lyn Lim, PPG Industries; Raul Rebak, GE Global Research; Brian Okerberg, PPG Industries

Monday PM **March 15, 2021**

Effects of Processing Conditions on the Tribocorrosion Resistance of Zr-based Thin Film Metallic Glass Coatings: *W. Wang*[1]; W. Cai[1]; [1]Virginia Polytechnic Institute and State University

Role of Surface Mechanical Attritions Processing Conditions on the Corrosion Behavior of Aluminum 7075 Alloys: *V. Beura*[1]; K. Solanki[1]; [1]Arizona State University

Computational Thermodynamics and Kinetics — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Nana Ofori-Opoku, Canadian Nuclear Laboratories; Eva Zarkadoula, Oak Ridge National Laboratory; Enrique Martinez Saez, Clemson University; Vahid Attari, Texas A&M University; Jorge Munoz, University of Texas at El Paso

Monday PM **March 15, 2021**

Martensitic Transformation in Superlattices of Two Non-transforming Materials: *S. Tripathi*[1]; M. Titus[1]; A. Strachan[1]; [1]Purdue University

Plutonium Phase Diagrams in the New Edition of the Plutonium Handbook: Experiments and Theory: *A. Perron*[1]; P. Turchi[1]; [1]Lawrence Livermore National Laboratory

Data Science and Analytics for Materials Imaging and Quantification — Poster Session

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Emine Gulsoy, Northwestern University; Charudatta Phatak, Argonne National Laboratory; Stephan Wagner-Conrad, Carl Zeiss Microscopy; Marcus Hanwell, Brookhaven National Laboratory; David Rowenhorst, Naval Research Laboratory; Tiberiu Stan, Northwestern University

Monday PM **March 15, 2021**

Quantitative EBSD Image Analysis and Prediction via Deep Learning: *Y. Han*[1]; J. Griffiths[1]; Y. Zhu[1]; H. Yu[1]; [1]Virginia Tech

High Dimensional Analysis of Abnormal Grain Growth under Dynamic Annealing Conditions: *M. Higgins*[1]; J. Kang[1]; N. Lu[1]; H. Liu[2]; R. Suter[2]; A. Shahani[1]; [1]University of Michigan; [2]Carnegie Mellon University

Understanding Powder Morphology and Its Effect on Flowability Through Machine Learning in Additive Manufacturing: *S. Yarasi*[1]; A. Kitahara[1]; A. Rollett[1]; E. Holm[1]; [1]Carnegie Mellon University

Deformation Induced Microstructural Modification — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Suveen Mathaudhu, University of California-Riverside ; Kester Clarke, Colorado School of Mines; Bharat Gwalani, Pacific Northwest National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

Monday PM **March 15, 2021**

Investigation of Mechanical Properties and Microstructral Valuation Under Different Heat Treatment Parameters of Aa6060 Alloy Used in Crash Boxes: *M. Konar*[1]; M. Güner[1]; G. Özçelik[1]; O. Çelik[1]; [1]ASAS Alüminyum Sanayi ve Ticaret A.S.

Optimization of Continuous Casting Products and High Aluminium-Magnesium Alloys Utilization in Automotive Industry Applications: *G. Demir*[1]; [1]Asas Alüminyum Sanayi ve Ticaret A.S

Synchrotron X-ray Probing Dynamic Structural Change of Materials under Shear Deformation by High-speed Rotational Diamond Anvil Cell: *T. Liu*[1]; B. Gwalani[1]; C. Park[2]; S. Sinogeikin[3]; A. Devaraj[1]; [1]Pacific Northwest National Laboratory; [2]Argonne National Laboratory; [3]DAC Tools, LLC

Magnesium Technology 2021 — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Victoria Miller, University of Florida; Petra Maier, University of Applied Sciences Stralsund; J. Brian Jordon, University of Alabama; Neale Neelameggham, IND LLC

Monday PM **March 15, 2021**

Role of Temperature and Pre-strain in Fatigue Strength of WE43-T5 Magnesium Alloy: *M. Knezevic*[1]; S. Ghorbanpour[1]; B. McWilliams[2]; [1]University of New Hampshire; [2]CCDC Army Research Laboratory

In situ Study of Mg-Zn Alloy Degradation Mechanisms towards Advancing In Vitro Testing: M. Viklund[1]; L. Wadsö[1]; *D. Orlov*[1]; [1]Lund University

Optimization of Mechanical Properties in Magnesium Zinc Alloys: *C. Hale*[1]; [1]North Carolina A&T University

Preparation of Thin-walled Magnesium AZ31 Alloy Tubes Using Friction Stir Extrusion: V. Shunmugasamy[1]; E. Khalid[1]; *B. Mansoor*; [1]Texas A&M University at Qatar

Corrosion Response of Friction Stir Processed EZ33 Mg Alloy: V. Shunmugasamy[1]; M. AbdelGawad[1]; E. Khalid[1]; *B. Mansoor*; [1]Texas A&M University at Qatar

Effect of Annealing on Microstructure and Hardness of Mg-9Al Alloy Plates Processed by Single-pass Differential Speed Rolling: *H. Zhang*[1]; Z. Xu[1]; S. Yarmolenko[1]; Q. Wei[2]; L. Kecskes[3]; J. Sankar[1]; [1]North Carolina A&T State University; [2]University of North Carolina at Charlotte; [3]Johns Hopkins University

Eutectic Modification of Mg_2Si in Mg-Si Alloys for Faster Hydrogen Absorption Kinetics.: *M. Kim*[1]; J. Piraquive[1]; Y. Ali[1]; S. McDonald[1]; T. Abbott[2]; K. Nogita[1]; [1]University of Queensland; [2]Magontec Ltd.

Mechanical and Microstructural Behavior of Rolled AZ31B Magnesium Alloy under Three Different Stress States: *L. Carneiro*[1]; D. Culbertson[1]; Q. Yu[2]; Y. Jiang[1]; [1]University of Nevada, Reno; [2]Lawrence Berkeley National Laboratory

Corrosion Behaviour of Shear Extruded Magnesium Alloy: *V. Beura*[1]; V. Joshi[2]; K. Solanki[1]; [1]Arizona State University; [2]Pacific Northwest National Laboratory

Liquid Enhanced Ga-Sn Alloy Anode for RMBs: *J. Liu*[1]; C. Song[1]; Y. Yuan[1]; D. Li[1]; F. Pan[1]; [1]Chongqing University

Mechanical Behavior of Nuclear Reactor Components — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee
Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Assel Aitkaliyeva, University of Florida; Eda Aydogan, Middle East Technical University; Laurent Capolungo, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories; Kayla Yano, Pacific Northwest National Laboratory; Caleb Massey, Oak Ridge National Laboratory

Monday PM **March 15, 2021**

The Thermo-mechanical Fracture of Chromium-zirconium Systems: T. Hasan[1]; *M. Zikry*[1]; [1]North Carolina State University

Simulating the Effects of Nuetron Irradiation on Zirconium Alloys: A Crystal Plasticity Finite Element Approach: O. Sedaghat[1]; *H. Abdolvand*[1]; [1]Western University

Practical Tools for Integration and Analysis in Materials Engineering — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Titanium Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Michael Gram, Titanium Metals Corporation; William Joost, Pratt & Whitney; Raymundo Arroyave, Texas A&M University; Charles Ward, AFRL/RXM

Monday PM **March 15, 2021**

An Automated Procedure for Reconstructing Deformation Twin Hierarchies in Heavily Twinned Microstructures Implemented Using MTEX: *D. Savage*[1]; R. McCabe[2]; M. Knezevic[3]; [1]University of New Hampshire/Los Alamos National Lab; [2]Los Alamos National Laboratory; [3]University of New Hampshire

Application of Prolate Spheroid Stereology to Microtexture Regions in Ti-6Al-4V: *J. James*[1]; A. Pilchak[2]; S. Jha[3]; R. Arroyave[1]; E. Payton[2]; [1]Texas A&M University; [2]AFRL; [3]AFRL/UDRI

Crystal Plasticity Model for Single Crystal Ni-based Superalloys: Capturing Orientation and Temperature Dependence of Flow Stress: S. Gupta[1]; *C. Bronkhorst*[1]; [1]University of Wisconsin, Madison

Rare Metal Extraction & Processing — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Gisele Azimi, University of Toronto; Takanari Ouchi, The University of Tokyo; Kerstin Forsberg, KTH Royal Institute of Technology; Hojong Kim, Pennsylvania State University; Shafiq Alam, University of Saskatchewan; Alafara Baba, University of Ilorin; Neale Neelameggham, IND LLC

Monday PM **March 15, 2021**

Extraction of Zn, Ga, Ge and In from Zinc Plant Residues: *V. Kashyap*[1]; [1]Colorado School of Mines

Recycling and Sustainability for Emerging Technologies and Strategic Materials — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: John Howarter, Purdue University; Mingming Zhang, ArcelorMittal Global R&D; Elsa Olivetti, Massachusetts Institute of Technology; Hong Peng, University of Queensland

Monday PM **March 15, 2021**

Computational Modeling of Current Density Distribution and Secondary Resistances for Aluminum Electrorefining in Ionic Liquids: *M. Nahian*[1]; Y. Peng[1]; L. Nastac[1]; R. Reddy[2]; [1]The University of Alabama; [2]University of Alabama

Conductivity of AlCl3-BMIC Ionic liquid Mixtures Containing TiCl4 at Different Temperatures and Molar Ratios: *M. Nahian*[1]; A. Ahmed[1]; P. Shinde[1]; R. Reddy[1]; [1]The University of Alabama

TMS-DGM Symposium: A Joint US-European Symposium on Linking Basic Science to Advances in Manufacturing of Lightweight Metals — Poster Session

Sponsored by: Deutsche Gesellschaft für Materialkunde e.V. (DGM): German Materials Society , TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee
Program Organizers: William Joost, Pratt & Whitney; Norbert Hort, Helmholtz-Zentrum Geesthacht

Monday PM **March 15, 2021**

The Microstructure, Morphology and Mechanical Properties of Rapidly Solidified Al-10wt%Si-0.4wt%Sc Alloy: *A. Sahoo*[1]; A. Bogno[1]; H. Henein[1]; [1]University of Alberta

100 Years and Still Cracking: A Griffith Fracture Symposium — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Megan Cordill, Erich Schmid Institute of Materials Science; William Gerberich, University of Minnesota; David Bahr, Purdue University; Christopher Schuh, Massachusetts Institute of Technology; Daniel Kiener, Montanuniverstität Leoben; Neville Moody; Nathan Mara, University of Minnesota; Erica Lilleodden, Helmholtz-Zentrum Geesthacht

Tuesday PM **March 16, 2021**

Crack Driving Force Expressions Using Compliance Approach in Clamped Beam Bending Geometry: *T. Chaudhari*[1]; A. Mishra[1]; H. Sahasrabuddhe[1]; [1]IIT Bombay

EAM Potential for Liquid Metal Induced Fracture: *A. Clement*[1]; T. Auger[1]; [1]CNRS / PIMM

Accelerated Discovery and Qualification of Nuclear Materials for Energy Applications — Poster Session

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Nuclear Materials Committee, TMS: Additive Manufacturing Committee
Program Organizers: Yongfeng Zhang, University of Wisconsin-Madison; Adrien Couet, University of Wisconsin-Madison; Michael Tonks, University of Florida; Jeffery Aguiar, Idaho National Laboratory; Andrea Jokisaari, Idaho National Laboratory; Karim Ahmed, Texas A&M University

Tuesday PM **March 16, 2021**

Anisotropic Biaxial Creep Behavior of Textured Nb-modified Zircaloy Cladding: *M. Hawary*[1]; K. Murty[1]; [1]North Carolina State University

Defect Cluster Mobilities and Preferred Configurations in \945-zirconium: A Comparison of Two Interatomic Potentials: *J. March-Rico*[1]; B. Wirth[1]; [1]University of Tennessee Knoxville

Helium Effect on Cavity Swelling in Dual-ion Irradiated Fe and Fe-Cr Alloys: *Y. Lin*[1]; A. Bhattacharya[2]; D. Chen[3]; J. Kai[3]; J. Henry[4]; S. Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]City University of Hong Kong; [4]CEA

Manufacturing Process Optimization of High-density LEU Targets for Mo-99 Production: *K. Kim*[1]; T. Cho[1]; S. Kim[1]; K. Lee[1]; Y. Jeong[1]; [1]Korea Atomic Energy Research Institute

Mesoscale Modeling of the Effect of Interfaces on Segregation of Point Defects and Solutes and the Patterning of Extended Defects: *K. Ahmed*[1]; A. Ozturk[1]; M. Gencturk[1]; L. Shao[1]; [1]Texas A&M University

Modeling and Analysis of the Effects of the Microstructure on U-10Mo Fuel Thickness Variation during Hot Rolling: *L. Li*[1]; V. Joshi[1]; A. Soulami[1]; [1]Battle Pacific Northwest National Lab

Additive Manufacturing Fatigue and Fracture V: Processing-Structure-Property Investigations and Application to Qualification — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Nik Hrabe, National Institute of Standards and Technology; John Lewandowski, Case Western Reserve University; Nima Shamsaei, Auburn University; Mohsen Seifi, ASTM International/Case Western Reserve University; Steve Daniewicz, University of Alabama

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Effect of Laser Power, Laser Spot Size and Hatch Spacing on Mechanical and Microstructural Properties of 316L Stainless Steel Processed via Selective Laser Melting: *T. Larimian*; T. Borkar[1]; M. Kannan[2]; D. Grzesiak[3]; B. AlMangour[4]; [1]Cleveland State University; [2]University of Akron; [3]West Pomeranian University of Technology; [4]Saudi Arabia Basic Industries Corporation

Effect of Thickness on Ultrasonic Fatigue Behavior of 316L Stainless Steel Made by Powder Bed Fusion Additive Manufacturing: *M. Trombley*[1]; Q. Shi[1]; J. Allison[1]; [1]University of Michigan

Quantifying Surface Roughness in Additive Manufactured Ti-6Al-4V Using In-situ X-ray Imaging: *A. Bhatt*[1]; C. Leung[1]; G. Soundarapandivan[2]; S. Marussi[1]; S. Shah[1]; R. Atwood[3]; M. Tiwari[1]; P. Lee[1]; [1]University College of London; [2]TWI Ltd; [3]Diamond Light Source Ltd

Ultrasonic Nondestructive Characterization of Hybrid Additively Manufactured 420 Stainless Steel: *L. Sotelo*[1]; C. Pratt[1]; H. Hadidi[1]; M. Sealy[1]; J. Turner[1]; [1]University of Nebraska Lincoln

Variation and Impact of Surface Roughness on Fatigue in Laser Powder Bed Fusion: *R. Evans*[1]; J. Gockel[1]; L. Sheridan[1]; [1]Wright State University

Additive Manufacturing for Energy Applications III — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Additive Manufacturing Committee, TMS: Nuclear Materials Committee
Program Organizers: Isabella Van Rooyen, Idaho National Laboratory; Indrajit Charit, University of Idaho; Subhashish Meher, Idaho National Laboratory; Michael Kirka, Oak Ridge National Laboratory; Kumar Sridharan, University of Wisconsin-Madison; Xiaoyuan Lou, Auburn University

Tuesday PM **March 16, 2021**

Additive Manufacturing of Nuclear Spacer Grids using Inconel 718 Alloy: Observed Distortion and Proposed Distortion Control Measures for Thin Walled Structures: *S. Uddin*[1]; J. Beuth[1]; Q. He[1]; [1]Carnegie Mellon University

Aid of Additive Manufacturing of 2D Materials for Miniaturization: Y. Wang[1]; *X. Zhang*[1]; [1]Stevens Institute of Technology

Development of Additive Manufacturing Processes for Embedding Thermocouples during Directed Energy Deposition: *M. McCoy*[1]; K. Cho[1]; J. Shelton[1]; P. Sabharwall[1]; I. Van Rooyen[1]; [1]Northern Illinois University

Experimental Fabrication of Porous Additive Manufactured Material: *L. Nunez*[1]; K. Cho[1]; I. Van Rooyen[2]; [1]Northern Illinois University; [2]Idaho National Laboratory

Numerical Study to Predict the Effect of Surface Roughness on the Thermal and Hydraulic Performance of Additively Manufactured Heat Exchangers: *J. Gonzalez*[1]; K. Cho[1]; J. Shelton[1]; P. Sabharwall[1]; I. Van Rooyen[1]; [1]Northern Illinois University

On the In-situ Formation of Nano Oxides during Laser Powder Bed Fusion as a Function of Steel Chemistry and Atmospheric Oxygen Level: *H. Yin*[1]; P. Deng[1]; M. Song[2]; M. Karadge[3]; X. Lou[1]; [1]Auburn University; [2]University of Michigan-Ann Arbor; [3]GE Research

Process-induced History Effects on the Creep Behavior of Additively Manufactured IN718 Alloys: *S. Sharma*[1]; K. Solanki[1]; [1]Arizona State University

Effect of Cold Rolling on the Microstructure and the Mechanical Properties of 316L Stainless Steel Parts Produced by Laser Powder Bed Fusion (LPBF): *L. Lemarquis*[1]; P. Giroux[1]; H. Maskrot[1]; B. Barkia[1]; O. Hercher[1]; F. Bondiguel[1]; P. Castany[2]; [1]Université Paris-Saclay, CEA; [2]Université de Rennes, INSA Rennes

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: Alex Plotkowski, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Kevin Chaput, Northrop Grumman; Mohsen Asle Zaeem, Colorado School of Mines; Wenda Tan, University of Utah; Lianyi Chen, University of Wisconsin-Madison

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Analytical Predictions and Experimental Observations of Melt Pool Geometry in Laser Powder Bed Fusion: *K. Graydon*[1]; N. Diaz Vallejo[1]; L. Zhou[1]; H. Hyer[1]; B. McWilliams[2]; K. Cho[2]; Y. Sohn[1]; [1]University of Central Florida; [2]CCDC Army Research Laboratory

Creating Periodic Surface Structures Using Multiple Laser Beams: *W. Zhang*[1]; W. Hou[1]; C. Arnold[1]; [1]Princeton University

Effect of Deoxidizer Addition on Melt Pool Oxidation of AISI 316L during SLM Process: *S. Chung*[1]; D. Eo[1]; J. Cho[1]; [1]Graduate Institute of Ferrous Technology, Postech

Energy Density on Melt Pool Dynamics and Solidification Microstructures in Laser Powder Bed Fusion Additive Manufacturing: *T. Zhang*[1]; C. Carter[1]; L. Yuan[1]; [1]University of South Carolina

In situ X-ray Observation and Quantification of Keyhole-induced Porosity during Laser Additive Manufacturing: *Y. Huang*[1]; C. Leung[1]; S. Clark[1]; S. Yeung[2]; Y. Chen[1]; L. Sinclair[1]; S. Marussi[1]; K. Fezzaa[3]; J. Thiyagalingam[2]; P. Lee[1]; [1]University College London; [2]Science and Technology Facilities Council; [3]Argonne National Laboratory

Influence of Processing Parameters and Geometry Effects on Residual Stress Development in Laser Powder Bed Fusion Additive Manufacturing: *A. Hayes*[1]; K. Muralidharan[1]; [1]The University of Arizona

Influence of Scan Strategies on Surface Morphology in LPBF: E. Duong[1]; L. Masseling[1]; U. Thombansen[1]; C. Knaak[1]; P. Dionne[2]; *M. Megahed*[2]; [1]Fraunhofer Institute for Laser Technology ILT; [2]ESI Group

Investigation into Interfacial Mixing Behavior of Blown Powder Deposited Inconel 625- Copper Alloy Bimetallic for Improvement of Bimetallic Joint Strength: *N. Naden*[1]; J. Schneider[1]; R. Osborne[2]; P. Gradl[3]; [1]University of Alabama in Huntsville; [2]ERC Inc./ Jacobs Space Exploration Group; [3]NASA/Marshall Space Flight Center

Laser Powder Bed Fusion of Metal Composites via In Situ Dealloying: *A. Chuang*[1]; A. Peters[1]; I. McCue[2]; J. Erlebacher[1]; [1]Johns Hopkins University; [2]JHU Applied Physics Laboratory

Melt Pool Evolution in High Power Selective Laser Melting of Nickel-based Alloy: E. Borisov[1]; K. Starikov[1]; A. Popovich[1]; *V. Popovich*[2]; [1]Peter the Great St. Petersburg Polytechnic University; [2]Delft University of Technology

On Mesoscopic Surface Formation in Metal Laser Powder Bed Fusion Process: *S. Zhang*[1]; S. Shrestha[1]; K. Chou[1]; [1]University of Louisville

Spatial Variation of Thermokinetics and Corresponding Grain Morphology Evolution in Laser Surface Engineered IN718: *M. Pantawane*[1]; S. Dasari[1]; S. Mantri[1]; R. Banerjee[1]; S. Banerjee[1]; N. Dahotre[1]; [1]University of North Texas

Using Dimensionless Numbers to Describe Process Boundaries in Laser Powder Bed Fusion: *T. Hanemann*[1]; C. Seyfert[1]; A. Witte[1]; P. Holfelder[1]; A. Rota[1]; M. Heilmaier[2]; [1]EOS Electro Optical Systems GmbH; [2]Karlsruhe Institute of Technology

Continuity of Eutectic Microstructures Across Melt Pool Boundaries in Laser Powder Bed Fusion: *J. Skelton*[1]; J. Fitz-Gerald[1]; J. Floro[1]; [1]University of Virginia

Wire Arc Additive Manufacturing of Nano-treated High Strength Aluminum Alloys: *M. Liese*[1]; M. Sokoluk[1]; Y. Chi[1]; X. Li[1]; [1]SciFacturing Lab

Additive Manufacturing: Materials Design and Alloy Development III -- Super Materials and Extreme Environments — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee
Program Organizers: Behrang Poorganji, University of Waterloo; Hunter Martin, HRL Laboratories LLC; James Saal, Citrine Informatics; Orlando Rios, Oak Ridge National Laboratory; Atieh Moridi, Cornell University; Jiadong Gong, Questek Innovations LLC

Tuesday PM **March 16, 2021**

Comprehensive Study on Creep Performance of Selective Laser Melted Inconel 718 through Post Heat Treatment and Microstructure-based Modelling: *S. Wu*[1]; [1]Monash University

Design and Development of Multi-Microlattice Structures for Improved Mechanical Behavior: *B. Sahariah*[1]; A. Namdeo[1]; P. Khanikar[1]; [1]Indian Institute of Technology Guwahati

Influence of Heat Treatments on the Dynamic Behavior of an Additively Manufactured IN718 Alloy: *S. Sharma*[1]; K. Solanki[1]; [1]Arizona State University

Mechanical Performance of Additively Manufactured Metallic Tetrahedral Microlattice Structure: *A. Namdeo*[1]; B. Sahariah[1]; P. Khanikar[1]; [1]Indian Institute of Technology Guwahati

Synchrotron Imaging of the Influence of Oxidation with Powder Age on Cracking Phenomena during Laser Powder Bed Fusion of CM247: *D. Rees*[1]; C. Leung[1]; G. Soundarapandiyan[2]; S. Marussi[1]; S. Shah[1]; R. Atwood[3]; B. Saunders[4]; G. Baxter[4]; P. Lee[1]; [1]University College London; [2]Coventry University; [3]Diamond Light Source Ltd.; [4]Rolls-Royce plc.

Additive Manufacturing: Solid-State Phase Transformations and Microstructural Evolution — Poster Session

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

Program Organizers: Bij-Na Kim, Carpenter Additive; Andrew Wessman, University of Arizona; Chantal Sudbrack, National Energy Technology Laboratory; Eric Lass, University of Tennessee-Knoxville; Katerina Christofidou, University of Sheffield; Peeyush Nandwana, Oak Ridge National Laboratory; Rajarshi Banerjee, University of North Texas; Whitney Poling, General Motors Corporation; Yousub Lee, Oak Ridge National Laboratory

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A Comparison of the Microstructure in Blown Powder Deposition Inconel 718 for Various Heat Treatments: *G. Puerto*[1]; C. Hill[2]; J. Schneider[1]; [1]University of Alabama in Huntsville; [2]NASA Space Flight Center

Constituent Phases and Microstructure of Cu-10Sn Alloy Produced by Laser Powder Bed Fusion: *L. Zhou*[1]; B. Lu[1]; H. Hyer[1]; A. Mehta[1]; S. Park[2]; Y. Sohn[1]; [1]University of Central Florida; [2]POSCO Technical Research Laboratories

Effect of Hot Isostatic Pressing Conditions on Microstructure Evolution and Hardness of Laser Powder Bed Fusion Processed Alloy 718: *H. Fagiha*[1]; R. Jiang[2]; J. Pauza[2]; M. Ahlfors[3]; C. Beamer[3]; A. Rollett[2]; A. Mostafaei[1]; [1]Illinois Institute of Technology; [2]Carnegie Mellon University; [3]Quintus Technologies

In Situ Observation of Phase Evolution in Ti-6Al-4V upon Laser Processing with Synchrotron X-ray Diffraction Analysis: *S. Oh*[1]; R. Lim[1]; J. Aroh[1]; J. Pauza[1]; A. Chuang[2]; B. Gould[2]; N. Parab[2]; J. Bernier[3]; T. Sun[4]; R. Suter[1]; A. Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory; [3]Lawrence Livermore National Laboratory; [4]University of Virginia

Microstructure-defect Printability in Laser Powder Deposition of Ni-based Superalloys: *X. Huang*[1]; [1]Texas A&M University

Microstructure Evolution in Laser Deposited AISI 420 Stainless Steel: Effect of Post-processing Heat Treatment: *M. Radhakrishnan*[1]; M. Hassan[1]; D. Otazu[2]; T. Lienert[2]; O. Anderoglu[1]; [1]University of New Mexico; [2]Optomec Inc

Tailoring Microstructure of Selective Laser Melted TiAl-alloy with In-situ Heat Treatment via Multiple Laser Exposure: I. Polozov[1]; A. Kantyukov[1]; A. Popovich[1]; *V. Popovich*[2]; [1]Peter the Great St. Petersburg Polytechnic University; [2]Delft University Of Technology

Tailoring the Microstructure of CoCrNi Medium-Entropy Alloy Manufactured by Selective Laser Melting: *M. Cagirici*[1]; P. Wang[2]; M. Nai[2]; J. Ding[1]; J. Wei[3]; [1]National University of Singapore; [2]Singapore Institute of Manufacturing Technology; [3]Harbin Institute of Technology

Well-aligned nanoprecipitates in Nickel alloy produced by direct metal laser sintering: *B. Yang*[1]; Z. Shang[1]; J. Ding[1]; J. Lopez[2]; W. Jarosinski[2]; T. Sun[1]; Y. Zhang[1]; N. Richter[1]; H. Wang[1]; X. Zhang[1]; [1]School of Materials Engineering, Purdue University; [2]Praxair Surface Techonologies Inc.

AI/Data Informatics: Applications and Uncertainty Quantification at Atomistics and Mesoscales — Poster Session I

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

Program Organizers: Kamal Choudhary, National Institute of Standards and Technology; Garvit Agarwal, Argonne National Laboratory; Wei Chen, Illinois Institute of Technology; Mitchell Wood, Sandia National Laboratories; Vahid Attari, Texas A&M University; Oliver Johnson, Brigham Young University; Richard Hennig, University of Florida

Tuesday PM **March 16, 2021**

A Machine Learning Investigation of Crystallographic Parameters for Abnormal Grain Growth: *M. Lyu*[1]; J. Pauza[1]; R. Cohn[1]; E. Holm[1]; [1]Carnegie Mellon University

A Sensitivity Analysis of Microstructure-Based Model for U-10Mo Hot Rolling and Annealing: *Y. Fu*[1]; W. Frazier III[1]; K. Choi[1]; L. Li[1]; Z. Xu[1]; V. Joshi[1]; A. Soulami[1]; [1]PNNL

Machine Learning Approach of Molecular Dynamics Simulations for Body-Centered Cubic Zirconium: *V. Meraz*[1]; B. Khamala[1]; A. Garcia[1]; A. De La Rocha[1]; J. Munoz[1]; T. Smidt[2]; W. de Jong[2]; [1]The University of Texas at El Paso; [2]Lawrence Berkeley National Laboratory

Microstructure-driven Parameter Calibration for Mesoscale Simulation: *T. Rodgers*[1]; D. Bolintineanu[1]; D. Moser[1]; R. Pokharel[2]; [1]Sandia National Laboratories; [2]Los Alamos National Laboratory

Mining Structure-property Linkages in Nonporous Materials Using Interpretative Deep Learning Approach: *H. Liu*[1]; N. Abdolrahim[1]; [1]University of Rochester

Defect and Phase Transformation Pathway Engineering for Desired Microstructures — Poster Session

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

Program Organizers: Yufeng Zheng, University of Nevada-Reno ; Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Timofey Frolov, Lawrence Livermore National Laboratory; Stoichko Antonov, Max-Planck-Institut für Eisenforschung GmbH; Jessica Krogstad, University of Illinois at Urbana-Champaign; Bin Li, University of Nevada, Reno

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Anisotropic Thermal Lattice Expansion and Crystallographic Structure of Strontium Aluminide within Al-10Sr Alloy as Measured by In-situ Neutron Diffraction: *K. Liss*[1]; S. Harjo[2]; T. Kawasaki[2]; K. Aizawa[2]; P. Xu[3]; [1]Guangdong Technion - Israel Institute of Technology (GTIIT); [2]J-PARC Center, Japan Atomic Energy Agency; [3]Materials Sciences Research Center, Japan Atomic Energy Agency

Deformation Induced Precipitation (DIP): A Cohesive Processing Strategy to Strengthen Magnesium Alloys: *S. Eswarappa Prameela*[1]; P. Yi[1]; L. Kecskes[1]; M. Falk[1]; T. Weihs[1]; [1]Johns Hopkins University

The Effect of Heating Rate on Recrystallization of Niobium: *Z. Thune*[1]; T. Bieler[1]; [1]Michigan State University

The Effects of Defect Structure on Transformation Properties in NiTi Alloys for Phase Change Thermal Management Applications: *A. Leff*[1]; A. Wilson[1]; D. Sharar[1]; [1]CCDC Army Research Laboratory

Environmentally Assisted Cracking: Theory and Practice — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Bai Cui, University of Nebraska-Lincoln; Raul Rebak, GE Global Research; Srujan Rokkam, Advanced Cooling Technologies Inc; Jenifer Locke, Ohio State University

Tuesday PM **March 16, 2021**

Extraction of Zinc from Zinc Hypoxide in the Process of Ammonia Leaching: L. Zhao[1]; *H. Li*[1]; J. Liang[1]; [1]North China University of Science and Technology

The Impact of Laser Shock Peening Parameters on the Ability to Mitigate Stress Corrosion Cracking in Al-Mg Alloys: *E. Dau*[1]; W. Golumbfskie[2]; M. McMahon[2]; [1]Vision Point Systems; [2]Naval Surface Warfare Center, Carderock Division

Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling — Poster Session

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Additive Manufacturing Committee, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Garrett Pataky, Clemson University; Ashley Spear, University of Utah; Antonios Kontsos, Drexel University; Brian Wisner, Ohio University; Jean-Charles Stinville, University of California-Santa Barbara

Tuesday PM **March 16, 2021**

Micro-scale Characterization of Life-limiting Areas in Additive Manufactured Parts: *C. Varney*[1]; P. Rottmann[1]; [1]University of Kentucky

The Effect of Corrosion Location Relative to Local Stresses on the Fatigue Life of Geometrically-complex, Galvanically Corroded AA7075-T6: *C. Cocke*[1]; J. Burns[1]; [1]University of Virginia

Frontiers in Solidification Science VIII — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Damien Tourret, IMDEA Materials; Amy Clarke, Colorado School of Mines; Ulrike Hecht, Access e.V. ; Nana Ofori-Opoku, Canadian Nuclear Laboratories; Melis Serefoglu, Koc University; Tiberiu Stan, Northwestern University

Tuesday PM **March 16, 2021**

Data-assimilation for Dendritic Solidification Using Phase-field Simulation Based on Limited Observation Data: *Y. Imai*[1]; S. Sakane[1]; T. Takaki[1]; [1]Kyoto Institute of Techonology

Electronic-structure Calculations of Local Orders in Liquid Metals: *B. Lee*[1]; G. Lee[2]; [1]Kyung Hee University; [2]Korea Research Institute of Science and Standards

Multi-phase-field Lattice Boltzmann Modeling and Simulations for Semi-solid Deformation: *N. Yamanaka*[1]; S. Sakane[1]; T. Takaki[1]; [1]Kyoto Institute of Technology

Heterostructured and Gradient Materials (HGM IV): Tailoring Heterogeneity for Superior Properties — Poster Session

Sponsored by: TMS Structural Materials Division, 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
; Yves Brechet, Grenoble Institute of Technology; Huajian Gao, Nanyang Technological University; Hyoung Seop Kim, Pohang University of Science and Technology; Ke Lu, Institute of Metal Research; Xiaolei Wu, Chinese Academy of Sciences

Tuesday PM **March 16, 2021**

Evolution of Diffusion Joint of Al-steel Clad Strip during Heat Treatment: *B. Krivská*[1]; M. Šlapáková[1]; R. Králík[1]; L. Bajtošová[1]; M. Cieslar[1]; M. Stolbchenko[2]; O. Grydin[2]; M. Schaper[2]; [1]Charles University; [2]Paderborn University

Origin of Enhanced Ductility in Laser Rapid Solidified Heterogeneous Hypereutectic Al-20Si Alloy: Slip Interactions between Soft Al Matrix and Hard Si Fibers?: *H. Lien*[1]; [1]University of Michigan

Work Hardening of Gradient FeCrAl Alloy: An *In- situ* Micropillar Compression Study: *T. Sun*[1]; Z. Shang[2]; J. Cho[2]; J. Ding[2]; Y. Zhang[2]; T. Niu[2]; B. Yang[2]; D. Xie[3]; J. Wang[3]; H. Wang[2]; X. Zhang[2]; [1]Purdue University; [2]Purdue University, School of Materials Engineering; [3]University of Nebraska-Lincoln

Effect of Layer Spacing and Elastic-plastic Mismatch on Fracture Toughness of Ti-TiN Multilayers: *A. Mishra*[1]; H. Gopalan[2]; M. Hans[3]; C. Kirchlechner[4]; J. Schneider[3]; G. Dehm[2]; N. Balila[1]; [1]Indian Institute of Technology Bombay; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]RWTH Aachen University; [4]Karlsruhe Institute of Technology

Hierarchical Morphologies in Co-sputter Deposited Immiscible Alloy Thin Films: *M. Powers*[1]; [1]University of Michigan

High Temperature Electrochemistry IV — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Nuclear Materials Committee, TMS: Hydrometallurgy and Electrometallurgy Committee
Program Organizers: Prabhat Tripathy, Batelle Energy Alliance (Idaho National Laboratory); Guy Fredrickson, Idaho National Laboratory

Tuesday PM **March 16, 2021**

Investigation on Preparation of Fe-Al Alloys by Direct Reduction of Fe2O3-Al2O3 Powder in CaCl2-NaCl Molten Salt System: *H. Li*[1]; [1]North China University of Science and Technology

Investigation on Preparation of Fe-Al Alloys by Direct Reduction of Fe2O3-Al2O3 Powder in CaCl2-NaCl Molten Salt System: J. Liu[1]; *H. Li*[1]; J. Liang[1]; [1]North China University of Science and Technology

Materials and Chemistry for Molten Salt Systems — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
Program Organizers: Stephen Raiman, Texas A&M University; Kumar Sridharan, University of Wisconsin-Madison; Nathaniel Hoyt, Argonne National Laboratory; Jinsuo Zhang, Virginia Polytechnic Institute and State University; Michael Short, Massachusetts Institute of Technology; Raluca Scarlat, University of California-Berkeley

Tuesday PM **March 16, 2021**

An Update on the Round Robin for Molten Salt Chemical and Thermal Properties Characterization: *R. Scarlat*[1]; T. Bessman[2]; J. McMurray[3]; [1]University of California, Berkeley; [2]University of South Carolina; [3]Oak Ridge National Laboratory

Cost-effective, Reliable Containment of High-temperature Molten Chlorides for Heat Transfer and Thermal Energy Storage: *L. Gao*[1]; E. Laskowksi[1]; K. McGowan[1]; R. Cullen[1]; M. Caccia[1]; K. Sandhage[1]; [1]Purdue University

Electron Energy Loss Spectroscopy Characterization of Molten Salt Corrosion Damage in Pure Ni and Model Ni-20Cr Binary Alloy: *K. Bawane*[1]; P. Manganaris[1]; Y. Wang[1]; J. Sure[2]; A. Ronne[3]; X. Liu[3]; P. Halstenberg[4]; S. Gill[2]; K. Sasaki[2]; Y. Chen-Wiegart[3]; S. Mahurin[4]; S. Pimblott[1]; J. Wishart[2]; L. He[1]; [1]Idaho National Laboratory; [2]Brookhaven National Laboratory; [3]Stony Brook University; [4]Oak Ridge National Laboratory

Fast and Accurate High-dimensional Neural Network Interatomic Potentials for Lithium-based Fluoride Salts: *S. Lam*[1]; Q. Li[2]; R. Ballinger; C. Forsberg[2]; J. Li[2]; [1]University of Massachusetts - Lowell; [2]Massachusetts Institute of Technology

Fluoride Salt Purification Using Bifluoride Salt for Hydrogen Fluoride-generation: *R. Laehn*[1]; D. Martinez[2]; A. Robison[1]; [1]Abilene Christian University; [2]ACU NEXT Project

High-temperature, Air-compatible Molten Salts, and an Associated Corrosion-resistant Containment Strategy, for Cost-effective and Reliable Heat Transfer and Thermal Energy Storage: *A. Caldwell*[1]; G. Itskos[1]; S. Bagherzadeh[1]; M. Caccia[1]; K. Sandhage[1]; [1]Purdue University

High-temperature, High-toughness, Corrosion-resistant Cermet Alloys (NiWC) for CSP Gen 3 Subsystem Component Design: *L. Handy-Cardenas*[1]; M. Elbakhshwan[1]; S. Lee[1]; M. Anderson[1]; J. Hensel[2]; G. Santillan[2]; [1]University of Wisconsin-Madison; [2]Powdermet

Investigating Test Parameters for Isothermal Salt Compatibility Experiments: *C. Parker*[1]; D. Sulejmanovic[1]; J. Kurley[1]; S. Raiman[1]; B. Pint[1]; [1]Oak Ridge National Laboratory

Performance of Corrosion Resistant Claddings on 316H Stainless Steel in Molten Fluoride Salt: *M. Weinstein*[1]; W. Doniger[1]; C. Falconer[1]; C. Zhang[2]; C. Topbasi[3]; K. Sridharan[1]; A. Couet[1]; [1]University Of Wisconsin Madison; [2]Computherm, LLC; [3]Electric Power Research Institute

Prediction of Actinide Salt Compounds Using Density-Functional Theory and the Universal Structure Predictor: Evolutionary Xtallography (USPEX) Algorithm: *M. Christian*[1]; T. Besmann[1]; [1]University of South Carolina

Purification of Molten NaCl-CaCl2 Using Anhydrous HCl: *D. Hamilton*[1]; [1]University of Utah

Relevance and Methods of Fluoroacidity Quantification: *H. Williams*[1]; N. Winner[1]; R. Scarlat[1]; [1]University of California - Berkeley

Short- and Medium-range Structure of Molten Fluorides with Cr Solutes: *N. Winner*[1]; H. Williams[1]; R. Scarlat[1]; M. Asta[1]; [1]University of California Berkeley

Testing Setup to Analyze Particulates in 316 Stainless Steel Molten Salt Systems: *R. Howe*[1]; J. Dowell[1]; T. Head[1]; T. Kennedy[1]; [1]ACU NEXT Lab

Yellowjacket: A New MOOSE-based Corrosion Modelling Application for Molten Salt Reactors: *P. Bajpai*[1]; C. Bhave[2]; M. Poschmann[1]; D. Andrs[3]; M. Tonks[2]; M. Piro[1]; [1]Ontario Tech University; [2]University of Florida; [3]Idaho National Laboratory

A High-temperature Thermodynamic Reference Electrode Enclosed in an Alumina Tube: *M. Zhang*[1]; J. Zhang[1]; [1]Virginia Tech

Development and Demonstration of a Novel Spectroelectrochemical Cell for Molten Salts: *D. Killinger*[1]; S. Phongikaroon[1]; [1]Virginia Commonwealth University

Materials Engineering -- From Ideas to Practice: An EPD Symposium in Honor of Jiann-Yang Hwang — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee, TMS: Pyrometallurgy Committee
Program Organizers: Bowen Li, Michigan Technological University; Baojun Zhao, University of Queensland; Jian Li, CanmetMATERIALS; Sergio Monteiro, Instituto Militar de Engenharia; Zhiwei Peng, Central South University; Dean Gregurek, RHI Magnesita; Tao Jiang, Central South University; Yong Shi, Futianbao Environment Technologies; Cuiping Huang, FuTianBao Environment Protection Technology Company Ltd.; Shadia Ikhmayies

Tuesday PM **March 16, 2021**

Ballistic Evaluation of the Multilayer Armor System Reinforced by Guaruman Fiber: R. Reis[1]; L. Nunes[1]; *S. Monteiro*; L. Nascimento[1]; [1]Military Institute of Engineering

Evaluation of Ballistic Behavior by Residual Velocity of Epoxy Composite Reinforced with Sisal Fabric after UV Radiation Exposure: *M. Oliveira*[1]; L. Nascimento[1]; S. Monteiro[1]; [1]Instituto Militar de Engenharia

Determination of the Elasticity Modulus of a PC/rGO Nanocomposite via Impulse Excitation Technique - Sonelastic: A. Oliveira da Silva[1]; R. Weber[1]; *S. Monteiro*; K. Monsores[1]; [1]Military Institute of Engineering

Influence of Surface Treatment on Physical and Chemical Behavior of Politetrafluoroethylene: K. Monsores[1]; G. Nicolau[1]; A. Oliveira[1]; S. Oliveira[1]; R. Weber[1]; *S. Monteiro*; [1]Instituto Militar de Engenharia

Influence of Weathering on the Mechanical Performance of an Aramid Fabric: A. Oliveira da Silva[1]; R. Weber[1]; R. Nascimento[1]; *S. Monteiro*; [1]Military Institute of Engineering

Physical and Morphological Analysis of Concrete Produced with Expanded Clay: *L. Demosthenes*[1]; J. Nunes; L. Coelho[1]; S. Monteiro[1]; A. Teixeira[1]; [1]Instituto Militar de Engenharia

Structural Characterization of Caranan Fiber (Mauritiella Aramata): A. Souza[1]; R. Junio[1]; *L. Neuba*[1]; R. Reis[1]; L. Demosthenes[1]; S. Monteiro[1]; L. Nascimento[1]; [1]IME

The Influence of Ultraviolet (UV) Radiation on the Surface of Coconut Fiber: G. Nicolau[1]; R. Weber[1]; *S. Monteiro*[1]; A. Oliveira da Silva[1]; K. Monsores[1]; F. Araújo[1]; [1]Instituto Militar de Engenharia

Thermal Behavior of Epoxy Matrix Composite Reinforced with Caranan Fibers: A. Souza[1]; R. Junio[1]; L. Neuba[2]; F. da Luz[2]; *S. Monteiro*[1]; L. Nascimento[2]; [1]Instituto Militar de Engenharia; [2]Instituto Militar de Engenharia

Weibull Analysis of the Mechanical Properties of the Epoxy Composite Reinforced with Guaruman Fibers: R. Reis[1]; L. Nunes[1]; *S. Monteiro*; L. Nascimento[1]; [1]Military Institute of Engineering

Additive Manufacturing of Functional, Energy, and Magnetic Materials — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Additive Manufacturing Committee, TMS: Magnetic Materials Committee
Program Organizers: Markus Chmielus, University of Pittsburgh; Sneha Prabha Narra, Worcester Polytechnic Institute; Mohammad Elahinia, University of Toledo; Reginald Hamilton, Pennsylvania State University; Iver Anderson, Iowa State University Ames Laboratory

Wednesday PM **March 17, 2021**

Additive Manufacturing of Soft Magnets for Electrical Machines—Prospects and Challenges: *T. Lamichhane*[1]; L. Sethuraman[2]; A. Dalagan[1]; H. Wang[1]; J. Keller[2]; M. Paranthaman[1]; [1]Oak Ridge National Laboratory; [2]National Renewable Energy Laboratory

Effect of Processing Parameters on Thermal Cyclic Stability of Nitinol Alloys Manufactured by Selective Laser Melting: *J. Zhu*[1]; E. Borisov[2]; J. Bijleveld[1]; E. Farber[2]; M. Hermans[1]; V. Popovich[1]; [1]Delft University of Technology; [2]Peter the Great Saint-Petersburg Polytechnic University

Modeling of Selective Laser Melting of NiTi Shape Memory Alloy: Laser Single Track and Melt Pool Dimension Prediction: *H. Abedi*[1]; R. Javanbakht[1]; M. Nematollahi[1]; K. Safaei[1]; A. Qattawi[1]; M. Elahinia[1]; [1]The University of Toledo

Advanced Functional and Structural Thin Films and Coatings — Poster Session

Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Adele Carrado, IPCMS - CNRS; Ramana Chintalapalle, University of Texas at El Paso; Gerald Ferblantier, Icube Laboratory - Strasbourg University; Nancy Michael, University of Texas at Arlington; Karine Mougin, Is2m Cnrs; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University

Wednesday PM **March 17, 2021**

A Study on PMMA-copolymers Grafted onto Ti Using Advanced Chemistry Approach: *F. Mouillard*; P. Masson[1]; G. Pourroy[1]; A. Carrado[1]; [1]IPCMS - CNRS

Atomic Layer Deposition & Atomic Layer Etching – An Overview of Selective Processes: O. Gokce[1]; N. Ravindra[1]; *S. Hossain*[1]; [1]New Jersey Institute of Technology

Calcium-phosphate Plasma Electrolytic Oxidation (PEO) Coatings on AZ31 Mg Alloy: Effects of Different Tricalcium Phosphate (TCP) Concentrations: *N. Attarzadeh*[1]; A. Kazemi[2]; M. Molaei[2]; A. Fattah-alhosseini[2]; [1]University of Texas at El Paso; [2]Bu-Ali Sina University

Studying Effects of Frequency on $ZrTiO_4/ZrO_2$ Nanocomposite Coatings on Ti–6Al–4V Alloys Produced by Plasma Electrolytic oxidation (PEO) Process: *N. Attarzadeh*[1]; E. Nikoomanzari[2]; K. Babaei[2]; A. Fattah-alhosseini[2]; [1]University of Texas at El Paso; [2]Bu-Ali Sina University

Temperature Dependence of Energy Gap in Semiconductors – Influence on Solar Cell Performance: L. Lin[1]; R. Daroowalla[2]; *R. Rangaraju*[3]; N. Ravindra[1]; [1]New Jersey Institute of Technology; [2]University of Maryland; [3]West Windsor-Plainsboro High School South

Advances in Surface Engineering III — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
Program Organizers: Tushar Borkar, Cleveland State University; Arif Mubarok, PPG; Rajeev Gupta, North Carolina State University; Sandip Harimkar, Oklahoma State University; Bharat Jasthi, South Dakota School of Mines & Tech

Wednesday PM **March 17, 2021**

Damage Tolerance of TiC-laden Tribaloy T400 Suspension-powder Plasma-sprayed Composite Biocompatible Coating: *M. Mistri*[1]; S. Joshi[2]; K. Balani[1]; K. Kar[1]; [1]Indian Institute of Technology Kanpur; [2]University West

Advances in Titanium Technology — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Don Li, Howmet Engineered Products; Yufeng Zheng, University of Nevada-Reno
; Peeyush Nandwana, Oak Ridge National Laboratory; Matthew Dunstan, US Army Research Laboratory

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Orientation Dependence in Static Globularization of Ti-6Al-4V: *J. Perez*[1]; B. Begley[1]; V. Miller[1]; [1]MSE, University of Florida

AI/Data Informatics: Applications and Uncertainty Quantification at Atomistics and Mesoscales — Poster Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Kamal Choudhary, National Institute of Standards and Technology; Garvit Agarwal, Argonne National Laboratory; Wei Chen, Illinois Institute of Technology; Mitchell Wood, Sandia National Laboratories; Vahid Attari, Texas A&M University; Oliver Johnson, Brigham Young University; Richard Hennig, University of Florida

Wednesday PM **March 17, 2021**

Parsimonious Neural Networks Learn Classical Mechanics and an Accurate Time Integrator: *S. Desai*[1]; A. Strachan[1]; [1]Purdue University

Quantifying RAMPAGE Interatomic Potentials for Metal Alloys: *E. Weiss*[1]; A. Hegde[2]; C. Safta[2]; H. Najm[2]; D. Riegner[1]; L. Ward[1]; W. Windl[1]; [1]The Ohio State University; [2]Sandia National Laboratories

Solving Stochastic Inverse Problems for Property-Structure Linkages Using Data-consistent Inversion: *A. Tran*[1]; T. Wildey[1]; [1]Sandia National Laboratories

Use of Atomistic Based Informatics to Model Ionic Bombardment to Synthesize Boron Carbides: *K. Asante Boahen*[1]; N. Baishnab[2]; P. Rulis[3]; M. Paquette[3]; R. Sakidja[1]; [1]Missouri State University; [2]University of Missouri, Columbia; [3]University of Missouri, Kansas City

Multi-fidelity Machine-learning with Uncertainty Quantification and Bayesian Optimization for Materials Design: Application to Random Alloys: J. Tranchida[1]; *A. Tran*; T. Wildey[1]; A. Thompson[1]; [1]Sandia National Laboratories

AI/Data informatics: Design of Structural Materials — 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
Program Organizers: Jennifer Carter, Case Western Reserve University; Amit Verma, Carnegie Mellon University; Natasha Vermaak, Lehigh University; Jonathan Zimmerman, Sandia National Laboratories; Darren Pagan, Pennsylvania State University; Chris Haines, Ccdc Army Research Laboratory; Judith Brown, Sandia National Laboratories

Wednesday PM **March 17, 2021**

Discovery of Optimized -phase Free Ti-based Alloys Using CALPHAD and Artificial Intelligence Approach: G. Dulikravich[1]; *R. Jha*; [1]Florida International University

Fast and High-throughput Synthesis of Film and Bulk High-entropy Alloys: *Y. Zou*[1]; [1]University of Toronto

Evaluating Uncertainty in Clustering of Nanoindentation Mapping Data: B. Becker[1]; *E. Hintsala*[1]; B. Stadnick[1]; D. Stauffer[1]; U. Hangen[1]; [1]Bruker Nano Surfaces Division

High-throughput Calculation to Predict the Eutectic Point in Quaternary System: *J. Lu*[1]; Y. Zhong[1]; [1]Worcester Polytechnic Institute

Algorithm Development in Materials Science and Engineering — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Mohsen Asle Zaeem, Colorado School of Mines; Mikhail Mendelev, KBR; Bryan Wong, University of California, Riverside; Ebrahim Asadi, University of Memphis; Garritt Tucker, Colorado School of Mines; Charudatta Phatak, Argonne National Laboratory; Bryce Meredig, Citrine Informatics

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Model and Improved Dynamic Programming Algorithm for Optimization of Unplanned Slab Allocation in the Steel Plant: *Y. Wang*[1]; Z. Zheng[1]; C. Wang[1]; X. Gao[1]; [1]Chongqing University

Biological Materials Science — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: David Restrepo, University of Texas at San Antonio; Steven Naleway, University of Utah; Jing Du, Pennsylvania State University; Ning Zhang, University of Alabama

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A Novel Cardiac Patch for Treating Myocardial Infarction: *J. Rincon Tabares*[1]; J. Velasquez[1]; H. Bilbo[1]; H. Han[1]; D. Restrepo[1]; [1]The University of Texas at San Antonio

Bone-Mimetic ß-TNTZ Alloy for Osteointegration and Antibacterial Property: A Rat Animal Model: *Y. Yu*[1]; S. Lin[2]; T. Yen[1]; [1]National Tsing Hua University; [2]New Taipei Municipal TuCheng Hospital, Chang Gung Memorial Hospital, Taiwan

Strain Field Mining of Steady-state Tearing Fields in Thin Film, Heterogeneous Fiber Networks: *S. Paluskiewicz*[1]; C. Muhlstein[1]; [1]Georgia Institute of Technology

The Effect of Cobalt Metal on the Microstructure of Titanium Foam: *H. Zhou*[1]; G. Qiu[1]; D. Yang[1]; T. Lu[1]; [1]Chongqing University

Ceramic Materials for Nuclear Energy Research and Applications — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Energy Committee, TMS: Nuclear Materials Committee
Program Organizers: Xian-Ming Bai, Virginia Polytechnic Institute and State University; Yongfeng Zhang, University of Wisconsin-Madison; Larry Aagesen, Idaho National Laboratory; Vincenzo Rondinella, Jrc-Ec

Wednesday PM **March 17, 2021**

A Model of Grain Boundary Energy Anisotropy in Uranium Dioxide Nuclear Fuel: *D. Fisher*; E. Hansen[1]; Y. Zhang[2]; S. Masengale[2]; A. Seoane[3]; T. Harbison[1]; [1]Brighan Young University-Idaho; [2]University of Wisconsin-Madison; [3]Virginia Tech

Development of Hydrothermal Corrosion Barrier Coatings for High-density Nuclear Fuels: *J. Lacy*[1]; H. Yeom[1]; K. Quillin[1]; K. Metzger[2]; E. Lahoda[2]; K. Sridharan[1]; [1]University of Wisconsin - Madison; [2]Westinghouse Electric Company

Hydrothermal Corrosion Study of Additive Manufactured SiC Fibers: *A. Seshadri*[1]; A. Dave[1]; B. Phillips[1]; K. Shirvan[1]; S. Harrison[2]; J. Pegna[2]; [1]Massachusetts Institute of Technology; [2]Free Form Fibers

Characterization of Minerals, Metals and Materials 2021 — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Jian Li, CanmetMATERIALS; Mingming Zhang, ArcelorMittal Global R&D; Bowen Li, Michigan Technological University; Sergio Monteiro, Instituto Militar de Engenharia; Shadia Ikhmayies; Yunus Kalay, Middle East Technical University; Jiann-Yang Hwang, Michigan Technological University; Juan Escobedo-Diaz, University of New South Wales; John Carpenter, Los Alamos National Laboratory; Andrew Brown, Army Research Laboratory; Rajiv Soman, Eurofins EAG Materials Science LLC; Alex Moser, US Naval Research Laboratory

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Analysis of Potential Applications of Kamafugite Rocks in Fertilizer: R. Motta[1]; E. Mattiello[1]; F. Ballotin[1]; P. Matias[1]; *G. Lima*; L. Pedroti[1]; J. Martins[2]; L. Silveira[2]; [1]Federal University of Viçosa; [2]Terra Brasil Minerals

Application of Desulphurization Residue in Cementitious Mortars: A. Azeredo[1]; *A. Azevedo*; M. Marvila[1]; L. Reis[1]; J. Linhares Júnior[1]; C. Vieira[1]; J. Alexandre[1]; S. Monteiro[2]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]IME

Ballistic Behavior of Epoxidic Matrix Composites Reinforced with Graphene Oxide Functionalized Curauá Fibers: *U. Costa*[1]; L. Nascimento[1]; W. Almeida Bezerra[1]; S. Monteiro[1]; [1]Military Institute of Engineering

Ballistic Behavior of Epoxy Matrix Composites Reinforced with Hemp Fabric Against .22 Ammunition: *M. Ribeiro*[1]; [1]Military Institute of Engineering

Characterization of Epoxidic Matrix Composites Reinforced with Graphene Oxide Functionalized Curaua Fibers: *U. Costa*[1]; L. Nascimento[1]; W. Almeida Bezerra[1]; S. Monteiro[1]; [1]Military Institute of Engineering

Characterization of Piassava Fiber Collected as Industrial Waste: J. Carvalho[1]; N. Simonassi[1]; *F. Lopes*[1]; C. Vieira[1]; [1]UENF

Chemical Characterization of Hemp Fabric for Engineering Composites Applications: *M. Ribeiro*[1]; [1]Military Institute of Engineering

Chemical, Physical and Morphological Characterization of Eco-clinker Produced From Industrial Waste: *A. Oliveira*[1]; L. Pedroti[1]; G. Brigolini[2]; J. Franco de Carvalho[1]; J. Lopes Ribeiro[1]; C. de Souza[1]; M. Altoé[2]; A. Martins Pereira[1]; W. Fernandes[1]; B. Cardoso Mendes[1]; C. Torres[1]; G. Soares de Lima[1]; M. Salgado Lopes[1]; [1]Federal University of Viçosa; [2]Federal University of Ouro Preto

Comparative Analysis of Mechanical Resistance and Corrosion of the Welded Region of Stainless Steel Lean Duplex 2102 and Stainless Steel Duplex 2205: R. Candido[1]; N. Cerqueira[1]; V. Souza[1]; D. Gallo[1]; *A. Azevedo*; [1]Centro Universitário Redentor

Life Cycle Assessment Applied to Red Ceramic Bricks Production Versus Red Ceramic Bricks Incorporated with Stone Wastes: A Comparative Study: J. Dias[1]; G. Xavier[1]; *A. Azevedo*[2]; J. Alexandre[1]; C. Vieira[1]; H. Colorado[3]; [1]UENF; [2]Fluminense Federal University; [3]Universidad de Antioquia

Comparison Between Red Ceramic Parts With and Without Ornamental Stone Waste Under Weting and Drying Cycles: M. Moraes[1]; G. Xavier[1]; *A. Azevedo*[2]; J. Alexandre[1]; M. Marvila[1]; S. Monteiro[3]; J. Dias[1]; [1]UENF; [2]Fluminense Federal University; [3]IME

Compressive Properties of Additively Manufactured Titanium Carbide: H. Amin[1]; J. Wang[1]; D. East[2]; A. Ameri[1]; H. Wang[1]; E. Morozov[1]; *J. Escobedo-Diaz*[1]; [1]University of New South Wales; [2]CSIRO Manufaturing

Correlation between Density and Diameter Variation of Carnauba Fibers: R. Junio[1]; L. Nascimento[1]; L. Neuba[1]; A. Souza[1]; L. Demosthenes[1]; *S. Monteiro*[2]; [1]Military Institute of Engineering; [2]Instituto Militar de Engenharia

Critical Length and Interfacial Strength of Sedge Fiber Embedded in Epoxy Matrix: *L. Neuba*[1]; A. Souza[1]; R. Junio[1]; M. Ribeiro[1]; R. Reis[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

Determination of the Crystallinity Index and Morphological Aspect of Carnauba Fibers: R. Junio[1]; L. Nascimento[1]; L. Neuba[1]; A. Souza[1]; R. Reis[1]; *S. Monteiro*[2]; [1]Military Institute of Engineering; [2]Instituto Militar de Engenharia

Dynamic Behavior of a High Hardness Ballistic Steel: S. Oliveira[1]; K. Monsores[1]; A. Silva[1]; G. Nicolau[1]; R. Weber[1]; A. Paula[1]; *S. Monteiro*[1]; [1]IME

Ecological Mortars with Blast Slag Residue Application: J. Linhares Júnior[1]; M. Marvila[1]; *A. Azevedo*; L. Reis[1]; A. Azeredo[1]; C. Vieira[1]; S. Monteiro[2]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]IME

Effect of Flying Ash as an Additive or Substitute for Portland Cement on Compression Strength in Concrete Blocks (Vibro-compacted): *H. García-Ortiz*[1]; A. Teja-Ruiz[1]; M. Pérez-Labra[1]; M. Reyes-Pérez[1]; E. Cardoso-Legorreta[1]; F. Legorreta-García[1]; F. Barrientos-Hernández[1]; J. Juárez T.[1]; [1]Universidad Autónoma del Estado de Hidalgo

Effect of the Incorporation of Bauxite and Iron Ore Tailings on the Properties of Clay Bricks: B. Mendes[1]; L. Pedroti[1]; B. Bonomo[1]; A. Lucas[1]; L. Silva[1]; M. Lopes[1]; *G. Lima*[1]; [1]Universidade Federal De Vicosa

Development of Artificial Stone with Industrial Solid Waste from Fluorescent Lamps in a Polymer Matrix: *V. Souza*[1]; E. Costa[1]; C. Vieira[1]; S. Monteiro[2]; G. Delaqua[1]; D. Campos[3]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia; [3]Instituto Federal do Espírito Santo

Evaluation of Different Methods of Surface Treatment of Natural Açaí Fiber Added in Cementitious Composites: *A. Azevedo*[1]; M. Marvila[2]; E. Zanelato[2]; T. Lima[2]; D. Cecchin[1]; J. Souza[3]; M. Barbosa[1]; S. Monteiro[4]; H. Alexandre[2]; J. Alexandre[2]; G. Xavier[2]; [1]Fluminense Federal University; [2]UENF; [3]UNB; [4]IME

Evaluation of Full Bedding Concrete Blocks Prisms with Different Laying Mortar Strength: T. Lima[1]; *A. Azevedo*[2]; M. Marvila[1]; E. Zanelato[1]; J. Alexandre[1]; S. Monteiro[3]; [1]UENF; [2]Fluminense Federal University; [3]IME

Evaluation of Thermal Healing in Pervious Concrete Pavers Produced with Reactive Powders Concrete: *W. Fernandes*[1]; L. Pedroti[1]; M. Felisberto[1]; G. Botelho[1]; G. Lima[1]; B. Mendes[1]; H. Pitanga[1]; A. Oliveira[1]; [1]Federal University of Vicosa

Evaluation of Izod Impact Properties of the Epoxy Matrix Composite Reinforced with Curaua Fibers Functionalized with Graphen Oxide: *U. Costa*[1]; L. Nascimento[1]; W. Almeida Bezerra[1]; S. Monteiro[1]; [1]Military Institute of Engineering

Evaluation of Mechanical Behavior in Traction of Epoxy-Caranan Composites: A. Souza[1]; R. Junio[1]; *L. Neuba*[1]; M. Oliveira[1]; S. Monteiro[1]; L. Nascimento[1]; [1]IME

Evaluation of Tensile Strength and Elastic Modulus of the Epoxy Matrix Composite Reinforced with Hemp Fabric for Engineering Applications: *M. Ribeiro*[1]; [1]Military Institute of Engineering

Evaluation of the Correlation between the Diameters of the Sedge Fibers and a Morphological Characterization: *L. Neuba*[1]; A. Souza[1]; R. Junio[1]; M. Ribeiro[1]; R. Reis[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

Evaluation of the Mechanical Behavior of Epxoy Matrix-hybrid Natural Faric Composite: Accelerated Aging by UV Radiation: C. Caminha[1]; *M. Oliveira*[1]; L. Nascimento[1]; S. Monteiro[1]; [1]Instituto Militar de Engenharia

In-situ Investigation of Iron Ore Stock Pile during Its Stacking and Reclaiming Process: *W. Pan*[1]; S. Chen[1]; Y. Zhang[1]; Z. Kang[2]; D. Wang[1]; [1]Beijing Key Lab of Green Recyclable Process for Iron & Steel Production Technology; [2]Shougang Jingtang United Iron & Steel Co.,Ltd.

Incorporation of Porcelain Residue Powder and Mineral Wastes in Epoxy Matrix for Artificial Stone Purchase: E. Costa[1]; *V. Souza*[1]; R. Rodríguez[1]; G. Barreto[1]; S. Monteiro[1]; C. Vieira[1]; [1]Universidade Estadual do Norte Fluminense

Influence of Modifier Admixture Based on Las in Cement Pastes: A. Martins[1]; M. Duarte[1]; J. Carvalho[1]; *A. Oliveira*; G. Arruda[1]; L. Pedroti[1]; [1]Universidade Federal de Viçosa

Influence of the Ceramic Block Sorptivity on the Adherence of Rendering Mortars: E. Zanelato[1]; *A. Azevedo*[2]; M. Marvila[2]; T. Lima[3]; J. Alexandre[2]; S. Monteiro[4]; G. Xavier[2]; C. Vieira[2]; [1]IFF; [2]UENF; [3]UCAM; [4]IME

Influence of the Granulometry of the Granite Residue on the Sorptivity of Ceramic Blocks: E. Zanelato[1]; *A. Azevedo*; M. Marvila[2]; T. Lima[3]; J. Alexandre[2]; P. Rocha[1]; S. Monteiro[4]; C. Vieira[2]; [1]IFF; [2]UENF; [3]UCAM; [4]IME

Influence of the Incorporation of Granite Waste on the Weathering Resistance of Soil Pigment-based Paints: M. Lopes[1]; L. Pedroti[1]; *G. de Lima*[1]; J. Ribeiro[1]; G. Nalon[1]; B. Mendes[1]; A. Oliveira Júnior[1]; [1]Federal University of Viçosa

Influence of the Mixing Processes of the Constituents of Incorporated Geopolymer Materials with Glass Waste: L. Reis[1]; *A. Azevedo*[2]; M. Marvila[1]; A. Azeredo[1]; J. Linhares Júnior[1]; N. Cerqueira[3]; S. Monteiro[4]; C. Vieira[1]; [1]UENF; [2]Fluminense Federal University; [3]UNIREDENTOR; [4]IME

Mechanical Properties Evaluation of Epoxy Matrix Composites for Different Conditions of Volumetric Fraction of Sedge Fibers: *L. Neuba*[1]; A. Souza[1]; R. Junio[1]; L. Demosthenes[1]; U. Costa[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

PCM Encapsulation for Incorporation in Construction Materials: *G. Lima*[1]; M. Oliveira[1]; L. Nascimento[1]; E. Martins[1]; J. Carlo[1]; L. Pedroti[1]; N. Albuini-Oliveira[1]; M. Lopes[1]; [1]Federal University of Viçosa

Density Weibull Analysis of tucum fiber with Different Diameters: *M. Oliveira*[1]; F. Garcia Filho[1]; F. da Luz[1]; S. Monteiro[1]; [1]Instituto Militar de Engenharia

Physical, Chemical and Mechanical Characterization of AISI 316 Austenitic Stainless Steel: L. Pinheiro[1]; N. Cerqueira[1]; V. Souza[1]; D. Gallo[1]; *A. Azevedo*; [1]UniREDENTOR

Research Progress of Aging Effects on Fiber Reinforced Polymer Composites: A Brief Review: *M. Oliveira*[1]; F. Da Luz[1]; S. Monteiro[1]; [1]Instituto Militar de Engenharia

Statistical Analysis of Izod Impact Resistance of an Epoxy Matrix Reinforced with Sedge Fibers: *L. Neuba*[1]; A. Souza[1]; R. Junio[1]; M. Ribeiro[1]; M. Oliveira[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

Study of Face Shell Bedding Concrete Blocks Prisms with Different Laying Mortar Strength: T. Lima[1]; *A. Azevedo*[2]; M. Marvila[1]; E. Zanelato[1]; A. Paes[1]; J. Alexandre[1]; S. Monteiro[1]; [1]UENF; [2]Fluminense Federal University

Study of Pathologies in Alkali Activated Materials Based on Slag: M. Marvila[1]; *A. Azevedo*; E. Zanelato[1]; T. Lima[1]; G. Delaqua[1]; C. Vieira[1]; L. Pedroti[1]; S. Monteiro[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro

Study of the Feasibility of Incorporation Clay From Campos Dos Goytacazes - RJ, in Mortar Applied on Walls and Ceilings: L. Granato[1]; G. Xavier[1]; H. Colorado[2]; *A. Azevedo*[3]; J. Alexandre[1]; C. Vieira[1]; M. Marvila[1]; [1]UENF; [2]Universidad de Antioquia; [3]Fluminense Federal University

Surface Characterization of Concentrated Jamesonite, in the Collectorless Flotation, in Acid, Neutral and Alkaline Medium: *J. Terrazas Medina*[1]; M. Reyes Perez[2]; E. Palacios Beas[3]; M. Flores Guerrero[4]; I. Reyes Domínguez[5]; A. Teja Ruiz[1]; M. Pérez Labra[1]; F. Barrientos Hernández[1]; [1] Universidad Autonoma del Estado de Hidalgo; [2]Universidad Autónoma del Estado de Hidalgo; [3]Instituto Politécnico Nacional; [4]Universidad Tecnológica de Tulancingo. Área de Electromecánica Industrial; [5]Universidad Autónoma de San Luis Potosí

Synergy between Cu and Cr on Localized Corrosion of the Low Alloy Steels: *K. Gao*; L. Yan[1]; X. Pang[1]; Z. Guo[1]; Y. Su[1]; L. Qiao[1]; [1]University of Science and Technology Beijing

Synthesis and Characterization of ZnO Nanoparticles Obtained from the Extract of Schinus Molle: E. Palacios[1]; *K. Cardenas*[1]; J. Dominguez[1]; M. Flores[1]; L. García[1]; P. Ramírez[1]; [1]Universidad Tecnológica de Tulancingo

S/TEM Characterization of Interdendritic Phases in Ni-30Cr Weld Metal 52XL: *C. Li*[1]; C. Fink[1]; J. Lippold[1]; J. Jinschek[1]; [1]The Ohio State University

Technical, Environmental and Economic Advantages in the Use of Rubber Asphalt: M. Soares[1]; N. Cerqueira[1]; F. Almeida[1]; *A. Azevedo*; M. Marvila[2]; [1]Centro Universitário Redentor; [2]UENF

The Simpex-Lattice Method Application to Optimize the Design of Soil-Slag-Fly Ash Mixtures: M. Rodrigues[1]; *L. Pedroti*[1]; T. Silva[1]; H. Pitanga[1]; K. Rodrigues[1]; E. Lopes[1]; [1]Federal University of Viçosa

Thermal Analysis by Differential Scanning Calorimetry of Sedge Fibers and Epoxy Matrix Composites Reinforced with Sedge Fibers: *L. Neuba*[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

Synthesis and Characterization of Iron Oxide Nanoparticles for Application in the Removal of Heavy Metals from the Aqueous Medium: *A. Córdova López*[1]; K. Rivera[1]; D. Serna[1]; L. García[1]; P. Ramírez[1]; M. Flores[1]; [1]Universidad Tecnológica de Tulancingo

Thermal Analysis of Sedge Fibers and Epoxy Matrix Composites Reinforced with Sedge Fibers: *L. Neuba*[1]; M. Oliveira[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

Thermal Stability of Plain Arapaima Scales and Scales-reinforced Epoxy Matrix Composites: *W. Almeida Bezerra*[1]; U. Oliveira Costa[1]; M. Souza Oliveira[1]; F. Santos da Luz[1]; L. Crystine da Cruz Demosthenes[1]; S. Neves Monteiro[1]; [1]Instituto Militar de Engenharia

Thermochemical Characterization of the Carnauba Fibers: R. Junio[1]; L. Nascimento[1]; L. Neuba[1]; A. Souza[1]; *S. Monteiro*[2]; [1]Military Institute of Engineering; [2]Instituto Militar de Engenharia

Thermogravimetric Characterization of Epoxy Matrix Composite Reinforced with Hemp Fabric for Engineering Applications: *M. Ribeiro*[1]; [1]Military Institute of Engineering

Use of Glass Waste as a Geopolymerization Reaction Activator for Ceramic Materials: *A. Azevedo*[1]; M. Marvila[2]; E. Zanelato[2]; T. Lima[2]; G. Delaqua[2]; S. Monteiro[3]; C. Vieira[2]; L. Pedroti[4]; [1]Fluminense Federal University; [2]UENF; [3]IME; [4]UFV

Variation of the Silica Module for Dosing Activated Alkali Mortars: M. Marvila[1]; *A. Azevedo*[1]; E. Zanelato[1]; T. Lima[1]; S. Monteiro[2]; C. Vieira[2]; J. Alexandre[1]; G. Xavier[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]IME

Weibull Analysis of the Tensile Strength for Different Diameters of Cyperus Malaccensis Sedge Fibers: *L. Neuba*[1]; A. Souza[1]; R.[1]; M. Ribeiro[1]; U. Costa[1]; S. Neves[1]; [1]Military Institute of Engineering (IME)

Evaluation of Izod Impact Energy of Epoxy Matrix Composites Reinforced with Hemp Fabric: *M. Ribeiro*[1]; [1]Military Institute of Engineering

Computational Techniques for Multi-Scale Modeling in Advanced Manufacturing — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Adrian Sabau, Oak Ridge National Laboratory; Anthony Rollett, Carnegie Mellon University; Laurentiu Nastac, University of Alabama; Mei Li, Ford Motor Company; Alexandra Anderson, Gopher Resource; Srujan Rokkam, Advanced Cooling Technologies Inc

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A Parametric Study of Grain Size and Its Volume Fraction Effect on Heterogeneous Materials Mechanical Properties: *K. Adam*[1]; T. Belgasam[1]; [1]Washington State University

Effect of Nozzle Injection Mode on Initial Transfer Behavior of Round Bloom: *P. Wang*[1]; l. Li[1]; D. Zhao[2]; W. Liu[2]; S. Wang[2]; H. Tang[1]; J. Zhang[1]; [1]University of Science & Technology Beijing; [2]Shanxi Taigang Stainless Steel Co., Ltd.

Study on the In-mold Flow Behavior Driven by a Subsurface Electromagnetic Stirring for IF Steel Slab Casting: *H. Xiao*[1]; S. Li[2]; P. Wang[1]; H. Tang[1]; J. Zhang[1]; [1]University of Science & Technology Beijing; [2]School of Materials Science and Engineering,Tsinghua University

High Entropy Alloys IX: Alloy Development and Properties — Poster Session

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Laboratory; E-Wen Huang, National Chiao Tung University; Srivatsan Tirumalai, The University of Akron; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center

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Computation of Thermodynamics and Stability of FeNiCoCr(Mn/Pd) High Entropy Alloys: Competition between Equiatomic and Non-equiatomic: *T. Nguyen-Dung*[1]; Y. Chen[1]; [1]Tohoku University

Thermal and Corrosion Behaviour of Laser-Deposited High Entropy Alloys: *M. Dada*[1]; P. Popoola[1]; N. Mathe[2]; S. Pityana[2]; S. Adeosun[3]; O. Aramide[1]; [1]Tshwane University of Technology; [2]Council for Scientific and Industrial Research; [3]University of Lagos, Akoka

Fusion Plasma Relevant Erosion of Reduced Activation High Entropy Alloy-based lPasma-facing Material: *O. Waseem*[1]; K. Woller[1]; F. Sweidan[2]; H. Ryu[2]; [1]Massachusetts Institute of Technology; [2]Korea Advanced Institute of Science and Technology

High Throughput *In Situ* Micro-mechanical Testing of Multi-principal Element Alloy Thin Films to Enable Rapid Combinatorial Qualification: *R. Quammen*[1]; P. Rottmann[1]; [1]University of Kentucky

Atom-by-atom Understanding of Atom Probe Tomography of HEAs: *J. Qi*[1]; C. Oberdorfer[1]; E. Marquis[2]; W. Windl[1]; [1]The Ohio State University; [2]University of Michigan

Materials for High Temperature Applications: Next Generation Superalloys and Beyond — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Govindarajan Muralidharan, Oak Ridge National Laboratory; Martin Heilmaier, KIT Karlsruhe; Benjamin Adam, Portland State University; Mario Bochiechio, Pratt & Whitney; Katerina Christofidou, University of Sheffield; Eric Lass, University of Tennessee-Knoxville; Jeremy Rame, Safran Aircraft Engines; Pierre Sallot, Safran; Akane Suzuki, GE Research; Michael Titus, Purdue University

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Creep Deformation Behavior of Ni - 33 Co Alloy: *D. Bandla*[1]; A. Chokshi[1]; [1]Indian Institute of Science Bangalore

Reference-free Potential Development for Metal-rich Carbides: *T. McGilvry-James*[1]; B. Timalsina[1]; N. Baishnab[2]; P. Adhikari[3]; S. San[3]; A. Duff[4]; W. Ching[3]; R. Sakidja[1]; [1]Missouri State University; [2]University of Missouri-Columbia; [3]University of Missouri-Kansas City; [4]Daresbury Laboratory

On the Quantitative Characterization of Weld Microstructures: *N. Kohlhorst*[1]; G. Muralidharan[2]; R. Miller[2]; J. Zhao[3]; [1]Ohio State Univerity; [2]Oak Ridge National Laboratory (ORNL); [3]University of Maryland, Department of Materials Science and Engineering

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: Jonghyun Lee, Iowa State University; Samuel Wagstaff, Oculatus; Alexandra Anderson, Gopher Resource; Fiseha Tesfaye, Abo Akademi University; Guillaume Lambotte, Boston Metal; Antoine Allanore, Massachusetts Institute of Technology

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Containerless Materials Processing for Materials Science on Earth and in Space: *J. Lee*[1]; S. Katamreddy[1]; Y. Cho[2]; S. Lee[2]; G. Lee[2]; [1]Iowa State University; [2]Korea Research Institute of Standards and Science

Effect of Nitrogen on Weldability and the Microstructure in Laser Beam Welding of Duplex Stainless Steel: *Y. Xia*[1]; K. Amatsu[1]; F. Miyasaka[1]; H. Mori[1]; [1]Osaka University

Influence of Asicity (CaO/SiO2) on Viscosity and Phase Structure of Chromium-containing High-titanium Blast Furnace Slag: *D. Yang*[1]; H. Zhou[1]; G. Qiu[1]; J. Kang[1]; Z. Pang[1]; [1]Chongqing University

Influence of Cr2O3 Content on Phase of Chromium-containing High-titanium Blast Furnace Slag: *D. Yang*[1]; G. Qiu[1]; H. Z'hou[1]; [1]Chongqing University

Influence of Rotation Speed and Temperature on Dissolution Rate of Cr2O3 in Ti-bearing Blast Furnace Slag: *D. Yang*[1]; F. Zhang[1]; G. Qiu[1]; J. Wang[1]; [1]Chongqing University

Thermodynamic Examination of Quaternary Compounds in the Ag–Fe–(Ge, Sn)–Se Systems by the Solid-state EMF Method: M. Moroz[1]; *F. Tesfaye*; P. Demchenko[2]; M. Prokhorenko[3]; B. Rudyk[1]; L. Soliak[1]; D. Lindberg[4]; O. Reshetnyak[2]; L. Hupa[5]; [1]National University of Water and Environmental Engineering; [2]Ivan Franko National University of Lviv; [3]Lviv Polytechnic National University; [4]Aalto University; [5]Åbo Akademi University

Phase Transformations and Microstructural Evolution — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Rongpei Shi, Lawrence Livermore National Laboratory; Yipeng Gao, Idaho National Laboratory; Fadi Abdeljawad, Clemson University; Bharat Gwalani, Pacific Northwest National Laboratory; Qi An, University of Nevada-Reno ; Eric Lass, University of Tennessee-Knoxville; Huajing (Wilson) Song, Los Alamos National Laboratory

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Dilatometric Analysis of Tempering Kinetics in a Cr–Mo–V Medium Carbon Steel: *E. Barrera-Villatoro*[1]; O. Vázquez-Gómez[1]; A. Gallegos-Pérez[1]; H. Vergara-Hernández[1]; E. López-Martínez[2]; P. Garnica-González[1]; [1]Tecnológico Nacional de México / I.T. Morelia; [2]Universidad del Istmo

Exploring Non-conventional Microstructural Evolution in Titanium Alloys by Advanced Characterization and Machine Learning: *D. Li*[1]; X. Zhang[2]; Y. Liao[2]; Y. Zheng[1]; [1]University of Nevada, Reno; [2]Iowa State University

Thermal and Mechanical Characterization of the Non-isothermal Tempering of an Experimental Medium-carbon Steel: *P. Díaz-Villaseñor*[1]; O. Vázquez-Gómez[1]; H. Vergara-Hernández[1]; A. Gallegos-Pérez[1]; E. López-Martínez[2]; B. Campillo[3]; [1]Tecnológico Nacional de México / I.T. Morelia; [2]Universidad del Istmo; [3]Universidad Nacional Autónoma de México

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