# TMS 2018

## 147th Annual Meeting & Exhibition

# PROGRAM AT-A-GLANCE

### TOPIC COLOR KEY:

- Additive Manufacturing
- Materials Processing, Corrosion & Functional Materials
- Mechanics & Physical Metallurgy
- Nuclear Materials
- Light Metals (Al & Mg)
- Characterization
- Nanostructured Materials
- Advanced Materials
- Energy & Environment
- CDSM & Materials Design

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# TMS2018

## 147th Annual Meeting & Exhibition

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*Sponsored by:* TMS Extraction and Processing Division
*Program Organizer:* Cynthia Belt, Consultant

Monday AM
March 12, 2018
Room: 228A
Location: Phoenix Convention Center

*Session Chair:* Cynthia Belt, Consultant

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**2018 EPD Distinguished Lecturer Award: The Revolutions Ahead in Pyrometallurgy**: *Geoffrey Brooks*[1]; [1]Swinburne University of Technology

**8:45 AM Question and Answer Period**

## 2018 Light Metals Keynote Session – Sustainability in the Aluminum Industry: Climate Neutral Industry with Zero Emissions and Zero Waste?

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Arne Ratvik, SINTEF

Monday AM
March 12, 2018
Room: 222ABC
Location: Phoenix Convention Center

*Session Chair:* Arne Ratvik, SINTEF

**8:30 AM Introductory Comments**

**8:35 AM Keynote**
**Climate and Energy Efficient Aluminium Production**: *Johannes Aalbu*[1]; [1]Hydro Aluminium

**9:00 AM Keynote**
**Aluminum Recycling – Can We be Zero Emissions and Zero Waste?**: *Ray Peterson*[1]; [1]Real Alloy

**9:25 AM Keynote**
**Towards Sustainable Solutions for Processing of Spent Potlining**: *Stephan Broek*[1]; [1]Hatch Ltd.

**9:50 AM Break**

**10:10 AM Keynote**
**Challenges and Progress in Environment Protection in China's Aluminum Metallurgy**: *Wanchao Liu*[1]; [1]Chalco Zhengzhou Non-ferrous Metal Research Institute Co. Ltd

**10:35 AM Keynote**
**Tackling the GHG Footprint of the Aluminium Industry – Status, Challenges and Technological Solutions**: *Pascal Lavoie*[1]; *David Wong*[1]; [1]Light Metals Research Centre, The University of Auckland

**11:00 AM Panel Discussion**

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – 3D Structures and Hybrid Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

Monday AM
March 12, 2018
Room: 101B
Location: Phoenix Convention Center

*Session Chairs:* Wenda Tan, University of Utah; Jang-Sik Lee, Pohang University of Science and Technology

**8:00 AM Introductory Comments**

**8:10 AM Invited**
**Adaptive Electrospinning: a Smart Electrospinning System for Low-cost and Scalable Flexible Electronics**: *Jiyoung Chang*[1]; Dongwoon Shin[1]; Jonghyun Kim[1]; [1]University of Utah

**8:40 AM Invited**
**Large Scale Laser Crystallization of Solution-based Nanoinks for Highly Transparent Conductive Electrode**: *Qiong Nian*[1]; [1]Arizona State University

**9:10 AM Invited**
**Additive Manufacturing of Nanomaterials-based Devices**: *Yong Lin Kong*[1]; [1]University of Utah

**9:40 AM Break**

**10:00 AM Invited**
**Functional Hybrid Polymer-inorganic Materials by Vapor Phase Infiltration**: *Mato Knez*[1]; [1]CIC nanoGUNE

**10:30 AM**
**Fully CMOS-Compatible Synthesis and Photodetector-integration of Ultrathin, Parallel-aligned ZnO Nanowire Arrays by Infiltration Synthesis**: *Chang-Yong Nam*[1]; Aaron Stein[1]; [1]Brookhaven National Laboratory

**10:50 AM**
**Hybrid Nanomaterials and their Applications in Energy and Water Areas**: Yongjie Zhan[1]; *Pei Dong*[2]; Hua Guo[3]; Lidia Kuo[3]; Jun Kim[3]; Emily Hacopian[3]; Qilin Li[3]; Jun Lou[3]; [1]Northwest University; [2]Rice University; George Mason University; [3]Rice University

**11:10 AM**
**NIR to UV-Vis-NIR Upconverting Nanolights for Phototriggered Drug Delivery and Tracking In-vivo**: *Ghulam Jalani*[1]; [1]Dalhousie University

## 9th International Symposium on High Temperature Metallurgical Processing – Energy-efficient and Clean Metallurgical Technology

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Monday AM
March 12, 2018

Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Jiann-Yang Hwang, Michigan Technological University; Zhiwei Peng, Central South University

**8:00 AM Introductory Comments**

**8:05 AM**
**Solid Oxide Membrane-based Green Processing and Modeling of Silicon Production**: Thomas Villalon[1]; *Jicheng Guo*[1]; Uday Pal[1]; Soumendra Basu[1]; [1]Boston University

**8:25 AM**
**Exergy and its Efficiency Estimations for Sponge Iron Production in a Rotary Hearth Furnace**: *Binay Kumar*[1]; Gour Roy[1]; Prodip Sen[1]; [1]IIT Kharagpur

**8:45 AM**
**Simplified Process for Making Anode Copper**: Zhi Wang[1]; Haibin Wang[1]; Xueyi Guo[2]; Zhixiang Cui[1]; *Baojun Zhao*[3]; [1]Dongying Fangyuan Nonferrous Metals; [2]Central South University; [3]The University of Queensland

**9:05 AM**
**Preparation of Manganese Ferrite by Low-temperature Solid-state Synthesis under CO-CO2 Atmosphere**: Bingbing Liu[1]; *Yuanbo Zhang*[1]; Juan Wang[1]; Manman Lu[1]; Zijian Su[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University

**9:25 AM Break**

**9:45 AM**
**Techno-economic Analysis of Energy Recovery from Plastic Waste**: *Maryam Ghodrat*[1]; Bijan Samali[1]; [1]Western Sydney University

**10:05 AM**
**Development of Continuous Blast Furnace Slag Solidification Process for Coarse Aggregates**: *Yasutaka Ta*[1]; Hiroyuki Tobo[1]; Hisahiro Matsunaga[1]; Keiji Watanabe[1]; [1]JFE Steel Corporation

**10:25 AM**
**An Innovative Oxygen-enriched Flash Smelting Technology for Lead Smelting and its Industrial Application**: Baozhong Ma[1]; *Chengyan Wang*[1]; Yongqiang Chen[1]; Peng Xing[1]; [1]School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

**10:45 AM**
**Characteristics and Control Technology of Fine Particulate Matter (PM) in Iron Ore Sintering**: *Tiejun Chun*[1]; [1]Anhui University of Technology

**11:05 AM**
**Sintering Surface Spraying Steam to Reduce NOx and Dioxin Emissions in Shougang**: *Pei Dong*[1]; [1]Shougang China

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Ion Irradiation and In-situ TEM

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

Monday AM
March 12, 2018

Room: 102A
Location: Phoenix Convention Center

*Session Chairs:* James Cole, Idaho National Laboratory; Lindsay O'Brien, Naval Nuclear Laboratory

**8:00 AM**
**Structural Damage and Phase Stability of Al0.3CoCrFeNi High Entropy Alloy under High Temperature Ion Irradiation**: *Tengfei Yang*[1]; Wei Guo[2]; Jonathan Poplawsky[2]; Dongyue Li[3]; Ling Wang[4]; Yuan Fang[5]; Zhanfeng Yan[5]; Yong Zhang[3]; Yugang Wang[5]; Steven Zinkle[4]; [1]University of Tennessee; Peking University; [2]Oak Ridge National Laboratory; [3]University of Science and Technology Beijing; [4]University of Tennessee; [5]Peking University

**8:25 AM**
**Effect of Irradiation Dose Rate on Precipitation in Fe-Cu and Fe-Cu-Mn Model Alloys**: *Shipeng Shu*[1]; Nathan Almirall[2]; Dane Morgan[1]; Scott Tumey[3]; Brian Wirth[4]; G. Odette[2]; [1]University of Wisconsin-Madison; [2]University of California, Santa Barbara; [3]Lawrence Livermore National Laboratory; [4]The University of Tennessee, Knoxville

**8:50 AM**
**Impact of Temperature on Microstructural Features using Dual Ion-irradiation in T91 Steel**: *Stephen Taller*[1]; Zhijie Jiao[1]; Kevin Field[2]; Gary Was[1]; [1]University of Michigan; [2]Oak Ridge National Laboratory

**9:15 AM**
**The Influence of Bimodal Cavity Distributions on Swelling Evolution in Helium Pre-implanted T91**: *Anthony Monterrosa*[1]; Gerrit VanCoevering[1]; Zhijie Jiao[1]; Gary Was[1]; [1]University of Michigan

**9:40 AM Break**

**10:00 AM Invited**
**Effect of Friction Stir Welding on Microstructure Evolution on In Situ and Ex Situ Self-ion Irradiated MA956**: *Elizabeth Getto*[1]; Brian Tobie[1]; Khalid Hattar[2]; Brad Baker[1]; Samuel Briggs[2]; [1]United States Naval Academy; [2]Sandia National Laboratory

**10:30 AM**
**Void Swelling Evolution and Radiation-induced Segregation & Precipitation in Self-ion Irradiated Ferritic/Martensitic HT9 Steel**: *Ce Zheng*[1]; Djamel Kaoumi[1]; [1]North Carolina State Univeristy

**10:55 AM**
**Effect of Temperature and Helium on Microstructure Evolution in Dual Ion Irradiated HT9 Steel**: *David Woodley*[1]; Zhijie Jiao[1]; Kai Sun[1]; Gary Was[1]; [1]University of Michigan

## Accident Tolerant Fuels for Light Water Reactor – ATF Program Overview

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

Monday AM
March 12, 2018
Room: 104A
Location: Phoenix Convention Center

*Session Chairs:* Peng Xu, Westinghouse Electric Company; Jon Carmack, Idaho National Laboratory

**8:00 AM Invited**
**The Department of Energy Advanced Nuclear Fuels Campaign**: *Jon Carmack*[1]; [1]Idaho National Laboratory

**8:30 AM Invited**
**Status Update on Westinghouse EnCoreTM ATF**: *Robert Oelrich*[1]; Peng Xu[1]; [1]Westinghouse Electric Company

**9:00 AM Invited**
**AREVA NP's Evolutionary Solution for Enhanced Accident Tolerant Fuel**: *Jeremy Bischoff*[1]; Christine Delafoy[1]; Elmar Schweitzer[2]; Kiran Nimishakavi[3]; [1]AREVA NP; [2]AREVA GmbH; [3]AREVA Inc.

**9:30 AM Break**

**9:50 AM Invited**
**Postirradiation of Accident Tolerant Fuel Concepts: Techniques, Highlights and Future Plans**: *Jason Harp*[1]; [1]Idaho National Laboratory

**10:20 AM Invited**
**Status of Accident Tolerant Fuel Cladding Development for LWRs**: *Kurt Terrani*[1]; [1]Oak Ridge National Laboratory

**10:50 AM Invited**
**Linking Advanced Multi-scale Modeling with Engineering Scale Fuel Performance Assessments of Accident Tolerant Fuels**: *Brian Wirth*[1]; Dwaipayan Dasgupta[1]; Gyan Singh[1]; R. Sweet[1]; [1]University of Tennessee - Knoxville

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Additive Manufacturing: A Revolution in Materials Processing

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Monday AM
March 12, 2018
Room: 231AB
Location: Phoenix Convention Center

*Session Chairs:* Eric Lass, National Institute of Standards and Technology; Allison Beese, Penn State University

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**GE Additive - Materials Evolution for the Revolution**: *Deborah Whitis*[1]; Behrang Poorganji[1]; [1]General Electric Company

**8:35 AM Invited**
**Assessing Additive Manufacturing Process Heterogeneity**: *Edwin Schwalbach*[1]; Michael Groeber[1]; Sean Donegan[1]; [1]Air Force Research Laboratory

**9:05 AM**
**Effect of Processing Parameters on Microstructure of PH 13-8 Stainless Steel Fabricated by Hybrid DED/CNC Manufacturing**: *Michael Juhasz*[1]; Jason Walker[1]; Brett Conner[1]; [1]Youngstown State University

**9:25 AM Break**

**9:45 AM Invited**
**Quantitative Microstructure-property Relationships in Additive Manufacturing of Metals**: *Allison Beese*[1]; [1]Pennsylvania State University

**10:15 AM**
**Microstructure-property Relationships in Advanced High Deposition Rate Cold Metal Transfer (CMT) Additive Manufactured IN718**: *Benjamin Adam*[1]; Thomas Langston[1]; Ahmet Tanrikulu[1]; Graham Tewksbury[1]; Tae-Kyu Lee[1]; [1]Portland State University

**10:35 AM**
**Using Additive/Subtractive Processing in the Freeform Fabrication of Bi-metallic Components**: *Judith Schneider*[1]; Sean Sporie[2]; Robin Osborne[3]; [1]University of Alabama - Huntsville; [2]DMG MORI; [3]NASA

**10:55 AM**
**Bimetallic Structure of Inconel 718 and GRCop-84 Processed Using LENS ™**: *Bonny Onuike*[1]; Bryan Heer[1]; Amit Bandyopadhyay[1]; [1]School of Mechanical and Material Engineering

## Additive Manufacturing of Metals: Fatigue and Fracture– Session I

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

Monday AM
March 12, 2018
Room: 232A
Location: Phoenix Convention Center

*Session Chair:* Nikolas Hrabe, National Institute of Standards and Technology

**8:00 AM Invited**
**Evaluation of Tensile and Low Cycle Fatigue Properties of 316 Stainless Using Binder Jetting Additive Manufacturing Technology**: *Donald Godfrey*[1]; Brian Baughman[1]; [1]Honeywell

**8:30 AM**
**Fatigue of Solid State Additive Manufactured Inconel 625**: Dustin Avery[1]; *JB Jordon*[1]; Paul Allison[1]; Nanci Hardwick[2]; [1]The University of Alabama; [2]Aeroprobe

**8:50 AM**
**Relating Defects at the Fracture Surface to Physical Properties of AM Materials**: *Stephanie DeJong*[1]; Andrea Exil[1]; Lisa Deibler[1]; Jay Carroll[1]; [1]Sandia National Laboratories

**9:10 AM**
**Effect of Hot Isostatic Pressing on Fatigue Properties of Additively Manufactured Ti-6Al-4V-ELI**: *Julius Bonini*[1]; Dayna Kinsey[1]; Krista Biggs[1]; Kevin Knight[2]; Ernesto Rios[3]; [1]Lucideon M + P; [2]Knight Mechanical Testing; [3]Renovis Surgical Technologies, Inc.

**9:30 AM Break**

**9:50 AM Invited**
**Fatigue Characteristics of Additively Manufactured Aerospace Materials**: *Brad Lerch*[1]; David Ellis[1]; Susan Draper[1]; Chantal Sudbrack[1]; [1]NASA-GRC

**10:20 AM**
**Fracture Characterization of Additive Manufactured Ti-6Al-4V**: *Emily Huskins-Retzlaff*[1]; M. Patrick Serbent[1]; Stephen Graham[1]; [1]United States Naval Academy

**10:40 AM**
**Anisotropic Fatigue Properties of IN718 Produced by Powder Bed Fusion**: *Amin S. Azar*[1]; Martin Fleissner Sunding[1]; Erik Andreassen[1]; [1]SINTEF

**11:00 AM Invited**
**MIDAS: Material Informed Digital Design Demonstration for Additive Structures**: Michael Groeber[1]; *Edwin Schwalbach*[1]; Michael Uchic[1]; Paul Shade[1]; William Musinski[1]; Sean Donegan[1]; Daniel Sparkman[1]; Jonathan Miller[1]; [1]Air Force Research Laboratory

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – High Speed Imaging in Additive Manufacturing

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

Monday AM
March 12, 2018
Room: 230
Location: Phoenix Convention Center

*Session Chairs:* Manyalibo Matthews, LLNL; Johanna Weker, SLAC

**8:00 AM**
**Correlating Pore Defect Formation in Laser Powder Bed Fusion Processing with In Situ Thermal and Interferometric Optical Measurement**: *Manyalibo Matthews*[1]; Philip Depond[1]; Jean Baptiste Forien[1]; Sonny Ly[1]; Gabe Guss[1]; Bradley Jared[2]; Jonathan Madison[2]; Elena Garlea[3]; Hahn Choo[4]; Christopher Spadaccini[1]; [1]Lawrence Livermore National Laboratory; [2]Sandia National Laboratories; [3]Y12 National Security Complex; [4]University of Tennessee

**8:20 AM**
**A Low Cost, High-speed Optical Monitoring System for Tracking Spatter during Laser Powder Bed Fusion**: *Christopher Barrett*[1]; Jason Walker[1]; Rodrigo Enriquez Gutierrez[1]; Eric MacDonald[1]; Brett Conner[1]; [1]Youngstown State University

**8:40 AM**
**Three Dimensional Characterization of AM 316L Stainless Steel**: *David Rowenhorst*[1]; Lily Nguyen[1]; Richard Fonda[1]; [1]U.S. Naval Research Laboratory

**9:00 AM**
**Defect Detection in LENS AM Using In Situ Thermal Camera Process Monitoring**: *Tom Stockman*[1]; Judith Schneider[1]; Cameron Knapp[2]; John Carpenter[2]; [1]University of Alabama Huntsville; [2]Los Alamos National Laboratory

**9:20 AM**
**High Speed Imaging of Particle-melt Interactions in Laser Directed Energy Deposition (L-DED)**: *James Haley*[1]; Joshua Yee[2]; Nancy Yang[2]; Julie Schoenung[1]; Enrique Lavernia[1]; [1]University of California, Irvine; [2]Sandia National Laboratories

**9:40 AM Break**

**10:00 AM Invited**
**Visualizing the Melt Pool and Void Formation in Ti Alloys Using Synchrotron-based X-ray Microscopy**: *Johanna Weker*[1]; Andrew Kiss[1]; Anthony Fong[1]; Vivek Thampy[1]; Nicholas Calta[2]; Aiden Martin[2]; Jenny Wang[2]; Philip Depond[2]; Gabe Guss[2]; Kevin Stone[1]; Christopher Tassone[1]; Ryan Ott[3]; Matthew Kramer[3]; Tony Van Buuren[2]; Manyalibo Matthews[2]; Michael Toney[1]; [1]SLAC National Accelerator Laboratory; [2]Lawrence Livermore National Laboratory; [3]Ames Laboratory

**10:30 AM**
**3D Imaging of Metal Powders Used for Additive Manufacturing**: *Dileep Singh*[1]; Chih-pin Chuang[1]; Francisco Medina[2]; Rutuja Samant[2]; [1]Argonne National Laboratory; [2]Edison Welding Institute

**10:50 AM**
**Defect Signatures for Metal Laser Powder Bed Fusion**: *Bradley Jared*[1]; Jon Madison[1]; Laura Swiler[1]; David Saiz[1]; Kevin Webb[2]; Erich Schwaller[1]; Josh Koepke[1]; Burke Kernan[1]; Brad Boyce[1]; Jeff Rodelas[1]; Manyalibo Matthews[3]; [1]Sandia National Laboratories; [2]Georgia Tech University; [3]Lawerence Livermore National Laboratory

**11:10 AM**
**Correlation of In-situ Process Monitoring Data to Material Properties and the Technologies Potential Impacts on AM Process Qualification**: *Alexander Janzen*[1]; Ankit Saharan[1]; [1]EOS North America

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Local Strain & Misorientation I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon,Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Monday AM
March 12, 2018
Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* Wolfgang Pantleon, Technical University of Denmark; Robert Suter, Carnegie Mellon University

**8:00 AM Invited**
**Advances in Information Extraction from Near-field High Energy Diffraction Microscopy Data Sets**: *Robert Suter*[1]; Yu-Feng Shen[1]; David Menasche[2]; [1]Carnegie Mellon University; [2]Hamilton LLC

**8:30 AM**
**In-situ Monitoring of Cyclic Deformation by High Resolution Reciprocal Space Mapping**: *Annika Diederichs*[1]; Ulrich Lienert[2]; Henning Friis Poulsen[3]; Wolfgang Pantleon[1]; [1]Department of Mechanical Engineering, Section of Materials and Surface Engineering, Technical University of Denmark; [2]DESY Photon Science, Deutsches Elektronen Synchrotron; [3]Department of Physics, Neutrons and X-Rays for Materials Physics (NEXMAP), Technical University of Denmark

**8:50 AM**
**High Resolution Strain Measurements in a Polycrystalline Superalloy during Plastic Deformation: Slip Band Discontinuity Analysis**: *J.C. Stinville*[1]; F. Bourdin[2]; M.P. Echlin[1]; W.C. Lenthe[1]; F. Bridier[3]; D. Texier[4]; J. Cormier[2]; P. Villechaise[2]; V. Valle[5]; T.M. Pollock[1]; [1]University of California Santa Barbara; [2]Institut Pprime, CNRS – ENSMA – Université de Poitiers, UPR CNRS 3346; [3]DCNS Research, DCNS; [4]Ecole de Technologie Superieure de Montreal; [5]Institut Pprime, CNRS – Université de Poitiers, UPR CNRS 3346

**9:10 AM**
**Strain Localisation Behaviour in Ti834 Subjected to Cold Creep Testing**: *Claudius Dichtl*[1]; Michael Preuss[1]; João Quinta da Fonseca[1]; [1]University of Manchester

**9:30 AM Break**

**9:50 AM**
**Dominant Axes of Orientation Distributions and the Peculiar Case of [111] Grains in Tension**: *Wolfgang Pantleon*[1]; [1]Technical University of Denmark

**10:10 AM**
**Microstructure and Deformation Mechanisms in Ti-7Al**: *Patrick Callahan*[1]; Jean-Charles Stinville[1]; Tresa Pollock[1]; [1]University of California, Santa Barbara

**10:30 AM**
**Measuring Intra-grain Orientation Gradient and Elastic Strain Field by Near-field High Energy X-ray Diffraction Microscopy**: *Yu-Feng Shen*[1]; R. Suter[1]; [1]Carnegie Mellon University

**10:50 AM**
**An Application of X-Ray Micro Computer Tomography to Understand Material Flow during Friction Stir Channelling Process**: Sheetal Pandya[1]; *Amit Arora*[1]; [1]Indian Institute of Technology Gandhinagar

**11:10 AM**
**Modern Diffraction Methods for the Investigation of Thermo-mechanical Processes**: *Klaus-Dieter Liss*[1]; [1]Australian Nuclear Science and Technology Organisation

## Advanced High-strength Steels – High Mn Steels

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Monday AM
March 12, 2018
Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Mingxin Huang, The University of Hong Kong; Xuejun Jin, Shanghai Jiao Tong University

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**Nanoprecipitate-hardened Fine-grained Twinning-induced Plasticity Steels with Excellent Cryogenic Strength-ductility Combinations**: *Xuejun Jin*[1]; Yu Li[1]; Wei Li[1]; [1]Shanghai Jiao Tong University

**8:30 AM**
**Deformation Twins Are Not Important for TWIP Steels**: *M.X. Huang*[1]; [1]The University of Hong Kong

**8:50 AM**
**Digital Image Correlation (DIC) Analysis of Temperature and Strain Rate Influence on the Serrated Flow Behaviour of High-Mn Steels**: *Sebastian Wesselmecking*[1]; Liudmila Tataurova[1]; Wolfgang Bleck[1]; [1]RWTH Aachen

**9:10 AM**
**Investigation of Processing and Deformation Behavior of Strip Cast Aluminum-alloyed High Manganese Steels**: *Marco Haupt*[1]; Sebastian Wesselmecking[2]; Gerhard Hirt[1]; [1]Institute of Metal Forming (IBF), RWTH Aachen University; [2]Department of Ferrous Metallurgy (IEHK), RWTH Aachen University

**9:30 AM Break**

**9:45 AM**
**Mechanical Behavior of a TWIP Steel (Fe-Mn-C-Al-Si) under Tension and Compression Loads.**: *Xiaoxue Chen*[1]; Jianguo Li[2]; Laszlo Kecskes[3]; Qiuming Wei[1]; [1]UNC-Charlotte; [2]University of Northwestern Poly-technical University; [3]US Army Research Laboratory

**10:05 AM**
**Impact of Short-range Ordering on the Yield Strength in High Mn Steels**: *Simon Sevsek*[1]; Wolfgang Bleck[1]; [1]Steel Institute, RWTH Aachen University

**10:25 AM**
**Cavitation Behavior of an Advanced High-Mn Austenitic TWIP Steel Microalloyed with V and Nb Under Hot-tensile Condition**: *Enrique Salas*[1]; Ignacio Mejía[2]; José María Cabrera[3]; [1]National Autonomus University of Mexico; [2]Universidad Michoacana de San Nicolás de Hidalgo; [3]Universitat Politècnica de Catalunya

**10:45 AM**
**On the Fracture Behavior of Twinning-induced Plasticity Steel**: *Luo Zhichao*[1]; Huang Mingxin[1]; [1]The University of Hong Kong

**11:05 AM**
**Thermomechanical Processing of High-Mn, High-Al Steels for Thick Plate Applications**: *Katherine Sebeck*[1]; Ryan Howell[2]; Demetrios Tzelepis[1]; Michael Foley[1]; [1]US Army TARDEC; [2]US Army PEO GCS

**11:25 AM**
**Crystal-plasticity Modeling of the Dislocation-dominated Strain Hardening in a TWIP Steel**: *Yizhuang Li*[1]; Mingxin Huang[1]; [1]The University of Hong Kong

## 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, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Monday AM
March 12, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* Paul Ohodnicki, NREL

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**Amorphous and Nanocomposite Magnets for High Efficiency, High Speed Motor Designs**: *Michael McHenry*[1]; [1]Carnegie Mellon University

**8:35 AM Invited**
**Building 3D Structures from Amorphous and Nanocrystalline Ribbon for Applications in High Efficiency Motors**: *Eric Theisen*[1]; [1]Metglas Inc.

**9:05 AM Invited**
**Engineering of Magnetic Properties of Co- and Fe-rich Microwires by Stress Annealing**: *Arcady Zhukov*[1]; Mihail Ipatov[2]; Juan Blanco[2]; Valentina Zhukova[2]; [1]Basque Country University and Ikerbasque; [2]University of Basque Country

**9:35 AM Break**

**9:50 AM Invited**
**Core Loss Reduction of Electrical Motor Being Applied to by Low Iron Loss**: *Keisuke Fujisaki*[1]; [1]Toyota Technological Institute

**10:20 AM**
**Multiport Converter and High Frequency Transformer Technology for Grid Integration of Distributed Generation Resources**: *Paul Ohodnicki*[1]; Michael McHenry[2]; Subhashish Bhattacharya[3]; Mark Juds[4]; Randy Bowman[5]; Alex Leary[5]; Richard Beddingfield[3]; Ronald Noebe[5]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University; [3]North Carolina State University; [4]Eaton Corporation; [5]NASA Glenn Research Center

**10:50 AM**
**Leakage Flux Induced Losses and Shielding in Magnetic Ribbon Cores**: *Richard Beddingfield*[1]; Kevin Byerly[2]; Mark Juds[3]; Subhashish Bhattacharya[1]; Paul Ohodnicki[2]; [1]North Carolina State University; [2]National Energy Technology Labs; [3]Eaton

**11:10 AM**
**Core Loss Measurements and Benchmarking of Commercial Soft Magnetic Core Materials for High Frequency Power Conversion**: *Kevin Byerly*[1]; Paul Ohodnicki[1]; Alex Leary; Seung-Ryul Moon[1]; Richard Beddingfield[2]; Subhashish Bhattacharya[2]; [1]National Energy Technology Laboratory; [2]North Carolina State University

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – 3D Microelectronic Packaging

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Monday AM
March 12, 2018

Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* John Elmer, Lawrence Livermore National Laboratory; Tae-Kyu Lee, Portland State University

**8:00 AM Invited**
**Failure and Material Analysis Challenges in 3D Microelectronic Packages**: Pilin Liu[1]; Kaushik Muthur Srinath[1]; Yan Li[1]; *Deepak Goyal*[1]; [1]Intel Corporation

**8:30 AM**
**Damage Mechanisms in TSVs and Back-end Structures due to Thermal Cycling and Electromigration**: *Indranath Dutta*[1]; Tae-Kyu Lee[2]; Sukeshwar Kannan[3]; Bibekananda Dutta[1]; [1]Washington State University; [2]Portland State University; [3]Global Foundries

**8:50 AM**
**Effect of Twin Grains on the Void Formation in Copper Filled through Silicon via under Thermal Process**: Limin Ma[1]; *Xuewei Zhao*[1]; Yishu Wang[1]; Fu Guo[1]; [1]Beijing University of Technology

**9:10 AM**
**Effect of Tin Orientation on Electromigration Failure of 20-um Microbumps**: *Kai-Cheng Shie*[1]; Chih Chen[1]; [1]National Chiao Tung Unirversity

**9:30 AM Break**

**9:50 AM**
**Effect of Sn Grain Orientation on Thermomigration in Sn2.3Ag Microbumps**: Yu-An Shen[1]; *Kai-Cheng Shie*[1]; Fan-Yi Ouyang[2]; Chih Chen[1]; [1]National Chiao Tung University; [2]National Tsing Hua University

**10:10 AM**
**Effects of Zn Addition on Cu-Sn Microjoints for Chip-stacking Applications**: *Yi-Wun Wang*[1]; Ting-Li Yang[1]; C.R. Kao[1]; [1]National Taiwan University

**10:30 AM**
**Edge Effect and Phase Formation in Cu-Sn-Ni Micro Joints during Solid-state Aging**: *Haiyang Yu*[1]; C.R. Kao[1]; [1]National Taiwan University

**10:50 AM**
**Micromechanical Properties of Single Crystalline $(Cu,Ni)_6Sn_5$ by Micropillar Compression and Nanoindentation**: *Jui-Yang Wu*[1]; C. Robert Kao[1]; [1]Department of Materials Science and Engineering, National Taiwan University

**11:10 AM**
**Effective Control of the Statistical Spread in Cu TSV Extrusion by a Cap Layer**: *Golareh Jalilvand*[1]; Omar Ahmed[1]; Cullen Fitzgerald[1]; Keenan Bosworth[1]; Zhenlin Pei[1]; Tengfei Jiang[1]; [1]University of Central Florida

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – Overview of Additive Manufacturing for Titanium Alloys

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

Monday AM
March 12, 2018

Room: 231C
Location: Phoenix Convention Center

*Session Chair:* Peter Collins, Iowa State University

**8:00 AM Introductory Comments**

**8:10 AM Invited**
**A History of Titanium Additive Manufacturing for Air Vehicle Structures**: *Brian Rosenberger*[1]; [1]Lockheed Martin

**8:40 AM Invited**
**Understanding Light-matter Interaction, Melt Pool Dynamics and Spatter Formation in Laser Powder Bed Fusion Processing**: *Manyalibo Matthews*[1]; Andrew Anderson[1]; Nicholas Calta[1]; Philip Depond[1]; Gabe Guss[1]; Saad Khairallah[1]; Wayne King[1]; Tien Roehling[1]; Alexander Rubenchik[1]; Johannes Trapp[1]; Sheldon Wu[1]; [1]Lawrence Livermore National Laboratory

**9:15 AM Invited**
**Processing Modalities of Ti-6Al-4V Fabricated via Additive Manufacturing**: *Ryan Dehoff*[1]; Peeyush Nandwana[1]; Sean Yoder[1]; Frederick List[1]; Chasen Ranger[2]; Ross Cunningham[2]; Anthony Rollett[2]; Suresh Babu[3]; [1]Oak Ridge National Laboratory; [2]Carnegie Mellon University; [3]The University of Tennessee

**9:45 AM Break**

**10:00 AM**
**Additive Manufacturing in a High Temperature Environment with Sensor Monitoring to a Closed-loop In-situ Feedback Control**: *James Withers*[1]; Anil Chaudhary[2]; Grady Phillips[3]; Glen Perram[3]; [1]ATS-MER, LLC; [2]Applied Optimization; [3]Air Force Institute of Technology

**10:20 AM**
**In-situ Investigation of Microstructure Evolution during Annealing in Ti-6Al-4V Alloy Produced by Additive Manufacturing**: *Sven Vogel*[1]; Shigehiro Takajo[2]; El'ad Caspi[3]; Asaf Pesach[3]; Ori Yeheskel[3]; Eitan Tiferet[3]; [1]Los Alamos National Laboratory; [2]LANL & JFE Steel Corporation, Kurashiki, Japan; [3]Nuclear Research Center Negev

**10:40 AM**
**Numerical and Experimental Study of As-built Powder Bed Fused Ti6Al4V Component**: Jonas Zielinski[1]; Jan Duechting[1]; Hans-Wilfried Mindt[2]; *Mustafa Megahed*[2]; [1]Fraunhofer; [2]ESI Group

## Alloys and Compounds for Thermoelectric and Solar Cell Applications VI – Session I

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Soon-Jik Hong, Kongju National University and Institute for Rare Metals; Philippe Jund, Université Montpellier 2; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science (NIMS) ; Hsin-jay Wu, National Sun Yat-sen University; Tiejun Zhu, Zhejiang University

Monday AM
March 12, 2018
Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Sinn-wen Chen, National Tsing Hua University; Hsin-jay Wu, National Sun Yat-Sen University

**8:00 AM Introductory Comments**

**8:10 AM Invited**
**Approaching Efficient Thermoelectrics: From Materials to Modules**: *Lidong Chen*[1]; Shengqaing Bai[1]; [1]Shanghai Institute of Ceramics, Chinese Academy of Sciences

**8:30 AM Invited**
**Half Heuslers: Promising Mid-to-high Temperature Thermoelectric Alloys**: *Joseph Poon*[1]; [1]University of Virginia

**8:50 AM Invited**
**High-performance Oxides-based Thermoelectric Ceramics for Energy Conversion**: *Yuanhua Lin*[1]; [1]Tsinghua University

**9:10 AM Invited**
**Low Dimensional Insulator-conductor Nanocomposites and their Thermoelectric Properties**: *Teruyuki Ikeda*[1]; Babak Alinejad[1]; [1]Ibaraki University

**9:30 AM Break**

**9:50 AM Invited**
**High Thermoelectric Figure-of-merit in n-type Ga-incorporated PbTe**: *Hsin-jay Wu*[1]; Yi-huei Du[1]; [1]National Sun Yat-sen University

**10:10 AM Invited**
**Enhancement of the Thermoelectric Properties of FeGa3–type Structures with Group 6 Transition Metals: A Computational Exploration**: *Regis Gautier*[1]; Benoit Boucher[1]; Rabih Al Rahal Al Orabi[2]; Bruno Fontaine[1]; Yuri Grin[3]; Jean-Francois Halet[1]; [1]ENSC Rennes; [2]Central Michigan University; [3]MPI Dresden

**10:30 AM Invited**
**Enhanced Thermoelectric Properties in a Printed Material**: *Koji Miyazaki*[1]; [1]Kyushu Institute of Technology

**10:50 AM Invited**
**Structure/Property Relationships of Thermoelectric Oxyselenides Bi1-xAxOCuSe (A=Ba, Sr, Ca, and Pb)**: *Winnie Wong-Ng*[1]; Yonggao Yan[2]; Matthew Lawson[3]; Lan Li[3]; James Kaduk[4]; [1]National Institute of Standards and Technology; [2]Wuhan University of Technology; [3]Boise State University; [4]Illinois Institute of Technology

**11:10 AM**
**Phonon Spectroscopy and Elasticity in Thermoelectric Mg2Si1-xSnx**: *Raphael Hermann*[1]; Benedikt Klobes[2]; Johannes de Boor[3]; Ahmet Atalasy[4]; Michael Yu[4]; Ronnie Simon[5]; [1]Oak Ridge National Laboratory; [2]University of Applied Sciences Bremerhaven; [3]Institute of Materials Research, German Aerospace Center; [4]Advanced Photon Source, Argonne National Laboratory; [5]Ju¨lich Centre for Neutron Science JCNS and Peter Gru¨nberg Institute PGI, JARA-FIT

**11:30 AM**
**Microstructure and Thermoelectric Properties of Se/Te-doped $CoSb_3$ Skutterudites Synthesized by Self-propagating High-temperature Synthesis**: *Miroslaw Kruszewski*[1]; Lukasz Ciupinski[1]; Radoslaw Zielinski[1]; Rafal Zybala[1]; Marcin Chmielewski[2]; [1]Warsaw University of Technology; [2]Institute of Electronic Materials Technology

## Application of Solidification Fundamentals to Challenges in Metal Additive Manufacturing – Process to Microstructure Relationships

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Alex Plotkowski, University of Tennessee - Knoxville; Kevin Chaput, Materials and Manufacturing Directorate; Lang Yuan, GE Global Research

Monday AM
March 12, 2018
Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Kevin Chaput, Air Force Research Laboratory

**8:00 AM Invited**
**Application of Interface Response Function Theory to Describe Non-equilibrium Solidification during Welding and Additive Manufacturing**: *Sudarsanam Babu*[1]; [1]The University of Tennessee, Knoxville

**8:30 AM**
**Enabling New Additive Alloys through Solidification Control**: *Hunter Martin*[1]; Brennan Yahata[2]; Robert Mone[2]; Ekaterina Stonkevitch[2]; Jacob Hundley[2]; Tobias Schaedler[2]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]HRL Labs

**8:50 AM**
**Crystal Growth in Face-centred-cubic Alloys Made by Additive Manufacturing: Epitaxial Growth, Branching and Splitting**: Bogdan Dovgyy[1]; Alessandro Piglione[1]; Chen Liu[1]; Paul Hooper[1]; *Minh-Son Pham*[1]; [1]Imperial College London

**9:10 AM**
**Microstructure Formation in Rapid Solidification of Electron-beam Melted Ni-Sn Alloys**: Rijie Zhao[1]; *Jianrong Gao*[1]; Jerry Guo[2]; Brant Wu[2]; [1]Northeastern University; [2]Dynasty Metal Additive Manufacturing Systems Co., Ltd

**9:30 AM Break**

**9:50 AM**
**Cellular Automata Modeling of Nucleation and Grain Growth in Alloy-based Additive Manufacturing**: *Matthew Rolchigo*[1]; Michael Mendoza[1]; Peter Collins[1]; Richard LeSar[1]; [1]Iowa State University

**10:10 AM**
**Solid Solubility Extension and Microstructural Evolution during Single and Double Pass Laser Scans in Al-Co and Al-Ce Binary Alloys**: *Cain Hung*[1]; Yu Sun[1]; Rainer Hebert[1]; [1]University of Connecticut

**10:30 AM**
**Building Microstructure-cooling Rate Relationships in Laser Welded Uranium-6 Wt. Pct. Niobium for Laser Powder Bed Fusion Processing**: *Amanda Wu*[1]; John Elmer[1]; Tarasankar DebRoy[2]; [1]Lawrence Livermore National Laboratory; [2]Pennsylvania State University

**10:50 AM**
**The Effect of Grain Refiners on the Columnar to Equiaxed Transition in Metal Additive Manufacturing of Aluminium Alloys**: *Mitesh Patel*[1]; Dong Qiu[1]; Gui Wang[2]; Mark Gibson[1]; David StJohn[2]; Mark Easton[1]; [1]RMIT University; [2]The University of Queensland

**11:10 AM**
**Microstructure Control in Laser Powder Bed Fusion: Correlating Directional Solidification Parameters with Selected Process Variables and Material's Properties**: *Umberto Scipioni Bertoli*[1]; Julie Schoenung[1]; [1]University of California, Irvine

## Bio-nano Interfaces and Engineering Applications Symposium – Bio-Nano Interfaces I

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

Monday AM
March 12, 2018

Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* Candan Tamerler, University of Kansas; Kalpana Katti, North Dakota University

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**Discovery of Biomaterials by Simulation and Experiment: Catalysts, Composites, and Therapeutics**: *Hendrik Heinz*[1]; [1]University of Colorado-Boulder

**8:35 AM Invited**
**Nanoclay Based Tissue Engineering Scaffolds for Mimicking Biointerfaces in Mesenchymal to Epithelial Transision of Prostate and Breast Cancer Metastasis to Bone**: *Kalpana Katti*[1]; Shahajahan Molla[1]; Sumanta Kar[1]; Dinesh Katti[1]; [1]North Dakota State University

**9:05 AM Invited**
**Nanoscale Structure and Properties of Biomaterials**: *Federico Rosei*[1]; [1]INRS

**9:35 AM Break**

**9:50 AM Invited**
**Biomolecular Design of Soft Interfaces for Technology and Medicine**: *Mehmet Sarikaya*[1]; [1]University of Washington

**10:30 AM Invited**
**Investigating the Interaction of Amyloidogenic Proteins with Inorganic Surfaces, Nanoparticles and Biomolecules by Atomistic Simulations**: *Stefano Corni*[1]; [1]University of Padova & CNR Institute of Nanoscience

**11:00 AM Invited**
**Modeling the Mechanics of Cancer Cells on Tissue Engineering Substrates**: *Dinesh Katti*[1]; Kalpana Katti[1]; [1]North Dakota State University

## Biological Materials Science – Structural Biological Materials

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

Monday AM
March 12, 2018

Room: 225B
Location: Phoenix Convention Center

*Session Chairs:* Steven Naleway, University of Utah; Holly Martin, Youngstown State University

**8:00 AM Invited**
**Materials Inspired from Fossils and their Relatives**: *David Kisailus*[1]; [1]University of California, Riverside

**8:30 AM**
**A Damper on the Head? Structural Role of the Skull Bone of Woodpeckers**: *Jae-Young Jung*[1]; Andrei Pissarenko[1]; Adwait Trikanad[2]; David Restrepo[2]; Frances Su[1]; Damian Gonzalez[1]; Andrew Marquez[1]; Steven Naleway[3]; Marc Meyers[1]; Pablo Zavattieri[2]; Joanna McKittrick[1]; [1]University of California, San Diego; [2]Purdue University; [3]The University of Utah

**8:50 AM**
**Energy Absorbent Natural Keratin Materials and Bioinspired Designs**: *Wei Huang*[1]; Alireza Zaheri[2]; David Restrepo[3]; Wen Yang[1]; Horacio Espinosa[2]; Robert Ritchie[4]; Pablo Zavattieri[3]; Joanna McKittrick[1]; [1]University of California, San Diego; [2]Northwestern University; [3]Purdue University; [4]Lawrence Berkeley National Laboratory

**9:10 AM**
**Pangolin Armor: Overlapping, Structure, and Mechanical Properties of the Keratinous Scales**: *Wen Yang*[1]; Bin Wang[1]; Marc Meyers[1]; [1]University of California, San Diego

**9:30 AM Break**

**9:50 AM Keynote**
**Institute of Metals/Robert Franklin Mehl Award Lecture: Biological Materials Science: Challenges and Opportunities**: *Marc Meyers*[1]; [1]University of California, San Diego

**10:30 AM Invited**
**Structure and Mechanics of Natural Scales: Inspiration for Novel Flexible Protective Systems**: Roberto Martini[1]; Yanis Balit[1]; *Francois Barthelat*[1]; [1]McGill University

**11:00 AM Invited**
**Material Architecture Inspired by Nature: Harnessing the Role of Interfaces and Other Clever Mechanisms**: *Pablo Zavattieri*[1]; [1]Purdue University

## CFD Modeling and Simulation in Materials Processing– Casting and Solidification I

*Sponsored by:* TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
*Program Organizers:* Laurentiu Nastac, The University of Alabama; Koulis Pericleous, University of Greenwich; Adrian Sabau, Oak Ridge National Laboratory; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, Colorado School of Mines

Monday AM
March 12, 2018

Room: 228B
Location: Phoenix Convention Center

*Session Chairs:* Koulis Pericleous, University of Greenwich; Gregory Poole, The University of South Alabama

**8:00 AM**
**A Comparison of the Volume-averaged and Continuum Mixture Approaches for Modeling Equiaxed Solidification**: *John Coleman*[1]; Matthew Krane[1]; [1]Purdue University

**8:20 AM**
**Massively Parallel GPU Lattice Boltzmann Method for 3D Alloy Solidification and Solute Transport**: *Ivars Krastins*[1]; Andrew Kao[1]; Koulis Pericleous[1]; [1]University of Greenwich

**8:40 AM**
**Numerical Simulation on Solidification Structure of 30Cr2Ni4MoV Steel under Different Temperature Gradient Using Procast Software**: *Zheng Chen*[1]; Jieyu Zhang[2]; [1]Shanghai University;Tongling University; [2]Shanghai University

**9:00 AM**
**Influence of Coil Configuration on Flow Characteristics in Electromagnetic Solidification Systems**: *Gregory Poole*[1]; Laurentiu Nastac[2]; [1]University of South Alabama; [2]University of Alabama

**9:20 AM**
**Discussion on Pouring Process Parameters Based on Slow Solidification Experiment of Extra - Thick Plate Mold**: *Bao Yang*[1]; Chang-jun Xu[1]; Lian-wang Zhang[1]; Jing Li[1]; [1]School of Materials and Metallurgy, University of Science and Technology Liaoning

**9:40 AM Break**

**10:00 AM**
**Validation of a Model for Predicting Air Entrainment during Pouring of Metal Castings**: *Seyyed Hojjat Majidi*[1]; Christoph Beckermann[1]; [1]University of Iowa

**10:20 AM**
**Modelling Directional Solidification in a Transverse Magnetic Field Validated via High Speed Synchrotron X-Ray Tomography**: *Andrew Kao*[1]; Biao Cai[2]; Peter Lee[2]; Koulis Pericleous[1]; [1]University of Greenwich; [2]The University of Manchester

**10:40 AM**
**Simulation Analysis on the Solidification Quality of Heavy Compatible Split Type Ingot**: *Lian-wang Zhang*[1]; Yan Zhang[1]; Chun-xiao Sun[1]; Chang-jun Xu[1]; Ye Cui[2]; [1]Technical Center of Metallurgical Engineering, University of Science and Technology Liaoning; [2]Liaoning Fu-An Heavy Industry Co.,Ltd

**11:00 AM**
**Effect of Hook Formation during Initial Solidification on Distribution of Subsurface Inclusions in Ultralow Carbon Steel Slabs**: *Xiao Pengcheng*[1]; Liguang Zhu[1]; Caijun Zhang[1]; Jingyi Zhou[1]; [1]North China University of Science and Technology

## Characterization of Minerals, Metals, and Materials – Characterization Methods

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Monday AM
March 12, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chairs:* Jian Li, NRCan/RNCan; Andrew Brown, University of New South Wales

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**Improve Product Quality and On-line Process Control with Three-dimensional Size and Shape Particle Characterization**: Terry Stauffer[1]; *Phil Plantz*[1]; Paul Cannon[1]; Alex Greenzweig[1]; [1]Microtrac

**8:25 AM**
**Case Studies Utilizing Advanced X-ray Computed Tomography Techniques**: *Jennifer Sietins*[1]; Clara Hofmeister[2]; [1]Army Research Laboratory; [2]ORISE

**8:45 AM**
**Integrated Imaging in Three Dimensions: The Sum is Greater than the Parts**: *Ashwin Shahani*[1]; Hrishikesh Bale[2]; Nicolas Gueninchault[3]; Arno Merkle[2]; Erik Lauridsen[3]; [1]University of Michigan; [2]Carl Zeiss X-ray Microscopy Inc.; [3]Xnovo Technology ApS

**9:05 AM**
**On FIB Milling Parameters**: *Jian Li*[1]; [1]CanmetMATERIALS

**9:25 AM Break**

**9:40 AM**
**The Full-field X-ray Nano-tomography System at the Advanced Photon Source: An Instrument Oriented toward In Situ Experiments**: *Vincent De Andrade*[1]; Alex Deriy[1]; Michael Wojcik[1]; Deming Shu[1]; Sunil Bean[1]; Doga Gürsoy[1]; Tekin Bicer[1]; Daniel Pelt[2]; Xiaogang Yang[1]; Mark Wolfman[3]; Arthur Glowacki[1]; Chris Jacobsen[1]; Kamel Fezzaa[1]; C Kaira[4]; Nikhilesh Chawla[4]; M Ley[5]; Narayanan Kasthuri[1]; Francesco De Carlo[1]; [1]Argonne National Laboratory; [2]Lawrence Berkeley National Laboratory; [3]University of Illinois Chicago; [4]Arizona State University; [5]Oklahoma State University

**10:00 AM**
**Transmission Kikuchi Diffraction for Characterization of Thin Film Phenomena**: *Mikhail Polyakov*[1]; Rachel Schoeppner[1]; Xavier Maeder[1]; Johann Michler[1]; [1]EMPA

**10:20 AM**
**3D Microstructural Characterization of Polymer and Ceramic Matrix Composite Materials (PMC, CMC) Using Serial Sectioning**: *Veeraraghavan Sundar*[1]; Satya Ganti[1]; Bryan Turner[1]; [1]UES Inc.

**10:40 AM**
**Correlative Multiscale Tomography for Additive Manufacturing**: *Bartlomiej Winiarski*[1]; Grzegorz Pyka[1]; Austin Wade[1]; Dirk Laeveren[1]; Philip Withers[2]; [1]Thermo Fisher Scientific; [2]The University of Manchester

**11:00 AM**
**Fabrication of Monolithic Nanoporous Copper by Chemical Dealloying Cu-Y Metallic Glasses**: *Ning Wang*[1]; Ye Pan[1]; [1]Southeast University

## Characterization of Minerals, Metals, and Materials – Characterization of Non-ferrous Metals

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Monday AM
March 12, 2018
Room: 124B
Location: Phoenix Convention Center

*Session Chairs:* Y. Eren Kalay, Middle East Technical University; Xuewei Lv, Chongqing University

**8:00 AM Introductory Comments**

**8:05 AM Invited**
**Characterization of Chape Memory Ti-Ni-Hf Alloys**: *Walman Castro*[1]; Roniere Soares[1]; [1]Universidade Federal de Campina Grande

**8:25 AM**
**In-situ Diagnostics of Damage Accumulation in Nickel-based Superalloy**: *Koji Kageyama*[1]; Fauzan Adziman[1]; Tan Sui[1]; Alexander Korsunsky[1]; Roger Reed[1]; [1]University of Oxford

**8:45 AM**
**Increasing Coercivity for Nd-Fe-B Melt Spun Ribbons by Adding 20 at.% Ce**: *Munan Yang*[1]; Hang Wang[1]; Yongfeng Hu[2]; Bin Yang[1]; [1]Jiangxi University of Science and Technology; [2]Canadian Light Source

**9:05 AM**
**Exploiting the Thixoformability of Ti-Co Alloys: Microstructure Evolution, Semisolid Deformation Behavior, and Mechanical Properties**: *Kaio Campo*[1]; Caio de Freitas[1]; Mariana de Mello[1]; Rubens Caram[1]; [1]UNICAMP - University of Campinas

**9:25 AM**
**The Influence of Liquid Structure on the Devitrification of Solid Amorphous Al-based Marginal Glass Forming Alloys**: *Bengisu Yasar*[1]; Ilkay Kalay[2]; Eren Kalay[1]; [1]METU; [2]Cankaya University

**9:45 AM Break**

**10:00 AM**
**Digital Image Analysis for the Automated Measurement of Dendritic Microstructures in Vacuum Arc Remelted Nickel Alloy 718**: Thomas Ivanoff[1]; Trevor Watt[2]; *Eric Taleff*[1]; [1]The University of Texas at Austin; [2]Stratasys

**10:20 AM**
**In Situ EBSD Study on the Development of Recrystallized Cube Texture in 3 Mass% Si Steel**: *Shigehiro Takajo*[1]; Sven Vogel[1]; David Field[2]; Colin Merriman[2]; [1]Los Alamos National Laboratory; [2]Washington State University

**10:40 AM**
**Synthesis and Characterization on Nickel Orthosilicate Anode of Lithium-ion Battery**: Guihong Han[1]; *Duo Zhang*[1]; Yanfang Huang[1]; [1]Zhengzhou University

**11:00 AM**
**Eletrochemical Behavior and Corrosion Properties of Ti-6Al-4V Alloy Made by Selective Laser Melting for Immersion in Artificial Seawater at Different Temperature**: *Yifei Zhang*[1]; [1]Northeastern University

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Boundaries and Interfaces I

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Monday AM
March 12, 2018

Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Wei Liu, Nanjing University of Science and Technology; Jian Luo, UCSD

**8:00 AM Invited**
**Developing Grain Boundary 'Phase' Diagrams: From Phenomenological Interfacial Thermodynamic Models to Atomistic Simulations**: Shengfeng Yang[1]; *Jian Luo*[1]; [1]University of California, San Diego

**8:30 AM**
**An Efficient Monte-Carlo Algorithm for Determining the Minimum Energy Structures of Metallic Grain Boundaries**: *Srikanth Patala*[1]; Mark Tschopp[2]; Arash Banadaki[1]; [1]North Carolina State University; [2]US Army Research Laboratory

**8:50 AM**
**First-principles Study of $Co_3W$ Antiphase Boundaries with Al Impurities**: *Chiraag Nataraj*[1]; Ruoshi Sun[1]; Axel van de Walle[1]; [1]Brown University

**9:10 AM**
**First-principles Computation Design of CoPt and FePt Nanoparticles with Desired Magnetic Properties through Tailoring Surface Segregation**: Zhenyu Liu[1]; *Guofeng Wang*[1]; [1]University of Pittsburgh

**9:30 AM Break**

**9:50 AM**
**Understanding Defect Tolerance and Grain Boundary Effect on Mechanical Properties of Nano-twinned Yttria-stabilized Tetragonal Zirconia**: *Ning Zhang*[1]; Mohsen Asle Zaeem[1]; [1]Missouri University of Science and Technology

**10:10 AM Invited**
**Materials Design from Functional Molecule-metal Interface**: *Wei Liu*[1]; [1]Nanjing University of Science and Technology

**10:40 AM**
**Modeling Segregation at Stacking Faults Using Cluster-assisted Statistical Mechanics**: *Michael Titus*[1]; Robert Rhein[2]; Anton Van der Ven[2]; Tresa Pollock[2]; [1]Purdue University; [2]University of California, Santa Barbara

**11:00 AM**
**Suppression of Martensitic Transitions in NiTi Shape Memory Alloys from Ab Initio Simulations: The Role of Compound Twins**: *Luis Sandoval*[1]; Justin Haskins[1]; John Lawson[2]; [1]Analytical Mechanics Associates, Inc.; [2]NASA Ames Research Center

**11:20 AM**
**Simulation on the Effects of Glass-glass Interfaces on the Plastic Deformation of Nano-glasses**: *G.P. Zheng*[1]; [1]Hong Kong Polytechnic University

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Phase Field Simulations I: Functional Materials and Alloys

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Monday AM
March 12, 2018

Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Brandon Runnels, University of Colorado, Colorado Springs; Katsuyo Thornton, University of Michigan, Ann Arbor

**8:00 AM Invited**
**Phase-field Simulation Environment for Functional Materials**: Xiaoxing Cheng[1]; Tiannan Yang[1]; Bo Wang[1]; *Long Qing Chen*[1]; [1]Penn State University

**8:30 AM**
**Computational Design and Simulation of Magnetoelectric Composites for Electric Field-controlled Magnetic Properties**: *Liwei Geng*[1]; Yu Wang[1]; [1]Michigan Technological University

**8:50 AM**
**Predicting Self-organization of Nanostructured Morphologies in Physical Vapor Deposited Phase-separating Alloys**: *Kumar Ankit*[1]; Benjamin Derby[2]; Amit Misra[2]; Michael Demkowicz[3]; [1]Arizona State University; [2]University of Michigan, Ann Arbor; [3]Texas A&M University, College Station

**9:10 AM**
**A Chemo-mechanical Phase-field Model for Phase Separation of a Li-ion Battery Electrode Particle to Study Influence of Surface Irregularities during Intercalation**: *Jaykumar Santoki*[1]; Daniel Schneider[1]; Marc Kamlah[1]; Britta Nestler[1]; [1]Karlsruhe Institute of Technology (KIT)

**9:30 AM Break**

**9:50 AM**
**Phase-field Modelling of Multiply-twinned Structures of FCC Metallic Nanomaterials**: Jong-Hyuk Lee[1]; Dong-Uk Kim[2]; Kunok Chang[3]; *Yongwoo Kwon*[1]; [1]Hongik University; [2]University of Michigan; [3]Korea Atomic Energy Research Institute

**10:10 AM**
**Monoclinic Distortion in Nanotwinned Ferroelectrics**: *Liwei Geng*[1]; Yongmei Jin[1]; Yu Wang[1]; [1]Michigan Technological University

**10:30 AM**
**Phase Field Simulation of Microstructure Evolution Driven by Strong Grain Boundary Anisotropy Computed Using Realistic Models for Grain Boundary Energy**: *Brandon Runnels*[1]; Josep Gras[1]; [1]University of Colorado Colorado Springs

**10:50 AM**
**Phase-field Simulation of Nodule Microstructure near Grain Boundaries in Nickel-based Alloys**: *Yuhki Tsukada*[1]; Ryota Oshima[2]; Toshiyuki Koyama[1]; Mitsuharu Yonemura[3]; [1]Nagoya University; [2]Nagoya Institute of Technology; [3]Nippon Steel & Sumitomo Metal

**11:10 AM**
**Influence of Fluid Flow on Morphological Evolution of Seaweed Structures Using Phase Field Modeling**: *Pavan Laxmipathy Veluvali*[1]; Fei Wang[2]; Michael Selzer[1]; Kumar Ankit[3]; Britta Nestler[1]; [1]Karlsruhe Institute of Technology (KIT); [2]Karlsruhe University of Applied Sciences; [3]Texas A&M University

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Phase Field Simulations I: Functional Materials and Microstructure Evolution

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Monday AM
March 12, 2018

Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Brandon Runnels, University of Colorado, Colorado Springs; Katsuyo Thornton, University of Michigan, Ann Arbor

**8:00 AM Invited**
**Phase-field Simulation Environment for Functional Materials**: Xiaoxing Cheng[1]; Tiannan Yang[1]; Bo Wang[1]; *Long Qing Chen*[1]; [1]Penn State University

**8:30 AM**
**Computational Design and Simulation of Magnetoelectric Composites for Electric Field-controlled Magnetic Properties**: *Liwei Geng*[1]; Yu Wang[1]; [1]Michigan Technological University

**8:50 AM**
**Predicting Self-organization of Nanostructured Morphologies in Physical Vapor Deposited Phase-separating Alloys**: *Kumar Ankit*[1]; Benjamin Derby[2]; Amit Misra[2]; Michael Demkowicz[3]; [1]Arizona State University; [2]University of Michigan, Ann Arbor; [3]Texas A&M University, College Station

**9:10 AM**
**A Chemo-mechanical Phase-field Model for Phase Separation of a Li-ion Battery Electrode Particle to Study Influence of Surface Irregularities during Intercalation**: *Jaykumar Santoki*[1]; Daniel Schneider[1]; Marc Kamlah[1]; Britta Nestler[1]; [1]Karlsruhe Institute of Technology (KIT)

**9:30 AM Break**

**9:50 AM**
**Phase-field Modelling of Multiply-twinned Structures of FCC Metallic Nanomaterials**: Jong-Hyuk Lee[1]; Dong-Uk Kim[2]; Kunok Chang[3]; *Yongwoo Kwon*[1]; [1]Hongik University; [2]University of Michigan; [3]Korea Atomic Energy Research Institute

**10:10 AM**
**Monoclinic Distortion in Nanotwinned Ferroelectrics**: *Liwei Geng*[1]; Yongmei Jin[1]; Yu Wang[1]; [1]Michigan Technological University

**10:30 AM**
**Phase Field Simulation of Microstructure Evolution Driven by Strong Grain Boundary Anisotropy Computed Using Realistic Models for Grain Boundary Energy**: *Brandon Runnels*[1]; Josep Gras[1]; [1]University of Colorado Colorado Springs

**10:50 AM**
**Phase-field Simulation of Nodule Microstructure near Grain Boundaries in Nickel-based Alloys**: *Yuhki Tsukada*[1]; Ryota Oshima[2]; Toshiyuki Koyama[1]; Mitsuharu Yonemura[3]; [1]Nagoya University; [2]Nagoya Institute of Technology; [3]Nippon Steel & Sumitomo Metal

**11:10 AM**
**Influence of Fluid Flow on Morphological Evolution of Seaweed Structures Using Phase Field Modeling**: *Pavan Laxmipathy Veluvali*[1]; Fei Wang[2]; Michael Selzer[1]; Kumar Ankit[3]; Britta Nestler[1]; [1]Karlsruhe Institute of Technology (KIT); [2]Karlsruhe University of Applied Sciences; [3]Texas A&M University

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Computational Design of Materials: CALPHAD

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

Monday AM
March 12, 2018

Room: 131C
Location: Phoenix Convention Center

*Session Chairs:* Carelyn Campbell, NIST; Fan Zhang, CompuTherm, LLC

**8:00 AM Invited**
**Use the Full Potential of the CALPHAD Modeling Tools**: *Fan Zhang*[1]; Shuanglin Chen[1]; Weisheng Cao[1]; Chuan Zhang[1]; Jun Zhu[1]; Duchao Lv[1]; [1]CompuTherm, LLC

**8:30 AM Invited**
**Application of Computational Thermodynamics in Yittria Stablized Zirconia System**: *Yu Zhong*[1]; [1]Florida International University

**9:00 AM**
**Thermodynamic Properties of Cu–Pb–F Ternary System**: *Satoshi Iikubo*[1]; Shoya Kawano[1]; Kumiko Yamamoto[1]; Yuya Suzuki[1]; Kenji Hirata[1]; Hideyuki Harada[1]; [1]Kyushu Institute of Technology

**9:20 AM Invited**
**Building a Co Diffusion Mobility Database for γ/ γ' Co-Superalloys**: Greta Lindwall[1]; Kil-won Moon[1]; *Carelyn Campbell*[1]; Peisheng Wang[1]; Ursula Kattner[1]; [1]National Institute of Standards and Technology

**9:50 AM Break**

**10:10 AM**
**Computational Thermodynamics Aided Design of Co-based γ'-strengthened Superalloys**: *Eric Lass*[1]; [1]National Institute of Standards and Technology

**10:30 AM**
**Calphad-type Assessment of the Ni-Ti-Hf System Combined with the DFT Calculations**: *Chang-Seok Oh*[1]; Eun Ae Choi[1]; Hak Sung Lee[1]; [1]Korea Institute of Materials Science

**10:50 AM**
**Thermodynamic Database for Co-Al-W-Ni-Ti-Ta-Cr Based Superalloys**: *Peisheng Wang*[1]; Ursula Kattner[2]; Carelyn Campbell[2]; Eric Lass[2]; Greg Olson[3]; [1]Northwestern University/NIST; [2]NIST; [3]Northwestern University

## Computational Materials Discovery and Optimization – Materials Informatics

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Richard Hennig, University of Florida; Houlong Zhuang, Arizona State University; Arunima Singh, Lawrence Berkeley National Laboratory; Eric Homer, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Monday AM
March 12, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chair:* Richard Hennig, University of Florida

**8:00 AM Invited**
**Machine Learning for Materials**: *Matthias Rupp*[1]; [1]Fritz Haber Institute of the Max Planck Society

**8:30 AM**
**Learning Grain Boundary Properties from Macroscopic and Microscopic Structural Descriptors**: *Ankita Mangal*[1]; Ian Chesser[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

**8:50 AM**
**Minimal Addition of Cerium for Stability of Critical Phases in Hard Magnetic AlNiCo Alloys: Combined Machine Learning and CALPHAD**: George Dulikravich[1]; *Rajesh Jha*[1]; [1]Florida International University

**9:10 AM Invited**
**Quantum-accurate Force Fields from Machine Learning of Large Materials Data**: *Shyue Ping Ong*[1]; Chi Chen[1]; Zhi Deng[1]; Richard Tran[1]; [1]University of California, San Diego

**9:40 AM Break**

**10:00 AM**
**Predicting Ferroelectric Properties from Microstructures with Deep Learning**: *Isaac Curtis*[1]; Vishnu Boddeti[2]; Samrat Choudhury[1]; [1]University of Idaho; [2]Michigan State University

**10:20 AM**
**Tailoring Properties in Multi-component Alloys through Heuristic Optimization**: *Aayush Sharma*[1]; Rahul Singh[1]; Ganesh Balasubramanian[1]; [1]Iowa State University

## Computational Materials Science and Engineering for Nuclear Energy – Nuclear Fuels and Cladding I

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Monday AM
March 12, 2018
Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* Adrien Couet, University of Wisconsin - Madison; Blas Uberuaga, Los Alamos National Laboratory

**8:00 AM Invited**
**Vacancy Clusters and Xenon Diffusion in $UO_2$**: *David Andersson*[1]; Christopher Matthews[1]; Romain Perriot[1]; Michael Cooper[1]; Christopher Stanek[1]; [1]Los Alamos National Laboratory

**8:30 AM**
**Thermophysical Properties of $(U,Zr)O_2$ Pellet-cladding Interface though MD Simulations**: *Dillon Frost*[1]; Michael Cooper[2]; Patrick Burr[1]; [1]UNSW Sydney; [2]Los Alamos National Lab

**8:50 AM**
**Computational Modelling of Thermal Transport in Uranium Dioxide**: *Ahmed Hamed*[1]; Anter El-Azab[1]; [1]Purdue University

**9:10 AM**
**Atomistic Study of Thermal Spike Response of Xe Bubbles in $UO_2$**: *Wahyu Setyawan*[1]; Michael Cooper[2]; Kenneth Roche[1]; Brian Wirth[3]; Blas Uberuaga[2]; David Andersson[2]; Richard Kurtz[1]; [1]Pacific Northwest National Laboratory; [2]Los Alamos National Laboratory; [3]University of Tennessee, Knoxville

**9:30 AM Break**

**9:50 AM**
**Effect of Post Fabrication Voids on Irradiation Performance of U-10Mo Monolithic Mini-plate**: *Walid Mohamed*[1]; Hee Seok Roh[1]; Hakan Ozaltun[2]; James Smith[2]; Joseph Nielsen[2]; Irina Glagolenko[2]; Gerard Hofman[1]; Bertrand Stepnik[3]; Harald Breitkreutz[4]; Abdellatif Yacout[1]; [1]Argonne National Laboratory; [2]Idaho National Laboratory; [3]AREVA NP, CERCA; [4]Research Neutron Source Heinz Maier-Leibnitz (FRM II), TUM

**10:10 AM**
**Phase-field Modeling of Fission Rate Effect on the Gas Bubble Swelling in U-Mo Fuel**: Linyun Liang[1]; *Zhi-Gang Mei*[1]; Abdellatif Yacout[1]; [1]Argonne National Laboratory

**10:30 AM**
**Effect of Dopants on Uranium-based Metallic Fuels to Mitigate Fuel-cladding Chemical Interactions**: *Rabi Khanal*[1]; Nathan Jerred[1]; Michael Benson[2]; Robert Mariani[2]; Indrajit Charit[1]; Samrat Choudhury[1]; [1]University of Idaho; [2]Idaho National Laboratory

**10:50 AM Invited**
**Modeling Inclusions with Surface Stresses in the Phase Field Framework**: *Daniel Schwen*[1]; Larry Aagesen[1]; [1]Idaho National Laboratory

## Computational Thermodynamics and Kinetics – Structure and Property

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

Monday AM
March 12, 2018
Room: 128A
Location: Phoenix Convention Center

*Session Chairs:* Kristin Persson, University of California, Berkeley; Pascal Bellon, University of Illinois

**8:00 AM Invited**
**A Novel Mechanism for Order Patterning in Alloys Driven by Irradiation**: *Pascal Bellon*[1]; Calvin Lear[2]; Robert Averback[1]; [1]University of Illinois; [2]University of Michigan

**8:30 AM**
**Thermoelectric Enhancement in Hybrid Ordered/Disordered Metamaterials via Phonon Localization and Band Anticrossing**: *Taishan Zhu*[1]; Elif Ertekin[1]; [1]University of Illinois at Urbana Champaign

**8:50 AM**
**Thermodynamic Analysis of Substitutional and Interstitial Ti Alloys**: *Naga Sri Harsha Gunda*[1]; Anton Van der Ven[1]; [1]University of California, Santa Barbara

**9:10 AM**
**Point Defects in Concentrated Alloys: Distributions of Properties**: *Celine Varvenne*[1]; Ghani Berkoun[1]; Aitor Luque[2]; William Curtin[2]; Emmanuel Clouet[3]; [1]Aix-Marseille Univ.-CNRS; [2]EPFL; [3]CEA Saclay

**9:30 AM Break**

**9:50 AM Invited**
**Design of Novel Functional Materials Using the Capabilities of the Materials Project**: *Kristin Persson*[1]; [1]University of California, Berkeley

**10:20 AM**
**Point Vacancy Affects on Ni/Al Nanolaminate Interface Diffusion and Combustion**: *Brandon Witbeck*[1]; Douglas Spearot[1]; [1]University of Florida

**10:40 AM**
**Interface Co-segregation of Additive Elements for MoSi2-Mo5Si3 Pseudobinary Alloys: A First-principles Study**: *Koretaka Yuge*[1]; [1]Department of Materials Science and Engineering, Kyoto University

**11:00 AM**
**Void Superlattice Formation: Symmetry and Lattice Parameter Selection**: *Yongfeng Zhang*[1]; Yipeng Gao[1]; Chao Jiang[1]; Daniel Schwen[1]; [1]Idaho National Laboratory

## Coupling Experiments and Modeling to Understand Plasticity and Failure – Plasticity

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Michael Sangid, Purdue University; Philip Eisenlohr, Michigan State University; Matthew Miller, Cornell University; Paul Shade, Air Force Research Laboratory

Monday AM
March 12, 2018
Room: 126B
Location: Phoenix Convention Center

*Session Chairs:* Michael Sangid, Purdue University; Paul Shade, Air Force Research Lab

**8:00 AM Invited**
**A Survey of Several High-energy X-ray Diffraction Studies and Implications for Models of Polycrystal Plasticity**: *Armand Beaudoin*[1]; Kamalika Chatterjee[2]; Darren Pagan[2]; Paul Shade[3]; Joel Bernier[4]; [1]Cornell High Energy Synchrotron Source; [2]University of Illinois at Urbana-Champaign; [3]Air Force Research Laboratory; [4]Lawrence Livermore National Laboratory

**8:25 AM Invited**
**The Importance of Introducing Probabilistic Information When Modeling the Constitutive Response of Aggregates (Part I)**: *Carlos Tome*[1]; Irene Beyerlein[2]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara

**8:50 AM Invited**
**The Importance of Introducing Probabilistic Information When Modeling the Constitutive Response of Aggregates (Part II)**: *Irene Beyerlein*[1]; Carlos Tome[2]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

**9:15 AM**
**Microstructure Evolution during Biaxial Load Path Changes: In-situ Experiments and Multi-scale FE-FFT Modeling**: *Manas Upadhyay*[1]; Anirban Patra[2]; Wei Wen[2]; Ricardo Lebensohn[2]; Carlos Tome[2]; Helena Van Swygenhoven[3]; [1]Paul Scherrer Institut; [2]Los Alamos National Laboratory; [3]Paul Scherrer Institute/Ecole Polytechnique Federale de Lausanne

**9:35 AM Break**

**9:50 AM Invited**
**Understanding Shear Band Formation Using High-resolution X-ray Diffraction and Numerical Modeling**: *Darren Pagan*[1]; Armand Beaudoin[2]; Matthew Miller[3]; [1]Cornell High Energy Synchrotron Source; [2]University of Illinois at Urbana-Champaign; [3]Cornell University

**10:15 AM Invited**
**Measurements and Crystal Plasticity Simulations of Microstructure-scale Deformation in Tantalum**: *Corbett Battaile*[1]; Hojun Lim[1]; Jay Carroll[1]; [1]Sandia National Laboratories

**10:40 AM**
**Microstructure and Texture Evolution during Thermo-mechanical Processing of Low-symmetry Metals**: *Rodney McCabe*[1]; Miroslav Zecevic[2]; Cody Miller[1]; Timothy Barrett[2]; Daniel Coughlin[1]; Marko Knezevic[2]; David Alexander[1]; [1]Los Alamos National Laboratory; [2]University of New Hampshire

**11:00 AM**
**Facile Measurements of Elastic Constants for Coupling Experiments and Modeling to Understand Plasticity and Failure**: *Xinpeng Du*[1]; Ji-Cheng Zhao[1]; [1]Ohio State University

**11:20 AM**
**Understanding Plastic Deformation in Polycrystals 301L Stainless Steel(301L SS) Using Far Field High Energy Diffraction Microscopy (HEDM) Experiments**: *Jinesh Dahal*[1]; Harshad Paranjapee[1]; Aaron Stebner[1]; Darren Dale[2]; Don Brown[3]; [1]Colorado School Of Mines; [2]Cornell High Energy Synchrotron Source; [3]Los Alamos National Laboratory

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – 1A: Grain Size Development During Forging & Heat Treatment in Ni-based Superalloys. 1B: Recrystallization & Grain Growth Ni-based Superalloys

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

Monday AM
March 12, 2018
Room: 126A
Location: Phoenix Convention Center

*Session Chairs:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials

**8:00 AM Invited**
**Strain Induced Excessive Grain Growth in Nickel Base Superalloys**: *Nathalie Bozzolo*[1]; Marie-Agathe Charpagne[2]; Jean-Michel Franchet[3]; Andrea Agnoli[3]; Marc Bernacki[1]; [1]MINES ParisTech; [2]University of California, Santa Barbara; [3]Safran

**8:30 AM Invited**
**Abnormal Grain Growth upon Annealing of a Hot-worked Ni-base Alloy**: *Michael Fahrmann*[1]; David Metzler[1]; [1]Haynes International Inc.

**9:00 AM**
**Influence of Thermomechanical Processing and Hot Deformation on Microstructural Evolution towards Building a Comprehensive Model for Dynamic Recrystallization Kinetics in Alloy IN625**: *Benjamin Adam*[1]; Graham Tewksbury[1]; William Wood[1]; Brandon Templin[2]; Jon Tirpak[3]; [1]Portland State University; [2]Scientific Forming Technology Corporation; [3]Advanced Technology International (ATI)

**9:20 AM**
**A Systematic Data-analytics Approach to the Design of Processing Routes for Forged Nickel-based Superalloy Inconel 706**: Nishan Senanayake[1]; *Jennifer Carter*[1]; [1]Case Western Reserve University

**9:40 AM Break**

**10:00 AM Invited**
**Influence of Forging Parameters on the Microstructure of Supersolvus Heat Treated Nickel-based Superalloy RR1000**: *Kevin Severs*[1]; Vikas Saraf[1]; Iain Parr[2]; Thomas Jackson[2]; Mark Hardy[2]; [1]ATI Forged Products; [2]Rolls-Royce plc

**10:30 AM**
**Heteroepitaxial Recrystallization in Polycrystalline Nickel-based Superalloys: Nucleation Mechanism**: *Marie-Agathe Charpagne*[1]; Jonathan Cormier[2]; Timothy Clark[3]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Institut Pprime, UPR CNRS 3346, ISAE-ENSMA; [3]Carlton Forge Works, PCC

**10:50 AM**
**Deformation Processing and Recrystallization of Single Crystal Ni-base Superalloys**: *Kyle Ventura*[1]; Sarah Frith[1]; Yujie Wang[1]; Arianne Lazaro[1]; Gerhard Fuchs[1]; [1]University of Florida

**11:10 AM**
**The Effect of Forging Parameters on Large Unrecrystallized Powder Features in RR1000 Nickel Base Superalloy**: *Soran Birosca*[1]; Mark Hardy[2]; [1]Swansea University; [2]Rolls-Royce

## Design for Mechanical Behavior of Architectured Materials via Topology Optimization – Optimal Design of Microlattices and Architected Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Natasha Vermaak, Lehigh University; Andrew Gaynor, U.S. Army Research Laboratory

Monday AM
March 12, 2018
Room: 132C
Location: Phoenix Convention Center

*Session Chairs:* Andrew Gaynor, ARL; Natasha Vermaak, Lehigh University

**8:00 AM Invited**
**Optimal Design of Architected Materials with Extreme Energy Dissipation**: *Lorenzo Valdevit*[1]; Alireza Asadpoure[2]; Babak Haghpanah[1]; [1]University of California, Irvine; [2]University of Massachusetts Dartmouth

**8:40 AM**
**Optimized Microlattices for High Strength and Impact Attenuation**: *Eric Clough*[1]; Christopher Roper[1]; Zak Eckel[1]; Jacob Hundley[1]; Morgan Stilke[1]; Tobias Schaedler[1]; [1]HRL Laboratories

**9:10 AM**
**Dense Architectured Materials in Engineering and in Nature**: Mohammad Mirkhalaf[1]; Zhen Yin[1]; *Francois Barthelat*[1]; [1]McGill University

**9:40 AM Break**

**10:00 AM**
**Inverse Homogenization Design of Micro-truss Architected Materials Using Geometric Primitives**: *Seth Watts*[1]; Wen Chen[1]; Julie Jackson[1]; William Smith[1]; Christopher Spadaccini[1]; Daniel Tortorelli[1]; [1]Lawrence Livermore National Laboratory

**10:30 AM**
**Multiscale Design with Architected Material Connectivity for Multiphysics Problems**: *Zongliang Du*[1]; Hayoung Chung[1]; Sandilya Kambampati[1]; Alicia Kim[1]; [1]University of California San Diego

**11:00 AM**
**Deformation and Failure of Bioinspired Segmented Architectured Beams and Plates**: *Ahmed Dalaq*[1]; Francois Barthelat[1]; [1]McGill University

## Dynamic Behavior of Materials VIII – Effect of Microstructure of Dynamic Response I

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

Monday AM
March 12, 2018
Room: 127B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:00 AM Invited**
**Modeling the Spall Behavior of Metallic Materials at the Atomic Scales and the Mesoscales**: *Avinash Dongare*[1]; Garvit Agarwal[1]; Sergey Galitskiy[1]; Jie Chen[1]; [1]University of Connecticut

**8:40 AM**
**Dynamic Tension-compression Anisotropy in a Stable Nanocrystalline Cu Alloy**: *Scott Turnage*[1]; Kristopher Darling[2]; Chaitanya Kale[1]; Kiran Solanki[1]; [1]Arizona State University; [2]Army Research Laboratory

**9:00 AM**
**The Role of Interfaces in Nucleation of Dynamic Damage in BCC Materials**: *Saryu Fensin*[1]; Eric Hahn[1]; Timothy Germann[1]; George Gray[1]; [1]Los Alamos National Laboratory

**9:20 AM**
**Evaluation of High Strain Rate Plastic Flow Behaviour of Nanocrystalline Nickel Using Ultra Fast Nanoindentation Test System**: *Sundararajan Govindan*[1]; Sudharshan Phani[2]; Suresh Babu[2]; Nitin Wasekar[2]; [1]Indian Institute of Technology Madras; [2]ARCI

**9:40 AM Break**

**10:00 AM Invited**
**Effect of Deviatoric Material Response on Perturbed Shock Front Stability**: Saul Opie[1]; Elizabeth Fortin[1]; Ashish Gopalakrishnan[1]; Eric Loomis[2]; *Pedro Peralta*[1]; [1]Arizona State University; [2]Los Alamos National Laboratory

**10:40 AM**
**Prediction of Fragmentation of an Aluminum Expanding Ring**: *Gianluca Iannitti*[1]; Andrew Ruggiero[1]; Gabriel Testa[1]; Nicola Bonora[1]; Domenico Gentile[1]; [1]University of Cassino

**11:00 AM**
**Kinetics of Void Nucleation and Growth at Grain Boundaries on Shock Loaded Copper Bicrystals**: *Elizabeth Fortin*[1]; Matthew Catlett[2]; Pedro Peralta[1]; [1]Arizona State University; [2]Los Alamos National Laboratory

## Energy Technologies and $CO_2$ Management Symposium – $CO_2$ Capture

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
*Program Organizers:* Ziqi Sun, Queensland University of Technology; Cong Wang, Northeastern University; Donna Guillen, Idaho National Laboratory; Tao Wang, Nucor Steel; Neale Neelameggham, Ind LLC; John Howarter, Purdue University

Monday AM
March 12, 2018
Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* Ziqi Sun, Queensland University of Technology, Australia; Xia Lou, Curtin University

**8:00 AM Keynote**
**Charge Modulation for Manipulating Material-gas Interactions: $CO_2$ Capture and $H_2$ Storage**: *Sean Smith*[1]; Xin Tan[1]; Hassan Tahini[1]; [1]University of New South Wales

**8:40 AM Invited**
**Gas Hydrate-based $CO_2$ Separation Process: Quantitative Assessment of the Effectiveness of Various Chemical Additives Involved in the Process**: Hossein Dashti[1]; *Xia Lou*[1]; [1]Curtin University

**9:00 AM**
**Interfacial Interactions of Self-healing Polymer-cement Composites Exposed to $CO_2$ Using Synchrotron Methods**: *Mohamed Elbakhshwan*[1]; Simerjeet Gill[1]; Chonghang Zhao[2]; Yu-chen Karen Chen-Wiegart[2]; Lynne Ecker[1]; M. Ian Childers[3]; Christina Lopano[4]; Barbara Kutchko[4]; Carlos Fernandez[3]; [1]Brookhaven National Laboratory; [2]Stony Brook University; [3]Pacific Northwestern National Laboratory; [4]National Energy Technology Laboratory

**9:20 AM**
**Tar Removal from Hot Coke Oven Gas for $H_2$ Amplification with in Situ $CO_2$ Capture**: *Huaqing Xie*[1]; Qin Qin[1]; Qingbo Yu[1]; [1]School of Metallurgy, Northeastern University

**9:40 AM Break**

**10:00 AM**
**An Evaluation Method for Material and Energy Conversion Effect with Steel Manufacturing Process Data**: *Shipeng Huang*[1]; Zhong Zheng[1]; Xiaoqiang Gao[2]; Shenglong Jiang[1]; Zhaojun Xu[1]; [1]College of Materials Science and Engineering, Chongqing University; [2]College of Economics and Business Administration, Chongqing University

**10:20 AM**
**Preparation and Characterization of Activated Carbon from Waste Ion-exchange Resin for $CO_2$ Adsorption**: *Mengqi Wei*[1]; Qingbo Yu[1]; Qiang Guo[2]; Zongliang Zuo[1]; Qin Qin[1]; [1]Northeastern University, China; [2]Hebei Construction& Investment New Energy Co. Ltd

**10:40 AM**
**Solid Solution CaxSr1-xO Catalysts in Transesterification for Biodiesel Production**: *Maria Lourdes Potestades*[1]; Shih-Kang Lin[1]; Wen-Dung Hsu[1]; Masahiro Yoshimura[1]; [1]National Cheng Kung University

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Data-driven Investigations of Fatigue

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Monday AM
March 12, 2018
Room: 125B
Location: Phoenix Convention Center

*Session Chair:* Ashley Spear, University of Utah

**8:00 AM Keynote**
**A Data Science Framework for Reduced-order Microstructure-sensitive Rank Ordering of Fatigue Performance**: Noah Paulson[1]; Matthew Priddy[2]; David McDowell[3]; *Surya Kalidindi*[3]; [1]Argonne National Laboratory; [2]Mississippi State University; [3]Georgia Institute of Technology

**8:40 AM Invited**
**Data-driven Approaches for Steel Fatigue Strength Prediction**: *Ankit Agrawal*[1]; Alok Choudhary[1]; [1]Northwestern University

**9:00 AM**
**Predicting the Effect of Microstructure on the Likelihood of Early Fatigue Failures Using Data Analytics Algorithms**: *Sushant Jha*[1]; Robert Brockman[1]; Rebecca Hoffman[1]; Vikas Sinha[2]; William Porter[1]; Dennis Buchanan[1]; Adam Pilchak[3]; James Larsen[3]; Reji John[3]; [1]University of Dayton Research Institute; [2]UES, Inc.; [3]US Air Force Research Laboratory

**9:20 AM Break**

**9:40 AM**
**Microstructure, Strain Localization and Fatigue in a Polycrystalline Nickel Base Superalloy at High Temperature**: *J.C. Stinville*[1]; E. Martin[2]; M. Karadge[2]; S. Ismonov[2]; M. Soare[2]; T. Hanlon[2]; S. Sundaram[2]; M.P. Echlin[1]; P. Callahan[1]; W.C. Lenthe[1]; V.M. Miller[1]; J. Miao[3]; A.E. Wessman[4]; R. Finlay[4]; A. Loghin[2]; J. Marte[2]; T.M. Pollock[1]; [1]University of California, Santa Barbara; [2]General Electric Global Research; [3]University of Michigan; [4]General Electric Aviation

**10:00 AM**
**Identification of Fatigue Weak Links in Aluminum Alloys Using a Data-driven Approach**: *Brian Wisner*[1]; Krzysztof Mazur[1]; Antonios Kontsos[1]; [1]Drexel University

**10:20 AM**
**High-throughput Fatigue Experiments for Early Damage Evolution and Lifetime Prediction**: *Thomas Straub*[1]; Michael Buck[1]; Ali Durmaz[2]; Chris Eberl[1]; [1]University of Freiburg; [2]Fraunhofer IWM

## Fracture: 65 Years after the Weibull Distribution and the Williams Singularity – Session I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Brad Boyce, Sandia National Laboratories; Ellen Cerreta, Los Alamos National Laboratory; Jacob Hochhalter, NASA LaRC; Jonathan Zimmerman, Sandia National Laboratories

Monday AM
March 12, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Ellen Cerreta, Los Alamos National Labs; Philip Noell, Sandia National Labs

**8:00 AM Invited**
**Singularities of Dynamic Cracks**: *Michael Marder*[1]; [1]UT Austin

**8:30 AM**
**The Effect of Loading Rate on Fracture Toughness of Low Ductility Materials**: *Carl Cady*[1]; Cheng Liu[1]; [1]Los Alamos National Laboratory

**8:50 AM Invited**
**Fracture Behavior of High Performance Sheet Steel**: *Kip Findley*[1]; Lindsay Golem[1]; Mykal Madrid[1]; Kester Clarke[1]; John Speer[1]; [1]Colorado School of Mines

**9:20 AM Break**

**9:40 AM Invited**
**Physical and Computational Aspects of Engineering Damage Mechanics**: *Curt Bronkhorst*[1]; Hashem Mourad[1]; Darby Luscher[1]; Daniele Versino[1]; [1]Los Alamos National Laboratory

**10:10 AM**
**On the Prediction of Failure in 6016 Aluminum Alloy Sheet by GISSMO Damage Model**: *Bin Liang*[1]; Yan Zhao[2]; Dengfu Chen[1]; Xinming Wan[2]; Junping Zhang[2]; Jia Zhou[2]; Mujun Long[1]; Huamei Duan[1]; [1]Chongqing University; [2]China Automotive Research Engineering Institute Co. Ltd

**10:30 AM**
**Void Initiation during Ductile Rupture of Pure Metals**: *Philip Noell*[1]; Jay Carroll[1]; Khalid Hattar[1]; Blythe Clark[1]; Brad Boyce[1]; [1]Sandia National Labs

## Frontiers in Advanced Functional Thin Films and Nanostructured Materials – Session I

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Ritesh Sachan, Army Research Office; Srinivasa Rao Singamaneni, The University of Texas at El Paso; Haiyan Wang, Purdue University; Nuggehalli Ravindra, New Jersey Institute of Technology; Raj Singh, Oklahoma State University; Amit Pandey, LG Fuel Cell Systems Inc.

Monday AM
March 12, 2018
Room: 103A
Location: Phoenix Convention Center

Funding support provided by: Quantum Design and Radiant Technologies

*Session Chairs:* Ritesh Sachan, Army Research Office; Nuggehalli M Ravindra, New Jersey Institute of Technology

**8:00 AM Keynote**
**Discovery of Ferromagnetism and High-temperature Superconductivity in Q-carbon**: *Jagdish (Jay) Narayan*[1]; Anagh Bhaumik[1]; Ritesh Sachan[2]; [1]North Carolina State University; [2]Materials Science Division, Army Research Office

**8:40 AM Invited**
**Diamond Epitaxy for High Power and High Temperature Electronics**: *Robert Nemanich*[1]; Franz A. Koeck[1]; Maitreya Dutta[2]; Raghuraj Hathwar[1]; Mehdi Saremi[1]; Srabanti Chowdhury[2]; Stephen M. Goodnick[1]; [1]Arizona State University; [2]Univeristy of California - Davis

**9:10 AM Invited**
**Nanostructure Synthesis by Pulsed Laser Melting**: *Ramki Kalyanaraman*[1]; [1]University of Tennessee

**9:30 AM Break**

**9:45 AM Invited**
**A New Approach to Align CNTs in CNT Films**: Yingying Yu[1]; Qingwen Li[2]; *Yuntian Zhu*[1]; [1]North Carolina State University; [2]Suzhou Institute of Nanotechnology and Nanobionics

**10:15 AM**
**Effect of Geometrical Defects on Thermal and Mechanical Properties of Metal-coated Multi-walled Carbon Nanotubes**: *Iman Salehinia*[1]; Ravindra Sunil Dhumal[1]; Dinesh Bommidi[1]; [1]Northern Illinois University

**10:35 AM**
**Control of Nucleation of 3C-SiC Utilizing Screw Dislocations in 6H-SiC**: *Ryo Watanabe*[1]; Sakiko Kawanishi[1]; Hiroyuki Shibata[1]; [1]Tohoku University

**10:55 AM**
**High-temperature Carbon-based Superconductors: B-doped Q-carbon**: *Anagh Bhaumik*[1]; Ritesh Sachan[2]; Siddharth Gupta[1]; Jagdish Narayan[1]; [1]North Carolina State University; [2]Materials Science Division, Army Research Office

**11:15 AM**
**Superhard Q-carbon Nanostructures Formed via Nanosecond Laser Melting and Ultrafast Quenching:** *Siddharth Gupta*[1]; Ritesh Sachan[2]; Anagh Bhaumik[1]; Punam Pant[1]; Roger Narayan[1]; Jagdish Narayan[1]; [1]North Carolina State University; [2]Materials Science Division, Army Research Office

## High Entropy Alloys VI – Alloy Development and Applications 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Monday AM
March 12, 2018

Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* Peter Liaw, The University of Tennesee; Jien-Wei Yeh, National Tsing Hua University

**8:00 AM Keynote**
**Breakthrough Applications of High-entropy Materials**: *Jien-Wei Yeh*[1]; [1]National Tsing Hua University

**8:30 AM Keynote**
**Mechanisms of Damage Tolerance of CrCoNi-based High-entropy Alloys**: Robert Ritchie[1]; *Bernd Gludovatz*[2]; Qian Yu[3]; Easo George[4]; [1]University of California, Berkeley; [2]University of New South Wales; [3]Zhejiang University; [4]Oak Ridge National Laboratory

**9:00 AM Invited**
**Microstructure and Properties of New Refractory High Entropy Superalloys**: *Oleg Senkov*[1]; Jacob Jensen[2]; Adam Pilchak[1]; Hamish Fraser[2]; [1]Air Force Research Laboratory; [2]The Ohio State University

**9:20 AM Invited**
**Designing Ti-Zr-Ta-Mo-W Refractory High-entropy Alloy**: *Aayush Sharma*[1]; Prashant Singh[2]; Mouhamad Diallo[1]; Pratik Ray[2]; Ganesh Balasubramanian[1]; Matthew Kramer[2]; Duane Johnson[2]; [1]Iowa State University; [2]Ames Laboratory

**9:40 AM Break**

**10:00 AM Invited**
**Developing Light-weight High-entropy Alloys: Modeling and Experiments**: *Michael Gao*[1]; Feng Rui[2]; Chuan Zhang[3]; Fan Zhang[3]; Jeffrey Hawk[1]; Paul Jablonski[1]; Kyle Rozman[1]; David Alman[1]; Chan Ho Lee[2]; Peiyong Chen[2]; Peter Liaw[2]; [1]National Energy Technology Laboratory; [2]University of Tennessee; [3]CompuTherm LLC

**10:20 AM Invited**
**A High-throughput Approach to Accelerate the Evaluation of Multicomponent Alloys**: Mu Li[1]; Rohan Mishra[1]; *Katharine Flores*[1]; [1]Washington University

**10:40 AM Invited**
**Investigating Microstructures in the Al-Co-Cr-Fe-Ni Alloys Using Bragg-edge Neutron Imaging Techniques**: *Louis Santodonato*[1]; Hassina Bilheux[1]; Rui Feng[2]; Gian Song[1]; Jean Bilheux[1]; Jiao Lin[1]; Zhi Tang[2]; Ke An[1]; Peter Liaw[2]; [1]Oak Ridge National Laboratory; [2]The University of Tennessee

**11:00 AM Invited**
**Assessing High-entropy Alloys for High Temperature Structural Application Possibilities**: *Young-Won Kim*[1]; [1]Gamteck LLC

**11:20 AM Invited**
**A New Centimeter–diameter LaCePrCoAl High Entropy Bulk Metallic Glass**: Yonghua Meng[1]; Jie Pan[1]; *Yi Li*[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

## High Entropy Alloys VI – Thermal and Other 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Monday AM
March 12, 2018

Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Michael Gao, National Energy Technology Laboratory; Tirumalai Srivatsan, The University of Akron

**8:00 AM Invited**
**High-throughput Screening of High Entropy Alloys Using a Computational Thermodynamic Approach**: *Chuan Zhang*[1]; Fan Zhang[1]; Rui Feng[2]; Michael C Gao[3]; Peter K Liaw[2]; [1]Computherm; [2]University of Tennessee; [3]National Energy Technology Laboratory

**8:20 AM Invited**
**Structures, Thermodynamics and Elasticity of High-entropy Alloys**: *Michael Gao*[1]; Mike Widom[2]; Jeffrey Hawk[1]; [1]National Energy Technology Lab; [2]Carnegie Mellon University

**8:40 AM Invited**
**Phase-stability and Short-range Ordering Behavior of FeMnCoCrAlx High-entropy Alloy: Theory and Experiment**: *Prashant Singh*[1]; Marshal Amalraj[2]; Aayush Sharma[3]; Ganesh Balasubramanian[3]; K. G. Pradeep[2]; Duane Johnson[1]; [1]Ames Laboratory; [2]RWTH Aachen University; [3]Iowa State University

**9:00 AM Invited**
**Development of Refractory High Entropy Alloys Fabricated by Powder Metallurgy Process**: Byungchul Kang[1]; Junho Lee[1]; Ho Jin Ryu[1]; *Soon Hyung Hong*[1]; [1]Korea Advanced Institute of Science and Technology (KAIST)

**9:20 AM**
**Compositional Effects on Thermal and Electrical Transport Properties in Ni-containing Single-phase Concentrated Solid Solution Alloys**: *Ke Jin*[1]; Brian Sales[1]; George Stocks[1]; Ke An[1]; Wallace Porter[1]; Yanwen Zhang[1]; William Weber[2]; Hongbin Bei[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

**9:40 AM Break**

**10:00 AM Invited**
**True Thermodynamic Equilibrium in High Entropy Alloys: Al0.3CoCrFeNi as a Case Study**: Bharat Gwalani[1]; Vishal Soni[1]; Deep Choudhuri[1]; Stephane Gorsse[2]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]CNRS, ICMCB

**10:20 AM Invited**
**Thermal Stability and Coarsening of Coherent Particles in a Precipitation-hardened $(NiCoFeCr)_{94}Ti_2Al_4$ High-entropy Alloy**: *Y.Y. Zhao*[1]; T.G. Nieh[1]; [1]University of Tennessee, Knoxville

**10:40 AM**
**Phase Stability and Transformation in a Light-weight High-entropy Alloy**: *Rui Feng*[1]; Michael C. Gao[2]; Chuan Zhang[3]; Wei Guo[4]; Jonathan D. Poplawsky[4]; Fan Zhang[3]; Jeffrey A. Hawk[2]; Joerg C. Neuefeind[4]; Yang Ren[5]; Peter K. Liaw[1]; [1]The University of Tennessee, Knoxville; [2]National Energy Technology Laboratory; [3]CompuTherm LLC; [4]Oak Ridge National Laboratory; [5]Argonne National Laboratory

**11:20 AM**
**Phase Stability and Microstructural Optimization in Al0.5NbTa0.8Ti1.5V0.2Zr High Entropy Alloy**: *Vishal Soni*[1]; Bharat Gwalani[1]; Oleg Senkov[2]; Adam Pilchak[3]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]UES Inc.; [3]Air Force Research Laboratory

**11:00 AM**
**Beneficial Effect of Non-equiatomic Compositions for Long-term Stability at 500°C of CoCrFeMnNi Family of HEA**: *Anna Fraczkiewicz*[1]; Michal Mroz[1]; [1]MINES St-Etienne

## Hume-Rothery Award Symposium: Computational Thermodynamics and Its Implications to Kinetics, Properties, and Materials Design – Keynote Session

*Sponsored by:* TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Michael Gao, National Energy Technology Lab; Chelsey Hargather, New Mexico Institute of Mining and Technology; Richard Hennig, University of Florida; James Saal, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

Monday AM
March 12, 2018
Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* James Saal, QuesTek Innovations, LLC; Dongwon Shin, Oak Ridge National Laboratory

**8:00 AM Introductory Comments:** Suveen Mathaudhu and Co-Organizers

**8:05 AM Invited**
**Computational Thermodynamics of Materials and Its Applications**: *Zi-Kui Liu*[1]; [1]The Pennsylvania State University

**8:40 AM Invited**
**Diffusion Kinetics in Complex Systems – the Materials-genome Approach**: *John Agren*[1]; [1]Royal Institute of Technology

**9:10 AM Invited**
**Materials Genomics: From CALPHAD to Flight**: *Greg Olson*[1]; [1]Northwestern University

**9:40 AM Break**

**9:55 AM Invited**
**Challenges to Predictive Kinetics in Complex Dislocation Energy Landscapes**: *David McDowell*[1]; [1]Georgia Institute of Technology

**10:25 AM Invited**
**Thermodynamics of Metal Hydroxide Vapors: Leveraging Theory and Experiment**: *Nathan Jacobson*[1]; Dwight Myers[2]; Charles Bauschlicher[3]; Quynhgiao Nguyen[1]; Elizabeth Opila[4]; [1]NASA Glenn Research Center; [2]East Central University; [3]NASA Ames Research Center; [4]Unversity of Virginia

**10:55 AM Invited**
**Automating First-principles Calculations of Point Defects**: Danny Broberg[1]; *Mark Asta*[1]; [1]University of California, Berkeley

## Integrative Materials Design III: Performance and Sustainability – New Directions, Process Optimization, and Computational Modeling in Additive Manufacturing

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories; Corbett Battaile, Sandia National Laboratories; Anastasios Gavras, Riley Power

Monday AM
March 12, 2018
Room: 132A
Location: Phoenix Convention Center

*Session Chairs:* Diana Lados, Worcester Polytechnic Institute; Robert Warren, Worcester Polytechnic Institute

**8:00 AM Invited**
**Adoption of Additive Manufacturing for Growth and Sustainment**: *David Abbott*[1]; [1]GE Aviation

**8:20 AM Invited**
**Material-aware Topology Optimization**: *Joshua Robbins*[1]; [1]Sandia National Laboratories

**8:40 AM Invited**
**From Mechanical Metamaterials to Simple Systems Made from Programmable Materials**: Matthew Berwind[1]; Hamideh Jafarpoorchekap[1]; *Chris Eberl*[2]; [1]University of Freiburg; [2]Fraunhofer IWM

**9:00 AM Invited**
**Integrating Design and Manufacturing in the Topology Optimization of High Performance Architected Materials and Components**: *James Guest*[1]; [1]Johns Hopkins University

**9:20 AM Break**

**9:35 AM Invited**
**Material Selection for Nuclear Engineering Designs a Challenge and Opportunity to Develop Graded Materials via Additive Manufacturing**: *Peter Hosemann*[1]; Ashley Recihardt[1]; Andrew Shapiro-Sharlotta[2]; John Paul Borgonia[2]; Peter Dillon[1]; Bryan McEnerney[2]; Massimiliano Fratoni[1]; Michael Ashby[3]; David Frazer[1]; Alan Bolind[1]; [1]University of California, Berkeley; [2]JPL; [3]University of Cambridge

**9:55 AM Invited**
**Data Science and Machine Learning Opportunities in Additive Manufacturing**: *Elizabeth Holm*[1]; Brian DeCost[1]; Anna Smith[1]; Andrew Kitahara[1]; [1]Carnegie Mellon University

**10:15 AM Invited**
**Integrated Materials Theory, Modeling, and Data Analytics for Metal Additive Manufacturing**: *Alex Plotkowski*[1]; Michael Kirka[1]; Vincent Paquit[1]; Sean Yoder[1]; Ryan Dehoff[1]; Suresh Babu[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee, Knoxville

**10:35 AM Invited**
**Development of Advanced Beam Scan Strategies in Electron Beam Powder Bed Additive Manufacturing**: *Michael Kirka*[1]; Vincent Paquit[1]; Alex Plotlowski[1]; Peeyush Nandwanna[1]; Sean Yoder[1]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory

**10:55 AM Invited**
**In-situ Inspection of Laser-based Directed Energy Deposition Processes Using Laser Ultrasonics**: *Marissa Brennan*[1]; Todd Palmer[1]; Maxwell Wiedmann[2]; Marvin Klein[2]; [1]Penn State University; [2]Intelligent Optical Systems

**11:15 AM Invited**
**Science-based Qualification for Repair of Stainless Steel Components through Additive Manufacturing**: *John Carpenter*[1]; Donald Brown[1]; Bjorn Clausen[1]; Jason Cooley[1]; Cameron Knapp[1]; [1]Los Alamos National Laboratory

## Magnesium Technology 2018 – Keynote Session

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Monday AM
March 12, 2018

Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory - PNNL

**8:00 AM Introductory Comments**

**8:10 AM Keynote**
**Mg Alloys: Challenges and Achievements in Controlling Performance, and Future Application Perspectives**: *Karl Kainer*[1]; [1]MagIC—Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht

**8:55 AM Keynote**
**Solute/Stacking Fault Energies in Mg and Implications for Ductility**: Binglun Yin[1]; Zhaoxuan Wu[1]; *William Curtin*[1]; [1]École Polytechnique Fédérale de Lausanne

**9:40 AM Break**

**10:00 AM Keynote**
**Recent Developments in Magnesium Alloy Corrosion Research**: *Nick Birbilis*[1]; [1]Monash University

**10:45 AM Keynote**
**Towards Active Corrosion Protection of Mg Alloys Using Corrosion Inhibition Approaches**: *Mikhail Zheludkevich*[1]; S.V. Lamaka[1]; D. Hoeche[1]; C. Blawert[1]; [1]MagIC—Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Fuels I

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Monday AM
March 12, 2018

Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory

**8:00 AM**
**The Elastic Constants of γ-phase U – 8 wt% Mo between 25-650°C via Resonant Ultrasound Spectroscopy**: *Matthew Steiner*[1]; Elena Garlea[2]; Sean Agnew[3]; [1]University of Cincinnati; [2]Y-12 National Security Complex; [3]University of Virginia

**8:20 AM**
**Phase Transformation Kinetics in Rolled U-10 wt. % Mo Foil: Effect of Post-rolling Heat Treatment and Prior γ-UMo Grain Size**: *Saumyadeep Jana*[1]; Nicole Overman[1]; Tamas Varga[1]; Curt Lavender[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

**8:40 AM**
**Effect of C and Si Impurities in U10Mo Alloy: Discovery of New Quaternary Si-rich Phase and its Influence on Transformation Kinetics**: *Arun Devaraj*[1]; Libor Kovarik[1]; Saumyadeep Jana[1]; Curt Lavender[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

**9:00 AM**
**Microstructural Characterization of U-Mo Fuel Plates Irradiated in the Advanced Test Reactor: Recent Observations**: *Dennis Keiser*[1]; Jan-Fong Jue[1]; Brandon Miller[1]; Jian Gan[1]; Adam Robinson[1]; James Madden[1]; [1]Idaho National Laboratory

**9:20 AM**
**Isothermal Transformation Kinetics of γ phase from a+ γ' Phase Mixture in U-10wt.%Mo Alloys**: *Ryan Newell*[1]; Youngjoo Park[1]; Dennis Keiser[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]Idaho National Laboratory

**9:40 AM Break**

**10:00 AM**
**3D Characterization of High Fluence Irradiated UZr and UMo Fuels**: *Maria Okuniewski*[1]; Jonova Thomas[1]; Sri Tapaswi Nori[1]; Alejandro Figueroa[1]; Peter Kenesei[2]; Hemant Sharma[2]; Jon Almer[2]; [1]Purdue University, Materials Engineering; [2]Argonne National Laboratory

**10:20 AM**
**Investigation of Tin as a Fuel Additive to Control FCCI**: *Michael Benson*[1]; James King[1]; Robert Mariani[1]; [1]Idaho National Laboratory

**10:40 AM**
**Characterization of U-Zr-RE Metallic Fuel Fabricated by Injection Casting**: *Jeong-Yong Park*[1]; Seoung-Woo Kuk[1]; Ki-Hwan Kim[1]; Young-Mo Ko[1]; Sung-Chan Park[1]; Jong-Hwan Kim[1]; [1]Korea Atomic Energy Research Institute

**11:00 AM**
**Development of an Alternative Manufacturing Process for U3Si2 Fuel by a Novel Additive Manufacturing Process**: *Isabella van Rooyen*[1]; Clemente Parga[1]; Jhonathan Rosales[1]; Ed Lahoda[2]; [1]Idaho National Laboratory; [2]Westinghouse Electric Company

## Materials for Energy Conversion and Storage – Energy Storage I

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Monday AM
March 12, 2018

Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Guihua Yu, University of Texas at Austin; Tianbiao Liu, Utah State University

**8:00 AM Invited**
**Effect of Structural Water on Electrochemical Energy Storage of Protons and Magnesium Ions in Layered Tungsten Oxides**: *Veronica Augustyn*[1]; [1]North Carolina State University

**8:25 AM Invited**
**High-frequency Supercapacitors: Design, Electrodes, and Applications**: *Zhaoyang Fan*[1]; [1]Texas Tech University

**8:50 AM Invited**
**Materials Design for Energy Storage and Beyond: From Nanostructures to Functional Polymers**: *Zheng Chen*[1]; [1]University of California, San Diego

**9:15 AM Invited**
**Nanostructured Garnet Electrolytes: Synthesis, Structure, and Electrochemical Properties**: Ting Yang[1]; Jon Weller[1]; *Candace Chan*[1]; [1]Arizona State University

**9:40 AM Break**

**9:55 AM Invited**
**Reversible Aluminum Intercalation in Transition Metal Sulfides**: Linxiao Geng[1]; *Juchen Guo*[1]; [1]University of California, Riverside

**10:20 AM Invited**
**Winning at Electricity through Electrowinning**: *Daniel Steingart*[1]; [1]Princeton University

**10:45 AM Invited**
**Redox Flow Batteries: From Inorganic to Organic Redox Active Materials**: *Tianbiao Liu*[1]; [1]Utah State University

**11:10 AM Invited**
**Atomistic Modeling Based Study of Glassy Electrolytes for All Solid State Sodium Ion Batteries**: Aniruddha Dive[1]; Clarence King[1]; Steve Martin[2]; *Soumik Banerjee*[1]; Scott Beckman[1]; [1]Washington State University; [2]Iowa State University

## Materials Processing Fundamentals – Steelmaking - Processing

*Sponsored by:* TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
*Program Organizers:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology; Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

Monday AM
March 12, 2018
Room: 228A
Location: Phoenix Convention Center

*Session Chairs:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology

**9:00 AM**
**The Effect of a Sulfur Addition on the Formation and Behavior of CaS Inclusions in a Steel Melt during a Secondary Refining Process without a Ca-treatment**: *Takanori Yoshioka*[1]; Yuta Shimamura[2]; Andrey Karasev[1]; Yasuhide Ohba[2]; Pär Jönsson[1]; [1]KTH Royal Institute of Technology; [2]Sanyo Special Steel Co., Ltd.

**9:20 AM**
**The Use of the PDA Method to Obtain Process Feedback on Inclusion Characteristics Based on Production Samples**: *Par Jonsson*[1]; Andrey Karasev[1]; Jesper Janis[2]; Fredrik Larsson[2]; Diana Janis[3]; [1]KTH Royal Institute of Technology; [2]Outokumpu Stainless; [3]Sandvik Materials Technology

**9:40 AM Break**

**10:00 AM**
**Measurement of Thermodynamic Property of Mg in Molten Iron Using Transpiration Method**: *Tomoyuki Maegawa*[1]; Shun Ueda[1]; Atsushi Okayama[2]; Kazuki Morita[1]; [1]The University of Tokyo; [2]Nippon Steel & Sumitomo Metal Corporation, Ltd.

**10:20 AM**
**Effect of $BO_{1.5}$ Addition on the Thermal Conductivity and the Structure of the CaO-$BO_{1.5}$-$AlO_{1.5}$ Mold Flux System**: *Sakae Shirayama*[1]; Youngjae Kim[2]; Kazuki Morita[1]; [1]The University of Tokyo; [2]Korea Institute of Geoscience and Mineral Resources (KIGAM)

**10:40 AM**
**Dephosphorization Kinetics between Bloated Metal Droplet and Slag Containing FeO: The Influence of CO Bubbles on the Mass Transfer of Phosphorus in the Metal**: *Kezhuan Gu*[1]; Kenneth Coley[1]; Neslihan Dogan[1]; [1]McMaster University

**11:00 AM**
**Mapping and Evaluating All the Ways to Remove Copper from Steel**: *Katie Daehn*[1]; André Cabrera Serrenho[1]; Julian Allwood[1]; [1]University of Cambridge

**11:20 AM**
**Desulfurization of Copper-iron Reduced from Copper Slag**: *Baojing Zhang*[1]; Zhang Ting'an[1]; Liping Niu[1]; Zhihe Dou[1]; Zhiqiang Li[1]; Dongliang Zhang[1]; [1]Northeastern University

## Mechanical Behavior at the Nanoscale IV – Nanoporous Materials and Thin Films

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Monday AM
March 12, 2018
Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Garritt Tucker, Colorado School of Mines; Qian Yu, Zhejiang University

**8:00 AM Invited**
**Small-scale Plasticity and Elasticity: Experimental Signatures of the Role of Capillarity**: *Jörg Weissmüller*[1]; [1]Hamburg University of Technology and Hemlholtz-Zentrum Geesthacht

**8:30 AM**
**The Mechanical Response of Core-shell Metallic Nanofoams**: Chang Kim[1]; Hassan Zbib[1]; Nia Hightower[1]; Hang Ke[2]; Ioannis Mastorakos[2]; *David Bahr*[1]; [1]Purdue University; [2]Clarkson University

**8:50 AM**
**Numerical Modeling and Experiments of the Mechanical Behavior of Porous Solids for Large Relative Densities**: *Timothy Ibru*[1]; Maximilian Busche[2]; Vadim Roytershteyn[2]; Garritt Tucker[3]; Antonia Antoniou[1]; [1]Georgia Institute of Technology; [2]Other; [3]Colorado School of Mines

**9:10 AM**
**Role of Nano-voids in Shock Wave Mitigation of Single Crystal Cu**: Anupam Neogi[1]; *Nilanjan Mitra*[1]; [1]Indian Institute of Technology Kharagpur

**9:30 AM Break**

**9:50 AM**
**Origins of Residual Stress during Thin Film Growth**: *Eric Chason*[1]; [1]Brown University

**10:10 AM**
**Size Effects in Nanoscale Wear of Silicon Carbide and Silicon**: *Chaiyapat Tangpatjaroen*[1]; David Grierson[1]; Steve Shannon[2]; Joseph Jakes[3]; Izabela Szlufarska[1]; [1]University of Wisconsin - Madison; [2]North Carolina State University; [3]Forest Biopolymers Science and Engineering

**10:30 AM**
**Thickness-dependent Tensile Behavior of Thermally-grown $SiO_2$**: *Na-Hyang Kim*[1]; Han-geul Kim[1]; Ju-Young Kim[1]; [1]UNIST

**10:50 AM**
**Initiation of Fatigue Damage in Ultra-fine Grained Thin Films**: *Oleksandr Glushko*[1]; [1]Erich Schmid Institute

## Mechanical Characteristics and Application Properties of Metals and Non-metals for Technology: An EPD Symposium in Honor of Donato Firrao – Compounds and Alloys

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Jiann-Yang Hwang, Michigan Technological University; Bowen Li, Michigan Technological University; Pasquale Russo Spena, Free University of Bozen-Bolzano

Monday AM
March 12, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Paolo Matteis, Politecnico di Torino (Turin Technical University); Shadia Ikhmayies, Al Isra University

**8:00 AM Invited**
**Sensitization Effects on Environmentally-assisted Cracking in 5XXX Al Alloys**: *John Lewandowski*[1]; [1]Case Western Reserve University

**8:40 AM**
**Welding Between Steels and Aluminum Alloys for Hybrid Car-body Applications**: *Paolo Matteis*[1]; Alessio Gullino[1]; Giorgio Scavino[1]; Francesco Rosalbino[1]; Graziano Ubertalli[1]; Cesare Puro[2]; Fabio D'Aiuto[2]; [1]Politecnico di Torino (Turin Technical University); [2]Centro Ricerche FIAT (FIAT Research Center)

**9:00 AM**
**Flow Behavior of High Strength Aluminum Alloy after Cold Rolling**: *G. Guven Yapici*[1]; K. Shojaei[1]; A. Hosseinzadeh[1]; [1]Ozyegin University

**9:20 AM**
**Production of $Cu_2O$ Powder Using Electrodeposition Method**: *Shadia Ikhmayies*[1]; [1]Al Isra University

## Metal-Matrix Composites Innovations, Advances and Applications: An SMD Symposium in Honor of William C. Harrigan, Jr. – Aluminum and Lightweight Metal Matrix Composites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys, LLC; William Harrigan, Gamma Technology, LLC

Monday AM
March 12, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* Troy Topping, California State University, Sacramento; Xiaodong Li, University of Virginia

**8:00 AM Keynote**
**Aluminum Matrix Composites 1970 to 2017**: *William Harrigan*[1]; [1]Gamma Technology, LLC

**8:40 AM Invited**
**Nanostructured Aluminum Alloys and their Composites via Cryomilling**: *Troy Topping*[1]; [1]California State University, Sacramento

**9:10 AM**
**Commercial-ready and Large-scale Manufacturing of Light-weight Aluminum Matrix Nanocomposites**: *Yuzheng Zhang*[1]; Bill Harrigan[1]; Al Sommer[1]; Marco Currelli[1]; Andy Parker[1]; Miguel Verduzco[1]; Mark Sommer[1]; [1]Gamma Alloys

**9:30 AM Break**

**9:50 AM Invited**
**Bio-inspired, Graphene/Metal-oxide Reinforced Metal-matrix Composites**: Yunya Zhang[1]; *Xiaodong Li*[1]; [1]University of Virginia

**10:20 AM**
**Bioinspired Al Composites Reinforced by In Situ Formed Al3Ni and Al3Ti**: Frederick Heim[1]; Yunya Zhang[1]; *Xiaodong Li*[1]; [1]University of Virginia

**10:40 AM Invited**
**Aluminium and Magnesium Based Metal Matrix Composites: Micro and Nano**: Nagaraj Chelliah[1]; *Mirle Surappa*[2]; [1]National Institute of Technology Warangal; [2]Indian Institute of Science

**11:10 AM**
**Development of an Electroless Plating Process for Multi-wall Carbon Nanotubes (MWCNTs) to Improve Their Dispersion and Wettability in Molten Aluminum**: *Mohammed Elsharkawi*[1]; Amal Esawi[1]; [1]Department of Mechanical Engineering, The American University in Cairo, New Cairo, Egypt

## Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Nanolaminates

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Meisha Shofner, Georgia Institute of Technology; Nikhilesh Chawla, Arizona State University

Monday AM
March 12, 2018
Room: 102C
Location: Phoenix Convention Center

*Session Chair:* Meisha Shofner, Georgia Institute of Technology

**8:00 AM Invited**
**Effects of Layer Thickness on the Mechanical Behavior of Oxidation-strengthened Zr/Nb Nanoscale Multilayers**: Jon Molina-Aldareguia[1]; *Miguel Monclús*[1]; Mauro Callisti[2]; Tomas Polcar[2]; Lingwei Yang[1]; Javier Llorca[1]; [1]IMDEA Materials Institute; [2]University of Southampton

**8:40 AM**
**Deformation Behavior of Novel Co-sputtered Nanolaminate Metal/Ceramic Composites**: *Somya Singh*[1]; C. Shashank Kaira[1]; Hrishikesh Bale[2]; J. Kevin Baldwin[3]; Nathan Mara[3]; Nikhilesh Chawla[1]; [1]Arizona State University; [2]Carl Zeiss X-ray Microscopy; [3]Los Alamos National laboratory

**9:00 AM**
**Size Effect in Ti-Fe-(Sn) Ultrafine Lamellar Eutectic Composites during Micro/-nano-indentation**: *Tapabrata Maity*[1]; Jürgen Eckert[1]; [1]Erich Schmid Institute of Materials Science, Montan University, Leoben

**9:20 AM Break**

**9:40 AM**
**The Influence of Laminar Bulk Metallic Glass/Crystalline Metal Interfaces on the Mechanical Properties of Roll Bonded Composites**: *Sina Shahrezaei*[1]; Irene Beyerlein[2]; Douglas Hofmann[3]; Suveen Mathaudhu[1]; [1]University of California, Riverside; [2]University of California, Santa Barbara; [3]California Institute of Technology

**10:00 AM**
**Mechanical Behavior of FCC Cu/FCC Co and FCC Cu/HCP Co Nanocomposite Films**: *Rohit Berlia*[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

**10:20 AM**
**Anisotropy of a High Strength Nanolayered Steel Revealed by In-situ Micro Mechanical Testing**: *Marlene Kapp*[1]; Anton Hohenwarter[2]; Bo Yang[1]; Reinhard Pippan[1]; [1]Erich Schmid Institute of Materials Science; [2]University of Leoben

**10:40 AM**
**Multilayered Metallic Glass-crystalline Nanocomposites with Improved Wear Resistance**: Mohammad Abboud[1]; Zafer Artvin[1]; Amir Motallebzadeh[2]; *Sezer Özerinç*[1]; [1]Middle East Technical University; [2]Koç University

## Non-equilibrium Features of Grain Boundaries – Thermal Stability of Non-equilibrium Grain Boundaries

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Liang Qi, University of Michigan; Yue Fan, University of Michigan, Ann Arbor; Josh Kacher, Georgia Tech; Elizabeth Holm, Carnegie Mellon University; Irene Beyerlein, University of California, Santa Barbara; Shigenobu Ogata, Osaka University

Monday AM
March 12, 2018
Room: 125A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:00 AM Invited**
**The Role of Non-equilibrium Grain Boundary Structure in Radiation Tolerance and Thermal Stability**: *Mitra Taheri*[1]; Pete Baldo[2]; Christopher Barr[1]; Jacob Gruber[1]; Marquis Kirk[2]; Garritt Tucker[1]; Yongqiang Wang[3]; Gregory Vetterick[1]; [1]Drexel University; [2]Argonne National Laboratory; [3]Los Alamos National Laboratory

**8:30 AM**
**Grain Boundary Spinodals: Faceting Instability and the Role of Junction Energetics**: *Fadi Abdeljawad*[1]; Douglas Medlin[1]; Jonathan Zimmerman[1]; Khalid Hattar[1]; Stephen Foiles[1]; [1]Sandia National Laboratories

**8:50 AM**
**Unraveling Anti-thermal Behavior in a Variety of FCC Metals**: *Ian Chesser*[1]; Yutong Bi[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

**9:10 AM**
**Topological Defects in 2D Orientation-field Models for Grain Growth**: *Bálint Korbuly*[1]; Mathis Plapp[2]; Hervé Henry[2]; James Warren[3]; László Gránásy[1]; Tamás Pusztai[1]; [1]Wigner Research Centre for Physics; [2]École Polytechnique; [3]National Institute of Standards and Technology

**9:30 AM Break**

**9:50 AM Invited**
**Grain Boundaries Driven Far from Equilibrium by a Continuous Influx of Vacancies**: *Michael Demkowicz*[1]; [1]Texas A&M University

**10:20 AM**
**The Effect of Segregation and Precipitation on Grain Growth in Eu-doped $MgAl_2O_4$-spinel**: *Amanda Krause*[1]; Animesh Kundu[1]; Carlen Donahue[1]; Richard Vinci[1]; Martin Harmer[1]; [1]Lehigh University

**10:40 AM**
**Reconciling Grain Growth and Shear-coupled GB Migration**: *Spencer Thomas*[1]; Kongtao Chen[1]; Jian Han[1]; Prashant Purohit[1]; David Srolovitz[1]; [1]University of Pennsylvania

**11:00 AM**
**Exploring the Interactions between Grain Boundaries and Precipitates in a Ni-Al Using Molecular Dynamics**: Rachel Morrison[1]; Saryu Fensin[2]; *Jennifer Carter*[1]; [1]Case Western Reserve University; [2]Los Alamos National Laboratory

## Phase Transformation Across Multiscale Material Interfaces – Structural Materials

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Soumya Nag, GE Global Research; Sudarsanam Babu, The University of Tennessee, Knoxville; Gregory Thompson, University of Alabama; Mohsen Asle Zaeem, Missouri University of Science and Technology; Niyanth Sridharan, Oak Ridge National Laboratory

Monday AM
March 12, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chairs:* Siddharth Pathak, University of Nevada; Monica Kapoor, NETL; Talukder Alam, UNT

**8:00 AM Invited**
**Roles of Transformation Interface for Controlling Microstructure and Properties of High Strength Steels**: *Tadashi Furuhara*[1]; Yongjie Zhang[1]; Goro Miyamoto[1]; [1]Tohoku University

**8:30 AM Invited**
**Atomic-scale Characterization of Solute Segregation in Interfaces in Light Alloys**: *Jian-Feng Nie*[1]; [1]Monash University

**9:00 AM Invited**
**Structure and Properties of BCC Mg Synthesized Using Interface Strain Engineering**: *Siddhartha Pathak*[1]; Manish Jain[1]; Marko Knezevic[2]; Nenad Velisavljevic[3]; Nathan Mara[3]; Irene Beyerlein[4]; [1]University of Nevada, Reno; [2]University of New Hampshire; [3]Los Alamos National Laboratory; [4]University of California, Santa Barbara

**9:30 AM Break**

**9:50 AM Invited**
**Exploiting Non-conventional Pathways for Transformations and Microstructural Evolution in Metastable Beta Ti Alloys**: Yufeng Zheng[1]; Rongpei Shi[1]; Yunzhi Wang[1]; Rajarshi Banerjee[2]; *Hamish Fraser*[1]; [1]The Ohio State University; [2]University of North Texas

**10:20 AM**
**Microstructural Characterization of Linear Friction Welded Interfaces in Ti-based Alloys**: *Talukder Alam*[1]; Srinivas Aditya Mantri[1]; Thomas Broderick[2]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]GE Aviation

## Phase Transformations and Microstructural Evolution – Phase Transformations in Steels I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Monday AM
March 12, 2018
Room: 129A
Location: Phoenix Convention Center

*Session Chair:* Paul Gibbs, LANL

**8:00 AM**
**Precipitation of CFCC-TmC Carbides during Tempering at 450°C of a Medium Mn Steel: A Thermodynamic and Kinetic Study Followed by Atom Probe Tomography**: *Alisson Kwiatkowski da Silva*[1]; Gerhard Inden[1]; Dirk Ponge[1]; Baptiste Gault[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

**8:20 AM**
**Impact of Solute Segregation on Phase Transformations during Cooling and Austempering of Direct-strip-cast High Strength Bainitic Steels**: *Jerome Cornu*[1]; Thomas Dorin[1]; Peter Hodgson[1]; [1]Deakin University Australia

**8:40 AM**
**In-situ Analysis of Redistribution of Carbon and Nitrogen during Tempering of Supermartensitic Stainless Steel**: *Frank Niessen*[1]; Matteo Villa[1]; Frédéric Danoix[2]; John Hald[1]; Marcel Somers[1]; [1]Technical University of Denmark; [2]Université de Rouen

**9:00 AM**
**Analysis of Misorientation Relationship between Austenite Parent and Twins**: *Alex Brust*[1]; Stephen Niezgoda[1]; Eric Payton[2]; [1]The Ohio State University; [2]AFRL

**9:20 AM**
**Modeling the Effect of Stress State on Martensitic Phase Transformation in Austenitic Steel**: *Milovan Zecevic*[1]; Manas Upadhyay[2]; Efthymios Polatidis[2]; Helena Van Swygenhoven[2]; Marko Knezecvic[1]; [1]University of New Hampshire; [2]Paul Scherrer Institute

**9:40 AM Break**

**10:00 AM**
**Role of Interaction between Particles on Particle Stability**: *Kunok Chang*[1]; Junhyun Kwon[1]; Gyeong-Geun Lee[1]; [1]Korea Atomic Energy Research Institute

**10:20 AM**
**Austenite Carbon Measurement in Q&P Steels: Atom Probe Tomography vs. High Energy XRay Diffraction**: *Frederic Danoix*[1]; Sébastien Allain[2]; Guillaume Geandier[2]; Jean Christophe Hell[3]; Michel Soler[3]; Samy Aoued[4]; Mohamed Goune[4]; [1]CNRS - Université de Rouen; [2]IJL Nancy; [3]Arcelormittal Maizières Research SA; [4]ICMCB Bordeaux

**10:40 AM**
**Study on the Effect of V Microalloying on Earthquake Resisting High-strength Reinforcing Bar Steels**: *Junho Chung*[1]; Taehyung Kim[1]; Jusang Lee[1]; [1]Hyundai-steel / Steel Research Center

## Rare Metal Extraction & Processing – Rare Earth Element I

*Sponsored by:* TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
*Program Organizers:* Hojong Kim, The Pennsylvania State University; Bradford Wesstrom, Freeport-McMoRan Copper & Gold; Shafiq Alam, University of Saskatchewan; Takanari Ouchi, The University of Tokyo; Gisele Azimi, University of Toronto; Neale Neelameggham, Ind LLC; Shijie Wang, Rio Tinto Kennecott Utah Copper; Xiaofei Guan, ShanghaiTech University

Monday AM
March 12, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* Takanari Ouchi, The University of Tokyo; Gisele Azimi, University of Toronto

**8:00 AM Keynote**
**The Demonstration Pilot Plant Results for the Search Minerals Direction Extraction Process for Rare Earth Recovery**: *David Dreisinger*[1]; Greg Andrews[2]; Niels Verbaan[3]; Mike Johnson[3]; Ernesto Bourricaudy[3]; [1]University of British Columbia; [2]Search Minerals Inc.; [3]SGS Minerals

**8:35 AM**
**Selective Oxidation of Cerium in Rare Earth Solutions, a Comparison of Four Oxidants**: *James McNeice*[1]; Ahmad Ghahreman[1]; [1]Queen's Universuty

**9:00 AM**
**A Study on the Effect of Crystal Habit Modifiers on the Co-precipitation of REE with Gypsum**: *Farzaneh Sadri*[1]; Zhi Yang[1]; Ahmad Ghahreman[1]; [1]Queen's University

**9:25 AM Break**

**9:45 AM**
**Beneficiation and Leaching Study of Norra Karr Eudialyte Mineral**: *Victoria Vaccarezza*[1]; Corby Anderson[1]; [1]Colorado School of Mines

**10:10 AM**
**Review on the Processes for the Recovery of Rare Earth Metals (REMs) from Secondary Resources**: *Archana Kumari*[1]; Manis Kumar Jha[1]; D. D. Pathak[2]; [1]CSIR-National Metallurgical Laboratory; [2]IIT-Indian School of Mines

**10:35 AM**
**Selective Reduction and Separation of Europium from Mixed Rare-earth Oxides Recovered from Waste Fluorescent Lamp Phosphors**: *Mark Strauss*[1]; Brajendra Mishra[1]; Gerard Martins[2]; [1]WPI; [2]Colorado School of Mines

**11:00 AM**
**The Recovery of Cesium Salts from the Taron Deposit**: *David Dreisinger*[1]; Mohammad Mokmeli[1]; Bill McWilliam[2]; [1]University of British Columbia; [2]Cascadero Copper Corporation

## Recent Developments in Biological, Structural and Functional Thin Films & Coatings – Biomedical & Polymeric Applications

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Adele Carradò, Université de Strasbourg IPCMS; Nancy Michael, University of Texas at Arlington; Ramana Chintalapalle, University of Texas - El Paso; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University; Gerald Ferblantier, Strasbourg University - ICube Laboratory

Monday AM
March 12, 2018
Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Adele Carradò, Université de Strasbourg IPCMS; Vikas Tomar, Purdue University

**8:00 AM Keynote**
**Nanoscale Heterogeneous Surfaces: How to Control Nanofriction in Biosensors?**: *Karine Mougin*[1]; [1]Institut de Science des Matériaux de Mulhouse

**8:40 AM**
**Examining the Long-term Adhesion Strength of Chitosan Bonded to Titanium when Exposed to the Atmosphere or Simulated Body Fluid**: *Holly Martin*[1]; Lauren DeBow[1]; Veronica Marcella[1]; Patrick McWhorter[1]; Snjezana Balaz[1]; [1]Youngstown State University

**9:00 AM**
**Hybrid PMMA-coating for Biomedical Applications**: Sebastien Kriegel[1]; Melania Reggente[1]; Patrick Masson[1]; Genevieve Pourroy[1]; Daniele Passeri[2]; Marco Rossi[2]; Heinz Palkowski[3]; *Adele Carradò*[1]; [1]Université de Strasbourg IPCMS CNRS; [2]Sapienza University of Rome; [3]TU Clausthal, IMET

**9:20 AM**
**Shaping of Ti/PMMA Sandwich Sheets for Biomedical Applications**: Melania Reggente[1]; Mohamed Harhash[1]; Patrick Masson[2]; Genevieve Pourroy[2]; Adele Carradò[2]; *Heinz Palkowski*[1]; [1]TU Clausthal; [2]Université de Strasbourg IPCMS

**9:40 AM Break**

**10:00 AM Invited**
**Coupling Electronic Structure to Atomistic Simulations for a Multi-scale Modelling of Realistic Materials**: *Christine Goyhenex*[1]; [1]IPCMS

**10:30 AM Invited**
**Functionalization of Thermoset Composite Surfaces for Welding Technologies**: *Gerhard Ziegmann*[1]; Widyanto Surjoseputro[1]; [1]Clausthal University of Technology

**11:00 AM**
**Coating of 3D Printed Microlattices via Magnetron Sputtering**: *Alina Garcia Taormina*[1]; Andrea M. Hodge[1]; [1]University of Southern California

**11:20 AM**
**3-D Printed Magnetic Polymers**: *Asahel Banobre*[1]; Sita Rajyalaxmi Marthi[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

## Refractory Metals 2018 – Refractory Metal Silicides and Composites

*Sponsored by:* TMS Structural Materials Division, TMS: Refractory Metals Committee
*Program Organizers:* Eric Taleff, The University of Texas at Austin; Martin Heilmaier, Karlsruhe Institute of Technology (KIT); Kevin Jaansalu, Royal Military College of Canada

Monday AM
March 12, 2018
Room: 124A
Location: Phoenix Convention Center

*Session Chairs:* Eric Taleff, The University of Texas at Austin; Kevin Jaansalu, Royal Military College of Canada

**8:00 AM**
**Oxidation and Creep Behavior of Mo-Si-Ti Alloys**: *Martin Heilmaier*[1]; Daniel Schliephake[1]; Alexander Kauffmann[1]; Camelia Gombola[1]; Xiangna Cong[1]; [1]Karlsruhe Institute of Technology (KIT)

**8:20 AM**
**Oxidation Resistance of W Substituted Mo-Si-B**: *Gaoyuan Ouyang*[1]; Pratik Ray[2]; Tuba Karahan[3]; Matthew Kramer[2]; Mufit Akinc[1]; [1]Iowa State University; [2]Ames Laboratory; [3]Gedik University

**8:40 AM**
**Tensile Response of Binary Mo-Si Solid Solution Alloys**: *Xiang Yu*[1]; Sharvan Kumar[1]; [1]Brown University

**9:00 AM**
**Mechanical Behavior of a Three-phase Mo-Si-B Alloy Produced by Reaction Synthesis**: *Xiang Yu*[1]; Sharvan Kumar[1]; [1]Brown University

**9:20 AM**
**Microstructure and Mechanical Properties of Cr-Si High-temperature Alloys**: *Yuki Aono*[1]; Toshihiro Omori[1]; Ryosuke Kainuma[1]; [1]Tohoku University

**9:40 AM Break**

**10:00 AM Invited**
**Assessments of the Mo-Si-X-(B) System for High Temperature Structural Application Potentials**: *Young-Won Kim*[1]; Sang-Lan Kim[1]; [1]Gamteck LLC

**10:30 AM**
**On the Design and Selection of Nb In Situ Composites**: *Panayiotis Tsakiropoulos*[1]; [1]University of Sheffield

**10:50 AM**
**Alloying Behaviour and Properties of Tetragonal Nb5Si3**: *Panayiotis Tsakiropoulos*[1]; [1]University of Sheffield

**11:10 AM**
**Synthesis of MoC-graphite Composite by High-energy Ball Milling**: *Madelyn Madrigal Camacho*[1]; Guillermo Aguilar[1]; Suveen Mathaudhu[1]; [1]University of California, Riverside

## Surface Interactions in Materials – Chemical and Physical Interactions

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Carlos Schvezov, Institute of Materials of Misiones; Sandip Harimkar, Oklahoma State University; Rajeev Gupta, The University of Akron

Monday AM
March 12, 2018
Room: 101A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:00 AM Introductory Comments**

**8:05 AM**
**Role of Amorphous Alumina Interlayer over Deposition of ZrN Thin Film on U-Mo Fuel for Nuclear Application**: *Zhi-Gang Mei*[1]; Sumit Bhattacharya[2]; Abdellatif Yacout[1]; [1]Argonne National Laboratory; [2]Northwestern University

**8:25 AM**
**Ultra-fast Boronizing of Low Carbon Steel Compared with Aluminum, and Zinc Coating**: *Bakr Rabeeh*[1]; [1]German University in Cairo, GUC

**8:45 AM**
**Silane Compound Modification on $SiO_2$ for the Efficient Copper Diffusion Barrier Layer and Adhesion Enhancer of Electroless Copper Plating**: *Wei-Yen Wang*[1]; Tzu-Chien Wei[1]; [1]National Tsing-Hua University

**9:05 AM**
**Analysis of the Interaction of Serum Albumin with Titanium Dioxide Films Using the Extended Derjaguin-Landau-Verwey-Overbeek (X-DLVO) Theory**: Jonathan M. Schuster[1]; *Carlos Schvezov*[1]; Mario Rosenberger[1]; [1]IMAM (UNaM-Conicet)

**9:25 AM Break**

**9:40 AM**
**Pt Decorating Effect on CNT Surface towards Adsorption of SF6 Decomposed Components**: *Hao Cui*[1]; Xiaoxing Zhang[2]; Dachang Chen[2]; Jiani Fang[2]; Ju Tang[2]; [1]Chongqing University; [2]Wuhan University

**10:00 AM**
**Surface Energies, Work Functions and Wulff Shapes of Elemental Crystals from High-throughput Density Functional Theory**: *Richard Tran*[1]; Zihan Xu[1]; Balachandran Radhakrishnan[1]; Wenhao Sun[2]; Donald Winston[3]; Joseph Montoya[3]; Kristin Persson[3]; Shyue Ong[1]; [1]Department of Nanoengineering, University of California, San Diego; [2]Department of Materials Science and Engineering, Massachusetts Institute of Technology; [3]Energy Technologies Area, Lawrence Berkeley National Laboratory

**10:20 AM**
**Formation Behavior of Fe2Al5 Phase in Fe/Molten Al Diffusion Couples**: *Takumi Yamada*[1]; Kwangsik Han[1]; Kaneharu Okuda[2]; Ryosuke Kainuma[1]; [1]Tohoku university; [2]JFE Steel Corporation

**10:40 AM**
**Influence of the Electrolyte on the Surface Free Energy of Anodic $TiO_2$ Coatings**: Maria Vera[1]; Jonathan Schuster[1]; Mario Rosenberger[1]; *Carlos Schvezov*[1]; [1]IMAM (CONICET-UNaM)

## Ultrafine-grained Materials X – Pioneers of ECAE/ ECAP and HPT

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Monday AM
March 12, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Suveen Mathaudhu, University of California, Riverside; S. Lee Semiatin, U.S. Air Force Research Laboratory

**8:00 AM Introductory Comments:** Lee Semiatin and Suveen Mathaudhu

**8:05 AM**
**The Early Days of Pioneering Ultrafine Grained Metals and Alloys**: *Terry Lowe*[1]; [1]Colorado School of Mines

**8:35 AM Keynote**
**Severe Plastic Deformation Technologies**: *Vladimir Segal*[1]; [1]EPM

**9:05 AM Keynote**
**Recent Developments in the Processing of Ultrafine-grained Materials Using ECAP and HPT**: *Terence Langdon*[1]; [1]University of Southern California

**9:35 AM Break**

**9:55 AM Keynote**
**Historical Aspects and Future Prospects of NanoSPD Materials Research for Superior Properties**: *Ruslan Valiev*[1]; [1]Ufa State Aviation Technical University

**10:25 AM Keynote**
**Struggles in the Land of Opportunity: 25 Years of ECAE Adventures with Tools, Teams, Tough Times, and Triumphs**: *Karl Hartwig*[1]; Robert Barber[2]; [1]Texas A&M University; [2]Shear Form, Inc.

**10:55 AM Keynote**
**Incremental Feeding for Upsizing Severely Deformed Areas under High Pressure**: Kosei Sumikawa[1]; Yoichi Takizawa[2]; Manabu Yumoto[2]; Yoshiharu Otagiri[2]; *Zenji Horita*[1]; [1]Kyushu University; [2]Nagano Forging Co., Ltd

## All-Conference Plenary – Defining the Future of Materials and Manufacturing Innovation

*Program Organizer:* David DeYoung, Alcoa

Monday PM
March 12, 2018
Room: 301
Location: Phoenix Convention Center

*Session Chair:* David DeYoung, Alcoa

**12:00 PM Introductory Comments**

**12:05 PM Plenary**
**Materials and ICME as an Enabler for Sustainable Energy and Interplanetary Travel**: *Charles Kuehmann*[1]; [1]SpaceX/Tesla

**12:45 PM Concluding Comments**

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – 2D Nanoelectronics

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

Monday PM
March 12, 2018
Room: 101B
Location: Phoenix Convention Center

*Session Chairs:* Dong Lin, Kansas State University; Lanxia Cheng, University of Texas at Dallas

**2:30 PM Invited**
**Van der Waals (vdW) Heterojunctions for Low Power Electronics**: *Tania Roy*[1]; [1]University of Central Florida

**3:00 PM**
**High Performance Graphene Field Effect Transistor Fabrication Using Alternative Metal Etching Route**: *Arul Vigneswar Ravichandran*[1]; Lanxia Cheng[1]; Antonio Lucero[1]; Jaebeom Lee[1]; Joy Lee[1]; Jiyoung Kim[1]; Archana Venugopal[2]; Arup Polley[2]; Luigi Colombo[2]; [1]The University of Texas at Dallas; [2]Texas Instruments

**3:20 PM Invited**
**Making Electronic Structure Theory Predictive and Practical: Computational Modeling of Defects and Interfaces in Nano-materials**: *Avik Ghosh*[1]; Yaohua Tan[1]; [1]University of Virginia

**3:50 PM Break**

**4:10 PM Invited**
**In-plane and Cross-plane Thermoelectric Transport in 2D Materials**: *Mona Zebarjadi*[1]; [1]University of Virginia

**4:40 PM Invited**
**Low-temperature Growth of Two-dimensional Layered Materials Toward Phase-engineered Hybrid Films**: *Yu-Lun Chueh*[1]; [1]National Tsing Hua University

**5:00 PM Invited**
**Novel In-situ Electrical Characterization of the Dielectric Deposition Process on 2D Transition Metal Dichalcogenides**: *Antonio Lucero*[1]; Jaebeom Lee[1]; Lanxia Cheng[1]; Jiyoung Kim[1]; [1]University of Texas at Dallas

## 9th International Symposium on High Temperature Metallurgical Processing – Simulation and Modeling of High Temperature Metallurgical Process

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Monday PM
March 12, 2018
Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Mark Kennedy, Proval Partners SA; Baoqiang Xu, Kunming University of Science and Technology

**2:30 PM Introductory Comments**

**2:35 PM**
**Modeling of Reactive Melt Infiltration Used in the Fabrication of Si-Co/C Composites**: *Khurram Iqbal*[1]; [1]University of Karachi

**2:55 PM**
**Neural Prediction Model for Extraction of Germanium from Zinc Oxide Dust by Microwave Alkaline Roasting-water Leaching**: *Wankun Wang*[1]; Fuchun Wang[1]; [1]Guizhou Institute of Technology

**3:15 PM**
**Numerical and Experimental Study of Carbothermal Reduction of Silica in a Laboratory Thermal Plasma Reactor**: *Yudong Li*[1]; Ramana Reddy[1]; [1]University of Alabama

**3:35 PM**
**Simulation of Velocity Field of Molten Steel in Electric Arc Furnace Steelmaking**: *Zeshi Yang*[1]; Lingzhi Yang[1]; Yufeng Guo[1]; Guangsheng Wei[2]; Ting Cheng[1]; [1]Central South University; [2]University of Science and Technology Beijing

**3:55 PM Break**

**4:15 PM**
**Thermodynamic Modelling of Magnesium-Oxide, Calcium-Oxide and Strontium-Oxide Reduction Systems via Pidgeon Process**: *Mehmet Bugdayci*[1]; Kerem Tasyurek[1]; Onuralp Yucel[1]; [1]Istanbul Technical University

**4:35 PM**
**Metallization and Carburization Kinetics in DR Shaft Furnaces. The Metcarb Model**: *Edelink Falero*[1]; Jose D'Abreu[1]; Mauricio Otaviano[2]; [1]Pontificia Universidade Católica do Rio de Janeiro; [2]Samarco

**4:55 PM**
**CFD Modeling of Flow and Chemical Reactions in a Submerged Lance Copper Smelting Furnace**: Guangwu Tang[1]; Kaile Tang[1]; Armin Silaen[1]; Hongjie Yan[2]; Zhixiang Cui[3]; Zhi Wang[3]; Haibin Wang[3]; Ping Zhou[2]; *Chenn Zhou*[1]; [1]Purdue University Northwest; [2]Central South University; [3]Dongying Fangyuan Nonferrous Metals

**5:15 PM**
**Numerical Simulation of Ultrasound-Induced Cavitation Bubbling in a Calcium Ferrite Melt**: *Ruirui Wei*[1]; [1]Chongqing University

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Neutron Irradiation and Ion vs Neutron

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

Monday PM
March 12, 2018
Room: 102A
Location: Phoenix Convention Center

*Session Chairs:* John Jackson, Idaho National Laboratory; Janelle Wharry, Purdue University

**2:30 PM**
**High-dose Neutron Irradiation Induced Evolution of Mechanical Properties and Microstructure of Ferritic/Martensitic Steels**: *Kun Wang*[1]; Kevin Field[1]; Chad Parish[1]; Josina Geringer[1]; Yutai Katoh[1]; [1]Oak Ridge National Laboratory, UT-Battelle

**2:55 PM**
**Microstructural Investigations of Temperature Effects in Reactor Pressure Vessel Steels from the UCSB ATR-2 Irradiation**: *Nathan Almirall*[1]; Peter Wells[1]; Takuya Yamamoto[1]; David Gragg[1]; Kirk Fields[1]; G. R. Odette[1]; Randy Nanstad[2]; Keith Wilford[3]; Tim Williams[3]; Lynne Ecker[4]; David Sprouster[4]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory; [3]Rolls Royce; [4]Brookhaven National Laboratory

**3:20 PM**
**Using Ion Irradiation to Extend the Damage Level of Neutron Irradiated 304L Stainless Steel**: *Samara Levine*[1]; Zhijie Jiao[1]; Gary Was[1]; [1]University of Michigan

**3:45 PM**
**Neutron Re-irradiation and Neutron-ion Irradiation Bootstrapping Approaches to Study Very High Dpa and He Effects in Nuclear Materials**: *Takuya Yamamoto*[1]; Danny Edwards[2]; Richard Kurtz[2]; G. Robert Odette[1]; [1]University of California, Santa Barbara; [2]Pacific Northwest National Laboratory

**4:10 PM Break**

**4:30 PM Invited**
**Temperature Shift for Emulating Solute Cluster Evolution Using Higher Dose Rate Irradiation**: *Matthew Swenson*[1]; Janelle Wharry[2]; [1]University of Idaho; [2]Purdue University

**4:55 PM**
**Microstructure Evolution in BOR60 Irradiated T91**: *Zhijie Jiao*[1]; Stephen Taller[1]; Kevin Field[2]; Gary Was[1]; [1]University of Michigan; [2]ORNL

**5:20 PM**
**The Structure and Composition of Mn-Ni-Si Precipitates in an Irradiated High-Ni RPV Steel Following Aging at 425°C for 57 Weeks**: *Soupitak Pal*[1]; Peter Wells[1]; G Odette[1]; [1]University of California, Santa Barbara

## Accident Tolerant Fuels for Light Water Reactor – Modeling & Simulation

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

Monday PM
March 12, 2018
Room: 104A
Location: Phoenix Convention Center

*Session Chairs:* Brian Wirth, University of Tennessee; Yongfeng Zhang, Idaho National Laboratory

**2:30 PM Invited**
**Atomic to Mesoscale Research and Development for U3Si2 Accident Tolerant Fuel**: *Yongfeng Zhang*[1]; David Andersson[2]; [1]Idaho National Laboratory; [2]Los Alamos National Laboratory

**3:00 PM**
**Calculating Swelling in U3Si2 Nuclear Fuel Using a Multi-scale Computational Approach**: *Larry Aagesen*[1]; Karim Ahmed[1]; Benjamin Beeler[1]; David Andersson[2]; Daniel Schwen[1]; Yongfeng Zhang[1]; [1]Idaho National Laboratory; [2]Los Alamos National Laboratory

**3:20 PM**
**Rate Theory Simulation of Fission Gas Behavior in $U_3Si_2$ under LWR Conditions**: *Yinbin Miao*[1]; Kyle Gamble[2]; David Andersson[3]; Bei Ye[1]; Mei Zhi-Gang[1]; Gerard Hofman[1]; Abdellatif Yacout[1]; [1]Argonne National Laboratory; [2]Idaho National Laboratory; [3]Los Alamos National Laboratory

**3:40 PM**
**Gaseous Fission Product Swelling Behavior in $U_3Si_2$ Fuel**: *Kyle Gamble*[1]; Tommaso Barani[2]; Davide Pizzocri[2]; Giovanni Pastore[1]; Yinbin Miao[3]; Jason Hales[1]; [1]Idaho National Laboratory; [2]Politecnico di Milano; [3]Argonne National Laboratory

**4:00 PM Break**

**4:20 PM**
**UB2 as Advanced Nuclear Fuel: Modelling In-reactor Evolution of Thermo-physical and Chemical Properties**: *Patrick Burr*[1]; Simon Middleburgh[2]; [1]UNSW Sydney; [2]Westinghouse Electric

**4:40 PM**
**Improvements to TRISO Based FCM Fuel Performance Modeling**: *Daniel Schappel*[1]; Kurt Terrani[2]; Brian Wirth[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

**5:00 PM**
**Thermal Conductivity of Uranium**: Fei Lin[1]; Eric Tea[1]; Manuel Umanzor[1]; Shuxiang Zhou[2]; Ryan Jacobs[2]; Dane Morgan[2]; *Celine Hin*[1]; [1]Virginia Tech; [2]University of Wisconsin-Madison

**5:20 PM**
**Thermal Conductivity of SiC Fiber-reinforced Composites for Accident Tolerant Fuel by the Finite Element Method**: Leo Carrilho[1]; Artem Aleshin[1]; *Peng Xu*[1]; [1]Westinghouse Electric Company

**5:40 PM**
**PCI Analysis of Coated Zircaloy Cladding under LWR Steady State and Startup Operations**: *Nathan Capps*[1]; Wenfeng Liu[1]; [1]Structrual Integraty

## Additive Manufacturing – Joint Keynote Session

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* David Bourell, University of Texas-Austin; John Carpenter, Los Alamos National Laboratory

Monday PM
March 12, 2018
Room: 231ABC
Location: Phoenix Convention Center

*Session Chair:* David Bourell, University of Texas-Austin

**2:30 PM Introductory Comments**

**2:35 PM Keynote**
**Additive Manufacturing Technologies, Applications, Markets and Opportunities**: *Ming Leu*[1]; [1]Missouri University of Science and Technology

**3:05 PM Keynote**
**Enabling Next Generation Additive Manufacturing: The 3D Deposition of Functional Materials for the Additive Manufacturing of Smart Devices - A UK Perspective**: *Richard Hague*[1]; [1]University of Nottingham

**3:35 PM Keynote**
**Metal Additive Manufacturing in Australasia and China**: *Ma Qian*[1]; [1]Centre for Additive Manufacturing, Royal Melbourne Institute of Technology

**4:05 PM Break**

**4:25 PM Keynote**
**Additive Manufacturing of Metals: Current Status and Future Outlook**: *Todd Palmer*[1]; [1]Pennsylvania State University

**4:55 PM Keynote**
**Polymers in Additive Manufacturing: Survey and Opportunities**: *David Rosen*[1]; [1]Georgia Institute of Technology

**5:25 PM Keynote**
**Additive Manufacturing of Ceramics**: *Suman Das*[1]; [1]Georgia Institute of Technology

**5:55 PM Concluding Comments**

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Local Strain & Misorientation II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Monday PM
March 12, 2018
Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* Veronica Livescu, Los Alamos National Laboratory; Cem Tasan, Massachusetts Institute of Technology

**2:30 PM Invited**
**Applications of Low(er) Voltage EBSD to Heavily Deformed Material Systems**: *Farangis Ram*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**3:00 PM**
**Investigating Surface Deformation and 3D Microstructure in Polycrystalline Metals**: *Zhe Chen*[1]; Samantha Daly[1]; [1]University of California, Santa Barbara

**3:20 PM**
**Characterization of Dislocation/GB Interactions via HR-EBSD and Machine Learning**: *Landon Hansen*[1]; Jay Carroll[2]; David Fullwood[1]; Eric Homer[1]; Robert Wagoner[3]; [1]Brigham Young University; [2]Sandia National Laboratories; [3]Ohio State University

**3:40 PM**
**Using Correlative HRDIC, EBSD and ECCI to Answer Questions of Microstructure-specific Plasticity**: *Allan Harte*[1]; Alistair Garner[1]; Alberto Orozco-Caballero[1]; João Quinta da Fonseca[1]; Michael Preuss[1]; [1]The University of Manchester

**4:00 PM Break**

**4:20 PM**
**Using EBSD to Quantify Defect Structures in Deformed IF Steels**: *David Field*[1]; [1]Washington State University

**4:40 PM**
**In-situ Characterization of Plasticity Mechanisms along Complex Stain Paths**: *Emeric Plancher*[1]; Ke Qu[1]; Nicolaas Vonk[1]; Cem Tasan[1]; [1]MIT

**5:00 PM**
**Plastic Deformation Behaviour of a γ-TiAl Alloy in High Cycle Fatigue at up to 700 °C by Nano-scale Digital Image Correlation of a Remodelled Au Speckle Pattern**: *Thomas Edwards*[1]; Fabio Di Gioacchino[1]; Nigel Martin[2]; Mark Dixon[2]; William Clegg[1]; [1]University of Cambridge; [2]Rolls-Royce plc

**5:20 PM**
**Microstructural Evolution of 316L Stainless Steel Subjected to Shear**: *Veronica Livescu*[1]; Curt Bronkhorst[1]; Benjamin Morrow[1]; Cheng Liu[1]; Hashem Mourad[1]; Bineh Ndefru[1]; Carl Trujillo[1]; [1]Los Alamos National Laboratory

**5:40 PM**
**Correlating Structural Heterogeneity to Deformation of Metallic Glasses Using Fluctuation Microscopy and Mesoscale Simulation**: Soohyun Im[1]; Pengyang Zhao[1]; Ju Li[2]; Yunzhi Wang[1]; *Jinwoo Hwang*[1]; [1]The Ohio State University; [2]Massachusetts Institute of Technology

## Advanced High-strength Steels – Quenching and Partitioning (Q&P) Steels

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Monday PM
March 12, 2018
Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Amy Clarke, Colorado School of Mines; Sébastien Allain, Université de Lorraine

**2:30 PM Invited**
**About the Origins and the Effects of Internal Stresses in Retained Austenite of Q&P Steels**: *Sébastien Allain*[1]; Steve Gaudez[1]; Guillaume Geandier[1]; Jean-Christophe Hell[2]; Samy Aoued[3]; Mohamed Gouné[3]; Michel Soler[2]; Frédéric Danoix[4]; Angéline Poulon[3]; [1]Institut Jean Lamour UMR 7198; [2]Arcelormittal Maizières Research SA; [3]Institut de Chimie de la Matière Condensée de Bordeaux UPR 9048; [4]Groupe de Physique des Matériaux UMR 6634

**2:55 PM**
**Retained Austenite Stability in Quenching and Partitioning Steels Investigating by Means of In Situ High Energy X-ray Diffraction during Tensile Testing**: *Jean Christophe Hell*[1]; Michel Soler[1]; Sébastien Allain[2]; Guillaume Geandier[2]; Mohamed Gouné[3]; Frédéric Danoix[4]; Samy Aoued[3]; [1]ArcelorMittal Global R&D; [2]Institut Jean Lamour; [3]ICMCB Bordeaux; [4]GPM Rouen

**3:15 PM**
**A Modified Quenching and Partitioning Process of Medium Mn Steel**: *Ran Ding*[1]; Jie Su[2]; [1]Tsinghua University; [2]Central Iron & Steel Research Institute

**3:35 PM**
**On the Selection of Optimal Quenching Temperature in Quenching and Partitioning (Q&P) Steels**: *Li Liu*[1]; Mingxin Huang[1]; [1]The University of Hong Kong

**3:55 PM Break**

**4:15 PM Invited**
**Interface Migration and Carbon Partitioning during Quenching and Partitioning: Role of Interfacial Mn Partitioning**: *Hao Chen*[1]; Zongbiao Dai[1]; Chi Zhang[1]; Zhigang Yang[1]; [1]Tsinghua University

**4:40 PM**
**Microstructure Evolution in a Model Fe-0.3%C-1.5%Si-2.5%Mn Steel during Quenching and Partitioning Treatments: In-situ Investigation by High Energy X-ray Diffraction and Modeling**: *Samy Aoued*[1]; Angéline Poulon-Quintin[1]; Frédéric Danoix[2]; Sébastien Allain[3]; Steve Gaudez[3]; Guillaume Geandier[3]; Jean-Christophe Hell[4]; Michel Soler[4]; Mohamed Gouné[1]; [1]CNRS, University Bordeaux, ICMCB; [2]Normandie Univ, UNIROUEN, INSA Rouen, CNRS, Groupe de Physique des Matériaux; [3]Institut Jean Lamour, CNRS - Université de Lorraine, Parc de Saurupt; [4]Automotive Products, ArcelorMittal Maizières Research

**5:00 PM**
**Austenite-martensite Interface Migration during Partitioning Treatment in a Quenching & Partitioning Steel**: *Zhuangming Li Zhuangming Li*[1]; Richard Thiessen[2]; Stefan Zaefferer[1]; Dierk Raabe[1]; [1]Max-Planck-Institut fuer Eisenforschung; [2]ThyssenKrupp AG

**5:20 PM**
**The Super High Strength of Aluminium-added Medium Manganese Steel after the Quenching and Tempering-associated Partitioning Process**: *Juhua Liang*[1]; Zhengzhi Zhao[1]; Jiangtao Liang[1]; Di Tang[1]; [1]USTB

**5:40 PM**
**Deformation Behaviour and Finite Element Method Modelling of TWinning Induced Plasticity (TWIP) Steel**: Ching-Tun Peng[1]; *Huijun Li*[2]; [1]Jiangsu University; [2]University of Wollongong

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Advances in Permanent Magnet Alloys

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Monday PM
March 12, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* Jun Cui, Iowa State University

**2:30 PM Introductory Comments**

**2:35 PM Invited**
**Nd-Fe-B Permanent Magnets with Ultimate Hard Magnetic Properties**: *Kazuhiro Hono*[1]; Taisuke Sasaki[1]; Hossein Sepehri-Amin[1]; Tadakatsu Ohkubo[1]; [1]National Institute for Materials Science

**3:05 PM**
**Role of Ga on the Microstructure and Coercivity in Nd-rich Ga-doped Nd-Fe-B Sintered Magnets**: *Taisuke Sasaki*[1]; Yukio Takada[2]; Takashi Sato[2]; Tadakatsu Ohkubo[1]; Akira Kato[3]; Yuji Kaneko[2]; Kazuhiro Hono[1]; [1]National Institute for Materials Science; [2]Toyota Central R&D Labs., Inc.; [3]Toyota Motor Corp.

**3:25 PM**
**Advances in Solid State Texture Development in Powder Processed Alnico Magnets**: *Aaron Kassen*[1]; Emma White[2]; Wei Tang[2]; Liangfa Hu[2]; Matthew Kramer[2]; Iver Anderson[2]; [1]Iowa State University; [2]Ames Laboratory

**3:45 PM Invited**
**Toward Production of Bulk Exchange-spring Magnets**: *Scott McCall*[1]; Alex Baker[1]; Sarah Baker[1]; Matthew Worthington[1]; Jonathon Lee[1]; Christine Orme[1]; Joshua Kuntz[1]; [1]Lawrence Livermore National Laboratory

**4:15 PM Break**

**4:30 PM Invited**
**Microstructure and Coercivity in Alnico Permanent Magnets**: *M. Kramer*[1]; Liqin Ke[1]; Ralph Skomski[2]; Lin Zhou[1]; Duane Johnson[1]; Qingfeng Xing[1]; Wei Tang[1]; Iver Anderson[1]; [1]Iowa State University; [2]University of Nebraska

**5:00 PM Invited**
**Microstructural Effects of Thermomagnetic Processing in Nd2Fe14B-based Permanent Magnet Materials**: *Michael Kesler*[1]; B. Jensen[2]; Lin Zhou[2]; Olena Palasyuk[2]; Kewei Sun[2]; Kevin Dennis[2]; Ben Conner[1]; William Carter[1]; Orlando Rios[1]; Matthew Kramer[2]; Cajetan Nlebedim[2]; Michael McGuire[1]; [1]Oak Ridge National Laboratory; [2]The Ames Laboratory

**5:20 PM**
**Nitrogenation of $Nd_{1-x}Zr_xFe_{10}Si_2$ with the ThMn12-type Structure as a Candidate Alloy for Permanent Magnets**: *Andrés Martín-Cid*[1]; David Mérida[2]; Margarit Gjoka[3]; Daniel Salazar[1]; Jose Manuel Barandiaran[2]; Dimitris Niarchos[3]; George Hadjipanayis[4]; [1]BCMaterials; [2]University of the Basque Country (UPV/EHU); [3]NCSR Demokritos; [4]University of Delaware

**5:40 PM**
**Quantifying Contributions of Praseodymium and Dysprosium to Hard Magnetic Properties of Nd-Fe-B Magnets**: *Cajetan Nlebedim*[1]; Kinjal Gandha[1]; Wei Tang[1]; Matthew Kramer[1]; [1]Ames Laboratory, US Department of Energy

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Quality and Reliability of Advanced Microelectronic Packaging I

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Monday PM
March 12, 2018
Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* Chih Chen, National Chiao Tung University; Luhua Xu, Apple

**2:30 PM**
**In Situ Studies of Whisker Nucleation Induced by Thermal Strain**: Nupur Jain[1]; Andrew Hitt[1]; Justin Vasquez[1]; *Eric Chason*[1]; [1]Brown University

**2:50 PM**
**IMCs Growth Mechanism in Tricrystal Sn3.0Ag0.5Cu Solder Joints under Current Stressing**: *Fu Guo*[1]; Jing Han[1]; Yishu Wang[1]; Yu Tian[1]; [1]Beijing University of Technology

**3:10 PM**
**Electromigration Behavior in SABI333 Solder Joints**: *Jing Han*[1]; Yishu Wang[1]; Peng Li[1]; Fu Guo[1]; [1]Beijing University of Technology

**3:30 PM**
**The Role of Inhomogeneous Properties on Tin Solder Electromigration Performance**: *Zachary Morgan*[1]; Yongmei Jin[1]; Vahid Attari[2]; Raymundo Arróyave[2]; [1]Michigan Technological University; [2]Texas A&M University

**3:50 PM**
**Characterization of Electromigration Damage in Sn-Cu Solder Joints Using Electron Backscatter Diffraction and 3D X-ray Microtomography**: *Marion Branch Kelly*[1]; C. Shashank Kaira[1]; Antony Kirubanandham[1]; Tyler Stannard[1]; Jason Williams[1]; Aravindha Antoniswamy[2]; Ravi Mahajan[2]; Nikhilesh Chawla[1]; [1]Arizona State University; [2]Intel

**4:10 PM Break**

**4:30 PM**
**Growth of Intermetallic Compound in Co/Sn3.5Ag/Co and Co/Sn3.5Ag/Cu Structure under Thermomigration**: *Yuan-Ruei Hsu*[1]; Gong-Lin Hong[1]; Shan-Yu Mao[1]; Wei-Jun Liu[1]; Fan-Yi Ouyang[1]; [1]National Tsing Hua University

**4:50 PM**
**Investigation of Processes Leading to Whisker Growth in Tin Thin Films with Advanced Multi-physics Simulations**: *Aritra Chakraborty*[1]; Philip Eisenlohr[1]; Pratheek Shanthraj[2]; [1]Michigan State University; [2]Max-Planck-Institut für Eisenforschung GmbH

**5:10 PM**
**Role of Surface Layer on Whisker Mitigation in Tin Doped with Indium**: *Sherin Bhassyvasantha*[1]; Bhaskar Majumdar[1]; Indranath Dutta[2]; [1]New Mexico Tech; [2]Washington State University

**5:30 PM**
**Effect of Copper Wire Diameter on the Variation in Shear Mode and Shear Strength**: *Patrick McCluskey*[1]; Subramani Manoharan[1]; Christian Runyon[2]; Stevan Hunter[3]; [1]University of Maryland; [2]Virginia Tech; [3]ON Semconductor

## Alloys and Compounds for Thermoelectric and Solar Cell Applications VI – Session II

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Soon-Jik Hong, Kongju National University and Institute for Rare Metals; Philippe Jund, Université Montpellier 2; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science (NIMS) ; Hsin-jay Wu, National Sun Yat-sen University; Tiejun Zhu, Zhejiang University

Monday PM
March 12, 2018

Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Franck Gascoin, Ensicaen University of Caen; Lan Li, Boise State University

**2:30 PM Invited**
**Effect of the Processing Method on the Thermoelectric Properties of Mg2(Si,Sn,Ge) Materials**: *Theodora Kyratsi*[1]; [1]University of Cyprus

**2:50 PM Invited**
**Novel Synthesis and Optimization of Half-Heusler Materials for Thermoelectric Applications**: Brian Jaques[1]; *Samuel Pedersen*[1]; Joseph Croteau[1]; Addrianna Lupercio[1]; Robert Bellomy[1]; Nick Kempf[2]; Matthew Lawson[1]; Lan Li[1]; Yanliang Zhang[2]; Darryl Butt[3]; [1]Boise State University; [2]Notre Dame; [3]University of Utah

**3:10 PM Invited**
**Thermoelectric Performance Enhancement via Modifying Band Structure**: *Wenjie Xie*[1]; [1]University of Stuttgart

**3:30 PM Invited**
**Atomic and Electronic Structures of 2D Semiconductors**: *Kyeongjae Cho*[1]; [1]UT Dallas

**3:50 PM**
**Hierarchical Control of Microstructure in Fe-Si-Ge Based Thermoelectric Alloys to Control Thermal Boundary Conductance**: *Wade Jensen*[1]; [1]University of Virginia

**4:10 PM Break**

**4:30 PM Invited**
**Controlling Stoichiometry, Defects, and Interfaces in Epitaxial Heusler Compounds: a Multifunctional Thermoelectrics Platform**: *Jason Kawasaki*[1]; [1]University of Wisconsin Madison

**4:50 PM Invited**
**Low Thermal Conductivity and Stacking Faults in Layered Selenides: Ba4Cu8Se13 and InGeTe3**: *Franck Gascoin*[1]; [1]CRISMAT Laboratory

**5:10 PM Invited**
**Thermoelectric Properties of Porphyrins**: *Lawrence Cook*[1]; Winnie Wong-Ng[2]; Greg Brewer[1]; Lan Li[3]; [1]The Catholic University of America; [2]National Institute of Standards and Technology; [3]Boise State University

## Alumina & Bauxite – Digestion and Precipitation

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Linus Perander, Outotec

Monday PM
March 12, 2018

Room: 221A
Location: Phoenix Convention Center

*Session Chair:* Alessio Scarsella, Outotec GmbH

**2:30 PM Introductory Comments**

**2:35 PM**
**Roasting Pretreatment- low Temperature Digestion Method for Comprehensive Utilization of High-sulfur Bauxite**: Dong Lu[1]; *Guozhi Lyu*[1]; Zhang Ting'an[1]; Weiguang Zhang[1]; Dong Xie[1]; Yanxiu Wang[1]; Long Wang[1]; [1]Northeastern University

**3:00 PM**
**Industrial Experience of New Sinter Hydro-chemical Processing Process at BAZ-SUAL**: Andrey Panov[1]; *Maksim Pechenkin*[1]; Sergey Ordon[1]; Oleg Milshin[2]; Aleksandr Fedyaev[3]; [1]RUSAL Engineering & Technology Centre; [2]RUSAL Global Management B.V.; [3]RUSAL-VAMI LLC

**3:25 PM**
**Effect of Sintering Conditions on the Stability of ß-2CaO·SiO$_2$ in High Sodium Carbonate Solution**: Dongdong Ma[1]; *Bo Wang*[1]; [1]Hebei University of Science and Technology

**3:50 PM**
**Research on Impurity Removal of Low Grade Bauxite**: Zhuang Li[1]; *Yijun Cao*[1]; Guihong Han[1]; Guixia Fan[1]; [1]Zhengzhou University

**4:15 PM Break**

**4:30 PM**
**Study on the Structure and Generation Mechanism of Intermediate (6AlO-OH) in Decomposition Process of Sodium Aluminate Solutions**: *Wei Liu*[1]; Zhoulan Yin[1]; Yaling Huang[1]; Zhiying Ding[1]; [1]Central South University

**4:55 PM**
**The Properties of Superfine ATH Precipitated by Carbonation Method**: *Andrey Panov*[1]; Aleksandr Senyuta[1]; Aleksandr Damaskin[1]; [1]RUSAL Engineering & Technology Centre

## Aluminum Alloys, Processing and Characterization – Characterizations and Applications of High Strength Aluminum Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Monday PM
March 12, 2018
Room: 221B
Location: Phoenix Convention Center

*Session Chair:* Randall Bowers, Secat, Inc.

**2:30 PM Invited**
**Aluminum for Aerospace Application: History, Current Challenges, and Path Forward**: *Zhengdong (Steven) Long*[1]; [1]Kaiser Aluminum

**3:00 PM**
**Grain Boundary Precipitation and Fracture Behavior of Al-Cu-Li Alloys**: *Ramasis Goswami*[1]; Noam Bernstein[1]; [1]Naval Research Laboratory

**3:20 PM**
**Characterization and Constitutive Modelling of AA 7075 for Hot Blank-cold Die Stamping**: *Gopinath Kannadasan*[1]; Fadi Abu-Farha[1]; Zeren Xu[1]; [1]Clemson University

**3:40 PM**
**Comparison of Texture and Surface Finish Evolution during Single Point Incremental Forming and Formability Testing of AA 7075**: *Maya Nath*[1]; Jaekwang Shin[1]; Ankush Bansal[1]; Mihaela Banu[1]; Alan Taub[1]; [1]University of Michigan

**4:00 PM Break**

**4:20 PM**
**Understanding the Co-precipitation Mechanisms of Al3(Sc, Zr) with Strengthening Phases in Extruded Al-Cu-Li Model Alloys**: *Katrin Mester*[1]; Baptiste Rouxel[1]; Timothy Langan[1]; Justin Lamb[1]; Matthew Barnett[1]; Thomas Dorin[1]; Kathleen Wood[2]; [1]Institute for Frontier Materials, Deakin University; [2]ANSTO

**4:40 PM**
**Microstructural Evolution after Single and Multi-pass Friction Stir Welding (FSW) of Wrought Mg-WE43 and Al-2024 Alloys**: *Michael Frank*[1]; Saurabh Nene[1]; Gaurav Argade[1]; Rajiv Mishra[1]; R.E. Brennan[2]; K. Cho[2]; [1]University of North Texas; [2]U.S. Army Research Laboratory

**5:00 PM**
**Determining a Retrogression Heat Treatment to Apply during Warm Forming of a High Strength AA7075 Sheet Material**: *Katherine Rader*[1]; Thomas Ivanoff[1]; Hyunwook Shin[1]; Jon Carter[2]; Louis Hector[2]; Eric Taleff[1]; [1]The University of Texas at Austin; [2]General Motors

**5:20 PM**
**Development of High-strength and High-electrical-conductivity Aluminum Alloys for Power Transmission Conductors**: *Francisco Flores*[1]; Nhon Vo[1]; David Seidman[2]; David Dunand[2]; [1]NanoAl; [2]Northwestern University

## Aluminum Reduction Technology – Cell Operations, Control & Improvements

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Monday PM
March 12, 2018
Room: 221C
Location: Phoenix Convention Center

*Session Chair:* Till Reek, TRIMET Aluminium SE

**2:30 PM Introductory Comments**

**2:35 PM**
**Maximizing Previous Pot Design to Have Higher Capacity**: Sahala Sijabat[1]; *Ivan Ermisyam*[1]; Indah Pandia[1]; Ivan Yudho[1]; [1]PT Inalum (Persero)

**3:00 PM**
**On the Use of Multivariate Statistical Methods to Detect, Diagnose and Mitigate Abnormal Events in Aluminium Smelters**: *Petre Manolescu*[1]; Carl Duchesne[1]; Jayson Tessier[2]; Gudrun Saevarsdottir[3]; [1]Laval University; [2]Alcoa Corporation, Smelting Center of Excellence; [3]Reykjavik University

**3:25 PM**
**Spike Detection Using Advanced Analytics and Data Analysis**: *Arthur Martel*[1]; [1]Rio Tinto

**3:50 PM**
**Speed, Agility and Simplicity (SAS) Recovery of Reduction Line-5 in Alba**: *Abdulla Ahmed*[1]; [1]Aluminium Bahrain (Alba)

**4:15 PM Break**

**4:30 PM**
**Partial Repair and Restart of a Damaged Aluminium Reduction Cell**: Abd El Zaher Abd El Star[1]; *Khalid Youssif*[1]; Mahmoud Salem[1]; [1]Aluminium Company of Egypt "EGYPTALUM"

**4:55 PM**
**Theory and Practice of High Temperature Gas Baking Technology for Alumninium Electrolysis Cells**: *Xudong Wang*[1]; Chengbo Wu[1]; Yingwu Li[1]; [1]Zhengzhou Jingwei Technology Industry Co., Ltd

**5:20 PM Concluding Comments**

## Bio-nano Interfaces and Engineering Applications Symposium – Bio-Nano Interfaces II

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

Monday PM
March 12, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:30 PM Invited**
**Use of Nanostructured Diamond in Medical Device Applications**: *Roger Narayan*[1]; [1]UNC/NCSU Joint Department of Biomedical Engineering

**3:00 PM**
**Surface Modification of Ti6Al4V to Confer Antibacterial Properties against** *Listeria Monocytogenes*: *Jesus Morales Espejo*[1]; Susana Díaz A.[1]; David Bahr[1]; Lia Stanciu[1]; [1]Purdue University

**3:20 PM Invited**
**Oligopeptides and Recombinamers at Surfaces and Interfaces to Address Oral Infections**: *Conrado Aparicio*[1]; [1]University of Minnesota

**3:50 PM**
**New Antimicrobial Peptides Generated through Genetic Algorithm Approach Using Chemical Property Based Cross-over**: *Kyle Boone*[1]; Kyle Camarda[1]; Paulette Spencer[1]; Candan Tamerler[1]; [1]University of Kansas

**4:05 PM Break**

**4:20 PM Invited**
**Connecting Biology and Electronics with Protons: From Ion Channels to Cells**: *Marco Rolandi*[1]; [1]University of California, Santa Cruz

**4:50 PM**
**Chemically Functionalised Graphene FET with Double Conductance Minima for the Label-free Sensing of Exosomes**: *Deana Kwong Hong Tsang*[1]; [1]Imperial College London

**5:05 PM Invited**
**Bioconjugated Nanoparticle Imaging Probes for Molecular Imaging with Computed Tomography**: *Ryan Roeder*[1]; Tyler Curtis[1]; Prakash Nallathamby[1]; Tyler Finamore[1]; Lisa Irimata[1]; Tracie McGinnity[1]; Lisa Cole[1]; Tracy Vargo-Gogola[2]; Karen Cowden Dahl[2]; [1]University of Notre Dame; [2]Indiana University School of Medicine

**5:35 PM**
**Biofilm Formation Behavior on Polymer Brush Surfaces by E.Coli and S. Epidermidis**: *Hideyuki Kanematsu*[1]; Takaya Sato[2]; Toshio Kamijo[2]; Saika Honma[2]; Atsuya Ohizumi[1]; Senshin Umeki[3]; Akiko Ogawa[1]; Nobumitsu Hirai[1]; Takeshi Kogo[1]; Daisuke Kuroda[1]; Hajime Ikegai[4]; Yoshimitsu Mizunoe[5]; [1]National Institute of Technology, Suzuka College; [2]National Institute of Technology, Tsuruoka College; [3]Tohoku University; [4]University of Human Arts and Science; [5]Jikei University

## Biological Materials Science – Synthesis of Bio-inspired Materials and Structures

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

Monday PM
March 12, 2018
Room: 225B
Location: Phoenix Convention Center

*Session Chairs:* Vinoy Thomas, University of Alabama, Birmingham; Steven Naleway, University of Utah

**2:30 PM Invited**
**Synergistic Structures from Magnetic Freeze Casting with Surface Magnetized Alumina Particles and Platelets**: Michael Frank; Sze Hei Siu[1]; Keyur Karandikar[1]; Chin-Hung Liu[1]; Steven Naleway[2]; Michael Porter[3]; Olivia Greave[1]; *Joanna McKittrick*[1]; [1]University of California, San Diego; [2]University of Utah; [3]Clemson University

**3:00 PM**
**Synthesis of PVA Scaffolds with Gradient Porous Structures by Freeze Casting**: *Ching-Chun Chiu*[1]; Haw-Kai Chang[1]; Hsin-Juei Wang[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

**3:20 PM**
**Freeze Casting of Surface-magnetized $TiO_2$ Using a Uniform Magnetic Field to Fabricate Materials Inspired by Bone**: *Isaac Nelson*[1]; Taylor Ogden[1]; Jake Abbott[1]; Steven Naleway[1]; [1]Department of Mechanical Engineering, University of Utah

**3:40 PM Invited**
**Development of Bamboo Based Bio-composites**: *Uday Vaidya*[1]; Vinoy Thomas[2]; [1]University of Knoxville; [2]University of Alabama at Birmingham

**4:10 PM Break**

**4:30 PM Invited**
**Bioinspired Structural and Functional Materials**: *Cordt Zollfrank*[1]; [1]Technische Universität München, Germany

**5:00 PM**
**Brick-and-mortar Alumina Containing a Nickel Compliant Phase Synthesized Using Spark Plasma Sintering**: *Amy Wat*[1]; Claudio Ferraro[2]; Xu Deng[3]; Antoni Tomsia[4]; Eduardo Saiz Gutierrez[2]; Robert Ritchie[1]; [1]University of California, Berkeley; [2]Imperial College London; [3]University of Electronic Science and Technology of China; [4]Lawrence Berkeley National Laboratory

**5:20 PM**
**Mechanics and Toughening Mechanisms of Nacre-inspired Composites**: *Sina Askarinejad*[1]; Nima Rahbar[1]; [1]Worcester Polytechnic Institute

**5:40 PM**
**Porous Bioinspired Materials through a Variety of Templating Techniques**: *Steven Naleway*[1]; Isaac Nelson[1]; Taylor Ogden[1]; [1]University of Utah

## Cast Shop Technology – HSE and Cast House Operation

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Mark Badowski, Hydro Aluminium

Monday PM
March 12, 2018
Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Jean-Francois Desmeules, Dynamic Concept

**2:30 PM Introductory Comments**

**2:35 PM**
**Root Cause Analysis Findings of a Force 3 Explosion**: *Alex Lowery*[1]; [1]WISE CHEM LLC

**3:00 PM**
**Condensation Warning System for Dry Material Storage**: *Gregory Blackstock*[1]; Jake Niedling[1]; [1]Arconic Inc.

**3:25 PM**
**ACS/Aluminum Crucible Skimmer**: *Bruno Maltais*[1]; Florent Gougerot[1]; [1]STAS Inc.

**3:50 PM**
**Drive-in Feeding of Crucibles for Casting Machine**: Jean-Francois Desmeules[1]; *Jean-Benoît Néron*[1]; [1]Dynamic Concept

**4:15 PM Break**

**4:30 PM**
**In-line Salt Fluxing Process with an FFD™**: Florent Gougerot[1]; Bruno Maltais[1]; *Etienne Tremblay*[1]; [1]STAS Inc.

**4:55 PM**
**The "Alcoa Filter System": A Cost Effective Solution for Enhanced CFF Performance**: *Robert Dumont*[1]; Jean-Francois Desmeules[2]; [1]Alcoa; [2]Dynamic Concept

**5:20 PM**
**Continuous Centrifugal Casting: A Revolutionary Process for Casting Aluminium Tubes**: *Luc Montgrain*[1]; Olivier Dion-Martin[2]; Jean-François Desmeules[2]; [1]AluMC3; [2]Dynamic-Concept

**5:45 PM**
**Development of a Prototype Unit for Continuous Centrifugal Casting of Aluminium Tubes**: *Olivier Dion-Martin*[1]; Jean-François Desmeules[1]; Luc Montgrain[2]; [1]Dynamic-Concept; [2]AluMC3

## CFD Modeling and Simulation in Materials Processing – Casting and Solidification II

*Sponsored by:* TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
*Program Organizers:* Laurentiu Nastac, The University of Alabama; Koulis Pericleous, University of Greenwich; Adrian Sabau, Oak Ridge National Laboratory; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, Colorado School of Mines

Monday PM
March 12, 2018
Room: 228B
Location: Phoenix Convention Center

*Session Chairs:* Gregory Poole, The University of South Alabama; Adrian Sabau, Oak Ridge National Laboratory

**2:30 PM**
**Microstructure Effects in High-pressure Die Casting Using an Innovative Two-phase Cooling System**: *Adrian Sabau*[1]; Emilian Popov[1]; Sam Kassoumeh[2]; [1]Oak Ridge National Laboratory; [2]Shiloh Industries

**2:50 PM**
**Numerical Modelling of Shrinkage and Hot Tears in High Pressure Die Casting of Al-Si-Cu Alloys**: *Mikko Karkkainen*[1]; Tao Liu[1]; Laurentiu Nastac[1]; Luke Brewer[1]; Vishweshwar Arvikar[2]; Ilya Levin[2]; [1]The University of Alabama; [2]Nemak Alabama

**3:10 PM Invited**
**Modeling the De-agglomeration and Dispersion of Particles in Metallic Alloy Melts during Ultrasonic Treatment**: *Koulis Pericleous*[1]; Georgi Djambazov[1]; Bruno Lebon[1]; Anton Manoylov[1]; [1]University of Greenwich

**3:40 PM**
**Numerical Modeling and Experimental Verification of Macrosegregation and CET Predictions in Large Steel Roll Ingots**: *Laurentiu Nastac*[1]; Konstantin Redkin[2]; Chris Hrizo[2]; Kevin Marsden[2]; [1]The University of Alabama; [2]Whemco

**4:00 PM Break**

**4:20 PM**
**Numerical Simulation of Electromagnetic and Heat Transfer Phenomena in Inductively Heated Risers**: Michael Cox[1]; *Gregory Poole*[1]; [1]University of South Alabama

**4:40 PM**
**Effect of Inlet Velocities on Mould Filling in Investment Casting**: *Victoria Thomas*[1]; Steve Leyland[2]; Robbie Bennett[2]; Stephen Brown[1]; Nicholas Lavery[1]; [1]Swansea University; [2]Jiangyin Uni-Pol Ltd.

**5:00 PM**
**Modeling of the Effect of Ultrasonic Frequency and Amplitude on Acoustic Streaming**: *Young Ki Lee*[1]; Jeong IL Youn[1]; Young Jig Kim[1]; Woo Chun Kim[2]; Tae Yup Lee[2]; [1]Sungkyunkwan University; [2]DR Axion Co., Ltd.

## Characterization of Minerals, Metals, and Materials – Characterization of Ceramics

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Monday PM
March 12, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chair:* Bowen Li, Michigan Technological University

**2:30 PM Introductory Comments**

**2:35 PM Invited**
**Natural Fiber Composites: Could They Compete with Kevlar™ in Personal Armor Systems against High Impact Ammunition?**: *Sergio Monteiro*[1]; [1]Military Institute of Engineering

**2:55 PM Invited**
**3D Chracterization of Ultra High Temperature Ceramics**: *Veeraraghavan Sundar*[1]; Derek King[1]; Satya Ganti[1]; Brian Turner[1]; [1]UES Inc.

**3:15 PM**
**The Study of Freeze-thaw Cycling of Water-saturated Porous Illite-based Ceramics**: *Michal Knapek*[1]; Tomas Hulan[2]; Patrik Dobron[1]; Stefan Csaki[1]; Frantisek Chmelik[1]; [1]Charles University; [2]Constantine the Philosopher University

**3:35 PM**
**Preparation and Characteristics of Steel Slag Ceramics from Converter Slag**: *Mingsheng He*[1]; Bowen Li[2]; Wangzhi Zhou[1]; Meng Liu[1]; Huasheng Chen[1]; Long Zou[1]; [1]Wuhan Iron & Steel Co., Ltd.; [2]Michigan Technological University

**3:55 PM Break**

**4:10 PM**
**In-situ XRD Investigation of Bauxite Dehydroxylation**: *Hong Peng*[1]; James Vaughan[1]; [1]The University of Queensland

**4:30 PM**
**New Higher Temperature Composites Based on Zirconium Cements**: *Ilyoukha Nickolai*[1]; [1]Academic Ceramic Center

**4:50 PM**
**The Investigation of Humics as a Binder for LiFePO4 Cathode Using in Lithium Ion Battery**: *Guihong Han*[1]; Shuzhen Yang[1]; Jiongtian Liu[1]; Yanfang Huang[1]; [1]Zhengzhou University

**5:10 PM**
**Evaluation of Brazilian Bentonite Modified by Acid Attack in Biofuel Production**: *Christiano Gianesi Bastos Andrade*[1]; Samuel Marcio Toffoli[1]; Francisco Rolando Valenzuela Diaz[1]; [1]University of São Paulo

**5:30 PM**
**Influence of Addition of $Na_2CO_3$ on the $Al_2O_3$-4wt% $Nb_2O_5$ Ceramic Compound**: *Jheison Santos*[1]; Luis Henrique Louro[1]; Lúcio Fábio Nascimento[1]; Paulo Roberto Jesus[1]; Rubens Marçal[1]; [1]Military Institute of Engineering

## Characterization of Minerals, Metals, and Materials – Microstructure and Performance of Materials

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Monday PM
March 12, 2018
Room: 124B
Location: Phoenix Convention Center

*Session Chair:* Paul Sanders, Michigan Technological University

**2:30 PM Introductory Comments**

**2:35 PM**
**Automated Microstructure Validation and Flaw Detection Using Computer Vision**: *Andrew Kitahara*[1]; Brian DeCost[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

**2:55 PM**
**Correlation between As-solidified Microstructures and Mechanical/ Tribological Behavior of Al-5wt.%Si-Xwt.%Bi Alloys**: *José Marcelino da Silva Dias*[1]; Thiago Costa[2]; Fábio Mariani[3]; Luiz Casteletti[3]; Noé Cheung[1]; Amauri Garcia[1]; [1]UNICAMP; [2]IFPA; [3]USP

**3:15 PM**
**Correlation of Microstructure to Mechanical Properties in Two Grades of Alumina**: *Tomoko Sano*[1]; Ian Buterbaugh[2]; Timothy Walter[1]; James Catalano[1]; Brendan Koch[3]; Calvin Lo[3]; James Hogan[3]; [1]U.S. Army Research Laboratory; [2]University of Arizona; [3]The University of Alberta

**3:35 PM**
**Effect of Orientations on Microstructure and Mechanical Properties of 7075 Aluminum Alloy by Rolling at Liquid Nitrogen Temperature**: *Jun Luo*[1]; Hongyun Luo[1]; [1]Beihang University

**3:55 PM Break**

**4:10 PM**
**Grain Size Characterization in Austenitic Stainless Steel Using Parameterized Ultrasonic Gaussian Echo Model**: *Song Peng*[1]; Qi Ouyang[1]; Zizong Zhu[1]; Tao Liu[1]; [1]Chongqing University

**4:30 PM**
**Laboratory Methods for Controlling Microstructure in Titanium Grade 2 and 5 Materials for the Calibration of Ultrasonic Microstructure Characterization**: *Matthew Schick*[1]; Philip Noell[2]; Thomas Ivanoff[1]; Doyle Motes[3]; Mark Warchol[3]; Lyudmila Warchol[3]; Eric Taleff[1]; [1]The University of Texas at Austin; [2]Sandia National Laboratories; [3]TRI/Austin

**4:50 PM**
**The Effect of Extrusion Rate on the Microstructural Evolution of ECAE Processed Pure Mg**: *Nicholas Krywopusk*[1]; Laszlo Kecskes[2]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]Army Research Laboratory, Aberdeen Proving Ground

**5:10 PM**
**The Influence of Microstructure on the Collapse Mechanisms and Specific Energy Absorption Capacity of Aluminium Alloy Foams**: *Md Abdul Kader*[1]; Paul Hazell[1]; Mohammad Saadatfar[2]; Andrew Brown[1]; Md Ashraful Islam[1]; Juan Escobedo-Diaz[1]; [1]UNSW, Canberra; [2]Australian National University

**5:30 PM**
**Bending Mechanical Evaluation in Composites with Epoxy Matrix Incorporating with Natural Fabric of Malva/Jute Fiber**: *Janaina da Silva Vieira*[1]; Felipe Perissé Duarte Lopes[1]; Ygor Macabú de Moraes[1]; Sergio Neves Monteiro[2]; Frederico Muylaert Margem[3]; Jean Igor Margem[4]; Djalma Souza[1]; [1]State University of the Northern Rio de Janeiro; [2]Military Institute of Engineering; [3]UniREDENTOR; [4]Institutos Superiores de Ensino do CENSA

## Computational Design and Simulation of Materials (CDSM 2018) – Plenary Session

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Monday PM
March 12, 2018
Room: 131B
Location: Phoenix Convention Center

*Session Chair:* Alan Luo, The Ohio State University

**2:30 PM Introductory Comments**

**2:35 PM Plenary**
**Genomic Materials Design: From CALPHAD to Space**: *Greg Olson*[1]; Charles Kuehmann[2]; [1]Northwestern University; [2]SpaceX & Tesla

**3:25 PM Plenary**
**Theoretical Modeling and Atomistic Calculation Verifications of Size-dependent Mechanical and Thermal Behaviors in Nanomaterials**: *Tong-Yi Zhang*[1]; [1]Shanghai University

**4:15 PM Break**

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Phase Field Simulations II: Lightweight Alloys

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Monday PM
March 12, 2018
Room: 131B
Location: Phoenix Convention Center

*Session Chair:* John Allison, University of Michigan, Ann Arbor

**4:40 PM**
**Examination of Precipitate Composition, Morphology, and Interactions in Mg-RE Alloys Using Phase Field Modeling**: *Stephen DeWitt*[1]; Katsuyo Thornton[1]; John Allison[1]; [1]University of Michigan - Ann Arbor

**5:00 PM**
**Microstructure Prediction of Titanium Aluminides Using Multi-phase Phase Field Modelling**: *Junyi Lee*[1]; Daniel Balint[1]; [1]Imperial College London

**5:20 PM**
**Phase Field Simulations of Grain Boundary Variant Selection and Intragranular Microstructure Formation in Polycrystalline Ti-6Al-4V**: *Bala Radhakrishnan*[1]; Sarma Gorti[1]; John Turner[1]; [1]Oak Ridge National Laboratory

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Computational Design of Materials: Uncertainty

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

Monday PM
March 12, 2018
Room: 131C
Location: Phoenix Convention Center

*Session Chair:* Raymundo Arroyave, Texas A&M University

**4:40 PM Invited**
**Uncertainty of Thermodynamic Data for Materials Design**: *Marius Stan*[1]; Noah Paulson[1]; [1]Argonne National Laboratory

**5:10 PM Invited**
**Thermodynamic Modeling with Uncertainty Quantification and its Implications for Additive Manufacturing**: *Brandon Bocklund*[1]; Richard Otis[2]; Zi-Kui Liu[1]; [1]Pennsylvania State University; [2]Jet Propulsion Laboratory

**5:40 PM**
**Reduced Order Modelling and Smart Regression Sampling of Energy Landscapes**: *Ruben Villarreal*[1]; [1]A&M University

## Computational Materials Discovery and Optimization – Materials Interfaces, 2D Materials, and Nanomaterials

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Richard Hennig, University of Florida; Houlong Zhuang, Arizona State University; Arunima Singh, Lawrence Berkeley National Laboratory; Eric Homer, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Monday PM
March 12, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chairs:* Francesca Tavazza, NIST; Houlong Zhuang, Mechanical and Aerospace Engineering

**2:30 PM Invited**
**The Use of Cluster Expansions to Predict the Structure and Properties of Catalysts**: *Tim Mueller*[1]; [1]Johns Hopkins University

**3:00 PM**
**A Combined Experimental-computational Approach to Determining Nanoscale Structures**: *Spencer Hills*[1]; Alper Kinaci[2]; Fatih Sen[1]; Maria Chan[1]; [1]Argonne National Laboratory; [2]Northwestern University

**3:20 PM**
**Data-driven Discovery of Photocathodes for $CO_2$ Reduction**: *Arunima Singh*[1]; Kristin Persson[1]; [1]Lawrence Berkeley National Laboratory

**3:40 PM**
**High-throughput Investigation of the Electronic Properties of 2D and Bulk Materials in the MaterialsWeb Database**: *Joshua Paul*[1]; Andy Linscheid[1]; Joshua Gabriel[1]; Richard Hennig[1]; [1]University of Florida

**4:00 PM Break**

**4:20 PM**
**Computational Screening of Novel Two-dimensional Topological Insulators and Layer-dependent Properties**: *Kamal Choudhary*[1]; Kevin Garrity[1]; Francesca Tavazza[1]; [1]National Institute of Standards and Technology

**4:40 PM**
**First Principle Prediction of Magnetic Topological Phase in Thin Films of Bi2XY4 (X = Mn, Cr; Y = Se, Te)**: *Sugata Chowdhury*[1]; Joseph Hagmann[1]; Curt Richter[1]; Angela Hight Walker[1]; Francesca Tavazza[1]; [1]National Institute of Standard and Technology

**5:00 PM**
**First-principles Calculations on the Multiferroic Properties of Two-dimensional Oxides**: *G.P. Zheng*[1]; [1]Hong Kong Polytechnic University

## Computational Materials Science and Engineering for Nuclear Energy – Nuclear Fuels and Cladding II

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Monday PM
March 12, 2018
Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* David Anderson, Los Alamos National Laboratory; Daniel Schwen, Idaho National Laboratory

**2:30 PM Invited**
**Fundamental Understanding of Corrosion of Nuclear Materials: Holistic Approach to Fuel Cladding Corrosion under Irradiation**: *Adrien Couet*[1]; [1]University of Wisconsin - Madison

**3:00 PM**
**A Model Coupling Hydrides Formation and Mechanical Behavior of Zircaloy Cladding during Fuel Rod Lifecycle**: *Hao Wang*[1]; Vikas Tomar[1]; [1]Purdue University

**3:20 PM**
**Competition of Deformation Modes in Irradiated Zr Alloys: A Micromechanical Approach**: *Pierre-Alexandre Juan*[1]; Remi Dingreville[1]; [1]Sandia National Laboratories

**3:40 PM**
**Hydrogen Transport and Trapping in Irradiation Damaged Zirconium Alloys**: *Jared Tannenbaum*[1]; Jesse Carter[1]; Richard Smith[1]; Bruce Kammenzind[1]; [1]Bettis Laboratory, NNL

**4:00 PM Break**

**4:20 PM**
**Formation and Re-orientation of Multi-phase Zirconium Hydrides under Applied Strain**: Jacob Bair[1]; *Mohsen Asle Zaeem*[1]; [1]Missouri University of Science and Technology

**4:40 PM**
**Residual Point Defects and their Evolution near Dislocation Loops and Grain Boundaries in α-zirconium: An Atomistic Study**: *Cong Dai*[1]; Peyman Saidi[1]; Zhongwen Yao[1]; Mark Daymond[1]; [1]Queen's University

**5:00 PM**
**A Quantitative Phase-Field Model for Gas Bubble Evolution in Nuclear Fuels**: *San-Qiang Shi*[1]; Z. Xiao[1]; [1]The Hong Kong Polytechnic University

## Computational Thermodynamics and Kinetics – Transport

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

Monday PM
March 12, 2018
Room: 128A
Location: Phoenix Convention Center

*Session Chairs:* Elif Ertekin, University of Illinois; Mahmoud Hussein, University of Colorado Boulder

**2:30 PM Invited**
**Supersonic Phasons Observed in Fresnoite**: *Michael Manley*[1]; [1]Oak Ridge National Laboratory

**3:00 PM**
**A First-principles Investigation of Various Vibrational Entropy Contribution Methods on Self-diffusion Coefficient Calculations in FCC and BCC Metals**: *Chelsey Hargather*[1]; John O'Connell[1]; Harrison Lee[1]; [1]New Mexico Institute of Mining and Technology

**3:20 PM**
**Development of a Mg Mobility Database Using Diffusion Multiples and Liquid-solid Diffusion Couples**: *Wei Zhong*[1]; Ji-Cheng Zhao[1]; [1]The Ohio State University

**3:40 PM Invited**
**Nanophononic Metamaterial: Severe Thermal Conductivity Reduction by Non-scattering Resonance Hybridizations**: *Mahmoud Hussein*[1]; [1]University of Colorado Boulder

**4:10 PM Break**

**4:30 PM**
**Ab Initio Molecular Dynamics Simulation of Transport in Al-Si Binary Liquids**: *Venkateswara Rao Manga*[1]; David Poirier[1]; [1]University of Arizona

**4:50 PM**
**Anharmonic Phonons in Low-symmetry $FeGe_2$ at the Paramagnetic Phase**: *Yang Shen*[1]; Hillary Smith[1]; Dennis Kim[1]; Fred Yang[1]; Doug Abernathy[2]; Matt Stone[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Oak Ridge National Laboratory

**5:10 PM**
**Effects of Simultaneous Pressure and Temperature on the Stability of $Silicon_{24}$**: *Brent Fultz*[1]; Timothy Strobel[2]; [1]California Institute of Technology; [2]Carnegie Institution of Washington

## Coupling Experiments and Modeling to Understand Plasticity and Failure – Fatigue

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Michael Sangid, Purdue University; Philip Eisenlohr, Michigan State University; Matthew Miller, Cornell University; Paul Shade, Air Force Research Laboratory

Monday PM
March 12, 2018
Room: 126B
Location: Phoenix Convention Center

*Session Chairs:* Michael Sangid, Purdue University; Paul Shade, Air Force Research Laboratory; Matt Miller, Cornell University; Philip Eisenlohr, Michigan State University

**2:30 PM Invited**
**Integrated Micromechanical Approaches to Understand Dwell Fatigue: In-situ Experiments from the Micro-scale Upwards**: Terry Jun[1]; Zhen Zhang[1]; Fionn Dunne[1]; *T Ben Britton*[1]; [1]Department of Materials, Imperial College

**2:55 PM Invited**
**Integrated Micromechanical Approaches to Understand Dwell Fatigue: Crystal and Discrete Dislocation Plasticity Modelling**: *Fionn Dunne*[1]; Ben Britton[1]; Zebang Zheng[1]; Daniel Balint[1]; Zhen Zhang[1]; [1]Imperial College

**3:20 PM Invited**
**Understanding the Fatigue Response of Each Crystal within a Copper Aggregate**: Mark Obstalecki[1]; Robert Carson[1]; Paul Dawson[1]; *Matthew Miller*[1]; [1]Cornell University

**3:45 PM**
**Characterizing the Effects a Smooth Crystal Lattice Orientation Field Formulation Has on the Evolution of Intragrain Deformation**: *Robert Carson*[1]; Paul Dawson[1]; [1]Cornell University

**4:05 PM Break**

**4:25 PM Invited**
**Opportunities for Validation of Grain-Level Plasticity and Fatigue Crack Growth Using High Energy X-ray Diffraction Microscopy; Part 1: Experimental Methods**: *Paul Shade*[1]; William Musinski[1]; Todd Turner[1]; David Menasche[2]; Joel Bernier[3]; Sirina Safriet[4]; Darren Pagan[5]; Peter Kenesei[6]; Jun-Sang Park[6]; Jon Almer[6]; [1]Air Force Research Laboratory; [2]Hamiltonian Group; [3]Lawrence Livermore National Laboratory; [4]University of Dayton Research Institute; [5]Cornell High Energy Synchrotron Source; [6]Argonne National Laboratory

**4:50 PM Invited**
**Opportunities for Validation of Grain-Level Plasticity and Fatigue Crack Growth Using High Energy X-ray Diffraction Microscopy; Part 2: Modeling Development and Considerations**: *William Musinski*[1]; Paul Shade[1]; Todd Turner[1]; David Menasche[2]; Joel Bernier[3]; Sirina Safriet[4]; Darren Pagan[5]; Peter Kenesei[6]; Jun-Sang Park[6]; Jon Almer[6]; [1]US Air Force Research Lab; [2]Hamiltonian Group; [3]Lawrence Livermore National Laboratory; [4]University of Dayton Research Institute; [5]Cornell High Energy Synchrotron Source; [6]Argonne National Laboratory

**5:15 PM Evening Poster Session Overview**

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – 2A: Precipitation Dissolution, Liquation in & Welding of Ni-based Superalloy and 2B: Effects of Ordering and Precipitate Behavior in Ni-based Superalloys

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC; Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

Monday PM
March 12, 2018
Room: 126A
Location: Phoenix Convention Center

*Session Chairs:* Chantal Sudbrack, QuesTek Innovations, LLC; Mark Hardy, Rolls-Royce plc

**2:30 PM Invited**
**An Overview of the Modeling of Precipitation and Dissolution in Gamma-gamma Prime Nickel-base Superalloys**: *Lee Semiatin*[1]; David Mahaffey[1]; Eric Payton[1]; Jay Tiley[1]; Oleg Senkov[2]; Nathan Levkulich[3]; [1]US Air Force Research Laboratory; [2]UES, Inc; [3]Wright-State University

**3:00 PM**
**Liquation Mechanisms of a Powder Processed Nickel Superalloy**: *Sean John*[1]; Helen Davies[1]; Simon Bray[2]; [1]Swansea University; [2]Rolls Royce Plc

**3:20 PM**
**Peculiar Semi-solid Deformation Behaviour in Co and Ni Alloys: An In Situ X-ray Tomographic Investigation**: *Mohammed Azeem*[1]; Robert Atwood[2]; Peter Lee[1]; [1]Manchester University; [2]Diamond Light Source

**3:40 PM**
**Role of Anisotropic Deformation on the Weld Cracking of a Directionally Solidified Ni-base Superalloy**: *Avinash Prabhu*[1]; Sudarsanam Suresh Babu[1]; [1]The University of Tennessee

**4:00 PM Break**

**4:20 PM Invited**
**Portevin-Le Chatelier Effect in Ni-based Superalloys: Experiments and Mechanisms**: *Chuanyong Cui*[1]; [1]Institute of Metal Research

**4:50 PM**
**The Effect of γ Particles in γ' Precipitates on the Mechanical Properties in Ni-Al-Ti Superalloys**: *Markus Kolb*[1]; Steffen Neumeier[1]; Mathias Göken[1]; [1]Universität Erlangen-Nürnberg

**5:10 PM**
**Influence of the Starting Microstructure on the Hot Deformation Behavior of a Low Stacking Fault Energy Ni-based Superalloy**: *Joshua McCarley*[1]; Sammy Tin[1]; [1]Illinois Institute of Technology

**5:30 PM**
**Mechanical Properties and Microstructural Characterization of Inconel Alloy 725 Variants**: *Martin Detrois*[1]; Kyle Rozman[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

## Design for Mechanical Behavior of Architectured Materials via Topology Optimization – Architected and Topology Optimization (TO) Design for Dynamic, Nonlinear, and Energy Applications

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Natasha Vermaak, Lehigh University; Andrew Gaynor, U.S. Army Research Laboratory

Monday PM
March 12, 2018
Room: 132C
Location: Phoenix Convention Center

*Session Chair:* Ted Blacker, Sandia National Labs

**2:30 PM**
**Design of Honeycomb TWIP Steels for Maximum Energy Absorption**: *Mackenzie Jones*[1]; David Garcia[1]; Yunhui Zhu[1]; Hang Yu[1]; [1]Virginia Tech

**3:00 PM**
**Discrete-element Modeling of Nacre-like Materials: Random Microstructures, Nonlinear Deformations and Fracture**: *Najmul Abid*[1]; Mohammad Mirkhalaf[1]; Francois Barthelat[1]; [1]McGill University

**3:30 PM**
**Tailoring the Dynamic Properties of 3D Woven Metallic Lattices through Topology Optimization**: *Hak Yong Lee*[1]; David Mills[1]; Ju Xue[1]; Timothy Weihs[1]; Kevin Hemker[1]; James Guest[1]; [1]Johns Hopkins University

**4:00 PM Invited**
**Extreme Design: An Adrenalin Rush with Topology Optimization, Metamaterials and Additive Manufacturing**: *Ted Blacker*[1]; [1]Sandia National Laboratories

## Dynamic Behavior of Materials VIII – Energetic Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

Monday PM
March 12, 2018
Room: 127B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:30 PM Invited**
**Initiation of Explosives by Hypervelocity Metal Fragments**: *John Yeager*[1]; Patrick Bowden[1]; Daniel Guildenbecher[2]; Joseph Olles[2]; [1]Los Alamos National Laboratory; [2]Sandia National Laboratories

**3:10 PM**
**Modeling ß-HMX-based Polymer-bonded Explosive: Shock, Plasticity and Damage Mechanics**: *Nicolò Grilli*[1]; Camilo Duarte Cordon[1]; Marisol Koslowski[1]; [1]Purdue University

**3:30 PM**
**Atomistic Insights into Decomposition and Reactions of Energetic Materials under Shock and Thermal Loading**: *Md Mahbubul Islam*[1]; Alejandro Strachan[1]; [1]Purdue University

**3:50 PM**
**Hotspots in High-energy Density Materials: The Role of Non-equilibrium Loading in Reactivity**: *Michael Sakano*[1]; Mahbub Islam[1]; Brenden Hamilton[1]; Alejandro Strachan[1]; [1]Purdue University

**4:10 PM Break**

**4:30 PM Invited**
**Anisotropic Shock Response of Poly (P-Phenylene Terephthalamide) (PPTA) and its Implications for Aramid-based Fibers Performance**: *Paulo Branicio*[1]; Subodh Tiwari[1]; Kohei Shimamura[1]; Fuyuki Shimojo[2]; Aiichiro Nakano[1]; Rajiv Kalia[1]; Priya Vashishta[1]; [1]University of Southern California; [2]Kumamoto University

**5:10 PM**
**Dynamic Deformation and Stress Wave Propagation in Ballistic Gel**: *Ghatu Subhash*[1]; [1]University of Florida

**5:30 PM Demonstration:** One minute oral presentation for posters

## Electrode Technology Symposium for Aluminum Production – Anode Raw Materials

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xianan Liao, Elkem Carbon

Monday PM
March 12, 2018
Room: 222C
Location: Phoenix Convention Center

*Session Chairs:* Guanghui Lang, Sunstone Development; Jilai Xue, University of Science and Technology Beijing

**2:30 PM Introductory Comments**

**2:35 PM**
**An XANES Study of Sulfur Speciation and Reactivity of Cokes Used for Aluminium Production**: *Gøril Jahrsengene*[1]; Richard Haverkamp[2]; Hannah Wells[2]; Stein Rørvik[3]; Arne Petter Ratvik[3]; Ann Mari Svensson[1]; [1]Norwegian University of Science and Technology; [2]Massey University; [3]SINTEF Materials and Chemistry

**3:00 PM**
**Influence of Crushing Technology and Particle Shape on the Bulk Density of Anode Grade Petroleum Coke**: *Frank Cannova*[1]; Mike Davidson[1]; Laura Forte[1]; Barry Sadler[2]; [1]BP; [2]Net Carbon Consulting

**3:25 PM**
**Study on the Calcination Performance and Desulfurization Mechanism of Petroleum Cokes with Different Sulfur Contents between 700-1100°C**: *Shoulei Gao*[1]; Jilai Xue[1]; Guanghui Lang[1]; Rui Liu[1]; Chongai Bao[1]; Zhiguo Wang[1]; Fali Zhang[1]; [1]Sunstone Development Co., Ltd

**3:50 PM**
**Rotary Hearth Calcining of Petroleum Cokes**: *William Barraclough*[1]; [1]Tenova Inc.

**4:15 PM Break**

**4:30 PM**
**Effects of High-Sulfur Cokes on Physicochemical Properties of Prebaked Anodes in Aluminium Electrolysis**: *Jiang Haitao*[1]; Tang Changting[1]; Ma Zhengqing[1]; Zhou Ping[1]; Li Yuan[1]; GAO Panpan[1]; [1]Shandong Nanshan Aluminium Co. Ltd

**4:55 PM**
**The Research and Industrial Application of An Improved Impact Cleaning Technology of the Double Anode Butts in Aluminium Electrolysis**: Youlai Wang[1]; Qiusi Yang[1]; Yong Li[1]; Xiancong Xiao[2]; Lei He[1]; *Hengjun Zhao*[1]; [1]Sichuan Aostar Aluminium Co., Ltd.; [2]Guiyang New High Alumina Carbon Technology Co., Ltd.

**5:20 PM**
**Analysis on the Material Balance Based on the Calcination Characteristics of a Chamber Calciner**: Sun Jiyun[1]; *Wei Dong*[2]; [1]Guiyang Aluminium Magnesium Design & Research Institute Co. Ltd, Guiyang; [2]Elkem Carbon (China)

## Energy Technologies and CO2 Management Symposium – Carbon-based Energy Materials and Sustainable Metallurgical Processes

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
*Program Organizers:* Ziqi Sun, Queensland University of Technology; Cong Wang, Northeastern University; Donna Guillen, Idaho National Laboratory; Tao Wang, Nucor Steel; Neale Neelameggham, Ind LLC; John Howarter, Purdue University

Monday PM
March 12, 2018

Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* Nawshad Haque, CSIRO, Australia; Jie Tang, National Institute for Materials Science

**2:30 PM Keynote**
**Graphene Electrode of Porous Structure for Supercapacitors with Ionic Liquid Electrolyte**: *Jie Tang*[1]; Lu-Chang Qin[2]; [1]Natioanl Institute for Materials Science; [2]University of North Carolina at Chapel Hill

**3:10 PM Invited**
**Carbon Nanotube-containing Electrocatalysts for Oxygen Reduction Reaction**: Jincheng Li[1]; Pengxiang Hou[1]; *Chang Liu*[1]; Hui-Ming Cheng[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

**3:30 PM Invited**
**Electrochemical Exfoliation of Graphite and Production of Functional Graphene**: *Yu Lin Zhong*[1]; [1]Griffith University

**3:50 PM Invited**
**Atom-functionalized Carbon-based Nanomaterials in Energy Applications: DFT Study**: *Ting Liao*[1]; [1]Queensland University of Technology

**4:10 PM Break**

**4:25 PM Invited**
**Evaluation of Variation in the Life Cycle Based Environmental Impacts for Copper Concentrate Production**: Will Sikora[1]; Trevor Saldanha[1]; *Nawshad Haque*[1]; [1]CSIRO

**4:45 PM**
**Direct Reduction of Copper Slag Composite Pellets within Lignite Using Biomass as Binder**: *Zongliang Zuo*[1]; Qingbo Yu[1]; Huaqing Xie[1]; Qin Qin[1]; Mengqi Wei[1]; [1]Northeastern University

**5:05 PM**
**Thermodynamic Analysis of Incineration Treatment of Waste Disposable Syringes in an EAF Steel-making Process**: *Maryam Ghodrat*[1]; Bijan Samali[1]; [1]Western Sydney University

**5:25 PM**
**The Reduction Kinetic of the Combined Cu-based Oxygen Carrier Used for Chemical Looping Gasification Technology**: *Kun Wang*[1]; Weipeng Luan[1]; Qingbo Yu[1]; Qin Qin[1]; [1]Northeastern University

**5:45 PM**
**Synergistic Effect Between Fat Coal and Poplar During Co-pyrolysis with Thermal Behavior and ATR-FTIR Analysis**: *Qingyun Zhang*[1]; Shengfu Zhang[1]; Rongjin Zhu[1]; Shuxing Qiu[1]; Yue Wu[1]; [1]Chongqing University

## Environmentally Assisted Cracking: Theory and Practice – Stress Corrosion Cracking I

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Bai Cui, University of Nebraska–Lincoln; Raul Rebak, GE Global Research; Sebastien Dryepondt, Oak Ridge National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Monday PM
March 12, 2018

Room: 127A
Location: Phoenix Convention Center

*Session Chairs:* Gary Was, University of Michigan; Peter Andresen, GE Global Research

**2:30 PM Introductory Comments**

**2:40 PM Invited**
**Environmental Cracking: Theory Depends on Practice**: *Peter L. Andresen*[1]; [1]GE Global Research (Retired)

**3:20 PM**
**Characterization of Stress Corrosion Cracking of 304 Stainless Steel Using High-energy Synchrotron X-ray Microtomography**: Li Xi[1]; *Djamel Kaoumi*[1]; D. G. Enos[2]; Peter Kenesei[3]; [1]North Carolina State Univeristy; [2]Sandia National Laboratory; [3]Argonne National Laboratory

**3:40 PM**
**Fundamental Mechanisms of Preventing Stress Corrosion Cracking of Austenitic Alloys by Laser Shock Peening**: *Bai Cui*[1]; Xueliang Yan[1]; Fei Wang[1]; Chenfei Zhang[1]; Yongfeng Lu[1]; Michael Nastasi[1]; [1]University of Nebraska–Lincoln

**4:00 PM Break**

**4:20 PM Invited**
**Mechanisms of High Temperature Stress Corrosion Crack Initiation in Austenitic Alloys**: *Gary Was*[1]; Wenjun Kuang[1]; Mi Wang[1]; Miao Song[1]; Mo-RIgen He[2]; Ian Robertson[2]; Zhijie Jiao[1]; [1]University of Michigan; [2]University of Wisconsin

**5:00 PM**
**IASCC Behavior of Additively Manufactured 316L Stainless Steel in Light Water Reactor Environments**: *Mi Wang*[1]; Miao Song[1]; Xiaoyuan Lou[2]; Raul Rebak[3]; Gary Was[1]; [1]University of Michigan; [2]Corromet LLC; [3]GE Global Research

**5:20 PM**
**The Effects of Grain Boundary Structure on the Intergranular Stress Corrosion Cracking Initiation Susceptibility of Alloy 690 in High Temperature Water**: *Wenjun Kuang*[1]; Gary Was[1]; [1]University of Michigan

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Multiscale Modeling Approaches to Improve Fatigue Predictions

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Monday PM
March 12, 2018
Room: 125B
Location: Phoenix Convention Center

*Session Chair:* Ashley Spear, University of Utah

**2:30 PM Invited**
**Simulation and Experimental Validation of Damage Accumulation and Phase Transformation during Cyclic Mechanical Loading of a Metastable Austenitic Stainless Steel Considering Prehistory Effects**: *Martina Zimmermann*[1]; Philipp Hilgendorff[2]; Andrei Grigorescu[3]; Claus Fritzen[4]; Hans-Jürgen Christ[4]; [1]TU Dresden; [2]Otto Fuchs KG; [3]Thyssenkrupp Presta; [4]Universitaet Siegen

**2:50 PM Invited**
**Prediction of Microstructurally–influenced Fatigue Crack Propagation**: *Patrick Golden*[1]; Robert Brockman[2]; Rebecca Hoffman[2]; William Musinski[1]; Sushant Jha[2]; Reji John[1]; [1]Air Force Research Laboratory; [2]University of Dayton Research Institute

**3:10 PM**
**A Qualitative FE Analysis of the Effect of the Local Texture on the Heterogeneous Plastic Strain Field in Nickel-based Superalloys during Low Cycle Fatigue**: *Jean-Briac le Graverend*[1]; [1]Texas A&M University

**3:30 PM**
**A Voxel-based Meshing Framework for the Simulation of Arbitrary 3D Crack Growth in Heterogeneous Materials**: *Brian Phung*[1]; Ashley Spear[1]; [1]University of Utah

**3:50 PM Break**

**4:10 PM**
**A Physically-based Methodology for the Deterministic Prediction of Microstucturally-sensitive Fatigue Crack Growth**: *David Wilson*[1]; Fionn Dunne[1]; [1]Imperial College London

**4:30 PM Invited**
**Time-based Subcycle Formulation for Fatigue Crack Growth under Arbitrary Random Variable Loadings**: *Yongming Liu*[1]; Karthik Rajan Venkatesan[1]; Wei Zhang[2]; [1]Arizona State University; [2]Beihang University

**4:50 PM**
**Cyclic Stress-strain Response and Microstructural Evolution Modeling of Nickel-based Superalloys during Low Cycle Fatigue**: *Fernando Leon-Cazares*[1]; Enrique Galindo-Nava[1]; Olivier Messé[1]; Thomas Jackson[2]; Catherine Rae[1]; [1]University of Cambridge; [2]Rolls-Royce

**5:10 PM**
**Prediction of Intergranular Micro-crack Initiation Induced by the Impingement of Persistent Slip Bands on Grain Boundaries**: *Jerome Hazan*[1]; Maxime Sauzay[1]; [1]CEA

## Fracture: 65 Years after the Weibull Distribution and the Williams Singularity – Session II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Brad Boyce, Sandia National Laboratories; Ellen Cerreta, Los Alamos National Laboratory; Jacob Hochhalter, NASA LaRC; Jonathan Zimmerman, Sandia National Laboratories

Monday PM
March 12, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Brad Boyce, Sandia National Laboratories; K. Ravi-Chandar, University of Texas at Austin

**2:30 PM Invited**
**Toughness, Roughness and Crack Path Engineering for Improved Ductile Fracture Resistance**: *Alan Needleman*[1]; [1]Texas A&M University

**3:00 PM Invited**
**An Integrity Basis of Fracture Challenges**: *Amine Benzerga*[1]; [1]Texas A&M University

**3:30 PM Invited**
**The Complexity of Ductile Fracture**: *Krishnaswamy Ravi-Chandar*[1]; [1]The University of Texas at Austin

**4:00 PM Break**

**4:20 PM Invited**
**Computational Procedure for Designing New Gen 3 Steels with High Formability and Ductile Fracture Resistance**: *Louis Hector Jr*[1]; Ankit Srivastava[2]; Daniel Gerbig[3]; Allan Bower[3]; [1]General Motors; [2]Texas A&M University; [3]Brown University

**4:50 PM Invited**
**Re-tooling the Engineering Predictive Practices for Durability and Damage Tolerance**: *Robert Piascik*[1]; Norman Knight[2]; [1]NASA Lanley Research Center; [2]Retired

**5:20 PM Invited**
**NASA's Plan for Development and Transition of Computational Materials-based Capabilities for Next-generation Durability / Damage Tolerance and Additive Manufacturing**: *Ed Glaessgen*[1]; [1]NASA

## Frontiers in Advanced Functional Thin Films and Nanostructured Materials – Session II

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Ritesh Sachan, Army Research Office; Srinivasa Rao Singamaneni, The University of Texas at El Paso; Haiyan Wang, Purdue University; Nuggehalli Ravindra, New Jersey Institute of Technology; Raj Singh, Oklahoma State University; Amit Pandey, LG Fuel Cell Systems Inc.

Monday PM
March 12, 2018
Room: 103A
Location: Phoenix Convention Center

Funding support provided by: Quantum Design and Radiant Technologies

*Session Chairs:* Srinivasa Rao Singamaneni, University of Texas-El Paso; John Prater, Army Research Office

**2:30 PM Invited**
**Graphene Film Nano Geometry Control for Advanced Functional Properties**: *Sungho Jin*[1]; [1]University of California, San Diego

**3:00 PM Invited**
**Materials Science in Two Dimensions**: *Daniel Kaplan*[1]; [1]U.S. Army RDECOM-ARDEC

**3:30 PM**
**Defects in Nanoscale Transitional Metal Di-chalcogenide Semiconducting Layers**: *L. M. Martinez*[1]; J. van Tol[2]; Srinivasa Rao Singamaneni[1]; [1]The University of Texas at El Paso; [2]National High Magnetic Field Laboratory

**3:50 PM Break**

**4:10 PM**
**Functionalized Graphene-polyoxometalate Nanodots Assembly as "Organic-inorganic" Hybrid Supercapacitors and Advanced Electrochemical Microscopy**: *Sanju Gupta*[1]; Bryce Aberg[1]; Sara Carrizosa[1]; [1]Western Kentucky University

**4:30 PM Invited**
**Processing and Properties of Nanomaterials in the C-B-N System**: *Raj Singh*[1]; [1]Oklahoma State University

**5:00 PM**
**Novel Synthesis and Characterization of Carbon-doped Cubic Boron Nitride (c-BN) by Pulsed Laser Annealing Technique**: *Ariful Haque*[1]; Jagdish Narayan[1]; [1]NCSU

## High Entropy Alloys VI – Alloy Development and Applications 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Monday PM
March 12, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* James Saal, QuesTek Innovations; An-Chou Yeh, National Tsing Hua University

**2:30 PM Invited**
**Development of High Temperature Alloys Based on the HEA Design Concept**: *An-Chou Yeh*[1]; [1]National Tsing Hua University

**2:50 PM Invited**
**Brazing of Ni-base Superalloy 600 Using a Newly Developed Mn35Fe5 (CoNiCu)20 Filler Foil**: *Zhenzhen Yu*[1]; Minrui Gao[1]; Stephen Liu[1]; Michael Kaufman[1]; [1]Colorado School of Mines

**3:10 PM Invited**
**High-throughput Predictive Design of Refractory High-entropy Alloys: Application to Ti-Zr-Ta-Mo-W with Validation**: *Duane Johnson*[1]; Prashant Singh[1]; Andrei Smirnov[1]; Pratik Ray[1]; Matt Kramer[1]; [1]Ames Laboratory/Iowa State University

**3:30 PM Invited**
**Calphad and New-phacomp Assisted Design of Single Phase CrMnFeCoNi-type High Entropy Alloys**: *Katerina Christofidou*[1]; Thomas McAuliffe[1]; Paul Mignanelli[1]; Pietro Orsatti[1]; Ed Pickering[2]; Howard Stone[1]; Nicholas Jones[1]; [1]University of Cambridge; [2]University of Manchester

**3:50 PM Break**

**4:10 PM Invited**
**ICME Design of High Entropy Alloys**: *James Saal*[1]; Ricardo Komai[1]; Pin Lu[1]; Ida Berglund[1]; Jeff Doak[1]; Jason Sebastian[1]; Greg Olson[1]; [1]QuesTek Innovations

**4:30 PM Invited**
**Intermetallic Compound Enhances Twinning and Strength in a Duplex High Entropy Alloy**: *Deep Choudhuri*[1]; Bharat Gwalani[1]; Mageshwari Komarasamy[1]; Sinivas Mantri[1]; Rajiv Mishra[1]; Rajarshi Banerjee[1]; [1]University of North Texas

**4:50 PM**
**Strengthening of an High Entropy Alloys Using Nanotwinned Grains**: *Bin Gan*[1]; William Yi Wang[1]; Yiguang Wang[1]; Jeffrey M. Wheeler[2]; [1]Northwestern Polytechnical University; [2]ETH Zurich

**5:10 PM Invited**
**Insight into High-temperature Oxidation of Refractory High-entropy Alloys and Mechanical Properties**: *Saad Sheikh*[1]; Sheng Guo[1]; [1]Chalmers University of Technology

**5:30 PM**
**Solidification and Miscibility of 3d Transition Metal High Entropy Alloys Containing Copper**: *Nicholas Derimow*[1]; Abraham Munitz[2]; Reza Abbaschian[1]; [1]University of California, Riverside; [2]Nuclear Research Center-Negev

## High Entropy Alloys VI – Thermal and Other 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Monday PM
March 12, 2018
Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Jim Hu, HRA; Alice Hu, City University of Hong Kong

**2:30 PM Invited**
**Configuration Entropy of High Entropy Alloys**: *Alice Hu*[1]; JW Yeh[2]; PK Liaw[3]; CH Hu[4]; Ky Fung[1]; PJ Yu[1]; [1]City University of Hong Kong; [2]National Tsing Hua University; [3]The University of Tennessee; [4]National Taiwan University

**2:50 PM**
**Evaluation of Microstructure and Mechanical Property Variations in AlxCrCoFeNi High Entropy Alloys by a High-throughput Laser Deposition Method**: *Mu Li*[1]; Rohan Mishra[1]; Katharine Flores[1]; [1]Washington University in St. Louis

**3:10 PM Invited**
**Validation of High Entropy Alloy Diffusion Databases**: *John Morral*[1]; [1]The Ohio State University

**3:30 PM Invited**
**Phase Stabilization of High Entropy Alloy under Dynamic Forcing Condition**: Hyun Seok Oh[1]; Zhiming Li[2]; Jin Yeon Kim[1]; Chae Woo Ryu[1]; Andreas Meyer[3]; Koichi Tsuchiya[4]; Dierk Raabe[2]; *Eun Soo Park*[1]; [1]Seoul National University; [2]Max-Planck Institut für Eisenforschung GmbH; [3]Deutsches Zentrum fuer Luft- und Raumfahrt (DLR); [4]National Institute for Materials Science

**3:50 PM Invited**
**Phase Formation and Stability in High Entropy Alloys**: Nicholas Derimow[1]; Trevor Clark[1]; Reza Abbaschian[1]; *Suveen Mathaudhu*[1]; [1]University of California, Riverside

**4:10 PM Break**

**4:30 PM**
**Rare-earth High-entropy Alloys with Giant Magnetocaloric Effect**: *Yuan Wu*[1]; Y. Yuan[1]; X. Tong[2]; Z. P. Lu[1]; [1]State Key Lab for Advanced Metals and Materials, USTB; [2]Oak Ridge National Laboratory

**4:50 PM**
**Phase Stability in the Al-Co-Cr-Fe-Nb-Ni High-entropy Alloy System**: *Martin Detrois*[1]; Stoichko Antonov[2]; Sammy Tin[2]; [1]National Energy Technology Laboratory; [2]Illinois Institute of Technology

**5:10 PM Invited**
**Investigation of High Entropy Alloys (HEAs) and the Application in Dissimilar Metals Welding**: *Jim Hu*[1]; Eric Walker[1]; Peiyong Chen[2]; Chanho Lee[2]; Douglas Fielden[2]; Peter Liaw[2]; [1]Honda R&D Americas; [2]The University of Tennessee, Knoxville

**5:30 PM**
**Unusual Interstitial Strengthening of High-entropy Alloys Evading the Strength-ductility Trade-off**: *Zhifeng Lei*[1]; Xiongjun Liu[1]; Shudao Wang[1]; Hui Wang[1]; Yuan Wu[1]; Paraskevas Kontis[2]; Baptiste Gault[2]; Dierk Raabe[2]; Houwen Chen[3]; Tai-Gang Nieh[4]; Zhaoping Lu[1]; [1]University of Science and Technology Beijing; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Chongqing University; [4]University of Tennessee

**5:50 PM**
**Diffusion Characteristics of AlxCoCrFeNi High Entropy Alloys**: K. Mathes[1]; Emily Holcombe[2]; *Thanh Tran*[2]; Peter Liaw[1]; [1]University of Tennessee; [2]NSWC Carderock

## Hume-Rothery Award Symposium: Computational Thermodynamics and Its Implications to Kinetics, Properties, and Materials Design – Density Functional Theory Methods

*Sponsored by:* TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Michael Gao, National Energy Technology Lab; Chelsey Hargather, New Mexico Institute of Mining and Technology; Richard Hennig, University of Florida; James Saal, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

Monday PM
March 12, 2018

Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* Richard Hennig, University of Florida; Chelsey Hargather, New Mexico Institute of Mining and Technology

**2:30 PM Invited**
**Density Functional Theory Applied to Alloy Phase Stability and Transformations – Is it Worth it?**: *Patrice Turchi*[1]; [1]Lawrence Livermore National Laboratory

**3:00 PM Invited**
**Automated Solute Diffusivity from First Principles**: *Dallas Trinkle*[1]; [1]University of Illinois, Urbana-Champaign

**3:30 PM Invited**
**Vibrational Entropy Effects on the Phase Diagrams of Nanostructured Thermoelectrics**: *Chris Wolverton*[1]; [1]Northwestern University

**4:00 PM Break**

**4:20 PM Invited**
**A Study of (Ti-6Al-4V)-hydrogen Phase Diagram and its Application in Engineering Microstructures of Ti Alloys**: *Z. Zak Fang*[1]; Pei Sun[1]; [1]University of Utah, Dept of Metallurgical Engineering

**4:50 PM Invited**
**Exploration of Large Ab Initio Data Spaces to Design Structural Materials with Superior Mechanical Properties**: *Joerg Neugebauer*[1]; Jan Janssen[1]; Blazej Grabowski[1]; Tilmann Hickel[1]; [1]Max-Planck-Institut fuer Eisenforschung

**5:20 PM Invited**
**Thermodynamics of Some Liquid Alkali Metals**: *Marcel Sluiter*[1]; Masanori Enoki[2]; Hiroshi Ohtani[2]; [1]TU Delft; [2]Tohoku University

## Integrative Materials Design III: Performance and Sustainability – Microstructure Evolution and Fatigue Performance in Additive Manufacturing & Other Advanced Manufacturing Technologies

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories; Corbett Battaile, Sandia National Laboratories; Anastasios Gavras, Riley Power

Monday PM
March 12, 2018

Room: 132A
Location: Phoenix Convention Center

*Session Chairs:* Fei Cao, Worcester Polytechnic Institute; Yuwei Zhai, Worcester Polytechnic Institute

**2:30 PM Invited**
**Additive Materials Behavior: Importance of Collecting Data Along the Way**: *Amber Andreaco*[1]; [1]GE Additive

**2:50 PM Invited**
**Characterization of Very High Cycle Fatigue in Ti-6Al-4V and Al-10Si-0.4Mg Alloys Fabricated by Laser Powder Bed Fusion**: *Jason Carroll*[1]; [1]Eaton

**3:10 PM**
**A Comparison of Fatigue Performance and Behavior of Ti-6Al-4V Made by Different Additive Manufacturing Technologies**: *Fei Cao*[1]; Diana Lados; [1]Worcester Polytechnic Institute

**3:30 PM**
**Microstructure, Tensile Properties, and Fatigue Crack Growth Mechanisms at the Microstructure Scale in Inconel 718 Manufactured by Laser Engineered Net Shaping**: *Yuwei Zhai*[1]; Diana Lados[1]; [1]Worcester Polytechnic Institute, Integrative Materials Design Center

**3:50 PM**
**Microstructure Evolution, Fatigue Crack Growth Mechanisms, and Effects of Heat Treatment in Ti-6Al-4V and Al-10Si-0.4Mg Alloys Fabricated by Laser and Electron Beam Powder Bed Fusion**: *Robert Warren*[1]; Haize Galarraga[1]; Diana Lados[1]; Ryan Dehoff[2]; Michael Kirka[2]; Ed Hummelt[3]; [1]Worcester Polytechnic Institute; [2]Oakridge National Laboratory; [3]Eaton Corporation

**4:10 PM Break**

**4:25 PM Invited**
**Optimizing HIP and Printing Parameters for EBM Ti-6Al-4V**: *Magnus Ahlfors*[1]; [1]Quintus Technologies

**4:45 PM Invited**
**Through-process Modeling for Alloy Design and Process Optimization for Cold Spray**: *Danielle Cote*[1]; Victor Champagne[2]; [1]Worcester Polytechnic Institute; [2]US Army Research Laboratory

**5:05 PM**
**Design of Cold-spray 6061 Aluminum Alloys for Fatigue Crack Growth Resistance in Structural Components, Coatings, and Repairs**: *Christopher Sample*[1]; Robert Warren[1]; Anastasios Gavras[2]; Diana Lados[1]; Victor Champagne[3]; [1]Worcester Polytechnic Institute; [2]Riley Power; [3]US Army Research Laboratory

**5:25 PM**
**Friction Stir Welding of Wrought and Cast Aluminum Alloys: Property Evaluations and Thermo-mechanical Modeling**: *Yi Pan*[1]; Diana Lados[1]; [1]Worcester Polytechnic Institution

**5:45 PM**
**Friction Stir Welding of Dissimilar Metals**: *Xiangbin Wang*[1]; Yi Pan[1]; Diana Lados[1]; [1]Worcester Polytechnic Institute, Integrative Materials Design Center

## Magnesium Technology 2018 – Corrosion and Surface Protection

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Monday PM
March 12, 2018
Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Mikhail Zheludkevich, Helmholtz-Zentrum Geesthacht (HZG); Nick Birbilis, Monash University

**2:30 PM Introductory Comments**

**2:35 PM**
**Adding Dimensions to the Immersion Testing of Magnesium Corrosion**: Lars Wadsö[1]; *Dmytro Orlov*[1]; [1]Lund University

**2:55 PM**
**Corrosion Characteristics of Two RE Containing Magnesium Alloys**: *Marwa AbdelJawad*[1]; Bilal Mansoor[1]; Ali Usman Chaudhry[1]; [1]Texas A&M University at Qatar

**3:15 PM**
**Effect of Fluoride Ion on the Microstructure and Properties of Permanganate Conversion Coating on AZ91D Magnesium Alloy**: *Shih-An Yang*[1]; Chao-Sung Lin[1]; [1]Department of Materials Science and Engineering, National Taiwan University

**3:35 PM**
**Ni-P-MWNTs Composite Coatings on Magnesium Alloys AZ31 Part 1: MWNTs Content in Coating**: *Dong Guo*[1]; [1]Hebei University of Science and Technology

**3:55 PM**
**Ni-P-MWNTs Composite Coatings on Magnesium Alloys AZ31 Part 2: Tribological Behavior and MWNTs Content in Coating**: *Dong Guo*[1]; [1]Hebei University of Science and Technology

**4:15 PM Break**

## Magnesium Technology 2018 – Poster Pitches

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Monday PM
March 12, 2018
Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Vineet Joshi, Pacific Northwest National Laboratory - PNNL; Neale Neelameggham, IND LLC

**4:30 PM Poster Pitches**

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Nuclear Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Monday PM
March 12, 2018
Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Assel Aitkaliyeva, University of Florida; Maria Okuniewski, Purdue University

**2:30 PM**
**Characterization of Intragranular Creep Deformation in Uranium Dioxide Using Electron Backscatter Diffraction and Electron Channeling Contrast Imaging**: *Benjamin Shaffer*[1]; Pedro Peralta[1]; [1]Arizona State University

**2:50 PM**
**Corrosion Assessment of an Alloy/Oxide Composite Using Electrochemical Techniques**: *Vineeth Kumar Gattu*[1]; William Ebert[1]; J Ernesto Indacochea[2]; [1]Argonne National Laboratory; [2]University of Illinois at Chicago

**3:10 PM**
**Grain Boundary Engineering for Improved Resistance to Corrosion and Stress Corrosion Cracking Resistance of Nuclear Alloys**: Abhishek Telang[1]; Amrinder Gill[2]; Mukul Kumar[3]; Sebastien Teysseyre[4]; Seetha Mannava[5]; Dong Qian[6]; *Vijay Vasudevan*[5]; [1]Integer; [2]AK Steel; [3]Lawrence Livermore National Laboratory; [4]Idaho National Laboratory; [5]University of Cincinnati; [6]University of Texas at Dallas

**3:30 PM**
**Comprehensive Characterization of Irradiation Defects in Ferric Nuclear Alloy via STEM-based Microscopy**: *Yuanyuan Zhu*[1]; Mychailo Toloczko[1]; Dan Edwards[1]; [1]Pacific Northwest National Laboratory

**3:50 PM**
**Fabrication of Lumped $Gd_2O_3$ Inserted Oxide Pellets for Burnable Absorber Fuel**: *Qusai Mistarihi*[1]; Ho Jin Ryu[1]; [1]Korea Advanced Institute of Science and Technology

**4:10 PM Break**

**4:30 PM**
**Understanding Micromechanical Deformation in Hard-facing Alloys for Improving Galling Resistance**: *Chong Zhao*[1]; Jun Jiang[1]; Fionn Dunne[1]; [1]Imperial College London

**4:50 PM**
**Probing Local Disorder in Ln-UO2 (Ln = Y, Nd, La) and UO2+x Systems**: Raul Palomares[1]; Sarah Finkeldei[2]; Lei Zhang[3]; Tiankai Yao[4]; Felix Brandt[2]; Alexandra Navrotsky[3]; Jie Lian[4]; *Maik Lang*[1]; [1]The University of Tennessee; [2]Forschungszentrum Jülich; [3]University of California Davis; [4]Rensselaer Polytechnic Institute

**5:10 PM**
**Radiation Effect on Nanomaterials at High Temperature -New Type of Radiation Detector for TREAT Nuclear Reactor-**: *You Qiang*[1]; Lokendra Khanal[1]; [1]University of Idaho and The Center for Advanced Energy Studies

## Materials for Energy Conversion and Storage – Solid Oxide Fuel Cells I

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Monday PM
March 12, 2018
Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Amit Pandey, LGFCS; Jung Pyung Choi, PNNL

**2:30 PM Invited**
**Comparison of Chromium Poisoning Effects on Performances of (La,Sr)MnO3 and (La,Sr)FeO3 Based Cathodes in Solid Oxide Fuel Cells**: Uday Pal[1]; *Ruofan Wang*[1]; Srikanth Gopalan[1]; Soumendra Basu[1]; [1]Boston University

**2:55 PM Invited**
**Chromium Sensor for Use in SOFC Systems**: *Jeffrey Fergus*[1]; Moaiz Shahzad[1]; Tommy Britt[1]; [1]Auburn University

**3:15 PM**
**Chromium Evaporation from Metallic Components and Cathode Poisoning in SOFC**: *Ashish Aphale*[1]; Md Aman Uddin[1]; Junsung Hong[1]; Justin Webster[1]; Su Jeong Heo[1]; Boxun Hu[1]; Prabhakar Singh[1]; [1]University of Connecticut

**3:40 PM Invited**
**Advanced Reactive Air Aluminization Process for SOFC Stacks**: *Jung Pyung Choi*[1]; Jeffry Stevenson[1]; [1]Pacific Northwest National Laboratory

**4:05 PM Break**

**4:20 PM Introductory Comments**

**4:25 PM Invited**
**Cr-poisoning and Recovery at SOFC Cathode/Electrolyte Interfaces**: *Teruhisa Horita*[1]; [1]AIST

**4:50 PM**
**Gaseous Chromium Capture and Mitigation of LSM Cathode Poisoning at 650 °C**: *Su Jeong Heo*[1]; Boxun Hu[1]; Ashish Aphale[1]; Junsung Hong[1]; Prabhakar Singh[1]; [1]University of Connecticut

**5:10 PM**
**Developing an ITSOFC for Electrocatalytically Controlled Partial Oxidation of Methane to Methanol**: *Abhinav Poozhikunnath*[1]; Radenka Maric[1]; [1]University of Connecticut

**5:30 PM Invited**
**Electrochemical Properties of (La,Sr)$MnO_3$ for Interconnector Application**: Fen Qin[1]; Hyun-Jong Choi[2]; Sun-Dong Kim[2]; Sang-Kuk Woo[2]; *Jung-Kun Lee*[1]; [1]University of Pittsburgh; [2]Korea Institute of Energy

**5:55 PM**
**Structural, Electrical and Dielectric Properties of Iron (Fe) Doped Gallium Oxide ($Ga_2O_3$)**: *Swadipta Roy*[1]; Ramana Chintalapalle[1]; [1]University of Texas at El Paso

## Materials Processing Fundamentals – Steelmaking - Properties

*Sponsored by:* TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
*Program Organizers:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology; Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

Monday PM
March 12, 2018
Room: 228A
Location: Phoenix Convention Center

*Session Chairs:* Jonghyun Lee, Iowa State University; Guillaume Lambotte, Boston Electromet

**2:30 PM**
**Research on the Pinpoint Controlling of CRA N08028 OCTG Microstructure and Properties**: *Pan Dong*[1]; Zhiqiang Yu[2]; Zhifang Zhang[3]; Genshu Zhou[2]; Pengsheng Yao[4]; Xitang Kang[4]; Guangwei Fan[5]; [1]State Key Laboratory of Advanced Stainless Steel Materials, Taiyuan Iron & Steel (Group) Co., Ltd.; [2]State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; [3]Shanxi Taigang Stainless Steel Co., Ltd.; [4]Shanxi Taigang Stainless Steel Tubes & Pipes Co., Ltd.; [5]Technology Center, Shanxi Taigang Stainless Steel Co., Ltd.

**2:50 PM**
**Electron Beam Surface Hardening of AISI H13 Tool Steel**: *Sandeep Thakare*[1]; [1]Bharat Forge Limited

**3:10 PM**
**Effects of Aging Treatment on the Microstructure and Mechanical Properties of a Nanoprecipitates-strengthened Ferritic Steel**: *Yu Zhao*[1]; Ye Cui[1]; Hao Guo[1]; Songsong Xu[1]; Xinghao Wei[1]; Zhongwu Zhang[1]; [1]Harbin Engineering University

**3:30 PM**
**Experimental Study on Formation Mechanism of Hot Charging Cracks of HSLA Steel**: Banglun Wang[1]; *Fenglian Wang*[1]; [1]Anhui Polytechnic University

**3:50 PM**
**Influence of Heat Treatment on PKS-HSS Cutting Tool (ASTM A600) and its Behaviour during Machining of Mild Steel (ASTM A36)**: Adeniran Afolalu[1]; Enesi Salawu[1]; Imhade Okokpujie[1]; Abiodun Abioye[1]; Olugbenga Omotosho[1]; Babatope Adejuyigbe[2]; Olayide Adetunji[3]; Omolayo Ikumapayi[4]; Oluwabunmi Abioye[1]; *Oluseyi Ajayi*[1]; [1]Covenant University; [2]Federal University of Oye; [3]Federal University of Agriculture, Abeokuta; [4]Afe Babalola University, Ado-Ekiti

## Mechanical Behavior at the Nanoscale IV – Twinning at the Nanoscale

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Monday PM
March 12, 2018
Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Irene Beyerlein, UCSB; Andrea Hodge, USC

**2:30 PM Invited**
**The Mechanics of Twinning at the Nanoscale**: *Irene Beyerlein*[1]; [1]University of California, Santa Barbara

**3:00 PM**
**Deformation Twinning in BCC Nanocrystals: Atomistic Modeling and In Situ Experiment**: *Yin Zhang*[1]; Jiangwei Wang[2]; Li Zhong[3]; Christopher Weinberger[4]; Scott Mao[3]; Ting Zhu[1]; [1]Georgia Institute of Technology; [2]Zhejiang University; [3]University of Pittsburgh; [4]Colorado State University

**3:20 PM**
**Mechanical Behavior and Strengthening Mechanisms of Nanotwinned AlMg Alloy**: *Sichuang Xue*[1]; Qiang Li[1]; Zhe Fan[2]; Yifan Zhang[1]; Han Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Texas A&M University

**3:40 PM Invited**
**Mechanical Behavior of Nanotwinned Alloys**: *Andrea Hodge*[1]; [1]University of Southern California

**4:10 PM Break**

**4:30 PM**
**In Situ Study on Strain-rate-dependent Work Hardening in FCC Co Dominated by High-density Stacking Faults**: *Ruizhe Su*[1]; Dajla Neffati[2]; Sichuang Xue[1]; Qiang Li[1]; Zhe Fan[1]; Yue Liu[3]; Haiyan Wang[1]; Yashashree Kulkarni[2]; Xinghang Zhang[1]; [1]Purdue University; [2]University of Houston; [3]Shanghai Jiao Tong University

**4:50 PM**
**Uniaxial Deformation of Nanotwinned Nanopillars/Nanotubes in Body-centered Cubic Tungsten**: *Shuozhi Xu*[1]; Thomas Payne[2]; Jacob Startt[2]; Chaitanya Deo[2]; David McDowell[2]; [1]University of California, Santa Barbara; [2]Georgia Institute of Technology

**5:10 PM**
**Development of New Titanium Alloys with High Strain Hardening Thanks to Combined TRIP and TWIP Effects: Microstructure/Mechanical Properties Relationships**: *Yolaine Danard*[1]; Lola Lilensten[1]; Cédrik Brozek[1]; Fan Sun[1]; Philippe Vermaut[1]; Frédéric Prima[1]; [1]PSL Research University, Chimie ParisTech — CNRS, Institut de Recherche de Chimie Paris

## Mechanical Characteristics and Application Properties of Metals and Non-metals for Technology: An EPD Symposium in Honor of Donato Firrao – Steel

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Jiann-Yang Hwang, Michigan Technological University; Bowen Li, Michigan Technological University; Pasquale Russo Spena, Free University of Bozen-Bolzano

Monday PM
March 12, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Pasquale Spena, Free University of Bozen-Bolzano; Jiann-Yang Hwang, Michigan Technological University

**2:30 PM Invited**
**Quench Embrittlement and Intergranular Fracture in High Carbon Steels**: *George Krauss*[1]; [1]Colorado School of Mines

**3:10 PM**
**Effect of Initial As-cast Structure on the Evolution of Microstructure and Texture and Finally Ridging Behavior of Ferritic Stainless Steel**: *Pranabananda Modak*[1]; Sudipta Patra[1]; Rahul Mitra[1]; Debalay Chakrabarti[1]; [1]Indian Institute of Technology Kharagpur

**3:30 PM**
**Tensile Behavior and Microstructure of TWIP Steels from Low to Warm Temperatures**: *Pasquale Russo Spena*[1]; [1]Free University of Bozen-Bolzano

**3:50 PM**
**Friction and Wear Characteristics of 304 Stainless and Rolled Upper Bainitic Rail Steels**: *Ayodeji Aapata*[1]; [1]Federal Polytechnic Idah

## Metal-Matrix Composites Innovations, Advances and Applications: An SMD Symposium in Honor of William C. Harrigan, Jr. – Synthesis and Developments of Emerging Composites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys, LLC; William Harrigan, Gamma Technology, LLC

Monday PM
March 12, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* Peter Liaw, University of Tennessee; Bakr Rabeeh, German University in Cairo, GUC

**2:30 PM Invited**
**Study on Hot Deformation Behavior and Processing Map of 20vol.%Al18B4O33w/2024 Composites**: *Wenchen Xu*[1]; [1]Harbin Institute of Technology

**3:00 PM**
**High-entropy-alloy Composites: Microstructures and Mechanical Behavior**: Rui Feng[1]; Michael C. Gao[2]; Xuesong Fan[1]; Haoyan Diao[1]; Wei Li[3]; *Peter K. Liaw*[1]; [1]The University of Tennessee; [2]National Energy Technology Laboratory; [3]University of Shanghai for Science and Technology

**3:20 PM**
**Mechanisms of Solid State Interactions of Titanium Nitride and Titanium Carbide Particles in a Secondary Hardenable Steel Matrix**: *Josef Pörnbacher*[1]; Stefan Marsoner[1]; Harald Leitner[2]; Gerald Ressel[1]; [1]Materials Center Leoben Forschung GmbH; [2]Böhler Edelstahl GmbH & Co KG

**3:40 PM**
**Influence of Interface Microstructure on Mechanical Properties of Metal/Ceramic Bonding in Cu-SiC and Cu-$Al_2O_3$ Composites**: *Dariusz Jarzabek*[1]; Marcin Chmielewski[2]; [1]Institute of Fundamental Technological Research; [2]Institute of Electronic Materials Technology

**4:00 PM Break**

**4:20 PM**
**Development and Characterization of In-situ Al-TiC Composites Prepared by Pneumatic Powder Injection Route**: *Sheetal Gupta*[1]; Anirban Giri[1]; Saikat Adhikari[1]; Vivek Srivastava[2]; [1]Aditya Birla Science & Tech. Co. Pvt. Ltd.; [2]Hindalco Industries Ltd.

**4:40 PM**
**The Effect of Si on the Interface Reaction of Ti3SiC2/Al Composites**: *Jianbo Zhang*[1]; Taotao Hu[1]; Yiming Jin[1]; [1]Jiangxi University of Science & Technology

**5:00 PM**
**The Synthesis and Processing of Light Weight Low Cost and High Performance Structural Aluminum Metal Matrix Composite Foam**: *Bakr Rabeeh*[1]; Mahmoud M. AbuEl-khier[1]; [1]German University in Cairo, GUC

**5:20 PM**
**Tensile Behavior of Hot Isostatically Pressed TiC-SKD11 Composite and Characteristic Analysis**: *Seong-Ju Park*[1]; Seung-Chan Cho[2]; Sang-Kwan Lee[2]; Dae-Ha Kim[3]; Keum-Cheol Hwang[3]; Hyun-Uk Hong[1]; [1]Department of Materials Science and Engineering, Changwon National University; [2]Composites Research Division, Korea Institute of Materials Science; [3]Daewha Alloytech

## Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Nanostructures and Polymer Nanocomposites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Meisha Shofner, Georgia Institute of Technology; Nikhilesh Chawla, Arizona State University

Monday PM
March 12, 2018
Room: 102C
Location: Phoenix Convention Center

*Session Chair:* Meisha Shofner, Georgia Institute of Technology

**2:30 PM Invited**
**Interfacial Study of Nanocomposites and Hybrid Systems**: *Jun Lou*[1]; [1]Rice University

**3:10 PM**
**In Situ Deformation Characteristics of a Free-standing Three-dimensional Graphene Foam-aluminum Nanohybrid**: *Pranjal Nautiyal*[1]; Mubarak Mujawar[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

**3:30 PM**
**Probing the Effects of Composition and Morphology on the Mechanical Properties of Nanocomposites Made via Liquid Metal Dealloying**: *Ian McCue*[1]; Bernard Gaskey[2]; Michael Demkowicz[1]; Jonah Erlebacher[2]; [1]Texas A&M University; [2]Johns Hopkins University

**3:50 PM**
**Synthesis and Characterization of Highly Porous Carbon from Waste Packaging Material for Value Added Products**: *Vijay Rangari*[1]; Mohanad Idrees[1]; [1]Tuskegee University

**4:10 PM Break**

**4:30 PM**
**Structure Property Relationship in Polyimide Nanocomposite for High-temperature Applications**: *Colin Rowbottom*[1]; Jonathan Spowart[2]; Hassan Mahfuz[1]; [1]Florida Atlantic University; [2]Air Force Research Laboratory

**4:50 PM**
**Ultra-high Elastic Strain Energy Storage in Hybrid Metal-oxide Infiltrated Polymer Nanocomposites**: *Keith Dusoe*[1]; Xinyi Ye[2]; Kim Kisslinger[2]; Aaron Stein[2]; Seok-Woo Lee[1]; Chang-Yong Nam[2]; [1]University of Connecticut; [2]Brookhaven National Laboratory

**5:10 PM**
**Carbon Nanocomposite for Reliable Seal Applications in High-temperature, High-pressure, Corrosive Environments**: *Lei Zhao*[1]; Zhiyue Xu[1]; [1]Baker Hughes, Inc.

**5:30 PM**
**The Dielectric Behavior in Reduced Graphene Oxide /Polymer Composites with a Segregated Structure**: *Yonghua Li*[1]; Mengkai Li[2]; [1]Harbin Engineering University; [2]Jilin University

## Non-equilibrium Features of Grain Boundaries – Structure of Non-equilibrium Grain Boundaries

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Liang Qi, University of Michigan; Yue Fan, University of Michigan, Ann Arbor; Josh Kacher, Georgia Tech; Elizabeth Holm, Carnegie Mellon University; Irene Beyerlein, University of California, Santa Barbara; Shigenobu Ogata, Osaka University

Monday PM
March 12, 2018
Room: 125A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:30 PM Invited**
**Understanding the Behavior of a Polycrystalline Aggregate with Sub-crystal Resolution Using High Energy X-rays**: *Matthew Miller*[1]; [1]Cornell University

**3:00 PM**
**Changes in the Grain Boundary Character and Curvature Distributions of Nickel at Multiple Annealing Stages from Three-dimensional X-ray Microscopy**: *Aditi Bhattacharya*[1]; C.M. Hefferan[2]; S.F. Li[3]; J. Lind[4]; Yufeng Shen[1]; R.M. Suter[1]; G.S. Rohrer[1]; [1]Carnegie Mellon University; [2]R. J. Lee Group; [3]Ditto Inc.; [4]Lawence Livermore National Laboratory

**3:20 PM**
**CSL Pinning Mechanism Associated with Non-thermally Activated Mobility in Sigma 7 and Sigma 9 Grain Boundaries**: *Jake Bair*[1]; Eric Homer[1]; [1]Brigham Young University

**3:40 PM**
**Discovering the Atomic Building Blocks of Grain Boundaries Using Machine Learning**: Conrad Rosenbrock[1]; Jonathan Priedeman[1]; *Eric Homer*[1]; Gus Hart[1]; Gábor Csányi[2]; [1]Brigham Young University; [2]University of Cambridge

**4:00 PM Break**

**4:20 PM Invited**
**Structures and Transitions in BCC W Grain Boundaries**: *Timofey Frolov*[1]; [1]Lawrence Livermore National Laboratory

**4:50 PM**
**Grain Boundary Network Structural Metrics and Phase Transitions**: *Oliver Johnson*[1]; Christian Kurniawan[1]; [1]Brigham Young University

**5:10 PM**
**Grain Boundary Structure Characterization with the Smooth Overlap of Atomic Positions Descriptor**: *Jonathan Priedeman*[1]; Conrad Rosenbrock[1]; Gus Hart[1]; Eric Homer[1]; [1]Brigham Young University

**5:30 PM**
**Mapping of 3D Grain Boundary Characteristics by LabDCT**: Nicolas Gueninchault[1]; Jun Sun[1]; Florian Bachmann[1]; Hrishikesh Bale[2]; Christian Holzner[2]; Leah Lavery[2]; *Erik Lauridsen*[1]; [1]Xnovo Technology ApS; [2]Carl Zeiss X-ray Microscopy Inc.

## Phase Transformation Across Multiscale Material Interfaces – Modeling and Joined Materials

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Soumya Nag, GE Global Research; Sudarsanam Babu, The University of Tennessee, Knoxville; Gregory Thompson, University of Alabama; Mohsen Asle Zaeem, Missouri University of Science and Technology; Niyanth Sridharan, Oak Ridge National Laboratory

Monday PM
March 12, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chairs:* Niyanth Sridharan, Oak Ridge National Laboratory; Timofey Frolov, UC Berkeley; Timothy Rupert, University of California, Irvine

**2:30 PM Invited**
**Effect of Lattice-level Covalent Character on Phase and Interfacial Stability in Mg-alloys**: D Choudhuri[1]; R Banerjee[1]; *Srinivasan Srivilliputhur*[1]; [1]University of North Texas

**3:00 PM Invited**
**Modeling Transitions at Interfaces**: *Timofey Frolov*[1]; [1]Lawrence Livermore National Laboratory

**3:30 PM Invited**
**Modeling of Complexion Transitions at One- and Two-dimensional Defects**: *Timothy Rupert*[1]; [1]University of California, Irvine

**4:00 PM Break**

**4:20 PM Invited**
**Efficient and Systematic Study of Phase Transformations Using Dual-anneal Diffusion Multiples**: *Ji-Cheng Zhao*[1]; [1]The Ohio State University

**4:50 PM**
**Analysis of the Stability of Interfaces Fabricated Using Solid State Welds**: *Niyanth Sridharan*[1]; Maxim Gussev[1]; Chad Parish[1]; Juan Carlos Tapia[1]; Kurt Terrani[1]; Sudarsanam Babu[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee Knoxville

**5:10 PM**
**Prevention of Coarsening Induced Phase Transformations in Al-Cu Alloys: Role of Interfaces**: *Amit Shyam*[1]; Dongwon Shin[1]; Yukinori Yamamoto[1]; Patrick Shower[1]; Brian Milligan[1]; James Morris[1]; Lawrence Allard[1]; Jonathan Poplawsky[1]; Juan Idrobo[1]; German Samolyuk[1]; James Haynes[1]; [1]Oak Ridge National Laboratory

## Phase Transformations and Microstructural Evolution – Phase Transformations in Steels II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Monday PM
March 12, 2018
Room: 129A
Location: Phoenix Convention Center

*Session Chairs:* Tushar Borkar, Cleveland State Univesity ; Peeyush Nandwana, ORNL

**2:30 PM**
**The Evolution of Grain Structure of Pure Iron during Directional Recrystallization**: *Ye Cui*[1]; Naimeng Liu[1]; Xianliang Xin[1]; Yang Zhang[1]; Dan Chen[1]; Zhongwu Zhang[1]; [1]Harbin Engineering University

**2:50 PM**
**Computational Design of Creep-resistant Ferritic Alloy Strengthened by Laves Phase**: *Chih-Hsiang Kuo*[1]; Benjamin Shassere[2]; Yukinori Yamamoto[2]; Sudarsanam Babu[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

**3:10 PM**
**Solid State Phase Transformation Mechanism in High Carbon Steel under Compressive Load and with Varying Cr Percent**: *Rumana Hossain*[1]; Farshid Pahlevani[1]; Veena Sahajwalla[1]; [1]Centre for Sustainable Materials, Research & Technology

**3:30 PM Demonstration: Poster Preview**

**4:00 PM Break**

**4:20 PM**
**Phase Transformations, Boron Segregation, and the Metatectic Reaction in Boron-containing Steels**: *Kara Luitjohan*[1]; Matthew Krane[1]; Volkan Ortalan[1]; David Johnson[1]; [1]Purdue University

**4:40 PM**
**Microstructure Characterization of Aged Heat Resistant Steels**: *Victor Lopez-Hirata*[1]; Maribel Saucedo-Muñoz[1]; Arturo Ortiz-Mariscal[1]; Jose Villegas-Cardenas[2]; [1]Instituto Politecnico Nacional (ESIQIE); [2]Universidad Politécnica

**5:00 PM**
**Abnormal Formation of the Sigma Phase in Sputter-deposited Austenitic Stainless Steel Coatings**: *Uma M.R. Seelam*[1]; Challapalli Suryanarayana[2]; [1]EAG Laboratories; [2]University of Central Florida

## Rare Metal Extraction & Processing – Rare Earth Elements II and Platinum Group Metals

*Sponsored by:* TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
*Program Organizers:* Hojong Kim, The Pennsylvania State University; Bradford Wesstrom, Freeport-McMoRan Copper & Gold; Shafiq Alam, University of Saskatchewan; Takanari Ouchi, The University of Tokyo; Gisele Azimi, University of Toronto; Neale Neelameggham, Ind LLC; Shijie Wang, Rio Tinto Kennecott Utah Copper; Xiaofei Guan, ShanghaiTech University

Monday PM
March 12, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* Hojong Kim, The Pennsylvania State University; Shijie Wang, Rio Tinto

**2:30 PM**
**Electrochemical Formation of Tb Alloys in Molten LiCl-KCl Eutectic Melts and Separation of Tb**: *Hirokazu Konishi*[1]; Hideki Ono[1]; Tetsuo Oishi[2]; Toshiyuki Nohira[3]; [1]Osaka University; [2]National Institute of Advanced Industrial Science and Technology (in Japan); [3]Kyoto University

**2:55 PM**
**Electrochemical and Spectroscopic Study of Eu(III)/Eu(II) Couple in the Ehtylmethylimidazolium Bis(trifluromethanesulfonyl)imide Ionic Liquid**: *David Bengio*[1]; Thomas Dumas[1]; Eric Mendes[1]; Pier Lorenzo Solari[2]; Richard Husar[1]; Michel Schlegel[3]; Philippe Moisy[1]; Stéphane Pellet-Rostaing[4]; [1]CEA Marcoule; [2]Synchrotron SOLEIL; [3]CEA Saclay; [4]ICSM

**3:20 PM**
**The Electrolytic Production of Rare Earths from their Oxides**: *James Withers*[1]; [1]ATS-MER, LLC

**3:45 PM**
**Commercial Processes for the Extraction of Platinum Group Metals (PGMs)**: *Rekha Panda*[1]; Manis Kumar Jha[1]; D. D. Pathak[2]; [1]CSIR-National Metallurgical Laboratory; [2]IIT-Indian School of Mines

**4:10 PM Break**

**4:30 PM**
**Recovery of Valuable Metals from Waste Printed Circuit Boards by Using Iodine-Iodide Leaching and Precipitation**: *Altansukh Batnasan*[1]; Kazutoshi Haga[1]; Atsushi Shibayama[1]; [1]Akita University

**4:55 PM**
**Cyclone Electrowinning of Amtimony from Antimonic Gold Concentrate Ores**: *Weijiao Yang*[1]; Liugen Sun[2]; Yihang Hu[3]; Yongqiang Yang[3]; Xingming Jiang[1]; Hua Wang[1]; [1]Kunming University of Science and Technology; [2] Beijing General Research Institute of Mining and Metallurgy; [3]Beijing General Research Institute of Mining and Metallurgy

## Recent Developments in Biological, Structural and Functional Thin Films & Coatings – Functional Films & Coatings I

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Adele Carradò, Université de Strasbourg IPCMS; Nancy Michael, University of Texas at Arlington; Ramana Chintalapalle, University of Texas - El Paso; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University; Gerald Ferblantier, Strasbourg University - ICube Laboratory

Monday PM
March 12, 2018

Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Ravindra Nuggenhalli, New Jersey Institute of Technology; Ramana Chintalapalle, University of Texas at El Paso El Paso - UTEP

**2:30 PM Keynote**
**Application of Synchrotron Techniques in Characterization of Metal Matrix Nano Composites**: *Prakash Srirangam*[1]; [1]University of Warwick

**3:10 PM Invited**
**Deformation, Failure and Fracture Mechanisms of ZrC-$ZrB_2$ and Cu-$ZrB_2$ Multilayered Nanostructures: An Atomistic Simulation Study**: *Ashfaq Adnan*[1]; Md. Kayser[1]; Krutarth Patel[1]; [1]The University of Texas at Arlington

**3:40 PM Invited**
**Exploring the Thermal and Mechanical Stability of Amorphous and Nanocrystalline Tantalum Films**: *Khalid Hattar*[1]; Olivia Donaldson[2]; Kathryn Small[1]; Jason Trelewicz[2]; [1]Sandia National Laboratories; [2]Stony Brook University

**4:10 PM Break**

**4:30 PM**
**Influence of Very Low Frequency on Particles in Freely Suspended Single Floating Droplet**: *Kinnari Shah*[1]; Nuggehalli Ravindra[2]; [1]LaGuardia Community College-CUNY; [2]New Jersey Institute of Technology

**4:50 PM**
**Stresses and Strains Effect on Light Emission from Indirect-bandgap Semiconductors**: *Sufian Abedrabbo*[1]; Nuggehalli Ravindra[2]; Anthony Fiory[2]; [1]Khalifa Institute of Science and Technology and the University of Jordan; [2]New Jersey Institute of Technology

**5:10 PM**
**Ceramic Nanofibers for High-temperature Gas Sensing Applications**: *Nanthakishore Makeswaran*[1]; James Kelly[2]; Jeffery Haslam[2]; Ramana Chintalapalle[1]; [1]University of Texas-El Paso; [2]Lawrence Livermore National Laboratory

**5:30 PM**
**Influence of Pressure and Temperature on Chromic Materials and their Technological Applications**: *Airefetalo Sadoh*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

## Refractory Metals 2018 – Refractory Metals and Alloys

*Sponsored by:* TMS Structural Materials Division, TMS: Refractory Metals Committee
*Program Organizers:* Eric Taleff, The University of Texas at Austin; Martin Heilmaier, Karlsruhe Institute of Technology (KIT); Kevin Jaansalu, Royal Military College of Canada

Monday PM
March 12, 2018

Room: 124A
Location: Phoenix Convention Center

*Session Chairs:* Martin Heilmaier, KIT Karlsruhe; Eric Taleff, The University of Texas at Austin

**2:30 PM**
**High Temperature Oxidation Behaviors of Refractory Complex Concentrated Alloys (RCCAs)**: *Todd Butler*[1]; Kevin Chaput[1]; James Dietrich[1]; Oleg Senkov[2]; [1]Air Force Research Laboratory; [2]UES, Inc.

**2:50 PM**
**Opportunities for BCC Refractory-metal-based Superalloys**: *Alexander Knowles*[1]; Howard Stone[2]; David Dye[1]; [1]Imperial College London; [2]University of Cambridge

**3:10 PM**
**High Ductility in Bulk Polycrystalline Tungsten Produced by Equal Channel Angular Extrusion**: *Zachary Levin*[1]; Karl Hartwig[1]; [1]Texas A&M University

**3:30 PM**
**Fracture Toughness Evaluation and Microstructural Characterization of Drawn Tungsten Wires**: *Vladica Nikolic*[1]; Manuel Pfeifenberger[1]; Anton Hohenwarter[2]; Reinhard Pippan[1]; [1]Austrian Academy of Sciences - Erich Schmid Institute of Materials Science; [2]Department of Materials Physics, University of Leoben

**3:50 PM**
**Fabrication of Tungsten Nanopowder by Combustion-based Method**: *Mingli Qin*[1]; Zheng Chen[1]; Xuanhui Qu[1]; [1]University of Science and Technology Beijing

**4:10 PM Break**

**4:30 PM**
**A Study on the Potential Analogous Rhenium Effect of Manganese in Tungsten-molybdenum Alloys Prepared by Mechanical Alloying**: Ossama Elsebaie[1]; *Kevin Jaansalu*[1]; [1]Royal Military College of Canada

**4:50 PM**
**Effect of Oxide Coating on the Fusion Welding of Molybdenum Tubing**: Samuel Barrette-Bédard[1]; *Kevin Jaansalu*[1]; [1]Royal Military College of Canada

**5:10 PM**
**A Metallurgical Study of Pressure Resistance Welded Molybdenum Based Materials**: *Sean Instasi*[1]; Nathan Jerred[1]; Indrajit Charit[1]; Gary Rozak[2]; [1]University of Idaho; [2]H.C. Starck Inc.

**5:30 PM**
**Characteristics of Dynamic Abnormal Grain Growth in Mo and Ta**: *Eric Taleff*[1]; [1]The University of Texas at Austin

## Scandium Extraction and Use in Aluminum Alloys – Scandium Extraction

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* John Grandfield, Grandfield Technology Pty Ltd; Aleksandr Krokhin, Rusal GM; Dmitry Eskin, Brunel University London; Antoine Allanore, Massachusetts Institute of Technology; Nigel Ricketts, Scandium International Mining Corp

Monday PM
March 12, 2018
Room: 222B
Location: Phoenix Convention Center

*Session Chair:* Nigel Ricketts, Scandium International Mining

**2:30 PM Introductory Comments**

**2:40 PM**
**Commercial Scandium Oxide Production by Sumitomo Metal Mining Co., Ltd.**: *Fumio Iwamoto*[1]; Nobuhiro Matsumoto[1]; [1]Sumitomo Metal Mining Co., Ltd.

**3:10 PM**
**Scandium Recovery from the Nyngan Laterite Project in NSW**: *Nigel Ricketts*[1]; Willem Duyvesteyn[2]; [1]EMC Metals Australia Pty Ltd; [2]Scandium International Mining Corp

**3:30 PM**
**Electrochemical Formation of Alloys of Scandium in Molten Salts**: *Çaglar Polat*[1]; Metehan Erdogan[2]; Ali Iplikçioglu[3]; Ishak Karakaya[1]; [1]Middle East Technical University; [2]Yildirim Beyazit University; [3]MINERTEK

**3:50 PM**
**Extraction of Scandium from Lateritic Nickel-cobalt Ore Leach Solution by Ion Exchange: A Special Study and Literature Review on Previous Works**: *Yigit Altinsel*[1]; Yavuz Topkaya[2]; Serif Kaya[2]; Bülent Sentürk[1]; [1]META Nikel Kobalt A.S.; [2]METU

**4:10 PM Break**

**4:25 PM**
**Direct Method for Producing Scandium Metal and Scandium-aluminium Intermetallic Compounds from the Oxides**: *Ana Maria Martinez*[1]; Karen Osen[1]; Henrik Gudbrandsen[1]; Camilla Sommerseth[1]; Zhaohui Wang[1]; Ove Darell[1]; [1]SINTEF

## Surface Engineering for Improved Corrosion Resistance – Session I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Rajeev Gupta, The University of Akron; Sandip Harimkar, Oklahoma State University; Carlos Schvezov, Institute of Materials of Misiones; Arvind Agarwal, Florida International University

Monday PM
March 12, 2018
Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Arvind Agarwal, Florida International University; Rajeev Gupta, The University of Akron

**2:30 PM Invited**
**Corrosion Resistant Magnesium Surface Alloys by SMASH**: *Krista Limmer*[1]; Joseph Labukas[1]; Heather Murdoch[1]; [1]U.S. Army Research Laboratory

**2:50 PM Invited**
**Enhancing the Corrosion Resistance of Biodegradable WE43 Mg Alloy via Solid Solution Alloying**: *Wenjun Cai*[1]; [1]University of South Florida

**3:10 PM**
**Performance of Thermal Spray Coating on Proprietary Magnesium/ Aluminum Alloy**: *Deepak Kumar*[1]; Zhiyue Xu[1]; [1]Baker Hughes Inc.

**3:30 PM Invited**
**Influence of Surface Chemistry on the Formation of Crystalline Hydroxide Coatings on Mg Alloys in Liquid Water and Steam Systems**: *Xiaobo Chen*[1]; Chong Ke[2]; Nick Birbilis[2]; [1]RMIT; [2]Monash University

**3:50 PM Break**

**4:10 PM**
**Examining the Corrosion Resistance of Magnesium Coated with Polyetherimide Using Three Different Methods**: *Holly Martin*[1]; Snjezana Balaz[1]; [1]Youngstown State University

**4:30 PM**
**Study on Corrosion Behavior of Rare-earth Added High Strength Magnesium in Presence of 8-hydroxyquinoline Corrosion Inhibitor**: *Gaurav Argade*[1]; Gowri Mohandass[1]; Steve Sanders[1]; Francis D'souza[1]; Teresa Golden[1]; Rajiv Mishra[1]; [1]University of North Texas

**4:50 PM**
**Impact of Pre-straining Induced Surface Modification on the Corrosion Resistance of Lean Duplex Stainless Steel**: Charles David[1]; Fiona Ruel[1]; Saghi Saedlou[1]; Paulina Erazmus-Vignal[2]; Vincent Vignal[3]; *Muriel Veron*[4]; Ricardo Nogueira[5]; [1]Aperam Stainless Europe; [2]SATT Grand Est; [3]ICB, UMR 6303 CNRS - Université Bourgogne Franche-Comté; [4]SIMAP, UMR 5266 CNRS - Université Grenoble-Alpes; [5]The Petroleum Institute

**5:10 PM**
**Corrosion Behavior of Microarc Oxidized Mg Alloy in Simulated Body Fluid**: Junqing Zhang[1]; *Lei Zhang*[1]; Benjamin Wilke[1]; Weiping Li[2]; Chengyun Ning[2]; Tonoy Chowdhury[1]; [1]University of Alaska Fairbanks; [2]South China University of Technology

**5:30 PM**
**Corrosion Characteristics of Additively Manufactured Materials**: *Daniel Hooks*[1]; Tom Leinert[1]; Justin Tokash[1]; [1]Los Alamos National Laboratory

## Surface Interactions in Materials – Physical and Mechanical Interactions

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Carlos Schvezov, Institute of Materials of Misiones; Sandip Harimkar, Oklahoma State University; Rajeev Gupta, The University of Akron

Monday PM
March 12, 2018
Room: 101A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:30 PM**
**Melt Expulsion during Ultrasonic Vibration-assisted Continuous Wave Laser Surface Melting**: *Sandip Harimkar*[1]; S. Habib Alavi[1]; [1]Oklahoma State University

**2:50 PM**
**Support Structure-dependent Reduction of Cobalt Oxide on Ceria**: *Zhongqi Liu*[1]; Ruigang Wang[1]; [1]The University of Alabama

**3:10 PM**
**Effect of Trace Addition of Graphene in Tribological Properties of Ultrasonic Vibration-assisted Laser Surface Textured Stainless Steel**: *Sourabh Biswas*[1]; Linqi Zhang[1]; Seyyed Habib Alavi[1]; Ali Kalkan[1]; Sandip Harimkar[1]; [1]Oklahoma State University

**3:30 PM**
**Wear Mechanism for H13 Steel Tool during Friction Stir Welding of CuCrZr Alloy**: *Pankaj Sahlot*[1]; Rajiv Mishra[2]; Amit Arora[1]; [1]Indian Institute of Technology Gandhinagar; [2]University of North Texas

**3:50 PM Break**

**4:05 PM**
**Understanding the Effects of Lubricants/Coatings on Friction and Wear during Reciprocatory Sliding Motion at High Contact Pressures**: *Dewika Mishra*[1]; Farjana Sonia[1]; Muntashir Hayat[1]; Ranjan Kathuria[1]; Dinesh Srivastava[2]; G. Ganesha[2]; Utpal Singha[2]; Amartya Mukhopadhyay[1]; [1]Indian Institute of Technology Bombay; [2]Nuclear Fuel Complex, Department of Atomic Energy

**4:25 PM**
**Surface Mediated Diffusive Deformation in Nanometer-sized Metallic Crystals**: *Scott Mao*[1]; Li Zhong[1]; Frederic Sansoz[2]; Yang He[1]; Chongmin Wang[3]; Ze Zhang[4]; [1]University of Pittsburgh; [2]University of Vermont; [3]Pacific Northwest National Laboratory; [4]Zhejiang University

**4:45 PM**
**Deformation of Erythrocytes Adhered to a Solid Surface by a Laminar Flow**: Alejandro Moreno[1]; Jonathan M. Schuster[2]; *Carlos Schvezov*[3]; Mario Rosenberger[3]; [1]IMAM (UNaM-Conicet) - FCEQyN (UNaM); [2]IMAM (UNaM-Conicet) - Inst. Sabato (UNSAM-CNEA); [3]IMAM (UNaM-Conicet)

**5:05 PM**
**Surface Roughening by Plastic Deformation in Amorphous and Crystalline Solids**: *Adam Hinkle*[1]; Lars Pastewka[2]; [1]Sandia National Laboratories; [2]Albert Ludwig University of Freiburg

## Ultrafine-grained Materials X – Pioneers of Alternative SPD Methods

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Monday PM
March 12, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:30 PM Keynote**
**Ultra-fine Grained Al Alloys and Composites Processed via Powder Metallurgy Route**: Yaojun Lin[1]; Ying Li[2]; Tao Hu[2]; Fei Chen[1]; *Enrique Lavernia*[3]; [1]Wuhan University of Technology; [2]University of California, Davis; [3]University of California, Irvine

**3:00 PM Keynote**
**Accumulative Roll Bonding (ARB) for Making Bulky Metals with Ultrafine Grained Structures**: *Nobuhiro Tsuji*[1]; [1]Kyoto University

**3:30 PM Keynote**
**Exceptional Properties by Expanding Microstructural Landscape via Friction Stir Processing**: *Rajiv Mishra*[1]; [1]University of North Texas

**4:00 PM Break**

**4:20 PM Keynote**
**Heterogeneous Structures: The Next Hot Research Area?!**: *Yuntian Zhu*[1]; Xiaolei Wu[2]; [1]North Carolina State University; [2]Institute of Mechanics, Chinese Academy of Science

**4:50 PM Invited**
**Extending the Limits of Nanostructured Metals Created by Dislocation Plasticity**: *Darcy Hughes*[1]; Tianbo Yu[2]; Niels Hansen[2]; Xiaoxu Huang[2]; [1]Consultant; [2] Technical University of Denmark

**5:20 PM Panel Discussion**

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – Nanomaterials for Environmental and Energy Applications

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

Tuesday AM
March 13, 2018
Room: 101B
Location: Phoenix Convention Center

*Session Chairs:* Chang-Yong Nam, Brookhaven National Lab; Dong Lin, Kansas State University

**8:30 AM Invited**
**Functional Oxide Nanotubes for Energy and Environmental Applications**: *Oomman Varghese*[1]; [1]University of Houston

**9:00 AM**
**Mixed-phase Nanoscale $TiO_2$ Photocatalysts: Aqueous Synthesis and Application to Water Detoxification**: *Konstantina Chalastara*[1]; George Demopoulos[1]; [1]McGill University

**9:20 AM Invited**
**Microfluidic Synthesis of Functional Nanomaterials: Principles, Design and its Applications in Biomedical Engineering**: *John Zhang*[1]; Nanjing Hao[1]; Yuan Nie[1]; [1]Dartmouth College

**9:50 AM**
**An Enhanced Electrochemical Biosensor Based on Novel 3D Nanowire Array/Nanoparticles Hybrid Structures**: *Zhiyang Li*[1]; Fan Gao[1]; Zhiyong Gu[1]; [1]University of Massachusetts Lowell

**10:10 AM Break**

**10:30 AM**
**Nickel Promoted CO Oxidation over Ceria Supported Cobalt-nickel Bimetallic Oxide Catalysts**: *Zhongqi Liu*[1]; Ruigang Wang[1]; [1]The University of Alabma

**10:50 AM Invited**
**Scalable and Hierarchical Nanostructure Integration for Energy and Environmental Applications**: *Pu-Xian Gao*[1]; [1]University of Connecticut

**11:20 AM**
**Sensing Properties of Nano $RuO_2$ in Amorphous $Ta_2O_5$ to Hydrogen Phosphate and Hydrogen Carbonate Ions**: Ai Honda[1]; Kenji Kawaguchi[1]; *Masatsugu Morimitsu*[1]; [1]Doshisha University

## 9th International Symposium on High Temperature Metallurgical Processing – Alloys and Materials Preparation

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Tuesday AM
March 13, 2018
Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Dean Gregurek, RHI AG; Yuanbo Zhang, Central South University

**8:30 AM Introductory Comments**

**8:35 AM**
**Supersolidus Liquid Phase Sintering of H13 Tool Steel Fabricated via Binder Jet Additive Manufacturing**: *Peeyush Nandwana*[1]; Derek Siddel[1]; Christopher Shafer[1]; Amy Elliott[1]; [1]Oak Ridge National Laboratory

**8:55 AM**
**High throughput Experimental Technologies for Novel Amorphous Metallic Materials Research**: Xiaoping Jiang[1]; *Andy Huang*[1]; Parker Liu[1]; [1]MTI Corporation

**9:15 AM**
**Pilot Scale Production of Ferrochrome with Si Wafer Kerf Loss Reductants Using 280kW Direct Current Arc Furnace**: *Jong Ho Kim*[1]; [1]Research Institute of Industrial Science and Technology

**9:35 AM**
**Sintering Study of WC-Co Hardmetals Obtained from Nanocrystalline Powders**: *Zhao Ding*[1]; Leon L. Shaw[1]; [1]Illinois Institute of Technology

**9:55 AM Break**

**10:15 AM**
**Synthesis of Nanocrystalline Carbide Ceramics via Reduction of Anion-loaded Activated Carbon Precursors**: *Grant Wallace*[1]; Jerome Downey[1]; Jannette Chorney[1]; Katie Schumacher[1]; Alaina Mallard[1]; [1]Montana Tech of the University of Montana

**10:35 AM**
**Growth of Iridium and Iridium Alloy Fibers from the Melt by Alloy-micro-pulling-down Method**: *Yuui Yokota*[1]; Takayuki Nihei[1]; Yuji Ohashi[1]; Shunsuke Kurosawa[1]; Kei Kamada[1]; Akira Yoshikawa[1]; [1]Tohoku University

**10:55 AM**
**Production of Lithium-Ion Cathode Material for Automotive Batteries Using Melting Casting Process**: *Delin Li*[1]; Wojciech Kasprzak[1]; Gregory Patience[2]; Pierre Sauriol[2]; Hernando Villazón Amarís[2]; Mickaël Dollé[3]; Michel Gauthier[3]; Steeve Rousselot[3]; Thomas Bibienne[3]; Majid Talebi-Esfandarani[3]; Yulong Liu[4]; Xueliang Sun[4]; Guoxian Liang[5]; [1]CanmetMATERIALS; [2]Polytechnique Montréal; [3]Université de Montréal; [4]Western University; [5]Johnson Matthey Battery Materials ltd

**11:15 AM**
**Fabrication Methods and Applications of Microstructured Carbon Based Liquid Copper Alloys**: *Khurram Iqbal*[1]; [1]University of Karachi

**11:35 AM**
**Structural Analysis of Ge-containing Ferrous Calcium Silicate Magnesia Slag for Applications of Black Copper Smelting**: Mohammad Al Hossaini Shuva[1]; M Akbar Rhamdhani[1]; *Geoffrey A Brooks*[1]; Syed H Masood[1]; Markus A Reuter[2]; [1]Swinburne University of Technology; [2]Helmholtz Institute Freiberg for Resource Technology

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Modeling-simulation and Fundamental Studies

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

Tuesday AM
March 13, 2018
Room: 102A
Location: Phoenix Convention Center

*Session Chairs:* Yongfeng Zhang, Idaho National Laboratory; Clinique Brundidge, Naval Nuclear Laboratory

**8:30 AM**
**A Heterogeneous Cavity Nucleation Model for Swelling in Simulated Ferritic Alloys**: *Gerrit VanCoevering*[1]; Aaron Kohnert[2]; Brian Wirth[3]; Gary Was[1]; [1]University of Michigan; [2]Los Alamos National Laboratory; [3]University of Tennessee

**8:55 AM**
**Accelerated Materials Evaluation of Damage Mechanisms in Concentrated Solid Solution Alloys**: *Yanwen Zhang*[1]; Gihan Velisa[1]; Shijun Zhao[1]; Mohammad Ullah[1]; Ke Jin[1]; Hongbin Bei[1]; William Weber[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

**9:20 AM**
**Simulation of Impact Toughness with the Effect of Temperature and Irradiation in Steels**: *Chenchong Wang*[1]; Wei Xu[2]; Chi Zhang[1]; [1]Tsinghua University; [2]Northeastern University

**9:45 AM**
**Impact of Irradiation-Enhanced Diffusion on Implanted Ion Profiles**: *Peter Doyle*[1]; Kelsa Benensky[1]; Steven Zinkle[1]; [1]University of Tennessee, Knoxville

**10:10 AM Break**

**10:30 AM Invited**
**Atomistically-informed Cluster Dynamics Modeling of Defect Cluster Evolution in Irradiated Structural Materials**: *Brian Wirth*[1]; Aaron Kohnert[2]; Andrew Payant[1]; [1]University of Tennessee; [2]Los Alamos National Laboratory

**11:00 AM**
**Ion and Neutron Irradiation Effects in a Co-free High Entropy Alloy**: *Congyi Li*[1]; Xunxiang Hu[2]; Tengfei Yang[3]; Brian Wirth[3]; Steve Zinkle[3]; [1]Bredesen Center; [2]Oak Ridge National Laboratory; [3]University of Tennessee, Knoxville

**11:25 AM**
**Microstructural Evaluation of Ion Irradiated Model Binary Alloys**: *Ling Wang*[1]; Steve Zinkle[1]; [1]University of Tennessee

## Accident Tolerant Fuels for Light Water Reactor – Advanced Fuels

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

Tuesday AM
March 13, 2018
Room: 104A
Location: Phoenix Convention Center

*Session Chairs:* Andrew Nelson, Los Alamos National Laboratory; Jason Harp, Idaho National Laboratory

**8:30 AM Invited**
**Uranium Silicide Behavior in Reactor Relevant Atmospheres**: *Elizabeth Sooby Wood*[1]; Joshua White[1]; Christopher Grote[1]; Andrew Nelson[1]; [1]Los Alamos National Laboratory

**9:00 AM**
**Microstructure Studies of Interdiffusion Behavior of $U_3Si_2$ and SiC**: Rita Hoggan[1]; Jason Harp[1]; *Lingfeng He*[1]; [1]Idaho National Laboratory

**9:20 AM**
**Spark Plasma Sintering and Microstructural Analysis of Pure and Mo Doped U3Si2 Pellets**: *Denise Adorno Lopes*[1]; Anna Benarosch[1]; Simon Middleburgh[2]; Kyle Johnson[3]; [1]Royal Institute of Technology; [2]Westinghouse Electric Sweden; [3]Studsvik Nuclear

**9:40 AM**
**Microstructure Characterization of $U_3Si_2$ Irradiated by High-energy Ions at LWR Temperatures**: *Yinbin Miao*[1]; Jason Harp[2]; Kun Mo[1]; Shaofei Zhu[1]; Abdellatif Yacout[1]; [1]Argonne National Laboratory; [2]Idaho National Laboratory

**10:00 AM Break**

**10:20 AM Invited**
**Laser Based Characterization of Microstructure and Thermal Properties in Nuclear Fuel Materials**: *Marat Khafizov*[1]; [1]The Ohio State University

**10:50 AM**
**The Microstructure and Fission Product Behavior in Irradiated AGR TRISO Fuel Particles**: *Isabella van Rooyen*[1]; Matthew Cook[1]; Yong Yang[1]; [1]University of Florida

**11:10 AM**
**Molecular Dynamics Investigation of Interfaces in $U_3Si_2$**: *Benjamin Beeler*[1]; Michael Baskes[2]; David Andersson[3]; Yongfeng Zhang[1]; [1]Idaho National Laboratory; [2]University of California, San Diego; [3]Los Alamos National Laboratory

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Mechanical Behavior of Additively Manufactured Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Tuesday AM
March 13, 2018
Room: 231AB
Location: Phoenix Convention Center

*Session Chairs:* Lee Semiatin, Air Force Research Laboratory; Edwin Schwalbach, Air Force Research Laboratory

**8:30 AM Invited**
**Process-microstructure-property-performance Relationships in Electron Beam Additively Manufactured Ti-6Al-4V**: Brian Hayes[1]; Brian Welk[2]; Sam Kuhr[2]; Wenqi Li[3]; Thomas Ales[4]; Iman Ghamarian[4]; Matt Clark[3]; D. Harlow[5]; Hamish Fraser[2]; *Peter Collins*[4]; [1]UES; [2]Ohio State University; [3]University of Nottingham; [4]Iowa State University; [5]Lehigh University

**9:00 AM Invited**
**Strength Variability Assessment within an SLM Ti-6AL-4V Component**: *Nicholas Mule*[1]; [1]Aerojet Rocketdyne

**9:30 AM**
**Location Dependent Shear Strength Testing of Additively Manufactured Titanium**: *Matthew Vaughn*[1]; Andrew Gaynor[2]; Justin Unger[1]; Jamie Guest[1]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]U.S. Army Research Laboratory

**9:50 AM**
**Dynamic Mechanical Response of AMTi64: Effect of Post-processing Treatments**: *Sindhura Gangireddy*[1]; Rajiv Mishra[2]; Eric Faierson[2]; [1]National Institute of Standards and Technology; [2]UNT Denton

**10:10 AM Break**

**10:30 AM**
**Effect of Laser Scan Strategy and Post Processing on High Strain Rate Deformation Response of Additively Manufactured Stainless Steel**: *Brandon McWilliams*[1]; Brahmananda Pramanik[2]; Andelle Kudzal[3]; Bruce Madigan[2]; [1]US Army Research Laboratory; [2]Montana Tech; [3]Worcester Polytechnic Institute

**10:50 AM Invited**
**Implications of Crystallographic Texture and High Dislocation Density in Selective Laser Melted Stainless Steel 316L**: *Sean Agnew*[1]; Md Shamsujjoha[1]; J. Fitz-Gerald[1]; [1]University of Virginia

**11:20 AM**
**Deformation Mechanisms of SLM 316L Stainless Steels and Ti-6Al-4V Alloys**: *Thomas Voisin*[1]; Joseph McKeown[1]; Jianchao Ye[1]; Nicholas Calta[1]; Ross Cunningham[2]; Anthony Rollett[2]; Melissa Santala[3]; Morris Wang[1]; [1]Lawrence Livermore National Laboratory; [2]Carnegie Mellon University; [3]Oregon State University

**11:40 AM**
**Compositional Influence on Microstructure and Mechanical Behavior of Additively Manufactured Austenitic Stainless Steels**: *Thale Smith*[1]; Katherine Terrassa[2]; Baolong Zheng[2]; Joshua Sugar[3]; Chris San Marchi[3]; Julie Schoenung[2]; [1]University of California, Davis; [2]University of California, Irvine; [3]Sandia National Laboratories

**12:00 PM**
**In-situ Synchrotron X-ray Diffraction Measurements of Mechanical Properties, Phase Transformation, and Strain Pole Figures of Additively Produced 17-4 Stainless Steel by Laser Powder Bed Fusion**: *Thien Phan*[1]; Darren Pagan[2]; [1]National Institute of Standards and Technology; [2]Cornell High Energy Synchrotron Source

## Additive Manufacturing of Metals: Fatigue and Fracture – Session II

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

Tuesday AM
March 13, 2018
Room: 232A
Location: Phoenix Convention Center

*Session Chair:* John Lewandowski, Case Western Reserve University

**8:30 AM Invited**
**The 3rd Sandia Fracture Challenge: Blind Predictions of Fracture Performance in Laser Powder Bed 316L**: *Brad Boyce*[1]; Sharlotte Kramer[1]; [1]Sandia National Laboratories

**9:00 AM**
**Additive Manufacturing: Efficient Evaluation of Fatigue Properties Using Short-time Procedures Based on Cyclic Indentation and Physical Quantities**: *Marcus Klein*[1]; Bastian Blinn[1]; Tilmann Beck; [1]TU Kaiserslautern

**9:20 AM**
**Fatigue Prediction for AlSi10Mg Parts Produced by Laser Powder-bed Fusion**: *P. Chris Pistorius*[1]; Ming Tang[1]; [1]Carnegie Mellon University

**9:40 AM**
**Investigating Strain Localization in Additively Manufactured Ti-alloys Using Experimentally Validated Crystal Plasticity Simulations, Explicitly Accounting for Residual Stresses**: *Kartik Kapoor*[1]; Todd Book[1]; Michael Sangid[1]; [1]Purdue University

**10:00 AM Break**

**10:20 AM Invited**
**Fatigue Propterties of AlSi10Mg Manufactured by SLM: the Role of Defects**: *Stefano Beretta*[1]; [1]Politecnico di Milano

**10:50 AM**
**Investigating Defect Formation Mechanisms in Powder-bed Metal Additive Manufacturing Using Synchrotron-based High-speed X-ray Radiography and Microtomography**: *Ross Cunningham*[1]; Cang Zhao[2]; Tao Sun[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory

**11:10 AM**
**Microstructural Effects on Environmental Assisted Crack Growth Behaviors of Austenitic Stainless Steel by Laser Powder Bed Fusion**: *Xiaoyuan Lou*[1]; Raul Rebak[2]; [1]CorroMet LLC; [2]GE Global Research

**11:30 AM**
**Effects of Internal Porosity and Anisotropic Microstructure on Instrumented Charpy Impact Energy for EBM Ti-6Al-4V**: *Nik Hrabe*[1]; Enrico Lucon[1]; Ryan White[1]; [1]National Institute of Standards and Technology

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – Beam Line Science in Additive Manufacturing

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

Tuesday AM
March 13, 2018
Room: 230
Location: Phoenix Convention Center

*Session Chairs:* Reeju Pokharel, Los Alamos National Laboratory; Christoph Kenel, Northwestern University

**8:30 AM Invited**
**High-speed Synchrotron X-ray Imaging of Laser Powder Bed Fusion Process**: Cang Zhao[1]; Kamel Fezzaa[1]; Ross Cunningham[2]; Lianyi Chen[3]; Anthony Rollett[2]; *Tao Sun*[1]; [1]Argonne National Laboratory; [2]Carnegie Mellon University; [3]Missouri University of Science and Technology

**9:00 AM Invited**
**In Situ and Real-time Investigation of AM Process by Combining High-speed X-ray Imaging, Acoustic and Optical Sensors and Machine Learning**: *Kilian Wasmer*[1]; [1]Empa - Swiss Federal Laboratories for Materials Science and Technology

**9:30 AM Invited**
**In-situ Neutron Diffraction Measurements for Isolating Microstructural Effects on Mechanical Properties of As-built AM 304L SS**: *Reeju Pokharel*[1]; Anirban Patra[1]; Don Brown[1]; Bjorn Clausen[1]; [1]Los Alamos National Laboratory

**10:00 AM Break**

**10:20 AM Invited**
**In Situ Synchrotron X-ray Diffraction and Tomography for Time-resolved Study of Phase and Structure Evolution during Consolidation of AM Metals**: *Christoph Kenel*[1]; Christian Leinenbach[2]; Ramille Shah[1]; David Dunand[1]; [1]Northwestern University; [2]Empa - Swiss Federal Laboratories for Materials Science and Technology

**10:50 AM**
**Investigating Stress Relaxation Behavior and Mechanisms in Ti- and Ni-alloys by In Situ Neutron Diffraction: Application to Additive Manufacturing**: *Zhuqing Wang*[1]; Alexandru Stoica[2]; Dong Ma[2]; Allison Beese[1]; [1]Pennsylvania State University; [2]Oak Ridge National Laboratory

**11:10 AM**
**Quasi In Situ Investigation of Microstructure Evolution in Additively Manufactured Layers**: *Maria Strantza*[1]; Bjorn Clausen[1]; John S. Carpenter[1]; Jason C. Cooley[1]; Donald W. Brown[1]; [1]Los Alamos National Laboratory

**11:30 AM**
**Structure / Property (Constitutive and Dynamic Strength / Damage) Characterization of Additively Manufactured (AM) Tantalum**: *George Gray*[1]; Cameron Knapp[1]; Veronica Livescu[1]; David Jones[1]; Saryu Fensin[1]; Carl Trujillo[1]; Daniel Martinez[1]; [1]Los Alamos National Laboratory

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Damage / Phase Transformation Plasticity

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Tuesday AM
March 13, 2018
Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* Benjamin Morrow, Los Alamos National Laboratory; Hiroyuki Toda, Kyushu University

**8:30 AM Invited**
**Combining Experiments and Models via a Bayesian Network Approach to Predict Short Fatigue Crack Growth**: Andrea Rovinelli[1]; *Michael Sangid*[1]; Yoann Guilhem[2]; Henry Proudhon[3]; Ricardo Lebensohn[4]; Wolfgang Ludwig[5]; [1]Purdue University; [2]ENS de Cachan; [3]MINES ParisTech; [4]Los Alamos National Laboratory; [5]INSA Lyon

**9:00 AM**
**Statistical Model Based on Large Field-of-view Images Predicts Microstructural Damage-sites**: *Benjamin Cameron*[1]; C. Tasan[1]; [1]MIT

**9:20 AM**
**Understanding Effect of Texture and Topology on Stress Hotspots Using Machine Learning**: *Ankita Mangal*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

**9:40 AM Invited**
**4D Hydrogen Embrittlement Behaviour in High Strength Aluminium Alloy**: *Hiroyuki Toda*[1]; Kazuyuki Shimizu[1]; H. Gao[1]; Kyosuke Hirayama[1]; [1]Kyushu University

**10:10 AM Break**

**10:30 AM Invited**
**In-situ Experiments to Capture the Rapid Evolution of Microstructure during Phase Transformation of Titanium Under Dynamic Loading**: *Benjamin Morrow*[1]; David Jones[1]; Paulo Rigg[2]; Ellen Cerreta[2]; [1]Los Alamos National Laboratory; [2]Washington State University

**11:00 AM**
**Novel 3D Crystallite-scale Characterization of Deformation during Cyclic Loading of Low Crystal-symmetry Phases**: *Partha Paul*[1]; Harshad Paranjape[2]; Darren Pagan[3]; L Catherine Brinson[1]; Aaron Stebner[2]; [1]Northwestern University; [2]Colorado School of Mines; [3]Cornell University

**11:20 AM**
**In-situ Neutron Diffraction during Biaxial Strain Path Changes**: Tobias Panzner[1]; Karl Sofinowski[1]; Efthymios Polatidis[1]; Miroslav Smid[1]; Steven Van Petegem[1]; *Helena Van Swygenhoven*[1]; [1]Paul Scherrer Institut

**11:40 AM**
**In Situ Electron Microscopy Investigation on Plastic Deformation in a Metastable Beta Titanium Alloy**: *Kui Du*[1]; Tingting Yao[1]; Miao Song[1]; Yulin Hao[1]; Rui Yang[1]; Hengqiang Ye[1]; [1]Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

**12:00 PM**
**Characterization of the Factors Influencing Retained Austenite Transformation in Q&P Steels via EBSD Analysis**: *Derrik Adams*[1]; David Fullwood[1]; Jeff Cramer[1]; Shamoon Irfan[1]; Hannah Evanson[1]; Tyler Mathis[1]; Stephen Cluff[1]; Mike Miles[1]; Eric Homer[1]; Tyson Brown[2]; Raj Mishra[2]; Robert Kubic[2]; [1]Brigham Young University; [2]General Motors

## Advanced High-strength Steels – 1st Generation AHSS

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Tuesday AM
March 13, 2018
Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Tadashi Furuhara, Tohoku University; Nobuhiro Tsuji, Kyoto University

**8:30 AM Invited**
**Important Factors to Design High-strength Ferritic Steel with Nano-sized Interphase Precipitation of Alloy Carbide**: *Tadashi Furuhara*[1]; Yongjie Zhang[1]; Goro Miyamoto[1]; [1]Tohoku University

**8:55 AM**
**Delamination Crack, Core/Shell Interface Precipitate, and Mechanical Properties in HSLA Steels**: *Jae Bok Seol*[1]; J.-C. Han[2]; S.-H. Na[2]; [1]NINT, POSTECH; [2]POSTECH

**9:15 AM**
**Significant Influence of Carbon and Niobium on the Precipitation Behavior and Microstructural Evolution and their Consequent Impact on Mechanical Properties in Microalloyed Steels**: Devesh Misra[1]; *Vignesh Natarajan*[1]; DM Sidorenko[2]; MD Mullholland[2]; M Manohar[2]; JE Hartmann[2]; [1]University of Texas at El Paso; [2]ArcelorMittal Research and Development Center – Chicago

**9:35 AM**
**Nanoscale Precipitation and Strengthening Mechanisms in Steels**: *Zhongwu Zhang*[1]; SongSong Xu[1]; Yu Zhao[1]; [1]Harbin Engineering University

**9:55 AM**
**Effect of Untransformed Ferrite on Tensile and Impact Properties of Martensitic Hot-press-forming Steels**: *Min Cheol Jo*[1]; Jaeyeong Park[1]; Seok Su Sohn[1]; Seongwoo Kim[2]; Jinkeun Oh[2]; Sunghak Lee[1]; [1]POSTECH; [2]POSCO

**10:15 AM Break**

**10:30 AM Invited**
**Deformation Mechanism of Dual Phase Steels Composed of Ferrite and Martensite**: *Nobuhiro Tsuji*[1]; Myeong-heom Park[1]; Daisuke Terada[2]; Yu Bai[1]; Akinobu Shibata[1]; [1]Kyoto University; [2]Chiba Institute of Technology

**10:55 AM**
**An Original Press Hardening Steel with Excellent Application Properties Produced by Compact Strip Process Technology**: *Wang Hui*[1]; Xinping Mao[1]; Jinqiao Xu[1]; Tao Gong[1]; Jie Wu[1]; Kuanhui Hu[1]; Rutao Zhong[1]; Hao Peng[1]; Yan Yu[2]; Lei Sun[3]; [1]Wuhan Branch of Baosteel Central Research Institute; [2]Automotive Engineering Institute, Guangzhou Automobile Group Co. Ltd.; [3]Beijing Automotive Technology Center, BAIC Motor

**11:15 AM**
**Effect of Strain Rate on Mechanical Properties of a 1 GPa-grade TRIP-aided Multi-microstructure Steel**: *Noriyuki Tsuchida*[1]; Satoshi Ohkura[1]; Takaaki Tanaka[2]; Yuki Toji[2]; [1]University of Hyogo; [2]JFE steel

**11:35 AM**
**Investigation of Fracture Behaviors of Coatings on Galvannealed CP1000 Steel**: *Liu Huasai*[1]; [1]Shougang Research Institute of Technology

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Development in Rare Earth Free Permanent Magnet Alloys

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Tuesday AM
March 13, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* Ian Ashcroft, University of Nottingham

**8:30 AM Introductory Comments**

**8:35 AM Invited**
**Opportunities and Challenges of Fe16N2 Compound Based Rare-earth-free Permanent Magnet**: *Jian-Ping Wang*[1]; [1]University of Minnesota

**9:05 AM Invited**
**Addressing Criticality in Magnetic Materials: A System Level Performance Assessment Approach**: *Cajetan Nlebedim*[1]; Helena Khazdozian[1]; [1]Ames Laboratory, US Department of Energy

**9:35 AM Invited**
**A New, Structural, Permanent Magnet Based on the Theory of High Entropy Alloys**: *Abraham Anapolsky*[1]; [1]Intermolecular Inc

**10:05 AM Break**

**10:25 AM Invited**
**Strategies for the Development of Coercivity in Rare Earth-lean High-energy Permanent Magnets**: *Daniel Salazar*[1]; [1]BCMaterials

**10:55 AM**
**Structural and Magnetic Properties of RE-Fe Compounds with Tetragonal $ThMn_{12}$ Structure**: *Ana Schönhöbel*[1]; Rajasekhar Madugundo[1]; Cristina Echevarria-Bonet[1]; Daniel Salazar-Jaramillo[2]; José Barandiarán[1]; George Hadjipanayis[2]; [1]BCMaterials; [2]University of Delaware

**11:15 AM**
**Anisotropic Dense Bulk MnBi Magnets with High Magnetic Performance**: *Baozhi Cui*[1]; Wei Tang[1]; Jun Cui[1]; [1]Ames Lab, DOE

**11:35 AM**
**Effect of Mn and Sb Substitutions on the Structural and Magnetic Properties of Fe1-xMnxSn1-ySby Alloys**: Cristina Echevarria-Bonet[1]; Olga Vekilova[2]; *Heike C. Herper*[2]; Daniel Salazar[1]; Ana Maria Schönhobel[1]; Andres Martin-Cid[1]; Rajasekhar Madugundo[1]; Jose Manuel Barandiaran[1]; George C. Hadjipanayis[3]; [1]BCMaterials; [2]Uppsala University; [3]University of Delaware

**11:55 AM**
**Coercivity Development in Mn-Al Alloys with Multi Elemental Additions**: *Rajasekhar Madugundo*[1]; Ana María Schönhöbel[1]; Daniel Jaramillo[1]; Jose Barandiaran[1]; George Hadjipanayis[2]; [1]BCMaterials; [2]University of Delaware

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Advanced Microelectronic Packaging Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Tuesday AM
March 13, 2018

Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* Albert Wu, National Central University; Carol Handwerker, Purdue University

**8:30 AM Invited**
**Thermosiphon Loops for Data Center Cooling – Exceeding Water Cooling Performance**: *Satish Kandlikar*[1]; [1]Rochester Institute of Technology

**9:00 AM**
**Advances in Copper Electroplating for IC Substrate Packaging Applications**: *Kousik Ganesan*[1]; Amaneh Tasooji[2]; Rahul Manepalli[1]; [1]Intel Corporation; [2]Arizona State University

**9:20 AM**
**Bonding Property of Silver Sintered Joint between SiC Device and DBC Substrates for EV Power Module**: *Won Sik Hong*[1]; Mi Song Kim[1]; Dajung Kim[1]; Chulmin Oh[1]; [1]Korea Electronics Technology Institutue(KETI)

**9:40 AM**
**Zero Pressure Ag Sinter Joining for Low Temperature Interconnection**: Hao Zhang[1]; Chuantong Cheng[1]; Yohji Suzuki[2]; Yasuyuki Akai[2]; Hiroyuki Fujii[2]; *Katsuaki Suganuma*[1]; [1]Osaka University; [2]Daicel

**10:00 AM Break**

**10:20 AM**
**Pressureless Ag Sintering Process for IPM Modules**: *Chulmin Oh*[1]; Dajung Kim[1]; Yoonhwa Choi[2]; Won Sik Hong[1]; [1]KETI; [2]JMJ Korea

**10:40 AM**
**Microstructural Investigation on the Mechanism of Ag Thin Film Bonding**: *Zhi-Quan Liu*[1]; Hao Zhang[2]; Cai-Fu Li[2]; Tohru Sugahara[2]; Shijo Nagao[2]; Katsuaki Suganuma[2]; [1]Institute of Metal Research, Chinese Academy of Sciences; [2]Institute of Scientific and Industrial Research, Osaka University

**11:00 AM**
**Study of Mechanical Properties in Aluminum Wedge-wedge Bonding**: *Matt McKay*[1]; Madeleine Peauroi[1]; Panthea Sepehrband[1]; Jamie Ferris[1]; [1]Santa Clara University

**11:20 AM**
**A Study of Microstructure, Electronic Flame-off Characteristics and Electrical Properties of Au-coated Al-Zn Wires**: *Keng-Yi Hsu*[1]; Fei-Yi Hung[1]; Truan-Sheng Lui[1]; [1]National Cheng Kung University

**11:40 AM**
**Measurement of Electrical Resistance of CNTs**: Leila Ladani[1]; *Zakia Ahmed*[1]; [1]University of Texas at Arlington

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – Processing for Quality

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

Tuesday AM
March 13, 2018

Room: 231C
Location: Phoenix Convention Center

*Session Chairs:* Manyalibo Matthews, Lawrence Livermore National Laboratory; Ryan Dehoff, Oak Ridge National Laboratory; Andrew Baker, The Boeing Company

**8:30 AM Invited**
**Addressing the Challenges for Additively Manufacturing Ti-6Al-4V Components for Structural Applications**: *Jay Keist*[1]; Todd Palmer[1]; Edward Reutzel[1]; Rich Martukanitz[1]; [1]Penn State University

**9:00 AM Invited**
**Coupling Laser Path Planning to the Formation Lack of Fusion Defects on Top Layers of Abbreviated Builds in Direct Metal Laser Melting of Ti-6Al-4V**: *Kevin Chaput*[1]; Edwin Schwalbach[1]; Sean Donegan[1]; Michael Groeber[1]; Jonathan Miller[1]; [1]Materials and Manufacturing Directorate

**9:30 AM Invited**
**Development of Post-Processing Technologies to Improve the Reliability of Additively Manufactured Titanium Alloy Components**: *Brady Butler*[1]; Jonathan Ligda[1]; Nathaniel Saenz[2]; James Paramore[3]; [1]U.S. Army Research Laboratory; [2]CQL AEOP; [3]ORISE

**10:00 AM Break**

**10:15 AM Invited**
**Ti-6Al-4V by Selective Laser Melting: How Microstructure and Porosity Influence the Mechanical Properties**: *Thomas Voisin*[1]; Nicholas Calta[1]; Jianchao Ye[1]; Joseph McKeown[1]; Ross Cunningham[2]; Anthony Rollett[2]; Morris Wang[1]; [1]Lawrence Livermore National Laboratory; [2]Carnegie Mellon University

**10:45 AM**
**Non-destructive Characterization of Porosity Distributions in Additively-Manufactured Ti Parts**: *Sam Yang*[1]; Jing Zou[2]; Yuqi Ren[3]; Darren Fraser[1]; Peter King[1]; Clement Chu[1]; Tony Murphy[1]; Leon Prentice[1]; [1]CSIRO; [2]Tianjin University; [3]Chinese Academy of Sciences

**11:05 AM**
**Investigating Sources of Porosity in Electron Beam-based Directed Energy Deposition of Titanium Components**: *Kyle Snyder*[1]; Richard Martukanitz[1]; Scott Stecker[2]; [1]Penn State Applied Research Lab; [2]Sciaky, Inc.

**11:25 AM**
**Effect of Geometry on the Porosity and Microstructure of Additively manufactured Titanium**: *Andelle Kudzal*[1]; Clara Hofmeister[2]; Joshua Taggart-Scarff[2]; Brandon McWilliams[3]; Jianyu Liang[1]; [1]Worcester Polytechnic Insitute; [2]Oak Ridge Institute for Science and Education; [3]US Army Research Laboratory

**11:45 AM**
**Effect of Build Direction on Microstructure and Tensile Properties of Ti-6Al-4V Sheet Fabricated by Selective Electron Beam Melting**: *Jian Wang*[1]; Kun Yang[1]; Hui Tang[1]; [1]Northwest Institute for Nonferrous Metal Research

## Algorithm Development in Materials Science and Engineering – DFT, Atomistic and Machine Learning Algorithms for Study and Design 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, Missouri University of Science and Technology; Mark Tschopp, Army Research Laboratory; Jonathan Zimmerman, Sandia National Laboratories; Ebrahim Asadi, University of Memphis; Mark Horstemeyer, Mississippi State University

Tuesday AM
March 13, 2018

Room: 130
Location: Phoenix Convention Center

*Session Chair:* Mohsen Asle Zaeem, Missouri University of Science and Technology

**8:30 AM Introductory Comments**

**8:40 AM Invited**
**Using Machine-learning to Create Predictive Material Property Models**: *Chris Wolverton*[1]; [1]Northwestern University

**9:10 AM**
**MSGalaxy: A Web-based Platform for Framework Design and Integration**: *Daniel Sauceda*[1]; Raymundo Arroyave[1]; Rodolfo Aramayo[1]; [1]Texas A&M

**9:30 AM**
**Open Source Distributed Tools for Multiscale Modeling of Materials**: *Marcus Hanwell*[1]; TJ Corona[1]; Robert O'Bara[1]; Dennis Dimiduk[2]; Michael Jackson[2]; Glen Hansen[3]; Sean Donegan[4]; Michael Groeber[4]; [1]Kitware; [2]BlueQuartz; [3]Sandia National Laboratories; [4]Air Force Research Laboratory

**9:50 AM Invited**
**Rational Design and Parametric Uncertainty Analysis of Classical Interatomic Potentials**: Eugene Ragasa[1]; Christopher O'Brien[2]; Richard Hennig[1]; Stephen Foiles[2]; *Simon Phillpot*[1]; [1]University of Florida; [2]Sandia National Laboratories

**10:20 AM Break**

**10:40 AM**
**High-throughput Evaluation and Comparison of Classical Interatomic-potentials: Structural, Elastic, Defect, Surface and Phonon Properties**: *Kamal Choudhary*[1]; Francesca Tavazza[1]; [1]National Institute of Standards and Technology

**11:00 AM**
**Reactive Molecular Dynamics of Electrochemical Processes – Ultrafast Resistance Switching in Electro-metallization Cells**: *Alejandro Strachan*[1]; Nicolas Onofrio[2]; Md Mahbubul Islam[1]; [1]Purdue University; [2]The Hong Kong Polytechnic University

**11:20 AM**
**Atomistically-informed Chemistry Models for Thermo-chemical Degradation of Ablative Composite Materials**: *Srujan Rokkam*[1]; Kiran Sasikumar[1]; Raghavan Ranganathan[2]; Peter Cross[3]; Richard Burnes[3]; [1]Advanced Cooling Technologies, Inc.; [2]Massachusetts Institute of Technology; [3]Naval Air Warfare Center

## Alloys and Compounds for Thermoelectric and Solar Cell Applications VI – Session III

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

*Program Organizers:* Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Soon-Jik Hong, Kongju National University and Institute for Rare Metals; Philippe Jund, Université Montpellier 2; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science (NIMS) ; Hsin-jay Wu, National Sun Yat-sen University; Tiejun Zhu, Zhejiang University

Tuesday AM
March 13, 2018

Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Albert Wu, National Central University; Hsin-jay Wu, National Sun Yat-Sen University

**8:30 AM Invited**
**Phase Boundary Mapping for the Discovery and Optimization of Thermoelectric Materials**: *G. Jeffrey Snyder*[1]; [1]Northwestern University

**8:50 AM Invited**
**Phase Diagrams Evaluation for Design of Thermoelectric Materials and Development of Fabrication Processes**: *Yoshisato Kimura*[1]; Natsumi Kaneko[1]; Yosuke Kubo[1]; Yong Hoon Lee[2]; Hiroyuki Matsunami[2]; Hirokuni Hachiuma[2]; [1]Tokyo Institute of Technology; [2]KELK Ltd.

**9:10 AM Invited**
**Phase Diagram of Ag-In-Se System and Thermoelectric Properties of In-containing $Ag_2Se$**: *Sinn-wen Chen*[1]; Zi-yang Huang[1]; Pai-chen Wei[2]; Yang-yuan Chen[2]; [1]National Tsing Hua University; [2]Academia Sinica

**9:30 AM**
**Phase Diagrams of Ternary Zn-Sb-In Systems and Thermoelectric Properties of In Doped Zn4Sb3**: *Su Hui Yi*[1]; Wu Hsin Jay[1]; [1]National Sun Yat-sen University

**9:50 AM**
**The Phase Diagram of Ge-Te-Sb and Enhanced Thermoelectric Properties of Sb-doped GeTe**: *Yi-Fen Tsai*[1]; Wu Hsin Jay[1]; [1]Department of Materials and Optoelectronic science, National Sun Yat-sen University

**10:10 AM Break**

**10:30 AM Invited**
**Evaluation of Interfacial Stability of PbTe Thermoelectric Module**: *Albert T. Wu*[1]; H. C. Hsieh[1]; T. H. Lee[2]; H. S. Chu[2]; [1]National Central University; [2]Industrial Technology Research Institute

**10:50 AM Invited**
**Thin-film Metallic Glass: an Effective Diffusion Barrier for Mid-temperature Thermoelectric Modules**: Chia-Chi Yu[1]; Hsin-jay Wu[2]; Ping-Yuan Deng[2]; Matthias T. Agne[3]; G. Jeffrey Snyder[3]; *Jinn Chu*[1]; [1]National Taiwan University of Science and Technology; [2]National Sun Yat-sen University; [3]Northwestern University

**11:10 AM**
**Evaluation of Co-P Diffusion Barrier for p-$Bi_2Te_3$ Thermoelectric Material**: *Chun-Hsien Wang*[1]; Albert T. Wu[1]; [1]National Central University, Taiwan

**11:30 AM**
**Role of Ni-Mo Diffusion Barrier on the High Temperature Stability of PbTe Based Thermoelectric Module**: *Sundararajan Govindan*[1]; D Sivaprahasam[2]; Raghavan Gopalan[2]; [1]Indian Institute of Technology Madras; [2]ARCI

## Alumina & Bauxite – Fundamentals, Product Quality, Efficiency and Modeling

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Linus Perander, Outotec

Tuesday AM
March 13, 2018

Room: 221A
Location: Phoenix Convention Center

*Session Chair:* Astrid Meyer, Hydro

**8:30 AM Introductory Comments**

**8:35 AM**
**Fitness-for-service Assessment and Re-rating of Flawed Alumina Feeding Vessels**: Maher Al-Dojayli[1]; *Kyle Chomyn*[1]; Hamid Ghorbani[1]; Patrice Barriault[1]; [1]Hatch

**9:00 AM**
**Miniplant Tests of HCl Technology of Alumina Production**: *Andrei Smirnov*[1]; Dmitriy Kibartas[1]; Aleksandr Senyuta[1]; Andrey Panov[1]; [1]RUSAL ETC

**9:25 AM**
**Development and Utilization of Detailed Models of Technology at RUSAL Alumina Refineries**: *Mamadou-Bano Balde*[1]; Vladimir Golubev[1]; Dmitriy Chistyakov[1]; [1]Windalco

**9:50 AM**
**Digital Transformation in Alumina Refining**: *Robert Jonas*[1]; [1]Honeywell

**10:15 AM Break**

**10:30 AM**
**Thermodynamics Analysis on Process of Pelletizing Chlorination of Fly Ash**: *Long Wang*[1]; Zhang Ting'an[1]; Guozhi Lyu[1]; Jingzhong Zhang[1]; Zhihe Dou[1]; Weiguang Zhang[1]; Xijuan Pan[1]; Yanxiu Wang[1]; [1]Northeastern University

**10:55 AM**
**Research on Alumina Preparation from Aluminium Chloride Solution by Electrolysis Process**: *Zhang Ting'an*[1]; Xiuxiu Han[1]; Guozhi Lyu[1]; Xijuan Pan[1]; Shagulyyev Agajan[1]; Daxue Fu[1]; Jiang Liu[1]; Junjie Zhang[1]; [1]Northeastern University

**11:20 AM**
**How Digitalization Can Further Improve Plant Performance and Product Quality - Outotec Pretium Advisory Tool for Alumina Calcination**: *Michael Missalla*[1]; Linus Perander[2]; Steffen Haus[2]; Nikola Anastasijevic[2]; Susanna Horn[3]; [1]Outotec Tecnologia Brasil Ltda; [2]Outotec GmbH & Co. KG; [3]Outotec Oyi

## Aluminum Alloys, Processing and Characterization – Behavior of Casting Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Tuesday AM
March 13, 2018

Room: 221B
Location: Phoenix Convention Center

*Session Chair:* Wei Wen, Arconic

**8:30 AM Invited**
**Aluminum In-situ Formed, Low Cost, Aluminum-silicon Nano Composite Materials**: Peter Guba[1]; Jerry Sokolowski[1]; Al Conle[1]; Andrzej Sobiesiak[1]; Adam Gesing[2]; *Subodh Das*[3]; [1]University of Windsor; [2]Gesing Consultants Inc.; [3]Phinix,LLC

**9:00 AM**
**Predicting Local Segregation and Microstructures in an Advanced High Pressure Die Cast Al Alloy**: *Tracy Berman*[1]; John Allison[1]; [1]University of Michigan

**9:20 AM**
**The Combined Effects of Sr Additions and Heat Treatment on the Microstructure and Mechanical Properties of High Pressure Die Cast A383 Alloy**: *Tao Liu*[1]; Sydney Morales[1]; Luke Brewer[1]; Mikko Karkkainen[1]; Nastac Laurentiu[1]; Arvikar Vish[2]; Levin Ilya[2]; [1]The University of Alabama; [2]Nemak Alabama

**9:40 AM**
**The Effect of Energy Attenuation in Molten A356 Alloy during Ultrasonic Degassing**: *Jeong IL Youn*[1]; Young Ki Lee[1]; Young Jig Kim[1]; Jeong Wook Park[2]; [1]Sungkyunkwan University; [2]DR AXION Co.,Ltd

**10:00 AM Break**

**10:20 AM**
**Influence of Additional Elements (Si Ti and B) on the Castability, Corrosion and Mechanical Properties of A201 Alloys**: *Suzan Abd El Majid*[1]; [1]Technion, Israel Institue of Technology

**10:40 AM**
**Effect of Ni Addition on the Solidification Process and Microstructure of Al-12%Si-4%Cu-1.2%Mn-x%Ni Heat-resistant Alloys**: *Hengcheng Liao*[1]; Qu Liu[1]; Guangjin Li[1]; Uday Dixit[2]; [1]Southeast University; [2] IIT Guwahati

**11:00 AM**
**New Design of High Strength Wrought Aluminum Alloys**: *Alexander Alabin*[1]; Viktor Mann[1]; Anton Frolov[1]; Aleksandr Krokhin[1]; [1]UC RUSAL

## Application of Solidification Fundamentals to Challenges in Metal Additive Manufacturing – Advanced Characterization

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Alex Plotkowski, University of Tennessee - Knoxville; Kevin Chaput, Materials and Manufacturing Directorate; Lang Yuan, GE Global Research

Tuesday AM
March 13, 2018

Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Michael Kirka, Oak Ridge National Laboratory

**8:30 AM Invited**
**Fast Synchrotron X-ray Imaging of the Mechanisms Controlling Laser Additive Manufacturing**: *Peter D. Lee*[1]; Chu Lun Alex Leung[1]; Enyu Guo[1]; Sebastian Marussi[1]; Robert Atwood[2]; Mike Towrie[3]; Phil Withers[1]; [1]The University of Manchester; [2]Diamond Light Source; [3]Science & Technology Facilities Council

**9:00 AM**
**Solidification Cracking during Selective Laser Melting (SLM) of Nickel-base Superalloy Inconel-738LC**: *Avinash Hariharan*[1]; Jeroen Risse[2]; Eric Jägle[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Fraunhofer-Institut für Lasertechnik ILT

**9:20 AM**
**Development of an In-situ TEM with Laser Sintering Capabilities at Sandia National Laboratories**: Patrick Price[1]; Adam Cook[1]; LaRico Treadwell[1]; *Khalid Hattar*[1]; [1]Sandia National Laboratories

**9:40 AM**
**Characterization of Rapid Cooling during Laser Powder Bed Fusion Additive Manufacturing of Ti-6Al-4V Using In Situ High Speed Synchrotron X-ray Diffraction**: *Nicholas Calta*[1]; Aiden Martin[1]; Jenny Wang[1]; Philip Depond[1]; Gabriel Guss[1]; Vivek Thampy[2]; Andrew Kiss[2]; Anthony Fong[2]; Johanna Nelson Weker[2]; Kevin Stone[2]; Christopher Tassone[2]; Ryan Ott[3]; Matthew Kramer[3]; Michael Toney[2]; Tony Van Buuren[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory; [2]SLAC National Accelerator Laboratory; [3]Ames Laboratory

**10:00 AM Break**

**10:20 AM**
**Tomography and 3D Grain Mapping for Additive Manufacturing Qualification**: *Leah Lavery*[1]; Luke Hunter[2]; Jeff Gelb[1]; [1]Carl Zeiss X-ray Microscopy; [2]Carl Zeiss Industrial Metrology

**10:40 AM**
**Laser Powder Bed Fusion of Metal and Bioactive Glass Revealed Via Synchrotron X-ray Imaging**: *Chu Lun Alex Leung*[1]; Robert Atwood[2]; Jesus Del Val Garcia[3]; Julian Jones[3]; Peter Lee[1]; [1]University of Manchester; [2]Diamond Light Source Ltd,; [3]Imperial College London

**11:00 AM**
**In-situ Monitoring of Solidification during Powder-deposition Based Additive Manufacturing**: *Sarah Wolff*[1]; Hao Wu[1]; Cang Zhao[2]; Niranjan Parab[2]; Tao Sun[2]; Jian Cao[1]; [1]Northwestern University; [2]Argonne National Laboratory

**11:20 AM**
**Microstructure and Wear Resistance of Laser Deposited Cobalt-free Cu-based Alloy for Valve Seat Application**: *Hajime Kato*[1]; Tadashi Oshima[1]; Kouji Tanaka[1]; Minoru Kawasaki[2]; Natsuki Sugiyama[2]; Hironori Aoyama[2]; [1]Toyota Central R&D Labs., Inc.; [2]Toyota Motor Corporation

## Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials – General Methods and Development

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee
*Program Organizers:* Haiming Wen, Missouri University of Science and Technology; Simon Ringer, The University of Sydney; Gregory Thompson, University of Alabama; Arun Devaraj, Pacific Northwest National Laboratory; Keith Knipling, U.S. Naval Research Laboratory; Gang Sha, Nanjing University of Science and Technology; David Seidman, Northwestern University; Chantal Sudbrack, QuesTek Innovations, LLC

Tuesday AM
March 13, 2018
Room: 124A
Location: Phoenix Convention Center

*Funding support provided by:* CAMECA Instruments, Inc.

*Session Chairs:* David Seidman, Northwestern University; Haiming Wen, Missouri University of Science & Technology

**8:30 AM Introductory Comments**

**8:35 AM Keynote**
**The Evolution of the Atom-Probe**: *John Panitz*[1]; [1]The University of New Mexico

**9:15 AM Invited**
**Instrumentation Developments for Emerging Metals and Minerals Applications of Atom Probe Tomography**: *Thomas Kelly*[1]; Ty Prosa[1]; David Reinhard[1]; Robert Ulfig[1]; David Larson[1]; [1]Cameca Instruments, Inc.

**9:50 AM**
**A New Approach to Detect Clusters of Varying Density in Atom Probe Tomography and Its Applications to Oxide-dispersion Strengthened Alloys**: *Jing Wang*[1]; Nathan Bailey[2]; Peter Hosemann[2]; Daniel Schreiber[1]; Mychailo Toloczko[1]; [1]Pacific Northwest National Laboratory; [2]University of California, Berkeley

**10:10 AM Break**

**10:25 AM Invited**
**Segregations at Defects and Interfaces and their Relations to Properties**: *Baptiste Gault*[1]; Paraskevas Kontis[1]; Huan Zhao[1]; Alisson Kwiatowski da Silva[1]; Surendra Kumar Makineni[1]; Yanhong Chang[1]; Dirk Ponge[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

**11:00 AM Invited**
**Applications of APT in Characterization of Magnesium Alloys – A Tool to Develop Heat-Treatable Wrought Magnesium Alloys**: *Kazuhiro Hono*[1]; Taisuke Sasaki[1]; Ming-Zhe Bian[1]; [1]National Institute for Materials Science

**11:35 AM Invited**
**Atom-probe Tomography of Materials with Nanometer-Range Characteristic Dimensions**: *Dieter Isheim*[1]; David Seidman[1]; [1]Northwestern University

## Bio-nano Interfaces and Engineering Applications Symposium – Bio-Nano Interfaces III

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

Tuesday AM
March 13, 2018
Room: 105A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:40 AM**
**Synthesis and Characterization of Superomniphobic Surfaces Inspired by Springtails**: *Po-Yi Chen*[1]; Ching-Yu Yang[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

**9:00 AM**
**Effects of Hydration and Mineralization on the Mechanical Behavior of Collagen Fibrils**: Marco Fielder[1]; *Arun Nair*[1]; [1]University of Arkansas

**9:20 AM Invited**
**Revealing the Full Hierarchical Structure of Spider Silks across All Length Scales**: *Hannes Schniepp*[1]; [1]The College of William & Mary

**9:50 AM**
**Revealing the Multi-functional Surface and Material Property of Venus Flytrap (Dionaea Muscipula)**: *Tiffany Liao*[1]; Po-Yi Chen[1]; Yueh-Ying Chou[1]; Wei-Chen Hung[1]; Po-Yu Chen[1]; [1]National Tsing Hua University

**10:10 AM Break**

**10:25 AM Invited**
**Single Molecular Imaging of Fluorescent-tagged Peptides Diffusing on a Surface of Boron Nitride**: *Peiying Li*[1]; Takakazu Seki[1]; Linhao Sun[1]; Yuhei Hayamizu[1]; [1]Tokyo Institute of Technology

**10:55 AM**
**Smart Biomaterials for $MoS_2$ and Gold Mining**: *Sibel Cetinel*[1]; Wei-Zheng Shen[1]; Maral Aminpour[1]; Prasanna Bhomkar[2]; Feng Wang[2]; Carlo Montemagno[1]; [1]University of Alberta; [2]National Institute for Nanotechnology

**11:15 AM**
**Computational Study of Selective Adsorption of Peptides on $MoS_2$ Surface**: *Maral Aminpour*[1]; Niloofar Nayebi[1]; Sibel Cetinel[1]; Carlo Montemagno[1]; [1]University of Alberta

**11:35 AM**
**Transmission Synchrotron X-ray Tomography and Nano-indentation Measurements for the Investigation of the Teeth Microstructure of Dinosaurs**: Tzu-Hsuan Huang[1]; *E-Wen Huang*[1]; Chun-Chieh Wang[2]; Shou-Yi Chang[3]; [1]National Chiao Tung University; [2]National Synchrotron Radiation Research Center, Hsinchu, Taiwan; [3]National Tsing Hua University, Hsinchu, Taiwan

## Biological Materials Science – Biomaterials and Biomedical Applications I

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

Tuesday AM
March 13, 2018
Room: 225B
Location: Phoenix Convention Center

*Session Chairs:* Holly Martin, Youngstown State University; Dwayne Arola, University of Washington

**8:30 AM**
**Fracture and Fatigue Behavior of Silver-cored Drawn Filled Tube Strands for Biomedical Applications**: *Janet Gbur*[1]; John Lewandowski[1]; [1]Case Western Reserve University

**8:50 AM**
**3D Full-field Mechanical Measurement of Shoulder Bones under Implant Loading**: *Yuxiao Zhou*[1]; Michael Lamberty[2]; Gregory Lewis[3]; April Armstrong[3]; Jing Du[1]; [1]Pennsylvania State University; [2]University of Puerto Rico at Mayagüez; [3]Penn State College of Medicine and M.S. Hershey Medical Center

**9:10 AM**
**Adsorption of Maleic Acid on the Surface of Hydroxyapatite and TiO2: A Pathway Towards Biomaterial Composites**: *Mitchell Albert*[1]; Amanda Clifford[1]; Igor Zhitomirsky[1]; Oleg Rubel[1]; [1]McMaster University

**9:30 AM Invited**
**Bioinspired Polyphenolic Materials: From Biomolecular Phenomena to Applications**: *Phillip Messersmith*[1]; [1]University of California, Berkeley

**10:00 AM Break**

**10:20 AM**
**Processing, Microstructure Characterization and Biological Response of Cold Sprayed Biocomposite Coatings**: *Eden Bhatta*[1]; Grant Crawford[1]; [1]South Dakota School of Mines and Technology

**10:40 AM**
**Implantable Nano-porous Resorbable and Non-resorbable Structures for Cancer Drug Delivery and Tissue Regeneration**: *John Obayemi*[1]; Vanessa Uzonwanne[1]; Jingjie Hu[2]; Ali Salifu[1]; Wole Soboyejo[1]; [1]Worcester Polytechnic Institute; [2]Princeton University

**11:00 AM**
**Effect of Nb and Ta Content on Properties of Ti-(26-35)Nb-(0-6)Ta-7Zr -0.7O**: *Dalibor Preisler*[1]; Josef Stráský[1]; Michal Landa[2]; Petr Harcuba[1]; Milos Janecek[1]; [1]Charles University; [2]The Czech Academy of Sciences

## Bulk Metallic Glasses XV – Alloy Development and Application I

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Tuesday AM
March 13, 2018
Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Peter Liaw, The University of Tennesee; William Johnson, California Institute of Technology

**8:30 AM Keynote**
**Commercial BMG's - Boutique Material or Disruptive Technology?**: *William Johnson*[1]; [1]California Institute of Technology

**9:00 AM Keynote**
**Fe-based Metallic Glass (MG) Ribbons for Energy Applications**: *CT Liu*[1]; Anding Wang[1]; [1]City University of Hong Kong

**9:30 AM Invited**
**Bulk Metallic Glasses: A High, but Narrow Path to Success**: *Jan Schroers*[1]; [1]Yale University

**9:50 AM Invited**
**Progress and Challenges Associated with the Development of Spacecraft Gearboxes Utilizing Bulk Metallic Glasses**: *Douglas Hofmann*[1]; Scott Roberts[1]; Robert Dillon[1]; [1]NASA JPL/Caltech

**10:10 AM Break**

**10:30 AM Invited**
**Designing Color in Gold Metallic Glasses**: Jong-Hyun Na[1]; *Marios Demetriou*[1]; William Johnson[1]; [1]Glassimetal Technology

**10:50 AM Invited**
**Property Enhancement of BMG Based Nanoglasses Prepared by RF Sputtering of Thin Films and High Pressure Torsion**: *Hans Fecht*[1]; Pierre Denis[1]; [1]Ulm University

**11:10 AM Invited**
**Manipulation of Plastic Flow in Metallic Glasses via Nanoscale Networks of Compositional Heterogeneities**: Jin Woo Kim[1]; Hyun Seok Oh[1]; Wan Kim[1]; Pyuck-Pa Choi[2]; Dierk Raabe[3]; *Eun Soo Park*[1]; [1]Seoul National University; [2]Korea Advanced institute of Science and Technology; [3]Max-Planck Institut für Eisenforschung GmbH

**11:30 AM**
**Determination of Critical Cooling Rates in Metallic Glass Forming Alloy Libraries through Laser Spike Annealing**: *Punnathat Bordeenithikasem*[1]; Jingbei Liu[2]; Sebastian Kube[2]; Yanglin Li[2]; Tianxing Ma[3]; Ellen Scanley[4]; Douglas Hofmann[1]; Christine Broadbridge[4]; Joost Vlassak[5]; Jonathan Singer[3]; Jan Schroers[2]; [1]NASA JPL/Caltech; [2]Yale University; [3]Rutgers University; [4]Southern Connecticut State University; [5]Harvard University

**11:50 AM Invited**
**Surface Properties of Thin Film Metallic Glasses Produced by Physical Vapor Deposition**: Tatiana Stefanov[1]; Harsha Vardhan Maraka[1]; *David Browne*[1]; [1]University College Dublin

## Cast Shop Technology: Energy Joint Session – Cast Shop Technology: Energy Joint Session

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee, TMS: Energy Committee
*Program Organizers:* Mark Badowski, Hydro Aluminium; Mark Jolly, Cranfield University; Donald Whipple, Bloom Engineering Co Inc; Cynthia Belt, Consultant

Tuesday AM
March 13, 2018
Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Mark Jolly, Cranfield University

**8:30 AM Introductory Comments**

**8:35 AM**
**Productivity and Energy Efficiency Improvements at Two Reverberatory Furnaces at Alcoa, Norway**: Henrik Gripenberg[1]; Delwyn Forrest[2]; Per-Bjornar Bekkevold[3]; Egil Solberg[3]; *Johannes Lodin*[1]; Fredrik Stark[4]; Fredrik Nyman[4]; [1]Linde Gas; [2]Alcoa; [3]Alcoa Mosjoen; [4]AGA Gas AB

**9:00 AM**
**The Application of ALTEK Stirring Technology to a 90MT Melting Furnace at ALCOA Moesjen, Norway**: *Alan Peel*[1]; Delwyn Forrest[2]; [1]ALTEK Group; [2]Alcoa

**9:25 AM**
**Case Study of Air Cooled Electromagnetic Stirred Melting Furnace at Hydro Henderson**: *James Herbert*[1]; Bill Painter[2]; [1]ALTEK LLC; [2]Hydro Henderson

**9:50 AM**
**Efficiency of the Casting Process Starts in the Melt Shop**: *Ryan Brown*[1]; [1]Norican Group

**10:15 AM Break**

**10:30 AM**
**Praxair's OPTIVIEW™ Image Analysis System for Enhanced Combustion Control on Aluminum Tilting Rotary Furnace**: *Valmiro Sa Neto*[1]; Joseph Maiolo[1]; Kevin Albrecht[1]; Bryan Bielec[1]; Jorge Visús Pool[2]; Joaquín de Diego Rincón[3]; Daniel Bujeda Celma[2]; Ignacio Parrilla Muñoz[4]; Juan Luis Suazo Tejeda[4]; [1]Praxair Inc.; [2]Praxair España, S.L.U.; [3]Praxair Euroholding, S.L.; [4]Aluminio la Estrella S.L.U.

**10:55 AM**
**Aluminum Melting Furnace Pressure Control**: *Edward Williams*[1]; Don Whipple[2]; [1]Alcoa; [2]Bloom Engineering

**11:20 AM**
**Gas Fired Holding Furnace Modeling for Efficient Operation**: Mohamed Hassan[1]; Saeed Alshehhi[1]; *Cynthia Belt*[2]; [1]Khalifa University of Science and Technology, Masdar Institute; [2]Energy Consultantant

**11:45 AM**
**Resource Efficiency Analysis of High Pressure Die Casting Process**: Micael Gonçalves[1]; *Mark Jolly*[1]; Konstantinos Salonitis[1]; Emanuele Pagone[1]; [1]Cranfield University

## CFD Modeling and Simulation in Materials Processing – Processing I

*Sponsored by:* TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
*Program Organizers:* Laurentiu Nastac, The University of Alabama; Koulis Pericleous, University of Greenwich; Adrian Sabau, Oak Ridge National Laboratory; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, Colorado School of Mines

Tuesday AM
March 13, 2018
Room: 228B
Location: Phoenix Convention Center

*Session Chairs:* Laurentiu Nastac, The University of Alabama; Kevin Chou, University of Louisville

**8:30 AM**
**A Multiphase CFD Model for the Prediction of Particulate Accumulation in a Laser Powder Bed Fusion Process**: Adam Philo[1]; *Daniel Butcher*[1]; Stuart Sillars[1]; Chris Sutcliffe[2]; Johann Sienz[1]; Stephen Brown[1]; Nicholas Lavery[1]; [1]Swansea University; [2]Renishaw

**8:50 AM**
**Numerical Model to Estimate Tool Wear and Pin Shape during Friction Stir Welding of CuCrZr Alloy**: *Pankaj Sahlot*[1]; Amit Arora[1]; [1]Indian Institute of Technology Gandhinagar

**9:10 AM**
**CFD Modelling of High Pressure Gas Atomization of Liquid Metals**: Aadhithya Priyadharshini Ashok Kumar[1]; Duncan Borman[1]; *Andrew Mullis*[1]; [1]University of Leeds

**9:30 AM Invited**
**Computational Analysis of Thermo-fluid Dynamics with Metallic Powder in SLM**: Subin Shrestha[1]; *Kevin Chou*[1]; [1]University of Louisville

**10:00 AM Break**

**10:20 AM**
**Evaporation and Diffusion of Mn in Inert Systems**: *Håkon Olsen*[1]; [1]Norwegian University of Science and Technology

**10:40 AM**
**Correlation of Heat Transfer Coefficient in Quenching Process Using ABAQUS**: *Sandeep Davare*[1]; G Balachandran[2]; R.K.P. Singh[1]; [1]Bharat Forge; [2]Kalyani Carpenter Special Steel Pvt Ltd. (KCSSPL)

**11:00 AM**
**A Theoretical Study on Removal of Inclusions from Molten Steel during Ingot Casting by Filtration**: *Shahin Akbarnejad*[1]; [1]Royal Institute of Technology (KTH)

## Characterization of Minerals, Metals, and Materials – Characterization and Uses of Metallurgical Slags

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Tuesday AM
March 13, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chairs:* Mingming Zhang, ArcelorMittal Global R&D; Mingsheng He, Wuhan Iron & Steel Ltd.

**8:30 AM Introductory Comments**

**8:35 AM**
**Preparation and Characterization of $NaNO_3$/BFS Composite Phase Change Materials**: *Jicheng Liu*[1]; Yuanbo Zhang[1]; Zijian Su[1]; Bingbing Liu[1]; Manman Lu[1]; Tao Jiang[1]; Guanghui Li[1]; [1]Central South University

**8:55 AM**
**Characteristics of WISCO Steelmaking Slags**: *Bowen Li*[1]; Mingsheng He[2]; Canhua Li[2]; [1]Michigan Technological University; [2]Wuhan Iron & Steel Co. Ltd.

**9:15 AM**
**Pilot Trial of Direct Modification of Molten Blast Furnace Slag and Production of High Acidity Coefficient Slag Wool Fibers**: Jun Li[1]; Lingling Zhang[1]; *Guizhou Zhao*[1]; Daqiang Cang[1]; [1]University of Science and Technology, Beijing

**9:35 AM**
**Reduction Behavior of Ternary Calcium Ferrites for CaO-$Fe_2O_3$-MgO System**: *Senwei Xuan*[1]; Xuewei Lv[1]; Kai Tang[1]; Chengyi Ding[1]; Gang Li[1]; Chenguang Bai[1]; [1]Chongqing University

**9:55 AM**
**Propagation of Power Ultrasound in Calcium Ferrite Melt**: *Ruirui Wei*[1]; [1]Chongqing University

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Boundaries and Interfaces II

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinese Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Tuesday AM
March 13, 2018
Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Panthea Sepehrband, Santa Clara University; Ismaila Dabo, Penn State

**8:30 AM Invited**
**Quantum-continuum Simulations of Solid-liquid Interfaces under Electrochemical Conditions**: *Ismaila Dabo*[1]; [1]Department of Materials Science and Engineering & Materials Research Institute, Penn State University

**9:00 AM**
**Droplet Spreading on a Surface Exhibiting Solid-liquid Interfacial Premelting**: *Brian Laird*[1]; Yang Yang[2]; [1]University of Kansas; [2]East China Normal University

**9:20 AM**
**In-plane Characterization of Structural and Thermodynamic Properties for the Steps at Faceted Chemically Heterogeneous Solid/Liquid Interfaces**: *Yang Yang*[1]; Hongtao Liang[1]; Brian Laird[2]; Mark Asta[3]; [1]East China Normal University; [2]University of Kansas; [3]UC Berkeley

**9:40 AM**
**Quantum Mechanical Simulations of MgO//Mg Interfacial Stability**: *Wenwu Xu*[1]; Andrew Horsfield[2]; Peter Lee[3]; [1]San Diego State University; [2]Imperial College London; [3]The University of Manchester

**10:00 AM Break**

**10:20 AM**
**Atomistic Investigation of the Energetics and Atomic Structure of the Ferrite-cementite Interface in Pearlite**: *Matthew Guziewski*[1]; Christopher Weinberger[1]; Shawn Coleman[2]; [1]Colorado State University; [2]Army Research Laboratory

**10:40 AM Invited**
**Friction and Adsorption at Nanoscale: The Effect of Metallic and Nonmetallic Properties**: *Wang Gao*[1]; Qing Jiang[1]; [1]Jilin University

**11:00 AM**
**Concurrently Coupled Atomistic and Continuum Simulation of Grain Boundaries in Materials**: *Shengfeng Yang*[1]; Youping Chen[2]; [1]Indiana University-Purdue University Indianapolis; [2]University of Florida

**11:20 AM**
**Atomistic Modeling of Point Defects Absorption and Diffusion in α–iron Grain Boundaries**: *Helena Zapolsky*[1]; Antoine Vaugeois[1]; Renaud Patte[1]; [1]University of Rouen

**11:40 AM**
**Tribological Properties of Carbon Nanotube Reinforced Natural Rubber Composites: Molecular Dynamics Study**: *Sumit Sharma*[1]; Raj Chawla[2]; [1]Lovely Professional University; [2]Mechanical Engineering, Lovely Professional University

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Dislocation, Plasticity, and Fracture

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Tuesday AM
March 13, 2018
Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Valery Levitas, Iowa State University; Dallas Trinkle, University of Illinois, Urbana-Champaign

**8:30 AM Invited**
**Phase Field Approach to Coupled Phase Transformations and Dislocation Evolution at Large Strains**: *Valery Levitas*[1]; [1]Iowa State University

**9:00 AM**
**A Crystal Plasticity Model for Dynamic Recrystallization in Ti-6Al-4V Alloy**: *Arunabha Roy*[1]; Riddhiman Bhattacharya[1]; John Allison[1]; Veera Sundararaghavan[1]; [1]University of Michigan at Ann Arbor

**9:20 AM**
**A Consistent Mesoscale Elastoplastic Phase-field Framework**: *Tianle Cheng*[1]; Youhai Wen[2]; Jeffrey Hawk[2]; [1]US Dept of Energy, National Energy Technology Laboratory / AECOM; [2]US Dept of Energy, National Energy Technology Laboratory

**9:40 AM**
**A Modified Phase-field Model for Crack Propagation in Multiphase Materials**: Arezoo Emdadi[1]; *Mohsen Asle Zaeem*[1]; William Fahrenholtz[1]; Gregory Hilmas[1]; [1]Missouri University of Science and Technology

**10:00 AM Break**

**10:20 AM**
**Large Scale Dislocation Dynamics Simulations of Strain Hardening of Ni Microcrystals under Tensile Loading**: *Satish Rao*[1]; Christopher Woodward[2]; Brahim Akdim[1]; Edwin Antillon[1]; Triplicane Parthasarathy[1]; Jaafar El-Awady[3]; Dennis Dimiduk[4]; [1]UES Inc.; [2]Air Force Research Laboratory; [3]Johns Hopkins University; [4]Ohio State University

**10:40 AM**
**Mesoscale Modeling of Mixed-type Dislocations in Al**: *Shuozhi Xu*[1]; Jaber Mianroodi[2]; Abigail Hunter[3]; Irene Beyerlein[1]; Bob Svendsen[2]; [1]University of California, Santa Barbara; [2]RWTH Aachen; [3]Los Alamos National Laboratory

**11:00 AM**
**Submicron Scale {1012} Tensile Twin Embryo Size in Magnesium and its Dependence on Neighboring Grains**: *M. Arul Kumar*[1]; Irene Beyerlein[2]; Carlos Tome[1]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara

**11:20 AM**
**Minimal Continuum Dislocation Dynamics Model for Slip in BCC Metals**: *Roman Gröger*[1]; Vaclav Vitek[2]; Turab Lookman[3]; [1]CEITEC IPM, Academy of Sciences of the Czech Republic; [2]University of Pennsylvania; [3]Los Alamos National Laboratory

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Computational Design of Materials: Case Studies

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

Tuesday AM
March 13, 2018
Room: 131C
Location: Phoenix Convention Center

*Session Chairs:* Jiadong Gong, Questek; Hao Chen, Tsinghua University

**8:30 AM Invited**
**Materials-by-design: A Mechanism-based Approach**: *K Ramesh*[1]; [1]Johns Hopkins University

**9:00 AM Invited**
**Computational Design of Metastable Austenite in the Advanced Transformation Induced Plasticity Steels**: *Hao Chen*[1]; Zongbiao Dai[1]; Chi Zhang[1]; Jie Su[1]; Zhigang Yang[1]; Boning Zhang[1]; [1]Tsinghua University

**9:30 AM**
**Materials Design Simulator for Al-Ce Based Alloys**: *Aurelien Perron*[1]; Vincenzo Lordi[1]; Orlando Rios[2]; David Weiss[3]; Scott McCall[1]; Patrice Turchi[1]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory; [3]Eck Industries

**9:50 AM**
**Investigation of Order-disorder Transition in Multi-principal-element Alloys**: *Xuejun Huang*[1]; Jiashi Miao[1]; Maryam Ghazisaeidi[1]; Alan Luo[1]; [1]The Ohio State University

**10:10 AM Break**

**10:30 AM Invited**
**ICME-Based Computational Materials Genomic Design**: *Jiadong Gong*[1]; Greg Olson[1]; [1]QuesTek Innovations

**11:00 AM**
**Searching for Corrosion Resistant Mg Alloys Using Genetic Algorithms**: *Joshua Paul*[1]; Krista Limmer[1]; Mark Tschopp[1]; Santanu Chaudhuri[2]; [1]U.S. Army Research Laboratory; [2]University of Illinois Urbana-Champaign

**11:20 AM**
**Ultralight Metallic/Composite Materials with Architected Cellular Structures**: *Maryam Tabatabaei*[1]; Satya N. Atluri[1]; [1]Texas Tech University

**11:40 AM**
**Effect of Stability of Critical Phases in Nickel-based Superalloys: Combined Machine Learning and CALPHAD Approach**: *Rajesh Jha*[1]; George Dulikravich[1]; [1]Florida International University

## Computational Materials Discovery and Optimization – Bulk Materials: Thermal, Magnetic, and Optical Properties

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Richard Hennig, University of Florida; Houlong Zhuang, Arizona State University; Arunima Singh, Lawrence Berkeley National Laboratory; Eric Homer, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Tuesday AM
March 13, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chairs:* Tim Muller, Johns Hopkins University; Anubhav Jain, Lawrence Berkeley National Laboratory

**8:30 AM**
**A Materials-informatics Approach for Finding New Hard-magnetic Phases**: *Johannes Möller*[1]; Georg Krugel[1]; Wolfgang Körner[1]; Daniel Urban[1]; Christian Elsässer[1]; [1]Fraunhofer IWM

**8:50 AM**
**Design Concepts of Optimized MRI Magnet by COMSOL Multiphysics Simulation**: *Akash Oraon*[1]; Sudipto Ghosh[1]; Shampa Aich[1]; Gautam Sinha[2]; [1]IIT Kharagpur; [2]Raja Ramanna Centre for Advanced Technology

**9:10 AM**
**Dual Band Metamaterial Perfect Absorber Based on Mie Resonances**: *Xiaoming Liu*[1]; Gaowu Qin[1]; [1]Northeastern University

**9:30 AM**
**Reentrant Melting of Sodium, Magnesium and Aluminum and Possible Universal Trend**: *Qijun Hong*[1]; Axel van de Walle[1]; [1]Brown University

**9:50 AM**
**Search for Rare-Earth Free Permanent Magnets in Fe and Co Based Compounds by Adaptive Genetic Algorithm**: Xin Zhao[1]; *Cai-Zhuang Wang*[1]; Balamurugan Balasubramanian[2]; David Sellmyer[2]; Manh Cuong Nguyen[1]; Kai-Ming Ho[1]; [1]Ames Laboratory and Department of Physics and Astronomy, Iowa State University; [2]Nebraska Center for Materials and Nanoscience and Department of Physics and Astronomy, University of Nebraska

**10:10 AM Break**

**10:30 AM Invited**
**Molecular Crystal Structure Prediction with Gator and Genarris**: *Noa Marom*[1]; [1]Carnegie Mellon University

**11:00 AM**
**Determination of Thermal Transport in Solids and Liquids by Non-equilibrium Molecular Dynamics Simulations**: Jonathan Severin[1]; *Philippe Jund*[1]; Sophie Loehlé[2]; [1]University of Montpellier; [2]Total

**11:20 AM**
**Economic Analysis of National Needs for Technology Infrastructure to Support the Materials Genome Initiative**: *Troy Scott*[1]; Alan O'Connor[1]; Gregory Tassey[2]; Amanda Walsh[1]; Benjamin Anderson[1]; [1]RTI International; [2]University of Washington, Economic Policy Research Center

## Computational Materials Science and Engineering for Nuclear Energy – Structural Materials I

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Tuesday AM
March 13, 2018
Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* Xian-Ming Bai, Virginia Tech ; Estelle Meslin, CEA

**8:30 AM Invited**
**Fundamentals of Energy Dissipation and Defect Energetics of Maximally Disordered Alloys**: *Malcolm Stocks*[1]; Sai Mu[1]; Shijun Zhao[1]; Raina Olsen[1]; German Samolyuk[1]; Bennet Larson[1]; Thom Berlijn[1]; Sebastian Wimmer[1]; Sergiy Mankovsky[1]; Hubert Ebert[1]; Biswanath Dutta[1]; Tilmann Hickel[1]; [1]Oak Ridge National Laboratory

**9:00 AM**
**Density Functional Theory Simulations of Clusters in Reactor Pressure Vessel Steels**: *Thomas Whiting*[1]; Daniel King[1]; Patrick Burr[2]; Mark Wenman[1]; [1]Imperial College London; [2]University of New South Wales

**9:20 AM**
**Molecular Dynamics Study of Irradiation Damage in Nano-grain Sized Polycrystal**: *Peyman Saidi*[1]; Cong Dai[1]; Zhongwen Yao[1]; Mark Daymond[1]; [1]Queen's University

**9:40 AM**
**Ab Initio Modeling of Vacancy-type Defects in a High Entropy Alloy**: *Congyi Li*[1]; George Stocks[2]; Brian Wirth[3]; Steve Zinkle[3]; [1]Bredesen Center; [2]Oak Ridge National Lab; [3]University of Tennessee, Knoxville

**10:00 AM Break**

**10:20 AM**
**Calculating Free Energies of Metal-He Interfaces from Atomic Models**: *Sanket Navale*[1]; Michael Demkowicz[2]; [1]Massachusetts Institute of Technology; [2]Texas A&M University

**10:40 AM**
**Simulation of Phosphorous Migration to Grain-boundary by Molecular Dynamics**: *Ken-ichi Ebihara*[1]; Tomoaki Suzudo[1]; Masatake Yamaguchi[1]; [1]Japan Atomic Energy Agency

**11:00 AM**
**Rate Theory Modeling of Fission Gas Behavior in Ion Implantation Experiment**: *Xin Xie*[1]; Wenhua Zhang[1]; Yedong Gao[1]; Jing Liu[1]; Hang Zang[1]; Wenbo Liu[1]; Bo Zhang[1]; Di Yun[1]; [1]Xi'an Jiaotong University

**11:20 AM Invited**
**Radiation Damage in Carbon-based Materials**: *Nigel Marks*[1]; [1]Curtin University

## Computational Thermodynamics and Kinetics – Transport and Structure

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

Tuesday AM
March 13, 2018
Room: 128A
Location: Phoenix Convention Center

*Session Chairs:* Marco Bernardi, Caltech; Brent Fultz, California Institute of Technology

**8:30 AM**
**Numerical Evaluation of Ionic Conducting Properties of $SrTi_{1-x}Fe_xO_{3-\delta}$ Solid Solutions**: *Namhoon Kim*[1]; Bin Ouyang[1]; Nicola Perry[2]; Elif Ertekin[1]; [1]University of Illinois; [2]Kyushu University

**8:50 AM**
**Thermal Magnon-phonon Interaction in $Pd_3Fe$**: *Fred (Chae-Reem) Yang*[1]; Olle Hellman[1]; Matthew Lucas[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Air Force Research Laboratory

**9:10 AM Invited**
**Advances in Computing Charge Carrier Dynamics from First Principles**: *Marco Bernardi*[1]; [1]Caltech

**9:40 AM**
**Extension of the Stability Range of Tau-10 Phase in Al-Fe-Si Alloy: Cluster Expansion Approach**: *Biswas Rijal*[1]; Richard Hennig[1]; Michele Manuel[1]; Sujeily Soto[1]; [1]University of Florida

**10:00 AM Break**

**10:20 AM**
**First-principles Calculations of Bulk and Interfacial Thermodynamic Properties for Al-Li and Al-Cu-Li Alloys**: *Bi-Cheng Zhou*[1]; Kyoungdoc Kim[1]; Christopher Wolverton[1]; [1]Northwestern University

**11:40 AM**
**Oxygen Diffusion around (10-12) Twin Boundary in Ti**: *Mohammad Shahriar Hooshmand*[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University

## Coupling Advanced Characterization and Modeling Tools for Understanding Fundamental Phase Transformation Mechanisms: An MPMD Symposium in Honor of Hamish Fraser – Session I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; Soumya Nag, GE Global Research; Rajarshi Banerjee, University of North Texas

Tuesday AM
March 13, 2018
Room: 127A
Location: Phoenix Convention Center

*Session Chair:* Rajarshi Banerjee, University of North Texas

**8:30 AM Introductory Comments:** Symposium Organizers

**8:35 AM Invited**
**Fun-research and Some Exciting Results (FRASER)**: *Michael Loretto*[1]; [1]University of Birmingham

**9:05 AM Invited**
**Phase Stability of Nanostructured Steel Studied by Atom Probe Tomography and the Defactant Concept**: *Reiner Kirchheim*[1]; [1]University of Goettingen

**9:35 AM Invited**
**Lattice Site Correspondence in Active Eutectoid Decomposition in Ti-Cu and Zr-Cu Alloys**: Harish Donthula[1]; Raghvendra Tewari[1]; Rajarshi Banerjee[2]; Gautam Dey[1]; *Srikumar Banerjee*[1]; [1]Bhabha Atomic Research Centre; [2]University of North Texas

**10:05 AM Break**

**10:25 AM Invited**
**Steel Ab Initio: Atomic Scale Characterization and Modeling in the Development of High Strength Steels**: *J. Mayer*[1]; M. Beigmohamadi[2]; M. Lipinska-Chwalek[1]; Tilmann Hickel[3]; T. Scheu[4]; Christian Liebscher[4]; Dierk Raabe[4]; James Wittig[5]; [1]RWTH Aachen University; [2]Ernst Ruska Centre; [3]Max-Planck-Institut fuer Eisenforschung GmbH; [4]Max-Planck-Institut für Eisenforschung; [5]Vanderbilt University

**10:55 AM Invited**
**Thermoelastic Equilibrium and Superfunctionality of Pre-transitional Materials: Superelasticity, Supermagnetostriction, Invar and Elinvar Effects**: *Armen Khachaturyan*[1]; Weifeng Rao[2]; Ye-Chuan Xu[2]; John Morris[2]; [1]Rutgers University; [2]Nanjing University of Information Science and Technology

**11:25 AM Invited**
**Phase Separation and Atomic Ordering in Mixed III – V Epitaxial Layers**: *Subhash Mahajan*[1]; [1]University of California

## Coupling Experiments and Modeling to Understand Plasticity and Failure – Plasticity Induced Damage

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Michael Sangid, Purdue University; Philip Eisenlohr, Michigan State University; Matthew Miller, Cornell University; Paul Shade, Air Force Research Laboratory

Tuesday AM
March 13, 2018
Room: 126B
Location: Phoenix Convention Center

*Session Chairs:* Matt Miller, Cornell University; Bill Musinski, Air Force Research Laboratory,

**8:30 AM Invited**
**Coupled Experiment and Modelling to Study Grain Orientation and Interaction Effects. Part 1**: *Jette Oddershede*[1]; Grethe Winther[2]; [1]Xnovo Technology, Denmark; [2]Department of Mechanical Engineering, Technical University of Denmark

**8:55 AM Invited**
**Coupled Experiment and Modelling to Study Grain Orientation and Interaction Effects. Part 2**: *Grethe Winther*[1]; Jette Oddershede[2]; [1]Technical University of Denmark; [2]Xnovo Technology, Denmark

**9:20 AM**
**On the Role of Casting Pores in the Fatigue Damage Process of a Cast Aluminium Alloy**: *Marcel Wicke*[1]; Martin Luetje[1]; Inigo Bacaicoa[1]; Angelika Brueckner-Foit[1]; [1]University of Kassel

**9:40 AM Invited**
**Simulation Study on Plasticity and Fracture in Aluminum Based on Real Microstructures**: *Martin Diehl*[1]; Pratheek Shanthraj[1]; Franz Roters[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

**10:05 AM Break**

**10:25 AM Invited**
**Using 3D Microstructure Characterization to Study the Mechanics of Polycrystalline Materials**: *Henry Proudhon*[1]; Wolfgang Ludwig[2]; Jean-Charles Stinville[3]; William Lenthe[3]; McLean Echlin[3]; Tresa Pollock[3]; [1]MINES ParisTech; [2]Université de Lyon; [3]University of California, Santa Barbara

**10:50 AM Invited**
**Challenges with Virtual Sample Instantiation for Prediction of Strain Localization and Crack Initiation in Polycrystalline Ni- and Ti-base Alloys**: J.C. Stinville[1]; McLean Echlin[1]; William Lenthe[1]; Toby Francis[1]; *Tresa Pollock*[1]; [1]University of California, Santa Barbara

**11:15 AM Invited**
**Integrating High Energy Diffraction Microscopy Data with Crystal Plasticity Models for Strength and Damage**: *Joel Bernier*[1]; Darren Pagan[2]; Nathan Barton[1]; Paul Shade[3]; William Musinski[3]; Todd Turner[3]; [1]Lawrence Livermore National Laboratory; [2]Cornell University; [3]Air Force Research Laboratory, WPAFB

**11:40 AM**
**Microstructure Sensitive Crack Nucleation in PM Ni Alloys**: *Bo Chen*[1]; Jun Jiang[1]; Fionn Dunne[1]; [1]Imperial College London

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – 3A: Characterising Strain Localization in Ni-based Superalloys. 3B Characterization & Understanding of Deformation in Ni-based Superalloys

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC; Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

Tuesday AM
March 13, 2018
Room: 126A
Location: Phoenix Convention Center

*Session Chairs:* Mark Hardy, Rolls-Royce plc; Kinga Unocic, Oak Ridge National Laboratory

**8:30 AM Invited**
**Novel Techniques for Investigation of Cyclic Plasticity in Nickel Base Polycrystals**: *J.C. Stinville*[1]; W.C. Lenthe[1]; M.P. Echlin[1]; P.G. Callahan[1]; T.M. Pollock[1]; [1]University of California, Santa Barbara

**9:00 AM**
**High Resolution Deformation Mapping Studies of the Deformation of a Ni Superalloy**: *Joao Fonseca*[1]; Allan Harte[1]; Thomas Armitage[1]; Alberto Orozco-Caballero[1]; [1]The University of Manchester

**9:20 AM**
**Benchmarking Multi-scale Models with Microtensile Experiments and 3D Microstructural Characterization of René 88DT**: *David Eastman*[1]; Paul Shade[2]; Michael Uchic[2]; George Weber[1]; Akbar Bagri[1]; Somnath Ghosh[1]; Will Lenthe[3]; Tresa Pollock[3]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]AFRL; [3]University of California, Santa Barbara

**9:40 AM**
**Tailoring the Properties of a Ni-based Superalloy via Modification of the Forging Process: An ICME Approach to Fatigue Performance**: *John Rotella*[1]; Martin Detrois[2]; Sammy Tin[3]; Michael Sangid[1]; [1]Purdue University; [2]ORISE, National Energy Technology Laboratory; [3]Illinois Institute of Technology

**10:00 AM Break**

**10:20 AM Invited**
**New Insights into Rate Limiting Deformation Processes in Ni-base Superalloys**: Tim Smith[1]; Don McAllister[2]; Jiashi Miao[2]; Maryam Ghazisaeidi[2]; Stephen Niezgoda[2]; Yunzhi Wang[2]; *Michael Mills*[2]; [1]NASA Glenn Research Center; [2]The Ohio State University

**10:50 AM Invited**
**Deformation Mechanisms in Polycrystalline Superalloys**: *Catherine Rae*[1]; Regina Schlütter[1]; Yuan Wang-Koh[1]; Olivier Messe[1]; [1]University of Cambridge

**11:20 AM**
**Effects of Strain Rate and Temperature Variation on Dislocation Structures and Faults in a Polycrystalline Ni-based Superalloy**: *Regina Schlütter*[1]; Olivier Messé[1]; Enrique Galindo-Nava[1]; Thomas Jackson[2]; Catherine Rae[1]; [1]University of Cambridge; [2]Rolls-Royce plc

**11:40 AM**
**Influence of Long Term Ageing on Deformation and Damage Behavior in Alloy 617**: *Guocai Chai*[1]; Guocai Chai[2]; Mattias Calmunger[1]; Sten Johansson[1]; Johan Moverare[1]; [1]Linköping University; [2]Sandvik Materials Technology

## Design for Mechanical Behavior of Architectured Materials via Topology Optimization – Design and Topology Optimization (TO) Considering Manufacturability, Microstructure, and Surface Effects

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Natasha Vermaak, Lehigh University; Andrew Gaynor, U.S. Army Research Laboratory

Tuesday AM
March 13, 2018
Room: 132C
Location: Phoenix Convention Center

*Session Chair:* Andrew Gaynor, U.S. Army Research Laboratory

**8:30 AM Invited**
**Incorporating Material Heterogeneity in Automated Design Tools**: *Michael Groeber*[1]; Edwin Schwalbach[1]; Michael Uchic[1]; Jonathan Miller[1]; Paul Shade[1]; William Musinski[1]; Sean Donegan[1]; Daniel Sparkman[1]; [1]AFRL

**9:10 AM**
**Realizing Optimized Mesoscale 3D Architected Material Designs via Nanoparticle Assembly by Pointwise Spatial Printing**: *Md Sadeq Saleh*[1]; Chunshan Hu[2]; Rahul Panat[1]; [1]Carnegie Mellon University; [2]Washington State University

**9:40 AM**
**Design of Functionally Graded Microstructures with Manufacturability**: *Jaejong Park*[1]; Alok Sutradhar[1]; Jami J. Shah[1]; [1]Ohio State University

**10:10 AM Break**

**10:30 AM**
**Design for Discovery: Integrated Computational Design & Additive Manufacturing of Mechanical Metastructures with a Parametric Level-set Based Approach**: *Shikui Chen*[1]; [1]State University of New York at Stony Brook

**11:00 AM**
**Efficient Microstructural Design: A Topological Sensitivity Approach**: *Krishnan Suresh*[1]; [1]University of Wisconsin, Madison

**11:30 AM**
**Topology Optimization for Sliding Abrasive Wear of Bi-material Composites**: *Xiu Jia*[1]; Natasha Vermaak[1]; [1]Lehigh University

## Dynamic Behavior of Materials VIII – Dynamic Response of BCC Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

Tuesday AM
March 13, 2018
Room: 127B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM Invited**
**Orientation Dependence of the Shock Response and Spall Fracture of Tantalum**: *David Jones*[1]; Saryu Fensin[1]; Carl Trujillo[1]; George Gray[1]; [1]Los Alamos National Laboratory

**8:50 AM**
**The Influence of Grain Boundary Orientation on the Strength and Failure of Tantalum**: *Eric Hahn*[1]; Saryu Fensin[1]; Tim Germann[1]; [1]Los Alamos National Laboratory

**9:10 AM**
**Improving High Strain-rate Strength Models of Tantalum Using Atomistic Simulations**: Alexander Moore[1]; Hojun Lim[1]; Justin Brown[1]; *J. Matthew Lane*[1]; [1]Sandia National Laboratories

**9:30 AM Invited**
**Taylor Impact Tests of Single- and Polycrystalline Tantalum**: *Hojun Lim*[1]; Jay Carroll[1]; Corbett Battaile[1]; Hyuk Jong Bong[2]; Shuh-Rong Chen[3]; Matthew Lane[1]; [1]Sandia National Laboratories; [2]Pacific Northwest National Laboratory; [3]Los Alamos National Laboratory

**10:10 AM Break**

**10:30 AM Invited**
**Using Taylor Cylinder Impact Experiments to Investigate Dynamic Behaviors of Materials**: *Shuh Rong Chen*[1]; Daniel Martinez[1]; Carl Trujillo[1]; George (Rusty) Gray[1]; [1]Los Alamos National Laboratory

**11:10 AM**
**Shear Response of High-purity Tantalum during Quasi-static and Dynamic Loading**: *Thomas Nizolek*[1]; James Valdez[1]; Cheng Liu[1]; George Gray[1]; [1]Los Alamos National Laboratory

**11:30 AM**
**Quantifying the Role of Grain Boundaries in the Dynamic Mechanical Performance of Additively Manufactured Pure Tantalum through Micropillar Compression and Spherical Nanoindentation Experiments**: *Jordan Weaver*[1]; David Jones[1]; Nan Li[1]; Saryu Fensin[1]; G.T. Gray[1]; Nathan Mara[1]; [1]Los Alamos National Laboratory

## Electrode Technology Symposium for Aluminum Production – Joint Session with Aluminum Reduction

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xianan Liao, Elkem Carbon

Tuesday AM
March 13, 2018
Room: 222C
Location: Phoenix Convention Center

*Session Chair:* Egil Skybakmoen, Sintef

**8:30 AM Introductory Comments**

**8:35 AM**
**Formation of Aluminium Carbide in Hall-Héroult Electrolysis Cell Environments**: Bronislav Novak[1]; *Arne Ratvik*[2]; Zhaohui Wang[2]; Tor Grande[1]; [1]Norwegian University of Science and Technology; [2]SINTEF

**9:00 AM**
**The Research and Trial of the Aluminum Electrolysis Cells with Current Out from the Bottom**: *Dongfang Zhou*[1]; Yafeng Liu[1]; Shaohu Tao[1]; [1]Shenyang Aluminum & Magnesium Engineering & Research Institute Co.Ltd

**9:25 AM**
**Laboratory Study of the Impact of Cathode Grade on the Formation of Deposits on the Aluminium Cathode Interface in Hall-Héroult Cells**: Jean-René Landry[1]; Mojtaba Fallah Fini[1]; *Gervais Soucy*[1]; Martin Desilets[1]; Patrick Pelletier[2]; Loig Rivoaland[3]; Didier Lombard[2]; [1]Université de Sherbrooke; [2]Rio Tinto; [3]Carbone Savoie

**9:50 AM**
**Understanding the Anode Porosity as a Means for Improved Aluminium Smelting**: *Epma Putri*[1]; Geoffrey Brooks[1]; Graeme Snook[2]; Stein Rørvik[3]; Lorentz Petter Lossius[4]; Ingo Eick[5]; [1]Swinburne University of Technology; [2]CSIRO, Mineral Resources; [3]SINTEF Materials & Chemistry; [4]Hydro Aluminium AS; [5]Hydro Aluminium Deutschland GmbH

**10:15 AM Break**

**10:30 AM**
**Effect of Changes in Anode Top Cover Composition on Anode Butt Quality**: *Ali Jassim*[1]; Edouard Mofor[1]; Jamil Wazir Eddin[1]; Shane Polle[1]; Daniel Whitfield[1]; [1]Emirates Global Aluminium

**10:55 AM**
**Inert Anodes – The Blind Alley to Environmental Friendliness?**: *Asbjorn Solheim*[1]; [1]SINTEF

**11:20 AM**
**Role of the Porosity of Carbon Anodes in the Nucleation and Growth of Gas Bubbles**: *Sandor Poncsak*[1]; Laszlo Kiss[1]; [1]University of Quebec at Chicoutimi

## Energy Technologies and CO2 Management Symposium – Novel Energy Technologies

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
*Program Organizers:* Ziqi Sun, Queensland University of Technology; Cong Wang, Northeastern University; Donna Guillen, Idaho National Laboratory; Tao Wang, Nucor Steel; Neale Neelameggham, Ind LLC; John Howarter, Purdue University

Tuesday AM
March 13, 2018
Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* Xiaobo Chen, RMIT, Australia; Jian Li Kang, Tianjin Polytechnic University

**8:30 AM Invited**
**Failure Behavior of Electrode Materials**: *Cheng Yan*[1]; Hansinee Sitinamaluwa[1]; [1]Queensland University of Technology

**8:50 AM Invited**
**Flexible and Hierarchical Nano-porous Catalyst with Efficient for Hydrogen Evolution Reaction**: *Jianli Kang*[1]; Guoliang Zhang[1]; Zhijia Zhang[1]; Qin Huang[1]; [1]Tianjin Polytechnic University

**9:10 AM Invited**
**Guided Evolution of Bulk Metallic Glass Nanostructures: A Platform for Designing 3D Electrocatalytic Surfaces**: *Gustavo Doubek*[1]; [1]University of Campinas

**9:30 AM Invited**
**Stifling Magnesium Corrosion via a Novel Anodic Coating**: *Xiaobo Chen*[1]; [1]RMIT

**9:50 AM Break**

**10:10 AM**
**2D Metal Oxide Nanosheets for Sustainable Applications**: *Ziqi Sun*[1]; [1]Queensland University of Technology

**10:30 AM**
**Vertically Aligned Ferroelectric KNbO3 Nanowire Arrays for Solar Energy Conversion**: *Shun Li*[1]; Boping Zhang[2]; Federico Rosei[3]; [1]Southern University of Science and Technology; [2]University of Science & Technology Beijing; [3]INRS

**10:50 AM**
**Flow Characteristic of Two-phase Bubble Reactor for Slag Waste Heat Recovery**: *Wenjun Duan*[1]; [1]Northeastern University

**11:10 AM**
**Two-dimensional Metal Oxide-based Nanomaterials for Energy Storage Devices**: *Jun Mei*[1]; Yuanwen Zhang[1]; Ziqi Sun[1]; [1]Queensland University of Technology

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Multi-mechanical Interactions During Extreme Environment Fatigue Loadings

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Tuesday AM
March 13, 2018
Room: 125B
Location: Phoenix Convention Center

*Session Chair:* Jean-Briac le Graverend, Texas A&M University

**8:30 AM**
**Investigation of Slip Transfer across Phase Boundaries with Application to Cold Dwell Facet Fatigue**: *Zebang Zheng*[1]; Daniel Balint[1]; Fionn Dunne[1]; [1]Imperial College London

**8:50 AM**
**Temperature and Microstructural Dependence of Dwell Fatigue in Dual-phase Titanium Alloys**: *Michelle Harr*[1]; Samantha Daly[2]; Adam Pilchak[3]; [1]University of Michigan; [2]University of California Santa Barbara; [3]Air Force Research Laboratory

**9:10 AM**
**The Effect of Dwell on Fatigue Crack Growth in a Ti-6Al-2Sn-4Zr-6Mo Alloy**: *Georgia Mills*[1]; Hangyue Li[2]; S. Williams[3]; P. Bowen[1]; [1]University of Birmingham; [2]The University of Birmingham; [3]Rolls-Royce plc

**9:30 AM**
**Characterization of Creep-fatigue Deformation in 9Cr-1MoV Steel and Weldments**: *Harrison Whitt*[1]; Tyler Payton[1]; Wei Zhang[1]; Michael Mills[1]; [1]The Ohio State University

**9:50 AM Break**

**10:10 AM**
**Modeling of Creep-fatigue Crack Growth in Steels for High Temperature Structural Applications**: Jose J. Ramirez[1]; *Gabriel P. Potirniche*[1]; Harrison Pugesek[1]; Martin Taylor[1]; Robert Stephens[1]; Indrajit Charit[1]; [1]University of Idaho

**10:30 AM**
**Thermal Fatigue Behavior of High Cr Roller Steel**: *Goran Kugler*[1]; David Bombac[2]; Milan Tercelj[1]; [1]University of Ljubljana, NTF-OMM; [2]University of Cambridge

## Fracture: 65 Years after the Weibull Distribution and the Williams Singularity – Session III

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Brad Boyce, Sandia National Laboratories; Ellen Cerreta, Los Alamos National Laboratory; Jacob Hochhalter, NASA LaRC; Jonathan Zimmerman, Sandia National Laboratories

Tuesday AM
March 13, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Jacob Hochhalter, NASA; Ashley Spear, University of Utah

**8:30 AM Invited**
**Trends in Microstructure-sensitive Computational Approaches to Fatigue Cracking**: *David McDowell*[1]; [1]Georgia Institute of Technology

**9:00 AM Invited**
**A Data-driven Approach to Predict Microstructurally Small Crack Evolution**: Kyle Pierson[1]; Jacob Hochhalter[2]; P. Thomas Fletcher[1]; *Ashley Spear*[1]; [1]University of Utah; [2]NASA Langley Research Center

**9:30 AM Invited**
**Composite Overwrapped Pressure Vessel (COPV) Life Test**: *Richard Russell*[1]; David Dawicke[2]; Jacob Hochhalter[1]; [1]NASA; [2]Analytical Services and Materials, Inc.

**10:00 AM Break**

**10:20 AM Invited**
**Forward Propagation of Random Microstructural Features for Reliability Estimates of Engineering Structures**: *John Emery*[1]; Peter Coffin[1]; Brian Robbins[1]; Samuel Bowie[2]; Jay Carroll[1]; [1]Sandia National Laboratories; [2]Georgia Tech

**10:50 AM**
**Grain and Sub-grain Level Strains ahead of an Evolving Fatigue Short Crack as Measured by X-ray Techniques**: *Diwakar Naragani*[1]; Michael Sangid[1]; Paul Shade[2]; Peter Kenesei[3]; Hemant Sharma[3]; [1]Purdue University; [2]Air Force Research Laboratory; [3]Argonne National Laboratory

**11:10 AM Invited**
**Using R-curves to Predict Fatigue Behavior in Crack Bridging Toughened Ceramics**: *Jamie Kruzic*[1]; [1]UNSW Australia

## Frontiers in Advanced Functional Thin Films and Nanostructured Materials – Session III

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Ritesh Sachan, Army Research Office; Srinivasa Rao Singamaneni, The University of Texas at El Paso; Haiyan Wang, Purdue University; Nuggehalli Ravindra, New Jersey Institute of Technology; Raj Singh, Oklahoma State University; Amit Pandey, LG Fuel Cell Systems Inc.

Tuesday AM
March 13, 2018
Room: 103A
Location: Phoenix Convention Center

Funding support provided by: Quantum Design and Radiant Technologies

*Session Chairs:* Amit Pandey, LG-Fuel Cell Systems; R. Singh, Oklahoma State University

**8:30 AM Invited**
**Stabilization of Nanocrystalline Grain Size at Elevated Temperatures: Theory and Experiment**: *Carl Koch*[1]; [1]North Carolina State University

**8:55AM Invited**
**Nanoscience and Nanotechnology Using Energetic Ion Beams/Gamma Radiation/Lasers**: *Anand Pathak*[1]; S. V. S. Rao[1]; V. S. Vendamani[1]; M. Dhanunjaya[1]; S. Rao[1]; [1]University of Hyderabad

**9:15AM**
**Hydrogen Plasma Annealing of E-Beam Evaporated SiO2 Tunnel Barriers**: *Matthew Filmer*[1]; Gregory Snider[1]; Alexei Orlov[1]; [1]University of Notre Dame

**9:35 AM Invited**
**Thin Film and Coatings for Biomaterials Applications**: *Adele Carradò*[1]; [1]Université de Strasbourg IPCMS

**10:00 AM Break**

**10:15 AM Invited**
**Structures and Mechanical Behavior of Metal-metal Nitride Nanolayered Films**: *Amit Misra*[1]; [1]University of Michigan

**10:40 AM**
**Engineering Elastic Strain Gradients to Tune the Electrical Properties of Semiconductors for Thermoelectric Applications**: *Eric Yao*[1]; Gyuseok Kim[2]; Brian Piccione[2]; Jungho Shin[2]; Daniel Gianola[1]; [1]University of California, Santa Barbara; [2]University of Pennsylvania

**11:00 AM**
**An Investigation of the Relationship between Mechanical and Optical Properties of Transparent Metal Oxide Multilayers**: *Chelsea Appleget*[1]; Andrea Hodge[1]; [1]University of Southern California

**11:20 AM**
**Unravelling Defects in Hybrid Perovskite Solar Cell Structures**: *C. Saiz*[1]; L. M. Martinez[1]; Srinivasa Rao Singamaneni[1]; [1]The University of Texas at El Paso

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Tuesday AM
March 13, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* Dan Miracle, AF Research Laboratory; Carl Lundin, The University of Tennessee, Knoxville

**8:30 AM Invited**
**Influence of Crystal Defects upon Phase Stability of High Entropy Alloys**: *Mingwei Chen*[1]; [1]Johns Hopkins University

**8:50 AM Invited**
**Mechanical Properties and Strengthening Mechanisms of Concentrated Solid Solution and High Entropy Alloys**: *Hongbin Bei*[1]; Zhenggang Wu[1]; Yanfei Gao[2]; [1]Oak Ridge National Laboratory; [2]Oak Ridge National Laboratory and The University of Tennessee

**9:10 AM Keynote**
**High Entropy Alloys, High throughput Experiments and High Temperature Materials**: *Dan Miracle*[1]; [1]AF Research Laboratory, Materials and Manufacturing Directorate

**9:30 AM Invited**
**Solid Solution Softening of an Equiatomic Ternary Refractory Alloy by Additional Alloying with a Fourth Element**: *Oleg Senkov*[1]; Satish Rao[1]; Christopher Woodward[1]; Adam Pilchak[1]; S. Semiatin[1]; [1]Air Force Research Laboratory

**9:50 AM Invited**
**Effects of Chemical Disorder on Radiation Response in Medium–and High–entropy Alloys**: *Yanwen Zhang*[1]; Gihan Velisa[1]; Shijun Zhao[1]; Mohammad Ullah[1]; Ke Jin[1]; Chenyang Lu[2]; Fuxiang Zhang[1]; Hongbin Bei[1]; Lumin wang[2]; William Weber[3]; [1]Oak Ridge National Laboratory; [2]University of Michigan; [3]University of Tennessee

**10:10 AM Break**

**10:25 AM Invited**
**Continued and Expanded Studies on Fusion Welds in High Entropy Alloys**: *Carl Lundin*[1]; John Bohling[1]; Joshua Burgess[2]; Cameron Hale[1]; Maneel Bharadwaj[3]; Peter Liaw[1]; [1]University of Tennessee; [2]GE Power; [3]John Deere

**10:45 AM Invited**
**Evolution of Microstructure, Texture and Strength during Severe Plastic Deformation of CrMnFeCoNi High-entropy Alloy**: *Werner Skrotzki*[1]; Aurimas Pukenas[1]; Bertalan Joni[2]; Eva Odor[2]; Tamas Ungar[2]; Anton Hohenwarter[3]; Reihard Pippan[3]; Easo George[4]; [1]Dresden University of Technology; [2]Eötvös University Budapest; [3]Montanuniversität Leoben; [4]Oak Ridge National Laboratory

**11:05 AM**
**Orientation Dependence of the Mechanical Response and Microstructural Evolution of NiCoCr Single Crystal Medium Entropy Alloys**: *Benay Uzer*[1]; Sezer Picak[2]; Jun Liu[2]; Demircan Canadinc[1]; Yuri I. Chumlyakov[3]; Ibrahim Karaman[2]; [1]Koc University; [2]Texas A&M University; [3]Tomsk State University

**11:25 AM Invited**
**Processing, Structure and Tensile Behavior of a Nano-lamellar Eutectic AlCoCrFeNi2.1 High Entropy Alloy**: *Pinaki Bhattacharjee*[1]; Irfan Wani[1]; Tilak Bhattacharjee[2]; Saad Sheikh[3]; Sheng Guo[3]; Nobuhiro Tsuji[2]; [1]IIT hyderabad; [2]Kyoto University; [3]Chalmers University

**11:45 AM Invited**
**Carbon and Nitrogen Co-doping in an Equiatomic High-entropy Alloy**: *Zhiming Li*[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung

**12:05 PM Invited**
**Effect of Cellular Structure on Mechanical Property in None-equal Molar AlCoCrFeNiTi High Entropy Alloy**: *Che-Wei Tsai*[1]; Chia-Ming Kuo[1]; [1]National Tsing Hua University

## Hume-Rothery Award Symposium: Computational Thermodynamics and Its Implications to Kinetics, Properties, and Materials Design – CALPHAD Methods

*Sponsored by:* TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Michael Gao, National Energy Technology Lab; Chelsey Hargather, New Mexico Institute of Mining and Technology; Richard Hennig, University of Florida; James Saal, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

Tuesday AM
March 13, 2018
Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* Michael Gao, National Energy Technology Lab; Carelyn Campbell, National Institute of Standards and Technology

**8:30 AM Invited**
**Software Tools for High-throughput CALPHAD from First-principles Data**: *Axel van de Walle*[1]; Ruoshi Sun[1]; Qijun Hong[1]; Sara Kadkhodaei[1]; [1]Brown University

**9:00 AM Invited**
**Computational Design of High Entropy Alloys: CALPHAD and Atomistic Simulation**: Won-Mi Choi[1]; *Byeong-Joo Lee*[1]; [1]Pohang University of Science and Technology

**9:30 AM Invited**
**CALPHAD, Are We There Yet?**: *Ursula Kattner*[1]; [1]National Institute of Standards and Technology

**10:00 AM Break**

**10:20 AM Invited**
**Computational Thermodynamics in the Y-Si-C-H-O System**: *Hans Seifert*[1]; [1]Karlsruhe Institute of Technology (KIT)

**10:50 AM Invited**
**Thermodynamic and Kinetic Modeling of Solidification and Precipitation Microstructure in Magnesium Alloys**: Jiashi Miao[1]; Chuan Zhang[2]; Weihua Sun[1]; Andrew Klarner[1]; Fan Zhang[2]; *Alan Luo*[1]; [1]The Ohio State University; [2]CompuTherm LLC

**11:20 AM Invited**
**Accurate Energetics beyond the Semilocal Density Functional Theory: Focusing on Transition Metal Disulfides and Cu2ZnSnS4-related Sulfides**: *Shun-Li Shang*[1]; Yi Wang[1]; Tim Anderson[2]; Zi-Kui Liu[1]; [1]Pennsylvania State University; [2]University of Florida

**11:50 AM Invited**
**Serving up CALPHAD Data to Build Better Databases and Design New Materials**: *Carelyn Campbell*[1]; [1]National Institute of Standards and Technology

## Integrative Materials Design III: Performance and Sustainability – Advanced Materials Characterization & Multi-scale Computational Modeling for Integrative Design and Reliability

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories; Corbett Battaile, Sandia National Laboratories; Anastasios Gavras, Riley Power

Tuesday AM
March 13, 2018
Room: 132A
Location: Phoenix Convention Center

*Session Chairs:* Corbett Battaile, Sandia National Laboratories; Tiantian Zhang, Worcester Polytechnic Institute

**8:30 AM Invited**
**The Hierarchy of Microstructure Parameters Affecting Tensile Ductility in Cast and Forged Ti-834 Alloy during High Temperature Exposure**: *Soran Birosca*[1]; [1]Swansea University

**8:50 AM**
**Plasticity in Textured Ti-6Al-4V under Tensile and Dwell-fatigue Loading**: *Tiantian Zhang*[1]; Diana Lados[1]; [1]Worcester Polytechnic Institute

**9:10 AM Invited**
**3D Tomography for Graphite Morphology Characterizations in Cast Irons Using High-energy X-rays**: *Dileep Singh*[1]; Chih-Pin Chuang[1]; John Hryn[1]; Jonathan Almer[1]; Peter Kenesei[1]; [1]Argonne National Laboratory

**9:30 AM**
**In Situ Study of Strain Partitioning and Damage in Carbide Free Bainitic Steels Using Micro Digital Image Correlation**: *Ankit Kumar*[1]; Aniruddha Dutta[2]; Roumen Petrov[3]; Jilt Sietsma[1]; [1]Delft University of Technology; [2]Max-Planck-Institut für Eisenforschung GmbH; [3]Ghent University

**9:50 AM**
**Experimental and Computational Studies of Fatigue Crack Propagation in Cast Al-Si Alloys Containing Secondary Phases**: *Tiantian Zhang*[1]; Anthony Spangenberger[1]; Diana Lados[1]; [1]Worcester Polytechnic Institute

**10:10 AM Break**

**10:25 AM Invited**
**Constitutive Model Development and Validation via Mesoscale X-ray Diffraction Data**: *Joel Bernier*[1]; Paul Shade[2]; Todd Turner[2]; Darren Pagan[3]; David Menasche[4]; [1]Lawrence Livermore National Laboratory; [2]Air Force Research Laboratory (WPAFB); [3]Cornell High Energy Synchrotron Source; [4]Hamiltonian Group, LLC

**10:45 AM Invited**
**Insights into Multiscale Deformation Phenomena from In Situ TEM Nanomechnical Testing**: *Andrew Minor*[1]; [1]University of California, Berkeley & LBL

**11:05 AM Invited**
**Deformation Twinning as a Design Parameter for Magnesium Alloys**: *Antonios Kontsos*[1]; [1]Drexel University

**11:25 AM Invited**
**Heterogeneous Deformation in High Purity Niobium**: *Thomas Bieler*[1]; Mingmin Wang[1]; Di Kang[1]; Derek Baars[1]; Aboozar Mapar[1]; Eureka Pai[1]; Tias Maiti[1]; Pulkit Garg[2]; Philip Eisenlohr[1]; Farhang Pourboghrat[3]; Kiran Solanki[2]; [1]Michigan State University; [2]Arizona State University; [3]The Ohio State University

**11:45 AM**
**A Multi-scale Model for Plasticity in BCC Metals**: *Corbett Battaile*[1]; Hojun Lim[1]; Christopher Weinberger[2]; [1]Sandia National Laboratories; [2]Colorado State University

## Looking through the Kaleidoscope: Discovering Your Path to Leadership – Morning Session

*Program Organizers:* Emily Bautista, Virginia Tech; Mackenzie Jones, Virginia Tech; Thomas Maulbeck, Virginia Tech; Rose Roberts, Virginia Tech

Tuesday AM
March 13, 2018
Room: 124B
Location: Phoenix Convention Center

*Session Chairs:* Emily Bautista, Virginia Tech; Mackenzie Jones, Virginia Tech; Thomas Maulbeck, Virginia Tech; Rose Roberts, Virginia Tech

**8:30 AM Invited**
**Materials Entrepreneurship as a Young Scientist**: *Michael Gibson*[1]; [1]Desktop Metal

**8:50 AM Invited**
**When to Step Up**: *Amanda Krause*[1]; [1]Lehigh University; GrainBound, Inc.

**9:10 AM Invited**
**Leadership within Different Spheres**: *David Williams*[1]; [1]The Ohio State University

**9:30 AM**
**Student Leadership: Igniting the Spark within Yourself and at Your University**: *Emily Bautista*[1]; [1]Virginia Tech

**9:50 AM Panel Discussion**

**10:10 AM Break**

**10:30 AM Invited**
**Technical Leadership: Risk vs Comfort**: *Christopher O'Brien*[1]; [1]ATI Specialty Materials

**10:50 AM Invited**
**Materials Design: Leading by Example**: *Greg Olson*[1]; [1]Northwestern University

**11:10 AM**
**Overcoming Challenges for Minorities in Leadership**: *Michele Manuel*[1]; Martin Thuo[2]; [1]University of Florida; [2]Iowa State University

**11:30 AM Panel Discussion**

## Magnesium Alloy Development: An LMD Symposium in Honor of Karl Kainer – Cast Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Norbert Hort, Helmholtz-Zentrum Geesthacht; Alan Luo, The Ohio State University

Tuesday AM
March 13, 2018
Room: 223
Location: Phoenix Convention Center

*Session Chairs:* Norbert Hort, Helmholtz-Zentrum Geesthacht; Alan Luo, The Ohio State University

**8:30 AM Introductory Comments**

**8:35 AM Keynote**
**Solutions for Next Generation Automotive Lightweight Concepts Based on Material Selection and Functional Integration**: *Horst Friedrich*[1]; Elmar Beeh[1]; Carmen Roider[1]; [1]Institute of Vehicle Concepts, German Aerospace Centre (DLR)

**9:05 AM Keynote**
**Recent Developments in the Application of the Interdependence Model of Grain Formation and Refinement**: *David StJohn*[1]; [1]University of Queensland

**9:35 AM Invited**
**Development of Magnesium-Rare Earth Die-casting Alloys**: *Mark Easton*[1]; Mark Gibson[2]; Suming Zhu[1]; Trevor Abbott[3]; Jian-Feng Nie[4]; Colleen Bettles[4]; Gary Savage[2]; [1]Royal Melbourne Institute of Technology University; [2]CSIRO; [3]Magontec; [4]Monash University

**9:55 AM Break**

**10:10 AM Keynote**
**Magnesium Pistons in Engines: Fiction or Fact?**: *Norbert Hort*[1]; Hajo Dieringa[1]; Karl Kainer[1]; [1]Helmholtz-Zentrum Geesthacht

**10:40 AM**
**Thermodynamics of Phase Formation in Mg–Al–C Alloys Applied to Grain Refinement**: *Guillaume Deffrennes*[1]; Bruno Gardiola[1]; Marc Lomello[2]; Jérôme Andrieux[1]; Olivier Dezellus[1]; Rainer Schmid-Fetzer[3]; [1]Université Claude Bernard Lyon 1, Laboratoire des Multimatériaux et Interfaces; [2]Université Savoie Mont Blanc, SYMME; [3]Institute of Metallurgy, Clausthal University of Technology

**11:00 AM**
**Creep Resistant Mg-Mn Based Alloys for Automotive Powertrain Applications**: *Mert Celikin*[1]; Mihriban Pekguleryuz[1]; [1]McGill University

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Fuels II

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Tuesday AM
March 13, 2018
Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Yongho Sohn, University of Central Florida; Isabella van Rooyen, Idaho National Laboratory

**8:30 AM Invited**
**Experimental Studies on Microstructure and Mechanical Properties of High Burnup Urania**: *Kurt Terrani*[1]; Chad Parish[1]; Mehdi Balooch[1]; Tyler Gerczak[1]; Philip Edmondson[1]; [1]Oak Ridge National Laboratory

**8:50 AM**
**Advanced Characterization of Irradiated UO2 Fuel**: *Lingfeng He*[1]; David Shuh[2]; Xianming Bai[3]; Michael Moorehead[1]; Brandon Miller[1]; Claude Degueldre[4]; Jason Harp[1]; [1]Idaho National Laboratory; [2]Lawrence Berkeley National Laboratory; [3]Virginia Polytechnic Institute and State University; [4]Lancaster University

**9:10 AM**
**In-situ Elevated Temperature Micro-cantilever Testing of $UO_2$**: *David Frazer*[1]; Benjamin Shaffer[2]; Pedro Peralta[2]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Arizona State University

**9:30 AM**
**Microstructural Characterization of Plutonium Based Fuels**: *Assel Aitkaliyeva*[1]; Cynthia Papesch[2]; [1]University of Florida; [2]Idaho National Laboratory

**9:50 AM**
**Phase Verification and Thermophysical Properties of Pu-Zr Alloys**: *Cynthia Papesch*[1]; Assel Aitkaliyeva[2]; [1]Idaho National Laboratory; [2]University of Florida

**10:10 AM Break**

**10:30 AM**
**Electron Microscopy Analysis of TRISO Fuel Particles with Failed SiC Layers from the AGR-2 Irradiation**: *Tyler Gerczak*[1]; John Hunn[1]; [1]Oak Ridge National Laboratory

**10:50 AM**
**Chemical and Microstructural Analysis of Irradiated Mixed Oxide Fuels**: *Riley Parrish*[1]; Jason Harp[2]; Assel Aitkaliyeva[3]; [1]University of Florida; [2]Idaho National Laboratory; [3]University of Florida, Idaho National Laboratory

**11:10 AM**
**Improvements and Applications of the FAST Fuel Model to Thorium-based and Mixed Oxide Fuels**: Andrew Prudil[1]; *John Bell*[2]; Evan Thomas[3]; Michael Welland[1]; Paul Chan[2]; [1]Canadian Nuclear Laboratories; [2]Royal Military College of Canada; [3]McMaster University

**11:30 AM**
**Non-destructive 3D Neutron Imaging of Composition in Nuclear Fuels**: *Adrian Losko*[1]; Sven Vogel[1]; Mark Bourke[1]; Kenneth McClellan[1]; Andy Nelson[1]; Darrin Byler[1]; Michael Mocko[1]; [1]Los Alamos National Laboratory

## Materials for Energy Conversion and Storage – Solid Oxide Fuel Cells II

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Tuesday AM
March 13, 2018
Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Soumendra N. Basu, Boston University; Uday Pal, Boston University

**8:30 AM Invited**
**Active Sites for Surface Exchange Reaction on Dual-phae-type Mixed Conductors**: Takuya Hatakeyama[1]; Itaru Oikawa[1]; *Hitoshi Takamura*[1]; [1]Tohoku University

**8:55 AM Invited**
**Nano-tailoring of Infiltrated Catalysts for Solid Oxide Regenerative Fuel Cells**: *Kyung Joong Yoon*[1]; [1]Korea Institute of Science and Technology

**9:20 AM**
**Phase-field Modeling of Microstructure Evolution in SOFC Electrodes**: Yinkai Lei[1]; Tianle Cheng[1]; *Youhai Wen*[1]; [1]National Energy Technology Laboratory

**9:40 AM Invited**
**Unravelling the Mystery of Interlayers and their Role on SOFC Durability**: *Xiao-Dong Zhou*[1]; Emir Dogdibegovic[2]; [1]University of Louisiana at Lafayette; [2]University of South Carolina

**10:05 AM Break**

**10:20 AM Invited**
**Rare Earth Nickelate Cathodes for SOFCs for Enhanced Oxygen Partial Pressure Operation**: Jane Banner[1]; *Srikanth Gopalan*[1]; [1]Boston University

**10:45 AM**
**Direct Performance Simulation Based on the Microstructure of SOFC Electrodes: A Phase Field Approach**: *Yinkai Lei*[1]; Tian-Le Cheng[1]; You-Hai Wen[1]; [1]National Energy Technology Laboratory

**11:05 AM**
**Solid Oxide Fuel Cell-battery Hybrid Electrochemical System for Electricity Grid Stability**: *Xiaofei Guan*[1]; Jun Jiang[1]; Shriram Ramanathan[2]; [1]Harvard University; [2]Purdue University

**11:25 AM Invited**
**Infiltration of SOFC Anodes with Stable Nano-catalysts for Performance Improvement**: Yanchen Lu[1]; Paul Gasper[1]; Boshan Mo[1]; Uday Pal[1]; Srikanth Gopalan[1]; *Soumendra Basu*[1]; [1]Boston University

**11:50 AM Invited**
**Scalable Nano-electrocatalyst Engineering Technique for Activation and Stabilization of SOFC Cathode**: *Shiwoo Lee*[1]; Navjot Sandhu[2]; Thomas Kalapos[1]; Kirk Gerdes[2]; Gregory Hackett[2]; [1]AECOM / National Energy Technology Laboratory; [2]National Energy Technology Laboratory

## Materials Innovation Keynote – Big Data and Machine Learning for Materials

*Program Organizers:* Carelyn Campbell, National Institute of Standards and Technology; Katsuyo Thornton, University of Michigan

Tuesday AM
March 13, 2018
Room: 129B
Location: Phoenix Convention Center

*Session Chairs:* Carelyn Campbell, National Institute of Standards and Technology; Katsuyo Thornton, University of Michigan

**8:30 AM Introductory Comments**

**8:35 AM Keynote**
**Big Data for Materials R&D, Deployment, and Lifecycle**: *Jed Pitera*[1]; [1]IBM Research - Almaden

**9:15 AM Keynote**
**How Materials Science Can Capitalize on Advances in Computer Science through Data Science and Machine Learning**: *Elizabeth Holm*[1]; [1]Carnegie Mellon University

**9:55 AM Question and Answer Period**

**10:15 AM Break**

**10:30 AM Keynote**
**Perspectives on Data Intensive Science from the DOE Office of Science**: *Laura Biven*[1]; [1]US Department of Energy

**11:10 AM Keynote**
**Going Smart and Deep on Materials**: *Ian Foster*[1]; [1]University of Chicago and Argonne National Laboratory

**11:50 AM Question and Answer Period**

## Materials Processing Fundamentals – Multiphysics - Process Modeling and Sensing

*Sponsored by:* TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
*Program Organizers:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology; Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

Tuesday AM
March 13, 2018

Room: 228A
Location: Phoenix Convention Center

*Session Chairs:* Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

**8:30 AM**
**Convection-Diffusion Model of Lithium-Bismuth Liquid Metal Batteries**: *Rakan Ashour*[1]; Douglas Kelley[1]; [1]University of Rochester

**8:50 AM**
**Electrovortex Flow in Metal Melts: Experiment and Simulation**: *Douglas Kelley*[1]; Rakan Ashour[1]; Alejandro Salas[2]; Norbert Weber[2]; Tom Weier[2]; [1]University of Rochester; [2]Helmholtz-Zentrum Dresden-Rossendorf

**9:10 AM**
**Surface Tension and Viscosity of Gamma-TiAl Alloys and Ti6Al4V Measured in Containerless Electromagnetic Processing under Reduced Gravity Conditions**: *Rainer Wunderlich*[1]; Ulrike Hecht[2]; Hans-Jörg Fecht[1]; [1]Ulm University; [2]ACCESS eV

**9:30 AM**
**Interface Fields Affecting Solidification Microstructure**: *Martin Glicksman*[1]; Kumar Ankit[2]; [1]Florida Institute of Technology; [2]Arizona State University

**9:50 AM**
**Chalcogenide Melts Study for High Temperature Thermoelectricity**: Youyang Zhao[1]; *Antoine Allanore*[1]; [1]Massachusetts Institute of Technology

**10:10 AM Break**

**10:30 AM**
**Ultrasound for Next-generation Alloy Casting**: *Bitong Wang*[1]; Andrew Caldwell[2]; Antoine Allanore[2]; Douglas Kelley[1]; [1]University of Rochester; [2]Massachusetts Institute of Technology

**10:50 AM**
**The Internet of Things (IoT) for Casting with 3D Printed Sand Molds**: *Jason Walker*[1]; Brian Vuksanovich[1]; Brett Conner[1]; Guha Manogharan[1]; Rich Lonardo[1]; Gerard Thiel[1]; Kirk Rogers[1]; Eric MacDonald[1]; [1]Youngstown State University

**11:10 AM**
**Study on Emulsion Phenomena and Field Flow Pattern in Side-blown Copper Smelting Process**: *Xiaolong Li*[1]; Zhang Ting'an[1]; Yan Liu[1]; Dongxing Wang[1]; [1]Northeastern University

**11:30 AM**
**Study on Minimum Starting Energy of Self-stirring Reactor Driven by Pressure Energy**: *Zimu Zhang*[1]; Qiuyue Zhao[1]; Maoyuan Li[1]; Xuhuan Guo[1]; Dianhua Zhang[1]; Zhang Ting'an[1]; [1]Northeastern University

**11:50 AM**
**Spatio-temporal Evolution Modeling of the Laser Helical Drilling with Femtosecond Pulses**: Xiaoji Li[1]; *Yiwei Dong*[1]; Qi Zhao[1]; Ertai Wang[1]; [1]Xiamen University

## Mechanical Behavior at the Nanoscale IV – Nanolayers and Nanocomposites

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Tuesday AM
March 13, 2018

Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Tim Rupert, UCI; Mao Scott, University of PIttsburgh

**8:30 AM Invited**
**Small-scale Mechanical Testing of Hierarchical Nanostructured Materials**: *Timothy Rupert*[1]; [1]University of California, Irvine

**9:00 AM**
**Fracture of Cu-Nb Multilayer Films on Polyimide**: *Megan Cordill*[1]; David Economy[2]; Marian Kennedy[2]; [1]Erich Schmid Institute of Materials Science; [2]Clemson University

**9:20 AM**
**A Multiscale Investigation of Core-shell Nanostructures Using the Coupled Atomistic and Discrete Dislocation Method**: Scott Muller[1]; *Arun Nair*[1]; [1]University of Arkansas

**9:40 AM**
**Thickness Dependent Strain Rate Sensitivity in Metallic Nanolayers**: *Yue Liu*[1]; Jennifer Hay[2]; Engang Fu[3]; Xinghang Zhang[4]; [1]Shanghai Jiao Tong University; [2]Nanomechanics, Inc.; [3]Peking University; [4]Purdue University

**10:00 AM Break**

**10:20 AM**
**Mechanical Properties of Ni Nanocomposites Embedded with Carbyne Chains**: *Scott Muller*[1]; Arun Nair[1]; [1]University of Arkansas

**10:40 AM**
**Atomistic Modeling of the Mechanical Properties of Nanoglass-metallic Glass Nanolaminates**: *Paulo Branicio*[1]; Z. Sha[2]; [1]University of Southern California; [2]Xi'an Jiaotong University

**11:00 AM**
**Interface Driven Mechanical Behavior of Mg/Nb Nano-layered Composites**: *Milan Ardeljan*[1]; Irene Beyerlein[2]; Siddhartha Pathak[3]; Marko Knezevic[1]; [1]University of New Hampshire; [2]University of California, Santa Barbara; [3]University of Nevada

**11:20 AM**
**Atomistic Investigation into the Mechanical Response of Ferrite-cementite Interfaces in Pearlite**: *Matthew Guziewski*[1]; Shawn Coleman[2]; Christopher Weinberger[1]; [1]Colorado State University; [2]Army Research Laboratory

**11:40 AM**
**Microstructure, Residual Stress, and Intermolecular Force Distribution of Graphene/Polymer Hybrid Composites: Nanoscale Morphology-promoted Synergistic Effects**: *Sanju Gupta*[1]; [1]Western Kentucky University

## Mechanical Characteristics and Application Properties of Metals and Non-metals for Technology: An EPD Symposium in Honor of Donato Firrao – Corrosion and Fatigue

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Jiann-Yang Hwang, Michigan Technological University; Bowen Li, Michigan Technological University; Pasquale Russo Spena, Free University of Bozen-Bolzano

Tuesday AM
March 13, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Amit Shyam, Oak Ridge National Laboratory; Bowen Li, Michigan Technological University

**8:30 AM Invited**
**Fatigue Behavior of Metastable Austenitic Stainless Steel AISI 304 under Different Test Frequencies**: *Davi Pessoa*[1]; Gunter Kirchhoff[2]; Martina Zimmermann[1]; [1]Technische Universität Dresden; [2]Fraunhofer-Institut für Werkstoff -und Strahltechnik

**9:10 AM**
**Corrosion Micro-scale Features and Alloy Microstructure Effects on Fatigue Initiation of AA7050-T7451**: *Noelle Easter Co*[1]; James Burns[1]; [1]University of Virginia

**9:30 AM**
**Creep-oxidation-small Fatigue Crack Interaction in Grade 91 Steel**: Sumit Bahl[1]; Sebastien Dryepondt[2]; Lawrence Allard[2]; Satyam Suwas[2]; *Amit Shyam*[2]; [1]Indian Institute of Science; [2]Oak Ridge National Laboratory

**9:50 AM**
**Influence of Surface and Near Surface Defects Caused by Laser Beam Cutting on the Fatigue Behavior of Plate-like Shaped Parts Made of Metastable Austenitic Stainless Steel AISI 304**: *Davi Pessoa*[1]; Patrick Herwig[2]; Martina Zimmermann[1]; [1]Technische Universität Dresden; [2]Fraunhofer-Institut für Werkstoff -und Strahltechnik IWS

## Metal-Matrix Composites Innovations, Advances and Applications: An SMD Symposium in Honor of William C. Harrigan, Jr. – Basic History and Advances in Metal Matrix Composites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys, LLC; William Harrigan, Gamma Technology, LLC

Tuesday AM
March 13, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* John Lewandowski, Case Western Reserve University; Dan Miracle, AF Research Laboratory

**8:30 AM Invited**
**Metal Matrix Composites – from Science to Technological Significance**: *Dan Miracle*[1]; [1]AF Research Laboratory

**9:00 AM Invited**
**Microstructure and Mechanical Behavior of Cryomilled Al-Mg Composites Reinforced with Nanometric Yttria Partially Stabilized Zirconia**: *Julie Schoenung*[1]; [1]University of California, Irvine

**9:30 AM**
**Hierarchically Engineered MMC's, a History of MMC Research at Powdermet Inc.**: *Andrew Sherman*[1]; [1]Powdermet Inc

**9:50 AM Break**

**10:10 AM Invited**
**Fracture and Fatigue of Particulate Composites, Nano-composites, and Toughening Mechanisms**: *John Lewandowski*[1]; [1]Case Western Reserve University

**10:40 AM**
**Designing New Self-healing Metallic Materials and Self-healing Metal Matrix Composites**: Volkan Kilicli[1]; Marjan Nezafati[2]; Nathan Salowitz[2]; *Pradeep Rohatgi*[2]; [1]Gazi University; [2]University of Wisconsin Milwaukee

**11:00 AM**
**Fatigue Crack Growth Resistance of Titanium Metal Matrix Composites**: *Hannah Stanley*[1]; [1]University of Birmingham

**11:20 AM**
**Experimental Optimization of Dry Sliding Wear Behavior of Titanium Matrix Composites Using Taguchi Methods**: *Koutarou Hattori*[1]; Shogen Hirami[1]; Yoshiko Hasegawa[2]; Hiroshi Izui[1]; Yoshiki Komiya[1]; [1]Nihon University; [2]Hasegawa Professional Engineer Office

**11:40 AM**
**Model-based Algorithm for Damage Detection in Piezoelectric Fiber-based Composites**: Khalid Shalan[1]; Mohamed AbdelMeguid[1]; *Tarek Hatem*[1]; Hesham Hegazi[2]; Yehia Bahei-El-Din[1]; [1]British University in Egypt; [2]Cairo University

## Multi-material Additive Manufacturing: Processing and Materials Design – Functionally Graded Metals and Composites

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Hang Yu, Virginia Tech; Nanci Hardwick, Aeroprobe Corporation; Steven Boles, Hong Kong Polytechnic University; Blake Barnett, Army Research Laboratory; Michael Gibson, Desktop Metal

Tuesday AM
March 13, 2018
Room: 232C
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM Invited**
**Developing Functionally Graded Metals through Additive Manufacturing: Progress, Challenges, and Future Vision for a Unique Technology**: *Douglas Hofmann*[1]; Scott Roberts[1]; Robert Dillon[1]; Richard Otis[1]; Samad Firdosy[1]; [1]NASA JPL/Caltech

**9:00 AM Invited**
**Experimental-computational Approach toward Design of Additively Manufactured Functionally Graded Metallic Materials**: *Allison Beese*[1]; Zi-Kui Liu[1]; [1]Pennsylvania State University

**9:30 AM**
**Hybrid Manufacturing of Functionally Graded M300 and 316L Steels**: Tim Daughtery[1]; Brian Vuksanovich[1]; Jason Walker[1]; Pedro Cortes[1]; *Brett Conner*[1]; [1]Youngstown State University

**9:50 AM**
**Additively Manufactured Functionally Graded Steels through a Novel Approach to Path Finding**: *Olga Eliseeva*[1]; Tanner Kirk[1]; Ji Ma[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M

**10:10 AM Break**

**10:30 AM Invited**
**Additive Manufacturing of Periodic Metal-metal Composites**: *Zachary Cordero*[1]; Matthew French[1]; Alexander Pawlowski[2]; Derek Splitter[2]; Amit Shyam[2]; [1]Rice University; [2]Oak Ridge National Laboratory

**11:00 AM**
**Development of High-performance 316L Stainless Steel Nanocomposites by Additive Manufacturing**: *Bandar AlMangour*[1]; Dariusz Grzesiak[2]; [1]Harvard University; [2]West Pomeranian University of Technology

**11:20 AM**
**Additive Manufacturing of Inconel 718 – Ti6Al4V Bimetallic Structures Using LENS™**: *Bonny Onuike*[1]; Amit Bandyopadhyay[1]; [1]School of Mechanical and Material Engineering

**11:40 AM**
**Bimetallic Bonding via Two Methods of Direct Metal Deposition Additive Manufacturing**: *Ryan Anderson*[1]; Timothy Hill[1]; Judy Schneider[1]; [1]University of Alabama at Huntsville

## Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Nanocarbon/Metal Composites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Meisha Shofner, Georgia Institute of Technology; Nikhilesh Chawla, Arizona State University

Tuesday AM
March 13, 2018

Room: 102C
Location: Phoenix Convention Center

*Session Chair:* Nikhilesh Chawla, Arizona State University

**8:30 AM**
**Predicting the Failure Mechanisms in Ni-graphene Nanocomposites for Different Loading, Crack Orientations and Graphene Structure**: *Scott Muller*[1]; Arun Nair[1]; [1]University of Arkansas

**8:50 AM**
**Development of Nanocarbon-infused Metals: A New Class of Covetic Materials**: *U. (Balu) Balachandran*[1]; [1]Argonne National Laboratory

**9:10 AM**
**Synthesis, Characterization, and Properties of Graphene Reinforced Metal-matrix Nano Composites Using Powder Metallurgy**: Meysam Tabandeh-Khorshid[1]; Ajay Kumar P.[1]; Emad Omrani[1]; *Pradeep Rohatgi*[1]; [1]University of Wisconsin Milwaukee

**9:30 AM**
**Intragranular Dispersion of Carbon Nanotubes Comprehensively Improves Aluminum Alloys**: *Kang Pyo So*[1]; Akihiro Kushima[1]; Jong Gil Park[2]; Xiaohui Liu[3]; Dong Hoon Keum[2]; Hye Yun Jeong[2]; Soo Hyun Joo[4]; Hyoung Seop Kim[4]; Hwanuk Kim[5]; Ju Li[1]; Young Hee Lee[2]; [1]Massachusetts Institute of Technology; [2]Sungkyunkwan University; [3]Shanghai Jiao Tong University; [4]Pohang University of Science and Technology; [5]Korea Basic Science Institute

**9:50 AM Break**

**10:10 AM**
**Investigation of Mechanical Properties of Cu-MWCNT Nanocomposites Synthesized by Wet Chemical Reduction Route**: *Shakti Mishra*[1]; Sambedan Jena[1]; Siddhartha Das[1]; Karabi Das[1]; [1]IIT Kharagpur

**10:30 AM**
**Carbon Nanotubes Reinforced Nanostructured WC-Co Hard Alloys**: *Guolong Tan*[1]; Chenglong Li[2]; Xijun Wu[3]; [1]Wuhan University of Technology; [2]Nostan Company; [3]Zhejiang University

## Non-equilibrium Features of Grain Boundaries – Mechanical Responses of Non-equilibrium Grain Boundaries - Part I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Liang Qi, University of Michigan; Yue Fan, University of Michigan, Ann Arbor; Josh Kacher, Georgia Tech; Elizabeth Holm, Carnegie Mellon University; Irene Beyerlein, University of California, Santa Barbara; Shigenobu Ogata, Osaka University

Tuesday AM
March 13, 2018

Room: 125A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM Invited**
**Atomic-scale Study of Twin Growth in Zirconium**: Olivier MacKain[1]; Emmanuel Clouet[1]; *David Rodney*[2]; [1]CEA Saclay; [2]Université de Lyon

**9:00 AM Invited**
**Effect of Neutron Irradiation on Deformation Homogeneity in Polycrystalline Materials**: *Meimei Li*[1]; Xuan Zhang[1]; Jonathan Almer[1]; Jun-Sang Park[1]; Hemant Sharma[1]; Peter Kenesei[1]; [1]Argonne National Lab

**9:30 AM**
**An Atomistic Survey of Grain Boundary – Dislocation Interactions in FCC Nickel**: *Devin Adams*[1]; Eric Homer[1]; David Fullwood[1]; Robert Wagoner[2]; Landon Hansen[1]; HyukJong Bong[2]; [1]Brigham Young University; [2]Ohio State University

**9:50 AM Break**

**10:10 AM Invited**
**Grain Boundary Factors Related to Void Formation**: *Curt Bronkhorst*[1]; Sabine Zentgraf[2]; Veronica Livescu[1]; Marcy Peter[1]; Scott Vander Wiel[1]; George Gray[1]; Hashem Mourad[1]; Brandon Runnels[2]; [1]Los Alamos National Laboratory; [2]University of Colorado - Colorado Springs

**10:40 AM Invited**
**Understating the Deformation and Fracture Behaviors of Heterogeneous Lamella Structures**: *Caizhi Zhou*[1]; Sixie Huang[1]; Rui Yuan[1]; [1]Missouri University of Science and Technology

**11:10 AM**
**Mechanical Behavior of (Ni,Fe)$Cr_2O_4$ Spinel Grain Boundaries Studied by Molecular Dynamics Simulations**: *Laurent Van Brutzel*[1]; Alain Chartier[1]; Maxime Sauzay[1]; [1]CEA

**11:30 AM**
**Dislocation Nucleation from Grain Boundary: A Comparison between Conventional MD and Accelerated MD**: *Jun-Ping Du*[1]; Yun-Jiang Wang[2]; Yu-Chieh Lo[3]; Liang Wan[4]; Shigenobu Ogata[4]; [1]Center for Elements Strategy Initiative for Structural Materials (ESISM), Kyoto University; [2]State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences; [3]Department of Materials Science and Engineering, National Chiao Tung University; [4]Department of Mechanical Science and Bioengineering, Osaka University

## Phase Transformation Across Multiscale Material Interfaces – Nanoscale Interfaces, Grain Boundaries and Coatings

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Soumya Nag, GE Global Research; Sudarsanam Babu, The University of Tennessee, Knoxville; Gregory Thompson, University of Alabama; Mohsen Asle Zaeem, Missouri University of Science and Technology; Niyanth Sridharan, Oak Ridge National Laboratory

Tuesday AM
March 13, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chairs:* Pradeep Gokuldoss, Max Planck Institute for Iron Research GmbH; Mitra Taheri, Drexel University; Diana Farkas, Virginia Tech.

**8:30 AM Invited**
**Morphological Evolution and Mechanical Behavior of Co-sputtered Cu-Mo Thin Films**: *Amit Misra*[1]; [1]University of Michigan

**9:00 AM Invited**
**Structure and Mechanical Response of Highly Defective Grain Boundaries**: *Diana Farkas*[1]; [1]Virginia Tech

**9:30 AM Invited**
**Grain Boundary Microstates under Irradiation: Which Came First?**: *Mitra Taheri*[1]; Osman El-Atwani[2]; Asher Leff[1]; Khalid Hattar[3]; James Nathaniel[1]; Blas Uberuaga[2]; [1]Drexel University; [2]Los Alamos National Laboratory; [3]Sandia National Laboratories

**10:00 AM Break**

**10:20 AM Invited**
**Nanoscale Interfacial Phase Structures in Roll-bonded Metallic Glass Composite Materials**: Sina Shahrezaei[1]; *Suveen Mathaudhu*[1]; [1]University of California, Riverside

**10:50 AM**
**Atom Probe Tomography Study of Interface Diffusion Assisted Self-healing Behaviour of Cr2Al(Si)C MAX Phase Coatings**: *Pradeep Konda Gokuldoss*[1]; [1]Max Planck Institute for Iron Research GmbH

**11:10 AM**
**The Effect of Diffusion on the Microstructure and Properties of a NiAl-based Anchor Phase Coating for CMSX-4**: *Megan McGregor*[1]; Matthew Hancock[2]; Lloyd Pallett[2]; William Clegg[1]; [1]University of Cambridge; [2]Rolls-Royce plc.

## Phase Transformations and Microstructural Evolution – Phase Transformations in Non-ferrous Systems I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Tuesday AM
March 13, 2018
Room: 129A
Location: Phoenix Convention Center

*Session Chairs:* Hao Chen, Tsinghua University; Peeyush Nandwana, ORNL

**8:30 AM**
**Precipitation of Dispersoids in Multicomponent Al-Mg-Si-Mn-Fe Alloys**: *Warren Poole*[1]; Chenglu Liu[1]; Qiang Du[2]; Nick Parson[3]; [1]The University of British Columbia; [2]SINTEF M&K; [3]Rio Tinto Aluminium

**8:50 AM**
**Quantitative Transmission Electron Microscopy of Microstructure Evolution in Al-Cu Alloys during Laser-induced Rapid Thermal Transients Characteristic of Additive Manufacturing**: *Jorg Wiezorek*[1]; Kai Zweiacker[2]; Can Liu[1]; Joseph McKeown[3]; Geoffrey Campbell[3]; [1]University of Pittsburgh; [2]EMPA; [3]LLNL

**9:10 AM**
**Precipitation Kinetics and Strengthening: Beyond the Textbook Description**: *Alexis Deschamps*[1]; Frederic De Geuser[1]; [1]Grenoble Institute of Technology

**9:30 AM**
**In Situ TEM Investigation of Microstructural Evolution in Gas Atomized Al-6061 Powder Particles**: *Sriram Vijayan*[1]; Benjamin Bedard[1]; Mark Aindow[1]; [1]University of Connecticut

**9:50 AM Break**

**10:10 AM**
**Long-term Thermal Stability of Nickel-base Superalloys**: *Alison Wilson*[1]; Mark Hardy[2]; Howard Stone[1]; [1]University of Cambridge; [2]Rolls-Royce plc

**10:30 AM**
**Microstructural Evolution of Nickel during Multiple Annealing Stages from Three-dimensional X-ray Microscopy**: *Aditi Bhattacharya*[1]; C.M. Hefferan[2]; S.F. Li[3]; J. Lind[4]; Yufeng Shen[1]; R.M. Suter[1]; G.S. Rohrer[1]; [1]Carnegie Mellon University; [2]R. J. Lee Group; [3]Ditto Inc.; [4]Lawence Livermore National Laboratory

**10:50 AM**
**Modifying the Microstructure in Polycrystalline Nickel Base Superalloys Using a Stepped Cooling Rate**: *Bader Alabbad*[1]; Sammy Tin[1]; [1]Illinois Institute of Technology

**11:10 AM**
**Coherent DO22 Superlattice in an Aged Ni-Cr-W-Ti Superalloy with High Strength**: *Gao Xiangyu*[1]; Hu Rui[1]; [1]Northwestern Polytechnical University

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Metal Powder Production

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

Tuesday AM
March 13, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* Yafeng Yang, Chinese Academy of Sciences ; Stefan Gulizia, CSIRO, Australia

**8:30 AM**
**A Review of the Preparation Methods of WC Powders**: *Yijie Wu*[1]; Jie Dang[1]; Zepeng Lv[1]; Shengfu Zhang[1]; Xuewei Lv[1]; Chenguang Bai[1]; [1]Chongqing University

**8:50 AM Invited**
**Advanced Melt-less Powder Manufacturing Technologies**: *Stefan Gulizia*[1]; Christian Doblin[1]; Peter King[1]; Robert Wilson[1]; Anselm Oh[1]; Leon Prentice[1]; [1]CSIRO

**9:20 AM Keynote**
**Development of Gas Atomization for Generating Reactive Metal Powders for Additive Manufacturing and Powder Processing**: *Iver Anderson*[1]; Emma White[1]; Tim Prost[1]; Jordan Tiarks[1]; Trevor Riedemann[1]; David Byrd[1]; Ross Anderson[1]; [1]Ames Laboratory

**10:00 AM Break**

**10:20 AM**
**Numerical Modeling of Gas-atomized Metal Powders: Powder Size Distribution**: *Taher Abu-Lebdeh*[1]; Joseph Pinkney[1]; Vincent Lamberti[2]; Sameer Hamoush[1]; Roland Seals[2]; [1]North Carolina A&T State University; [2]Y-12 National Security Complex

**10:40 AM Keynote**
**The Fabrication of Core-shell Special Powders and their Potential Applications**: *Yafeng Yang*[1]; [1]Institute of Processing Engineering, Chinese Academy of Science

**11:20 AM**
**Technologies for the Processing of Sieve Residues: A Novel Approach for Cost-effective Production of 3D Printing Powders**: *Ivan Mikhailov*[1]; [1]LMTI / UC RUSAL

## Rare Metal Extraction & Processing – Base and Rare Metals

*Sponsored by:* TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
*Program Organizers:* Hojong Kim, The Pennsylvania State University; Bradford Wesstrom, Freeport-McMoRan Copper & Gold; Shafiq Alam, University of Saskatchewan; Takanari Ouchi, The University of Tokyo; Gisele Azimi, University of Toronto; Neale Neelameggham, Ind LLC; Shijie Wang, Rio Tinto Kennecott Utah Copper; Xiaofei Guan, ShanghaiTech University

Tuesday AM
March 13, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* Shafiq Alam, University of Saskatchewan; Xiaofei Guan, ShanghaiTech University

**8:30 AM**
**Thermodynamic Study of Ga Extraction for Trace Element Analysis by ICP-MS**: *Kyungjean Min*[1]; David Johnson[1]; Kevin Trumble[1]; [1]Purdue University

**8:55 AM**
**Electrodeposition of γ-MnO2 from Manganese Nodule Leach Liquor: Surface Modification and Electrochemical Applications**: A. Baral[1]; B.C. Tripathy[1]; *M.K. Ghosh*[1]; [1]CSIR-Institute of Minerals and Materials Technology

**9:20 AM**
**Recovery of Manganese from Scrap Batteries of Mobile Phones**: *Deblina Dutta*[1]; Rekha Panda[2]; Manis Kumar Jha[2]; Sudha Goel[1]; [1]Indian Institute of Technology (IIT), Kharagpur; [2]CSIR-National Metallurgical Laboratory

**9:45 AM**
**The Management of Lead Concentrate Acquisition in "Trepca"**: *Ahmet Haxhiaj*[1]; Bajram Haxhiaj[1]; [1]University of Pristina

**10:10 AM Break**

**10:30 AM**
**Study of the Mechanochemical Calcification for Mixed Rare Earth Concentrate**: *Jiang Liu*[1]; Zhang Ting'an[1]; Zhihe Dou[1]; Yukun Huang[1]; [1]Northeastern University

**10:55 AM**
**Recovery of Lithium from Brine with $MnO_2$ Nanowire Ion Sieve Composite**: *Rajashekhar Marthi*[1]; York Smith[1]; [1]University of Utah

**11:20 AM**
**FEM Simulation of Nodulation in Copper Electrorefining**: *Ken Adachi*[1]; Yuya Nakai[1]; Atsushi Kitada[1]; Kazuhiro Fukami[1]; Kuniaki Murase[1]; [1]KyotoUniversity

**11:45 AM**
**Microfluidic Solvent Extraction of Zinc from Low Concentration Sulfate Solution Using D2EHPA**: *Feng Jiang*[1]; Libo Zhang[1]; Jian Jian[1]; Hongying Xia[1]; Shaohua Ju[1]; Jinhui Peng[1]; [1]Kunming University of Science and Technology

## Recent Developments in Biological, Structural and Functional Thin Films & Coatings – Functional Coatings for Green Technology and Sustainability

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Adele Carradò, Université de Strasbourg IPCMS; Nancy Michael, University of Texas at Arlington; Ramana Chintalapalle, University of Texas - El Paso; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University; Gerald Ferblantier, Strasbourg University - ICube Laboratory

Tuesday AM
March 13, 2018
Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Heinz Palkowski, TU Clausthal; Nancy Michael, University of Texas at Arlington

**8:30 AM**
**Electro-deposited Cr Coating Layer to Hinder Fuel Cladding Chemical Interaction in Sodium Fast Reactor (SFR)**: *Sunghwan Yeo*[1]; Junhwan Kim[1]; [1]Korea Atomic Energy Research Institute

**8:50 AM**
**Corrosion Studies of Martensitic Stainless Steel Blades**: *Dhruv Kothari*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

**9:10 AM Keynote**
**Applications for Multifunctional Systems: Balancing Industrial Need, Cost, Complexity and Sustainability**: *Vannessa Goodship*[1]; [1]University of Warwick

**9:50 AM Break**

**10:10 AM**
**Extending the Scope of Application of Thermal Sprayed Coatings by Using their Magnetic Properties**: *Gian Luigi Angrisani*[1]; Piriya Taptimthong[1]; Marc Christopher Wurz[1]; Kai Möhwald[1]; [1]Leibniz Universität Hannover

**10:30 AM**
**Grain Boundary Engineering of Corrosion Resistant Aluminum Alloys**: *Joel Bahena*[1]; Andrea Hodge[1]; [1]University of Southern California

**10:50 AM**
**Formation & Characterization of Black Silicon by Reactive Ion Etching**: *Sita Rajyalaxmi Marthi*[1]; Asahel Banobre[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

## Scandium Extraction and Use in Aluminum Alloys – Aluminium Scandium Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* John Grandfield, Grandfield Technology Pty Ltd; Aleksandr Krokhin, Rusal GM; Dmitry Eskin, Brunel University London; Antoine Allanore, Massachusetts Institute of Technology; Nigel Ricketts, Scandium International Mining Corp

Tuesday AM
March 13, 2018
Room: 222B
Location: Phoenix Convention Center

*Session Chairs:* Dmitry Eskin, Brunel University; Greg Hilderman, Performance Power Materials

**8:30 AM Introductory Comments**

**8:35 AM**
**Sc Applications in Aluminum Alloys: Overview of Russian Research in the 20th Century**: *Dmitry Eskin*[1]; [1]Brunel University

**9:05 AM**
**Effect of Treatment Parameters on Structure, Mechanical and Corrosion Properties of Al-Mg-Sc Alloy Forgings with Reduced Concentration of Scandium**: *Aleksandr Krokhin*[1]; Viktor Mann[1]; Dmitry Ryabov[1]; Nikolay Babitskiy[2]; [1]UC RUSAL; [2]RUSAL ETC LLC

**9:25 AM**
**Novel Heat Treatments for Scandium Containing Al-Si Alloys (Including 6xxx Series Alloys)**: *Timothy Langan*[1]; Mahendra Ramajayam[2]; Thomas Dorin[2]; [1]Clean TeQ; [2]Deakin University

**9:45 AM**
**Scandium-enriched Nano-precipitates in Aluminum Provide Enhanced Coarsening and Creep Resistance**: *David Dunand*[1]; David Seidman[1]; [1]Northwestern University

**10:05 AM Break**

**10:20 AM**
**The Effect of Scandium and Zirconium on the Microstructure, Mechanical Properties and Formability of a Model Al-Cu Alloy**: *Thomas Dorin*[1]; Mahendra Ramajayam[1]; Timothy Langan[2]; [1]Deakin University; [2]CleanTeQ

**10:40 AM**
**Influence of the Al3(Sc,Zr) Dispersoids and the Stretching on the Natural Ageing Behavior of a Binary Al-4wt%Cu Alloys**: *Baptiste Rouxel*[1]; Thomas Dorin[1]; [1]Institut of Frontier Material - Deakin Univiersity

**11:00 AM**
**An Examination of the Effect of Solidification Processing upon the Strengthening of AlMgSc Alloys**: Vahid Fallah[1]; Andrew Howells[1]; *Mark Gallerneault*[1]; [1]Alcereco Inc.

**11:20 AM**
**The Effect of Scandium on the Electrical Conductivity and Mechanical Properties of Al-Sc Alloys**: *Tao Ying*[1]; Lidong Gu[1]; Xiaoqin Zeng[1]; [1]Shanghai Jiao Tong University

**11:40 AM**
**Design and Processing Conditions of Hypoeutectic Al-Cu-Sc Alloys for Maximum Benefit of Scandium**: *Abdoul-Aziz Bogno*[1]; Jonas Valloton[1]; Hani Henein[1]; Douglas Ivey[1]; A. Locock[1]; M. Gallerneault[2]; [1]University of Alberta; [2]Alcereco Inc.

## Surface Engineering for Improved Corrosion Resistance – Session II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Rajeev Gupta, The University of Akron; Sandip Harimkar, Oklahoma State University; Carlos Schvezov, Institute of Materials of Misiones; Arvind Agarwal, Florida International University

Tuesday AM
March 13, 2018
Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Sandip Harimkar, Oklahoma State University; Krista Limmer, US Army Research Laboratory

**8:30 AM Invited**
**Nanostructured Al-alloy Coatings for Corrosion Protection of High-strength Al and Mg Alloys**: *Rose Roy*[1]; Joshua Abbott[1]; Robert Hilty[1]; [1]Xtalic Corporation

**8:50 AM**
**Passivity of Al-transition Metal Alloys and Al-inhibitor Composites**: Javier Esquivel[1]; Mohammad Umar Farooq Khan[1]; *Rajeev Gupta*[1]; [1]The University of Akron

**9:10 AM**
**Advanced Surface Mechanical Treatments and Grain Boundary Engineering for Improved Resistance to Corrosion and Stress Corrosion Resistance of FCC Alloys**: Abhishek Telang[1]; Qin Yang[2]; Richard Chiang[2]; Sebastien Teysseyre[3]; Seetha Mannava[2]; Dong Qian[4]; *Vijay Vasudevan*[2]; [1]Integer; [2]University of Cincinnati; [3]Idaho National Laboratory; [4]University of Texas at Dallas

**9:30 AM Invited**
**Predict Corrosion Phenomena and Surface Properties of Al-based Alloys**: *Lan Li*[1]; Thiago da Silva[1]; Mike Hurley[1]; [1]Boise State University

**9:50 AM**
**Oxidation and Corrosion Phenomena in Powder-processed Icosahedral-phase-strengthened Aluminum Alloys**: *Sarshad Rommel*[1]; Hannah Leonard[1]; Thomas Watson[2]; Venkat Vedula[3]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]UTC Aerospace Systems

**10:10 AM Break**

**10:30 AM**
**Corrosion Behavior of CP-copper with CG and UFG Grain Size after Irradiation by High Current Pulsed Electron Beam**: *Yue Zhang*[1]; Fuyang Yu[1]; Fuyu Dong[1]; Shengzhi Hao[2]; Jingtao Wang[3]; Chuang Dong[2]; [1]Shenyang University of Technology; [2]Dalian University of Technology; [3]Nanjing University of Science & Technology

**10:50 AM**
**Aqueous Corrosion Behaviour of Pulse Electrodeposited Nanocrystalline Ni-W and Ni-W/SiC Nanocomposite Coatings**: *Sundararajan Govindan*[1]; Nitin Wasekar[2]; Vamsi M.V.N[3]; [1]Indian Institute of Technology Madras; [2]ARCI; [3]McGill University

**11:10 AM**
**Corrosion Behavior of Laser Surface Melted Inconel 718 Superalloy**: *Sumit Sharma*[1]; Koushik Biswas[1]; A Nath[1]; Jyotsna Dutta Majumdar[1]; [1]Indian Institute of Technology Kharagpur

## Thermo-mechanical Response of Materials with Special Emphasis on In-situ Techniques – High Temperature Mechanical Properties of Materials I

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Sanjit Bhowmick, Bruker Nano Surfaces; Jeff Wheeler, ETH Zurich; María Teresa Pérez Prado, IMDEA Materials Institute; Dongchan Jang, Korea Advanced Institute of Science and Technology; Robert Wheeler, MicroTesting Solutions LLC; Josh Kacher, Georgia Tech

Tuesday AM
March 13, 2018
Room: 101A
Location: Phoenix Convention Center

*Session Chairs:* Sanjit Bhowmick, Bruker Nano Surfaces; Josh Kacher, Georgia Tech

**8:30 AM Introductory Comments**

**8:35 AM Keynote**
**Real Time 3-D X-ray Computed Micro-tomography Study of the Strength and Toughness of Nuclear Graphite between 25° and 1000°C**: *Dong Liu*[1]; Bernd Gludovatz[2]; Harold Barnard[3]; Martin Kuball[4]; Robert Ritchie[5]; [1]Oxford University; [2]University of New South Wales; [3]Lawrence Berkeley National Laboratory; [4]University of Bristol; [5]University of California, Berkeley

**9:10 AM**
**Local Dislocation Configurations and their Contribution to Early Stage Globularization in Alpha Beta Titanium Alloys**: *Victoria Miller*[1]; Adam Pilchak[2]; Jordan Moering[3]; [1]University of California, Santa Barbara; [2]Air Force Research Laboratory; [3]Protochips

**9:30 AM**
**An Analysis of Thermo-mechanical Fatigue Crack Growth in the Titanium Alloy Ti-6246**: *Jennie Palmer*[1]; Jonathan Jones[1]; Mark Whittaker[1]; Steve Williams[2]; [1]Swansea University; [2]Rolls-Royce plc

**9:50 AM**
**Design and Fabrication of MEMS-based Symmetric Structure for In-situ Nanomechanical Tensile Experiments**: *Minsoo Kim*[1]; Dongchan Jang[1]; Hansuek Lee[1]; Daegon Kim[1]; [1]KAIST(Korea Advanced Institute of Science and Technology)

**10:10 AM Break**

**10:30 AM Invited**
**In-situ Deformation and Characterisation of Carbon Controlled Steels**: Jim Hickey[1]; *T Ben Britton*[1]; [1]Department of Materials, Imperial College

**11:00 AM**
**Developing Thermo-mechanical Fatigue Crack Growth Techniques**: *Jonathan Jones*[1]; Mark Whittaker[1]; Robert Lancaster[1]; Svjetlana Stekovic[2]; Daniel Leidermark[2]; Daniel Child[3]; Stephen Pattison[3]; Christopher Hyde[4]; James Rouse[4]; Stephen Williams[3]; [1]Swansea University; [2]Linkoping University; [3]Rolls-Royce plc; [4]Nottingham University

**11:20 AM**
**Rationalization of Heterogeneous Creep Deformation Behavior of Dissimilar Metal Welds**: *Mohan Subramanian*[1]; Sudarsanam Suresh Babu[1]; Jonathan Galler[1]; John DuPont[1]; Zhili Feng[1]; Xinghua Yu[1]; [1]University of Tennessee

## Ultrafine-grained Materials X – Temperature Effects and Thermal Stability

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Tuesday AM
March 13, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Janelle Wharry, Purdue University; Avinash Dongare, University of Connecticut

**8:30 AM Invited**
**The Impact of Severe Plastic Deformation and Subsequent Annealing on Elevated Temperature Deformation Behavior of Al-Mg Alloys**: Chenlu Meng[1]; Stefanie Sandloebes[1]; Sandra Korte-Kerzel[1]; *Günter Gottstein*[1]; [1]RWTH Aachen University

**9:00 AM Invited**
**Are Selected Laser-melted (SLM) Alloys UFG?**: *Sean Agnew*[1]; Md Shamsujjoha[1]; James Fitz-Gerald[1]; [1]University of Virginia

**9:30 AM**
**Mechanical Behavior of UFG Titanium at Elevated Temperatures**: *G. Guven Yapici*[1]; S.V. Sajadifar[1]; T. Niendorf[2]; H.J. Maier[3]; [1]Ozyegin University; [2]Kassel University; [3]Hannover University

**9:50 AM**
**Severe Deformation at Elevated Temperatures - the Key to Extremely Elongated Nanostructures**: *Oliver Renk*[1]; Pradipta Ghosh[1]; Reinhard Pippan[1]; [1]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

**10:10 AM Break**

**10:30 AM Invited**
**Anomalous Deformation Behavior of Thermally Stable Nanocrystalline Immiscible Alloys**: *Kiran Solanki*[1]; Kris Darling[2]; [1]Arizona State University; [2]Army Research Laboratory

**11:00 AM Invited**
**Development of Al and Mg-based Nanostructured Alloys**: *Aashish Rohatgi*[1]; Nicole Overman[1]; Scott Whalen[1]; Suveen Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California, Riverside

**11:30 AM**
**Oxygen and Zirconium Clustering in Nanocrystalline Fe-Zr Alloys and its Impact on Microstructural Stability and High Temperature Mechanical Properties**: *Yuzeng Chen*[1]; Guibin Shan[1]; Anna Ceguerra[2]; Simon Ringer[2]; Feng Liu[1]; [1]Northwestern Polytechnical University; [2]Chongqing University

**11:50 AM**
**Bulk Nanocrystalline Metals Cast under Slow Cooling**: *Chezheng Cao*[1]; Gongcheng Yao[1]; Abdolreza Javadi[1]; Xiaochun Li[1]; [1]University of California, Los Angeles

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – Design and Synthesis of 2D Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

Tuesday PM — Room: 101B
March 13, 2018 — Location: Phoenix Convention Center

*Session Chairs:* Stephen McDonnell, University fo Virginia; Wenda Tan, University of Utah

**2:00 PM Invited**
**Functional Interfacial, Electromechanical, and Phase Change Properties of a Spectrum of 2D Materials**: Gowoon Cheon[1]; Yao Zhou[1]; Daniel Rehn[1]; Austin Sendek[1]; *Evan Reed*[1]; [1]Stanford University

**2:30 PM Invited**
**Noncovalent Interactions in Functional Nanomaterials**: *KC Santosh*[1]; Valentino Cooper[1]; [1]Oak Ridge National Laboratory

**3:00 PM**
**Data-driven Discovery of New Two- and One-dimensional Materials and Lattice-commensurate Heterostructures**: *Gowoon Cheon*[1]; Karel-Alexander Duerloo[2]; Austin Sendek[1]; Chase Porter[1]; Yuan Chen[1]; Evan Reed[1]; [1]Stanford University; [2]Boston Consulting Group

**3:20 PM Break**

**3:40 PM Invited**
**Silicene, Graphene and Nanospheres: Nanomaterials Investigations with Surface Science Approaches**: *Petra Reinke*[1]; [1]University of Virginia

**4:10 PM**
**Atomic Level Point Defect Identification in Graphene Materials**: *Srinivasa Rao Singamaneni*[1]; [1]The University of Texas at El Paso

**4:30 PM**
**Metal-2D Contact Engineering**: *Keren Freedy*[1]; Peter Litwin[1]; Hans Olson[1]; Ashutosh Giri[1]; Patrick Hopkins[1]; Stephen McDonnell[1]; [1]University of Virginia

**4:50 PM Invited**
**Synthesis and Application of Large-area 2D Materials**: *Eric Vogel*[1]; [1]Georgia Institute of Technology

## 9th International Symposium on High Temperature Metallurgical Processing – Fundamental Research on High Temperature Metallurgical Processing

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Tuesday PM — Room: 227B
March 13, 2018 — Location: Phoenix Convention Center

*Session Chairs:* Jerome Downey, Montana Tech of the University of Montana; Chenguang Bai, Chongqing University

**2:00 PM Introductory Comments**

**2:05 PM**
**Dissolution Rate of Carbon in Molten Iron-manganese Alloys**: *Hamideh Kaffash*[1]; Merete Tangstad[1]; [1]NTNU

**2:25 PM**
**Irreversibilities in Copper Matte Smelting and Settling**: *Paul Mather*[1]; Matthew Krane[1]; [1]Purdue University

**2:45 PM**
**Degradation Mechanisms of Refractories in a Bottom Blown Copper Smelting Furnace**: *Mao Chen*[1]; Zhixiang Cui[2]; Chuandong Wei[2]; Baojun Zhao[1]; [1]University of Queensland; [2]Dongying Fangyuan Nonferrous Metals Co. Ltd

**3:05 PM**
**The Dissolution Behavior of MgO into Molten High Titanium Slag**: *Gangqiang Fan*[1]; Xuewei Lv[1]; Jian Wang[1]; Shengping Li[1]; Wei Lv[1]; Kai Hu[1]; Chenguang Bai[1]; [1]Chongqing University

**3:25 PM Break**

**3:45 PM**
**Refractory Wear in a High Carbon Ferromanganese Smelting Furnace**: *Dean Gregurek*[1]; Karl Budna[1]; Daniel Kreuzer[1]; Alfred Spanring[1]; [1]RHI AG

**4:05 PM**
**High Temperature Dielectric Property Measurement System**: *Liu Chenhui*[1]; Libo Zhang[2]; Jiyun Gao[1]; Jinhui Peng[2]; [1]Yunnan Minzu University; [2]Kunming University of Science and Technology

**4:25 PM**
**Reaction Routes of CaO-$Fe_2O_3$-$TiO_2$ and Calcium Ferrite-$TiO_2$ System in Continuous Heating Process**: *Chengyi Ding*[1]; Xuewei Lv[1]; Gang Li[1]; Chenguang Bai[1]; Senwei Xuan[1]; Kai Tang[1]; Yang Xu[1]; [1]Chongqing University

**4:45 PM**
**Thermodynamic Calculations on Electric Furnace Smelting Separation of Chromium-bearing Vanadium Titanium Magnetite**: *Wenchao He*[1]; Xuewei Lv[1]; Yu Zhang[1]; Xueqin Li[1]; [1]Chongqing University

**5:05 PM**
**Preparation for High Activity Degree Lime and Effect on Desulfurization of Hot Metal Pretreatment**: *Su-ju Hao*[1]; Jiann-Yang Hwang[1]; Wu-feng Jiang[2]; Yu-zhu Zhang[2]; [1]Michigan Technological University; [2]North China University of Science and Technology

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Ceramics and Nuclear Fuels

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

Tuesday PM — Room: 102A
March 13, 2018 — Location: Phoenix Convention Center

*Session Chairs:* Micah Hackett, TerraPower; Assel Aitkaliyeva, University of Florida

**2:00 PM**
**Dislocation Loop Formation in Proton Irradiated Pure Zirconium**: *Hattie Xu*[1]; Michael Preuss[1]; Philipp Frankel[1]; Tamás Ungár[1]; [1]University of Manchester

**2:25 PM**
**Enhanced Dynamic Recovery of Radiation Damage in Silicon Carbide under Accelerated Testing Using Ion Beams**: *William Weber*[1]; Eva Zarkadoula[2]; Haizhou Xue[1]; Yanwen Zhang[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

**2:50 PM**
**Self-Organization of Gas Bubble Superlattices**: *David Sprouster*[1]; K Hattar[2]; C Sun[3]; Y Gao[3]; C Jiang[3]; L He[3]; Y Zhang[3]; J Gan[3]; L Ecker[1]; [1]Brookhaven National Laboratory; [2]Sandia National Laboratories; [3]Idaho National Laboratory

**3:15 PM**
**Microstructural Characterization of the Processes, Stability, and End-of-range Effects in Heavily Irradiated Pyrochlores**: *Terry Holesinger*[1]; James Valdez[1]; Cortney Kreller[1]; Matthew Janish[1]; Yongqiang Wang[1]; Blas Uberuaga[1]; [1]Los Alamos National Laboratory

**3:40 PM Break**

**4:00 PM Invited**
**Microstructural and Nanoindentation Properties of a Lanthanum-containing Nanostructured Ferritic Steel Irradiated by High Dose Iron Ions**: *Somayeh Pasebani*[1]; Indrajit Charit[2]; Yaqiao Wu[3]; Jatuporn Burns[4]; Darryl Butt[5]; James Cole[6]; Lin Shao[7]; [1]Oregon State University; [2]University of Idaho; [3]Boise State University; [4]Center for Advanced Energy Studies ; [5]University of Utah; [6]Idaho National Laboratory; [7]Texas A&M

**4:30 PM**
**Irradiation Temperature Influence on Nanolayered Response in Select MAX Phase Ceramics to High Fluence Self-ion Irradiation**: *William Hanson*[1]; William Weber[1]; Yanwen Zhang[2]; [1]The University of Tennessee; [2]Oak Ridge National Lab

**4:55 PM**
**3D Study of Neutron-irradiated Fe-9Cr Alloy and 316 Stainless Steel Using Far-field and Near-field High-energy X-ray Diffraction Microscopy**: *Xuan Zhang*[1]; Chi Xu[2]; Yiren Chen[1]; Meimei Li[1]; Jun-Sang Park[1]; Peter Kenesei[1]; Hemant Sharma[1]; Jonathan Almer[1]; [1]Argonne National Lab; [2]University of Florida

## Accident Tolerant Fuels for Light Water Reactor – Structural Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

Tuesday PM
March 13, 2018
Room: 104A
Location: Phoenix Convention Center

*Session Chairs:* Yukinori Yamamoto, Oak Ridge National Laboratory; Kevin Field, Oak Ridge National Laboratory

**2:00 PM Invited**
**Ex-situ and In-situ Determination of α' Phase Formation/Dissolution in High-Cr Ferritic Alloys Using Small-angle Neutron Scattering**: *Kevin Field*[1]; Kenneth Littrell[1]; Samuel Briggs[2]; [1]Oak Ridge National Laboratory; [2]Sandia National Laboratory

**2:30 PM**
**Quantitative Characterization of Y and Ti Inclusions in a 14Cr-YWTi Nanostructured Ferritic Alloy and their Effect on High Temperature Fracture**: *Soupitak Pal*[1]; MD Alam[1]; G Odette[1]; [1]University of California, Santa Barbara

**2:50 PM**
**Relationship Between Reactive Element Particle Dispersions and Irradiation-induced Defects in Neutron Irradiated Commercial APMT Alloy**: *Dalong Zhang*[1]; Samuel Briggs[2]; Richard Howard[1]; Kevin Field[1]; [1]Oak Ridge National Laboratory; [2]Sandia National Laboratories

**3:10 PM**
**Effects of Ce Addition on the Microstructure and Mechanical Properties of Accident-tolerance Fe-Cr-Al Fuel Cladding Materials**: *Naimeng Liu*[1]; ZhongWu Zhang[1]; Yang Zhang[1]; Ye Cui[1]; Dan Chen[1]; Yu Zhao[1]; SongSong Xu[1]; Hao Guo[1]; [1]Harbin Engineering University

**3:30 PM Break**

**3:50 PM**
**Quality Optimization of Seamless Thin-wall Tube Production of ATF Wrought FeCrAl Alloys**: *Yukinori Yamamoto*[1]; Zhiqian Sun[1]; Maxim Gussev[1]; Kevin Field[1]; Bruce Pint[1]; Kurt Terrani[1]; [1]Oak Ridge National Laboratory

**4:10 PM**
**Impact Toughness of Model and Commercial FeCrAl Alloys**: *Zhiqian Sun*[1]; Yukinori Yamamoto[1]; [1]Oak Ridge National Laboratory

**4:30 PM**
**ODS FeCrAl Fabrication Methodology for Optimizing Ductility and Sink Strength**: *Caleb Massey*[1]; Sebastien Dryepondt[2]; Philip Edmondson[2]; Kurt Terrani[2]; Steven Zinkle[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

**4:50 PM**
**Effect of Dynamic Strain Aging on Mechanical Properties of Zircaloy-4**: *Nilesh Kumar*[1]; Abdullah Alomari[1]; Korukonda Murty[1]; [1]NC State University

**5:10 PM**
**Thermal Aging Embrittlement in a Friction Stir Processed Al-bearing, High-Cr Stainless Steel**: *Anumat Sittiho*[1]; Vedavyas Tungala[2]; Aniket Dutt[2]; Peyman Samimi[3]; Somayeh Pasebani[3]; Indrajit Charit[1]; Rajiv Mishra[2]; [1]University of Idaho; [2]University of North Texas; [3]Oregon State University

**5:30 PM**
**Development of Alumina-forming Duplex Stainless Steels as Potential ATF Cladding Materials: Preliminary Assessments of High Temperature Steam Corrosion Behavior and Tensile Property**: *Hyunmyung Kim*[1]; Gokul Obulan Subramanian[1]; Chaewon Kim[1]; Changheui Jang[1]; [1]KAIST

## Acta Materialia Symposium – Acta Materialia Award Session

*Program Organizer:* Carolyn Hansson, University of Waterloo

Tuesday PM
March 13, 2018
Room: 129B
Location: Phoenix Convention Center

**3:15 PM Introductory Comments**

**3:25 PM Invited**
**Acta Materialia Gold Medal Lecture: Formation of Deformation Twins in Metallic Crystals**: *Subhash Mahajan*[1]; [1]University of California

**3:45 PM Question and Answer Period**

**3:55 PM Invited**
**Acta Materialia Silver Medal Lecture: 4D Materials Science: Probing Microstructural Evolution of Metallic Materials in Real-Time**: *Nikhilesh Chawla*[1]; [1]Arizona State University

**4:15 PM Question and Answer Period**

**4:25 PM Invited**
**Acta Materialia Hollomon Award for Materials and Society Lecture: Makers and Material Makers: Materials Science & Engineering in the Era of Additive Manufacturing**: *Julie Christodoulou*[1]; [1]Office of Naval Research

**4:45 PM Question and Answer Period**

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – High Temperature Alloys and Properties

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Tuesday PM
March 13, 2018
Room: 231AB
Location: Phoenix Convention Center

*Session Chairs:* Chantal Sudbrack, QuesTek Innovations, LLC; Clay Houser, QuesTek Innovations

**2:00 PM Invited**
**Electron Beam Melting of High-gamma Prime Ni-base Superalloys**: *Michael Kirka*[1]; Duncan Greeley[1]; Manuel Villalpando[1]; Matthew Ireland[2]; Alex Plotkowski[1]; Andrew Scopel[2]; Yousub Lee[1]; Charles Hawkins[1]; Peeyush Nandwana[1]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory; [2]University of Maine

**2:30 PM**
**Direct Metal Laser Melting of Gamma Prime Strengthened Superalloys; An Assessment of Microstructure Response through Additive Manufacturing and Heat Treatment**: *Laura Dial*[1]; Ian Spinelli[1]; Michael Larsen[1]; Daniel Ruscitto[1]; [1]GE Global Research

**2:50 PM**
**Heterogeneous Microstructure and Indentation Hardness of SLE-Deposited Rene80 Superalloy**: *Andriy Dotsenko*[1]; Suman Das[1]; Ranadip Acharya[1]; [1]Georgia Tech

**3:10 PM**
**Microstructure Investigation of Powder Bed Fusion Processed Rene 65**: *Andrew Wessman*[1]; Behrang Poorganji[1]; Mahdi Jamshidinia[1]; [1]GE Additive

**3:30 PM Break**

**3:50 PM**
**Location-specific Microstructure and the Effect of Heat Treatment on Electron-beam Melted Ni-based Superalloy LSHR**: *Chantal Sudbrack*[1]; Michael Kirka[2]; S. Lee Semiatin[3]; Timothy Gabb[1]; [1]NASA Glenn Research Center; [2]Oak Ridge National Laboratory; [3]Air Force Research Laboratory

**4:10 PM**
**Laser Additive Manufacturing of Titanium Aluminides**: *Silja-Katharina Rittinghaus*[1]; Andreas Vogelpoth[1]; [1]Fraunhofer ILT (Institute for Laser Technology)

**4:30 PM**
**Relations between Microstructure and Oxidation Resistance of an Additive Manufactured Nickel-based Superalloy**: Zhenyu Liu[1]; Satia Soltanattar[1]; Brian Gleeson[1]; *Guofeng Wang*[1]; [1]University of Pittsburgh

**4:50 PM**
**Potential Contributors to Creep Resistance in DMLS Processed IN718 Revealed through Modeling of Creep Test Data**: *Blake Rogers*[1]; Amaneh Tasooji[1]; [1]ASU

**5:10 PM**
**Flow Stress Asymmetry Dependance on Post-processing Parameters and Deformation Conditions of a Selective Laser Melting Additive Manufactured Inconel 718**: *Omar Rodriguez*[1]; Sharniece Holland[2]; Omar Mireles[1]; Lin Li[2]; Paul Allison[2]; [1]NASA MSFC; [2]The University of Alamaba

## Additive Manufacturing of Metals: Fatigue and Fracture – Session III

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

Tuesday PM
March 13, 2018
Room: 232A
Location: Phoenix Convention Center

*Session Chair:* Nima Shamsaei, Auburn University

**2:00 PM Invited**
**Accounting for Thermal Process Induced Residual Stress in Additive Manufacturing Based Laser Cladding Repair of High-strength AerMet®100 Steel**: *Kevin Walker*[1]; Stephen Sun[2]; Milan Brandt[2]; Adrian DeWald[3]; Michael Hill[3]; [1]Defence Science and Technology Group; [2]RMIT University; [3]Hill Engineering

**2:30 PM**
**The Influence of Build Orientation on the Thermal Fatigue Behavior of Additively Manufactured AlSi10Mg Coupons**: *Joy Forsmark*[1]; Wei-Jen Lai[1]; Carlos Engler-Pinto[1]; John Cornell[1]; Mark Madin[1]; Wolfram Buschhaus[1]; [1]Ford Motor Company

**2:50 PM**
**Strength, Fatigue, Fracture, and Microstructure of Additively Manufactured Austenitic Stainless Steel**: *Chris San Marchi*[1]; Thale Smith[1]; Julie Schoenung[2]; Joshua Sugar[1]; [1]Sandia National Laboratories; [2]University of California, Irvine

**3:10 PM**
**Evaluation of the Cyclic Stress-strain Behavior of Additively Manufactured AlSi10Mg**: *Matilde Scurria*[1]; Benjamin Möller[2]; Rainer Wagener[2]; Tobias Melz[1]; [1]Technische Universität Darmstadt, Research Group of System Reliability, Adaptive Structures and Machine Acoustics SAM; [2]Fraunhofer Institute for Structural Durability and System Reliability LBF

**3:30 PM Break**

**3:50 PM Invited**
**Fatigue Behavior of DMLS IN718 and Ti-6Al-4V through Coupled Modeling and In Situ Experiments**: *Michael Sangid*[1]; [1]Purdue University

**4:20 PM**
**Study on Dominant factors on Fatigue Strength of Additive Manufactured Ti-6Al-4V Alloy**: *Junichi Ozaki*[1]; Takehisa Yamada[1]; Masahiro Takanashi[1]; Ryoji Kakiuchi[1]; Akihiro Sato[1]; [1]IHI Corporation

**4:40 PM**
**Fatigue Crack Growth Anisotropy in Selective Laser Melting Produced Alloy 718 at Ambient and Elevated Temperatures**: *Halsey Ostergaard*[1]; Jamie Kruzic[1]; [1]University of New South Wales

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – Modeling in Additive Manufacturing

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

Tuesday PM
March 13, 2018
Room: 230
Location: Phoenix Convention Center

*Session Chairs:* Wayne King, LLNL; Peter Collins, Iowa State University

**2:00 PM Invited**
**Accelerating Qualification of Additively Manufactured Metal Parts**: *Wayne King*[1]; Andrew Anderson[1]; Robert Ferencz[1]; Neil Hodge[1]; Saad Khairallah[1]; Manyalibo Matthews[1]; Alexander Rubenchik[1]; Otis Walton[1]; Morris Wang[1]; [1]Lawrence Livermore National Laboratory

**2:30 PM**
**Online Monitoring of Powder Bed Fusion Processes and Validation of Numerically Predicted Heating and Cooling Rates - Implications on As-built Work Piece**: *Mustafa Megahed*[1]; Christoph Beetz[1]; Narcisse N'Dri[1]; Hans-Wilfried Mindt[1]; Mark Cola[2]; Lars Jaquemetton[2]; James Craig[3]; Thomas Wakeman[3]; Peralta Alonso[4]; James Neumann[4]; [1]ESI Group; [2]Sigma Labs, Inc.; [3]Stratonics Inc; [4]Honeywell Aerospace

**2:50 PM**
**Predicting Deformation and Cracking as a Function of Additive Manufacturing Process Parameters**: *Richard Otis*[1]; Cornelia Altenbuchner[1]; Andrew Shapiro[1]; [1]Jet Propulsion Laboratory

**3:10 PM**
**Validation of Laser Powder Bed Fusion Finite Element Model**: *Li Ma*[1]; Kevontrez Jones[2]; Jarred Heigel[1]; Brandon Lane[1]; Richard Ricker[1]; Greta Lindwall[1]; Carelyn Campbell[1]; Lyle Levine[1]; [1]National Institute of Standards and Technology; [2]Northwestern University

**3:30 PM Break**

**3:50 PM Invited**
**(Some of) The ICME Building Blocks to Qualify the Process and Materials of Additive Manufacturing**: *Peter Collins*[1]; [1]Iowa State University

**4:20 PM**
**Automated Material, Geometry and Process Qualification in Metal Melting Based Additive Manufacturing Technologies Using Experimentally Validated Simulation Tools**: *Deepankar Pal*[1]; Javed Akram[1]; Pradeep Chalavadi[1]; Abdul Khan[1]; Chong Teng[1]; Brent Stucker[1]; [1]3DSIM

**4:40 PM**
**Modeling the Life Cycle of High throughput Tensile Specimens Produced by Laser Powder Bed Fusion: From Fabrication to Performance**: *Kyle Johnson*[1]; Bradley Jared[1]; John Emery[1]; Jonathan Madison[1]; Carl Jacques[1]; Burke Kernen[1]; Kurtis Ford[1]; Joseph Bishop[1]; [1]Sandia National Laboratories

**5:00 PM**
**Finite Element Modelling of the Laser Metal Directed Energy Deposition Process**: *Edison Bonifaz*[1]; [1]Universidad San Francisco de Quito

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Dislocations and Planar Faults

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon,Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Tuesday PM
March 13, 2018
Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* Irene Beyerlein, University of California, Santa Barbara; Thomas Bieler, Michigan State University

**2:00 PM**
**Analyzing Subsurface Dislocation Content of Ti-5Al-2.5Sn Alloy Using Micro-Laue Diffraction Based Streak Anlaysis and Transmission Electron Microscopy**: *Chen Zhang*[1]; Shanoob Nair[1]; Hongmei Li[1]; Philip Eisenlohr[1]; Martin Crimp[1]; Carl Boehlert[1]; Ruqing Xu[2]; Thomas Bieler[1]; [1]Michigan State University; [2]Argonne National Lab

**2:20 PM**
**Electron Microscopy Image Simulation Using Atomistic Simulation Data**: *Joseph Tessmer*[1]; Saransh Singh[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**2:40 PM**
**3D Dislocation Crystallography**: *Zongqiang Feng*[1]; Chengwei Lin[1]; Guilin Wu[1]; Xiaoxu Huang[1]; [1]Chongqing University

**3:00 PM**
**Three-dimensional X-ray Diffraction Imaging of Dislocations in Polycrystalline Metals Under Tensile Loading**: *Mathew Cherukara*[1]; Reeju Pokharel[2]; Timothy S'O.Leary[2]; Kevin Baldwin[2]; Evan Maxey[1]; Wonsuk Cha[1]; Jorg Maser[1]; Ross Harder[1]; Saryu Fensin[2]; Richard Sandberg[2]; [1]Argonne National Lab; [2]Los Alamos National Laboratory

**3:20 PM Break**

**3:40 PM Invited**
**Atomic Scale Modeling and Experimental Observations of Deformation Mechanisms in Ni Base Superalloys**: You Rao[1]; T. M. Smith[1]; M. J. Mills[1]; *Maryam Ghazisaeidi*[1]; [1]Ohio State University

**4:10 PM**
**Analysis of Dislocation Slip Across Boundaries in Tantalum Using ECCI and CC-EBSD**: *Bret Dunlap*[1]; Martin Crimp[1]; [1]Michigan State University

**4:30 PM**
**TEM 3D Visualization Using Two Micrographs**: *Benjamin Eftink*[1]; Kaan Unal[1]; George Gray[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

**4:50 PM**
**Evolution of Stacking Faults during Thermomechanical Processing of Biomedical Co–Cr–Mo Alloys Studied by X-ray Diffraction Line-profile Analysis**: *Kenta Yamanaka*[1]; Mmanami Mori[2]; Kazuo Yoshida[1]; Shigeo Sato[3]; Akihiko Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College; [3]Ibaraki University

**5:10 PM**
**Detection of the Onset of Plasticity in Micro-crystals: In-situ Deformation of InSb Micro-pillars under Synchrotron Coherent X-ray Nanobeam**: *Ludovic Thilly*[1]; Vincent Jacques[2]; Christoph Kirchlechner[3]; [1]Pprime Institute - University of Poitiers; [2]LPS-Orsay; [3]MPIE Düsseldorf

## Advanced High-strength Steels – Medium Mn Steels

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Tuesday PM
March 13, 2018
Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Young-Kook Lee, Yonsei University; Cem Tasan, Massachusetts Institute of Technology

**2:00 PM Invited**
**Tensile Properties of Tempered-martensitic Medium Mn Lightweight Steel**: Sukjin Lee[1]; Seok-Hyeon Kang[1]; Jae-Hoon Nam[1]; Sang-Min Lee[1]; *Young-Kook Lee*[1]; [1]Yonsei University

**2:25 PM**
**Strengthening Mechanism of a Medium Mn Steel with a Yield Strength of 2.2 GPa and Uniform Elongation of 16%**: *M.X. Huang*[1]; Binbin He[1]; [1]The University of Hong Kong

**2:45 PM**
**In Situ μ-DIC Measurements of Strain Partitioning in Medium Mn Steel**: *Aniruddha Dutta*[1]; Dirk Ponge[1]; Stefanie Sandlöbes[2]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Institut für Metallkunde und Metallphysik, RWTH Aachen

**3:05 PM**
**The Impact of Aluminum on the Microstructure and Deformation Behavior in Medium-Mn TRIP Steels**: Devesh Misra[1]; *Bing Yu*[1]; Yashwanth Injeti[1]; [1]University of Texas at El Paso

**3:25 PM**
**Comparison of the Hot-stamped Boron-alloyed Steel and the Warm-stamped Medium-Mn Steel on Microstructure and Mechanical Properties**: *Ying Chang*[1]; Cunyu Wang[2]; Xiaodong Li[1]; Guojun Zheng[1]; Han Dong[2]; [1]Dalian University of Technology; [2]Central Iron & Steel Research Institute

**3:45 PM Break**

**4:00 PM**
**Effects of Annealing Time and Strain Rate on Alloy Partitioning and Mechanical Properties of a Medium-Mn Steel**: *Jake Benzing*[1]; Aniruddha Dutta[2]; Lutz Morsdorf[2]; Alisson Kwiatkowski da Silva[2]; Dirk Ponge[2]; Jeongho Han[3]; Whitney Poling[4]; Bill Luecke[4]; Dierk Raabe[2]; Jim Wittig[1]; [1]Vanderbilt University; [2]Max-Planck-Institut für Eisenforschung; [3]Chungnam National University; [4]National Institute of Standards and Technology

**4:20 PM**
**Investigation on Sheared Edge Crack Susceptibility of the Third-generation Automobile Medium-Mn Steel**: *Xiaodong Li*[1]; Shuo Han[1]; Cunyu Wang[2]; Ying Chang[1]; Han Dong[2]; [1]Dalian University of Technology; [2]Central Iron & Steel Research Institute

**4:40 PM**
**Enhanced Formability of Duplex Light-weight Steels by Warm-rolling**: *Yongmoon Lee*[1]; Chong Soo Lee[1]; [1]Postech

**5:00 PM**
**Development, Characterization and Mechanical Property Evaluation of a Medium Mn High Si Multicomponent Steel for Automotive Applications**: *Nicky Kisku*[1]; Sumantra Mandal[1]; K.K Ray[1]; [1]Indian Institute of Technology, Kharagpur

**5:20 PM**
**Resetting Microstructures and Properties in TRIP-assisted Advanced High Strength Steels**: *Menglei Jiang*[1]; C. Cem Tasan[1]; [1]MIT

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Alloy Development and Application of Magneto-thermal Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Tuesday PM
March 13, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* TV (Jay) Jayaraman, University of Michigan

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Methods for Characterizing the Hysteresis of Magnetocaloric Materials**: *Victorino Franco*[1]; Jia Yan Law[1]; Luis M. Moreno-Ramírez[1]; Alejandro Conde[1]; [1]Sevilla University

**2:35 PM Invited**
**Efficient Energy-conversion Near Room-temperature with Transition Metal Based Magnetic Materials**: *Ekkes Brück*[1]; [1]Delft University of Technology

**3:05 PM Invited**
**Optimisation of Magnetically Hard Pyromagnets**: *Karl Sandeman*[1]; Dominique Givord[2]; Laurent Ranno[2]; Nora Dempsey[2]; [1]City University of New York, USA; [2]Université Grenoble Alpes, CNRS, Institut Néel

**3:35 PM Break**

**3:55 PM Invited**
**Spin Seebeck Effect and Anisotropy in Magnetic Oxides**: Vijaysankar Kalappattil[1]; Raja Das[1]; Manh-Huong Phan[1]; *Hariharan Srikanth*[1]; [1]University of South Florida

**4:25 PM**
**Magnetocaloric Effect and Local Structure in B/In-substituted Gd-Co-Al Metallic Glasses**: *Jason Douglas*[1]; Eric Lass[1]; Robert Shull[1]; [1]National Institute of Standards and Technology

**4:45 PM**
**Severe Plastic Deformation as a Tool for Production Advanced Magnetic Materials**: *Sergey Taskaev*[1]; Konstantin Skokov[2]; Vladimir Khovaylo[3]; Oliver Gutfleisch[2]; [1]Chelyabinsk State University; [2]TU Darmstadt; [3]NITU MISIS

**5:05 PM**
**Influence of Co-doping on the Crystal Structure, Magnetocaloric Properties and Elastic Moduli of the La(Fe,Si)13 Compound**: *Dan Huang*[1]; Ronghui Kou[1]; Jianrong Gao[1]; Jiaqiang Yan[2]; Veerle Keppens[2]; David Mandrus[2]; Yang Ren[3]; [1]Northeastern University; [2]University of Tennessee; [3]Argonne National Laboratory

**5:25 PM**
**Magnetocaloric Properties of (Fe,Mn)3Al Based Alloys under Hydrostatic Pressure**: Vinay Sharma[1]; *Raju Ramanujan*[1]; [1]Nanyang Technological University

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Quality and Reliability of Advanced Microelectronic Packaging II

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Tuesday PM
March 13, 2018

Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* Kwang-Lung Lin, National Cheng Kung University; C. Robert Kao, National Taiwan University

**2:00 PM**
**Multi Axis Loading Impact in Via-in Pad Plated Over (VIPPO) Board Design on Thermal Cycling Performance**: *Tae-Kyu Lee*[1]; Mohamed Sheikh[1]; Andy Hsiao[1]; Weidong Xie[2]; Steven Perng[2]; [1]Portland State University; [2]Cisco Systems

**2:20 PM**
**Characterization of X-ray Impact on Memory Retention Time for External In-package DRAM**: *George Vakanas*[1]; Jaeho Lee[2]; Purushotham Kaushik Muthur Srinath[1]; Mahesh Deshmane[1]; Gunnar Zimmermann[1]; Elah Bozorg-Grayeli[1]; Leslie Lau[1]; Shereen Elhalawaty[1]; Jiraporn Seangatith[1]; Prasad Ramanathan[1]; Wonyong Choi[2]; Oungsic Cho[2]; Yeongkee Chang[2]; Saikumar Jayaraman[1]; [1]INTEL Corporation; [2]SK Hynix

**2:40 PM**
**The Effect of Bump Metallurgy on First Level Interconnect Solder Bump Integrity**: *Shereen Elhalawaty*[1]; George Vakanas[1]; Jiraporn Seangatith[1]; Prasad Ramanathan[1]; Elah Bozorg-Grayeli[1]; Bharat Penmecha[1]; Pilin Liu[1]; Charles Zhang[1]; [1]Intel Corporation

**3:00 PM**
**Resistance Changes of Pd-coated Cu and Ag Bonding Wires in High Temperature Storage**: *Stevan Hunter*[1]; Michael Hook[2]; Michael Mayer[2]; [1]ON Semiconductor; [2]University of Waterloo

**3:20 PM**
**Understand the Corrosion-induced Disappearance of Cu9Al4 from the Cu-Al Ball Bond Interface**: *Yuelin Wu*[1]; Andre Lee[1]; [1]Michigan State University

**3:40 PM Break**

**4:00 PM**
**A Study of Ag Alloy Wire with Flash Au after Sulfidation Test**: *Yu-Hsien Wu*[1]; Fei-Yi Hung[1]; Truan-Sheng Lui[1]; [1]National Cheng Kung University

**4:20 PM**
**Thermal Cycling Reliability of Solder and NiSn Solid-liquid Interdiffusion Joints with Thermal Coefficient Mismatch: Influence of Mechanical Properties of Joint Materials**: *Hirofumi Ito*[1]; Makoto Kuwahara[1]; Masanori Usui[1]; [1]Toyota Central R&D Labs., Inc.

**4:40 PM**
**Observations of Microstructure Evolution and Damage during Creep Testing and Thermal Loading of SAC 305 Solder Alloys**: *Tianhong Gu*[1]; Grey Chen[1]; Chris Gourlay[1]; Ben Britton[1]; [1]Imperial College London

**5:00 PM**
**In Situ X-ray Microtomography of Thermal and Power Cycling of Silver-based Thermal Interface Materials**: *Irene Lujan Regalado*[1]; Jason Williams[1]; Yanghe Liu[2]; Shailesh Joshi[2]; Nikhilesh Chawla[1]; [1]Arizona State University; [2]Toyota Research Institute of North America

**5:20 PM**
**Corrosion Resistance of Surface Finishes for High Reliability Devices**: *Tsan-Hsien Tseng*[1]; Albert T. Wu[1]; [1]National Central University

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – Solidification and Microstructure I

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

Tuesday PM
March 13, 2018

Room: 231C
Location: Phoenix Convention Center

*Session Chairs:* Michael Bermingham, The University of Queensland; Rajarshi Banerjee, University of North Texas; Brady Butler, US Army Research Lab

**2:00 PM Invited**
**Modeling the Effects of Alloying on Microstructure Formation under Additive Manufacturing Conditions**: *Richard LeSar*[1]; Matthew Rolchigo[1]; Michael Mendoza[1]; Peter Collins[1]; [1]Iowa State University

**2:30 PM Invited**
**The Effect of Boron on the Grain Size and Texture in Additively Manufactured ß-Ti Alloys**: Srinivas Aditya Mantri[1]; Talukder Alam[1]; Deep Choudhuri[1]; Christopher Yannetta[1]; Calvin Mikler[1]; Peter Collins[2]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]Iowa State University

**3:00 PM**
**Predicting the Solidification Microstructure of Pulsed-LPBF Ti-6Al-4V Alloy Using Phase-field Modelling**: *Dany Rasmussen*[1]; Nikolas Provatas[1]; Mathieu Brochu[1]; [1]McGill University

**3:20 PM Break**

**3:35 PM Invited**
**Microstructure Characterisation and Mechanical Properties of Ti-6Al-4V with Grain Refinement Made by Direct Laser Fabrication**: *Kai Zhang*[1]; Tom Jarvis[1]; Sheng Cao[1]; Xinhua Wu[1]; [1]Monash University

**4:05 PM Invited**
**Tuning Microstructural Evolution in Additively Manufactured Ti Alloys Using High throughput Experimental Approaches**: Brian Welk[1]; Kevin Chaput[2]; Samuel Kuhr[1]; *Hamish Fraser*[1]; [1]The Ohio State University; [2]AFRL/RX

**4:35 PM**
**Effect of Scan Patterns on Microstructure Evolution of Ti6Al4V Alloy**: *Javed Akram*[1]; Deepankar Pal[1]; Pradeep Chalavadi[1]; Brent Stucker[1]; [1]3DSIM, LLC

**4:55 PM**
**Titanium Based Metal-matrix Composites via In-situ Nitridation: Microstructure and Tribological Properties**: *Tushar Borkar*[1]; Thomas Scharf[2]; Rajarshi Banerjee[2]; [1]Cleveland State University; [2]University of North Texas

## Algorithm Development in Materials Science and Engineering – DFT and Atomistic Algorithms for Study and Design 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, Missouri University of Science and Technology; Mark Tschopp, Army Research Laboratory; Jonathan Zimmerman, Sandia National Laboratories; Ebrahim Asadi, University of Memphis; Mark Horstemeyer, Mississippi State University

Tuesday PM
March 13, 2018

Room: 130
Location: Phoenix Convention Center

*Session Chair:* Douglas Spearot, University of Florida

**2:00 PM Invited**
**An Explicit Methodology for Hierarchical Bridging between Ab Initio and Atomistic Scales**: *Mark Horstemeyer*[1]; Christopher Barrett[1]; Ric Carino[1]; Imran Aslam[1]; Doyl Dickel[1]; Michael Baskes[1]; [1]Mississippi State University

**2:30 PM**
**Large-scale Real-space Electronic Structure Calculations**: Bikash Kanungo[1]; Phani Motamarri[1]; *Vikram Gavini*[1]; [1]University of Michigan

**2:50 PM**
**Parallel Algorithms for Hyperdynamics in LAMMPS**: *Steve Plimpton*[1]; Danny Perez[2]; Art Voter[2]; [1]Sandia National Laboratories; [2]Los Alamos National Laboratory

**3:10 PM**
**Accelerated Quantum Molecular Dynamics**: *Enrique Martinez Saez*[1]; Christian Negre[1]; Danny Perez[1]; Marc Cawkwell[1]; Arthur Voter[1]; Anders Niklasson[1]; [1]Los Alamos National Laboratory

**3:30 PM Break**

**3:50 PM Invited**
**Computational Phonon Manipulation**: *Peter Chung*[1]; Francis VanGessel[1]; Jie Peng[1]; Rose Gallagher[1]; [1]University of Maryland in College Park

**4:20 PM**
**Computing the Lattice Green Function in Complex Materials**: *Anne Marie Tan*[1]; Dallas Trinkle[1]; [1]University of Illinois, Urbana-Champaign

**4:40 PM**
**Automated Calculation of First-principles Based Diffusion Coefficients in Non-dilute Alloys**: *Brian Puchala*[1]; Sanjeev Kolli[2]; John Goiri[2]; Naga Sri Harsha Gunda[2]; Julija Vinckeviciute[2]; John Thomas[2]; Anton Van der Ven[2]; [1]University of Michigan, Ann Arbor; [2]University of California, Santa Barbara

**5:00 PM**
**Transition State Redox during Dynamical Processes in Semiconductors and Insulators**: *Guangfu Luo*[1]; Thomas Kuech[1]; Dane Morgan[1]; [1]University of Wisconsin-Madison

## Alloys and Compounds for Thermoelectric and Solar Cell Applications VI – Session IV

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

*Program Organizers:* Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Soon-Jik Hong, Kongju National University and Institute for Rare Metals; Philippe Jund, Université Montpellier 2; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science (NIMS) ; Hsin-jay Wu, National Sun Yat-sen University; Tiejun Zhu, Zhejiang University

Tuesday PM
March 13, 2018

Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Takao Mori, National Institute for Materials Science; Philippe Jund, Université de Montpellier

**2:00 PM Invited**
**Effect of Oxygen on the Doping Mechanisms of Thermoelectric Materials via Ab Initio Simulations: Application to ZnSb and NiTiSn.**: *Philippe Jund*[1]; Alexandre Berche[1]; [1]Université Montpellier 2 - ICGM

**2:20 PM Invited**
**Ni-interstials Making Strong Influence on Thermoelectric Properties of TiNiSn Half Heuslers**: *Yinglu Tang*[1]; Xiaoshuang Li[1]; Lukas Martin[2]; Christian Leinenbach[1]; Toni Ivas[1]; Shashwat Anand[3]; Jeffrey Snyder[3]; Corsin Battaglia[1]; [1]EMPA; [2]ETH; [3]Northwestern University

**2:40 PM**
**Effect of Magnetic Ion Doping on the Thermoelectric Properties of Zintl Phase Materials**: *Gabin Guélou*[1]; Takao Mori[1]; [1]National Institute for Materials Science

**3:00 PM Invited**
**Phonon Scattering and Propagation Considerations for Thermoelectrics**: *Yanzhong Pei*[1]; [1]Tongji University

**3:20 PM Invited**
**Anisotropic Thermal Expansion and Bond Softening in Thermoelectric Materials**: *Alexandra Zevalkink*[1]; [1]Michigan State University

**3:40 PM Break**

**4:00 PM Invited**
**Tailoring Thermoelectric Properties of Telluride-based Materials from Bulk to Thin Films**: *Li-Chyong Chen*[1]; Deniz Wong[2]; Kuei-Kuan Wu[2]; Kuei-Hsien Chen[2]; [1]National Taiwan University; [2]Academia Sinica

**4:20 PM Invited**
**Thermoelectric Borides and Sulfides; Role of Magnetism and Disorder**: *Takao Mori*[1]; [1]National Institute for Materials Science (NIMS)

**4:40 PM Invited**
**Suppressing Bipolar Effects by Deep Defect State for High Thermoelectric Efficiency**: *Qian Zhang*[1]; [1]Harbin Institute of Technology (Shenzhen)

**5:00 PM**
**Enhancement of Thermoelectric Performance Through Optimization of Hot-pressing Parameters in the Gas Atomized Bi0.5Sb1.5Te3 Alloys**: *Peyala Dharmaiah*[1]; D.W Shin[1]; M Babu[1]; C.H. Lee[1]; Soon-Jik Hong[1]; [1]Kongju National University

## Aluminum Alloys, Processing and Characterization – Aluminum Alloy Development

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Tuesday PM
March 13, 2018
Room: 221B
Location: Phoenix Convention Center

*Session Chair:* Hiromi Nagaumi, Soochow University

**2:00 PM Invited**
**A Study of Sensitization in Naturally Aged 5xxx Alloys**: *William Golumbfskie*[1]; Emily Holcombe[1]; Mitra Taheri[2]; [1]Naval Surface Warfare Center, Carderock Division; [2]Drexel University

**2:30 PM Invited**
**Phase Formation of Monotectic Al-In and Al-Ga-In Alloys and Implications Thereof**: *Xiaoming Wang*[1]; Xingtao Liu[1]; [1]Purdue University

**2:50 PM**
**Effect of Ultrasonic Melt Treatment, Mn and Cooling Rate on the Formation of Fe-containing Intermetallics in Hypereutectic Al-Si Alloy**: *Carmelo Todaro*[1]; Mark Easton[1]; Dong Qiu[1]; Ma Qian[1]; [1]RMIT University

**3:10 PM**
**Investigations on Pb-free 6000 Series Aluminum Alloy for Machining Applications**: *Saikat Adhikari*[1]; Anirban Giri[1]; V Siva Raman[2]; Pramod Koparde[3]; Sachin Gupta[3]; L Vijayaraghavan[2]; S Sankaran[2]; [1]Aditya Birla Science and Technology Company Pvt. Ltd.; [2]Indian Institute of Technology, Madras; [3]Hindalco Industries Ltd.

**3:30 PM Break**

**3:50 PM**
**Optimization in Novel Partial-solid High Pressure Aluminum Die Casting by Taguchi Method**: *Yekta Suslu*[1]; Mehmet Acar[2]; Mithat Senol[2]; Muammer Mutlu[2]; Ozgul Keles[1]; [1]Istanbul Technical University; [2]Mita Kalip ve Dokum Sanayii A.S.

**4:10 PM**
**New Aluminum Alloys for High Pressure Casting**: *Alexander Alabin*[1]; Viktor Mann[1]; Anton Frolov[1]; Aleksandr Krokhin[1]; [1]UC RUSAL

**4:30 PM**
**Application of the Hot Stamping Process to Aluminum Alloy Structural Components**: *Ehab Samuel*[1]; [1]National Research Council Canada

## Aluminum Reduction Technology – Joint Session: Alumina Quality

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Tuesday PM
March 13, 2018
Room: 221C
Location: Phoenix Convention Center

*Session Chair:* Claude Fradet, Rio Tinto Aluminium

**2:00 PM Introductory Comments**

**2:05 PM Keynote**
**Understanding and Defining Alumina Quality for Smelting**: *James Metson*[1]; [1]University of Auckland

**2:40 PM Keynote**
**Alumina Dissolution - A Critical Step in Aluminum Electrolysis**: *Laszlo Kiss*[1]; [1]University of Quebec in Chicoutimi

**3:15 PM Panel Discussion Led by Claude Fradet, Panel members include Jim Metson, Lazlo Kiss, and Alessio Scarsella**

**3:45 PM Break**

**4:00 PM**
**Discussion on Alumina Dissolution and Diffusion in Commercial Aluminum Reduction Cell**: *Youjian Yang*[1]; Bingliang Gao[1]; Zhaowen Wang[1]; Zhongning Shi[1]; Xianwei Hu[1]; Wenju Tao[1]; Fengguo Liu[1]; [1]Northeastern University

**4:25 PM**
**Investigation of Alumina Concentration Gradients within Hall-Héroult Electrolytic Bath**: *Jayson Tessier*[1]; Katie Cantin[1]; Davíð Þór Magnússon[1]; [1]Alcoa

**4:50 PM**
**Study of Alumina Dissolution in Cryolitic Bath to the Vertical Soderberg (VSS) Aluminum Production Process**: *Diego Marinho*[1]; Marcelo Mourão[2]; [1]Votorantim Metais CBA; [2]Universidade de São Paulo (USP)

**5:15 PM**
**Impacts of Sodium on Alumina Quality and Consequences for Current Efficiency**: *Grant McIntosh*[1]; Hasini Wijayaratne[1]; Gordon Agbenyegah[1]; Margaret Hyland[1]; James Metson[1]; [1]Light Metal Research Centre

## Application of Solidification Fundamentals to Challenges in Metal Additive Manufacturing – Solidification Modeling

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Alex Plotkowski, University of Tennessee - Knoxville; Kevin Chaput, Materials and Manufacturing Directorate; Lang Yuan, GE Global Research

Tuesday PM
March 13, 2018
Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Lang Yuan, GE Global Research

**2:00 PM Invited**
**Phase-field Modeling of Solidification Microstructures during Additive Manufacturing**: Yanzhou Ji[1]; Feng-Yi Yu[1]; Huiliang Wei[1]; Yanhong Wei[2]; Tarasankar Debroy[1]; *Long Qing Chen*[1]; [1]Penn State University; [2]Nanjing University of Aeronautics & Astronautics

**2:30 PM**
**Simulating Grain Formation during Metal Additive Manufacturing (AM): Potential Pathways for Producing Equiaxed Grain Structures**: *David StJohn*[1]; Arvind Prasad[1]; Lang Yuan[2]; Peter Lee[3]; [1]University of Queensland; [2]GE Global Research; [3]University of Manchester

**2:50 PM**
**Microstructural Modeling of the Solidification of Alloys in Additive Manufacture**: Alojz Ivankovic[1]; Denis Dowling[1]; *David Browne*[1]; [1]University College Dublin

**3:10 PM**
**Phase-field Modeling of Solidification under SLM Conditions**: *Guillaume Boussinot*[1]; Jonas Zielinski[2]; Markus Apel[1]; [1]Access e.V.; [2]Fraunhofer Institut fuer Lasertechnik

**3:30 PM Break**

**3:50 PM**
**Fluid Dynamics Effects on Microstructure Prediction in the Laser Additive Manufacturing Process**: *Adrian Sabau*[1]; Lang Yuan[2]; Srdjan Simunovic[1]; John Turner[1]; Neil Carlson[3]; [1]Oak Ridge National Laboratory; [2]GE Global Research; [3]Los Alamos National Laboratory

**4:10 PM**
**Heat Transfer and Fluid Flow during Fabrication of Overhang Structure in Laser-powder Bed Fusion Additive Manufacturing**: *Yi Li*[1]; Yousub Lee[2]; Wei Zhang[1]; [1]The Ohio State University; [2]Oak Ridge National Laboratory

**4:30 PM**
**Dynamics of Melting and Resolidification: Application to the Interlayer Band Microstructure in Laser Metal Deposition**: *Guillaume Boussinot*[1]; Ulrike Hecht[1]; Markus Apel[1]; Silja-Katharina Rittinghaus[2]; Oleg Stryzhyboroda[1]; [1]Access e.V.; [2]Fraunhofer-Institut fuer Lasertechnik

**4:50 PM**
**Experimental and Simulation Study of Solidification and Micro-structural Evolution of Liquid Metal Alloys for Additive Manufacturing Process Simulation and Materials Design**: *Jonathan Raush*[1]; Sanjeev Tulasigeri[1]; Boliang Zhang[2]; Shengmin Guo[2]; Wenjin Meng[2]; [1]University of Louisiana at Lafayette; [2]Louisiana State University

## Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials – Novel Applications and Modelling

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee
*Program Organizers:* Haiming Wen, Missouri University of Science and Technology; Simon Ringer, The University of Sydney; Gregory Thompson, University of Alabama; Arun Devaraj, Pacific Northwest National Laboratory; Keith Knipling, U.S. Naval Research Laboratory; Gang Sha, Nanjing University of Science and Technology; David Seidman, Northwestern University; Chantal Sudbrack, QuesTek Innovations, LLC

Tuesday PM
March 13, 2018
Room: 124A
Location: Phoenix Convention Center

*Funding support provided by:* CAMECA Instruments, Inc.

*Session Chairs:* Dieter Isheim, Northwestern University; Gregory Thompson, University of Alabama

**2:00 PM Invited**
**New Experimental APT Methods for the Analysis of Nanoparticles**: *Peter Felfer*[1]; Jan Joosten[1]; Chandra Macaulay[1]; Taulant Sinani[1]; [1]FAU Erlangen-Nürnberg

**2:35 PM Invited**
**Studying the Distribution of Trace Elements in Zircon: Deformation and Standards**: *Julie Cairney*[1]; Alexandre La Fontaine[1]; Florant Exertier[1]; Sandra Piazolo[2]; Patrick Trimby[3]; Limei Yang[1]; [1]The University of Sydney; [2]The University of Leeds; [3]Oxford Instruments Nanoanalysis

**3:10 PM Invited**
**Chemical Imaging of Interfaces and Interphases in Tooth Biominerals**: *Derk Joester*[1]; [1]Northwestern University

**3:45 PM Break**

**4:05 PM**
**Advanced APT Simulations by Combining Electrostatics with Molecular Dynamics**: *Christian Oberdorfer*[1]; Travis Withrow[1]; Emmanuelle Marquis[2]; Wolfgang Windl[1]; [1]The Ohio State University; [2]University of Michigan

**4:25 PM**
**Non-diffusive Drag Effect in APT of AlCu Alloy**: Travis Withrow[1]; Christian Oberdorfer[1]; Emmanuelle Marquis[2]; *Wolfgang Windl*[1]; [1]The Ohio State University; [2]University of Michigan

**4:45 PM Invited**
**Modeling Atom Probe Tomography: A Path for Diagnosis and Treatment of Reconstruction Artifacts Symptoms**: *François Vurpillot*[1]; Benoit Gervais[2]; Constantinos Hatzoglou[1]; Stefan Parviainen[1]; [1]GPM UMR 6634; [2]CIMAP UMR 6252

## Biological Materials Science – Bones, Teeth, and Dental Materials

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

Tuesday PM
March 13, 2018
Room: 225B
Location: Phoenix Convention Center

*Session Chairs:* Vinoy Thomas, University of Alabama, Birmingham; Dwyane Arola, University of Washington

**2:00 PM Invited**
**Tooth Enamel: Imaging a Highly Graded Structure at the Nanoscale**: *Derk Joester*[1]; [1]Northwestern University

**2:30 PM**
**Spatial Variations in Aging of Teeth about the Arch**: Weishi Yan[1]; Marit Oilo[2]; Avina Paranjpe[1]; Hai Zhang[1]; *Dwayne Arola*[1]; [1]University of Washington; [2]University of Bergen

**2:50 PM**
**Finite Element Simulations and 3D-printed Models of Bone as an Interpenetrating Composite**: *Frances Su*[1]; Fereshteh Sabet[2]; Rachel Hsiong[1]; Justin Salim[1]; Iwona Jasiuk[2]; Joanna McKittrick[1]; [1]University of California, San Diego; [2]University of Illinois at Urbana-Champaign

**3:10 PM**
**The Influence of Plastic Deformation Mechanisms on the Adhesion Behavior and Collagen Formation in Osteoblast Cells**: *Benay Uzer*[1]; Felipe Monte[2]; Kamal Awad[3]; Pranesh Aswath[2]; Venu G. Varanasi[4]; Demircan Canadinc[1]; [1]Koc University; [2]University of Texas at Arlington; [3]University of Texas at Arlington, National Research Centre, Giza, Egypt; [4]Texas A&M University

**3:30 PM Break**

**3:50 PM Invited**
**Damage Tolerance in Dental Restorative Materials**: *Jamie Kruzic*[1]; Carina Tanaka[1]; [1]UNSW Sydney

**4:20 PM**
**Osteoblast Functions on Bioactive 3D Printed Porous Ti-6Al-4V Scaffolds**: *Krishna Chaitanya Nune*[1]; Devesh Misra[1]; SJ Li[2]; Yl Hao[2]; W Zhang[2]; [1]University of Texas at El Paso; [2]Chinese Academy of Sciences

**4:40 PM**
**Reduction of Osteoporosis by Means of Hydrogels and Nanohydroxyapatite with Integration of Magnesium**: *Gerardo Presbitero*[1]; Laura Peña[2]; Cristina Piña[1]; M. A. L. Hernandez-Rodríguez[3]; [1]National Autonomous University of Mexico; [2]Universidad de Monterrey; [3]Universidad Autónoma de Nuevo León

**5:00 PM**
**Synthesis and Evaluation of Polypyrrole-hydroxyapatite Composite Developed through Electro-deposition for Use as Bio-compatible Coating over Metallic Orthopaedic Implant Surfaces**: *Rajib Chakraborty*[1]; Partha Saha[1]; [1]Indian Institute of Technology- Kharagpur

## Bulk Metallic Glasses XV – Structures and Mechanical Properties I

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Tuesday PM
March 13, 2018

Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Takeshi Egami, The University of Tennessee, Knoxville; Koichi Tsuchiya, NIMS

**2:00 PM Keynote**
**Ductility of Metallic Glasses**: *Takeshi Egami*[1]; [1]University of Tennessee

**2:30 PM Invited**
**Elastic Heterogeneities in Bulk Metallic Glasses**: Peter Tsai[1]; Kelly Kranjc[1]; *Katharine Flores*[1]; [1]Washington University

**2:50 PM Invited**
**Mechanically-induced Structural Rejuvenation by HPT Deformation in Zr-Cu-Al Bulk Metallic Glass**: *Koichi Tsuchiya*[1]; Jian Qiang[2]; [1]NIMS; [2]University of Tsukuba

**3:10 PM Invited**
**Spatio-temporal Correlation in Rheology of Metallic Glasses**: Shuangxi Song[1]; *Mingwei Chen*[2]; [1]Shanghai Jiao Tong University; [2]Johns Hopkins University

**3:30 PM Break**

**3:50 PM Invited**
**Research on the Deformation Behaviors and Shear Band Multiplication of Bulk Metallic Glasses**: *Ke-Fu Yao*[1]; Guan-Nan Yang[1]; Yang Shao[1]; [1]Tsinghua University

**4:10 PM**
**Linking Macroscopic Rejuvenation to Nano-elastic Fluctuations in a Metallic Glass**: Perry Ross[1]; Stefan Kuechemann[1]; Peter Derlet[2]; Haibin Yu[3]; Walter Arnold[4]; Peter Liaw[5]; Konrad Samwer[6]; *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign; [2]Paul Scherrer Institute; [3]Huazhong University of Science and Technology; [4]Saarland University; [5]University of Tennessee; [6]University of Göttingen

**4:30 PM Invited**
**High Pressure Quenched Metallic Glasses**: *Wojciech Dmowski*[1]; Stanislaw Gierlotka[2]; Yoshihiko Yokoyama[3]; Takeshi Egami[1]; [1]University of Tennessee; [2]Institute of High Pressure Physics; [3]Tohoku University

**4:50 PM Invited**
**Ductile Fracture in Notched Bulk Metallic Glasses**: *Jie Pan*[1]; Yi Li[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

**5:10 PM Invited**
**Cluster Connectivity in Metallic Glass**: Xiaoya Wei[1]; Si Lan[1]; *Xun-Li Wang*[1]; [1]City University of Hong Kong

## Cast Shop Technology: Recycling and Sustainability Joint Session – Cast Shop Technology: Recycling and Sustainability Joint Session

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Mark Badowski, Hydro Aluminium; Elsa Olivetti, Massachusetts Institute of Technology

Tuesday PM
March 13, 2018

Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Elsa Olivetti, Massachusetts Institute of Technology

**2:00 PM Introductory Comments**

**2:05 PM**
**Recycling of Oxide from Dross into Aluminum Electrolysis Cells**: *Martin Syvertsen*[1]; Bjarte Øye[1]; [1]SINTEF Materials and Chemistry

**2:30 PM**
**Behavior of Mg-Si-rich Phases in Aluminum Can Sheets and Their Impact on Metal Oxidation during Industrial Thermal Pre-treatment**: *Jan Steglich*[1]; Christiane Matthies[1]; Marcel Rosefort[1]; Bernd Friedrich[2]; [1]TRIMET Aluminium SE; [2]RWTH Aachen University

**2:55 PM**
**Potential for Handheld Analyzer to Address Emerging Positive Material Identification (PMI) Challenges**: *Leslie Brooks*[1]; Gabrielle Gaustad[1]; [1]Rochester Institute of Technology

**3:20 PM**
**Dissipative Use of Critical Metals in the Aluminum Industry**: *Ayo Arowosola*[1]; Alexandra Leader[1]; Leslie Brooks[1]; Gabrielle Gaustad[1]; [1]Rochester Institute of Technology

**3:45 PM Break**

**4:00 PM**
**In-situ Observation of Dross Formation during Melting of Al-Mg Alloy**: *Takehito Hiraki*[1]; Hitomi Noguchi[2]; Nobuhiro Maruoka[3]; Tetsuya Nagasaka[1]; [1]Graduate School of Engineering, Tohoku University; [2]Institute for Materials Research, Tohoku University; [3]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

**4:25 PM**
**The Implementation of a Comprehensive Dross Management Program at Constellium Ravenswood**: *James Herbert*[1]; Steve Tua[2]; [1]ALTEK LLC; [2]Constellium Ravenswood

**4:50 PM**
**Environmental Impacts of Aluminum Dross after Metal Extraction**: *Mohamed Hassan*[1]; Nour Attia[1]; Kareem Hassan[1]; [1]Masdar Institute of Science and Technology

## CFD Modeling and Simulation in Materials Processing – Processing II

*Sponsored by:* TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
*Program Organizers:* Laurentiu Nastac, The University of Alabama; Koulis Pericleous, University of Greenwich; Adrian Sabau, Oak Ridge National Laboratory; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, Colorado School of Mines

Tuesday PM
March 13, 2018
Room: 228B
Location: Phoenix Convention Center

*Session Chairs:* Konstantin Redkin, Whemco; Adrian Sabau, Oak Ridge National Laboratory

**2:00 PM Invited**
**Recent Development and Applications of CFD Simulation for Friction Stir Welding**: *Gaoqiang Chen*[1]; Qingyu Shi[1]; Shuai Zhang[1]; [1]Tsinghua University

**2:30 PM**
**Modeling of Argon Gas Behavior in Continuous Casting of Steel**: *Hyunjin Yang*[1]; Surya Vanka[1]; Brian Thomas[1]; [1]University of Illinois at Urbana Champaign

**2:50 PM**
**CFD Modeling of Transport Phenomena and Inclusion Removal in a Gas-stirred Ladle**: *Qing Cao*[1]; Laurentiu Nastac[1]; [1]The University of Alabama

**3:10 PM**
**An Innovative Modeling Approach for Predicting the Desulfurization Kinetics in an Argon-stirred Ladle Furnace**: *Qing Cao*[1]; Laurentiu Nastac[1]; [1]The University of Alabama

**3:30 PM Break**

**3:50 PM**
**Simulation of Non-metallic Inclusion Deposition and Clogging of Nozzle**: Hadi Barati[1]; Menghuai Wu[2]; *Tobias Holzmann*[2]; Abdellah Kharicha[2]; Andreas Ludwig[2]; [1]K1-MET GmbH; [2]Montanuniversitaet Leoben

**4:10 PM**
**Research on the Flow Properties and Erosion Characteristics in Combined Blown Converter at Steelmaking Temperature**: *Shaoyan Hu*[1]; Rong Zhu[1]; Runzao Liu[1]; Kai Dong[1]; [1]University of Science and Technology Beijing China

**4:30 PM**
**Effect of Shrouding Nozzles Arrangement on Flow Field and Stirring Ability of Coherent Jet in EAF Steelmaking Process**: *Fuhai Liu*[1]; Rong Zhu[1]; [1]University of Science & Technology Beijing

## Characterization of Minerals, Metals, and Materials – Characterization of Polymer and Composite Materials

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Tuesday PM
March 13, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chairs:* Sergio Monteiro, Military Institute of Engineering; Mingming Zhang, ArcelorMittal

**2:00 PM Introductory Comments**

**2:05 PM**
**Development and Performance of the Polycarbonate Composites Containing High Amount of Sisal Fiber**: Noan Simonassi[1]; Flavio Ramos[1]; *Sergio Monteiro*[1]; Édio Lima Junior[1]; Dayana Rodrigues[2]; [1]Militar Institute of Engineering; [2]Universidade Federal do Rio de Janeiro

**2:25 PM**
**Dynamic-mechanical Analysis of Epoxy Composites Reinforced with PALF Fibers**: *Gabriel Glória*[1]; Maria Carolina Teles[1]; Felipe Lopes[1]; Carlos Maurício Vieira[1]; Frederico Margem[2]; Sérgio Monteiro[3]; Maycon Gomes[4]; [1]State University of the Northern Rio de Janeiro; [2]Faculdade Redentor; [3]Instituto Militar de Engenharia, IME; [4]Instituto Federal Fluminense, IFF

**2:45 PM**
**Characterization of PCBs from Obsolete Computers Aiming the Recovery of Precious Metals**: Mariana Carvalho[1]; Marcos Paulo Caldas[1]; *Jorge Tenório*[1]; Denise Espinosa[1]; [1]University of São Paulo

**3:05 PM**
**IZOD Impact Test Comparative Analyzis of Epoxy and Polyester Matrix Composites Reinforced with Hemp Fibers**: Dhyemila Mantovani[1]; Janaina Vieira[1]; Lucas Pontes[1]; Lázaro Rohen[1]; Anna Carolina Neves[1]; *Carlos Maurício Vieira*[1]; Frederico Margem[1]; Sergio Monteiro[1]; [1]Universidade Estadual do Norte Fluminense

**3:25 PM Break**

**3:40 PM**
**Synthesis of Polymeric Hydrogel Loaded with Antibiotic Drug for Wound Healing Applications**: *Angélica Zafalon*[1]; Vinicius Santos[1]; Ademar Lugao[1]; Duclerc Parra[1]; Vijaya Rangari[2]; [1]Nuclear and Energetic Research Institute; [2]Tuskegee University

**4:00 PM**
**Comparative Mechanical Analysis of Epoxy Composite Reinforced with Malva/Jute Hybrid Fabric by Izod and Charpy Impact Test**: *Janaina da Silva Vieira*[1]; Ygor Macabú de Moraes[1]; Felipe Perissé Duarte Lopes[1]; Sergio Neves Monteiro[2]; Frederico Muylaert Margem[3]; Djalma Souza[1]; Jean Igor Margem[4]; [1]State University of the Northern Rio de Janeiro; [2]Military Institute of Engineering; [3]UniREDENTOR; [4]Institutos Superiores de Ensino do CENSA

**4:20 PM**
**Comparison Between Epoxy Matrix Composites Reinforced with Ramie Fabric under Pressure and Vacuum**: *Caroline Gomes de Oliveira*[1]; Janine Feitosa de Deus[1]; Felipe Perissé Duarte Lopes[1]; Lucas de Almeida Pontes[1]; Sérgio Neves Monteiro[2]; Frederico Muylaert Margem[3]; [1]UENF - Universidade Estadual do Norte Fluminense; [2]Military Institute of Technology - IME; [3]Faculdade Redentor

**4:40 PM**
**Charpy Impact Test in Polyester Matrix Composites Reinforced With Hybrid Blanket of the Jute and Malva Fibers**: *Jean Margem*[1]; Ygor Moraes[2]; Frederico Margem[2]; Sergio Monteiro[3]; Marina Margem[4]; [1]Isecensa Institute for High Education of the Censa; [2]Uenf; [3]Ime Military institute of Engineering; [4]UFF - Universidade Federal Fluminense

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Methodology and Chemistry of Materials

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Tuesday PM
March 13, 2018
Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Zhimin Ao, Guangdong University of Technology; Susan Sinnott, Penn State University

**2:00 PM Invited**
**Advances in Atomic-scale Methods for Materials Chemistry**: *Susan Sinnott*[1]; [1]Penn State University

**2:30 PM**
**High-throughput Computational Studies of Structural, Electrical, Phonon and Thermal Properties of Two-dimensional Materials**: *Lan Li*[1]; [1]Boise State University

**2:50 PM Invited**
**DFT Calculations on Carbon Materials for Gas Monitoring and Organic Pollutants Degradation**: *Zhimin Ao*[1]; [1]Guangdong University of Technology

**3:20 PM Break**

**3:40 PM**
**Dispersion Corrected Density Functional Theory Study of \946-PVDF/ Ionic Liquid Complexes**: *Ranjini Sarkar*[1]; Tarun Kundu[1]; [1]Indian Institute of Technology, Kharagpur

**4:00 PM**
**Cluster Variation Method Applied to Phase Transformations**: *Tetsuo Mohri*[1]; [1]Tohoku University

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Multiscale Modeling

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Tuesday PM
March 13, 2018
Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* David Fullwood , Brigham Young University; Thien Duong, Texas A&M University

**2:00 PM Invited**
**Multiscale Simulations of Plastic Deformation in Polycrystalline Metals Using Databases**: *Surya Kalidindi*[1]; Marat Latypov[2]; David Montes de Oca Zapiain[1]; Evdokia Popova[1]; [1]Georgia Institute of Technology; [2]University of Lorraine

**2:30 PM**
**Multi-scale Modelling of a Material Performance in a Cutting Edge of a Mining Bucket Loader**: *Matti Lindroos*[1]; Anssi Laukkanen[1]; Tom Andersson[1]; Tatu Pinomaa[1]; Tuukka Verho[1]; [1]VTT Research Center of Finland

**2:50 PM**
**Scale-parity Preserving Multiscale Models for Investigating the Mechanical Properties of Geopolymers**: Mohammad Sadat[1]; Sourav Gur[1]; *Krishna Muralidharan*[1]; George Frantziskonis[1]; Lianyang Zhang[1]; [1]University of Arizona

**3:10 PM Invited**
**Macro and Meso-scale Performance of a Super-dislocation Model for Tracking Dislocation Evolution and Interactions**: *David Fullwood*[1]; Landon Hansen[1]; Hyuk Jong Bong[2]; Eric Homer[1]; Robert Wagoner[2]; [1]Brigham Young University; [2]Ohio State University

**3:40 PM Break**

**4:00 PM**
**From Process to Performance: A Scale Bridging Numerical Framework for Addressing Joint Formation and Electromigration in Cu/Sn/Cu Interconnections**: *Vahid Attari*[1]; Thien Doung[1]; Raymundo Arroyave[1]; Zachary Morgan[2]; Yongmei Jin[2]; [1]Texas A&M University; [2]Michigan Technological University

**4:20 PM**
**Effect of Porosity on the Stress-strain Response and Hysteretic Energy Dissipation Capacity of NiTi Shape Memory Alloys**: George Frantziskonis[1]; Sourav Gur[1]; *Krishna Muralidharan*[1]; [1]University of Arizona

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Computational Design of Materials: Machine Learning

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

Tuesday PM
March 13, 2018
Room: 131C
Location: Phoenix Convention Center

*Session Chairs:* Bryce Meredig, Citrine Informatics; Dongwon Shin, Oak Ridge National Laboratory

**2:00 PM Invited**
**Computational Thermodynamic and Machine Learning Approach to Accelerate the Design of High-temperature Alloys**: *Dongwon Shin*[1]; Sangkeun Lee[1]; Yukinori Yamamoto[1]; Michael Brady[1]; [1]Oak Ridge National Laboratory

**2:30 PM Invited**
**Atomate: A High-level Interface to Generate, Execute, and Analyze Computational Materials Science Workflows**: *Kiran Mathew*[1]; Joseph Montoya[1]; Zi-Kui Liu[2]; Jeffrey Neaton[1]; Shyue Ping Ong[3]; Kristin Persson[1]; Anubhav Jain[1]; [1]Lawrence Berkeley Lab; [2]The Pennsylvania State University; [3]University of California San Diego

**3:00 PM**
**Alloy Design Strategy to Accelerate Nitriding of Fe alloys : A Combined DFT and CALPHAD Study**: *Hyuck Mo Lee*[1]; Ku Kang[1]; Changsoo Lee[1]; [1]KAIST

**3:20 PM**
**The Fundamental Thermodynamic Investigation on the Grade 91 Alloy**: *Andrew Smith*[1]; Yu Zhong[1]; [1]Florida International University

**3:40 PM Break**

**4:00 PM Invited**
**Machine Learning as the "I" in ICME: Integrating Experiment, Simulation, and Theory for Alloy Design**: *Bryce Meredig*[1]; [1]Citrine Informatics

**4:30 PM**
**A Path Planning Algorithm for Functionally Graded Materials Design**: *Tanner Kirk*[1]; Edgar Galvan[1]; Richard Malak[1]; Raymundo Arroyave[1]; [1]Texas A&M University

**4:50 PM**
**On the Fly Efficient Global Optimization Techniques to Accelerate Materials Design**: *Anjana Talapatra*[1]; Shahin Boluki[1]; Thien Duong[1]; Raymundo Arroyave[1]; Xiaoning Qian[1]; Edward Dougherty[1]; [1]Texas A&M University

**5:10 PM**
**Multiscale Modeling for Systematic Design of Metallic Microstructures to Provide Resistance to Fatigue and Wear**: *Anssi Laukkanen*[1]; Tom Andersson[1]; Matti Lindroos[1]; Tatu Pinomaa[1]; [1]VTT

## Computational Materials Discovery and Optimization – Materials for Energy Technologies

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Richard Hennig, University of Florida; Houlong Zhuang, Arizona State University; Arunima Singh, Lawrence Berkeley National Laboratory; Eric Homer, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

Tuesday PM
March 13, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chair:* Richard Hennig, University of Florida

**2:00 PM Invited**
**Software Tools for High-throughput Materials Data Generation and Data Mining**: *Anubhav Jain*[1]; [1]LBNL

**2:30 PM**
**Structure-property Linkages for Porous Membranes Using the Materials Knowledge Systems Framework**: *Yuksel Yabansu*[1]; Patrick Altschuh[2]; Johannes Hötzer[2]; Britta Nestler[2]; Surya Kalidindi[1]; [1]Georgia Institute of Technology; [2]Karlsruhe Institute Of Technology

**2:50 PM Invited**
**Light-metal Complex Hydrides: Computational Structure Prediction and Interaction with Functionalized Nanoporous Hosts**: *Eric Majzoub*[1]; [1]University of Missouri - St. Louis

**3:20 PM Break**

**3:40 PM Invited**
**Holistic Computational Structure Screening of More than 12 000 Candidates for Solid Lithium-ion Conductor Materials**: Austin Sendek[1]; Qian Yang[1]; Ekin Cubuk[1]; Karel-Alexander Duerloo[1]; Yi Cui[1]; *Evan Reed*[1]; [1]Stanford University

**4:10 PM**
**Improving the Ductility of Boron Carbide from Computational Design**: *Qi An*[1]; William Goddard III[2]; [1]University of Nevada, Reno; [2]California Institute of Technology

**4:30 PM**
**Fabricating Optimized Crystallographic Textures through Heterogeneous Templated Grain Growth**: *Dallin Frandsen*[1]; Oliver Johnson[1]; [1]Brigham Young University

## Computational Materials Science and Engineering for Nuclear Energy – Structural Materials II

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Tuesday PM
March 13, 2018
Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* Malcolm Stocks, Oak Ridge National Laboratory; Nigel Marks, Curtin University

**2:00 PM Invited**
**Atomistic Modeling of Primary Damage in Fe-based Ferritic Alloys**: Yaxuan Zhang[1]; Daniel Schwen[2]; *Xian-Ming Bai*[1]; [1]Virginia Tech; [2]Idaho National Laboratory

**2:30 PM**
**Sink Density Effect on Radiation-induced Segregation and Precipitation in Fe-Cr Alloys**: *Enrique Martinez Saez*[1]; Oriane Senninger[2]; Alfredo Caro[1]; Frédéric Soisson[2]; Maylise Nastar[2]; Blas Uberuaga[1]; [1]Los Alamos National Laboratory; [2]Commissariat a l'Energie Atomique

**2:50 PM**
**Dislocation Loop Bias in BCC Fe**: *Andrew Ervin*[1]; Luis Casillas-Trujillo[1]; Haixuan Xu[1]; [1]University of Tennessee

**3:10 PM**
**Density Functional Theory Study of the Magnetic Moment of Solute Mn in BCC Fe**: *Daniel King*[1]; Thomas Whiting[1]; Simon Middleburgh[2]; Patrick Burr[3]; Paul Fossati[1]; Yi Cui[1]; Mark Wenman[1]; [1]Imperial College London; [2]Westinghouse Electric; [3]University of New South Wales

**3:30 PM Break**

**3:50 PM**
**Discrete Dislocation Sinks in Spatially Resolved Cluster Dynamics Simulations**: *Aaron Kohnert*[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

**4:10 PM**
**Kinetics of Point Defect Absorption by Sinks: Effect of Point Defect Properties and Surrounding Microstructure**: *Denise Carpentier*[1]; Thomas Jourdan[1]; Yann Le Bouar[2]; Mihai-Cosmin Marinica[1]; [1]CEA Saclay; [2]LEM CNRS/ONERA

**4:30 PM**
**Breaking the Power Law: Multiscale Simulations of Self-ion Irradiated Tungsten**: *Miaomiao Jin*[1]; Michael Short[1]; Cody Permann[2]; [1]Massachusetts Institute of Technology; [2]Idaho National Laboratory

**4:50 PM Invited**
**Flux Effect on RIS in a Fe3%Ni Model Alloy: CD Modelling of the T Shift**: Lisa Belkacémi[1]; *Estelle Meslin*[1]; Brigitte Décamps[2]; Bertrand Radiguet[3]; Jean Henry[1]; [1]CEA; [2]CSNSM-Université Paris Saclay; [3]GPM-Université de Rouen

## Coupling Advanced Characterization and Modeling Tools for Understanding Fundamental Phase Transformation Mechanisms: An MPMD Symposium in Honor of Hamish Fraser – Session II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; Soumya Nag, GE Global Research; Rajarshi Banerjee, University of North Texas

Tuesday PM
March 13, 2018
Room: 127A
Location: Phoenix Convention Center

*Session Chair:* Peter Collins, Iowa State University

**2:00 PM Invited**
**The ß to α Transformation in Titanium Alloys**: *Dipankar Banerjee*[1]; [1]Indian Institute of Science

**2:30 PM Invited**
**Computational Investigation of Omega Phase Evolution in Ti-Mo and Ti-V Systems**: Deep Choudhuri[1]; S Banerjee[1]; R Banerjee[1]; *Srinivasan Srivilliputhur*[1]; [1]University of North Texas

**3:00 PM Invited**
**Evolution of Microstructure and Transformation Texture in Titanium Alloys**: Rongpei Shi[1]; Dong Wang[2]; Yufeng Zheng[1]; Rajarshi Banerjee[3]; Hamish Fraser[1]; *Yunzhi Wang*[1]; [1]The Ohio State University; [2]Xi'an Jiaotong University; [3]University of North Texas

**3:30 PM Break**

**3:50 PM Invited**
**New Techniques for Interrogation of Structure in Additively Manufactured Materials**: Andrew Polonsky[1]; Marie-Agathe Charpagne[1]; Brent Goodlet[1]; *Tresa Pollock*[1]; [1]University of California, Santa Barbara

**4:20 PM Invited**
**Qualification of Topology Optimized Titanium Parts Made by Additive Manufacturing through In-situ Process Monitoring**: *Sudarsanam Babu*[1]; Sean Yoder[1]; Ryan Dehoff[2]; Peeyush Nandwana[2]; Vincent Paquit[2]; Michael Kirka[2]; [1]The University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory

## Coupling Experiments and Modeling to Understand Plasticity and Failure – Dislocation Scale Plasticity

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Michael Sangid, Purdue University; Philip Eisenlohr, Michigan State University; Matthew Miller, Cornell University; Paul Shade, Air Force Research Laboratory

Tuesday PM
March 13, 2018
Room: 126B
Location: Phoenix Convention Center

*Session Chairs:* Philip Eisenlohr, Michigan State University; Maryam Ghazisaeidi, Ohio State University

**2:00 PM Invited**
**New Observations of Phase Transformations during Deformation in Superalloys and High Entropy Alloys: Experiments**: *Michael Mills*[1]; Jiashi Miao[1]; Tim Smith[2]; Connor Slone[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University; [2]NASA Glenn Research Center

**2:25 PM Invited**
**New Observations of Phase Transformations during Deformation in Superalloys and High Entropy Alloys: Modeling**: Changning Niu[1]; Carlyn LaRosa[1]; You Rao[1]; T. M. Smith[1]; Jiashi Miao[1]; M. J. Mills[1]; *Maryam Ghazisaeidi*[1]; [1]Ohio State University

**2:50 PM**
**A Direct Connection between In-situ TEM and Dislocation Simulations**: *Stefan Sandfeld*[1]; Daniel Kiener[2]; Rachel Derby[1]; Dominik Steinberger[1]; [1]TU Freiberg; [2]University of Leoben

**3:10 PM**
**Continuum Dislocation Dynamics at Finite Deformation and the Path toward Localization and Failure in Metals**: *Anter El-Azab*[1]; [1]Purdue University

**3:30 PM Break**

**3:50 PM Invited**
**Concurrent Multi-scale Modeling: Towards a Procedure to Test Modeling Hypothesis at the Mesoscale**: *Laurent Capolungo*[1]; Hi Vo[1]; John Graham[2]; Richard Lesar[2]; [1]Los Alamos National Laboratory; [2]Iowa State University

**4:15 PM**
**Experimental and Computational Analysis of Deformation in Solid Solution and Precipitation Strengthened Ni-Cr-Co Alloys**: *Connor Slone*[1]; Supriyo Chakraborty[1]; Stephen Niezgoda[1]; Michael Mills[1]; [1]The Ohio State University

**4:35 PM**
**Mechanical Behavior of Polycrystalline Microscale Silver Pillars**: *Md Sadeq Saleh*[1]; Mehdi Hamid[2]; Hussein Zbib[2]; Rahul Panat[1]; [1]Carnegie Mellon University; [2]Washington State University

**4:55 PM**
**Plasticity of BCC Metals at Low Temperatures - Coupling Theory with Experiments**: *Roman Gröger*[1]; Zdenek Chlup[1]; Ivo Kubena[1]; Tomas Kruml[1]; [1]Academy of Sciences of the Czech Republic

**5:15 PM**
**Improved Understanding of the Portevin–Le Châtelier Effect though Modelling Using Discrete Diffusion Coupled with Discrete Dislocation Dynamics**: *William White*[1]; Daniel Balint[1]; Ben Britton[1]; [1]Imperial College

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – 4A: Characterization of Creep Deformation & Damage in Ni-based Superalloys. 4B: Characterization of Creep or Fatigue Deformation & Damage in Ni-based Superalloys

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC; Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

Tuesday PM
March 13, 2018
Room: 126A
Location: Phoenix Convention Center

*Session Chairs:* Michael Titus, Purdue University; Mark Hardy, Rolls-Royce plc

**2:00 PM Invited**
**Are Ni-based SX Superalloys Always Stronger in Creep?**: Louis Thébaud[1]; Patrick Villechaise[2]; *Jonathan Cormier*[2]; Coraline Crozet[1]; Alexandre Devaux[1]; Denis Béchet[1]; Jean-Michel Franchet[3]; Anne-Laure Rouffié[3]; Mike Mills[4]; [1]Aubert et Duval; [2]ENSMA / Institut Pprime - UPR CNRS 3346; [3]SAFRAN Tech; [4]Ohio State University

**2:30 PM**
**Integrated Modeling of Creep in Ni-base Superalloys**: *Pengyang Zhao*[1]; Chen Shen[2]; Michael Mills[1]; Yunzhi Wang[1]; Stephen Niezgoda[1]; [1]The Ohio State University; [2]GE Global Research

**2:50 PM**
**A Physics-oriented Creep Damage Model for Single Crystal Superalloys**: *Jean-Briac le Graverend*[1]; [1]Texas A&M University

**3:10 PM**
**Assessment of the Remaining Creep Life for DZ125 Superalloy Based on Microstructural Degradation**: *Chao Fu*[1]; Yadong Chen[1]; Qiang Feng[1]; [1]University of Science and Technology Beijing

**3:30 PM Break**

**3:50 PM**
**Microstructural Damage Evolution during High-temperature Creep in Nickel-based Single Crystal Superalloys: A Phase Field Study**: *Harikrishnan Rajendran*[1]; Jean-Briac le Graverend[1]; [1]Texas A&M University

**4:10 PM**
**Effects of Ageing on Microstructure, Elemental Distribution and Low Cycle Fatigue Behavior and Corresponding Deformation Mechanisms of Haynes-282 at Elevated Temperatures**: *Shreya Mukherjee*[1]; Sujoy Kar[1]; Soumitra Tarafder[2]; S. Sivaprasad[2]; Puspendu Sahu[3]; [1]Indian Institute of Technology Kharagpur, India; [2]CSIR- National Metallurgical Laboratory , Jamshedpur, India; [3]Jadavpur University , Jadavpur, India

**4:30 PM**
**The Effects of Aging Heat Treatments on the Mechanical Performance of an Inconel 740 Casting**: *Kyle Rozman*[1]; Martin Detrois[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; [1]NETL

**4:50 PM**
**Oxidation Impact on Fatigue Mechanisms of DS200+Hf Alloy**: *Lorena Mataveli Suave*[1]; Jonathan Cormier[2]; Guillaume Benoit[2]; Denis Bertheau[2]; Patrick Villechaise[2]; [1]Safran; [2]Institut Pprime

**5:10 PM**
**The Performance of a New γ' Bond Coating on Single Crystal Ren\233; N5 in Sustained Peak Low-cycle Fatigue**: *Marissa Lafata*[1]; David Jorgensen[2]; Akane Suzuki[3]; Don Lipkin[3]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Honeywell Aerospace; [3]GE Global Research

## Design for Mechanical Behavior of Architectured Materials via Topology Optimization – Recent Advancements and Material Applications of Topology Optimization (TO)

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Natasha Vermaak, Lehigh University; Andrew Gaynor, U.S. Army Research Laboratory

Tuesday PM
March 13, 2018

Room: 132C
Location: Phoenix Convention Center

*Session Chair:* Natasha Vermaak, Lehigh University

**2:00 PM Invited**
**Topology Optimization of Architected Materials with Application-specific Tailored Properties**: *James Guest*[1]; [1]Johns Hopkins University

**2:40 PM**
**Topology Optimization with RVE Lattice Structures Subject to Additive Manufacturing and Stress Design Constraints**: *David Weinberg*[1]; Nam-Ho Kim[1]; [1]Autodesk, Inc.

**3:10 PM**
**Topology Optimization of Multi-material Truss Lattice Structures via Geometry Projection**: *Hesaneh Kazemi*[1]; Julián Norato[1]; Ashkan Vaziri[2]; [1]University of Connecticut; [2]Northeastern University

**3:40 PM Break**

**3:55 PM Invited**
**A Level Set Based Topology Optimization Framework to Design Extreme Thermos-elastic Microstructure: Influence of Graded Interfaces and Multi-materials**: Alexis Faure[1]; *Rafael Estevez*[1]; Georgios Michailidis[1]; Guillaume Parry[1]; Natasha Vermaak[2]; [1]Universite Grenoble Alpes; [2]Lehigh University

**4:35 PM**
**A Panel Discussion for the Design of Materials via Topology Optimization**: *Natasha Vermaak*[1]; Andrew Gaynor[2]; [1]Lehigh University; [2]U.S. Army Research Laboratory

## Dynamic Behavior of Materials VIII – Effect of Microstructure of Dynamic Response II

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

Tuesday PM
March 13, 2018

Room: 127B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:00 PM Invited**
**Experimental and Computational Spectroscopy for Deciphering Amorphization in Boron Carbide due to Dynamic Loading**: *Ghatu Subhash*[1]; [1]University of Florida

**2:40 PM**
**Non-equilibrium Simulations of Shock-induced Horizontal Defects and Amorphization in 4H Silicon Carbide**: *Rachel Flanagan*[1]; Shiteng Zhao[1]; Eric Hahn[2]; Carlos Ruestes[3]; Chris Wehrenberg[4]; Bruce Remington[4]; Marc Meyers[1]; [1]UCSD; [2]Los Alamos National Laboratories; [3]National University of Cuyo , Mendoza; [4]Lawrence Livermore National Laboratories

**3:00 PM**
**Shock-wave Energy Dissipation in Metal-organic Frameworks and Network Forming Ionic Liquids**: *Karthik Guda Vishnu*[1]; Kiettipong Banlusan[1]; Alejandro Strachan[1]; [1]Purdue University

**3:20 PM Invited**
**Powerful Laser-driven Shock Induced Amorphization**: *Shiteng Zhao*[1]; Bimal Kad[1]; Eric Hahn[2]; Bruce Remington[3]; Christopher Wehrenberg[3]; Jerry Lasalvia[4]; Karren More[5]; Marc Meyers[1]; [1]University of California, San Diego; [2]Los Alamos National Lab; [3]Lawrence Livermore National Lab; [4]Army Reserach Lab; [5]Oak Ridge National Laboratory

**3:40 PM Break**

**4:00 PM**
**Effects of Microstructure and Strain Rate on the Dynamic Deformation and Fracture Mechanisms in Dual Phase Steels**: *Sukanya M. Sharma*[1]; Shrikant P. Bhat[2]; Arun Gokhale[1]; Naresh Thadhani[1]; [1]Georgia Tech; [2]ArcelorMittal

**4:20 PM Invited**
**The Effect of Plastic Deformation and Transformed Martensite on the Mechanical Response of Lean Duplex Stainless Steel 2101**: Ali Ameri[1]; *J.P. Escobedo-Diaz*[1]; M. Ashraf[1]; Z. Quadir[2]; [1]University of New South Wales-Canberra; [2]Curtin University

**4:40 PM**
**Mechanical Properties and Shear Localization of High Entropy Alloy CoCrFeMnNi Prepared by Powder Metallurgy**: *Bingfeng Wang*[1]; Xiaoxia Huang[1]; Yong Liu[1]; Bin Liu[1]; [1]Central South University, China

**5:00 PM**
**Investigation of Dynamic Mechanical Response in Al0.1CoCrFeNi High Entropy Alloy**: *Sindhura Gangireddy*[1]; Deep Choudhuri[1]; Daniel Whitaker[1]; Whitley Green[1]; Rajiv Mishra[1]; [1]University of North Texas

## Electrode Technology Symposium for Aluminum Production – Anode Materials and Properties

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xianan Liao, Elkem Carbon

Tuesday PM
March 13, 2018

Room: 222C
Location: Phoenix Convention Center

*Session Chair:* Jianhong Yang, Jiangsu University

**2:00 PM Introductory Comments**

**2:05 PM**
**Challenges and Successes of Conducting Trials for Anode Design Modification**: *David Molenaar*[1]; Beverley Pillay[2]; Yusuke Tsuji[3]; Yutong Zhu[1]; [1]CSIRO; [2]South32; [3]Mitsubishi

**2:30 PM**
**Study on Optimization of Anode Structure for Aluminum Reduction Cell**: *Jing Liu*[1]; Hui Dong[2]; Yu Mao[2]; Jihong Mao[2]; Yungang Ban[2]; [1]School of Mechanical Engineering and Automation Northeastern University; Northeastern University Engineering & Research Institute Co., Ltd.; [2]Northeastern University Engineering & Research Institute Co., Ltd.

**2:55 PM**
**Interaction between Anode Aggregate and Binder in the Sessile Drop Wetting Test**: *Bruno Rausch*[1]; Juraj Chmelar[1]; Hogne Linga[1]; Lorentz Petter Lossius[1]; Rebecca Thorne[2]; Viktorija Tomkute[1]; [1]Hydro Aluminium AS; [2]NILU

**3:20 PM**
**Development and Application of Large-scale Shaft Kilns**: Guanghui Lang[1]; Rui Liu[1]; Yujing Jiang[1]; Yan Li[1]; *Ronald Logan*[1]; [1]Sunstone

**3:45 PM Break**

**4:00 PM**
**Study on the Property and Desulfurization Mechanisms of Petroleum Cokes with Different Sulfur Contents from 1200°C to 2800°C**: *Shoulei Gao*[1]; Jilai Xue[1]; Guanghui Lang[1]; Rui Liu[1]; Chongai Bao[1]; Zhiguo Wang[1]; Fali Zhang[1]; [1]Sunstone Development Co., Ltd

**4:25 PM**
**The Current Status and Development Trend of the Prebaked Anode Market in China**: Zhang Shuchao[1]; *Dong Wei*[2]; [1]Elkem Carbon (China) Co.,LTD; [2]Elkem Carbon (China) Co.,LTD

## Energy Technologies and CO2 Management Symposium – Technologies for Energy Efficiency

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
*Program Organizers:* Ziqi Sun, Queensland University of Technology; Cong Wang, Northeastern University; Donna Guillen, Idaho National Laboratory; Tao Wang, Nucor Steel; Neale Neelameggham, Ind LLC; John Howarter, Purdue University

Tuesday PM
March 13, 2018

Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* Chang Liu, IMR-CAS, China; Yulin Zhong, Griffith University

**2:00 PM Invited**
**Modeling Key Atomic Processes in Titanium Alloys for Energy Efficiency**: *Hao Wang*[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

**2:20 PM**
**Improving Energy Efficiency in Direct Method for Continuous Casting of Lead Sheets**: *Arun Prabhakar*[1]; Joanna Mielnicka[1]; Mark Jolly[1]; Konstantinos Salonitis[1]; [1]Cranfield University

**2:40 PM**
**Research on High Efficiency Energy Conversion Technology for Modern Hot Blast Stove**: *Fuming Zhang*[1]; Xin Li[1]; Zurui Hu[1]; [1]Shougang Group

**3:00 PM**
**Effect of Heat Input on the Microstructure of EH36 Shipbuilding Steel**: *Xiaodong Zou*[1]; Cong Wang[1]; [1]Northeastern University

**3:20 PM Break**

**3:40 PM**
**An Exergy Study of Cowper Stove Operations with an Iron Blast Furnace**: *Patrick Krane*[1]; Matthew Krane[1]; [1]Purdue University

**4:00 PM**
**Simulation Based Method for Analyzing Energy-utilization Feature in Steelmaking-continuous Casting Process**: *Zhaojun Xu*[1]; Zhong Zheng[1]; Xiaoqiang Gao[2]; Jipeng Fan[1]; [1]College of Materials Science and Engineering, Chongqing University; [2]College of Economics and Business Administration, Chongqing University

**4:20 PM**
**Waste Heat Recovery from Aluminum Production**: *Miao Yu*[1]; Maria Gudjonsdottir[2]; Pall Valdimarsson[2]; Gudrun Saevarsdottir[2]; [1]Tianjin University; [2]Reykjavik Universiry

**4:40 PM**
**Leaching and Carbonation of Electric Arc Furnace(EAF) Slag under a Microwave Field for Mineral Carbonation**: Zhibo Tong[1]; Guojun Ma[1]; Xiang Zhang[1]; Junjie Liu[1]; *Langsha Shao*[1]; [1]Wuhan University of Science and Technology

## Environmentally Assisted Cracking: Theory and Practice – Hydrogen Embrittlement

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Bai Cui, University of Nebraska–Lincoln; Raul Rebak, GE Global Research; Sebastien Dryepondt, Oak Ridge National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Tuesday PM
March 13, 2018

Room: 105A
Location: Phoenix Convention Center

*Session Chairs:* Khalid Hattar, Sandia National Laboratories; Chris San Marchi, Sandia National Laboratories

**2:00 PM Invited**
**Comparison of Hydrogen Introduction Techniques for In-situ TEM Straining Experiments**: *Khalid Hattar*[1]; Christopher Barr[1]; Daniel Bufford[1]; Brittany Muntifering[1]; Kathryn Small[1]; Ai Leen Koh[2]; Richard Karnesky[1]; [1]Sandia National Laboratories; [2]Stanford Univeristy

**2:40 PM**
**Evaluating the Effect of Sensitizing Time on the Hydrogen Embrittlement of Austenitic Stainless Steels**: *Osama Alyousif*[1]; [1]Kuwait University

**3:00 PM Invited**
**Dispelling Myths about Gaseous Hydrogen Environmental Fracture and Fatigue**: *Chris San Marchi*[1]; Joe Ronevich[1]; [1]Sandia National Laboratories

**3:40 PM Break**

**4:00 PM**
**Trapping against Hydrogen Embrittlement**: *Zahra Hosseini*[1]; Kevin Nibur[2]; Richard Gangloff[3]; Mohsen Dadfarnia[1]; Brian Somerday[4]; Petros Sofronis[1]; [1]University of Illinois, Urbana-Champaign; [2]Hy-Performance Materials Testing; [3]University of Virginia; [4]Southwest Research Institute

**4:20 PM**
**Hydrogen and Dislocation Assisted Grain Boundary Crack Initiation Mechanism**: Liang Wan[1]; Wen-Tong Geng[1]; Nobuyuki Ishikawa[1]; Hajime Kimizuka[1]; *Shigenobu Ogata*[1]; [1]Osaka University

**4:40 PM**
**Effect of Hydrogen on Ideal Shear Strength of Metals: An Ab-initio Study**: Pulkit Garg[1]; *Ilaksh Adlakha*[1]; Kiran Solanki[1]; [1]Arizona State University

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Relationships among Processing, Microstructure, and Fatigue Properties

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Tuesday PM
March 13, 2018
Room: 125B
Location: Phoenix Convention Center

*Session Chair:* Jean-Briac le Graverend, Texas A&M University

**2:00 PM Invited**
**Statistical Characterization of Microstructure and Fatigue of Wire and Arc Additive Manufactured Stainless Steel 304**: Jerard Gordon[1]; Christina Haden[1]; Jacob Hochhalter[2]; *D Gary Harlow*[1]; [1]Lehigh University; [2]NASA Langley Research Center

**2:20 PM**
**Fatigue Strength Scaling and Deformation at the Nanoscale – Nanotwinned and Nanocrystalline Metals**: *Nathan Heckman*[1]; Christopher Barr[1]; Timothy Furnish[1]; Khalid Hattar[1]; Stephen Foiles[1]; Fadi Abdeljawad[1]; Christoph Eberl[2]; Andrea Hodge[3]; Brad Boyce[1]; [1]Sandia National Laboratories; [2]Fraunhofer Institute for Mechanics of Materials IWM; [3]University of Southern California

**2:40 PM**
**Microstructural and Mechanical Properties of Linear Friction Welded Ti-6Al-2Sn-4Zr-6Mo**: *Toby Webster*[1]; [1]University of Birmingham

**3:00 PM**
**Effect of Advanced Mechanical Surface Treatments on Room and Elevated Temperature Residual Stress, Microstructure, Strength, and Fatigue Behavior of ATI 718Plus Alloy**: *Micheal Kattoura*[1]; Seetha Ramaiah Mannava[1]; Dong Qian[2]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]University of Texas at Dallas

**3:20 PM Break**

**3:40 PM**
**Influence of Cold Spray on the Enhancement of Corrosion Fatigue of the AZ31B Cast Mg Alloy**: *Sugrib Shaha*[1]; S.B. Dayani[1]; H. Jahed[1]; [1]University of Waterloo

**4:00 PM**
**Fatigue Behavior of Ti6Al4V with Surface Modified by Femtosecond LASER**: Alan Santos[1]; Leonardo Campanelli[1]; Paulo Sergio Silva[1]; *Claudemiro Bolfarini*[1]; [1]Universidade Federal de São Carlos

**4:20 PM**
**Effects of Cooling Condition on Fatigue Crack Propagation Behaviors of ß-processed Ti-6Al-4V Alloys**: Daeho Jeong[1]; *Hyokyung Sung*[1]; Jehyun Lee[2]; Sangshik Kim[1]; [1]Gyeongsang National University; [2]Changwon National University

## Fracture: 65 Years after the Weibull Distribution and the Williams Singularity – Session IV

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Brad Boyce, Sandia National Laboratories; Ellen Cerreta, Los Alamos National Laboratory; Jacob Hochhalter, NASA LaRC; Jonathan Zimmerman, Sandia National Laboratories

Tuesday PM
March 13, 2018
Room: 128A
Location: Phoenix Convention Center

*Session Chairs:* Jonathan Zimmerman, Sandia National Laboratories; Frank Del Rio, National Institute of Standards and Technology

**2:00 PM Invited**
**A Probability Model for Stress Rupture Failure of Carbon Composites, Incorporating Weibull Fiber Strength Statistics, Local Fiber Load Sharing, and Matrix Creep**: *Amy Engelbrecht-Wiggans*[1]; Leigh Phoenix[1]; [1]Cornell University

**2:30 PM**
**Use of Weibull Distribution to Characterize High Performance Fibers**: Krishan K Chawla[1]; *Nikhilesh Chawla*[2]; Irene Lujan Regalado[2]; [1] University of Alabama at Birmingham; [2]Arizona State University

**2:50 PM Invited**
**Predicting Joint Strength: Evaluating Interface Corner Stress Intensity Factor and Cohesive Zone Modeling Approaches**: *Earl Reedy*[1]; [1]Sandia National Laborabories

**3:20 PM Break**

**3:40 PM Invited**
**Applicability of Weibull Statistics for Micro- and Nano-scale Silicon Components**: *Frank DelRio*[1]; Robert Cook[1]; Brad Boyce[2]; [1]National Institute of Standards and Technology; [2]Sandia National Laboratories

**4:10 PM**
**Fracture Toughness of Silicon by Variable Temperature Micropillar Splitting**: Carmen Lauener[1]; Ming Chen[1]; *Jeff Wheeler*[1]; [1]ETH Zurich

**4:30 PM**
**Limitations and Applicability of LEFM to Spalling Fracture in Single Crystal Semiconductors**: *Corinne Packard*[1]; [1]Colorado School of Mines

**4:50 PM**
**Weibull Analysis of High Strength Ni- and Fe-based Bulk Metallic Glasses**: *Henry Neilson*[1]; John Lewandowski[1]; [1]Case Western Reserve University

**5:10 PM Invited**
**Size, Temperature, Environmental Effects on Brittle Fracture (BDT)**: *William Gerberich*[1]; Nathan Mara; [1]University of Minnesota

## Frontiers in Advanced Functional Thin Films and Nanostructured Materials – Session IV

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Ritesh Sachan, Army Research Office; Srinivasa Rao Singamaneni, The University of Texas at El Paso; Haiyan Wang, Purdue University; Nuggehalli Ravindra, New Jersey Institute of Technology; Raj Singh, Oklahoma State University; Amit Pandey, LG Fuel Cell Systems Inc.

Tuesday PM
March 13, 2018

Room: 103A
Location: Phoenix Convention Center

Funding support provided by: Quantum Design and Radiant Technologies
*Session Chairs:* Haiyan Wang, Purdue University; Adele Moatti, North Carolina State University

**2:00 PM Invited**
**Point Defect Energetics at Oxide Heterointerfaces**: Tim McMaster[1]; Gaurav Arora[1]; *Dilpuneet Aidhy*[1]; [1]University of Wyoming

**2:30 PM Invited**
**Epitaxial Growth of Advanced Ceramic and Metal Films**: *Xinghang Zhang*[1]; Jin Li[1]; Haiyan Wang[1]; [1]Purdue University

**3:00 PM Invited**
**Oxide Epitaxy with Large Mismatch: Bronze-phase $VO_2$ on $SrTiO_3$**: *Matthew Chisholm*[1]; Hunter Sims[2]; Xiang Gao[1]; Shinbuhm Lee[1]; Sokrates Pantelides[2]; Ho Nyung Lee[1]; [1]Oak Ridge National Laboratory; [2]Vanderbilt University

**3:30 PM Break**

**3:50 PM Invited**
**Physiochemical and Antioxidant Properites of CNPs Modulated by Anions of the Precursor**: *Sudipta Seal*[1]; Swetha Barkam[1]; Ritesh Sachan[2]; Amitava Adhikary[1]; [1]University of Central Florida; [2]Army Research Office

**4:10 PM**
**Kinetic Modeling of the Structural Transition in $VO_2$ Thin Films**: *Adele Moatti*[1]; Ritesh Sachan[1]; John Prater[1]; Jagdish Narayan[1]; [1]NCSU

**4:30 PM**
**Functionalization of Transparent Oxide Thin Films Using Silicon Doped Nanoparticles**: *Gerald Ferblantier*[1]; Fabien Ehrhardt[1]; Corinne Ulhaq-Bouillet[2]; Emilie Steveler[1]; Yann Le Gall[1]; Daniel Mathiot[1]; [1]Strasbourg University - ICube Laboratory; [2]Strasbourg University - IPCMS

**4:50 PM**
**Effect of Process Parameters on Phase Stability and Metal-insulator Transition of Vanadium Dioxide (VO2) Thin Films by Pulsed Laser Deposition (PLD)**: *Ryan McGee*[1]; Ankur Goswami[1]; Kalvin Schofield[1]; Thomas Thundat[1]; [1]University of Alberta

**5:10 PM**
**A Structural Analysis of the Epitaxial Ni/$VO_2$ Heterostructure Integrated on Si(001)**: *Gabrielle Foley*[1]; Srinivasa Singamaneni[2]; Adele Moatti[1]; John Prater[3]; Jagdish Narayan[1]; [1]NCSU; [2]The University of Texas at El Paso; [3]Army Research Office

**5:30 PM Invited**
**Unraveling Self-Assembly Dynamics to Direct Higher Order**: *Philip Rack*[1]; [1]The University of Tennessee; Oak Ridge National Laboratory

## Frontiers in Solidification Science and Engineering – Eutectic and Dendritic Growth

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee
*Program Organizers:* Mohsen Asle Zaeem, Missouri University of Science and Technology; Damien Tourret, IMDEA Materials Institute; Mohsen Eshraghi, California State University, Los Angeles; Johannes Hötzer, University of Applied Science Karlsruhe

Tuesday PM
March 13, 2018

Room: 126C
Location: Phoenix Convention Center

*Session Chair:* Mohsen Asle Zaeem, Missouri University of Science and Technology

**2:00 PM Introductory Comments**

**2:10 PM**
**Spacing Homogenization in Lamellar Eutectics with Anisotropic Interfaces**: Maxime Ignacio[1]; *Mathis Plapp*[1]; [1]CNRS/Ecole Polytechnique

**2:30 PM**
**Analysis of Microstructure Rearrangement Processes during Velocity Variations of Directionally Solidified Eutectic Alloys**: *Johannes Hötzer*[1]; Philipp Steinmetz[2]; Michael Kellner[2]; Anne Dennstedt[3]; Britta Nestler[2]; [1]University of Applied Science Karlsruhe; [2]Karlsruhe Institute of Technology; [3]German Aerospace Center

**2:50 PM**
**Impurities at Work: Integrated Imaging of Eutectic Modification**: *Saman Moniri*[1]; Xianghui Xiao[2]; Ashwin Shahani[3]; [1]University of Michigan, Department of Chemical Engineering; [2]Advanced Photon Source, Argonne National Laboratory; [3]University of Michigan, Department of Materials Science & Engineering

**3:10 PM**
**Effect of Interphase Boundary Anisotropy on Three-phase Eutectic Microstructures**: Samira Mohagheghi[1]; *Melis Serefoglu*[1]; [1]Koc University

**3:30 PM Break**

**3:50 PM**
**Extension of Jackson-Hunt analysis for Curved Interfaces**: *Sumanth Nani Enugala*[1]; Britta Nestler[1]; [1]Karlsruhe Institute of Technology

**4:10 PM**
**Multiscale Modeling of Dendritic Grain Structures by Coupling DNN-CA-FE Methods**: Romain Fleurisson[1]; Gildas Guillemot[1]; *Charles-Andre Gandin*[1]; [1]MINES ParisTech

**4:30 PM**
**In Situ X-ray Tomographic Examination and Modeling of Dendrite Patterns during Solidification in Co and Ni Alloys**: *Mohammed Azeem*[1]; Shyamprasad Karagadde[2]; Nghia Vo[3]; Robert Atwood[3]; Peter Lee[1]; [1]Manchester University; [2]Indian Institute of Technology Bombay; [3]Diamond Light Source

**4:50 PM**
**Dendrite Orientation Selection and Growth Dynamics of Al-based Alloys**: *Maike Becker*[1]; Stefan Klein[2]; Matthias Kolbe[1]; Sebastian Wiese[3]; Florian Kargl[1]; [1]Deutsches Zentrum für Luft- und Raumfahrt; [2]DGM - Deutsche Gesellschaft für Materialkunde e.V.; [3]Rheinisch-Westfaelische Technische Hochschule Aachen

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Tuesday PM
March 13, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* Easo George, Ruhr University Bochum; Rajiv Mishra, University of North Texas

**2:00 PM Keynote**
**Relating Elementary Deformation Mechanisms to Macroscopic Mechanical Properties in High- and Medium-entropy Alloys**: *E. P. George*[1]; G. Laplanche[2]; A. Kostka[2]; [1]Oak Ridge National Laboratory; [2]Ruhr University Bochum

**2:20 PM Invited**
**Deformation Behavior of the Modified and FCC Structured CoCrFeMnNi Alloys**: Choi Minku[1]; *Nokeun Park*[1]; [1]Yeungnam University

**2:40 PM**
**Experimental and Computational Studies of Microstructures and Mechanical Behavior of AlxCoCrFeNi High-entropy Alloys (HEAs)**: Haoyan Diao[1]; Tingkun Liu[1]; Yanfei Gao[1]; Jonathan Poplawsky[2]; Wei Guo[2]; Rui Feng[1]; Karin A. Dahmen[3]; *Peter K. Liaw*[1]; [1]The University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory; [3]University of Illinois at Urbana–Champaign

**3:00 PM Invited**
**Size Effects in High-entropy Alloys and Quasicrystals**: *Yu Zou*[1]; [1]University of Toronto

**3:20 PM**
**Microstructure and Mechanical Properties of FeCoNiCr High-entropy Alloy Strengthened by Nano-Y2O3 Dispersion**: *Xiong-Jun Liu*[1]; Bei Jia[1]; Hui Wang[1]; Yuan Wu[1]; Zhao-Ping Lu[1]; [1]University of Science and Technology Beijing

**3:40 PM Break**

**4:00 PM Invited**
**Investigation of Plastic Deformation Modes in Al0.1CoCrFeNi High Entropy Alloy**: *Deep Choudhuri*[1]; Mageshwari Komarasamy[1]; Victor Ageh[1]; Rajiv Mishra[1]; [1]University of North Texas

**4:20 PM**
**Investigation of Dynamic Mechanical Response in Al0.3CoCrFeNi High Entropy Alloy**: *Sindhura Gangireddy*[1]; Bharat Gwalani[1]; Rajiv Mishra[1]; [1]UNT Denton

**4:40 PM**
**Mechanical Properties and Oxidation Resistance of NbTiZr-contaning Refractory High Entropy Alloys with Varying Al, Cr and Mo Content**: Ulanbek Auyeskhan[1]; Hojin Ryu[1]; *Owais Waseem*[1]; [1]Korea Advanced Institute of Science and Technology

**5:00 PM**
**On the Temperature Dependence of Fatigue-crack Propagation in the CrMnFeCoNi High-entropy Alloy**: *Keli Thurston*[1]; Bernd Gludovatz[2]; Easo George[3]; Robert Ritchie[4]; [1]University of California, Berkeley; [2]University of New South Wales; [3]Oak Ridge National Laboratory; [4]Lawrence Berkeley National Laboratory

**5:20 PM**
**Work Hardening Behavior and Strain Localization in Single Crystalline High Entropy Alloys**: *Sezer Picak*[1]; Ceylan Hayrettin[1]; Jun Liu[1]; Demircan Canadinc[1]; Yury I. Chumlyakov[1]; Ibrahim Karaman[1]; [1]Texas A&M

**5:40 PM**
**Evaluation of Friction and Wear Behavior of a Single-phase Equiatomic TiZrHfNb High-entropy Alloy Using Nanoscratch Technique**: *Y.X. Ye*[1]; T.G. Nieh[1]; [1]The University of Tennessee

## Hume-Rothery Award Symposium: Computational Thermodynamics and Its Implications to Kinetics, Properties, and Materials Design – Computational Thermodynamic Approaches

*Sponsored by:* TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Michael Gao, National Energy Technology Lab; Chelsey Hargather, New Mexico Institute of Mining and Technology; Richard Hennig, University of Florida; James Saal, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

Tuesday PM
March 13, 2018
Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* Arthur Pelton, Ecole Polytechnique; Long Qing Chen, Penn State University

**2:00 PM Invited**
**The Application of Computational Thermodynamics to Design Reactive-element Doped High-temperature Alloys: Hf Additions to NiCrAl**: *Brian Gleeson*[1]; Thomas Gheno[2]; Austin Ross[3]; Zi-Kui Liu[3]; [1]University of Pittsburgh; [2]CEA; [3]Penn State University

**2:30 PM Invited**
**Thermodynamic Modeling of the History of 3.45-billion-year-old Meteorites**: *Hiroshi Ohmoto*[1]; Uschi Graham[2]; Takeshi Kakegawa[3]; Zi-Kui Liu[1]; [1]The Pennsylvania State University; [2]University of Kentucky; [3]Tohoku University

**3:00 PM Invited**
**Thermodynamic Theory of Mechanical Destrain**: Fei Xue[1]; Yanzou Ji[1]; *Long Qing Chen*[1]; [1]Penn State University

**3:30 PM Break**

**3:50 PM Invited**
**Thermodynamic Calculation of Aqueous Phase Diagrams**: *Arthur Pelton*[1]; Gunnar Eriksson[2]; Klaus Hack[2]; Christopher Bale[1]; [1]Ecole Polytechnique; [2]GTT-Technologies

**4:20 PM Invited**
**The Application of Computational Thermodynamics to the Cathode-electrolyte in Solid Oxide Fuel Cells**: *Yu Zhong*[1]; [1]Worcester Polytechnic Institute

**4:50 PM Invited**
**Calphad in FCC High Entropy Alloys: From Binary Alloys to Multi-principal-component Alloys**: *Zhijun Wang*[1]; [1]Northwestern Polytechnical University

## Integrative Materials Design III: Performance and Sustainability – Role of ICME, Data Management & Integrative Design for Fatigue and High Temperature Performance

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories; Corbett Battaile, Sandia National Laboratories; Anastasios Gavras, Riley Power

Tuesday PM
March 13, 2018
Room: 132A
Location: Phoenix Convention Center

*Session Chairs:* Anthony Spangenberger, Worcester Polytechnic Institute; Sammy Tin, Illinois Institute of Technology

**2:00 PM Invited**
**Application of Integrated Computational Materials Engineering (ICME) and Accelerated Insertion of Materials (AIM) Tools to the Design and Development of Cost-effective Advanced Materials with Improved Performance and Sustainability**: *Jason Sebastian*[1]; James Saal[1]; Greg Olson[2]; [1]QuesTek Innovations LLC; [2]QuesTek Innovations LLC and Northwestern University

**2:20 PM Invited**
**Phase-based Data: One Size Doesn't Fit All**: *Ursula Kattner*[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

**2:40 PM Invited**
**Design of Fatigue Resistant Ni-base Superalloys via Meso-scale Engineering**: *Sammy Tin*[1]; Martin Detrois[1]; Mike Sangid[2]; John Rotella[2]; [1]Illinois Institute of Technology; [2]Purdue University

**3:00 PM Invited**
**Integrative Materials Design of Mo-Si-B Alloys**: *Richard Neu*[1]; Kyle Brindley[1]; [1]Georgia Institute of Technology

**3:20 PM Invited**
**Microstructure-sensitive Models for Predicting Near Surface Residual Stress Redistribution in P/M Nickel-base Superalloys**: *Micheal Burba*[1]; Dennis Buchanan[2]; Michael Caton[1]; Reji John[1]; Robert Brockman[2]; [1]Air Force Research Laboratory; [2]University of Dayton Research Institute

**3:40 PM Break**

**3:55 PM Invited**
**Integrating Computational and Experimental Methods to Quantify Microstructure Sensitivity of Thin Fatigue-critical Components**: *Jacob Hochhalter*[1]; Saikumar Yeratapally[2]; Patrick Leser[1]; Geoffrey Bomarito[1]; Timothy Ruggles[2]; Richard Russell[3]; David Dawicke[4]; [1]NASA LaRC; [2]National Institute of Aerospace; [3]NASA Kennedy Space Center; [4]AS&M, Inc

**4:15 PM Invited**
**Probabilistic Prediction of Effect of Stress Ratio and Notches on Minimum Fatigue Life of Ti-6Al-4V**: *Reji John*[1]; Sushant Jha[2]; Patrick Golden[1]; William Porter[2]; Dennis Buchanan[2]; James Larsen[1]; [1]Air Force Research Laboratory; [2]University of Dayton Research Institute

**4:35 PM**
**Fatigue Crack Growth in Structural Cast Aluminum Alloys: Microstructural Mechanisms, Modeling Strategies, and Integrated Design**: *Anthony Spangenberger*[1]; Diana Lados[1]; [1]Worcester Polytechnic Institute, Integrative Materials Design Center

**4:55 PM Invited**
**A Microstructure-sensitive Location-specific Design Tool for Predicting the Yield and Creep Behavior of LSHR Ni-base Superalloy**: *T. Parthasarathy*[1]; Reji John[2]; [1]UES, Inc.; [2]Air Force Research Laboratory

**5:15 PM**
**Fatigue Crack Growth Modeling and Mechanisms in Al and Ni Engine Materials under Hot Compressive Dwell Conditions**: *Xiang Chen*[1]; Diana Lados[1]; Richard Pettit[2]; David Dudzinski[3]; [1]Worcester Polytechnic Institute, Integrated Materials Design Center; [2]FractureLab, LLC; [3]Derivation Research Laboratory Inc

## Looking through the Kaleidoscope: Discovering Your Path to Leadership – Afternoon Session

*Program Organizers:* Emily Bautista, Virginia Tech; Mackenzie Jones, Virginia Tech; Thomas Maulbeck, Virginia Tech; Rose Roberts, Virginia Tech

Tuesday PM
March 13, 2018
Room: 124B
Location: Phoenix Convention Center

*Session Chairs:* Emily Bautista, Virginia Tech; Mackenzie Jones, Virginia Tech; Thomas Maulbeck, Virginia Tech; Rose Roberts, Virginia Tech

**2:00 PM Invited**
**The Art and Science of Leadership: Influence and Disruption**: *Karen Maud*[1]; [1]GE

**2:20 PM**
**The Leader Inside: Determining Your Specifc Skills and How to Apply Them (Interactive Session)**: Emily Bautista[1]; *Karen Maud*[2]; [1]Virginia Tech; [2]GE Power

**3:00 PM Invited**
**Perspectives on Contrasting Leadership in Industry, Academia, and Government**: *Amy Clarke*[1]; [1]Colorado School of Mines

**3:20 PM Invited**
**The Many Facets of Effective Leadership: A View from Two Perspectives**: *George Spanos*[1]; [1]TMS

**3:40 PM Break**

**4:00 PM Invited**
**Park & Diamond**: *David Hall*[1]; Jordan Klein[1]; [1]Park & Diamond

**4:20 PM Invited**
**Leadership along the Academic Track**: *Tresa Pollock*[1]; [1]University of California, Santa Barbara

**4:40 PM Invited**
**An Internship Program for Laboratory Technicians at the Oak Ridge National Laboratory**: *Edgar Lara-Curzio*[1]; [1]Oak Ridge National Laboratory

**5:00 PM Question and Answer Period**

**5:10 PM Concluding Comments**

## Magnesium Alloy Development: An LMD Symposium in Honor of Karl Kainer – Wrought Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Norbert Hort, Helmholtz-Zentrum Geesthacht; Alan Luo, The Ohio State University

Tuesday PM
March 13, 2018
Room: 223
Location: Phoenix Convention Center

*Session Chairs:* Jiehua Li, University of Leoben; Mert Celikin, McGill University

**2:00 PM**
**Alloy Design for the Development of Heat-Treatable High-Strength Mg-Zn-Ca-Zr Sheet Alloy with Excellent Room Temperature Formability**: Byeong-Chan Suh[1]; Ming-Zhe Bian[1]; Taiki Nakata[2]; *Taisuke Sasaki*[1]; Shigeharu Kamado[2]; Kazuhiro Hono[1]; [1]National Institute for Materials Science; [2]Nagaoka University of Technology

**2:20 PM**
**Development of Magnesium Sheets**: *Dietmar Letzig*[1]; Jan Bohlen[1]; Gerrit Kurz[1]; Jose Victoria-Hernandez[1]; Sangbong Yi[1]; [1]MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht

**2:40 PM**
**Effects of Severe Plastic Deformation on Mechanical Properties and Corrosion Behavior of Magnesium Alloys**: *Kwang Seon Shin*[1]; Ahmad Bahmani[1]; [1]Seoul National University

**3:00 PM**
**Enhancing Impact Toughness of Mg-3%Al-1%Zn Alloy by Grain Structure Modification**: Tomoya Maeda[1]; Naoko Ikeo[1]; Yoshiaki Osawa[2]; *Toshiji Mukai*[1]; [1]Kobe University; [2]National Institute for Materials Science

**3:20 PM Break**

**3:35 PM**
**Development of Heat-Treatable High-Strength Mg-Zn-Ca-Zr Sheet Alloy with Excellent Room Temperature Formability**: *Ming-Zhe Bian*[1]; Taisuke Sasaki[1]; Byeong-Chan Suh[1]; Taiki Nakata[2]; Shigeharu Kamado[2]; Kazuhiro Hono[1]; [1]National Institute for Materials Science (NIMS); [2]Nagaoka University of Technology

**3:55 PM**
**Interaction between Propagating Twins and Non-shearable Precipitates in Magnesium Alloys**: *Matthew Barnett*[1]; Huan Wang[1]; [1]Deakin University

## Magnesium Technology 2018 – Alloy Design

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Tuesday PM
March 13, 2018
Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Sean Agnew, University of Virginia; Suveen Mathaudhu, University of California – Riverside

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Material Design for Enhancing Toughness of Mg Alloy and Application for Biodegradable Devices**: *Toshiji Mukai*[1]; [1]Kobe University

**2:25 PM**
**Developmentof BioMg 250 Bioabsorbable Implant Alloy**: *Raymond Decker*[1]; S.E. LeBeau[1]; [1]nanoMag, LLC

**2:45 PM**
**Effect of Ca on the Microstructure and Mechanical Properties in Mg Alloys**: *Eleftherios Andritsos*[1]; Guy Skinner[1]; Anthony Paxton[1]; [1]King's College London

**3:05 PM**
**Influences of Yttrium Content on Microstructure and Mechanical Properties of As-cast Mg-Ca-Y-Zr Alloys**: *Sihang You*[1]; Yuanding Huang[1]; Karl [1]; Norbert Hort[1]; [1]Helmholtz-Zentrum Geesthacht

**3:25 PM Break**

**3:45 PM**
**Experimental Study of the Solidification Microstructure in the Mg-rich Corner of Mg-Al-Ce System**: *Charlotte Wong*[1]; Mark Styles[2]; Suming Zhu[1]; Trevor Abbott[3]; Kazuhiro Nogita[4]; Stuart McDonald[4]; David StJohn[4]; Mark Gibson[2]; Mark Easton[1]; [1]RMIT University; [2]CSIRO; [3]Magontec Limited; [4]University of Queensland

**4:05 PM**
**Investigation of Grain Refinement Method for AZ91 Alloy using Carbide Inoculation**: *Jun Ho Bae*[1]; Young Min Kim[1]; Ha Sik Kim[1]; Bong Sun You[1]; [1]Korea Institute of Materials Science

**4:25 PM**
**Strengthening and Toughening Behaviors of the Mg-9Al Alloy Containing Oxygen Atoms**: S. W. Kang[1]; *Donghyun Bae*[1]; [1]Yonsei University

**4:45 PM**
**Investigations on Microstructure and Mechanical Properties of Non-flammable Mg-Al-Zn-Ca-Y Alloys**: *Stefan Gneiger*[1]; Nikolaus Papenberg[1]; Simon Frank[1]; Rudolf Gradinger[1]; [1]AIT Austrian Institute of Technology

**5:05 PM**
**Surface and interfacial energies of $Mg_{17}Al_{12}$-Mg system**: *Fangxi Wang*[1]; Bin Li[1]; [1]University of Nevada Reno

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Structural Materials I

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Tuesday PM
March 13, 2018
Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Osman Anderoglu, University of New Mexico; Walter Luscher, Pacific Northwest National Laboratory

**2:00 PM Invited**
**Progress in Developing High Dose Radiation Tolerant Ferritic Steels for Nuclear Applications**: *Stuart Maloy*[1]; Eda Aydogan[1]; Ben Eftink[1]; Tarik Saleh[1]; Mychailo Toloczko[2]; Thak-Sang Byun[2]; Curt Lavender[2]; G. Robert Odette[3]; MD E. Alam[3]; Soupitak Pal[3]; Dave Hoelzer[4]; [1]Los Alamos National Laboratory; [2]PNNL; [3]University of California, Santa Barbara; [4]ORNL

**2:20 PM**
**Irradiation of Additively Manufactured Grade 91 Ferritic/Martensitic Steel**: *Benjamin Eftink*[1]; Eda Aydogan[1]; Daniel Vega[1]; Jordan Weaver[1]; Todd Steckley[1]; Di Chen[1]; Matthew Chancey[1]; Yongqiang Wang[1]; Carly Cady[1]; Thomas Lienert[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

**2:40 PM**
**Neutron irradiation Induced Microstructures in Ferritic/Martensitic Steel HT9**: Ce Zheng[1]; *Djamel Kaoumi*[1]; [1]North Carolina State Univeristy

**3:00 PM**
**Effects of Proton Irradiation on Microstructure in Additively Manufactured 316L Stainless Steel Made by Laser Powder Bed Fusion**: *Miao Song*[1]; Mi Wang[1]; Gary Was[1]; Xiaoyuan Lou[2]; Raul Rebak[3]; [1]University of Michigan; [2]Corromet LLC; [3]GE Global Research

**3:20 PM**
**In Situ EBSD Analysis of Deformation Mechanisms in Highly Irradiated Austenitic Steels**: *Maxim Gussev*[1]; Philip Edmondson[1]; Keith Leonard[1]; [1]Oak Ridge National Laboratory

**3:40 PM Break**

**4:00 PM**
**Ar Bubble Effects on Precipitation Reactions in Solubilized AISI 316L Steel Irradiated with Heavy Ions**: Ítalo Oyarzabal[1]; Mariana Timm[1]; William Pasini[1]; Franciele Oliveira[1]; Francine Tatsh[1]; Livio Amaral[1]; Clarice Kunioshi[2]; *Paulo Fichtner*[1]; [1]Universidade Federal do Rio Grande do Sul; [2]Centro Tecnologico da Marinha em Sao Paulo

**4:20 PM**
**Microstructural and Mechanical Integrity of Laser Weldment of Neutron Irradiated AISI 304 SS**: *Keyou Mao*[1]; Paula Freyer[2]; Frank Garner[3]; Janelle Wharry[1]; [1]Purdue University; [2]Westinghouse Electric Company LLC; [3]Texas A&M University

**4:40 PM**
**Shear Punch Measurement of the Mechanical Properties of Irradiated Cladding Material from ATR Irradiations**: *Tarik Saleh*[1]; Stuart Maloy[1]; G. Odette[2]; Tobias Romero[1]; Matthew Quintana[1]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara

**5:00 PM**
**Dual Ion Beam Irradiation of Commercial-grade Austenitic Alloys Relevant to LWR Core Components at High Dose**: *Calvin Lear*[1]; Miao Song[1]; Mi Wang[1]; Gary Was[1]; [1]University of Michigan

## Materials for Energy Conversion and Storage – Energy Storage II

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Tuesday PM
March 13, 2018

Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Partha Mukherjee , Purdue University; Leela Arava, Wayne State University

**2:00 PM Invited**
**Analysis of Discharge Reactions and Electrolyte Effects at the Cathode of Li/S Batteries**: *Perla Balbuena*[1]; Saul Perez Beltran[1]; Ethan Kamphaus[1]; Jaebeom Han[1]; [1]Texas A&M University, Artie McFerrin Department of Chemical Engineering

**2:25 PM Invited**
**Atomic Scale Simulations of Solid Electrolytes: Mechanical Properties and Beyond**: *Donald Siegel*[1]; [1]University of Michigan

**2:50 PM Invited**
**Cathode Design from Atomistic to Mesoscale Dimensions**: *Sarbajit Banerjee*[1]; [1]Texas A&M University

**3:15 PM Invited**
**Chemomechanical Behaviors of Composite Electrodes in Li-ion Batteries: Experiments and Modeling**: *Kejie Zhao*[1]; [1]Purdue University

**3:40 PM Break**

**3:55 PM Invited**
**Advanced Study on Complex Hydrides for All-Solid-State Secondary Batteries**: *Atsushi Unemoto*[1]; Koji Yoshida[2]; Shohei Suzuki[1]; Jun Kawaji[1]; Shin-ichi Orimo[3]; [1]Research and Development Group, Hitachi Ltd; [2]Advanced Institute for Materials Research (AIMR), Tohoku University; [3]IMR, Tohoku University

**4:15 PM**
**Effect of Sonication Power on Al2O3 Coated LiNi0.5Mn0.3Co0.2O2 Cathode Material for LIB**: *Dila Sivlin*[1]; Ozgul Keles[1]; [1]ITU

**4:35 PM**
**Electrode-crosstalk in High Energy Lithium Ion Batteries**: *Kaushik Kalaga*[1]; Daniel Abraham[1]; [1]Argonne National Laboratory

**4:55 PM Invited**
**Hybrid Nanostructured Materials for High Performance Na-ion Batteries**: Binson Babu[1]; KP Lakshmi[1]; *Manikoth Shaijumon*[1]; [1]IISER Thiruvananthapuram

**5:20 PM**
**Investigation of Dynamic Load Effect on Performance and Safety of Lithium- Ion Battery with Raman Spectroscopy**: *Bing Li*[1]; Vikas Tomar[1]; [1]Purdue University

**5:40 PM Invited**
**Measurements of Stress and Fracture in High-capacity Li-ion Battery Anodes**: *Matt Pharr*[1]; [1]Texas A&M University

## Materials Processing Fundamentals – Alloy Processing and Properties Modeling

*Sponsored by:* TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
*Program Organizers:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology; Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

Tuesday PM
March 13, 2018

Room: 228A
Location: Phoenix Convention Center

*Session Chairs:* Samuel Wagstaff, Novelis; Jonghyun Lee, Iowa State University

**2:00 PM**
**Improvement of Tensile Properties of Vertical-twin-roll-cast Ti/Al Clad Sheets**: *Dae Woong Kim*[1]; Dong Ho Lee[2]; Jung Su Kim[3]; Seok Su Sohn[1]; Hyoung Seop Kim[1]; Sung Hak Lee[1]; [1]POSTECH; [2]POSCO; [3]Korea Technology Finance Corporation

**2:20 PM**
**Yield Strength Prediction in 3D during Local Heat Treatment of Structural A356 Alloy Components in Combination with Thermal-stress Analysis**: *Tobias Holzmann*[1]; Andreas Ludwig[1]; Peter Raninger[2]; [1]Montanuniversität Leoben; [2]Materials Center Leoben Forschung GmbH

**2:40 PM**
**Thermodynamic Properties of Magnetic Semiconductors $Ag_2FeSn_3S_8$ and $Ag_2FeSnS_4$ Determined by the EMF Method**: *Mykola Moroz*[1]; Fiseha Tesfaye[1]; Pavlo Demchenko[2]; Myroslava Prokhorenko[3]; Daniel Lindberg[1]; Oleksandr Reshetnyak[2]; Leena Hupa[1]; [1]Åbo Akademi University; [2]Ivan Franko National University of Lviv; [3]Lviv Polytechnic National University

**3:00 PM**
**Study on the Heat Treatment of UNS N 10003 Alloy after Cold Working**: *Jianping Liang*[1]; Kexin Chen[2]; Jinhui Fan[2]; Zhijun Li[1]; Chaowen Li[1]; Shuangjian Chen[1]; [1]Shanghai Institute of Applied Physics, Chinese Academy of Sciences (CAS); [2]Donghua University

**3:20 PM**
**Effects of Heat Treatment on the Electrochemical Performance of Al Based Anode Materials for Air-battery**: *Xingyu Gao*[1]; Jilai Xue[1]; Xuan Liu[1]; Gaojie Shi[1]; [1]University of science and technology Beijing

**3:40 PM Break**

**4:00 PM**
**Microstructure Characterization and Mechanical Properties of Mg-9Al (wt.%) Alloy during Low-temperature Equal Channel Angular Extrusion (ECAE)**: *Suhas Eswarappa Prameela*[1]; Xiaolong Ma[1]; Laszlo Kecskes[2]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]US Army Research Laboratory

**4:20 PM**
**Highly Productive Machining of the Newest, Super Hard Intractable Composite-ceramic Materials**: *David Butskhrikhidze*[1]; [1]Georgian Technical University

**4:40 PM**
**Design and Enhancement of Impression Forged Cylindrical Blanks**: *Ahmed Elkholy*[1]; [1]Kuwait University

**5:00 PM**
**Manufacturing of a New Type of High Strength High Conductivity Cu–Cr Alloy**: *Huiming Chen*[1]; Dawei Yuan[1]; Mingmao Li[1]; Hang Wang[1]; Bin Yang[1]; [1]Jiangxi University of Science and Technology , China

## Mechanical Behavior at the Nanoscale IV – 2D and Unique Structured Materials

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Tuesday PM
March 13, 2018
Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Christopher Weinberger, Colorado State University; Nan Li, Los Alamos National Laboratory

**2:00 PM Invited**
**Dislocation Structure in Layered Chalcogenides**: *Douglas Medlin*[1]; [1]Sandia National Laboratories

**2:30 PM**
**Nanomechanical Characterization of Two Dimensional Materials**: *Jun Lou*[1]; [1]Rice University

**2:50 PM**
**Mechanical Testing of a Nanostructured Lyotropic Mesophase Material from an Ionic Liquid Monomer**: *Bineh Ndefru*[1]; Millicent Firestone[1]; Veronica Livescu[1]; George Gray[1]; James Valdez[1]; [1]Los Alamos National Laboratory

**3:10 PM**
**Mechanical Response of Highly Dense Vertically Aligned Carbon Nanotube (VACNT) Brushes Reinforced by Intertube Bridging**: *Cayla Harvey*[1]; Cordero Nuanez[1]; William Mook[2]; Johann Michler[3]; Yury Gogotsi[4]; Siddhartha Pathak[1]; [1]Chemical and Materials Engineering, University of Nevada, Reno; [2]Sandia National Laboratories; [3]Laboratory for Mechanics of Materials and Nanostructures, EMPA - Swiss Federal Laboratories for Materials Science and Technology; [4]Department of Materials Science and Engineering and A.J. Drexel Nanotechnology Institute, Drexel University

**3:30 PM Break**

**3:50 PM**
**Impact of Point Defects on the Mechanical Properties of 122-superconductors**: *Ian Bakst*[1]; Christopher Weinberger[1]; Seok-Woo Lee[2]; John Sypek[2]; Paul Canfield[3]; [1]Colorado State University; [2]University of Connecticut; [3]Iowa State University

**4:10 PM**
**Micro-mechanical Characterization of Novel $ThCr_2Si_2$-structured Intermetallic Compounds: Fundamental Understanding of Superelasticity by Experiment and Computer Simulation**: *Keith Dusoe*[1]; Ian Bakst[2]; John Sypek[2]; Paul Canfield[3]; Christopher Weinberger[2]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]Colorado State University; [3]Iowa State University

**4:30 PM**
**Superelasticity and Micaceous Plasticity of the Novel Intermetallic Compound $CaFe_2As_2$ at Small Length Scales**: *John Sypek*[1]; Christopher Weinberger[2]; Paul Canfield[3]; Sergey Bud'ko[3]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]Colorado State University; [3]Ames National Lab

**4:50 PM**
**Diffusive Plasticity in Nanometer-sized Metallic Crystals**: *Scott Mao*[1]; Li Zhong[1]; Frederic Sansoz[2]; Yang He[1]; Chongmin Wang[3]; Ze Zhang[4]; [1]University of Pittsburgh; [2]University of Vermont; [3]Pacific Northwest National Laboratory; [4]Zhejiang University

## Mechanical Characteristics and Application Properties of Metals and Non-metals for Technology: An EPD Symposium in Honor of Donato Firrao – Mechanical Properties

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Jiann-Yang Hwang, Michigan Technological University; Bowen Li, Michigan Technological University; Pasquale Russo Spena, Free University of Bozen-Bolzano

Tuesday PM
March 13, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Eren Kalay, METU; Pasquale Spena, Free University of Bozen-Bolzano

**2:00 PM Invited**
**Integration of Metallography, Fractography and Mechanical Properties Tests as a Key to Failure Analysis of Quenched and Tempered Large Steel Components**: *Donato Firrao*[1]; Paolo Matteis[1]; [1]Politecnico di Torino - DISAT

**2:40 PM**
**Microstructure and Mechanical Properties of Low-carbon Ferritic and Bainitic Steels with Different Contents of Mo, Ti and Nb for Seismic and Fire-resistant Applications**: *Jun Yeon Kim*[1]; Chang Hoon Lee[2]; Joon Oh Moon[2]; Hyun Uk Hong[1]; [1]Changwon National University; [2]Korea Institute of Materials Science

**3:00 PM**
**Embrittlement in Cast Superaustenitic Stainless Steel**: Mertcan Baskan[1]; Scott Chumbley[2]; *Eren Kalay*[1]; [1]METU; [2]Iowa State University

**3:20 PM Break**

**3:40 PM**
**Thermo-Calc of the Phase Diagrams of the Nb-N System**: *Shadia Ikhmayies*[1]; [1]Al Isra University

**4:00 PM**
**Finding the Small Charge Explosion Center by Analyzing Occurrence of Mechanical Twins in FCC Metals**: *Donato Firrao*[1]; Paolo Matteis[1]; Graziano Ubertalli[1]; [1]Politecnico di Torino - DISAT

## Metal-Matrix Composites Innovations, Advances and Applications: An SMD Symposium in Honor of William C. Harrigan, Jr. – Mechanical Behavior of Metal Matrix Composites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys, LLC; William Harrigan, Gamma Technology, LLC

Tuesday PM
March 13, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* Steve Siebeck, TU Chemnitz; Martins Sarma, Helmholtz-Zentrum Dresden - Rossendorf

**2:00 PM Invited**
**Influence of Boron to the Creep Behavior of Particle Reinforced Aluminum Matrix Composites (AMCs)**: Guntram Wagner[1]; *Steve Siebeck*[1]; [1]Chemnitz University of Technology

**2:30 PM**
**Effect of Matrix Properties and Sliding Counterface on the Wear Behavior of Magnesium Alloy Metal Matrix Composites**: S. Jayalakshmi[1]; R. Arvind Singh[1]; *Tirumalai Srivatsan*[2]; [1]Kumaraguru College of Technology (KCT); [2]The University of Akron

**2:50 PM**
**Characterization in Drilling Process of Carbon Fiber Reinforced Plastic Composite Materials**: *Kamlesh Phapale*[1]; [1]Bharat Forge Ltd.

**3:10 PM**
**Synthesis and Microstructural Development of Particulate Reinforced Metal-matrix Composites Using the Technique of Spray Atomization and Deposition**: Tirumalai Srivatsan[1]; Yaojun Lin[2]; Fei Chen[2]; *Enrique Lavernia*[2]; [1]The University of Akron; [2]University of California, Irvine

**3:30 PM Break**

**3:50 PM**
**Magnetically Induced Cavitation for the Dispersion of Particles in Liquid Metals**: *Martins Sarma*[1]; Gunter Gerbeth[1]; Ilmars Grants[2]; Andris Bojarevics[2]; [1]Helmholtz-Zentrum Dresden - Rossendorf; [2]Institute of Physics

**4:10 PM**
**An Engineered Magnesium Alloy Nanocomposite: Mechanisms Governing Microstructural Development and Mechanical Properties**: Sravya Tekumalla[1]; Shikhar Bharadwaj[1]; Tirumalai Srivatsan[2]; *Manoj Gupta*[1]; [1]National University of Singapore; [2]The University of Akron

**4:30 PM**
**Investigation of the Mechanical Properties of $Al_2O_3$ Reinforced Nickel Composite Coatings**: *Olgun Yilmaz*[1]; Metehan Erdogan[2]; Ishak Karakaya[1]; [1]Middle East Technical University; [2]Yildirim Beyazit University

**4:50 PM**
**The Tensile Response and Fracture Behavior of a Copper-Niobium Microcomposite: Role of Surface Modification**: Paul Arindam[1]; *Tirumalai Srivatsan*[1]; [1]The University of Akron

**5:10 PM**
**Fundamental Issues and Highlights of Reactive Wetting in Carbon-based Composites**: *Khurram Iqbal*[1]; [1]University of Karachi

## Multi-material Additive Manufacturing: Processing and Materials Design – Architectured and Mesostructured Materials

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Hang Yu, Virginia Tech; Nanci Hardwick, Aeroprobe Corporation; Steven Boles, Hong Kong Polytechnic University; Blake Barnett, Army Research Laboratory; Michael Gibson, Desktop Metal

Tuesday PM
March 13, 2018

Room: 232C
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:00 PM Invited**
**Strong and Robust Nanoarchitectures**: *Ruth Schwaiger*[1]; [1]Karlsruhe Institute of Technology (KIT)

**2:30 PM Invited**
**Design and Fabrication of Lightweight, Hierarchical Multi-material Composites with Tunable Thermal Mechanical Properties**: *Rayne Zheng*[1]; [1]Virginia Tech

**3:00 PM**
**Multi Phase Materials with Architectured Micro Scale Interfaces**: *Niyanth Sridharan*[1]; David Gandy[2]; Maxim Gussev[1]; Sudarsanam Babu[3]; [1]Oak Ridge National Laboratory; [2]Electric Power Research Institute; [3]University of Tennessee, Knoxville

**3:20 PM Break**

**3:40 PM Invited**
**Multi-material Topology Optimization for 3D Printed Multi-functional Architected Materials and Components**: Saranthip Koh[1]; Josephine Carstensen[1]; Christopher Williams[2]; *James Guest*[1]; [1]Johns Hopkins University; [2]Virginia Tech

**4:10 PM Invited**
**Understanding and Predicting the Heterogeneous Local Ligament-level Deformation Response in Metal Lattice Structures**: *Holly Carlton*[1]; Jonathan Lind[1]; Mark Messner[1]; Nickolai Volkoff-Shoemaker[1]; Nathan Barton[1]; Mukul Kumar[1]; [1]Lawrence Livermore National Laboratory

**4:40 PM**
**Meso-scale Design of Heterogeneous Material Systems in Multi-material Additive Manufacturing**: *David Garcia*[1]; Mackenzie Jones[1]; Yunhui Zhu[1]; Hang Yu[1]; [1]Virginia Tech

**5:00 PM**
**Design and Optimization of Fiber Reinforced Polymers Enabled by Additive Manufacturing**: *William Hartley*[1]; David Garcia[1]; Hang Yu[1]; [1]Virginia Tech

## Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Metallic and Ceramic Nanocomposites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Meisha Shofner, Georgia Institute of Technology; Nikhilesh Chawla, Arizona State University

Tuesday PM
March 13, 2018

Room: 102C
Location: Phoenix Convention Center

*Session Chair:* Jonathan Spowart, Air Force Research Laboratory

**2:00 PM**
**In-situ Study on Mechanical Behavior of Flash-sintered Yttria Stabilized-zirconia at Elevated Temperature**: *Jaehun Cho*[1]; Qiang Li[1]; Han Wang[1]; Zhe Fan[1]; Jin Li[1]; Sichuang Xue[1]; Haiyan Wang[1]; Troy Holland[2]; Amiya Mukherjee[3]; Xinghang Zhang[1]; [1]Purdue University; [2]Colorado State University; [3]UC Davis

**2:20 PM**
**Precipitation Phenomena in Al-Zn-Mg Alloy Matrix Composites Reinforced with B4C Particles**: *Chuandong Wu*[1]; Kaka Ma[2]; Dalong Zhang[3]; Guoqiang Luo[1]; Fei Chen[1]; Qiang Shen[1]; Lianmeng Zhang[1]; Enrique Lavernia[4]; [1]Wuhan University of Technology; [2]Colorado State University; [3]Oak Ridge National Laboratory; [4]University of California-Irvine

**2:40 PM**
**Nanoparticle Reinforced Nanocomposites by Means of Sputtering and Nanoparticle Co-deposition**: *Mikhail Polyakov*[1]; Rachel Schoeppner[1]; Xavier Maeder[1]; Johann Michler[1]; [1]EMPA

**3:00 PM**
**Effects of Reinforcement Size and Volume Fraction on Tensile Behavior of Al-SiC Composites**: *Conrad Park*[1]; Erica Bindas[1]; Ji Xia[1]; Corey Meyer[1]; Don Hashiguchi[2]; Kyung Chung[2]; John Lewandowski[1]; Matthew Willard[1]; [1]Case Western Reserve University; [2]Materion Brush Incorporated

**3:20 PM Break**

**3:40 PM**
**Characterization of Magnetic Microstructure in Near Eutectoid Co-Pt Ordered Alloys**: *Isha Kashyap*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**4:00 PM**
**Nanoindentation Creep Response of Magnesium/Boron Nitride Nanocomposites**: *Meysam Haghshenas*[1]; Manoj Gupta[2]; [1]University of North Dakota; [2]National University of Singapore,

**4:20 PM**
**The Mechanical Behavior of Hierarchical Mg Matrix Nanocomposite with High Volume Fraction Reinforcement**: *Jinling Liu*[1]; Xu He[1]; Leigang Zhang[1]; Xi Luo[1]; Linan An[2]; [1]Southwest Jiaotong University; [2]University of Central Florida

## Non-equilibrium Features of Grain Boundaries – Mechanical Responses of Non-equilibrium Grain Boundaries - Part II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Liang Qi, University of Michigan; Yue Fan, University of Michigan, Ann Arbor; Josh Kacher, Georgia Tech; Elizabeth Holm, Carnegie Mellon University; Irene Beyerlein, University of California, Santa Barbara; Shigenobu Ogata, Osaka University

Tuesday PM
March 13, 2018
Room: 125A
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:00 PM Invited**
**Dislocations, Twins, Grain Boundaries and their Interactions in HCP Rhenium**: Julian Sabisch[1]; Lu Jiang[1]; Liang Qi[2]; Joshua Kacher[3]; Andrew Minor[1]; Daryl Chrzan[1]; *Mark Asta*[1]; [1]University of California, Berkeley; [2]University of Michigan; [3]Georgia Technological Institute

**2:30 PM Invited**
**The Influence of 3-D Structure on the Mechanical Behavior of Layered Nanocomposites**: *Nathan Mara*[1]; Youxing Chen[2]; Nan Li[2]; Jon Baldwin[2]; Ben Liu[2]; Richard Hoagland[2]; [1]University of Minnesota and Los Alamos National Laboratory; [2]Los Alamos National Laboratory

**2:50 PM Invited**
**Dislocation Interactions with Bi-phase Interfaces Using Phase Field Dislocation Dynamics (PFDD)**: *Abigail Hunter*[1]; Irene Beyerlein[2]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara

**3:20 PM Break**

**3:40 PM**
**Continuum Framework for Dislocation Structure, Energy and Dynamics of Dislocation Arrays and Low Angle Grain Boundaries**: *Yang Xiang*[1]; Luchan Zhang[1]; [1]Hong Kong University of Science and Technology

**4:00 PM Invited**
**Competing Effects of Nonmetal Impurities and Planned Metallic Dopants on Grain Boundary Deformation**: *Timothy Rupert*[1]; [1]University of California, Irvine

**4:30 PM Invited**
**Characterization of Single Grain Boundary and Interface Mechanical Properties Using In-situ TEM**: *Shen Dillon*[1]; [1]University of Illinois at Urbana-Champaign

**5:00 PM**
**Understanding the Effects of Hydrogen on the Plasticity of Individual Crystals within a Polycrystalline Nickel Aggregate Using High Energy X-ray Diffraction and High Pressure Torsion**: *Timothy Long*[1]; Matthew Miller[1]; [1]Cornell University

## Perfluorocarbon Generation and Emissions from Industrial Processes – PFC Generation Mechanisms from Industrial Processes

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* Pascal Lavoie, Light Metals Research Centre - The University of Auckland; David Wong, University of Auckland; Pernelle Nunez, International Aluminium Institute

Tuesday PM
March 13, 2018
Room: 222B
Location: Phoenix Convention Center

*Session Chair:* David Wong, The University of Auckland

**2:00 PM Introductory Comments**

**2:05 PM**
**Conditions and Mechanisms of Gas Emissions from Didymium Electrolysis and Its Process Control**: *Ksenija Milicevic*[1]; Dominic Feldhaus[1]; Bernd Friedrich[1]; [1]RWTH Aachen University

**2:30 PM**
**Perfluorocarbon Formation during Rare Earth Electrolysis**: *Karen Osen*[1]; Ana Maria Martinez[1]; Henrik Gudbrandsen[1]; Anne Store[1]; Ole Kjos[1]; Camilla Sommerseth[1]; Heiko Gaertner[1]; Thor Anders Aarhaug[1]; Pierre Chamelot[2]; Mathieu Gibilaro[2]; Laurent Massot[2]; [1]SINTEF; [2]Laboratoire de Génie Chimique, Université de Toulouse

**2:55 PM**
**PFC Evolution Characteristics during Aluminium and Rare Earth Electrolysis**: *Ole Kjos*[1]; Asbjørn Solheim[1]; Thor Aarhaug[1]; Karen Osen[1]; Ana Maria Martinez[1]; Camilla Sommerseth[1]; Henrik Gudbrandsen[1]; Anne Støre[1]; Heiko Gaertner[1]; [1]SINTEF

**3:20 PM**
**Evaluation of Time Consistency when Quantifying Emissions of Perfluorocarbons Resulting from Low Voltage Anode Effects**: *Lukas Dion*[1]; Pernelle Nunez[2]; Simon Gaboury[3]; David Wong[4]; Alexey Spirin[5]; [1]Université du Québec à Chicoutimi; [2]International Aluminium Institute; [3]Rio Tinto; [4]Light Metal Research Center; [5]UC RUSAL

## Phase Transformations and Microstructural Evolution – Phase Transformations in Non-ferrous Systems II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Tuesday PM
March 13, 2018
Room: 129A
Location: Phoenix Convention Center

*Session Chairs:* Ashwin Shahani, University of Michigan; Samantha Lawrence, LANL

**2:00 PM**
**The Completeness of ω Phase Transformation in Metastable β Titanium Alloys Studied by X-ray Diffraction**: *Jana Šmilauerová*[1]; Václav Holý[1]; Petr Harcuba[1]; Dominik Kriegner[1]; [1]Charles University

**2:20 PM**
**Role of Initial Microstructure on the Stability of Pressure Induced ω-phase Zirconium**: *M. Arul Kumar*[1]; N Hilairet[2]; Yanbin Wang[3]; Rodney McCabe[1]; Irene Beyerlein[4]; Carlos Tome[1]; [1]Los Alamos National Laboratory; [2]Université Lille ; [3]Argonne National Laboratory; [4]University of California, Santa Barbara

**2:40 PM**
**Dynamic Precipitation in a Mg-9wt.%Al Alloy during Low-temperature Equal Channel Angular Extrusion (ECAE)**: *Xiaolong Ma*[1]; Suhas Eswarappa-Prameela[1]; Nicholas Krywopusk[1]; Laszlo Kecskes[2]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]US Army Research Laboratory

**3:00 PM Demonstration: Poster Preview**

**3:30 PM Break**

**3:50 PM**
**Elastic Modulus and Structural Changes upon Age Hardening of a Palladium-based Alloy, Paliney 7**: *Patrick Bowen*[1]; David Birdsall[1]; Edward Laitila[2]; Edward Smith[1]; [1]Deringer-Ney Inc; [2]Michigan Technological University

**4:10 PM**
**Effects of Low-cost Coherent L12-structured Nano-precipitates in Commercial Aluminum Alloys**: *Nhon Vo*[1]; Evander Ramos[1]; Francisco Flores[1]; David Seidman[2]; David Dunand[2]; [1]NanoAl LLC; [2]Northwestern University

**4:30 PM**
**Phase-field Modeling of Widmanstätten Growth**: *Hocine Lebbad*[1]; Benoît Appolaire[1]; Alphonse Finel[1]; Yann Le Bouar[1]; [1]ONERA/CNRS

**4:50 PM**
**Application of a Generalized Interface Model for Calculation of Solid-liquid Interfacial Free Energy in Alloys**: *Ning Ma*[1]; Jeff Hoyt[2]; Sumathy Raman[1]; Mark Asta[2]; [1]Corporate Strategic Research, ExxonMobil Research & Engineering Company; [2]University of California, Berkeley

**5:10 PM**
**Phase Transformation Modeling of Technical Al Alloy during Solidification**: *Jiwon Park*[1]; Chang-Seok Oh[1]; [1]Korea Institute of Materials Science

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Aluminium Powder Metallurgy and Composites

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

Tuesday PM
March 13, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* Tim Sercombe, The University of Western Australia; Katsuyoshi Kondoh, Osaka University

**2:00 PM**
**Microstructural and Chemical Analysis of Gas Atomized and Heat Treated Aluminum Alloy Powders**: *Benjamin Bedard*[1]; Alexis Ernst[1]; Tyler Flanagan[1]; Sumit Suresh[1]; Avinash Dongare[1]; Seok-Woo Lee[1]; Harold Brody[1]; Aaron Nardi[2]; Victor Champagne[3]; Mark Aindow[1]; [1]Materials Science and Engineering, and Institute of Materials Science, University of Connecticut; [2]United Technologies Research Center; [3]U.S. Army Research Laboratory, Weapons and Materials Research Directorate

**2:20 PM Invited**
**AA5083 Powder Sintering Comparison Using AC and DC Currents**: *Frank Kellogg*[1]; Michael Kornecki[1]; Selva Vennila Raju[2]; Brandon McWilliams[3]; Ray Brennan[3]; [1]SURVICE Engineering; [2]ORAU; [3]US Army Research Laboratory

**2:50 PM Keynote**
**Aluminum Matrix Composites by Both Powder Metallurgy (PM) and Additive Manufacturing (AM) Methods**: *Tim Sercombe*[1]; Xiaopeng Li[2]; [1]The University of Western Australia; [2]University of NSW

**3:30 PM Break**

**3:50 PM Keynote**
**Solid-state Sintering of Al Alloy Powder and AlN Synthesis in Sintering**: *Katsuyoshi Kondoh*[1]; [1]Osaka University

**4:30 PM**
**Mechanical Characterization of Cold Sprayed Aluminum Alloy Powders Using In-situ Micropillar Compression and Tension**: *Tyler Flanagan*[1]; Benjamin Berdard[1]; Alexis Ernst[1]; Sumit Suresh[1]; Mark Aindow[1]; Avinash Dongare[1]; Harold Brody[1]; Aaron Nardi[2]; Victor Champagne[3]; Seok-Woo Lee[1]; [1]University of Connecticut; [2]United Technologies Research Center; [3]U.S. Army Research Laboratory

**4:50 PM**
**Influence of Hot Rolling on Mechanical Behavior and Strengthening Mechanism in Boron Carbide Reinforced Aluminum Matrix Composites**: *Hao Guo*[1]; JianNeng Zhang[1]; Yang Zhang[1]; Ye Cui[1]; Dan Chen[1]; Yu Zhao[1]; SongSong Xu[1]; NaiMeng Liu[1]; ZhongWu Zhang[1]; [1]Key laboratory of Superlight Materials and Surface technology, Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University

**5:10 PM**
**Synthesis and Characterization of Dual Matrix In-situ Al-based Nanocomposites**: *Suprabha Lakra*[1]; Tapas Bandyopadhyay[1]; Karabi Das[1]; [1]IIT Kharagpur

**5:30 PM**
**Mesoscale Modeling of Single Particle Impact Induced Microstructural Evolution during Cold Spray of Aluminum Powders**: *Sumit Athikavil Suresh*[1]; Jie Chen[1]; Benjamin Bedard[1]; Alexis Ernst[1]; Tyler Flanagan[1]; Seok-Woo Lee[1]; Mark Aindow[1]; Harold Brody[1]; Victor Champagne[1]; Avinash Dongare[1]; [1]University of Connecticut

**5:50 PM Invited**
**Fabrication of Powder Metallurgy Ti-6Al-4V Connecting Rod by Powder Forging Process**: *Youngmoo Kim*[1]; Young-Beom Song[1]; Sung Ho Lee[1]; Young-Sam Kwon[2]; [1]Agency for Defense Development; [2]Cetatech Co.

## Rare Metal Extraction & Processing – Ti, V, Mo & W

*Sponsored by:* TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
*Program Organizers:* Hojong Kim, The Pennsylvania State University; Bradford Wesstrom, Freeport-McMoRan Copper & Gold; Shafiq Alam, University of Saskatchewan; Takanari Ouchi, The University of Tokyo; Gisele Azimi, University of Toronto; Neale Neelameggham, Ind LLC; Shijie Wang, Rio Tinto Kennecott Utah Copper; Xiaofei Guan, ShanghaiTech University

Tuesday PM
March 13, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* Bradford Wesstrom, Freeport-Mcmoran; Neale Neelameggham, IND LLC

**2:00 PM**
**Present Status and Development of Preparation Technologies of Titanium-rich Materials**: Shiju Zhang[1]; Shiju Zhang[2]; Songli Liu[3]; *Wenhui Ma*[1]; Wenhui Ma[4]; Wenhui Ma[5]; Yongnian Dai[1]; Yongnian Dai[4]; Yongnian Dai[5]; [1]Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology; [2]Resources and Environmental Engineering College, Panzhihua University; [3]Machinery and Electrical Engineering, Yangtze Normal University; [4]State Key Laboratory of Complex Nonferrous Metal Resources Cleaning Utilization in Yunnan Province, Kunming University of Science and Technology; [5]Engineering Research Center for Silicon Metallurgy and Silicon Materials of Yunnan Provincial Universities, Kunming University of Science and Technology

**2:25 PM**
**Effect of CaO Additive on the Interfacial Reaction between the BaZrO3 Refractory and Titanium Enrichment Melt**: *Guangyao Chen*[1]; Juyun Kang[1]; Pengyue Gao[1]; Wajid Ali[1]; Ziwei Qin[1]; Xionggang Lu[1]; Chonghe Li[1]; [1]Shanghai Univeristy

**2:50 PM**
**Extracting Uranium and Molybdenum from Refractory U-Mo Associated Ore**: *Kang Liu*[1]; Zhiping Yang[1]; Fengqi Zhao[1]; Liuyin Shi[1]; Yan Song[1]; Xing Fan[1]; [1]BeiJing Research Institute of Chemical Engineering and Metallurgy

**3:15 PM**
**Thermodynamics Analysis on the Process of Decarburization and Vanadium Protection by $CO_2$**: *Liu Zhuolin*[1]; Zhang Ting'an[1]; Niu Liping[1]; Lv Guozhi[1]; Dou Zhihe[1]; Pan Xijuan[1]; [1]School of Metallurgy of Northeastern University

**3:40 PM Break**

**4:00 PM**
**Purification of a Nigerian Wolframite Ore for Improved Industrial Applications**: *Alafara Baba*[1]; Muhammed Muhammed[1]; Mustapha Raji[1]; Kuranga Ayinla[1]; Misitura Lawal[2]; Folahan Adekola[1]; Abdul Alabi[3]; Rafiu Bale[1]; [1]University of Ilorin, Nigeria.; [2]Kebbi State University of Sc. & Tech.; [3]Kwara State University, Malete

**4:25 PM**
**Extraction of Vanadium and Chromium from the Material Containing Chromium, Titanium and Vanadium**: *Sheng Huang*[1]; Shengfan Zhou[1]; Bianfang Chen[1]; Biao Liu[1]; Qi Ge[1]; Mingyu Wang[1]; Xuewen Wang[1]; [1]Central South University

**4:50 PM**
**Extraction Separation of V and Fe in High Acid and High Iron Solution**: *Weiguang Zhang*[1]; Zhang Ting'an[1]; Guozhi Lyu[1]; Yajing Tian[1]; Biyu Long[1]; Xuejiao Cao[1]; [1]Northeastern University

**5:15 PM**
**Batch Studies for Removing Vanadium(V) and Chromium(VI) from Aqueous Solution Using Anion Exchange Resin**: *Yang Yang*[1]; Hong-Yi Li[1]; Min-Min Lin[1]; Bing Xie[1]; [1]Chongqing University

## Recent Developments in Biological, Structural and Functional Thin Films & Coatings – Functional Films & Coatings II

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Adele Carradò, Université de Strasbourg IPCMS; Nancy Michael, University of Texas at Arlington; Ramana Chintalapalle, University of Texas - El Paso; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University; Gerald Ferblantier, Strasbourg University - ICube Laboratory

Tuesday PM
March 13, 2018
Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Gerald Ferblantier, Université de Strasbourg ICube; Ramana Chintalapalle, University of Texas at El Paso El Paso - UTEP

**2:00 PM Keynote**
**Control of Thin $MoSe_2$ Layer in Cu(InGa)$Se_2$-based Thin Film Solar Cell**: *Woo Kyoung Kim*[1]; Jaseok Koo[1]; [1]Yeungnam University

**2:40 PM**
**Modeling, Deposition, and Characterization of Nano-crystalline Nitrides for Use in Optical Coatings**: *Neil Murphy*[1]; Lirong Sun[2]; John Jones[1]; John Grant[3]; [1]Air Force Research Laboratory; [2]General Dynamics Information Technology; [3]Azimuth Corporation

**3:00 PM**
**Rare Earth-doped Tin Oxide and Zinc Oxide Thin Films for Photovoltaic Applications**: *Gerald Ferblantier*[1]; Karima Bouras[1]; Abdelilah Slaoui[1]; Guy Schmerber[2]; [1]Strasbourg University - ICube Laboratory; [2]Strasbourg University - IPCMS

**3:20 PM**
**Tunable Optical Constants and Solar Selectivity of Multilayer Films for Smart Window Applications**: *P. Dubey*[1]; C. Grijalva[1]; C. Ramana[1]; [1]University of Texas at El-Paso

**3:40 PM Break**

**4:00 PM Invited**
**Functional Thin Film Enabled Sensor Technologies for Harsh Environment Sensing Applications**: *Paul Ohodnicki*[1]; [1]National Energy Technology Laboratory

**4:30 PM**
**Characterization and Performance Evaluation of Titanium Doped ß-$Ga_2O_3$ Thin Films for Oxygen Sensors in Extreme Environment**: *Sandeep Manandhar*[1]; Anil Battu[1]; Chintalapalle Ramana[1]; [1]University of Texas at El Paso

**4:50 PM**
**Structural and Optical Properties of Tungsten Doped Hafnium Oxide Nanocrystalline Thin Films**: *Marlyn Torres*[1]; Ann Uribe[1]; Chintalapalle Ramana[1]; [1]University of Texas at El Paso

**5:10 PM**
**Effect of Refractory Metal Incorporation on Structural and Mechanical Properties of ß-$Ga_2O_3$ Nanocrystalline Films for Extreme Environment Applications**: *Anil Krishna Battu*[1]; Sandeep Manandhar[1]; Ramana Chintalapalle[1]; [1]University of Texas at El Paso

**5:30 PM**
**Magnetic Field Assisted Directed and Deterministic Assembly**: *Balraj Mani*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

## Surface Engineering for Improved Corrosion Resistance – Session III

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Rajeev Gupta, The University of Akron; Sandip Harimkar, Oklahoma State University; Carlos Schvezov, Institute of Materials of Misiones; Arvind Agarwal, Florida International University

Tuesday PM
March 13, 2018
Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Xiaobo Chen, RMIT University; Rajeev Gupta, The University of Akron

**2:00 PM Invited**
**Development of Linseed Oil Based Self-healing Coatings to Improve Corrosion Protection**: *Qixin Zhou*[1]; Haoran Wang[1]; [1]University of Akron

**2:20 PM**
**Mechanical and Corrosion Behavior of 304 Austenitic Stainless Steel Processed by Cryogenic Rolling**: Rahul Singh[1]; Deepak Sachan[1]; Raviraj Verma[2]; *Abhishek Kumar*[1]; [1]Motilal Nehru National Institute of Technology Allahabad; [2]IIT Roorkee

**2:40 PM**
**Severe Plastic Deformation Surface Treatment on Corrosion and Environmental Cracking of Oilfield Alloys**: *Ting Chen*[1]; Kripa Varanasi[1]; [1]Massachusetts Institute of Technology

**3:00 PM**
**Stainless Steel Corrosion Resistance in 0.5 M $H_2SO_4$ Using Cassia Fistula Extract**: *Olugbenga Omotosho*[1]; Joshua Okeniyi[1]; Cleophas Loto[1]; Sunday Afolalu[1]; Emmanuel Obi[1]; Oluwatobi Sonoiki[1]; Oluwatobi Sonoiki[1]; Segun Oladipupo[1]; Timi Oshin[1]; Adebanji Ogbiye[1]; [1]Covenant University, Ota

**3:20 PM Break**

**3:35 PM**
**Corrosion Resistance of Aluminium in 0.5 M $H_2SO_4$ in the Presence of Cassia Fistula Extract**: *Olugbenga Omotosho*[1]; Joshua Okeniyi[1]; Cleophas Loto[1]; Abimbola Popoola[2]; Adeoluwa Oni[1]; Ayomide Alabi[1]; Abisola Olarewaju[1]; [1]Covenant University, Ota; [2]Department of Chemical, Metallurgical & Materials Engineering, Tshwane University of Technology

**3:55 PM**
**Graphene Ultra-thin Coating for Remarkable Corrosion Resistance: Current Status and Challenges**: *RK Singh Raman*[1]; [1]Monash University

## Thermal and Mechanical Stability of Nanocrystalline Materials – Thermal Stability of Nanocrystalline Metals I

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

Tuesday PM
March 13, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Arvind Kalidindi, Massachusetts Institute of Technology; Daniel Bufford, Sandia National Laboratories

**2:00 PM Invited**
**An Atom Probe Tomography Prospective to Nanogranular Thermal Stability**: *Gregory Thompson*[1]; Xuyang Zhou[1]; Thomas Koenig[1]; Monica Kapoor[1]; Florian Vogel[1]; Brad Boyce[2]; Blythe Clark[2]; Kris Darling[3]; B. Chad Hornbuckle[3]; [1]University of Alabama; [2]Sandia National Laboratories; [3]Army Research Laboratory

**2:30 PM**
**Atom Probe Tomography Investigation of Diamantane Induced Stability in Nanocrystalline Aluminum**: Torben Boll[1]; Martin Heilmaier[2]; Ali Yousefiani[3]; *James Earthman*[4]; [1]Karlsruhe Institute of Technology (KIT) and Karlsruhe Nano Micro Facility; [2]Karlsruhe Institute of Technology (KIT); [3]Boeing Research & Technology; [4]University of California, Irvine

**2:50 PM Invited**
**Thermal Stability of Nanocomposite Metals: In Situ Observation of Anomalous Residual Stresses Relaxation during Annealing Under Synchrotron Radiation**: *Ludovic Thilly*[1]; Pierre-Olivier Renault[1]; Florence Lecouturier[2]; [1]Pprime Institute - University of Poitiers; [2]LNCMI-Toulouse

**3:20 PM Invited**
**Investigating the Thermal Stability of FCC and BCC Nanocrystalline Thin Films by In Situ TEM Annealing and Post Mortem TKD Analysis**: *Josh Kacher*[1]; Jordan Key[1]; [1]Georgia Tech

**3:50 PM Break**

**4:10 PM Invited**
**The Mechanisms of Thermal Stability and Strength of Nanocrystalline Immiscible Alloys**: K. Darling[1]; K. Solanki[2]; R. Koju[3]; *Yuri Mishin*[3]; [1]US Army Research Laboratory; [2]Arizona State University; [3]George Mason University

**4:40 PM Invited**
**Connecting Thermal Stability to Fatigue and Wear Resistance in Nanocrystalline Binary Alloys**: *Brad Boyce*[1]; Nicolas Argibay[1]; Timothy Furnish[1]; Khalid Hattar[1]; Christopher Barr[1]; Michael Chandross[1]; Fadi Abdeljawad[1]; Stephen Foiles[1]; Blythe Clark[1]; [1]Sandia National Laboratories

## Thermo-mechanical Response of Materials with Special Emphasis on In-situ Techniques – High Temperature Mechanical Properties of Materials II

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Sanjit Bhowmick, Bruker Nano Surfaces; Jeff Wheeler, ETH Zurich; María Teresa Pérez Prado, IMDEA Materials Institute; Dongchan Jang, Korea Advanced Institute of Science and Technology; Robert Wheeler, MicroTesting Solutions LLC; Josh Kacher, Georgia Tech

Tuesday PM
March 13, 2018
Room: 101A
Location: Phoenix Convention Center

*Session Chairs:* Bob Wheeler, Microtesting Solutions; Jeff Wheeler, ETH Zurich

**2:00 PM Invited**
**Deformation Mechanisms of Cu/Nb Nanoscale Metallic Multilayers as a Function of Temperature and Layer Thickness**: *Miguel Monclus*[1]; Jeromy Snel[1]; Miguel Castillo-Rodriguez[1]; Nathan Mara[2]; Irene Beyerlein[3]; Javier Llorca[1]; Jon Molina-Aldareguia[1]; [1]IMDEA Materials; [2] Los Alamos National Laboratory; [3]University of California, Santa Barbara

**2:30 PM**
**Combinatorial In Situ Micromechanics of the Al-Cu System at Low Temperatures**: Yuan Xiao[1]; Bin Gan[2]; Alla Sologubenko[1]; *Jeff Wheeler*[1]; [1]ETH Zurich; [2]Northwestern Polytechnic University

**2:50 PM**
**Nanomechanical Properties of Graphene Oxide and Carbon Nanotube Scaffolds**: *Sanjit Bhowmick*[1]; Chandra Sekhar Tiwary[2]; Syed Asif[1]; Pulickel Ajayan[2]; [1]Bruker Nano Surfaces; [2]Rice University

**3:10 PM Invited**
**Metals under High-pressure, High Temperature and during Plastic Deformation: In-situ Studies of Thermo-mechanical Response by Neutron and Synchrotron Quantum Beams**: *Klaus-Dieter Liss*[1]; [1]Australian Nuclear Science and Technology Organisation

**3:40 PM Break**

**4:00 PM Invited**
**The Effect of Strain Rate on the Tensile Properties of Single Crystal Ni – an In Situ Study**: *Dhriti Bhattacharyya*[1]; Alan Xu[1]; Joel Davis[1]; Michael Saleh[1]; [1]Australian Nuclear Science and Technology Organisation

**4:30 PM**
**High throughput Study of Underlying Mechanisms of Serrated Flow in Nickel-based Diffusion Multiple via High Temperature Nanoindentation**: *Bin Gan*[1]; Yuan Xiao[2]; Miguel A. Monclus[3]; Jeffrey Wheeler[2]; [1]Northwestern Polytechnical University; [2]ETH Zurich; [3]IMDEA Materials Institute

**4:50 PM**
**Analysis of Longitudinal Twinning in γ-TiAl by Micropillar Compression up to 700 °C with Strain and Crystal Orientation Mapping**: *Thomas Edwards*[1]; Fabio Di Gioacchino[1]; Nigel Martin[2]; Mark Dixon[2]; William Clegg[1]; [1]University of Cambridge; [2]Rolls-Royce plc

## Ultrafine-grained Materials X – Early Career Scientist

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Tuesday PM
March 13, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Irene Beyerlein, University of California, Santa Barbara; Srikanth Patala, North Carolina State University

**2:00 PM**
**Achieving Ultra-high Strengthening of $A_2O2_4$ Alloy through Combination of High-pressure Torsion and Subsequent Aging Treatment**: *Takahiro Masuda*[1]; Xavier Sauvage[2]; Zenji Horita[1]; [1]Kyushu University; [2]CNRS, University of Rouen

**2:20 PM**
**Compositionally Tailoring the Mechanical Properties of Nanotwinned Metal Thin Films for Preliminary Micro-cantilever MEMS Devices**: *Gianna Valentino*[1]; Jessica Krogstad[2]; Timothy Weihs[1]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]University of Illinois at Urbana-Champaign

**2:40 PM**
**Thermodynamical Instability of a Single-phase, Nanocrystalline TiZrNbHfTa Alloy and its Impact on the Mechanical Properties**: *Benjamin Schuh*[1]; Bernhard Völker[1]; Juraj Todt[2]; Loic Perriere[3]; Jean-Philippe Couzinié[3]; Anton Hohenwarter[1]; [1]Montanuniversität Leoben; [2]Erich-Schmid-Institute of Materials Science, Austrian Academy of Sciences; [3]Université Paris Est, ICMPE (UMR 7182), CNRS, UPEC

**3:00 PM**
**Mechanical Behavior of Bulk Mg-based Ultra-fine Layered Composites**: *Brandon Leu*[1]; Irene Beyerlein[1]; Nathan Mara[2]; John Carpenter[2]; Arulkumar Mariyappan[2]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

**3:20 PM Break**

**3:40 PM**
**Microstructural Evolution and Thermal Stability of Accumulatively Roll-bonded Cu-Nb Nanolaminates**: *Jaclyn Avallone*[1]; Thomas Nizolek[2]; Irene Beyerlein[1]; Nathan Mara[2]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

**4:00 PM**
**Averting Plastic Flow Localization in Metal Nanocomposites by Tailoring Microstructure Morphology**: *Ian McCue*[1]; Mengying Liu[1]; Michael Demkowicz[1]; [1]Texas A&M University

**4:20 PM**
**Microstructure, Hardness, and Recrystallization of Tungsten Processed by ECAE to High Strain at Very Low Homologues Temperature**: *Zachary Levin*[1]; Karl Hartwig[1]; [1]Texas A&M University

**4:40 PM**
**Evolution of Structural Instabilities during Cyclic Deformation of UFG Metals**: *Marlene Kapp*[1]; Oliver Renk[1]; Thomas Leitner[1]; Pradipta Ghosh[1]; Bo Yang[1]; Reinhard Pippan[1]; [1]Erich Schmid Institute of Materials Science

**5:00 PM**
**Strengthening and Toughening Effects of Twin Mesh Structures in Polycrystalline Mg**: *Xin Wang*[1]; Lin Jiang[1]; Dalong Zhang[1]; Chase Cooper[1]; Ruilin Wang[1]; Ali Hernandez[1]; Timothy Rupert[1]; Subhash Mahajan[1]; Irene Beyerlein[2]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California, Irvine; [2]University of California, Santa Barbara

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – Nanomaterials, Characterization, and Applications

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

Wednesday AM
March 14, 2018
Room: 101B
Location: Phoenix Convention Center

*Session Chairs:* Lanxia Cheng, University of Texas at Dallas; Stephen McDonnell, University fo Virginia

**8:30 AM**
**Anisotropic and Shape-selective Nanomaterials: Structure-property Relationships**: *Simona Hunyadi Murph*[1]; [1]Savannah River National Laboratory & University of Georgia

**8:50 AM Invited**
**Cubic Boron Nitride / Diamond Heterostructures via Plasma-Enhanced Chemical Vapor Deposition**: *Robert Nemanich*[1]; Joseph Shammas[1]; Yu Yang[1]; Xingye Wang[1]; Franz Koeck[1]; Martha McCartney[1]; David Smith[1]; [1]Arizona State University

**9:20 AM**
**Optimization of Gold Surface Density on $SiO_2$@Au Core-Shell Nanoparticles for Holographic Fabrication of Ordered Arrays for Plasmonic Metamaterials**: *Kyle Iwamoto*[1]; Prakash Nallathamby[2]; Eveline Rigo[3]; Gregory Timp[3]; Ryan Roeder[2]; [1]University of Notre Dame, Department of Chemical and Biomolecular Engineering; [2]University of Notre Dame, Department of Aerospace and Mechanical Engineering, Bioengineering Graduate Program; [3]University of Notre Dame, Department of Electrical Engineering

**9:40 AM Invited**
**Atomic Layer Semiconductors and Heterostructures for Engineering Tunable 2D Nanoelectromechanical Systems (NEMS)**: *Philip Feng*[1]; [1]Case Western Reserve University

**10:00 AM Break**

**10:20 AM**
**2-D Nanosheets and Rod-like $WO_3$ Obtained via Chemical Precipitation Method for Detecting Formaldehyde**: *HuiMin Yu*[1]; JianZhong Li[1]; [1]Northeastern University

**10:40 AM**
**Oxidation of Silicon for Application on Atomic Layer Deposition**: *Su Min Hwang*[1]; Xin Meng[1]; Aotonio Lucero[1]; Harrison Kim[1]; Jiyoung Kim[1]; [1]The University of Texas at Dallas

**11:00 AM**
**Site Selection by Epitaxial Group IV Quantum Dots on Patterned Si (001) Surfaces - the Roles of Lengthscales and Surface Morphology**: Jatin Amatya[1]; *Jerrold Floro*[1]; [1]University of Virginia

**11:20 AM**
**Study on the Stress-induced Ferroelectric Polarization of Hafnium Zirconate Thin Films Realized at Low Temperature**: *Jaidah Mohan*[1]; Si Joon Kim[1]; Dushyant Narayan[2]; Jaegil Lee[3]; Jiyoung Kim[1]; Scott Summerfelt[4]; [1]University of Texas at Dallas; [2]University of Colorado Boulder; [3]Seoul National University; [4]Texas Instruments Inc.

## 9th International Symposium on High Temperature Metallurgical Processing – Extraction and Recovery of Metals

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Wednesday AM
March 14, 2018
Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland

**8:30 AM Introductory Comments**

**8:35 AM**
**Pyrometallurgical Processing of Secondary Lead Material: An Industry Overlook**: *Camille Fleuriault*[1]; [1]Gopher Resource

**8:55 AM**
**Recovery of Aluminium and its Compounds with Hydro and Pyrometalurgical Methods from Non-metallic Residue**: *Osman Celik*[1]; Onuralp Yucel[1]; [1]Istanbul Technical University

**9:15 AM**
**Purification of Molten Zinc Chloride-Alkali Chloride by Cementation Reaction**: *Gen Kamimura*[1]; Hiroyuki Matsuura[1]; [1]The University of Tokyo

**9:35 AM**
**Sulfation Roasting of Nickel Sulfide Concentrate in the Presence of Sodium Sulfate**: *Guangshi Li*[1]; Hongwei Cheng[1]; Xionggang Lu[1]; Qian Xu[1]; [1]Shanghai University

**9:55 AM Break**

**10:15 AM**
**Thermodynamic Analysis of Smelting of Spent Catalysts for Recovery of Platinum Group Metals**: *Zhiwei Peng*[1]; Zhizhong Li[1]; Xiaolong Lin[1]; Yutian Ma[2]; Yan Zhang[2]; Yuanbo Zhang[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University; [2]Jinchuan Group Co. Ltd.

**10:35 AM**
**Preparation of Titanium Foams through Direct Electrolysis of the Sintered CaO-TiO2 in Molten Salt CaCl2**: *Zhengfeng Qu*[1]; Meilong Hu[1]; Leizhang Gao[1]; Pingsheng Lai[1]; Chenguang Bai[1]; [1]Chongqing University

**10:55 AM**
**Experimental Study on Oxidative Desulfurization and Selective Reduction of Molten Copper Slag**: *Wang Yun*[1]; Zhu Rong[1]; Chen Qizhou[1]; [1]University Of Science and Technology Beijing

**11:15 AM**
**Recycling SiO2 and Al2O3 from the Laterite Nickel Slag in Molten Sodium Hydroxides**: *Donggen Fang*[1]; Jilai Xue[1]; [1]University of Science and Technology Beijing

**11:35 AM**
**Removal of Sulfur from Copper Dross Generated by Refining Lead**: *Baoqiang Xu*[1]; Xutao Guo[1]; Yong Deng[1]; Hen Xiong[1]; Bin Yang[1]; Dachun Liu[1]; Wenlong Jiang[1]; [1]National Engineering Laboratory for Vacuum Metallurgy, Key Laboratory of Nonferrous Metals Vacuum Metallurgy of Yunnan Province, Kunming University of Science and Technology

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Mechanical Behavior and Technique Development

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

Wednesday AM
March 14, 2018
Room: 102A
Location: Phoenix Convention Center

*Session Chairs:* Peter Hosemann, University of California Berkeley; Elaine West, Naval Nuclear Laboratory

**8:30 AM**
**Linking RIS and Grain Decohesion Using In Situ TEM 4-point Beams**: *Kayla Yano*[1]; Janelle Wharry[1]; [1]Purdue University

**8:55 AM**
**Localized Helium Implantation Utilizing a Helium Ion Beam Microscope to Evaluate Swelling and Mechanical Property Changes**: *Peter Hosemann*[1]; David Frazer[1]; Yun Yang[1]; Mehdi Balooch[1]; Manfred Ambad[1]; [1]University of California, Berkeley

**9:20 AM**
**Characterizing Displacement Cascade Damage via Virtual Diffraction Techniques**: *James Stewart*[1]; Remi Dingreville[1]; [1]Sandia National Laboratories

**9:45 AM**
**Quantifying Radiation Damage in Materials Using Stored Energy Fingerprints**: *Charles Hirst*[1]; Rachel Connick[1]; Logan Abel[1]; Sean Lowder[1]; Ki-Jana Carter[1]; Kangpyo So[1]; Penghui Cao[1]; Michael Short[1]; [1]Massachusetts Institute of Technology

**10:10 AM Break**

**10:30 AM Invited**
**Characterizing the Defect Structure and Defect Density in Neutron and Proton Irradiated Zr Alloys by X-ray Line Profile Analysis**: *Tamás Ungár*[1]; Gábor Ribárik[2]; Matthew Tpping[1]; Rebecca Johns[1]; Rory Hulse[1]; Hattie Xu[1]; Levente Balogh[3]; Philipp Frankel[1]; Christopher Race[1]; Michael Preuss[1]; [1]University of Manchester; [2]Eötvös University Budapest; [3]Chalk River Nuclear Laboratories

**11:00 AM**
**Carbon Contamination in Ferritic/Martensitic Steels during Ion Irradiation: Characterization and Mitigation**: *Jing Wang*[1]; Mychailo Toloczko[1]; Karen Kruska[1]; Daniel Schreiber[1]; Yuanyuan Zhu[1]; Danny Edwards[1]; Zihua Zhu[1]; [1]Pacific Northwest National Laboratory

**11:25 AM**
**Towards In-situ Thermo-mechanical Property Monitoring during Ion Irradiation**: *Cody Dennett*[1]; Kangpyo So[1]; Khalid Hattar[2]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Sandia National Laboratories

## Accident Tolerant Fuels for Light Water Reactor – Ceramic Cladding & Coatings

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

Wednesday AM
March 14, 2018
Room: 104A
Location: Phoenix Convention Center

*Session Chairs:* Kumar Sridharan, University of Wisconsin; Yutai Katoh, Oak Ridge National Laboratory

**8:30 AM Invited**
**Transient Swelling of SiC/SiC Composites and its Implications to Fuels and Core Designs**: *Yutai Katoh*[1]; Takaaki Koyanagi[1]; Gyanender Singh[1]; Ken Yueh[2]; [1]Oak Ridge National Laboratory; [2]Electric Power Research Institute

**9:00 AM**
**Experimental Characterization of Micro-scale Failure Mechanisms and Governing Properties in SiC/SiC Composites**: *Joseph Kabel*[1]; Peter Hosemann[1]; Takaaki Koyanagi[2]; Yutai Katoh[2]; Christian Deck[3]; [1]University of California, Berkeley; [2]Oak Ridge National Laboratory; [3]General Atomics

**9:20 AM**
**Radiation Effects on SiC/SiC Composites for Advanced Accident Tolerant Fuel Cladding Tubes**: *Shradha Agarwal*[1]; William Weber[1]; [1]UTK and ORNL

**9:40 AM**
**Simulation of SiC-SiC Composite Micro-pillar Compression as an Investigation of Fiber/Matrix Interface Properties**: *Ian Love*[1]; Brian Bay[1]; Peter Hosemann[2]; Joey Kabel[2]; Christian Deck[3]; Julie Tucker[1]; [1]Oregon State University; [2]University of California, Berkeley; [3]General Atomics

**10:00 AM Break**

**10:20 AM Invited**
**Development of Cold Spray Coatings for Accident Tolerant Fuel (ATF) Cladding**: *Kumar Sridharan*[1]; Benjamine Maier[1]; Greg Johnson[1]; Hwasung Yeom[1]; Tyler Dabney[1]; Mia Lenling[1]; Payton Scallon[1]; Samantha Joers[1]; Kyle Blomstrand[1]; Javier Romero[2]; Hemant Shah[2]; Jorie Walters[2]; Peng Xu[2]; [1]University of Wisconsin-Madison; [2]Westinghouse Electric Company

**10:50 AM Invited**
**Multilayer Metal-ceramic Coatings for Accident Tolerant Fuel**: Francisco Garcia Ferré[1]; Javier Romero[2]; Jonna Partezana[2]; Peng Xu[2]; *Fabio Di Fonzo*[1]; [1]Istituto Italiano di Tecnologia; [2]Westinghouse Electric Company LLC

**11:20 AM**
**ZrSiO4 as an Efficient Barrier Coating for Nuclear Applications**: Sumit Bhattacharya[1]; Michael Pellin[1]; *Abdellatif Yacout*[1]; [1]Argonne National Laboratory

**11:40 AM**
**Enhanced Accident Tolerant Zirconium-silicide Coated LWR Fuel Cladding**: *Hwasung Yeom*[1]; Cody Lockhart[1]; Robert Mariani[2]; Xianming Bai[3]; Peng Xu[4]; Kumar Sridharan[1]; [1]University of Wisconsin-Madison; [2]Idaho National Laboratory; [3]Virginia Polytechnic Institute and State University; [4]Westinghouse Electric Company

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Post-build Thermal Processing: Effects on Microstructure and Properties

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Wednesday AM
March 14, 2018
Room: 231AB
Location: Phoenix Convention Center

*Session Chair:* Eric Lass, National Institute of Standards and Technology

**8:30 AM Invited**
**Building Parts by Welding Millions of Little Bits of Metal Together: What Could Possibly Go Wrong?**: *Lyle Levine*[1]; [1]National Institute of Standards and Technology

**9:00 AM**
**Microstructural Characterization of Ti64 Following Hot Isostatic Pressing**: *Brad Baker*[1]; Joel Schubbe[1]; [1]US Naval Academy

**9:20 AM**
**Microstructure and Mechanical Properties of Selectively Laser Melted IN718 Alloy before and after Heat Treatment**: *Le Zhou*[1]; Abhishek Mehta[1]; Yongho Sohn[1]; [1]University of Central Florida

**9:40 AM**
**Spatial Heterogeneity of Microstructure and Mechanical Properties in Inconel 718 Fabricated by Selective Laser Melting**: *Sharniece Holland*[1]; Lin Li[1]; [1]The University of Alabama

**10:00 AM Break**

**10:20 AM**
**Microstructural Evolution during Post-built Thermal Processing of Additively Manufactured Inconel 625**: *Eric Lass*[1]; Mark Stoudt[1]; Daniel Ng[1]; Maureen Williams[1]; [1]National Institute of Standards and Technology

**10:40 AM**
**Reversion in Ternary Alloys using Phase-field and CALPHAD Methods**: *Trevor Keller*[1]; Greta Lindwall[1]; Ursula Kattner[1]; Jonathan Guyer[1]; [1]National Institute of Standards and Technology

**11:00 AM**
**The Effects of Pore Morphology in 316L AM Builds**: *Richard Fonda*[1]; David Rowenhorst[1]; Scott Olig[1]; Jerry Feng[1]; [1]US Naval Research Laboratory

**11:20 AM**
**Fabrication of Large Additively Manufactured Stainless Steel Structures Using Directed Energy Deposition**: *Zakariya Khayat*[1]; Todd Palmer[1]; [1]Applied Research Lab Penn State University

**11:40 AM**
**The Effects of Hot Isostatic Pressing on the Microstructure and Tensile Properties of Additively Manufactured 2205 Duplex Stainless Steel**: *Andrew Iams*[1]; Todd Palmer[1]; [1]Penn State University

**12:00 PM**
**Microstructural Development in Heat-treated 17-4 PH Stainless Steel Parts Prepared by Selective Laser Melting**: *Yu Sun*[1]; Mark Aindow[1]; Rainer Hebert[1]; [1]University of Connecticut

## Additive Manufacturing of Metals: Fatigue and Fracture – Session IV

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

Wednesday AM
March 14, 2018

Room: 232A
Location: Phoenix Convention Center

*Session Chair:* Mohsen Seifi, Case Western Reserve University

**8:30 AM Invited**
**3D Printing of Metallic Glasses by Thermoplastic Forming**: *Jan Schroers*[1]; mike Gibson[2]; Nicholas Mykulowycz[2]; Richard Fontana[2]; Jonah Myerberg[2]; Ric Fulop[2]; Yet-Ming Chiang[3]; Chris Schuh[3]; John Hart[3]; [1]Yale University; [2]Desktop Metal; [3]Massachusetts Institute of Technology

**9:00 AM**
**Influence of Build-angle on Charpy Impact Fracture of Laser Powder Bed 3D-printed Stainless Steel and Aluminum Cast Alloy**: *Brahmananda Pramanik*[1]; Kristofer Kuelper[1]; MD. Salahuddin[1]; Bruce Madigan[1]; [1]Montana Tech of the University of Montana

**9:20 AM**
**Mechanical Property and Microstructural Comparison of Additive Manufactured Titanium (Ti64) Lattices**: *Michael Brand*[1]; Robin Pacheco[1]; Cameron Knapp[1]; John Carpenter[1]; [1]Los Alamos National Laboratory

**9:40 AM**
**Tensile and Fatigue Performance Ti-6Al-4V ELI and Non-ELI Material Manufactured by Selective Laser Melting**: *Oscar Quintana*[1]; Weidong Tong[1]; [1]DePuy Synthes Joint Reconstruction

**10:00 AM Break**

**10:20 AM Invited**
**Fatigue Properties of Ti-6Al-4V Additively Manufactured by Selective Electron Beam Melting**: *Ma Qian*[1]; Yingying Sun[1]; Hui Ping Tang[2]; Stefan Gulizia[3]; [1]RMIT University (Royal Melbourne Institute of Technology); [2]State Key Laboratory of Porous Metal Materials, Northwest Institute for Non-ferrous Metal Research, Xian, China; [3]Commonwealth Scientific and Industrial Research Organisation (CSIRO)

**10:50 AM**
**Evaluation of The Mechanical Properties of 15Cr-5Ni Stainless Steel Produced by Direct Metal Laser Sintering**: *Davoud Mashhadi Jafarlou*[1]; Victor Champagne[2]; Ian R. Grosse[1]; [1]Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst; [2]US Army Research Laboratory, Aberdeen, USA

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – Metals in Additive Manufacturing I

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

Wednesday AM
March 14, 2018

Room: 230
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM Invited**
**Assessment of the Material Performance upon Additive Manufacturing – Are Post-treatments Always Required?**: *Thomas Niendorf*[1]; Stefan Leuders[2]; Liang Wu[2]; Johannes Günther[1]; Florian Brenne[1]; [1]University of Kassel; [2]Voestalpine Additive Manufacturing Center GmbH

**9:00 AM**
**Characterization of Strut, Node, and Cell Geometry and Mechanical Properties in 3D EBM Printed Ti64 Lattices**: *Connie Dong*[1]; Rachel Collino[1]; Matthew Begley[1]; [1]University of California, Santa Barbara

**9:20 AM**
**Mechanical Properties of AM Metals**: *Jay Carroll*[1]; Lisa Deibler[1]; Andrea Exil[1]; Brad Boyce[1]; Bradley Salzbrenner[1]; [1]Sandia National Laboratories

**9:40 AM Invited**
**Parameter Development of Wire-based Laser Metal Deposition and Characterization of Ti6Al2Sn4Zr2Mo**: *Irmela Burkhardt*[1]; Stefan Riekehr[1]; Volker Ventzke[1]; Nikolai Kashaev[1]; Josephin Enz[1]; [1]Helmholtz-Zentrum Geesthacht Center for Materials and Coastal Research

**10:10 AM Break**

**10:30 AM**
**A Comparison of the Microstructures, Tensile Properties, and Fatigue Crack Growth Mechanisms in Ti-6Al-4V Alloys Fabricated by Three Powder-Based Additive Manufacturing Technologies**: *Robert Warren*[1]; Yuwei Zhai[1]; Haize Galarraga[1]; Diana Lados[1]; Ryan Dehoff[2]; Michael Kirka[2]; Eric Brown[3]; Gregory Vigilante[3]; [1]Worcester Polytechnic Institute; [2]Oakridge National Laboratory; [3]Benét Laboratories

**10:50 AM**
**High-Temperature Tensile, Creep and Microstructural Characterization of Additively Manufactured 15-5 PH Stainless Steel**: *Dallas Roberts*[1]; Martin Taylor[1]; Indrajit Charit[1]; Jing Zhang[2]; [1]University of Idaho; [2]Indiana University - Purdue University Indianapolis (IUPUI)

**11:10 AM**
**Effects of Laser Beam Intensity Profile on the Evolution of Microstructure and Defects in 316L SS Components Fabricated via Laser Engineered Net Shaping**: *Baolong Zheng*[1]; Nancy Yang[2]; Josh Yee[2]; James Haley[1]; Thale Smith[1]; Yizhang Zhou[1]; Enrique Lavernia[1]; Julie Schoenung[1]; [1]University of California; [2]Sandia National Laboratories

**11:30 AM**
**Revealing Martensite Decomposition in Ti-6Al-4V Alloys Additively Manufactured with Electron Beam Melting by X-ray and Neutron Diffraction**: *Kenta Yamanaka*[1]; Manami Mori[2]; Yusuke Onuki[3]; Shigeo Sato[3]; Akihiko Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College; [3]Ibaraki University

**11:50 AM**
**Net Shape 3D Printed NdFeB Permanent Magnet**: Jacim Jacimovic[1]; Reinhard Simon[1]; Felix Greuter[1]; Lorenz Herrmann[1]; *Francisco Garcia Ferre*[1]; [1]ABB Corporate Research

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Constitutive Behavior I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Wednesday AM
March 14, 2018

Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* M. Arul Kumar, Los Alamos National Laboratory; Miguel Monclus, IMDEA Materials

**8:30 AM Invited**
**Understanding the Role of Interfaces on Fully Lamellar TiAl Alloys through Micromechanical Testing**: Jon Molina-Aldareguia[1]; Alberto Palomares[1]; Teresa Pérez-Prado[1]; *Miguel Monclus*[1]; [1]IMDEA Materials Institute

**9:00 AM**
**Microstructural Evolution of Ti-7Al Under Cyclic Loading**: *Rachel Lim*[1]; Yufeng Shen[1]; He Liu[1]; Robert Suter[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

**9:20 AM**
**Role of Grain Boundary Sliding in Deformation of Polycrystalline Materials**: *Ajey Venkataraman*[1]; Marissa Linne[2]; Samantha Daly[3]; Michael Sangid[1]; [1]Purdue University; [2]University of Michigan; [3]University of California, Santa Barbara

**9:40 AM**
**Time Dependent Plasticity and Cold Dwell Fatigue in Ti-alloys**: *David Collins*[1]; Edmund Tarleton[1]; Angus Wilkinson[1]; [1]University of Oxford

**10:00 AM Break**

**10:20 AM**
**Effect of Heterogeneous Microstructure on Deformation Twinning in HCP Titanium**: *M. Arul Kumar*[1]; M Wronski[2]; Rodney McCabe[1]; K Wierzbanowski[2]; Laurent Capolungo[1]; Carlos Tome[1]; [1]Los Alamos National Laboratory; [2]AGH University of Science and Technology

**10:40 AM**
**In Situ TEM Study of Dislocation – {10-12} Twin Boundary Interaction in Mg**: *Fulin Wang*[1]; Rodney McCabe[2]; Christopher Barrett[3]; Haitham El Kadiri[3]; Sean Agnew[1]; [1]Department of Materials Science and Engineering, University of Virginia; [2]Materials Science and Technology Division, Los Alamos National Laboratory; [3]Department of Mechanical Engineering, Mississippi State University

**11:00 AM**
**Twinning-detwinning Behavior during the Low-cycle Fatigue Testing of Pure Magnesium Using High Energy X-Ray Diffraction**: *Aeriel Murphy*[1]; Darren Pagan[2]; Armand Beaudoin[3]; Matthew Miller[2]; John Allison[1]; [1]University of Michigan; [2]Cornell University; [3]University of Illinois Urbana-Champaign

**11:20 AM**
**In-situ Neutron Diffraction of Pure Mg during ECAE Processing**: *Nicholas Krywopusk*[1]; Laszlo Kecskes[2]; Matthew Frost[3]; Alexandru Stoica[3]; Todd Hufnagel[1]; Ke An[3]; Timothy Weihs[1]; [1]Johns Hopkins University; [2]Army Research Laboratory, Aberdeen Proving Ground; [3]Oak Ridge Laboratory

**11:40 AM**
**Micro-compression Testing of Mg-Nb Multilayered Nano-composites for Ultra-high Strength, Formability and Ductility**: *Manish Jain*[1]; Nenad Velisavljevic[2]; Marko Knezevic[3]; Irene Beyerlein[2]; Nathan Mara[2]; Siddhartha Pathak[1]; [1]University of Nevada Reno; [2]Los Alamos National Laboratory; [3]University of New Hampshire, NH

## Advanced High-strength Steels – Hydrogen Embrittlement, Fracture and Damage

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Wednesday AM
March 14, 2018

Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Damien Fabregue, MATEIS, INSA Lyon

**8:30 AM Invited**
**Hydrogen Trapping and Desorption due to Nanometer-sized Copper Particles in Quenched-and-tempered Martensite Steel**: *Hung-Wei Yen*[1]; Yu-Chen Lin[1]; Hsin-Chih Lin[1]; [1]National Taiwan University

**8:55 AM**
**Ab Initio Insights into Hydrogen Trapping by Precipitates in High-strength Steels**: *Tilmann Hickel*[1]; Eunan McEniry[1]; Poulumi Dey[1]; Joerg Neugebauer[1]; [1]Max-Planck-Institut fuer Eisenforschung GmbH

**9:15 AM**
**Unravelling Hydrogen Enhanced Failure of Pipe-line Steels Using Advanced Microstructural Characterisation Tools**: *Jim Hickey*[1]; T Ben Britton[1]; Mary Ryan[1]; [1]Imperial College London

**9:35 AM**
**Hydrogen Embrittlement in a Model Advanced High Strength Steels**: Peng Gong[1]; Arjan Rijkenberg[2]; *William Rainforth*[1]; [1]University of Sheffield; [2]Tata Steel

**9:55 AM**
**Studying Hydrogen Embrittlement in Nano-twinned Polycrystalline Fe-12.5Mn-1.2C Austenitic Steel**: *Mahmoud Khedr*[1]; Li Wei[1]; Jin XueJun[1]; [1]Shanghai Jiao Tong University

**10:15 AM Break**

**10:30 AM Invited**
**Prediction of Strength and Fracture Mode of Heterogeneous Spot Welds Made of AHSS by Finite Elements Simulation**: *Damien Fabregue*[1]; Thibaut Huin[1]; Sylvain Dancette[1]; Thomas Dupuy[2]; [1]MATEIS, INSA Lyon; [2]ArcelorMittal

**10:55 AM**
**Liquid Metal Embrittlement in TRIP Steels**: *Nathaniel Briant*[1]; Luke Brewer[1]; Mark Barkey[1]; [1]University of Alabama

**11:15 AM**
**Microscale Evaluation of Hydrogen Susceptibility of Martensitic Sheet Steels**: *Yiran Lu*[1]; Shrikant Bhat[2]; Sharvan Kumar[1]; [1]Brown University; [2]ArcelorMittal, Global R&D

**11:35 AM**
**Elucidating the Effect of Liquid Metal Embrittlement on Fatigue Behavior in Resistance Spot Welding of Advanced High Strength Steel**: *JB Jordon*[1]; Luke Brewer[1]; Conner Cleek[1]; Mitchell Roze[1]; Mark Barkey[1]; [1]The University of Alabama

**11:55 AM**
**Non-metallic Inclusion and their Effect on Fatigue Strength for CAS-hardened Carbon Steel in Gears**: *Izudin Dugic*[1]; Robin Berndt[1]; Simon Josefsson[1]; Martin Hedstrom[2]; [1]Linnaeus University; [2]China Euro Vehicle Technology AB

**12:15 PM**
**Void Formation Mechanisms during Tensile Testing of a Cold-rolled Dual Phase Steel**: Hamid Ashrafi[1]; M. Shamanian[1]; R. Emadi[1]; *Seyed Alireza Etesami*[2]; [1]Isfahan University of Technology; [2]University of Memphis

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Additive Manufacturing and Advanced Processing of Permanent Magnetic Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Wednesday AM
March 14, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* Francis Johnson, GE Global Research

**8:30 AM Introductory Comments**

**8:40 AM Invited**
**Fabrication of Nanocomposite Magnets with High Energy Density: Challenges and Approaches**: *J.Ping Liu*[1]; [1]University of Texas-Arlington

**9:10 AM Invited**
**Additive Manufacturing of Highly Reactive Lanthanides**: *Amy Elliott*[1]; Michael Benedict[2]; Ayyoub Momen[1]; [1]Oak Ridge National Laboratory; [2]GE Appliances

**9:40 AM Invited**
**Additive Manufacturing of High Performance NdFeB Bonded Magnets**: *M. Parans Paranthaman*[1]; [1]Oak Ridge National Laboratory

**10:10 AM Break**

**10:30 AM Invited**
**Single-crystalline Nd-Fe-B Nanoparticles via Low-energy Ball Milling**: *Jeff Shield*[1]; Meiyu Wang[1]; Li Zhang[1]; Ye Lin[1]; [1]University of Nebraska

**11:00 AM Invited**
**Energy Dense Processing of Magnetic Materials**: *Raju Ramanujan*[1]; X Tan[1]; H Parmar[1]; Y Zhong[1]; V Chaudhary[1]; [1]Nanyang Technological University

**11:30 AM Invited**
**Additive Manufacturing for Superior Alnico Magnets**: *Emma White*[1]; Aaron Kassen[1]; Emrah Simsek[1]; Wei Tang[1]; Ryan Ott[1]; Michael Kirka[2]; Ryan Dehoff[2]; Iver Anderson[1]; [1]Ames Laboratory of US DOE; [2]Oak Ridge National Laboratory

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Emerging Interconnects

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Wednesday AM
March 14, 2018
Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* Won-sik Hong, Korea Electronics Technology Institute; Eric Cotts, Binghamton University

**8:30 AM**
**Low Temperature Bonding Material with Submicron Copper Particles**: *Kei Anai*[1]; Shinichi Yamauchi[1]; Takahiko Sakaue[1]; Yoichi Kamikoriyama[1]; Katsuaki Suganuma[2]; [1]Mitsui Mining & Smelting Co.,Ltd.; [2]Osaka University

**8:50 AM**
**Copper-to-copper Direct Bonding on Highly (111) Oriented Nano-twinned Copper in N2 Ambient**: *Jing-Ye Juang*[1]; Chia-Ling Lu[1]; Kuan-Ju Chen[1]; Chih Chen[1]; King-Ning Tu[2]; [1]National Chiao Tung University; [2]University of California at Los Angeles

**9:10 AM**
**Low-temperature and Pressureless Cu-to-Cu Bonding by Electroless Plating**: *H. T. Hung*[1]; S. Yang[1]; C. R. Kao[1]; [1]National Taiwan University

**9:30 AM**
**Electroplated (111)-oriented Au Films in Au-Au Direct Bonding**: *John Wu*[1]; Chih Chen[1]; [1]National Chiao Tung University

**9:50 AM**
**Effect of Orientation on the Bondability of the Sputtered Nano-twinned Copper**: *Leh-Ping Chang*[1]; Fan-Yi Ouyang[1]; [1]National Tsing Hua University

**10:10 AM Break**

**10:30 AM**
**Thermal Stable Ag-Ag Joints Bonded by Ultrasound-assisted Stress Migration Bonding**: *Hao Zhang*[1]; Norio Asatani[1]; Yukiharu Kimoto[1]; Aiji Suetake[1]; Shijo Nagao[1]; Tohru Sugahara[1]; Katsuaki Suganuma[1]; [1]The Institute of Scientific and Industrial Research (ISIR) Osaka University

**10:50 AM**
**Cu-to-Cu Direct Bonding by <111>-oriented Nanotwinned Copper Films with Chemical-mechanical Polishing**: *Shih-Yang Chang*[1]; Chih Chen[1]; [1]National Chiao Tung University

**11:10 AM**
**Nanoscale Soldering of Self-assembled Multi-segment Metallic Nanowires**: *Jirui Wang*[1]; Fan Gao[1]; Chefu Su[1]; Junwei Su[1]; Hongwei Sun[1]; Zhiyong Gu[1]; [1]University of Massachusetts Lowell

**11:30 AM**
**Electromigration Behavior of Printing Ag Nanoparticles Interconnects**: *Wan-Hsuan Lin*[1]; Fan-Yi Ouyang[1]; [1]National Tsing Hua University

## Advanced Real Time Optical Imaging – Iron and Steelmaking I

*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, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology

Wednesday AM
March 14, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Jinichiro Nakano, USDOE National Energy Technology Laboratory; Hiroyuki Shibata, Tohoku University

**8:30 AM**
**Introduction to Advanced Real Time Optical Imaging**: *Jinichiro Nakano*[1]; [1]US Department of Energy National Energy Technology Laboratory

**8:50 AM Invited**
**Mass Transfer in High-temperature Laser Confocal Microscopy**: Stephano Piva[1]; Deepoo Kumar[1]; Dai Tang[1]; *P. Chris Pistorius*[1]; [1]Carnegie Mellon University

**9:20 AM Invited**
**Direct Observation of Iron Solidification under Molten Slag**: *Takeshi Yoshikawa*[1]; [1]The University of Tokyo

**9:50 AM**
**Using High-temperature Confocal Scanning Laser Microscopy to Study Transient Phenomena: Swelling and Spontaneous Emulsification**: Stephen Spooner[1]; Ian Moore[1]; Sridhar Seetharaman[1]; *Zushu Li*[1]; [1]University of Warwick

**10:10 AM Break**

**10:30 AM Invited**
**In-situ Studies of Selective Oxidation in Advanced High Strength Steels**: Mary Story[1]; *Bryan Webler*[1]; [1]Carnegie Mellon University

**11:00 AM**
**Agglomeration Behavior of Non-metallic Inclusions in Liquid High Carbon Steel**: *Yasuhiro Tanaka*[1]; Farshid Pahlevani[1]; Veena Sahajwalla[1]; [1]University of New South Wales

**11:20 AM**
**Agglomeration of Non-metallic Inclusions at the Liquid Steel/Ar Gas Interface: A Summary of In-situ Observation Experiments and a Theoretical Study**: *Wangzhong Mu*[1]; Neslihan Dogan[1]; Kenneth Coley[1]; [1]McMaster University

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – ICME for Additive Manufacturing

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

Wednesday AM
March 14, 2018

Room: 231C
Location: Phoenix Convention Center

*Session Chairs:* Paul Mason, Thermo-Calc Software Inc.; Aaron Stebner, Colorado School of Mines; Richard LeSar, Iowa State University

**8:30 AM Invited**
**ICME Design, Modeling, and Accelerated Qualification of Additively Manufactured Ti-based Alloys**: *Ricardo Komai*[1]; Jeffrey Doak[1]; David Snyder[1]; Greg Olson[1]; [1]QuesTek Innovations LLC

**9:00 AM Invited**
**Scientifically Based Probability Modeling for Additive Manufacturing of Ti-6Al-4V**: *D Gary Harlow*[1]; Peter Collins[2]; [1]Lehigh University; [2]Iowa State University

**9:30 AM Invited**
**Platforms for High throughput Structure-property Characterizations to Support Machine Learning Approaches to Additive Manufacturing**: *Aaron Stebner*[1]; [1]Colorado School of Mines

**10:00 AM Break**

**10:15 AM Invited**
**Thermodynamic Database for Multi-component Ti-Based Alloys and TiAl-based Materials**: Yang Yang[1]; Qing Chen[1]; *Paul Mason*[2]; [1]Thermo-Calc Software AB; [2]Thermo-Calc Software Inc.

**10:45 AM**
**A Fully Integrated Model for the Prediction of Location-specific Yield Strength in Electron Beam Additively Manufactured Ti-6Al-4V**: *Thomas Ales*[1]; Peter Collins[1]; [1]Iowa State University

**11:05 AM**
**Optimization of Additive Manufacturing Process for Ti-6Al-4V via Integrated Computational Materials Engineering and Sequential Minimum Energy Design Approach**: *Kai Wing Kelvin Leung*[1]; Azadeh Keshtgar[1]; Luca Airoldi[1]; Nicole Apetre[1]; Nagaraja Iyyer[1]; Jonathan Pegues[2]; Nima Shamsaei[2]; [1]Technical Data Analysis Inc.; [2]Auburn University

## Algorithm Development in Materials Science and Engineering – Atomistic Algorithms for Study and Design 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, Missouri University of Science and Technology; Mark Tschopp, Army Research Laboratory; Jonathan Zimmerman, Sandia National Laboratories; Ebrahim Asadi, University of Memphis; Mark Horstemeyer, Mississippi State University

Wednesday AM
March 14, 2018

Room: 130
Location: Phoenix Convention Center

*Session Chairs:* Mark Tschopp, Army Research Laboratory; Abigail Hunter, Los Alamos National Laboratory

**8:30 AM Invited**
**Three-dimensional Structure and Motion of Defect Loops on the {10-12} Twin Boundary in Magnesium**: *Douglas Spearot*[1]; Khanh Dang[1]; Laurent Capolungo[2]; Carlos Tome[2]; [1]University of Florida; [2]Los Alamos National Laboratory

**9:00 AM**
**A New Method of Quantifying Solid-solution Hardening at Various Solute Concentrations Using Molecular Dynamics**: *Edwin Antillon*[1]; Christopher Woodward[2]; Satish Rao[1]; Brahim Akdim[1]; Triplicane Parthasarathy[1]; [1]AFRL/UES; [2]AFRL

**9:20 AM**
**Plastic Material Spin in Atomistic Simulations**: *Doyl Dickel*[1]; Mark Horstemeyer[1]; [1]Mississippi State University

**9:40 AM**
**Integrating Molecular Dynamics and Phase-Field Modeling to Study Oxidation of Iron**: Fan Xie[1]; Alireza Toghraee[1]; *Mohsen Asle Zaeem*[1]; [1]Missouri University of Science and Technology

**10:00 AM Break**

**10:20 AM**
**A Computational Framework for Predicting Failure Behavior of 2D Tin+1Cn Materials**: *Ning Zhang*[1]; Mohsen Asle Zaeem[1]; [1]Missouri University of Science and Technology

**10:40 AM**
**Plasticity Analysis in Molecular Dynamics via Simple Shear Field Decomposition**: *Christopher Barrett*[1]; [1]Mississippi State University

**11:00 AM**
**Algorithms to Simulate the Structure and Mobility of Nanoscale Dislocation Shear Loops via Atomistic Simulations**: *Khanh Dang*[1]; Laurent Capolungo[2]; Douglas Spearot[1]; [1]University of Florida; [2]Los Alamos National Laboratory

**11:20 AM**
**Atomistic Cross-scale Simulations of Crystal Plasticity**: *Alexander Stukowski*[1]; Luis Zepeda-Ruiz[2]; Tomas Oppelstrup[2]; Vasily Bulatov[2]; [1]Darmstadt University of Technology; [2]Lawrence Livermore National Laboratory

## Alloy Development and Powder Manufacture for Additive Manufacturing – ICME General Approaches

*Sponsored by:* TMS Materials Processing and Manufacturing Division
*Program Organizers:* Paul Prichard, Kennametal; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; James Foley, Los Alamos National Laboratory

Wednesday AM
March 14, 2018

Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Peter Collins, Iowa State University

**8:30 AM Invited**
**Computational Design of High-performance Aluminum Alloys for Additive Manufacturing**: *David Snyder*[1]; Gregory Olson[1]; [1]QuesTek Innovations LLC

**9:00 AM**
**Development and Application of Techniques for Rapid Alloy Screening via Novel Bicombinatorial Approaches**: *Brian Martin*[1]; Peter Collins[1]; [1]ISU

**9:20 AM**
**Microstructural Optimization and Design of Metallic Materials for AM**: *Fuyao Yan*[1]; Wei Xiong[2]; Gregory Olson[1]; [1]Northwestern University; [2]University of Pittsburgh

**9:40 AM**
**Rapid Solidification of Cu-Sn(-Ti) Based Alloys: Towards Alloy Design for Selective Laser Melting**: *Xiaoshuang Li*[1]; Adriaan Spierings[2]; Konrad Wegener[3]; Christian Leinenbach[1]; [1]Empa-Swiss Federal Laboratories for Materials Science and Technology; [2]Inspire AG, Innovation Center for Additive Manufacturing Switzerland; [3]ETH Zurich, Institute for Machine Tools and Manufacturing

**10:00 AM Break**

**10:20 AM Invited**
**Relationship between Alloy Composition and Solidification Conditions**: *Mathieu Brochu*[1]; [1]McGill University

**10:50 AM Invited**
**Alloy Design Principles for Additive Manufacturing – Lessons from Learned from Welding Metallurgy**: *Sudarsanam Babu*[1]; Alex Plotkowski[1]; [1]The University of Tennessee, Knoxville

**11:20 AM**
**Microstructural and Orientation Changes by Modifications on Composition and Processing Parameters In Additive Manufactured Materials**: *Michael Mendoza*[1]; Iman Ghamarian[1]; Matthew Rolchigo[1]; Richard LeSar[1]; Peter Collins[1]; [1]Iowa State University

## Alloys and Compounds for Thermoelectric and Solar Cell Applications VI – Session V

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Soon-Jik Hong, Kongju National University and Institute for Rare Metals; Philippe Jund, Université Montpellier 2; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science (NIMS) ; Hsin-jay Wu, National Sun Yat-sen University; Tiejun Zhu, Zhejiang University

Wednesday AM
March 14, 2018

Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Lan Li, Boise State University; Sinn-wen Chen, National Tsing Hua University

**8:30 AM Invited**
**Thermoelectric Properties of SnSe: Understanding and Tuning**: *Yongsheng Zhang*[1]; [1] Institute of Solid State Physics, Chinese Academy of Sciences

**8:50 AM Invited**
**Tuning Electrical and Thermal Properties in Atomic Layer Materials**: *Lan Li*[1]; Matthew Lawson[1]; Ying Rui[1]; [1]Boise State University

**9:10 AM**
**Composite of ZnO/Au Hybrid Structure on Silk Textile for Flexible Photocatalyst Application**: *Wan-Ting Chiu*[1]; Yuma Tahara[2]; Chun-Yi Chen[1]; Tso-Fu Mark Chang[1]; Tomoko Hashimoto[2]; Hiromichi Kurosu[2]; Masato Sone[1]; [1]Tokyo Institute of Technology; [2]Nara Women's University

**9:30 AM**
**Thin Film Heusler Systems: Boosting ZT**: *Ernst Bauer*[1]; Bernhard Hinterleitner[1]; Igor Knapp[1]; Michael Poneder[1]; Mathieu Taupin[1]; Christoph Eisenmenger-Sittner[1]; Christian Nöbauer[1]; [1]Vienna University of Technology

**9:50 AM**
**Prediction of Thermoelectric Transport Properties in Layered Complex Nitrides**: *Isao Ohkubo*[1]; Takao Mori[1]; [1]National Institute for Materials Science (NIMS)

**10:10 AM Break**

**10:30 AM Invited**
**Molecular-dynamics Simulations of Liquid-like Copper Diffusion in Copper Chalcogenides**: Keenan Zhuo[1]; Jing Wang[1]; Jianping Gao[1]; Uzi Landman[1]; *Mei-Yin Chou*[2]; [1]Georgia Institute of Technology; [2]Academia Sinica

**10:50 AM Invited**
**Optimization of Thermoelectric Performance for SnTe Alloys and Simulation of the TEG Module with Single SnTe Legs**: *Hongchao Wang*[1]; Teng Wang[1]; Xue Wang[1]; Wenbin Su[1]; Woochul Kim[2]; Chunlei Wang[1]; [1]Shandong University; [2]Yonsei University

**11:10 AM Invited**
**Inorganic Halide Double Perovskites for Thin Film Solar Cell Application**: *Feng Yan*[1]; [1]The University of Alabama

**11:30 AM Invited**
**MIP Infrastructure and High-throughput Study on Diamond-like Thermoelectric Chalcogenides**: *Jiong Yang*[1]; [1]Shanghai University

**11:50 AM**
**Room Temperature Orientation-dependent Thermal Conductivity of Thermoelectric SnSe**: *Yi Li*[1]; Bin He[1]; Joseph Heremans[1]; Ji-Cheng Zhao[1]; [1]The Ohio State University

**12:10 PM Concluding Comments**

## Alumina & Bauxite – Valorisation of Bayer Process Residues: Red Mud Treatment and Scandium Extraction

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Linus Perander, Outotec

Wednesday AM
March 14, 2018

Room: 221A
Location: Phoenix Convention Center

*Session Chairs:* Peter-Hans ter Weer, TWS Services and Advice; Antoine Allanore, Massachusetts Institute of Technology

**8:30 AM Introductory Comments**

**8:35 AM**
**Expertimental Investigation on Reduction of Cast Iron from Bayer Red Mud and Laterite Nickel**: *Jianmin Zeng*[1]; Jiacheng Wang[1]; Aoping He[1]; [1]Guangxi University

**9:00 AM**
**Analyzing the Bauxite Residue Amendment through the Addition of Ca and Mg Hydroxides Followed by Carbonation**: *Luis Venancio*[1]; Jose Antonio Silva Souza[2]; Emanuel Macedo[2]; Fernando Botelho[2]; Raíssa Fonseca[1]; Lucas Martins[1]; Mateus Tavares[1]; Lucas Emanuel Soares[1]; [1]Federal University of Maranhao; [2]Federal University of Pará

**9:25 AM**
**Comprehensive Utilization of Red Mud: Current Research Status and a Possible Way Forward for Non-Hazardous Treatment**: *Zhang Ting'an*[1]; Yanxiu Wang[1]; Guozhi Lyu[1]; Yan Liu[1]; Weiguang Zhang[1]; Qiuyue Zhao[1]; [1]Northeastern University

**9:50 AM**
**Alumina, Iron and Titanium Extracting from Bauxite Residue with Low Lime Sinter Method**: Di Zhang[1]; Wei Zhang[1]; Xin Hou[1]; Daming Liu[1]; Guanyi Liu[1]; *Bo Wang*[1]; [1]Hebei University of Science and Technology

**10:15 AM Break**

**10:30 AM**
**Developing New Process for Selective Extraction of Rare Earth Elements from Bauxite Residue Based on Functionalized Ionic Liquids**: *Panagiotis Davris*[1]; Efthymios Balomenos[2]; Dimitrios Panias[1]; Ioannis Paspaliaris[1]; [1]National Technical University of Athens; [2]Aluminum of Greece

**10:55 AM**
**Effects of Reductive Roasting with Sodium Salts on Leaching Behavior of Non-ferrous Elements in Bauxite Ore Residue**: *Bona Deng*[1]; Tao Jiang[1]; Guanghui Li[1]; Qing Ye[1]; Foquan Gu[1]; Mingjun Rao[1]; Zhiwei Peng[1]; [1]Central South University

**11:20 AM**
**Specific Features of Scandium Behavior during Sodium Bicarbonate Digestion of Red Mud**: Andrey Panov[1]; *Aleksandr Suss*[1]; Aleksandr Kozyrev[1]; Nataliya Kuznetsova[1]; Sergey Gorbachev[1]; [1]RUSAL Engineering & Technology Centre

## Aluminum Alloys, Processing and Characterization – Microstructures and Mechanical Properties of Aluminum Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Wednesday AM
March 14, 2018

Room: 221B
Location: Phoenix Convention Center

*Session Chair:* Dimitry Sediako, University of British Columbia

**8:30 AM Invited**
**Effect of Addition of Mn and Cr on Precipitation Behavior of Dispersoids in Al-Mg-Si-Cu Alloy**: *Hiromi Nagaumi*[1]; Han Yi[2]; Tongguang Zhai[3]; Guo Shijie[1]; [1]Soochow University; [2]Suzhou Research Institute for Nonferrous Metals; [3]University of Kentucky

**9:00 AM**
**Failure of 5000 and 6000 Series Aluminum Alloys in Modular Wastewater Treatment Aeration Tanks**: John Pavelich[1]; *John Nychka*[1]; [1]University of Alberta

**9:20 AM**
**Grain Refinement of Al–Si–Mg Cast Alloys by Al3Ti3B Master Alloy**: *Xixi Dong*[1]; Shouxun Ji[1]; [1]Brunel Centre for Advanced Solidification Technology (BAST), Brunel University London

**9:40 AM**
**Improving Bendability of Al-Mg-Si Alloy Sheet by Minor Alloying Element Addition**: *Sazol Das*[1]; Matthew Heyen[1]; Rajeev Kamat[1]; Richard Hamerton[1]; [1]Novelis

**10:00 AM Break**

**10:20 AM**
**Indentation Deformation of Cold Rolled AA 6061 Aluminum Alloy**: *Diaoyu Zhou*[1]; Wenwen Du[2]; Xiyu Wen[2]; Wei Liang[1]; Fuqian Yang[2]; [1]Taiyuan University of Technology; [2]University of Kentucky

**10:40 AM**
**Effect of Tooling Size and Geometry on the Determination of Forming Limit Curves for an Aluminum Alloy**: *Randall Bowers*[1]; Xiyu Wen[2]; Shridas Ningileri[1]; [1]Secat, Inc.; [2]University of Kentucky

**11:00 AM**
**Deep Drawing and Anodizing Quality Improvement in AA3003-O Alloy by Optimization of Homogenization, Rolling and Annealing**: *Anirban Giri*[1]; Saikat Adhikari[1]; Manu Saxena[2]; Sachin Gupta[2]; Sudhir Jain[2]; [1]Aditya Birla Science and Technology Company Pvt. Ltd.; [2]Hindalco Industries Ltd.

**11:20 AM**
**Progress in Aluminum-cerium High-temperature Alloy Development**: *Zachary Sims*[1]; David Weiss[2]; Scott McCall[3]; Jonathan Lee[3]; Hunter Henderson[1]; Eric Stromme[4]; Patrice Turchi[3]; Aurelien Perron[3]; Orlando Rios[1]; [1]Oak Ridge National Laboratory; [2]Eck Industries; [3]Lawrence Livermore National Laboratory; [4]United States Navy

## Aluminum Reduction Technology – Cell Design & Modelling

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Wednesday AM
March 14, 2018

Room: 221C
Location: Phoenix Convention Center

*Session Chair:* Marc Dupuis, Genisim

**8:30 AM Introductory Comments**

**8:35 AM**
**Alucell: A Unique Suite of Models to Optimize Pot Performances and Design**: *Steeve Renaudier*[1]; Steve Langlois[1]; Benoit Bardet[1]; Marco Picasso[2]; Alexandre Masserey[3]; [1]Rio Tinto; [2]EPFL; [3]Ycoorsystems

**9:00 AM**
**Anode Bottom Burnout Shape and Velocity Field Investigation in a High Amperage Electrolysis Cell**: *Valdis Bojarevics*[1]; Evgeniy Radionov[2]; Yaroslav Tretiyakov[2]; [1]University of Greenwich; [2]Rusal ETC

**9:25 AM**
**CFD Modelling of Alumina Feeding**: *Kristian Etienne Einarsrud*[1]; Sindre Engzelius Gylver[1]; Eirik Manger[2]; [1]Norwegian University of Science and Technology (NTNU); [2]Hydro Aluminium, Primary Metal Technology, Norway

**9:50 AM**
**Effect of Steel Multi-collector Bars on Current Density and Magnetohydrodynamic Stability in an Aluminum Reduction Cell**: *Meijia Sun*[1]; Baokuan Li[1]; Linmin Li[1]; Jian-ping Peng[1]; [1]Northeastern University

**10:15 AM Break**

**10:30 AM**
**MHD Generation of Liquid Metal Droplets in Aluminium Reduction Cell**: *Abdellah Kharicha*[1]; [1]University of Leoben

**10:55 AM**
**Numerical Simulation Study on Gas Collecting System of 400kA Grade Aluminum Electrolytic Cell**: Hongliang Zhang[1]; *Kena Sun*[1]; Jie Li[1]; Tianshuang Li[1]; Ling Ran[1]; Fengqi Ding[1]; Zhong Zou[1]; [1]Central South University

**11:20 AM**
**Study on 3D Full Cell Ledge Shape Calculation and Optimal Design Criteria by Coupled Thermo-flow Model**: Hongliang Zhang[1]; *Ling Ran*[1]; Jinding Liang[1]; Tianshuang Li[1]; Kena Sun[1]; Jie Li[1]; [1]Central South University

**11:45 AM**
**The Successful Implementation of Energy Saving Technology Based on Steady Flow and Heat Preservation**: *Dengpeng Chai*[1]; Zhirong Shi[1]; Yanan Zhang[1]; Yanfang Zhang[1]; Guanghui Hou[1]; Yanfang Wang[1]; Qingtao Hu[1]; Bin Fang[1]; [1]Zhengzhou Non-ferrous Metals Research Institute Co. Ltd of CHALCO

**12:10 PM Concluding Comments**

## Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials – Light-weight Alloys

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee
*Program Organizers:* Haiming Wen, Missouri University of Science and Technology; Simon Ringer, The University of Sydney; Gregory Thompson, University of Alabama; Arun Devaraj, Pacific Northwest National Laboratory; Keith Knipling, U.S. Naval Research Laboratory; Gang Sha, Nanjing University of Science and Technology; David Seidman, Northwestern University; Chantal Sudbrack, QuesTek Innovations, LLC

Wednesday AM
March 14, 2018

Room: 124A
Location: Phoenix Convention Center

*Funding support provided by:* CAMECA Instruments, Inc.

*Session Chairs:* Keith Knipling, U.S. Naval Research Laboratory; James Coakley, Northwestern University

**8:30 AM Invited**
**Phase Transformations in Titanium Alloys**: *James Coakley*[1]; Dieter Isheim[2]; Anna Radecka[3]; David Dye[4]; Paul Bagot[5]; Howard Stone[1]; David Seidman[2]; [1]University of Cambridge; [2]Northwestern University; [3]Rolls-Royce plc.; [4]Imperial College London; [5]Oxford University

**9:05 AM**
**Direct Observation of Hydrogen in Ti Alloys by Atom Probe Tomography**: *Yanhong Chang*[1]; Baptiste Gault[1]; Andrew Breen[1]; Dirk Ponge[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

**9:25 AM**
**Spinodal Decomposition and Periodic Segregation in Grain Boundaries on Al Alloy**: *Huan Zhao*[1]; Dirk Ponge[1]; Baptiste Gault[1]; Agnieszka Szczepaniak[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

**9:45 AM**
**Deformation-induced Mg Redistribution in Al-Mg Alloys Revealed Using Atom Probe Tomography**: *Shenbao Jin*[1]; Jing Xue[1]; Min Zha[2]; Xianghai An[3]; Xiaozhou Liao[3]; Jiehua Li[4]; Gang Sha[1]; [1]Nanjing University of Science and Technology; [2]Jilin University; [3]The University of Sydney; [4]Institute of Casting Research, Montanuniversität Leoben

**10:05 AM Break**

**10:25 AM**
**Multi-dimensional Multi-scale Investigation on Solute Partitioning Behaviours and Redistribution ahead of Solidification Fronts**: *Jiehua Li*[1]; [1]University of Leoben

**10:45 AM**
**Effect of Pre-strain on the Solute Clustering, Mechanical Properties, and Work-hardening of a Naturally Aged Al-Cu-Mg Alloy**: *Di Shao*[1]; Gang Liu[1]; Gang Sha[2]; [1]Xi'an Jiaotong University; [2]Nanjing University of Science and Technology

**11:05 AM**
**Partitioning Behavior of Group VB Transition Metals in $L1_2$-Strengthened Aluminum Alloys**: *Dinc Erdeniz*[1]; Anthony De Luca[1]; David Seidman[1]; David Dunand[1]; [1]Northwestern University

**11:25 AM**
**Core/Triple Shell Precipitates in Al-Er-Sc-Zr-(V,Nb,Ta) Alloys**: *Keith Knipling*[1]; [1]U.S. Naval Research Laboratory

## Biodegradable Materials for Medical Applications – Magnesium Alloys I

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Jaroslaw Drelich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund; Jan Seitz, Syntellix AG; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California-Riverside

Wednesday AM
March 14, 2018

Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Jaroslaw Drelich, Michigan Technological University; Frank Witte, Charite - Universitätsmedizin Berlin

**8:30 AM Keynote**
**Resoloy – the Resorbable Mg Alloy for Stents**: *Michael Stekker*[1]; Norbert Hort[2]; Frank Feyerabend[2]; Dirk Steglich[2]; Clemens Meyer-Kobbe[1]; [1]MeKo Laser Material Processing; [2]Helmholtz-Zentrum Geesthacht

**9:10 AM Invited**
**Mechanical and Corrosion Property Profile of Biodegradable, Open-porous Scaffolds Made of Sintered Magnesium Short Fibers**: *Gabor Szakacs*[1]; Frank Witte[1]; [1]Charite - Universitätsmedizin Berlin

**9:40 AM**
**Biodegradable Mg-implants – Current Market Experiences**: *Jan Seitz*[1]; Martin Kirschner[1]; [1]Syntellix AG

**10:00 AM Break**

**10:20 AM Invited**
**Development of a New Biodegradable Surgical Clip Made of a Magnesium Alloy: Evaluation of its Safety and Tolerability for Canine Cholecystectomy**: *Takumi Fukumoto*[1]; Toshihiko Yoshida[1]; Takeshi Urade[1]; Naoko Ikeo[1]; Toshiji Mukai[1]; [1]Kobe University

**10:50 AM**
**Comparative Study on Corrosion Behavior WE33 in Immersion and Polarization Influenced by Heat Treatment**: *Petra Maier*[1]; Maximilian Bechly[1]; Benjamin Hess[1]; Norbert Hort[2]; [1]University of Applied Sciences Stralsund; [2]Helmholtz-Zentrum Geesthacht

**11:10 AM**
**Metal Injection Molding (MIM) of Mg-Alloys**: *Martin Wolff*[1]; Johannes Schaper[1]; Eshwara Nidadavolu[1]; Monika Luczak[1]; Frank Feyerabend[1]; Michael Dahms[2]; Thomas Ebel[1]; Regine Willumeit-Römer[1]; Thomas Klassen[3]; [1]Helmholtz-Zentrum Geesthacht; [2]University of Applied Sciences, FH-Flensburg; [3]Helmut Schmidt University, Hamburg

**11:30 AM**
**Biological Response of Surface Modified Mg-Sr Alloy for Orthopedic Applications**: *Krishna Chaitanya Nune*[1]; Devesh Misra[1]; Lili Tan[2]; Weidan Wang[2]; Xiaoming Yu[2]; Ke Yang[2]; [1]University of Texas at El Paso; [2]Chinese Academy of Sciences

**11:50 AM**
**Corrosion Properties of Mg-Ca-Gd Alloy Applied to Biodegradable Implants**: *Ana Caroline Almeida*[1]; Carlos Elias[1]; Daniel Fernandes[1]; Paulo Soares[2]; [1]Instituto Militar de Engenharia; [2]Pontifícia Universidade Católica do Paraná

## Biological Materials Science – Functional Biological Materials

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

Wednesday AM
March 14, 2018

Room: 225B
Location: Phoenix Convention Center

*Session Chairs:* Steven Naleway, University of Utah; Jing Du, Penn State University

**8:30 AM Invited**
**From Superhydrophobic to Superhydrophilic: Synthesis of Multifunctional Surfaces Inspired from Carnivorous Plants**: *Po-Yu Chen*[1]; Zheng-Jun Shih[1]; Yu-Min Lin[1]; Po-Yi Chen[1]; [1]National Tsing Hua University

**9:00 AM**
**Design and Testing of Bio-inspired Flexible Armors**: *Susana Estrada*[1]; Alexander Ossa[1]; Dwayne Arola[2]; Sean Ghods[2]; [1]Universidad EAFIT; [2]University of Washington

**9:20 AM**
**3D Porosity Analysis of Fruit Tissues for Evaluation of Gas Exchange**: *Tomas Silva Santisteban*[1]; Yogini Jaiswal[2]; Yanling Xue[3]; Tiqiao Xiao[3]; Leonard Williams[2]; [1]Thermo Fisher Scientific; [2]North Carolina Agricultural and Technical State University; [3]Shanghai Synchrotron Radiation Facility (SSRF), Shanghai Institute of Applied Physics, Chinese Academy of Sciences

**9:40 AM**
**Optimizing the Structure-property Relationship of Shark Teeth Using Bio-inspired Design**: *John Wood*[1]; Hongjoo Rhee[2]; A. McIntosh[1]; M. Horstemeyer[3]; M. Murphy[2]; R. Prabhu[1]; [1]Department of Agricultural and Biological Engineering; [2]Center for Advanced Vehicular Systems; [3]Department of Mechanical Engineering

**10:00 AM Break**

**10:20 AM Invited**
**On the Dynamic Load Response of Fish Scales: Designed for Resistance to Puncture**: Chris Son[1]; Alex Ossa[1]; Sandra Murcia[1]; Anqi Lin[1]; *Dwayne Arola*[1]; Sean Ghods[1]; [1]University of Washington

**10:50 AM**
**Mechanism Controlling Ion Diffusion in Wood Cell Wall Layers**: *Joseph Jakes*[1]; [1]USDA Forest Products Laboratory

**11:10 AM**
**Modeling Water Absorption and Associated Mechanical Property Changes of Natural Fiber Reinforced Biocomposites**: Nicole Robertson[1]; John Wolodko[1]; *John Nychka*[1]; [1]University of Alberta

## Bladesmithing 2018 – Bladesmithing

*Program Organizers:* Bharat Jasthi, South Dakota School of Mines and Technology; Roxana Ruxanda, Emerson; Garry Warren, University of Alabama; Michael West, South Dakota School of Mines and Technology; Eric Schmidt, Vallourec; Samuel Wagstaff, Novelis

Wednesday AM
March 14, 2018

Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Michael West, South Dakota School of Mines and Technology; Garry Warren, University of Alabama

**8:30 AM Introductory Comments**

**8:35 AM Keynote**
**DragonSlayer: The First 20 Years**: *Greg Olson*[1]; [1]Northwestern University

**9:00 AM**
**Bowie Knife Forged From a File**: *David Sapiro*[1]; Mary Story[1]; [1]Carnegie Mellon University

**9:20 AM**
**Damascus Razor Characterization**: *Stuart Shirley*[1]; Tom Boundy[1]; [1]Colorado School of Mines

**9:40 AM**
**Challenges of Using Black Hills Iron Ore in Bladesmithing**: *Daniel Nagel*[1]; George Bernard[1]; William Carpenter[1]; Aaron Fortier[1]; Austin Holmes[1]; Strauss Langrud[1]; Cole Osendorf[1]; Abigail Sherwood[1]; Meghan Strawniak[1]; George Tillman[1]; [1]South Dakota School of Mines and Technology

**10:00 AM Break**

**10:15 AM**
**Forging a Multi-Layered Seax**: *Hannah Goldstein*[1]; Anthony Petters[1]; Gabriel Garcia[1]; Benjamin Meffert[1]; Dane Sayre[1]; [1]University of Kentucky

**10:35 AM**
**Keris: Legacy of Indonesia's Ancient Weapon in Metallurgical Point of View**: Abrar Ridhollah[1]; Fauzan Kurniawan[1]; *Safira Firdausi*[1]; [1]Sepuluh Nopember Institute of Technology

**10:55 AM**
**Pattern Welded Hunga Munga**: *David Sapiro*[1]; [1]Carnegie Mellon University

**11:15 AM**
**Investigating the Mechanical Properties of Knives in a Comparison Between Two SPD Methods**: *Wojciech Lukaszczyk*[1]; [1]Illinois Institute of Technology

**11:35 AM**
**Evaluation of Processing Methods on the Mechanical Properties and Corrosion Resistance of Various Steels**: *Albert Ostlind*[1]; Matthew Dougherty[1]; Kerry-Ann Stirrup[1]; [1]New Mexico Institute of Mining and Technology

**11:55 AM**
**East Meets West**: *Calvin Belcher*[1]; Stoney Middleton[1]; Tucker Parris[1]; [1]Materials Science at UC Irvine

## Building an ICME Infrastructure: Developing Tools that Integrate Across Length and Time Scales to Accelerate Materials Design – ICME Gap Analysis: Multiscale Modeling and Characterization of Structural Materials: I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Carelyn Campbell, National Institute of Standards and Technology; Mark Carroll, Federal Mogul Powertrain; Adam Hope, Thermo-Calc Software; Hojun Lim, Sandia National Laboratories; Myoung-Gyu Lee, Korea University; Amy Clarke, Colorado School of Mines; Dongwon Shin, Oak Ridge National Laboratory

Wednesday AM
March 14, 2018

Room: 132C
Location: Phoenix Convention Center

*Session Chair:* Hojun Lim, Sandia National Laboratories

**8:30 AM Invited**
**Need for Uncertainty Quantification in Multiscale Materials Modeling**: *Stephen Foiles*[1]; [1]Sandia National Laboratories

**9:10 AM Invited**
**Data Science and Informatics: Key Integrators of Multiscale Experiments and Multiscale Models in ICME**: *Surya Kalidindi*[1]; [1]Georgia Institute of Technology

**9:50 AM Break**

**10:10 AM Invited**
**Gaps in Multiscale Modeling to Address Mechanical Properties of Metal Alloys**: *David McDowell*[1]; [1]Georgia Institute of Technology

**10:50 AM Invited**
**Challenges in Multiscale Modeling of Emergent Phenomena in Solid Mechanics**: *Joseph Bishop*[1]; [1]Sandia National Laboratories

**11:30 AM Invited**
**Conceptual and Computational Challenges in Multiscale Modeling**: *Richard LeSar*[1]; [1]Iowa State University

## Bulk Metallic Glasses XV – Alloy Development and Application II

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Wednesday AM
March 14, 2018
Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Frans Spaepen, Harvard School of Engineering & Applied Sciences; Joseph Poon, University of Virginia

**8:30 AM Keynote**
**Stress Measurements on Colloidal Crystals and Glasses**: J. Terdik[1]; David Weitz[1]; *Frans Spaepen*[1]; [1]Harvard School of Engineering & Applied Sciences

**9:00 AM Invited**
**Synthesis and Processing of Roll-bonded Metal/ Metallic Glass Laminated Composites**: Sina Shahrezaei[1]; Douglass Hofmann[2]; Stephanie O'Keeffe[3]; Irene Beyerlein[4]; *Suveen Mathaudhu*[1]; [1]University of California, Riverside; [2]NASA - Jet Propulsion Laboratory; [3]Liquidmetal Technologies, Inc.; [4]University of California, Santa Barbara

**9:20 AM**
**Selective Laser Melting of Bulk Metallic Glass**: *Tim Sercombe*[1]; [1]The University of Western Australia

**9:40 AM Invited**
**Formation and Properties of Ni-free Ti-based Bulk Metallic Glasses for Biomedical Applications**: *Shujie Pang*[1]; Ying Liu[1]; Peter K. Liaw[2]; Tao Zhang[1]; [1]Beihang University; [2]The University of Tennessee

**10:00 AM Break**

**10:20 AM Invited**
**Damping, Elasticity, and Density of Sputtered Zr-Ni-Al Nano-films as Gleaned from Laser Interferometry**: *Anthony Kwong*[1]; Matt Matheny[1]; John Sader[2]; Julia Greer[1]; [1]California Institute of Technology; [2]University of Melbourne

**10:40 AM Invited**
**Amorphous Magnetic Films**: *Joseph Poon*[1]; [1]University of Virginia

**11:00 AM Invited**
**Catalytic Amorphous Metals in Energy Applications**: Vahid Hasannaeimi[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

**11:20 AM Invited**
**Exploring Novel Functionalities of Metallic Glasses**: *Kostas Georgarakis*[1]; [1]Cranfield University

**11:40 AM Invited**
**Structures and Dynamics in Ni-Nb System via Combinatorial and High-throughput Methods**: *Fanqiang Meng*[1]; Emrah Simsek[1]; Matthew Besser[1]; Matthew Kramer[1]; Ryan Ott[1]; [1]Ames Laboratory

**12:00 PM**
**Research on the Thermoplastic Formability of Lightweight Ti-based Bulk Metallic Glasses**: *Pan Gong*[1]; Xin-yun Wang[1]; Ke-fu Yao[2]; [1]Huazhong University of Science and Technology; [2]Tsinghua University

## Cast Shop Technology – Melt Treatment

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Mark Badowski, Hydro Aluminium

Wednesday AM
March 14, 2018
Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Johannes Morscheiser, Aleris Rolled Products Germany GmbH

**8:30 AM Introductory Comments**

**8:35 AM**
**Constellium's R&D on the Use of Power Ultrasound in Liquid Aluminum: An Overview**: *Philippe Jarry*[1]; Jean-Louis Achard[1]; [1]C-TEC

**9:00 AM**
**Molten Metal Cleanliness: Recent Developments to Improve Measurement Reliability**: Paul Evans[1]; *Phil Enright*[2]; Ricky Ricks[1]; [1]TSC; [2]NTec

**9:25 AM**
**On-site Benchmark of LiMCA II vs. LiMCA III for Monitoring of Non-metallic Inclusions in Liquid Aluminium**: Mark Badowski[1]; *Thien Dang*[2]; Nicholas Towsey[2]; Daniel Krings[1]; Klaus Hoffmann[2]; [1]Hydro Aluminium; [2]TRIMET Aluminium SE

**9:50 AM**
**Discussion of Bi-film Index and LiMCA Data in Industrial Aluminum Remelting Trials**: *Anne Kvithyld*[1]; Jan Anders Sæter[2]; Martin Syvertsen[1]; Harry Fossheim[2]; Arne Nordmark[1]; Ronny Sottar[2]; Thorvald Abel Engh[3]; [1]SINTEF; [2]Alcoa; [3]NTNU

**10:15 AM Break**

**10:30 AM**
**Inclusion Composition Determination by In-line LIBS Measurement – Plant Assessment**: *Pierre Le Brun*[1]; Joe Craparo[2]; Gary Parker[3]; Jimmy Landham[3]; Robert De Saro[2]; [1]Constellium Technology Center; [2]Energy Research Company; [3]Constellium Muscle Shoals

**10:55 AM**
**An Innovative Ultrasonic Technology for the Continuous Quality Monitoring of Liquid Aluminum on Casting Lines**: *Jean-Louis Achard*[1]; Fabio Taina[1]; Pierre Le Brun[1]; Pierre-Yves Menet[1]; [1]Constellium

**11:20 AM**
**Ultrasonic Doppler Velocimetry in Liquid Aluminum**: *Fabio Taina*[1]; Jean-Louis Achard[1]; Philippe Jarry[1]; [1]C-TEC, Constellium Technology Center

**11:45 AM**
**Nitridation Reaction of Aluminum and Magnesium in 5XXX Series Aluminum Alloy**: *Yu Matsui*[1]; Masaru Morobayashi[1]; Hirohisa Shiomi[1]; Koichi Takahashi[1]; [1]UACJ Corporation

## CFD Modeling and Simulation in Materials Processing – Processing III

*Sponsored by:* TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
*Program Organizers:* Laurentiu Nastac, The University of Alabama; Koulis Pericleous, University of Greenwich; Adrian Sabau, Oak Ridge National Laboratory; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, Colorado School of Mines

Wednesday AM
March 14, 2018
Room: 228B
Location: Phoenix Convention Center

*Session Chairs:* Ruigang Wang, The University of Alabama; Laurentiu Nastac, The University of Alabama

**8:30 AM**
**Effect of Carbide Configuration on the Current Distribution in Submerged Arc Furnaces for Silicon Production – A Modelling Approach**: *Yonatan Afework Tesfahunegn*[1]; Merete Tangstad[2]; Thordur Magnusson[3]; Gudrun Saevarsdottir[1]; [1]Reykjavik University; [2]Norwegian University of Science and Technology (NTNU); [3]United Silicon HF.

**8:50 AM**
**Investigation of Combustion and Heat Transfer in an Industrial Reheating Furnace Using CFD**: Yuchao Chen[1]; Xiang Liu[1]; Armin Silaen[1]; Kurt Johnson[2]; *Chenn Zhou*[1]; [1]Purdue University Northwest; [2]ArcelorMittal

**9:10 AM**
**Finite Element Modelling of Electrokinetic Deposition of Zinc on Mild Steel with ZnO-***Citrus Sinensis* as Nano-additive: *Oluseyi Ajayi*[1]; Olasubomi Omowa[1]; Oluwabunmi Abioye[1]; Olugbenga Omotosho[1]; Esther Akinlabi[2]; Stephen Akinlabi[2]; Abiodun Abioye[1]; Felicia Owoeye[1]; Sunday Afolalu[1]; [1]Covenant University, Cananland, Ota; [2]University of Johannesburg

**9:30 AM**
**Modeling of Cooling System in Nitrogen Cooled Aluminum Extrusion Molds and Investigation of Its Effect on Profile Surface**: *Murat Konar*[1]; [1]Asas Alüminyum

**9:50 AM**
**Implementing CFD Modelling to Address Defect Formation in Core Injection Moulding**: *Stefano Cademartori*[1]; Nicholas Humphreys[2]; Jean-Christophe Gebelin[2]; Jeffery Brooks[1]; [1]University of Birmingham; [2]Doncasters Group

**10:10 AM Break**

**10:30 AM**
**Mathematical Model for Gas Fired Rorary Hearth Furnace for Sponge Iron Production**: *Sooraj Saleem*[1]; Gour Gopal Roy[1]; [1]Indian Institute of Technology, Kharagpur

**10:50 AM**
**Numerical Simulation of Turbulence Flow and Solidification in a Bloom Continuous Casting Mould with Electromagnetic Stirring**: *Shaoxiang Li*[1]; Peng Lan[1]; Jiaquan Zhang[1]; [1]University of Science & Technology Beijing

**11:10 AM**
**Numerical Analysis of Heat and Mass Transfer on the Self-densification of Metal Hydride Tank**: *Xi Lin*[1]; Dongke Sun[2]; Qian Li[1]; [1]Shanghai University; [2]Southeast University

## Characterization of Minerals, Metals, and Materials – Analysis of Surfaces and Interfaces

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Wednesday AM
March 14, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chair:* Shadia Ikhmayies, Al Isra University

**8:30 AM Introductory Comments**

**8:35 AM Invited**
**Applications of Aberration-corrected Low-energy Electron Microscopy for Metal Surfaces**: *Zheng Wei*[1]; Tao Li[1]; Meng Li[1]; Xueli Cao[1]; Hanying Wen[1]; Guodong Shi[1]; Lei Yu[1]; Lin Zhu[1]; Wen-xin Tang[1]; Chenguang Bai[1]; [1]Chongqing University

**8:55 AM**
**Surface Damage Layers Produced by Ga Ion and Xe-plasma FIB Milling of Al6061**: *Alexis Ernst*[1]; Mei Wei[1]; Mark Aindow[1]; [1]University of Connecticut

**9:15 AM**
**ZnO Thin Films of Flowered-Fibrous Micro/Nanowebs on Glass Substrates Using the Spray Pyrolysis Method**: *Shadia Ikhmayies*[1]; [1]Al Isra University

**9:35 AM**
**Examining Regional Weather Effects on Single Ply Roofing Membranes**: *Gisica Abdallah*[1]; Holly Martin[1]; Jeffrey Meyers[2]; [1]Youngstown State University; [2]Simon Roofing

**9:55 AM**
**Analytical Investigation of Coatings Defects**: *Arif Mubarok*[1]; Brittany Sinagra[1]; [1]PPG Industries

**10:15 AM Break**

**10:30 AM**
**Recovery of Au(CN)2- from Gold Cyanidation Solution with Graphene Oxide and Reduced Graphene Oxide Hydrogels as Adsorbents**: Lang Yang[1]; Kaige Sun[1]; Feifei Jia[1]; *Shaoxian Song*[1]; [1]Wuhan University of Technology

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Diffusion I

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Wednesday AM
March 14, 2018

Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Qing-Miao Hu, Institute of Metal Research, Chinese Academy of Science; Chelsey Zacherl Hargather, New Mexico Institute of Mining and Technology

**8:30 AM Invited**
**A Comprehensive First-principles Study of Solute Elements in Dilute Ni Alloys: Diffusion Coefficients and Their Implications to Tailor Creep Rate**: *Chelsey Hargather*[1]; Shun-Li Shang[2]; Zi-Kui Liu[2]; [1]New Mexico Institute of Mining and Technology; [2]The Pennsylvania State University

**9:00 AM**
**First-principles Investigation of Thermodynamics and Precipitation Kinetics in Al-Sc Alloys**: *Ankit Gupta*[1]; Bengue Tas Kavakbasi[2]; Biswanath Dutta[1]; Blazej Grabowski[1]; Martin Peterlechner[2]; Tilmann Hickel[1]; Sergiy V. Divinski[2]; Gerhard Wilde[2]; J Neugebauer[1]; [1]Max-Planck Institute for Iron Research; [2]Institute of Materials Physics, University of Muenster

**9:20 AM**
**Monte Carlo Simulation for i-s Clustering in Iron Based on the First-principles Calculation**: *Masanori Enoki*[1]; Yohei Osawa[1]; Marcel Sluiter[2]; Hiroshi Ohtani[1]; [1]Tohoku University; [2]Delft University of Technology

**9:40 AM**
**Mobility of Small Point Defect Clusters and Prismatic Dislocation Loops**: Jan Fikar[1]; *Roman Gröger*[1]; Robin Schäublin[2]; [1]IPM; [2]ETHZ

**10:00 AM Break**

**10:15 AM**
**Impurity Segregation in Copper: Theory vs. Experiment**: *Vsevolod Razumovskiy*[1]; Sergiy Divinski[2]; Lorenz Romaner[1]; [1]Materials Center Leoben; [2]University of Münster

**10:35 AM Invited**
**Atomic Diffusion and Its Effect on Creep Resistance of High Temperature Titanium Alloys**: *Qing-Miao Hu*[1]; [1]Institute of Metal Research, Chinese Academy of Science

**11:05 AM**
**The Kinetic Mechanism Underlying the Solid-state Precipitation of Core-shell Particle in Al-Zr-Er Alloy**: *Shang-Yi Ma*[1]; Shao-Qing Wang[1]; [1]Chinese Academy of Sciences

**11:25 AM**
**Thermally Activated Solute-drag Strengthening by Interstitial Impurities in BCC Cr**: *Christian Brandl*[1]; [1]Karlsruhe Institute of Technology

**11:45 AM**
**Simulation of Solidification/Devitrification in Ni-Nb Alloys**: *Mikhail Mendelev*[1]; Tongqi Wen[1]; Cai-Zhuang Wang[1]; [1]Ames Laboratory

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Microstructure and Processing Simulations I

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Wednesday AM
March 14, 2018

Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Avinash Dongare, University of Connecticut; Dongwon Shin, Oak Ridge National Laboratory

**8:30 AM Invited**
**Unraveling the Evolution of Microstructure of Materials at the Mesoscales Using Quasi-coarse-grained Dynamics Simulations**: *Avinash Dongare*[1]; Sumit Suresh[1]; Garvit Agarwal[1]; [1]University of Connecticut

**9:00 AM**
**Simulating Phase Transformation and Texture Evolution during Forging of Ti6Al4V**: *Connor Campbell*[1]; Xin (Tony) Yao[2]; Terry Lowe[1]; [1]Colorado School of Mines; [2]Weber Metals, Inc.

**9:20 AM**
**Phase-field Simulation of Nanodomain Formation in Ti-Nb-O Alloys**: *Yuya Ishiguro*[1]; Yuhki Tsukada[1]; Toshiyuki Koyama[1]; [1]Nagoya University

**9:40 AM**
**Process Simulation of H13 Steel Dipping into Molten Aluminum and Prediction of its Thermal Fatigue Cracking**: *Yan Lu*[1]; Alan Luo[1]; Keith Ripplinger[2]; Geoffrey Taber[1]; Yu Mao[1]; Duane Detwiler[3]; [1]The Ohio State University; [2]Honda Engineering North America, Inc.; [3]Honda R&D Americas, Inc

**10:00 AM Break**

**10:20 AM Invited**
**Influence of Platinum Chaplet Pins on Recrystallization Defect in Single Crystal Turbine Blade Casting**: *Runnan Wang*[1]; Qingyan Xu[1]; Baicheng Liu[1]; [1]Tsinghua University

**10:50 AM**
**Microstructure Prediction for TMW-4M3 during Heat Treatment**: *Takaaki Hara*[1]; Shinichi Kobayashi[1]; Tomonori Ueno[1]; Nobufumi Ueshima[2]; Katsunari Oikawa[2]; [1]Hitachi Metals, Ltd.; [2]Tohoku University

**11:10 AM**
**Lattice Mismatch Modeling of Aluminum Alloys**: *Dongwon Shin*[1]; Shibayan Roy[2]; Thomas Watkins[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory; [2]Indian Institute of Technology

**11:30 AM**
**Meso Scale Modeling of Self-assembly and Mechanical Behavior of SWCNT Aerogels**: *Ankit Gupta*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Computational Design: Microstructure and Mechanical Behaviors

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

Wednesday AM
March 14, 2018

Room: 131C
Location: Phoenix Convention Center

*Session Chairs:* Yunzhi Wang, Ohio State University; Zhiqiang Han, Tsinghua University

**8:30 AM Invited**
**Study on the Effect of Applied Pressure on Directional Dendritic Growth by In-situ Observation**: Shan Shang[1]; Keyan Wu[1]; Leewei Kuo[1]; *Zhiqiang Han*[1]; [1]Tsinghua University

**9:00 AM**
**Predicting Microstructural Evolution in Oxidation Resistant Coatings during Manufacturing and during Degradation in Service**: *Rishi Pillai*[1]; Timur Galiullin[1]; Wencai Leng[1]; Daniel Grüner[1]; Dmitry Naumenko[1]; W.J. Quadakkers[1]; [1]Forschungszentrum Juelich GmbH

**9:20 AM**
**Microstructure Evolution and Simulation in 22MnB5 Steel during Hot Stamping**: *Kuanhui Hu*[1]; Rongdong Han[1]; [1]Wuhan Iron and Steel Co., LTD

**9:40 AM**
**Modeling of Solute-dependent Fluidity and Hot Tearing Sensitivity of Conductive Aluminum Alloys**: Hengcheng Liao[1]; *Qigui Wang*[2]; Xiaojin Suo[1]; Zixing Feng[1]; Qin Huang[1]; [1]Southeast University; [2]GM Global Propulsion Systems

**10:00 AM Break**

**10:15 AM Invited**
**Computational Design and Simulation of Ultralow Modulus, Hysteresis-free, and Linear Pseudo-elastic Shape Memory Alloy**: Jiaming Zhu[1]; Yipeng Gao[2]; Dong Wang[1]; Tong-Yi Zhang[3]; *Yunzhi Wang*[2]; [1]Xi'an Jiaotong University; [2]The Ohio State University; [3]Shanghai University

**10:45 AM**
**Coupling Void Coalescence Criteria in Finite Element Models: Application to Tensile Test**: *Ahmed Abdelkader*[1]; Chahinaz Saleh[2]; [1]Enppi; [2]Faculty of Engineering, Cairo University

**11:05 AM**
**Prediction of the Abrasive Wear Behaviour of Heat Treated Aluminium-clay Composites**: *Ademola Agbeleye*[1]; David Esezobor[1]; Johnson Agunsoye[1]; Olawale Balogun; Adeyanju Sosimi[1]; [1]University of Lagos

**11:25 AM**
**Modelling of Mechanical Behavior at High Strain Rate of TI-6AL-4V Manufactured by Means of Direct Metal Laser Sintering Technique**: *Nicola Bonora*[1]; Andrew Ruggiero[1]; Gianluca Iannitti[1]; Gabriel Testa[1]; Domenico Gentile[1]; [1]University of Cassino

**11:45 AM**
**Optimizing Elastic Moduli of the Silicate Glasses through High-throughput Atomistic Modeling and Machine Learning Techniques**: *Yong-Jie Hu*[1]; Ge Zhao[2]; Tyler Del Rose[1]; Maarten De Jong[3]; Liang Qi[1]; [1]University of Michigan; [2]The Pennsylvania State University; [3]Space Exploration Technologies (SpaceX)

## Computational Materials Science and Engineering for Nuclear Energy – Novel Models and Method Development

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Wednesday AM
March 14, 2018

Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* Haixuan Xu, The University of Tennessee Knoxville; Izabela Szlufarska, University of Wisconsin-Madison

**8:30 AM Invited**
**Experimentally Validated Computational Modeling of Advanced Alloys and Radiation Effects for Nuclear Energy Applications**: *Steven Zinkle*[1]; Lizhen Tan[2]; Ying Yang[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

**9:00 AM**
**Cluster Dynamics in Irradiated Materials: A Hybrid Deterministic/Stochastic Coupling Algorithm**: *Pierre Terrier*[1]; Thomas Jourdan[2]; Manuel Athènes[2]; Gilles Adjanor[3]; Gabriel Stoltz[4]; [1]Ecole des Ponts Paristech & CEA, SRMP; [2]CEA Saclay; [3]EDF R&D; [4]Ecole des Ponts Paristech

**9:20 AM**
**Rate-theory Modeling of Irradiation Damage Cascades and the Influence of the Underlying Microstructure using the MOOSE Framework**: *Jesse Carter*[1]; Jared Tannenbaum[1]; Richard Smith[1]; [1]Bettis Laboratory, NNL

**9:40 AM**
**A Phase Field Study of Void Superlattice Formation in Irradiated Materials**: *Yipeng Gao*[1]; Daniel Schwen[1]; Chao Jiang[1]; Yongfeng Zhang[1]; [1]Idaho National Laboratory

**10:00 AM Break**

**10:20 AM**
**Microstructure-sensitive Phase Field Fracture Model Including Anisotropic Elastic Properties**: *Shuaifang Zhang*[1]; Wen Jiang[2]; Cheng Liu[3]; Izabela Szlufarka[3]; Michael Tonks[1]; [1]Pennsylvania State University; [2]Idaho National Lab; [3]University of Wisconsin-Madison

**10:40 AM**
**Off-stoichiometric Cluster Dynamics in Irradiated Oxides**: *Sarah Khalil*[1]; Todd Allen[2]; Anter El-Azab[3]; [1]Alexandria University - Egypt; [2]UW-Madison; [3]Purdue University

**11:00 AM Invited**
**Real-space Diffusion-driven Models for Microstructural Evolution of Irradiated Materials**: *Sergei Dudarev*[1]; [1]UK Atomic Energy Authority

## Computational Method and Experimental Approaches for Model Development and Validation, Uncertainty Quantification, and Stochastic Predictions – Mathematical and Machine Learning Approaches Applied to UQ

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory; Richard Hennig, University of Florida; Avinash Dongare, University of Connecticut; Shawn Coleman, U.S. Army Research Laboratory; Niaz Abdolrahim, University of Rochester; Joseph Bishop, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Li Ma, National Institute of Standards and Technology

Wednesday AM
March 14, 2018

Room: 132B
Location: Phoenix Convention Center

*Session Chairs:* Avinash Dongare, University of Connecticut; Li Ma, National Institute of Standard and Technology

**8:30 AM Invited**
**Uncertainty Quantification for Additive Manufacturing Applications across Scales**: *Laura Swiler*[1]; Kyle Johnson[1]; [1]Sandia National Laboratories

**9:00 AM**
**Large Scale Sensitivity of Uncertain Parameters on Optimal Control Solutions: An Example in Additive Manufacturing**: *Bart van Bloemen Waanders*[1]; Joseph Hart[2]; [1]Sandia National Laboratories; [2]North Carolina State University

**9:20 AM Invited**
**The Role of Data Analysis in Uncertainty Quantification: Examples from Materials Science**: *Paul Patrone*[1]; Andrew Dienstfrey[1]; [1]NIST

**9:50 AM**
**Uncertainty Quantification in Materials Strength Models Using Bayesian Inference**: *David Rivera*[1]; Jason Bernstein[1]; Katie Schmidt[1]; Nathan Barton[1]; Ana Kupresanin[1]; Jeff Florando[1]; [1]LLNL

**10:10 AM Break**

**10:30 AM Invited**
**Machine Learning Based Atomistic Force Fields**: *Rampi Ramprasad*[1]; Venkatesh Botu[1]; Rohit Batra[1]; James Chapman[1]; Huan Tran[1]; [1]University of Connecticut

**11:00 AM Invited**
**It's a SNAP: Automated Generation of High-accuracy Interatomic Potentials Using Quantum Data**: *Aidan P. Thompson*[1]; [1]Sandia National Laboratories

**11:30 AM**
**Linear Scaling, Quantum-accurate Interatomic Potentials with SNAP; Reaching those Hard-to-reach Places in Classical Molecular Dynamics**: *Mitchell Wood*[1]; Aidan Thompson[1]; [1]Sandia National Laboratories

## Computational Thermodynamics and Kinetics – Phase Equilibria and Transformations

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

Wednesday AM
March 14, 2018

Room: 128A
Location: Phoenix Convention Center

*Session Chairs:* Blazej Grabowski, Max-Planck-Institut für Eisenforschung; James Saal, QuesTek Innovations

**8:30 AM Invited**
**ICME Design of High-performance Materials with Computational Materials Science**: *James Saal*[1]; Greg Olson[1]; [1]QuesTek Innovations

**9:00 AM**
**Developing Ab-initio Models for Precipitation in Alloys**: *Anirudh Raju Natarajan*[1]; John Thomas[1]; Brian Puchala[2]; Anton Van der Ven[1]; [1]University of California, Santa Barbara; [2]University of Michigan, Ann Arbor

**9:20 AM**
**Thermolab: A Matlab Toolbox for Experimenting Computational Thermodynamics**: *Thien Duong*[1]; Raymundo Arroyave[1]; [1]Texas A&M University

**9:40 AM**
**Effect of Precipitate Characteristics on the Sensitization of Austenitic Stainless Steels**: *Satish Kumar Kolli*[1]; Vahid Javaheri[1]; Thomas Ohligschläger[2]; David Porter[1]; [1]University of Oulu, Oulu; [2]Outokumpu, Tornio R & D Center

**10:00 AM Break**

**10:20 AM Invited**
**Efficient and Accurate Computation of Melting Temperatures and Enthalpies and Entropies of Fusion from Ab Initio**: *Blazej Grabowski*[1]; Li-Fang Zhu[1]; Jörg Neugebauer[1]; [1]Max-Planck-Institut für Eisenforschung

**10:50 AM**
**Simulation of Grain Boundary Migration and Phase Transformation in Metals with Overdamped Langevin Dynamics**: *Carolina Baruffi*[1]; Alphonse Finel[1]; Oguz Umut Salman[2]; Brigitte Bacroix[2]; [1]ONERA; [2]LSPM -Université Paris 13

**11:10 AM**
**Transition Process from BCT Martensite to η Phase during Tempering in Fe-C Alloy**: *Yohei Osawa*[1]; Michitoshi Saeki[1]; Masanori Enoki[1]; Marcel Sluiter[2]; Hiroshi Ohtani[1]; [1]Tohoku University; [2]Delft University of Technology

**11:30 AM**
**Secondary Phase Dissolution in Al Alloys Using DICTRA Models**: *Kyle Fitzpatrick-Schmidt*[1]; Danielle Cote[1]; Richard Sisson[1]; Victor Champagne[2]; [1]Worcester Polytechnic Institute; [2]U.S. Army Research Laboratory

## Coupling Advanced Characterization and Modeling Tools for Understanding Fundamental Phase Transformation Mechanisms: An MPMD Symposium in Honor of Hamish Fraser – Session III

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; Soumya Nag, GE Global Research; Rajarshi Banerjee, University of North Texas

Wednesday AM
March 14, 2018

Room: 127A
Location: Phoenix Convention Center

*Session Chair:* Sudarsanam Babu, University of Tennessee - Knoxville

**8:30 AM Invited**
**Advanced Characterization and Modeling Tools in the Context of Corrosion**: Oumaima Gharbi[1]; Shravan Kairy[1]; *Nick Birbilis*[1]; [1]Monash University

**9:00 AM Invited**
**Deformation by Dislocations, Twinning, and Phase Transformations in Compositionally Concentrated FCC Solid Solutions**: *Michael Mills*[1]; Jiashi Miao[1]; Connor Slone[1]; Tim Smith[2]; Maryam Ghazisaeidi[1]; [1]The Ohio State University; [2]NASA Glenn Research Center

**9:30 AM Invited**
**Phase Transformations, Microstructure Evolution and Mechanical Properties of Nickel-base Superalloys Studied by Analytical Scanning and Transmission Electron Microscopy**: Micheal Kattoura[1]; Seetha Mannava[1]; Dong Qian[1]; *Vijay Vasudevan*[1]; [1]University of Cincinnati

**10:00 AM Break**

**10:20 AM Invited**
**The Need for Advanced Techniques to Couple Multiscale Physics Based Structural Models**: *Jaimie Tiley*[1]; [1]Air Force Office of Scientific Research

**10:50 AM Invited**
**Progress with 3-dimensional Materials Science Tools for Aerospace Alloy Engineering**: *Dennis Dimiduk*[1]; Michael Uchic[2]; Michael Groeber[2]; Paul Shade[2]; Sean Donegan[2]; Michael Jackson[1]; [1]BlueQuartz Software, LLC; [2]Air Force Research Laboratory

**11:20 AM Invited**
**Probabilistic Methodology for Analyzing and Reconstructing Parent Microstructures from EBSD Maps of Transformation Products**: *Stephen Niezgoda*[1]; Eric Payton[2]; Alex Brust[1]; Vikas Sinha[3]; [1]The Ohio State University; [2]Air Force Research Laboratory; [3]UES, Inc.

## Coupling Experiments and Modeling to Understand Plasticity and Failure – Plasticity in HCP Alloys

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Michael Sangid, Purdue University; Philip Eisenlohr, Michigan State University; Matthew Miller, Cornell University; Paul Shade, Air Force Research Laboratory

Wednesday AM
March 14, 2018

Room: 126B
Location: Phoenix Convention Center

*Session Chairs:* Darren Pagan, CHESS; Michael Sangid, Purdue University

**8:30 AM Invited**
**Comparison of Parameters Required for Computational Models for Modeling Heterogeneous Deformation in Titanium Obtained with Different Approaches**: *Thomas Bieler*[1]; Chen Zhang[1]; Harsha Phukan[1]; Yang Su[1]; Hongmei Li[1]; Philip Eisenlohr[1]; Martin Crimp[1]; Carl Boehlert[1]; Leyun Wang[2]; Robert Suter[3]; Jonathan Lind[4]; Peter Kenesei[5]; Jun-Sang Park[5]; Ruqing Xu[5]; Wenjun Liu[5]; [1]Michigan State University; [2]Shanghai Jiao Tong University; [3]Carnegie Mellon University; [4]Lawrence Livermore National Laboratory; [5]Argonne National Laboratory

**8:55 AM Invited**
**Reliability of Slip Resistance Determination in Hexagonal Materials**: Chen Zhang[1]; Aritra Chakraborty[1]; *Philip Eisenlohr*[1]; Carl Boehlert[1]; Martin Crimp[1]; Thomas Bieler[1]; [1]Michigan State University

**9:20 AM**
**Coupled Intergranular and Transgranular Fracture Modes in H.C.P. Alloys**: *Ismail Mohamed*[1]; S. Ziaei[1]; Mohammed Zikry[1]; [1]North Carolina State University

**9:40 AM**
**The Effect of Temperature on Deformation of CP-Ti**: *Joao Fonseca*[1]; Alberto Orozco-Caballero[1]; [1]The University of Manchester

**10:00 AM Break**

**10:20 AM Invited**
**Neighbour Effects on Grain Resolved Stress Distributions in Hexagonal Metals Revealed by 3D X-ray Diffraction Measurements**: Hamidreza Abdolvand[1]; Jonathan Wright[2]; *Angus Wilkinson*[3]; [1]Western University; [2]ESRF; [3]University of Oxford

**10:45 AM**
**The Influence of Elastic Interactions on Local Stresses and Deformation Mechanism during Tensile Loading of Two-phase Titanium Alloys**: *William Joost*[1]; Maija Kuklja[2]; Sreeramamurthy Ankem[2]; [1]Pratt & Whitney; [2]University of Maryland

**11:05 AM**
**Geometrically Necessary Dislocations (GNDs) and Crystal Plasticity in HCP Metals**: *Wyatt Witzen*[1]; Curt Bronkhorst[2]; Tresa Pollock[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

**11:25 AM**
**Localized Deformation Fields in Hexagonal Close-packed Polycrystals**: *Hamid Abdolvand*[1]; Angus Wilkinson[2]; [1]University of Western Ontario; [2]University of Oxford

**11:45 AM**
**Study of the Deformation of Mg-Y by In Situ EBSD and Visco-plastic Self-consistent Modeling**: *Bijin Zhou*[1]; Alireza Maldar[1]; Xiaoqin Zeng[1]; Leyun Wang[1]; [1]Shanghai Jiao Tong University

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – 5A: Fe-based Superalloy Development & Properties. 5B: Deformation & Damage in Fe and Ni-based Superalloys

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC; Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

Wednesday AM
March 14, 2018

Room: 126A
Location: Phoenix Convention Center

*Session Chair:* Yukinori Yamamoto, Oak Ridge National Laboratory

**8:30 AM Invited**
**Microstructural Investigation and In-situ Neutron Diffraction on Novel Creep-resistant Ferritic Superalloys**: *Peter Liaw*[1]; Shao-Yu Wang[1]; Gian Song[2]; David Dunand[3]; Gautam Ghosh[3]; Sungil Baik[3]; [1]The University of Tennessee; [2]Oak Ridge National Laboratory; [3]Northwestern University

**9:00 AM**
**Deformation and Damage Behavior during LCF, TMF and CF in an Advanced Heat Resistant Austenitic Stainless Steel**: *Guocai Chai*[1]; Guocai Chai[2]; [1]Sandvik Materials Technology; [2]Linköping University

**9:20 AM**
**Alloy Design Concepts of Creep-resistant, Alumina-forming Ferrous Alloys for High-temperature Structural Applications**: *Yukinori Yamamoto*[1]; Michael Brady[1]; Govindarajan Muralidharan[1]; Bruce Pint[1]; Chih-Hsiang Kuo[2]; Benjamin Shassere[3]; Sudarsanam Babu[2]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]University of Tennessee (currently at ORNL)

**9:40 AM**
**Investigation on Creep Properties of Alloy 709 (Fe-25Ni-20Cr) at 1023 K**: *Abdullah Alomari*[1]; Korukonda Murty[1]; Nilesh Kumar[1]; [1]North Carolina State University

**10:00 AM Break**

**10:20 AM**
**Effects of Cr on High-temperature Tensile Properties in High-Ni-containing Austenitic Cast Steels**: *Jisung Yoo*[1]; Won-Mi Choi[1]; Byeong-Joo Lee[1]; Yong-Jun Oh[2]; Seongsik Jang[3]; Sunghak Lee[1]; [1]A Center for Advanced Aerospace Materials Pohang University of Science and Technology; [2]Department of Advanced Materials Engineering Hanbat National University; [3]Research and Development Center Key Yang Precision

**10:40 AM**
**High Temperature Creep Behavior of a Fe-20Cr-25Ni Based Austenitic Stainless Steel**: *Martin Taylor*[1]; Harrison Pugesek[1]; Jose Ruiz Ramirz[1]; Nicholas Shaber[1]; Indrajit Charit[1]; Gabriel Potirniche[1]; Robert Stephens[1]; [1]University of Idaho

**11:00 AM**
**Creep Behavior and Microstructural Characterization of Weld Transition Joints between P91 and AISI 304**: *Javed Akram*[1]; Prasad Kalvala[2]; Mano Misra[2]; [1]3DSIM, LLC; [2]University of Utah

**11:20 AM**
**Processing and Properties of Forged and Cast Haynes 282 Alloy for A-USC Steam Turbine Components**: *Philip Maziasz*[1]; [1]Oak Ridge National Laboratory

## Dynamic Behavior of Materials VIII – Dynamic Response of HCP Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

Wednesday AM
March 14, 2018

Room: 127B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM Invited**
**Characterisation and Understanding of Deformation Fields in Textured Zirconium Deformed at High Rate**: Vivian Tong[1]; Euan Wielweski[2]; *T Ben Britton*[1]; [1]Department of Materials, Imperial College; [2]Glasgow University

**9:10 AM**
**The Mechanical Behaviors and Microstructural Evolution of AZ31B Magnesium Alloy with Gradient Texture under Impact Loading**: *Weiliang Zhang*[1]; Peijie Li[1]; [1]Tsinghua University

**9:30 AM**
**Dynamic Deformation and Failure of Ultrafine-grained Titanium**: *Zezhou Li*[1]; Bingfeng Wang[2]; Shiteng Zhao[1]; Ruslan Z. Valiev[3]; Kenneth S. Vecchio[1]; Marc A. Meyers[1]; [1]University of California,San Diego; [2]Central South China; [3]Institute of Physics of Advanced Materials, Ufa State Aviation Technical University

**9:50 AM**
**Effect of Phase Transformation on High Temperature Dynamic Flow Stresses of CP-Ti**: *Sindhura Gangireddy*[1]; Steven Mates[2]; [1]University of North Texas; [2]National Institute of Standards and Technology

**10:10 AM Break**

**10:30 AM Invited**
**On the Microstructure-property Relationships in Shock Compressed Solids**: *Cyril Williams*[1]; [1]U.S. Army Research Laboratory

**11:10 AM**
**Effects of Thermo-mechanical Processing on the Dynamic Behavior of Additive Manufactured Ti-6Al-4V**: *Andrew Brown*[1]; Adam Gregg[1]; Ali Ameri[1]; JP Escobedo[1]; Paul Hazell[1]; Daniel East[2]; Zakaria Quadir[3]; [1]UNSW Australia; [2]CSIRO ; [3]Curtin University

**11:30 AM**
**Strain Rate and Stress Triaxiality Effects on Ductile Damage of Additive Manufactured Ti-6Al-4V**: *Andrew Ruggiero*[1]; Gianluca Iannitti[1]; Gabriel Testa[1]; Nicola Bonora[1]; Domenico Gentile[1]; [1]University of Cassino

## Electrode Technology Symposium for Aluminum Production – Cathode Materials and Properties

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xianan Liao, Elkem Carbon

Wednesday AM
March 14, 2018

Room: 222C
Location: Phoenix Convention Center

*Session Chairs:* Stian Madshus, Elkem Carbon; Mohamed Mahmoud, Emirates Global Aluminium

**8:30 AM Introductory Comments**

**8:35 AM**
**Transport of Sodium in $TiB_2$ Materials Investigated by a Laboratory Test and DFT Calculations**: Zhaohui Wang[1]; *Arne Petter Ratvik*[1]; Jesper Friis[1]; [1]SINTEF Materials and Chemistry

**9:00 AM**
**Multi-scale Modelling of $TiB_2$ Degradation Using Crystal Elasticity Model and Density Functional Theory**: Afaf Saai[1]; Zhaohui Wang[1]; Micol Pezzotta[1]; Jesper Friis[1]; *Arne Ratvik*[1]; Per Vullum[1]; [1]SINTEF MK

**9:25 AM**
**Simulation on the Initial Stage of Sodium-Graphite Intercalation Using First Principle Calculation**: *Jing Sun*[1]; Jilai Xue[1]; Liu Xuan[1]; Zengjie Wang[1]; Li Lu[1]; [1]University of Science and Technology Beijing (USTB)

**9:50 AM**
**Cathode Structure Optimization Research for Aluminum Reduction Cell**: *Yungang Ban*[1]; Jing Liu[1]; Yu Mao[1]; Jihong Mao[1]; [1]Northeastern University Engineering & Research Institute Co. Ltd

**10:15 AM Break**

**10:30 AM**
**Research on the Penetration of Potassium-based Electrolyte into Dry Barrier Materials**: *Bao Shengzhong*[1]; Chai Dengpeng[1]; Shi Zhirong[1]; [1]Zhengzhou Non-ferrous Metals Research Institute Co.Ltd of Chalco

**10:55 AM**
**Development and Application of Electrocalciners with Increased Calcination Temperature**: *Yi Yang*[1]; Shikai Gong[1]; Xiaosong Zhou[1]; Qianjin Ning[1]; [1]Guiyang Aluminum Magnesium Design and Research Institute

## Environmentally Assisted Cracking: Theory and Practice – Stress Corrosion Cracking II

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Bai Cui, University of Nebraska–Lincoln; Raul Rebak, GE Global Research; Sebastien Dryepondt, Oak Ridge National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Wednesday AM
March 14, 2018
Room: 105A
Location: Phoenix Convention Center

*Session Chairs:* Karl Sieradzki, Arizona State University; Sergei Shipilov, Oak Ridge National Laboratory

**8:30 AM Invited**
**Dealloying Induced Stress Corrosion Cracking**: *Karl Sieradzki*[1]; Nilesh Badwe[1]; Xiying Chen[1]; Erin Karasz[1]; Ariana Tse[1]; [1]Arizona State University

**9:10 AM**
**Electrochemical-mechanical Interactions in an Aluminum Alloy under Slow Strain Rate Stress Corrosion Cracking**: *Xinzhu Zheng*[1]; Homero Castaneda[1]; Ankit Srivastava[1]; [1]Texas A&M University

**9:30 AM**
**Corrosion Crack Propagation Modeling Using Meshless Peridynamics Approach**: *Srujan Rokkam*[1]; Michael Brothers[1]; Max Gunzburger[2]; Kishan Goel[3]; [1]Advanced Cooling Technologies, Inc.; [2]Florida State University; [3]Naval Air Systems Command

**9:50 AM Break**

**10:10 AM Invited**
**From First Discoveries in the Late 1800s to Mechanistic Understanding and Radiation Effects in the Early 2000s: Over 140 Years of Stress Corrosion Cracking Research**: *Sergei Shipilov*[1]; [1]Oak Ridge National Laboratory

**10:50 AM**
**EAC Behavior of Modified Duplex Stainless Steel Bars in Seawater**: *Kewei Gao*[1]; Haisheng Tong[1]; Xiaolu Pang[1]; Yanjing Su[1]; Yanhui Sun[1]; [1]University of Science and Technology Beijing

**11:10 AM**
**The Stress Corrosion Cracking Mechanism of a Cu-free Al-Zn-Mg Alloy in Sodium Chloride Solutions**: *Christoph Altenbach*[1]; Daniela Zander[1]; [1]RWTH Aachen University

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Fatigue Characterization Using Advanced Experimental Methods in 2D and 3D

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Wednesday AM
March 14, 2018
Room: 125B
Location: Phoenix Convention Center

*Session Chair:* Antonios Kontsos, Drexel University

**8:30 AM**
**Miniaturised Ultrasonic Fatigue Testing in Torsion**: Tinger Wen[1]; *Jicheng Gong*[1]; Angus Wilkinson[1]; [1]University of Oxford

**8:50 AM**
**The Effect of Grain Size on Low Cycle Fatigue and Cyclic Stress Strain Behavior of Unalloyed Mg**: *Aeriel Murphy*[1]; John Allison[1]; [1]University of Michigan

**9:10 AM**
**Nickel-titanium-hafnium Alloy Design for Tribological Systems**: *Sean Mills*[1]; Christopher Dellacorte[2]; Ronald Noebe[2]; Aaron Stebner[1]; [1]Colorado School of Mines; [2]NASA Glenn Research Center

**9:30 AM**
**Analysis of Crack Initiation and Early Growth in Ti Using Miniaturised Ultrasonic Fatigue Testing**: *Arutyun Arutyunyan*[1]; Jicheng Gong[1]; Angus Wilkinson[1]; [1]University of Oxford

**9:50 AM Break**

**10:10 AM**
**Fatigue Damage Precursor Effects on the Dynamic Properties of a-Iron**: *Joseph Indeck*[1]; Cyril Williams[2]; Kavan Hazeli[1]; [1]University of Alabama in Huntsville; [2]U.S. Army Research Laboratory

**10:30 AM**
**Cyclic Deformation Induced Twinning in an Austenitic Ferritic Two Phase Alloy during Low Cycle Fatigue**: Guocai Chai[1]; *Guocai Chai*[2]; Lars Ewenz[3]; Katarina Persson[1]; Martina Zimmermann[3]; [1]Sandvik Materials Technology; [2]Linköping University ; [3]Dresden Technical University

## Federation of European Materials Societies (FEMS) Keynote Symposium: Energy and Transportation from a European Materials Perspective – Keynote Session I

*Sponsored by:* Federation of European Materials Societies (FEMS)
*Program Organizer:* Brett Suddell, Federation of European Materials Societies (FEMS)

Wednesday AM
March 14, 2018
Room: 228A
Location: Phoenix Convention Center

*Session Chair:* Brett Suddell, Federation of European Materials Societies (FEMS)

**8:30 AM Introductory Comments**

**8:35 AM Invited**
**Materials and Energy: The Need for a Systemic Approach**: *Yves Brechet*[1]; [1]Grenoble INP and High Commissioner to Atomic Energy, France

**9:05 AM Invited**
**A European Corporate R&D View: New Materials and Processes in Transportation and Energy**: *Winfried Keiper*[1]; [1]Bosch Corporate Research, Germany

**9:35 AM Invited**
**Third Generation Solar Cells from Laboratory to Factory: Developing a Scale-up Route for Perovskite Solar Cells to Turn 'Buildings into Power Stations'**: *David Worsley*[1]; Trystan Watson; [1]Swansea University, United Kingdom

**10:05 AM Break**

**10:25 AM Invited**
**European Efforts in the Development of High-Quality Metallic Components for Energy and Transport Applications**: *David Jarvis*[1]; [1]HIPtec, Norway

**10:55 AM Invited**
**Fatigue Micromechanisms and Failure Analysis of Rail Steels**: *Donato Firrao*[1]; R. Doglione[1]; Paolo Matteis[1]; S. Rossi[2]; R. Sesana[3]; [1] DISAT, Politecnico di Torino, Italy; [2]Rete Ferroviaria Italiana SpA, Italy; [3]DIMEAS, Politecnico di Torino, Italy

**11:25 AM Panel Discussion**
This discussion will be moderated by Pedro Dolabella Portella.

## Frontiers in Solidification Science and Engineering – Nucleation and Grain Refinement

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee
*Program Organizers:* Mohsen Asle Zaeem, Missouri University of Science and Technology; Damien Tourret, IMDEA Materials Institute; Mohsen Eshraghi, California State University, Los Angeles; Johannes Hötzer, University of Applied Science Karlsruhe

Wednesday AM
March 14, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chair:* Damien Tourret, IMDEA Materials

**8:30 AM**
**Nucleation Modes in a Hydrodynamic Phase-field Crystal Model of Solidification**: Laszlo Granasy[1]; *Frigyes Podmaniczky*[1]; Gyula Tóth[1]; [1]Wigner Research Centre for Physics

**8:50 AM**
**Investigating Nucleation Phenomena and Equilibrium/Non-equilibrium Phases in Rapid Solidification of Binary Al-Cu Alloys**: Avik Mahata[1]; *Mohsen Asle Zaeem*[1]; Michael Baskes[2]; [1]Missouri University of Science and Technology; [2]University of California, San Diego

**9:10 AM**
**Kinetic Factor in the Nucleation Rate of Stoichiometric Compounds**: *Huajing Song*[1]; Yang Sun[1]; Feng Zhang[1]; Cai-zhuang Wang[1]; Kai-Ming Ho[2]; Mikhail Mendelev[1]; [1]Ames Laboratory, US Department of Energy; [2]Iowa State University

**9:30 AM**
**Modeling of Twin Growth during Directional Solidification of Polycristalline Silicon**: *Adrian Pineau*[1]; Gildas Guillemot[1]; Charles-Andre Gandin[1]; [1]MINES ParisTech

**9:50 AM**
**Influence of Ta on Solidification Behaviour of Undercooled Ni-Ta Alloys**: Matthias Kolbe[1]; *Masoumeh Faraji*[2]; Thomas Lierfeld[3]; Gunther Eggeler[4]; Dieter Herlach[1]; [1]German Aerospace Center; [2]Coventry University; [3]SGL Group; [4]Ruhr- Universität Bochum

**10:10 AM Break**

**10:30 AM**
**Investigating the Impact of Inoculation on Al Based Alloys**: *Mareike Wegener*[1]; Maike Becker[1]; Matthias Kolbe[1]; Florian Kargl[1]; [1]German Aerospace Center (DLR)

**10:50 AM**
**Inoculation in Lab Scale Low Alloyed Steel Castings**: *Marvin Gennesson*[1]; Dominique Daloz[2]; Julien Zollinger[2]; Bernard Rouat[2]; Hervé Combeau[2]; Joëlle Demurger[3]; Delphine Poirier[3]; [1]Institut Jean Lamour / Asco Industries; [2]Institut Jean Lamour; [3]Asco Industries

**11:10 AM**
**Solidification of Al Alloys Investigated by HAADF-STEM, EELS, and APT**: *Jiehua Li*[1]; [1]University of Leoben

**11:30 AM**
**Solidification of a Mushy Zone in a Static Temperature Gradient: Phase-field Simulations**: *Guillaume Boussinot*[1]; Markus Apel[1]; Alexandre Viardin[1]; [1]Access e.V.

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Wednesday AM
March 14, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* E-Wen Huang, National Chiao Tung University; Shou-Yi Chang, National Tsing Hua University

**8:30 AM Invited**
**Sluggish Phase Transition in CoCrFeMnNi High Entropy Alloy: Collective Structural Modulation**: *E-Wen Huang*[1]; Yu-Lun Jao[1]; Jayant Jain[2]; Wan Chuck Woo[3]; An-Chou Yeh[4]; [1]National Chiao Tung University; [2]IIT Delhi; [3]Korea Atomic Energy Research Institute; [4]National Tsing Hua University

**8:50 AM**
**In-situ Synchrotron X-ray Diffraction Characterization of High Entropy Alloys for Hydrogen Storage Applications**: *Guilherme Zepon*[1]; Daniel Leiva[1]; Renato Strozi[2]; Vinicius Aranda[1]; Santiago Figueroa[3]; Walter Botta[1]; [1]Department of Materials Engineering - Federal University of São Carlos; [2]Graduate Program of Materials Science and Engineering - Federal University of São Carlos; [3]Brazilian Synchrotron Ligth Laboratory

**9:10 AM Invited**
**Probing Local Lattice Distortion in High-entropy Alloys**: *Yang Tong*[1]; Gihan Velisa[1]; Taini Yang[2]; Ke Jin[1]; Chenyang Lu[2]; Hongbin Bei[1]; J. Ko[3]; D. Pagan[3]; R. Huang[3]; Y. Zhang[1]; L. Wang[2]; F. Zhang[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan; [3]Cornell University

**9:30 AM Invited**
**Radiation Effects in High Entropy Alloys Revealed by Atom Probe Tomography**: *Jonathan Poplawsky*[1]; Wei Guo[1]; Wei-Ying Chen[2]; Rui Feng[3]; Tengfei Yang[3]; Haoyin Diao[3]; Peter Liaw[3]; [1]Oak Ridge National Laboratory; [2]Argonne National Laboratory; [3]The University of Tennessee

**9:50 AM Invited**
**Real-time Mapping of Local Dissolution Processes in $Al_x$CoCrFeNi High-entropy Alloys**: *Yunzhu Shi*[1]; Bin Yang[1]; Liam Collins[2]; Nina Balke[2]; Peter Liaw[3]; [1]University of Science and Technology Beijing; [2]Oak Ridge National Laboratory; [3]The University of Tennessee

**10:10 AM Break**

**10:30 AM Invited**
**Loss of Crystallographic Anisotropy and Deformation Heterogeneity in FCC and BCC High-entropy Alloys**: Chi-Huan Tung[1]; Wen-Ju Chen[1]; Tai-Jan Huang[1]; Yu-Chieh Lo[2]; *Shou-Yi Chang*[1]; [1]National Tsing Hua University; [2]National Chiao Tung University

**10:50 AM**
**Measurement of Equilibrium Concentrations of Vacancies in High-entropy Alloy Co-Cr-Ni by In-situ Neutron Diffraction**: *Yu-Lun Jao*[1]; E-Wen Huang[1]; [1]National Chiao Tung University

**11:10 AM Invited**
**In Situ Ion Irradiation on Al-Co-Cr-Fe-Ni High Entropy Alloys**: Jing Hu[1]; *Meimei Li*[1]; Rui Feng[2]; Mark Kirk[1]; Peter Liaw[2]; [1]Argonne National Laboratory; [2]University of Tennessee

**11:30 AM Invited**
**Core Structure of ½<111> Screw Dislocations in Refractory BCC High Entropy Alloys**: *Yi-Shen Lin*[1]; Vaclav Vitek[1]; [1]University of Pennsylvania

**11:50 AM Invited**
**Separation of Static and Dynamic Displacements in CrMnFeCoNi**: *Lewis Owen*[1]; Helen Playford[2]; Howard Stone[1]; Nicholas Jones[1]; [1]University of Cambridge; [2]ISIS Neutron and Muon Source

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Wednesday AM
March 14, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* Michael Bakas, U.S. Army Research Office; Michael Widom, Carnegie Mellon University

**8:30 AM Invited**
**Complex Multicomponent Alloys: From High-throughput Calculations to Microstructure Effects in High Entropy Alloys**: *James Morris*[1]; [1]Oak Ridge National Laboratory

**8:50 AM Invited**
**First-principles Prediction of High-entropy-alloy Stability**: *Michael Widom*[1]; Rui Feng[2]; Peter Liaw[2]; Michael Gao[3]; [1]Carnegie Mellon University; [2]University of Tennessee; [3]National Energy Technology Laboratory

**9:10 AM Invited**
**Atomistic Monte Carlo Modeling of the Microstructures of High Entropy Alloys**: *Guofeng Wang*[1]; [1]University of Pittsburgh

**9:30 AM Invited**
**The Melting of Ultra-high Temperature Refractory High Entropy Alloys: An Ab Initio Molecular Dynamics Study**: *William Yi Wang*[1]; Bin Gan[1]; Jun Wang[1]; Deye Lin[2]; Bin Tang[1]; Shun-Li Shang[3]; Hongchao Kou[1]; Haifeng Song[2]; Xi-Dong Hui[4]; Yiguang Wang[1]; Jinshan Li[1]; Peter Liaw[5]; Zi-Kui Liu[3]; [1]Northwestern Polytechnical University; [2]Institute of Applied Physics and Computational Mathematics; [3]The Pennsylvania State University; [4]University of Science and Technology Beijing; [5]The University of Tennessee

**9:50 AM Invited**
**Life at the Edge: Nudging High-entropy Alloy Systems along Different Pathways**: *M. Kramer*[1]; Duane Johnson[1]; Pratik Ray[1]; [1]Iowa State University

**10:10 AM Break**

**10:30 AM Invited**
**Predictive Modeling of the Elastic Properties of Refractory High Entropy Alloys**: *Wei Chen*[1]; Peter Liaw[2]; [1]Illinois Institute of Technology; [2]University of Tennessee

**10:50 AM**
**Computational Investigations of Mechanical Behavior of AlxCrCoFeNi High-entropy Alloy**: Yu-Chia Yang[1]; Cuixia Liu[1]; Chun-Yu Lin[1]; *Zhenhai Xia*[1]; [1]University of North Texas

**11:10 AM**
**The Role of Short-range Order on the Dislocation Behavior in BCC and FCC Multicomponent Solid Solution Alloys Using Atomistic Simulations**: *Edwin Antillon*[1]; Satish Rao[1]; Christopher Woodward[2]; Triplicane Parthasarathy[1]; Oleg Senkov[1]; Brahim Akdim[1]; [1]AFRL/UES; [2]AFRL

**11:30 AM Invited**
**Atomistic Simulations of Dislocation Behavior in BCC and FCC Multicomponent Solid Solution Alloys**: *Satish Rao*[1]; Edwin Antillon[1]; Christopher Woodward[2]; Brahim Akdim[1]; Triplicane Parthasarathy[1]; Oleg Senkov[1]; [1]UES Inc.; [2]Air Force Research Laboratory

## High Temperature Corrosion of Structural Materials – Ni-base Alloys and Corrosive Environments at Elevated Temperatures

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
*Program Organizers:* Kinga Unocic, Oak Ridge National Laboratory; David Shifler, Office of Naval Research; Mark Weaver, University of Alabama; Steve Coryell, Special Metals; James Earthman, University of California, Irvine

Wednesday AM
March 14, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* Kinga Unocic, Oak Ridge National Laboratory; David Shifler, Office of Naval Research

**8:30 AM Invited**
**Oxide Scale Formation on Cast Ni-base Superalloys in High $pO_2$-environments: Effect of Alloying Additions and Presence of Water Vapor in the Test Gas**: *Dmitry Naumenko*[1]; Katja Wollgarten[1]; Timur Galiullin[1]; Wojciech Nowak[2]; Willem Josef Quadakkers[1]; [1]Forschungszentrum Juelich GmbH; [2]Rzeszów University of Technology

**9:00 AM**
**The Interaction between Applied Stress and Oxidation in a Coarse Grain Ni-based Superalloy at Temperatures above 700 °C**: *Joshua Ramsay*[1]; Mary Taylor[1]; Hugh Evans[1]; Dan Child[2]; Hang Li[1]; Paul Bowen[1]; [1]University of Birmingham; [2]Rolls-Royce plc.

**9:20 AM**
**The Effect of Titanium Additions on the Oxidation Properties of Ni-Cr-Al Ternary Alloys**: *Thomas Reynolds*[1]; Mary Taylor[1]; Mark Hardy[2]; Hugh Evans[1]; [1]University of Birmingham; [2]Rolls-Royce plc

**9:40 AM**
**Outward Diffusion through Protective Alumina on NiAl-alloys**: *Torben Boll*[1]; Olof Bäcke[2]; Martin Heilmaier[1]; Krystyna Stiller[2]; [1]Karlsruhe Institute for Technology; [2]Department of Physics, Chalmers University of Technology

**10:00 AM Break**

**10:20 AM**
**Oxidation Mechanism of NiAl-Mo Alloys: Insights from a Cellular Automaton Approach**: *Pratik Ray*[1]; Mufit Akinc[2]; Matthew Kramer[1]; [1]Ames Laboratory, US-DOE; [2]Iowa State University

**10:40 AM**
**Oxidation of Transient Liquid Phase Bonded Ni Alloys in High-temperature $CO_2$**: *Ömer Dogan*[1]; Monica Kapoor[1]; Richard Oleksak[1]; Casey Carney[1]; Gordon Holcomb[1]; [1]National Energy Technology Laboratory

**11:00 AM**
**Effects of $CO_2$ on Fatigue and Creep Properties of the Ni-base Alloy 282**: *Kinga Unocic*[1]; Amit Shyam[1]; Sebastien Dryepondt[1]; Philip Maziasz[1]; [1]Oak Ridge National Laboratory

**11:20 AM**
**Evaluating the Influence of $CO_2$ Purity on the Corrosion of Structural Alloys for Supercritical $CO_2$ Power Cycles**: *Matthew Walker*[1]; Elizabeth Withey[1]; Alan Kruizenga[1]; [1]Sandia National Laboratories (Livermore)

## Hume-Rothery Award Symposium: Computational Thermodynamics and Its Implications to Kinetics, Properties, and Materials Design – Data Science and Diffusion

*Sponsored by:* TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Michael Gao, National Energy Technology Lab; Chelsey Hargather, New Mexico Institute of Mining and Technology; Richard Hennig, University of Florida; James Saal, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

Wednesday AM
March 14, 2018

Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* Suveen Mathaudhu, University of California, Riverside; Raymundo Arróyave, Texas A&M University

**8:30 AM Invited**
**Alloy Design as the Solution to a Continuous Constraint Satisfaction Problem**: *Raymundo Arroyave*[1]; Anas Abu-Odeh[1]; Tann Kirk[1]; Edgar Galvan[1]; Richard Malak[1]; [1]Texas A & M University

**9:00 AM Invited**
**Rapid and Systematic Data Collection for Computational Thermodynamics and Kinetics**: *Ji-Cheng Zhao*[1]; [1]The Ohio State University

**9:30 AM Invited**
**Computational Thermodynamics: Humans and Machines**: *Marius Stan*[1]; [1]Argonne National Laboratory

**10:00 AM Break**

**10:20 AM Invited**
**Mass and Heat Diffusion and Thermotransport in Liquid Alloys**: *Graeme Murch*[1]; [1]The University of Newcastle

**10:50 AM Invited**
**First-principles Calculation of Self-diffusion of Oxygen in Zirconia**: *Ying Chen*[1]; Hubin Luo[2]; Tetsuo Mohri[1]; [1]Tohoku University; [2]Chinese Academy of Sciences

**11:20 AM Invited**
**The Future of Aerospace Applications of Additive Manufacturing: Opportunities, Optimization and Modeling**: *Andrew Shapiro*[1]; [1]Jet Propulsion Laboratory

**11:50 AM Invited**
**Mixed-space Approach to Phonons for Polar Materials and its Connection with the Calculations of Seebeck Coefficient**: *Yi Wang*[1]; Long Qing Chen[1]; Zi-Kui Liu[1]; [1]Pennsylvania State University

## Integrative Materials Design III: Performance and Sustainability – Integrative Materials Design and Manufacturing: Approaches, Advances, and Applications

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories; Corbett Battaile, Sandia National Laboratories; Anastasios Gavras, Riley Power

Wednesday AM
March 14, 2018

Room: 132A
Location: Phoenix Convention Center

*Session Chairs:* Wenjun Cai, University of South Florida; Brad Boyce, Sandia National Laboratories

**8:30 AM Invited**
**Nuances in Addressing Multilevel Materials Design Problems**: *David McDowell*[1]; [1]Georgia Institute of Technology

**8:50 AM Invited**
**Hierarchical Microstructural Paradigms for Achieving Exceptional Strength and Ductility**: *Rajiv Mishra*[1]; [1]University of North Texas

**9:10 AM Invited**
**The Effects of Microstructural Evolution during Hot- and Warm-forming of Aluminum Alloy Sheet on Pervice Performance**: *Eric Taleff*[1]; [1]The University of Texas at Austin

**9:30 AM Invited**
**Improved Formability of Aluminium Alloys at Low Temperatures for Automotive Application**: *Belinda Gruber*[1]; Florian Grabner[2]; Thomas Kremmer[1]; Stefan Kirnstötter[3]; Robert Schneider[4]; Robin Schäublin[5]; Peter Uggowitzer[5]; Stefan Pogatscher[1]; [1]Montanuniversitaet Leoben; [2]Leichtmetallkompetenzzentrum Ranshofen GmbH; [3]AMAG Rolling GmbH; [4]Voestalpine Automotive Components Schwäbisch Gmünd GmbH & Co. KG; [5]ETH Zürich

**9:50 AM Invited**
**Magnesium Based Metal Matrix Nanocomposites - Processing and Properties**: Hajo Dieringa[1]; *Norbert Hort*[1]; [1]Helmholtz-Zentrum Geesthacht

**10:10 AM Break**

**10:25 AM Invited**
**Thermodynamically Stable Nanocrystalline Al, Ni and Ag Alloys by Electrodeposition**: Rose Roy[1]; *Robert Hilty*[1]; Alyssa Kelley[1]; [1]Xtalic Corporation

**10:45 AM Invited**
**Optimizing Wear and Corrosion Resistance of Superlattice Coatings through Atomic-scale Design**: *Wenjun Cai*[1]; [1]University of South Florida

**11:05 AM Invited**
**Increased Materials Reliability via Shot Peening: Simulations and Experiments**: Siavash Gahnbari[1]; Raheleh Rahimi[1]; *David Bahr*[1]; [1]Purdue University

**11:25 AM Invited**
**Designing a Resilient Carburization Heat Treating Process**: *Richard Sisson*[1]; Lei Zhang[1]; Jaiqi Ren[1]; Mei Yang[1]; [1]Worcester Polytechnic Institute, Center for Heat Treating Excellence

**11:45 AM Invited**
**Microstructure Evolution of the High Temperature Intermetallic Phase $Al_4Fe_{1.7}Si$**: *Sujeily Soto-Medina*[1]; Giulia Perina[1]; Nicholas Etrick[1]; Biswas Rijal[1]; Richard Hennig[1]; Michele Manuel[1]; [1]University of Florida

## Magnesium Alloy Development: An LMD Symposium in Honor of Karl Kainer – Degradation and Microstructure

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Norbert Hort, Helmholtz-Zentrum Geesthacht; Alan Luo, The Ohio State University

Wednesday AM
March 14, 2018

Room: 223
Location: Phoenix Convention Center

*Session Chairs:* Dietmar Letzig, MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht; Mark Easton, Royal Melbourne Institute of Technology University

**8:30 AM Keynote**
**Degradable Magnesium Implants - Assessment of the Current Situation**: *Regine Willumeit-Roemer*[1]; Nezha Ahmad Agha[1]; Berengere Luthringer[1]; [1]Helmholtz-Zentrum Geesthacht

**9:00 AM**
**Study on Mg-Si-Sr Ternary Alloys for Biomedical Applications**: *Omer Van der Biest*[1]; Andrea Gil-Santos[1]; Norbert Hort[2]; Rainer Schmid-Fetzer[3]; Nele Moelans[1]; [1]K.U. Leuven; [2]Helmholtz-Zentrum Geesthacht; [3]Clausthal University of Technology

**9:20 AM**
**Biodegradable Mg-Y and Mg-Li Alloys with the Addition of Ca and Zn for Medical Application**: *Sonia Boczkal*[1]; Michal Karas[1]; Anna M. Osyczka[2]; Marzena Lech-Grega[1]; [1]Institute of Non-Ferrous Metals, Light Metals Division, Skawina, Poland; [2]Jagiellonian University, Faculty of Biology and Earth Sciences, Cracow, Poland

**9:40 AM Invited**
**Co-precipitation on the Basal and Prismatic Planes in Mg-Gd-Ag-Zr Alloy Subjected to Over-ageing**: *Jiehua Li*[1]; [1]University of Leoben

**10:00 AM Break**

**10:20 AM**
**Intermetallic Phase Characteristics in the Mg-Nd-Zn System**: *Domonkos Tolnai*[1]; Samuel Hill[1]; Serge Gavras[1]; Tungky Subroto[1]; Ricardo Buzolin[2]; Norbert Hort[1]; [1]Helmholtz Zentrum Geesthacht; [2]Graz University of Technology

**10:40 AM Invited**
**Solidification Analysis of Grain Refined AZ91D Magnesium Alloy via Neutron Diffraction**: *Tyler Davis*[1]; Lukas Bichler[1]; Dimitry Sediako[1]; Levente Balogh[2]; [1]University of British Columbia; [2]Canadian Nuclear Laboratories

**11:00 AM**
**Evolution of the Dislocation Structure during Compression in a Mg-Zn-Y Alloy with Long Period Stacking Ordered Structure**: *Kristian Máthis*[1]; Moustafa El-Tahawy[2]; Gerardo Garcés[3]; Jeno Gubicza[2]; [1]Faculty of Mathematics and Physics, Charles University; [2]Eötvös Loránd University; [3]CENIM-CSIC

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Structural Materials II

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Wednesday AM
March 14, 2018

Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Stuart Maloy, Los Alamos National Laboratory; Brian Cockeram, Bechtel-Bettis

**8:30 AM Invited**
**Microstructure Evolution in Neutron Irradiated and Ion Irradiated Alloy T91**: *Gary Was*[1]; Stephen Taller[1]; Zhijie Jiao[1]; Kevin Field[2]; [1]University of Michigan; [2]Oak Ridge National Laboratory

**9:10 AM**
**The ATR-2 RPV Steel Irradiation Hardening Data Base: An Overview and Some Major Findings**: *Nathan Almirall*[1]; Peter Wells[1]; Takuya Yamamoto[1]; David Gragg[1]; Kirk Fields[1]; G. R. Odette[1]; Randy Nanstad[2]; Keith Wilford[3]; Tim Williams[3]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory; [3]Rolls Royce

**9:30 AM**
**Microstructure Based Hardening Models for Alloys Irradiated with Charged Particles an in the ATR and BOR60 Reactors**: *Takuya Yamamoto*[1]; Peter Wells[1]; Emanuelle Marquis[2]; Dhriti Bhattacharyya[3]; Tarik Saleh[4]; Stuart Maloy[4]; G. Robert Odette[1]; [1]University of California, Santa Barbara; [2]University of Michigan; [3]ANSTO; [4]Los Alamos National Laboratory

**9:50 AM**
**Effect of 0.25 and 2.0 MeV He-ion Irradiation on Cr Atoms Distribution in Model Fe-Cr Alloys**: *Stanislaw Dubiel*[1]; Jan Zukrowski[1]; Yves Serruys[1]; [1]AGH University of Science and Technology

**10:10 AM Break**

**10:30 AM**
**Radiation Effects on HT9 Tempered Martensitic Steels as a Function of Initial Dislocation Density**: *Eda Aydogan*[1]; Stuart Maloy[1]; Yongqiang Wang[1]; [1]Los Alamos National Laboratory

**10:50 AM**
**Atom Probe Examinations of Zircaloy Irradiated at 358-410C**: *Brian Cockeram*[1]; Phil Edmondson[2]; Keith Leonard[2]; Jim Hollenbeck[1]; [1]NNL Bettis Laboratory; [2]Oak Ridge National Laboratory

**11:10 AM**
**Examining the Effects of Neutron Irradiation on Zirconium-alloy Oxide Film Microstructure Using Focused Ion Beam Techniques**: *Gene Lucadamo*[1]; John Seidensticker[1]; Ram Bajaj[2]; Arash Parsi[3]; [1]Bettis Laboratory, NNL; [2]Bettis Laboratory, NNL (retired); [3]Westinghouse Electric Company

**11:30 AM**
**Post-irradiation Examination (PIE) of Irradiated Hafnium**: *Ken Anderson*[1]; Brandon Miller[2]; Jeffery Aguiar[3]; Jason Gruber[1]; Richard Smith[1]; [1]Naval Nuclear Laboratory; [2]Idaho National Laboratory-Materials & Fuels Complex; [3]Idaho National Laboratory-Fuel Design and Development

## Materials for Energy Conversion and Storage – Functional Materials I

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Wednesday AM
March 14, 2018

Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Kyle Brinkman, Clemson University; Ritesh Sachan, ARL, North Carolina

**8:30 AM**
**An Intermediate-temperature Oxygen Transport Membrane Based on Rare-earth Doped Bismuth Oxide**: *Kyle Brinkman*[1]; Mingyang Zhao[1]; Tao Hong[1]; Frank Chen[2]; Shumin Fang[3]; Siwei Wang[3]; Hailiang Zhang[3]; [1]Clemson University; [2]University of South Carolina; [3]Nanowise LLC

**8:50 AM Invited**
**Understanding Elasticity of Novel Porous Ceramics at Different Physical Conditions**: *Joseph Gladden*[1]; Ashoka Karunarathne[1]; Gautam Priyadarshan[1]; Amit Pandey[2]; [1]University of Mississippi; [2]LG Fuel Cell Systems Inc.

**9:15 AM Invited**
**Interfacial Charge Transfer Dynamics in Graphene-inorganic 'Hybrids' with Transition Metal Oxides Using In-situ Raman Spectroelectrochemistry**: *Sanju Gupta*[1]; [1]Western Kentucky University

**9:40 AM**
**Superionicity Emanating from Jammed States**: *Venkata Annamareddy*[1]; Jacob Eapen[1]; [1]North Carolina State University

**10:00 AM Break**

**10:15 AM**
**Silicon/Graphite Nanocomposites with a Thin Carbon Shell: How Etching Enhances the Electrochemical Performance of Si-based Composite**: *Maziar Ashuri*[1]; Qianran He[1]; Leon Shaw[1]; [1]Illinois Institute of Technology (IIT)

**10:35 AM**
**Using a Catalyst to Enhance the Free Corrosion Dealloying Rate & Application of Nanoporous Materials as Alloy-type Anodes in Alkali Ion Batteries**: *Eric Detsi*[1]; [1]University of Pennsylvania

**10:55 AM**
**In Situ Imaging and Spectroscopy of Carbon Deposition on a Ni/$CeO_2$ Catalyst**: *Ethan Lawrence*[1]; Peter Crozier[1]; [1]Arizona State University

**11:15 AM**
**Combinatorial Development of Hetero-structured LSC-113 and LSC-214 Perovskite Cathode for High ORR Activity**: *Dogancan Sari*[1]; Ziya Torunoglu[1]; Yunus Kalay[1]; Tayfur Ozturk[1]; [1]Middle East Technical University

**11:35 AM**
**Formation and Corrosion Properties of $Zr_{50}Al_{10}Cu_{30}Au_{10}$ and $Zr_{41}Cu_{41}Al_8Ag_6Au_4$ Bulk Glassy Alloys**: *El-Sayed Shalaan*[1]; Akihisa Inoue[2]; Fahad Al-Marzouki[1]; Saleh Al-Heniti[1]; Abdullah Obaid[1]; [1]King Abdulaziz University; [2]Josai International University

## Mechanical Behavior at the Nanoscale IV – Material Properties in Small Dimensions

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Wednesday AM
March 14, 2018

Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Seok-Woo Lee, University of Connecticut; Wendy Gu, Stanford University

**8:30 AM Invited**
**Solution Growth of Single-crystalline Intermetallic Compounds and their Mechanical Behaviors at Small Length Scales**: *Seok-Woo Lee*[1]; John Sypek[1]; Keith Dusoe[1]; Gyuho Song[1]; Paul Canfield[2]; Sergey Budko[3]; Christopher Weinberger[4]; [1]University of Connecticut; [2]Iowa State University; [3]Ames Laboratory; [4]Colorado State University

**9:00 AM**
**Size-dependent Pseudo-elasticity in Gold Nanocrystals**: *X. Wendy Gu*[1]; Lindsey Hanson[2]; A. Paul Alivisatos[3]; [1]Stanford University; [2]Trinity College; [3]UC Berkeley

**9:20 AM**
**Stress-dependent Activation Volumes in Au Nanowires**: *Christian Brandl*[1]; [1]Karlsruhe Institute of Technology

**9:40 AM**
**Plasticity of Face-centered Cubic Metallic Nanoparticles under Uniaxial Compression**: Selim Bel Haj Salah[1]; *Celine Gerard*[1]; Laurent Pizzagalli[1]; [1]Institut Pprime, CNRS - ENSMA - Université de Poitiers

**10:00 AM Break**

**10:20 AM**
**Slip Dynamics in Small-scale Crystals and the Transition from Intermittent to Smooth Flow**: Gregory Sparks[1]; *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign

**10:40 AM**
**The Extreme Value Statistics of Intermittent Plasticity**: *Peter Derlet*[1]; Robert Maass[2]; [1]Paul Scherrer Institut; [2]University of Illinois at Urbana-Champaign

**11:00 AM**
**Ultrahigh Strength and Fracture of Metallic and Semiconductor Nanowires**: *Yang Lu*[1]; [1]City University of Hong Kong

**11:20 AM**
**Stress-strain Responses from Spherical Nanoindentation and Micro-pillar Compression Experiments in Fe-3% Si: A Comparative Study**: *Soumya Varma*[1]; Jordan Weaver[2]; Johann Michler[3]; Surya Kalidindi[4]; Siddhartha Pathak[1]; [1]University of Nevada Reno; [2]Los Alamos National Laboratory; [3]EMPA – Swiss Federal Laboratories for Materials Testing and Research; [4]Woodruff School of Mechanical Engineering, Georgia Institute of Technology

**11:40 AM**
**Loading Sequence Dependent Deformation Mode of FCC Nanowires**: *Sangryun Lee*[1]; Ill Ryu[2]; Seunghwa Ryu[1]; [1] Korea Advanced Institute of Science and Technology; [2]University of Texas at Dallas

## Mechanical Behavior at the Nanoscale IV – Temperature, Rate and Environmental Effects

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Wednesday AM
March 14, 2018

Room: 103A
Location: Phoenix Convention Center

*Session Chairs:* Jaime Marian, UCLA; Nathan Mara, Los Alamos National Lab

**8:30 AM Invited**
**Understanding the Fundamental Mechanisms of Serrated Flow in BCC Alloys Using Computational Modeling**: *Jaime Marian*[1]; Yue Zhao[1]; Lucile Dezerald[2]; [1]University of California, Los Angeles; [2]Université de Lorraine

**9:00 AM**
**Mechanical Properties of Rapidly Solidified $Ni_5Ge_3$ Intermetallic**: *Nafisul Haque*[1]; Robert Cochrane[1]; Andrew Mullis[1]; [1]University of Leeds

**9:20 AM**
**Determination of Crack Tip Stress around the Notch of IN-617 by Using Nano Mechanical Raman Spectroscopy**: *Debapriya Mohanty*[1]; Yang Zhang[1]; Vikas Tomar[1]; [1]Purdue University

**9:40 AM**
**Dynamic TEM In Situ Mechanical Testing: Characterization of Defects Motion at High Strain Rates**: *Thomas Voisin*[1]; Michael D.[1]; Tian Li[1]; Jonathan Ligda[2]; Nicholas Lorenzo[2]; Brian Schuster[2]; Melissa Santala[1]; Yong Zhang[3]; Xiaolong Ma[3]; Geoffrey Campbell[1]; Timothy Weihs[3]; [1]Lawrence Livermore National Laboratory; [2]Army Research Laboratory; [3]Johns Hopkins University

**10:00 AM Break**

**10:20 AM Invited**
**High-throughput Nanomechanical Characterization of Fe-alloys for Service under Extreme Conditions**: *Nathan Mara*[1]; Doug Stauffer[2]; Youxing Chen[3]; Jordan Weaver[3]; Siddhartha Pathak[4]; Ashley Reichardt[5]; Peter Hosemann[5]; [1]Los Alamos National Laboratory and the University of Minnesota; [2]Bruker Nano Surfaces; [3]Los Alamos National Laboratory; [4]University of Nevada, Reno; [5]University of California, Berkeley

**10:50 AM**
**Temperature Effect on the Stochastic Plasticity in BCC Micropillars**: *Nicole Aragon*[1]; Ill Ryu[1]; [1]The University of Texas at Dallas

**11:10 AM**
**Temperature Dependence of Indentation Size Effects on Polycrystalline Tungsten from 25 to 950 C**: *Ben Beake*[1]; Adrian Harris[1]; Dave Armstrong[2]; Johnny Moghal[2]; [1]Micro Materials Ltd; [2]University of Oxford

**11:30 AM**
**Instrumentation for In Operando Characterization**: *Douglas Stauffer*[1]; Eric Hintsala[1]; Syed Asif[1]; [1]Bruker Nano Surfaces

## Multi-material Additive Manufacturing: Processing and Materials Design – Non-beam Based and Emerging AM Technologies for Metals

*Sponsored by:* TMS: Additive Manufacturing Committee

*Program Organizers:* Hang Yu, Virginia Tech; Nanci Hardwick, Aeroprobe Corporation; Steven Boles, Hong Kong Polytechnic University; Blake Barnett, Army Research Laboratory; Michael Gibson, Desktop Metal

Wednesday AM
March 14, 2018

Room: 232C
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM**
**Large-scale Additive Manufacture of MMC and Layered Multi-material Products**: *Chase Cox*[1]; Nanci Hardwick[1]; [1]Aeroprobe Corporation

**8:50 AM**
**Nanomechanical and EBSD Characterization of Thermo-mechanical Additive Manufactured Inconel 625**: *Paul Allison*[1]; Zack McClelland[2]; Dustin Avery[1]; Oscar Rivera[3]; J.B. Jordon[1]; Luke Brewer[1]; Nanci Hardwick[4]; [1]University of Alabama; [2]US Army ERDC; [3]Sikorsky Aircraft Corporation; [4]Aeroprobe Corporation

**9:10 AM**
**Novel High Temperature Drop on Demand Liquid Metal-jetting for the Production of Single and Multi-material 3D Objects**: *Marco Simonelli*[1]; Mark East[1]; Nesma Aboulkhair[1]; Chris Tuck[1]; Richard Hague[1]; [1]University of Nottingham

**9:30 AM Invited**
**A Separable Support Strategy for 3D Printing of Complex Metal Parts**: *Nihan Tuncer*[1]; Jay Tobia[1]; Michael Gibson[1]; Nicholas Mykulowycz[1]; Alexander Barbati[1]; Aaron Preston[1]; Dans Krause; Brian Kernan[1]; Mark Sowerbutts[1]; Dana Krause[1]; Richard Fontana[1]; Jonah Myerberg[1]; Ricardo Fulop[1]; Yet-Ming Chiang[1]; Christopher Schuh[1]; Animesh Bose[1]; Jan Schroers[1]; John Hart[2]; Jay Tobia[1]; [1]Desktop Metal, Inc.; [2]Massachusetts Institute of Technology

**10:00 AM Break**

**10:20 AM**
**Microstructure and Mechanical Properties of Additive Friction Stir Processed Dissimilar Metals**: Biswajit Dalai[1]; Nanci Hardwick[2]; Jianqing Su[2]; Benjamin Sutton[3]; Nicholas Mohr[3]; Seetha Mannava[1]; Young-Sik Pyun[4]; *Vijay Vasudevan*[1]; [1]University of Cincinnati; [2]Aeroprobe Corp; [3]EPRI; [4]Sunmoon University

**10:40 AM**
**Bonding Features and Microstructural Evolution in Cold Sprayed Metallic Coatings and Bulks: A New Materials Perspective**: *Yu Zou*[1]; [1]University of Toronto

**11:00 AM**
**Development of Novel Squeeze Cast High Tensile Strength Al-Si-Cu-Ni-Sr Alloys**: Li Fang[1]; Luyang Ren[1]; Xinyu Geng[1]; *Henry Hu*[1]; Xueyuan Nie[1]; Jimi Tjong[1]; [1]University of Windsor

## Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Metal Matrix Nanocomposites

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Meisha Shofner, Georgia Institute of Technology; Nikhilesh Chawla, Arizona State University

Wednesday AM
March 14, 2018

Room: 102C
Location: Phoenix Convention Center

*Session Chair:* Meisha Shofner, Georgia Institute of Technology

**8:30 AM**
**Super Copper with Populous Self-dispersed Nanoparticles**: *Gongcheng Yao*[1]; Chezheng Cao[1]; Abdolreza Javadi[2]; Xiaochun Li[2]; [1]Department of Materials Science and Engineering, University of California; [2]Department of Mechanical and Aerospace Engineering, University of California

**8:50 AM**
**How to Play with Grain Size and Texture to Tune Mechanical Properties of Architectured Materials: The Case of Cu-Nb (Nano)Composite Wires**: *Ludovic Thilly*[1]; Pierre-Olivier Renault[1]; Florence Lecouturier[2]; [1]Pprime Institute - University of Poitiers; [2]LNCMI-Toulouse

**9:10 AM**
**Rapid Synthesis of Lightweight Metal Matrix Nanocomposite Processed by High-pressure Torsion**: *Megumi Kawasaki*[1]; Jae-il Jang[2]; Terence Langdon[3]; [1]Oregon State University; [2]Hanyang University; [3]University of Southampton

**9:30 AM**
**Mechanochemical Synthesis of Intermetallic Phases in Systems Al - Nb - (Ti) via Mechanical Alloying**: *Petra Hanusova*[1]; [1]Brno University of Technology, Faculty of Mechanical Engineering

**9:50 AM**
**Synthesis and Characterization of Crystalline-amorphous Composite**: *Taiwo Dada*[1]; Olanrewaju Ojo[1]; Chuang Deng[1]; [1]University of Manitoba

**10:10 AM Break**

**10:30 AM**
**Fabrication of Super Al and Mg Powders with Self-dispersed Nanoparticles**: *Abdolreza Javadi*[1]; Shuaihang Pan[1]; Chezheng Cao[1]; Gongcheng Yao[1]; Xiaochun Li[1]; [1]University of California, Los Angeles

**10:50 AM**
**The Effects of Nano-$Al_4C_3$ on Precipitation Hardening and Mechanical Behaviors in Al-5.5Cu Composites**: *Daeyoung Kim*[1]; Jun Yeon Hwang[2]; Hyunjoo Choi[1]; [1]School of Advanced Materials Engineering, Kookmin University; [2]Institute of Advanced Composite Materials, Korea Institute of Science and Technology

**11:10 AM**
**Superplastic Behavior of Ultrafine Grained Aluminium Matrix Nano Composite**: *Suman Deb*[1]; Sushanta Panigrahi[1]; Matthias Weiss[2]; [1]Indian Institute of Technology, Madras; [2]Deakin University

**11:30 AM**
**Microstructure and Mechanical Properties of AA5083-$Al_2O_3$ Bulk Nanocomposites Produced by Two-step Ultrasonic Casting Technique**: *Vishwanatha Hire Math*[1]; Jayakumar Eravelly[1]; Cheruvu Kumar[1]; Sudipto Ghosh[1]; [1]Indian Institute of Technology

## Perfluorocarbon Generation and Emissions from Industrial Processes – PFC Measurements, Reduction and Abatement Methods

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* Pascal Lavoie, Light Metals Research Centre - The University of Auckland; David Wong, University of Auckland; Pernelle Nunez, International Aluminium Institute

Wednesday AM
March 14, 2018

Room: 222B
Location: Phoenix Convention Center

*Session Chair:* Ana Maria Martinez, SINTEF

**8:30 AM Introductory Comments**

**8:35 AM**
**Low Voltage PFC Measurements and Potential Alternative to Reduce Them at Alcoa Smelters**: Eliezer Batista[1]; *Luis Espinoza-Nava*[1]; Chris Tulga[2]; Richard Marcotte[2]; Yan Duchemin[3]; Steven Starr[4]; Petre Manolescu[5]; [1]Alcoa Technical Center; [2]Alcoa Massena; [3]Alcoa ABI; [4]Alcoa TN; [5]Alcoa Iceland

**9:00 AM**
**New Approach for Quantification of Perfluorocarbons Resulting from High Voltage Anode Effects**: *Lukas Dion*[1]; Simon Gaboury[2]; László Kiss[1]; Sándor Poncsák[1]; Charles-Luc Lagacé[3]; [1]Université du Québec à Chicoutimi; [2]Rio Tinto; [3]Aluminerie Alouette inc.

**9:25 AM**
**New Algorithm for Calculating CF4 Emissions from High Voltage Anode Effects**: *Jerry Marks*[1]; Pernelle Nunez[2]; [1]J Marks & Associates; [2]International Aluminium Institute

**9:50 AM**
**Validation of Online Monitoring of PFC by QCL with FTIR Spectroscopy**: *Thor Anders Aarhaug*[1]; Alain Ferber[1]; Heiko Gaertner[1]; Steinar Kolås[2]; Sven Olof Ryman[2]; Peter Geiser[3]; [1]SINTEF; [2]Hydro Aluminium; [3]Neo Monitors

**10:15 AM Break**

**10:30 AM**
**PFC Emission Reduction in the Semiconductor Industry**: *Michael Czerniak*[1]; [1]Edwards

**10:55 AM**
**Methodologies to Measure Greenhouse Gas (GHG) Emissions from Industrial Processes and Determine the GHG Emission Factors**: *Brian Mader*[1]; [1]3M Company Environmental Laboratory

## Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XVII – Phase Stability of Advanced Electronic Interconnection I

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University; Thomas Reichmann, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Hiroshi Nishikawa, Osaka University; Shien Ping Feng, The University of Hong Kong; Yee-Wen Yen, National Taiwan University of Science & Technology; Song-Mao Liang, Clausthal University of Technology

Wednesday AM
March 14, 2018

Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Shih-kang Lin, National Cheng Kung University; Hiroshi Nishikawa, Osaka University

**8:30 AM Introductory Comments**

**8:35 AM Invited**
**Sinter Joining and Wiring without Pressure Assist for GaN Power Device Interconnection**: *Katsuaki Suganuma*[1]; [1]Osaka University

**9:00 AM Invited**
**Interfacial Reaction Studies in SLID Bonding Processes Using Ga and In**: *Sinn-wen Chen*[1]; Tsu-ching Yang[1]; Ji-min Lin[1]; [1]National Tsing Hua University

**9:25 AM**
**Solid-solution Cu-to-Cu Interconnection Fabricated with Sub-micron Ga-based Pastes**: *Shih-kang Lin*[1]; Che-yu Yeh[1]; Hseng-ming Liao[1]; Mei-jun Wang[1]; [1]National Cheng Kung University

**9:45 AM**
**Mechanical Properties of In-33.7Bi Alloy for Low Melting Temperature Solder**: Sanghun Jin[1]; Min-Su Kim[1]; Shutetsu Kanayama[2]; *Hiroshi Nishikawa*[1]; [1]Osaka University; [2]Panasonic Corporation

**10:10 AM Break**

**10:30 AM**
**Microstructure Evolution due to Isothermal Reactive Diffusion between Solid Co and Liquid Sn**: *Minho O*[1]; Noritomo Odashima[1]; Masanori Kajihara[1]; [1]Tokyo Institute of Technology

**10:50 AM**
**Ga-doping Effect upon Sn-0.7Cu/Cu Interfacial Reactions and the Isothermal Section of Sn-Cu-Ga Ternary System**: *Chih-han Yang*[1]; Yu-chen Liu[1]; Yi-kai Kuo[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

**11:10 AM**
**Interfacial Reactions in the Au/Sn/Ni/Cu Multilayer Couples**: Yi-Zhen Guo[1]; *Chu-Hsuan Wang*[1]; Yee-Wen Yen[1]; Yu-Chun Li[1]; [1]National Taiwan University of Science and Technology

**11:30 AM**
**Thermodynamic Stability Maps for the La0.6Sr0.4Co0.2Fe0.8O3±d–SO2–O2 System for Application in Solid Oxide Fuel Cells**: *Shadi Darvish*[1]; Yu Zhong[2]; [1]Florida International University; [2]Worcester Polytechnic Institute

## Phase Transformations and Microstructural Evolution – Phase Transformations in Titanium I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Wednesday AM
March 14, 2018
Room: 129A
Location: Phoenix Convention Center

*Session Chairs:* Mark Aindow, University of Connecticut; Rajarshi Banerjee, North Texas University

**8:30 AM**
**The Microstructural Evolution and Mechanical Behavior of Beta Titanium Alloys Based on Ti-13Cr(wt.%)**: Vahid Khademi[1]; JoAnn Ballor[1]; *Carl Boehlert*[1]; Masahiko Ikeda[2]; [1]Michigan State University; [2]Kansai University

**8:50 AM**
**Nano-scale Instabilities in Beta Titanium Alloys**: *Yufeng Zheng*[1]; Rajarshi Banerjee[2]; Dipankar Banerjee[3]; Hamish Fraser[1]; [1]The Ohio State University; [2]University of North Texas; [3]Indian Institute of Science

**9:10 AM**
**Control of ß Phase Stability and Deformation Induced Martensitic Transformation in a Near-a titanium Alloy**: *Fan Meng*[1]; Gregory Olson[1]; [1]Northwestern University

**9:30 AM**
**Interface Characteristics in Ti6246**: *Abigail Ackerman*[1]; Ioannis Bantounas[1]; Vassili Vorontsov[1]; David Rugg[2]; David Dye[1]; [1]Imperial College, London; [2]Rolls Royce Plc

**9:50 AM**
**Effects of Grain Orientation during Spark Plasma Sintering Beta Phase Ti-Al-Nb Alloys**: *Stoney Middleton*[1]; [1]University of California, Irvine

**10:10 AM Break**

**10:30 AM**
**Thermo-mechanical Simulation of Solid-state Welding in Ti-17**: *Samuel Kuhr*[1]; Gopal Viswanathan[1]; Jonathan Orsborn[2]; Thomas Broderick[3]; Hamish Fraser[1]; [1]CAMM / The Ohio State University; [2]CEMAS / The Ohio State University ; [3]GE Aviation

**10:50 AM**
**Phase-field Approach Coupled with Crystal Plasticity for Three-dimensional Recrystallization in Ti-Al Alloys and Comparison with Experiment**: *Arunabha Roy*[1]; Sriram Ganesan[1]; Pinar Acar[1]; Susan Gentry[1]; Anna Trump[1]; John Allison[1]; Katsuyo Thornton[1]; Veera Sundararaghavan[1]; [1]University of Michigan at Ann Arbor

**11:10 AM**
**The Effect of Deformation-induced Adiabatic Heating on Microstructure Evolution of Ti-6Al-4V Alloy during Open-die Screw Press Forging**: *Mykola Kulakov*[1]; Tatyana Konkova[2]; Giribaskar Sivaswamy[1]; Salaheddin Rahimi[1]; [1]Advanced Forming Research Centre, University of Strathclyde; [2]Department of Design, Manufacture & Engineering Management, University of Strathclyde

## Phase Transformations and Microstructural Evolution – Special Topics in Phase Transformations I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Wednesday AM
March 14, 2018
Room: 124B
Location: Phoenix Convention Center

*Session Chairs:* Gregory Thompson, University of Alabama; Paul Gibbs, LANL

**8:30 AM**
**Nucleation and Growth of Crystalline Carbonates from Amorphous Precursors**: *Derk Joester*[1]; [1]Northwestern University

**8:50 AM**
**Morphological Development of Quasicrystals in Powder-processed Icosahedral-phase-strengthened Aluminum Alloys**: *Hannah Leonard*[1]; Sarshad Rommel[1]; Thomas Watson[2]; Venkat Vedula[3]; Mark Aindow[1]; [1]University of Conneticut; [2]Pratt & Whitney; [3]UTC Aerospace Systems

**9:10 AM**
**In Situ Observation of Shear-driven Amorphization Process in Silicon Crystals**: *Scott Mao*[1]; Yang He[1]; Feifei Fan[2]; Chongmin Wang[3]; Ting Zhu[2]; [1]University of Pittsburgh; [2]Georgia Institute of Technology; [3]Pacific Northwest National Laboratory

**9:30 AM**
**Evolution of Martensitic Transformation Behavior in Cu-Zr-Ni Shape Memory Alloy Thin Films Evaluated Using Combinatorial Nanocalorimetry**: Yucong Miao[1]; Anjana Talapatra[2]; Ruben Villareal[2]; Raymundo Arroyave[2]; *Joost Vlassak*[1]; [1]Harvard University; [2]Texas A&M University

**9:50 AM**
**Deformation-induced Phase Transformations during Biaxial or Strain Path Change: HR-DIC and Synchrotron X-ray Diffraction**: Efthymios Polatidis[1]; Wei-Neng Hsu[1]; Miroslav Smid[1]; Steven Van Petegem[1]; *Helena Van Swygenhoven*[1]; [1]Paul Scherrer Institut

**10:10 AM Break**

**10:30 AM**
**Phase Stability and Microstructure of the Zeta Phase in Transition Metal Carbides and Nitrides**: *Christopher Weinberger*[1]; Xiao-Xiang Yu[2]; Hang Yu[3]; Bradford Schulz[2]; Gregory Thompson[2]; [1]Colorado State University; [2]University of Alabama; [3]Drexel University

**10:50 AM**
**Role of Anisotropic Mobility and Grain Orientation on Microstructure Evolution during Sintering**: Sudipta Biswas[1]; Daniel Schwen[2]; Vikas Tomar[1]; *Hao Wang*; [1]Purdue University; [2]Idaho National Laboratory

**11:10 AM**
**Irradiation-induced Phase Reversal and Grain Boundary Formation in U-alloys**: *Yipeng Gao*[1]; Yongfeng Zhang[1]; [1]Idaho National Laboratory

**11:30 AM**
**The X-phase of Precipitates**: *Qingfeng Xing*[1]; [1]Ames Laboratory

**11:50 AM**
**Tuning Phase Transformation in Compositionally Complex Alloys for Superior Mechanical Properties**: *Zhiming Li*[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Porous Metal Materials

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

Wednesday AM
March 14, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* Ming Yan, South University of Science and Technology of China; Jianzhong Wang, State Key Laboratory of Porous Metal Materials, NIN, China

**8:30 AM**
**Effects of Geometry Anisotropy on Fluid-flow and Mechanical Properties of Titanium Foams**: *Chedtha Puncreobutr*[1]; Sedthawatt Sucharitpwatskul[2]; Anchalee Manonukul[2]; [1]Chulalongkorn University; [2]National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA)

**8:55 AM**
**Fabrication of Porous Copper Structure by Using Powder Injection Molding and Space Holder Technology**: *Hanlyun Cho*[1]; Seong Jin Park[1]; [1]Pohang University of Science and Technology

**9:20 AM Keynote**
**Research Progress in High-performance Metal Powder Porous Materials**: *H. P. Tang*[1]; Q.B. Wang[1]; J. Wang[1]; [1]Northwest Institute for Nonferrous Metal Research

**10:00 AM Break**

**10:20 AM Invited**
**Effect of Gradient Structure on the Sound Absorption Coefficient of Porous Metal Fiber Materials**: *Jianzhong Wang*[1]; Qingbo Ao[1]; Jun Ma[1]; Huiping Tang[1]; [1]Northwest Institute for Nonferrous Metal Research

**10:50 AM**
**Processing and Characterization of Porous High Entropy Alloy Structures via Freeze-casting**: *Mora Issa*[1]; Silvia Briseño Murguia[1]; Yoav Snir[2]; Marcus Young[1]; [1]University of North Texas, Department of Material Science and Engineering; [2]Department of Materials Science, Nuclear Research Center Negev (NRCN), Israel

**11:10 AM**
**Preparation of Titanium Foams with Uniform and Fine Pore Characteristics through Powder Metallurgy Route Using Urea Particles as Space Holder**: Guibao Qiu[1]; Tengfei Lu[1]; *Jian Wan*[1]; Chenguang Bai[1]; [1]Chongqing University

**11:30 AM**
**A Novel Approach to Making Metal@titanium Core-shell Powder by Fluidized Bed Chemical Vapor Deposition**: *Yafeng Yang*[1]; [1]Institute of Processing Engineering, Chinese Academy of Science

## Stored Renewable Energy in Coal – Stored Renewable Energy in Coal

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee, TMS: Energy Committee
*Program Organizers:* Neale Neelameggham, Ind LLC; Sarma Pisupati, Penn State University; John Howarter, Purdue University; Huimin Lu, Beihang University

Wednesday AM
March 14, 2018
Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* John Howarter, Purdue University; Sarma Pisupati, Pennsylvania State University

**8:30 AM**
**Aluminum-silicon Alloys Prepared from High-aluminum Fly Ash to Extract Magnesium from Serpentine**: *Huimin Lu*[1]; Wu Guangzhi[2]; Neale Ramaswami Neelameggham[3]; [1]Beihang University; [2]Inner Mongolia Xintai Construction and Installation (Group) Co., Ltd; [3]IND LLC

**8:50 AM**
**Organic Agriculture Using Natural Material Coal**: *Neale Neelameggham*[1]; Brian Davis[2]; [1]Ind LLC; [2]Brian Davis Associates Consulting

**9:10 AM**
**Extraction and Production of Rare Earth Elements from Coal-Seam Bedrock and Caprock**: *John Gordon*[1]; [1]JG Novel Solutions

**9:30 AM**
**Extraction and Thermal Dissolution of Low-rank Coal by N-methyl-2-pyrrolidinone**: *Jun Zhao*[1]; Haibin Zuo[1]; Siyang Long[1]; Jingsong Wang[1]; Qingguo Xue[1]; [1]University of Science and Technology Beijing

**9:50 AM Break**

**10:10 AM**
**Enhancement of Coal Nanostructure and Investigation of Its Novel Properties**: *Manoj B*[1]; [1]Christ University

**10:30 AM**
**A Review on the State of Coal Use as Soil Amendment in East Africa and China**: *Abebe Dakka*[1]; Neale, R. Neelameggham[2]; Lu Huimin[3]; Girma Balcha[4]; [1]Kotobe Metropolitan University (KMU) ; [2] Ind LLC; [3] Beihang University of Aeronautics and Astronautics; [4]Environment, Climate Change and Coffee Forest Forum

## Thermal and Mechanical Stability of Nanocrystalline Materials – Thermal Stability of Nanocrystalline Metals II

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

Wednesday AM
March 14, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Shen Dillon, University of Illinois at Urbana-Champaign; Garritt Tucker, Colorado School of Mines

**8:30 AM Invited**
**Grain Boundary Phases and their Thermal Stability**: *Timofey Frolov*[1]; [1]Lawrence Livermore National Laboratory

**9:00 AM**
**Mesoscale Modeling of Grain Boundary Segregation: The Role of Anisotropy in Segregation**: *Fadi Abdeljawad*[1]; Stephen Foiles[1]; Blas Uberuaga[2]; Enrique Martinez[2]; [1]Sandia National Laboratories; [2]Los Alamos National Laboratory

**9:20 AM**
**The Role of Entropy on the Stability of Nanocrystalline Alloys**: *Arvind Kalidindi*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

**9:40 AM Invited**
**Stabilization of Nanocrystalline Alloys through the Incorporation of Grain Boundary Complexions**: *Timothy Rupert*[1]; [1]University of California, Irvine

**10:10 AM Break**

**10:30 AM Invited**
**Toward Understanding the Factors that Govern the Temperature Dependence of Mobility in FCC Metals**: *Elizabeth Holm*[1]; Ian Chesser[1]; Yutong Bi[1]; Jonathan Humberson[1]; [1]Carnegie Mellon University

**11:00 AM**
**The Effect of Free Volume and Interfacial Junctions on the Stability of Nanocrystalline Structures**: *Günter Gottstein*[1]; Lasar Shvindlerman[1]; [1]RWTH Aachen University

**11:20 AM**
**Polycrystal Plasticity with Grain Noundary Evolution**: *Nikhil Chandra Admal*[1]; Jaime Marian[1]; [1]University of California, Los Angeles

**11:40 AM**
**Thermal Stability of Ultra-tough Nanocrystalline Cu-1%Nb**: *Khaled Youssef*[1]; Mohamed Abaza[1]; Ronald Scattergood[2]; Carl Koch[2]; [1]Qatar University; [2]North Carolina State University

## Thermo-mechanical Response of Materials with Special Emphasis on In-situ Techniques – In-Situ TEM/SEM Nanomechanics

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Sanjit Bhowmick, Bruker Nano Surfaces; Jeff Wheeler, ETH Zurich; María Teresa Pérez Prado, IMDEA Materials Institute; Dongchan Jang, Korea Advanced Institute of Science and Technology; Robert Wheeler, MicroTesting Solutions LLC; Josh Kacher, Georgia Tech

Wednesday AM
March 14, 2018
Room: 101A
Location: Phoenix Convention Center

*Session Chairs:* Dongchan Jang, KAIST, S. Korea; Janelle Wharry, Purdue University

**8:30 AM Invited**
**In Situ TEM Imaging and Quantitative Orientation Mapping of the Structural Evolution in Nanocrystalline Metals during Mechanical Deformation**: Christian Kuebel[1]; *Ankush Kashiwar*[1]; Horst Hahn[1]; [1]KIT

**9:00 AM Invited**
**Mechanics of Irradiated Alloys Studied through In Situ TEM Testing**: *Janelle Wharry*[1]; Kayla Yano[1]; Priyam Patki[1]; Yaqiao Wu[2]; [1]Purdue University; [2]Boise State University, Center for Advanced Energy Studies

**9:30 AM**
**Investigating Irradiation Creep by In Situ TEM**: *Daniel Bufford*[1]; Baoming Wang[2]; Khalid Hattar[1]; Aman Haque[2]; [1]Sandia National Laboratories; [2]The Pennsylvania State University

**9:50 AM**
**Studying Tensile Properties of Silicon via In-situ Microcompression Testing of Push-to-pull Pillar**: *Ming Chen*[1]; Ralph Spolenak[1]; Jeffrey Wheeler[1]; [1]ETH Zurich

**10:10 AM Break**

**10:30 AM Invited**
**High-resolution Digital Image Correlation: Advances in Quantifying the Strain Distribution at the Submicron–scale in Hexagonal Materials**: *Alberto Orozco-Caballero*[1]; João Quinta da Fonseca[1]; [1]The University of Manchester

**11:00 AM Invited**
**Deformation of Monatomic Metallic Glasses Processed through In-situ Ultrafast Liquid Quenching**: *Scott Mao*[1]; [1]University of Pittsburgh

**11:30 AM**
**In-situ ECCI Characterization of Microstructural Defects and their Effect on Superconducting Properties of SRF Cavity Niobium**: *Mingmin Wang*[1]; Shreyas Balachandran[2]; Santosh Chetri[2]; Anatolii Polyanskii[2]; Peter Lee[2]; Christopher Compton[3]; Thomas Bieler[1]; [1]Michigan State University; [2]National High Magnetic Field Laboratory; [3]Facility for Rare Isotope Beams

## Ultrafine-grained Materials X – Grain Boundary Diffusion and Migration: Joint Session with Non-Equilibrium Features on Grain Boundaries

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Wednesday AM
March 14, 2018
Room: 125A
Location: Phoenix Convention Center

*Session Chairs:* Liang Qi, University of Michigan; Jason Trelewicz, Stony Brook University

**8:30 AM Invited**
**Activation Volume Tensors for Atomistic Events at Grain Boundaries**: Kathleen Alexander[1]; Sabrina Ball[1]; *Christopher Schuh*[1]; [1]MIT

**9:00 AM Invited**
**Comparing Grain Growth Mechanisms in Nanocrystalline FCC Metals due to Ion Irradiation, Mechanical Loading, Conductive Heating, and Laser Heating**: Daniel Bufford[1]; Abdeljawad Fadi[1]; Christopher Barr[1]; Patrick Price[1]; *Khalid Hattar*[1]; [1]Sandia National Laboratories

**9:30 AM**
**Thermally Induced Grain Coarsening in Alpha Iron**: *Yu-Feng Shen*[1]; S. Maddali[2]; David Menasche[3]; Aditi Bhattacharya[1]; G. Rohrer[1]; R. Suter[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory; [3]Hamilton, LLC

**9:50 AM**
**Increased Defect Densities in SPD-processed Hydrogenated Palladium and their Impact to the Macroscopic Strength**: *Wolfgang Ress*[1]; Erhard Schafler[1]; Wolfgang Sprengel[2]; Yuzeng Chen[3]; Reiner Kirchheim[4]; Michael Zehetbauer[1]; Daria Setman[1]; [1]University of Vienna; [2]Graz University of Technology; [3]Northwestern Polytechnical University; [4]Georg August Universitaet Goettingen

**10:10 AM Break**

**10:30 AM Invited**
**Grain Boundary Statistical Mechanics: A Disconnection Dynamics Approach**: *David Srolovitz*[1]; Jian Han[1]; Spencer Thomas[1]; Vaclav Vitek[1]; [1]University of Pennsylvania

**11:00 AM Invited**
**Gaining New Insights into Structure/Property Relations by Mining and Analysis of Published Images**: Ian McCue[1]; Joshua Stuckner[2]; Mitsu Murayama[2]; *Michael Demkowicz*[1]; [1]Texas A&M University; [2]Virginia Tech

**11:30 AM**
**Grain Coarsening in Two-dimensional Phase-field Models with an Orientation Field**: Bálint Korbuly[1]; *Tamás Pusztai*[1]; Hervé Henry[2]; Mathis Plapp[2]; Markus Apel[3]; László Gránásy[1]; [1]Wigner Research Centre for Physics; [2]École Polytechnique, CNRS, Université Paris-Saclay; [3]Access e.V.

**11:50 AM**
**A New Mathematical Framework for Simulation of Grain Growth**: *Mary Comer*[1]; Shruthi Kubatur[2]; [1]Purdue University; [2]Nikon Research Corporation of America

## Ultrafine-grained Materials X – Rolling Studies

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Wednesday AM
March 14, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Caizhi Zhou, Missouri University of Science and Technology; Chong Soo Lee, POSTECH

**8:30 AM Invited**
**Ultra-fine Laminated Mg/Nb Composites Produced via Accumulative Roll Bonding**: *Marko Knezevic*[1]; Daniel Savage[1]; Nathan Mara[2]; Sven Vogel[2]; Rodney McCabe[2]; Irene Beyerlein[3]; [1]University of New Hampshire; [2]Los Alamos National Laboratory; [3]University of California, Santa Barbara

**9:00 AM Invited**
**Tensile Characteristics of Ultrafine Grained Fe-Cr-Mn Stainless Steel Fabricated by Reverse Transformation**: Jeom-Yong Choi[1]; Ik-Soo Shin[2]; *Kyung-Tae Park*[2]; [1]POSCO; [2]Hanbat National University

**9:30 AM**
**Mechanical Properties of Mg-3%Gd with a Heterogeneous Lamella Structure**: *Guilin Wu*[1]; Xuan Luo[1]; Zongqiang Feng[1]; Tianlin Huang[1]; Xiaoxu Huang[1]; [1]Chongqing University

**9:50 AM**
**Atomistic Simulation of Driven Steady States in Rolled Cu-Nb Nano-composites**: *Ian Chesser*[1]; Elizabeth Holm[1]; Michael Demkowicz[2]; [1]Carnegie Mellon University; [2]Texas A&M

**10:10 AM Break**

**10:30 AM**
**Mechanical Behavior of 304L Austenitic Stainless Steel Processed by Cryogenic Rolling**: Rahul Singh[1]; Sunkulp Goel[2]; *Abhishek Kumar*[3]; [1]MNNIT Allahabad; [2]Herbert Gleiter Institute of Nanoscience, Nanjing University of Science and Technology; [3]Motilal Nehru National Institute of Technology

**10:50 AM**
**Effect of Cu on Structure and Mechanical Properties in an Al-0.3%Cu Alloy Cold Rolled to 98%**: *Tianlin Huang*[1]; Linfei Shuai[1]; Guilin Wu[1]; Xiaoxu Huang[1]; [1]Chongqing University

**11:10 AM**
**Investigation of Fatigue Micro-mechanisms in Ultrafine Grained CoCrxNi Medium Entropy Alloy**: *Shivakant Shukla*[1]; Mageshwari Komarasamy[1]; Kaimiao Liu[1]; Rajiv Mishra[1]; [1]University of North Texas

**11:30 AM**
**Mechanical Properties of Ultrafine Grained 2519 Aluminum Alloy**: Gbadebo Owolabi[1]; *Temitayo Daramola*[1]; Nadir Yilmaz[1]; Horace Whitworth[1]; Ahmet Zeytinci[2]; [1]Howard University; [2]University of District Columbia

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – Joint with Bio-Nano Interface Engineering and Applications Symposium

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

Wednesday PM
March 14, 2018
Room: 101B
Location: Phoenix Convention Center

*Session Chairs:* Stephen McDonnell, University of Virginia; Candan Tamerler, University of Kansas

**2:00 PM**
**Nanoparticles-grafted Functionalized Graphene Coated with Nanostructured Polyaniline Layered Nanocomposites for High-performance Biosensors**: *Sanju Gupta*[1]; Romney Meek[1]; [1]Western Kentucky University

**2:20 PM**
**Transparent Titanium Dioxide Nanotubes: Processing, Characterization, and Application in Establishing Cellular Response Mechanisms**: *Jevin Meyerink*[1]; Divya Kota[1]; Scott Wood[1]; Grant Crawford[1]; [1]South Dakota School of MInes & Technology

**2:40 PM**
**Self-assembled Formate Dehydrogenase-metal Nanoparticle Hybrids Improved Enzyme Stability**: *Rachel Lietz*[1]; Sarah VanOosten[1]; Erkan Mozioglu[1]; Brandon Tomas[1]; Kasra Alizadeh[1]; Mark Richter[1]; Candan Tamerler[1]; [1]University of Kansas

**3:00 PM**
**Development of FRET Biosensor Based on Aptamer/Functionalized Graphene for Ultrasensitive Detection of Bisphenol A and Discrimination from Analogues**: *Sanju Gupta*[1]; Rebecca Wood[1]; [1]Western Kentucky University

**3:20 PM Break**

**3:40 PM**
**Effect of pH on the Green Synthesis of MPA –capped CdTe/CdSe Quantum Dots and Cell Viability of Fibroblast Histiocytoma Cells**: Vuyelwa Ncapayi[1]; Sandile Songca[2]; Tetsuya Kodama[3]; *Oluwafemi Oluwatobi*[1]; [1]University of Johannesburg; [2]University of Zululand; [3]Tohoku University Sendai

**4:00 PM**
**Large Scale Synthesis of Highly Fluorescent CuInS2/ZnS Quantum Dots - Porphyrin Conjugates for Photodynamic Therapy**: *Ncediwe Tsolekile*[1]; Mangaka Matoetoe[2]; Oluwafemi Oluwatobi[1]; Sandile Songca[3]; [1]University of Johannesburg; [2]Cape-Peninsula University of Technology; [3]University of Zululand

## 9th International Symposium on High Temperature Metallurgical Processing – Treatment and Recycling of Metallurgical Slag/Solid Wastes

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Wednesday PM
March 14, 2018
Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Rafael Padilla, University of Concepcion; Guanghui Li, Central South University

**2:00 PM Introductory Comments**

**2:05 PM**
**Production of Titanium from Waste Slag**: *Samuel Martin Treceno*[1]; Thomas Hughes[1]; Catherine Bishop[1]; Ian Brown[2]; Yaodong Jia[2]; Aaron Marshall[1]; Matthew Watson[1]; [1]University of Canterbury; [2]Callaghan Innovation

**2:25 PM**
**Recovery of Fe-Cu Alloys from Copper Slag**: *Mario Sanchez*[1]; Fernando Parada[2]; Jose Palacios[3]; [1]Universidad Andrés Bello; [2]Universidad de Concepcion; [3]Universidad Playa Ancha

**2:45 PM**
**Physiochemical Properties of High Alumina Blast Furnace Slag**: *Zhiming Yan*[1]; Zhengde Pang[1]; Xuewei Lv[1]; Guibao Qiu[1]; Chenguang Bai[1]; [1]Chongqing University

**3:05 PM**
**Effect of Cooling Rate on the Acidolysis of Titania Slag**: *Yu Zhang*[1]; Zhixiong You[1]; Jinsheng Wang[1]; Xuewei Lv[1]; [1]Chongqing University

**3:25 PM Break**

**3:45 PM**
**Selective Recovery of P and Mn from Steelmaking Slag by Carbothermic Reduction**: Shin-ya Kitamura[1]; *Dong Jun Shin*[1]; Xu Gao[1]; Shigeru Ueda[1]; [1]Tohoku University

**4:05 PM**
**The Use of Zirconia-based Solid Electrolytes Oxygen Sensor in High Titanium Slag**: *Kai Hu*[1]; Run Zhang[1]; Xuewei Lv[1]; [1]Chongqing University

**4:25 PM**
**In-situ Observation of the Precipitation Behavior of Dy2O3 Containing Slag System**: *Fei Wang*[1]; Bin Yang[1]; Bart Blanpain[2]; Muxing Guo[2]; [1]Kunming University of Science and Technology; [2]KU Leuven

**4:45 PM**
**Recovery of Zn and Mn from Spent Alkaline Batteries**: *Guozhu Ye*[1]; Marcel Magnusson[1]; Pekka Väänänen[2]; Yang Tian[3]; [1]Swerea MEFOS; [2]Isologistics; [3]Kuming University of Science and Technology

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Facility Overviews and Materials Development

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

Wednesday PM
March 14, 2018
Room: 102A
Location: Phoenix Convention Center

*Session Chairs:* Kevin Field, Oak Ridge National Laboratory; Jian Gan, Idaho National Laboratory

**2:00 PM**
**Accelerated Advanced Nuclear Materials Development at LAMDA through the NSUF Mechanism**: *Kory Linton*[1]; Kevin Field[1]; [1]Oak Ridge National Laboratory

**2:25 PM**
**Deconvolution of Complex Environmental Effects Active in Nuclear Reactor Materials Through In-situ Ion Irradiation**: Caitlin Taylor[1]; *Christopher Barr*[1]; Samuel Briggs[1]; Brittany Muntifering[1]; Khalid Hattar[1]; [1]Sandia National Laboratories

**2:50 PM**
**TEM with In Situ Ion Irradiation of Nuclear Materials at the IVEM-tandem**: *Meimei Li*[1]; Mark Kirk[1]; Jing Hu[1]; Peter Baldo[1]; Ed Ryan[1]; [1]Argonne National Laboratory

**3:15 PM**
**Modeling and Validation on Role of Stoichiometry on Degradation in Ni-Cr Alloys for Nuclear Applications**: *Fei Teng*[1]; Kevin Field[2]; Benjamin Spencer[3]; Octav Ciuca[4]; Grace Burke[4]; Emmanuelle Marquis[5]; Li-Jen Yu[5]; Leland Barnard[6]; Julie Tucker[1]; [1]Oregon State University; [2]Oak Ridge National Laboratory; [3]Idaho National Labortory; [4]University of Manchester; [5]University of Michigan - Ann Arbor; [6]Elysium Industries

**3:40 PM Break**

**4:00 PM Invited**
**Simulation and Experimental Investigation on the Applications of Nonlinear Ultrasonic Techniques in Non-destructive Probes of Nuclear Materials**: *Shenyang Hu*[1]; Wahyu Setyawan[1]; Yulan Li[1]; Chuck Henager[1]; [1]Pacific Northwest National Laboratory

**4:20 PM**
**Effect of Alloying Elements on Defect Evolution in Ni-20X Concentrated Binary Alloys**: *Taini Yang*[1]; Chenyang Lu[1]; Gihan Velisa[2]; Ke Jin[2]; Hongbin Bei[2]; Yanwen Zhang[2]; Lumin Wang[1]; [1]University of Michigan; [2]Oak Ridge National Lab

**4:40 PM**
**Mechanical Properties, Damage and Morphology Details of Nanocrystalline and Ultrafine Tungsten Materials Exposed to Low Energy Helium and Heavy Ion Irradiation**: *Osman El-Atwani*[1]; Erika Esquivel[1]; Mert Efe[2]; Jordan Weaver[1]; Jason Trelewicz[3]; Nathan Mara[1]; Stuart Maloy[1]; [1]Los Alamos National laboratory; [2]Middle East Technical University; [3]Stony Brook University

## Accident Tolerant Fuels for Light Water Reactor – Cladding Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

Wednesday PM
March 14, 2018

Room: 104A
Location: Phoenix Convention Center

*Session Chairs:* Lingfeng He, Idaho National Laboratory; Meimei Li, Argonne National Laboratory

**2:00 PM Invited**
**In Situ Ion Irradiation of Multilayer (TiN, TiAlN) Ceramic Coating for Accident Tolerant Zr-alloy Fuel Claddings**: Jing Hu[1]; *Meimei Li*[1]; Douglas Wolfe[2]; Mark Kirk[1]; Arthur Motta[2]; [1]Argonne National Laboratory; [2]The Pennsylvania State University

**2:30 PM**
**Mitigation of Oxidation of Zircaloy Cladding in High Temperature Steam via Cr and CrAl Coatings**: *Weicheng Zhong*[1]; Peter Mouche[1]; Brent Heuser[1]; [1]University of Illinois

**2:50 PM**
**Steam Oxidation and Heavy Ion Irradiation Behaviors of $Ti_2AlC$ Ceramics**: *Bai Cui*[1]; Fei Wang[1]; Ziyad Smoqi[1]; Qing Su[1]; Michael Nastasi[1]; [1]University of Nebraska–Lincoln

**3:10 PM**
**Crystallographic and Chemical Instabilities of MAX Phases during Proton Irradiation**: Joseph Ward[1]; Michael Preuss[1]; Philipp Frankel[1]; Phillip Withers[1]; Simon Middleburgh[2]; Michel Barsoum[3]; *Maxwell Rigby*[1]; [1]University of Manchester; [2]Westinghouse; [3]Drexel University

**3:30 PM Break**

**3:50 PM**
**New Zr-based MAX Phases as Accident Tolerant Fuel Cladding**: *David Bowden*[1]; Tamas Ungar[2]; Shafqat Shah[3]; Michael Preuss[1]; Philipp Frankel[1]; [1]University of Manchester; [2]Eötvös University Budapest; [3]University of Cambridge

**4:10 PM**
**Corrosion Products of FeCrAl Alloys in Simulated LWR Environments during In-situ Proton Corrosion-irradiation Experiment**: *Peng Wang*[1]; Gary Was[1]; [1]University of Michigan

**4:30 PM**
**Oxidation Behavior of FeCrAl Alloys at T= 300-600C for 100-1000 Hours**: *Nan Li*[1]; Scott Parker[1]; Elizabeth Wood[1]; Andy Nelson[1]; [1]Los Alamos National Laboratory

**4:50 PM**
**Modeling Radiation Defect Cluster Accumulation in Neutron Irradiated FeCrAl**: *Dwaipayan Dasgupta*[1]; Brian Wirth[1]; [1]University of Tennessee

**5:10 PM**
**Simulation of Iron-chrome-aluminum Alloy Cladding under LOCA Conditions Using the BISON Fuel Performance Code**: *R. Sweet*[1]; Kurt Terrani[2]; Brian Wirth[1]; [1]University of Tennessee - Knoxville; [2]Oak Ridge National Laboratory

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Emerging Materials and Processes

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Wednesday PM
March 14, 2018

Room: 231AB
Location: Phoenix Convention Center

*Session Chairs:* Mark Stoudt, National Institute of Standards and Technology; Thien Phan, National Institute of Standards and Technology

**2:00 PM Invited**
**Additive Manufacturing of Bulk Metallic Glasses (aka Amorphous Metals): A Novel Material Coming Full Circle**: *Douglas Hofmann*[1]; Scott Roberts[1]; Andre Pate[1]; [1]NASA JPL/Caltech

**2:30 PM**
**Development of Process-structure-property Relationships for Optimization of Alloy 17-4PH for SLM AM Process**: *Abhinav Saboo*[1]; David Snyder; Greg Olson; [1]QuesTek Innovations LLC

**2:50 PM**
**Processing of Fe-Co Soft Ferromagnetic Alloys Using Laser Engineered Net Shaping (LENS)**: *Andrew Kustas*[1]; Kyle Johnson[1]; Shaun Whetten[1]; Dave Keicher[1]; Mark Rodriguez[1]; Daryl Dagel[1]; Joseph Michael[1]; Allen Roach[1]; Nicolas Argibay[1]; Don Susan[1]; [1]Sandia National Laboratories

**3:10 PM**
**Processing-microstructure-property Evolution in Laser Deposited Hiperco-50: Potential for Spatial Control of Magnetic Behavior**: *Robert Dillon*[1]; Samad Firdosy[1]; Adam Herrmann[2]; Ryan Conversano[1]; Bryan McEnerney[1]; John Paul Borgonia[1]; Andrew Shapiro-Scharlotta[1]; [1]Jet Propulsion Laboratory; [2]University of Cincinnati

**3:30 PM Break**

**3:50 PM**
**Laser Modulation Effects on the Morphology and Microstructure of Additively Manufactured Metals**: *Tien Roehling*[1]; Sheldon Wu[2]; Saad Khairallah[2]; John Roehling[2]; Gabe Guss[2]; Michael Crumb[2]; Manyalibo Matthews[2]; [1]University of the Pacific; [2]Lawrence Livermore National Laboratory

**4:10 PM**
**A Study on the Production of Oriented High-silicon Steel by Powder Bed Additive Manufacturing**: *Marco Simonelli*[1]; Jannis Lemke[2]; Michele Garibaldi[1]; Ian Ashcroft[1]; Chris Tuck[1]; Richard Hague[1]; [1]University of Nottingham; [2]SAES Getters

**4:30 PM**
**Additive Manufacturing of Tantalum: Differing Microstructure with Differing Build Parameters**: *Roberta Beal*[1]; George Gray[1]; Bineh Ndefru[1]; Veronica Livescu[1]; Cameron Knapp[1]; John Carpenter[1]; [1]Los Alamos National Laboratory

**4:50 PM**
**Direct Metal Writing: Controlling the Rheology through Microstructure**: *Wen Chen*[1]; Luke Thornley[1]; Diran Apelian[1]; Andrew Pascall[1]; Eric Duoss[1]; Joshua Kuntz[1]; Christopher Spadaccini[1]; [1]Lawrence Livermore National Laboratory

**5:10 PM**
**Additive Manufacturing of 3D Nano-architected Metals**: *Andrey Vyatskikh*[1]; Stéphane Delalande[2]; Akira Kudo[1]; Xuan Zhang[3]; Julia Greer[1]; [1]California Institute of Technology; [2]PSA Group; [3]Tsinghua University

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Modeling of Additive Manufacturing Processes

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Wednesday PM
March 14, 2018
Room: 232A
Location: Phoenix Convention Center

*Session Chairs:* Behrang Poorganji, GE Additive; Trevor Keller, National Institute of Standards and Technology

**2:00 PM Invited**
**Modeling and Simulation of Phase and Microstructure Formation in Ni and Ti Alloys during AM Using Finite Elements, Computational Thermodynamics and Phase Field Simulation**: *Christian Leinenbach*[1]; Toni Ivas[1]; [1]Empa-Swiss Federal Laboratories for Materials Science and Technology

**2:30 PM**
**Process Modeling, Microstructure Measurements, and Residual Stresses in Additively Manufactured Austenitic Stainless Steels**: *Josh Sugar*[1]; Michael Stender[1]; Lauren Beghini[1]; Samuel Subia[1]; David Keicher[1]; Chris D'Elia[2]; Mike Hill[2]; Chris San Marchi[1]; [1]Sandia National Laboratories; [2]UC Davis

**2:50 PM**
**Multi-physics Modeling of Wire Arc Additive Manufacturing (WAAM) Process**: *Ranadip Acharya*[1]; Mike Klecka[1]; Alexander Staroselsky[1]; Vijay Jagdale[1]; John Sharon[1]; Tahany El-Wardany[1]; Joseph Mantese[1]; Sergei Burlatsky[1]; William Tredway[1]; [1]United Technologies Research Center

**3:10 PM**
**Investigation of Grain Structure Development in Laser-based Manufacturing via Modeling and Experiment**: *Wenda Tan*[1]; [1]University of Utah

**3:30 PM Break**

**3:50 PM**
**Quantifying the Impact of Microstructure Variability and Local Micro-textures in Mechanical Performance of Additively Manufactured Metals**: *Judith Brown*[1]; Theron Rodgers[1]; Joseph Bishop[1]; Kyle Johnson[1]; [1]Sandia National Laboratories

**4:10 PM**
**Microstructure Evolution during Rapid Solidification: Developing Predictive Modeling Capabilities for Additive Manufacturing**: *Joseph McKeown*[1]; Amy Clarke[2]; Jean-Luc Fattebert[1]; Aurelien Perron[1]; John Roehling[1]; Adam Stokes[2]; Patrice Turchi[1]; [1]Lawrence Livermore National Laboratory; [2]Colorado School of Mines

**4:30 PM**
**High-fidelity Mesoscale Thermal/Fluid Modeling of the LENS Additive Manufacturing Process**: *Bradley Trembacki*[1]; David Noble[1]; Daryl Dagel[1]; Shaun Whetten[1]; Mario Martinez[1]; [1]Sandia National Laboratories

**4:50 PM**
**Multi Scale Solid Mechanics Models of Additive Manufacturing**: *Kurtis Ford*[1]; Bradley Trembacki[1]; Kyle Johnson[1]; David Noble[1]; Mario Martinez[1]; Joe Bishop[1]; [1]Sandia

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – Metals in Additive Manufacturing II

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

Wednesday PM
March 14, 2018
Room: 230
Location: Phoenix Convention Center

*Session Chairs:* Roland Loge, EPFL; Adam Clare, University of Nottingham

**2:00 PM Invited**
**Controlling Bulk Residual Stresses in SLM by 3D Laser Shock Peening**: *Roland Loge*[1]; Nikola Kalentics[1]; Patrice Peyre[2]; Eric Boillat[1]; [1]EPFL; [2]CNRS-ENSAM Paristech

**2:30 PM**
**Effect of Build Process Environment on Selective Laser Melted Inconel 718**: *Glenn Bean*[1]; David Witkin[1]; Tait McLouth[1]; Dhruv Patel[1]; Woonsup Park[1]; Rafael Zaldivar[1]; [1]The Aerospace Corporation

**2:50 PM**
**Issues of Spatter during Laser Powder Bed Fusion of Nickel-base Superalloys**: *Alexander Gasper*[1]; Adam Clare[1]; Ian Ashcroft[1]; [1]University of Nottingham

**3:10 PM**
**The Impact of Powder Feedstock Variability on Microstructure and Defects in Selective Laser Melted Superalloy 718**: *Timothy Smith*[1]; Chantal Sudbrack[1]; [1]NASA Glenn Research Center

**3:30 PM Break**

**3:50 PM Invited**
**High-throughput Testing and Characterization of Novel Additive Manufacturing Processes and Properties**: Kendrick Mensink[1]; Guillermo Aguilar[1]; *Suveen Mathaudhu*[1]; [1]University of California, Riverside

**4:20 PM Invited**
**Healing Defects within Powder Bed Fabrication**: *Adam Clare*[1]; Richard Leach[1]; Ian Ashcroft[1]; Matthias Hirsch[1]; Rikesh Patel[1]; Steve Sharples[1]; [1]University of Nottingham

**4:50 PM**
**The Role of Different Hot Isostatic Pressing and Post Heat Treatment Routes for SLM -built Alloy 718**: *Magnus Ahlfors*[1]; [1]Quintus Technologies

**5:10 PM**
**Influence of Processing in Selective Laser Melting on Cracking and Microstructure of Nickel Alloy Inconel 738LC**: *Marcus Chun Wai Lam*[1]; Paul Rometsch[1]; Xinhua Wu[1]; [1]Monash University

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Plasticity Modeling / Experiments

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Wednesday PM
March 14, 2018

Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* Marko Knezevic, University of New Hampshire; Kaan Inal, University of Waterloo

**2:00 PM Invited**
**A New Numerical Integration Scheme for Fast Fourier Transform-based Crystal Plasticity Models**: *Kaan Inal*[1]; Jaspreet Nagra[1]; Abhijit Brahme[1]; Ricardo[2]; [1]University of Waterloo; [2]Los Alamos National Laboratory

**2:30 PM**
**Using Crystal Plasticity to Predict Local Deformation during Reverse Loading of an Aerospace Alloy**: *Michael Atkinson*[1]; João Quinta da Fonseca[1]; [1]University of Manchester

**2:50 PM**
**Simulations of Bi-crystal Nanoindentation and Polycrystalline Uniaxial Tensile Deformation with a Grain Boundary-aware Crystal Plasticity Model**: *Yang Su*[1]; Philip Eisenlohr[1]; Thomas Bieler[1]; Martin Crimp[1]; [1]Michigan State University

**3:10 PM**
**Representative Volume Generation from 2D EBSD Maps and their Implementation in FFT Based Crystal Plasticity Models**: *Simon Wyatt*[1]; T Ben Britton[1]; [1]Department of Materials, Imperial College

**3:30 PM Break**

**3:50 PM**
**Tensile Behavior of Individual Grains in Austenitic Steel Studied by 3DXRD and Crystal Plasticity Simulations**: *Nicolai Juul*[1]; Jette Oddershede[2]; Grethe Winther[1]; [1]Technical University of Denmark; [2]Xnovo Technology ApS

**4:10 PM**
**Experimental and Crystal Plasticity Based Characterization of Heterogeneous Deformation in Hexagonal Titanium**: *Harsha Phukan*[1]; Thomas Bieler[1]; Chen Zhang[1]; Ruqing Xu[2]; Philip Eisenlohr[1]; Martin Crimp[1]; Carl Boehlert[1]; [1]Michigan State University; [2]Argonne National Laboratory

**4:30 PM**
**In-situ EBSD Analysis and Crystal Plasticity FE Simulations in a CP Titanium**: *Joo-Hee Kang*[1]; Ji Hoon Kim[2]; Chan Hee Park[1]; Jong Woo Won[1]; Chang-Seok Oh[1]; [1]Korea Institute of Materials Science; [2]Pusan National University

**4:50 PM**
**Comparison of Strain Maps from Digital Image Correlation and Modeling of Polycrystalline Metals**: *Nathan Bieberdorf*[1]; Antonia Antoniou[1]; Laurent Capolungo[2]; Vincent Taupin[3]; Aurélien Villani[4]; Vadim Roytershteyn[5]; [1]Georiga Institute of Technology; [2]Los Alamos National Laboratory; [3]University of Lorraine; [4]Mines St. Etienne; [5]Space Science Institute

**5:10 PM**
**A Study of Anisotropy in Tensile and Cyclic Deformation Behavior of Hexagonal Close Packed Titanium Using Electron Backscatter Diffraction and Elastoplastic Self-consistent Simulations**: *Subhasis Sinha*[1]; Nilesh Gurao[1]; [1]Indian Institute of Technology Kanpur

## Advanced High-strength Steels – Phase Transformation and Thermo-mechanical Processing

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Wednesday PM
March 14, 2018

Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Matthias Militzer, The University of British Columbia; Feng Liu, Northwestern Polytechnical University

**2:00 PM Invited**
**Microstructure and Mechanical Properties of the Coarse Grained Intercritically Annealed Heat Affected Zone in High Strength Pipeline Steels**: Maddie Madhumanti[1]; Thomas Garcin[1]; Laurie Collins[2]; Matthias Militzer[1]; *Warren Poole*[1]; [1]The University of British Columbia; [2]Evraz NA

**2:25 PM**
**Dynamic Transformation of Austenite during Plate Rolling of a High Nb X70 Pipeline Steel**: *Samuel Rodrigues*[1]; Clodualdo Aranas Jr.[1]; Fulvio Siciliano[2]; John Jonas[1]; [1]McGill University; [2]Dynamic Systems Inc.

**2:45 PM**
**A Computational Approach to Designing Martensitic Microstructures in Carbon Steels**: *Shengyen Li*[1]; Steven Mates[1]; Mark Stoudt[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

**3:05 PM**
**Microstructure of Flash Processed 10XX Steel**: *Cullen Pearson*[1]; S Babu[1]; Ben Shassere[2]; Gary Cola[3]; [1]UTK; [2]Oak Ridge National Laboratory ; [3]SPF Works LLC

**3:25 PM**
**Phase Transition Enhanced Ductility in a Superstrong Nanostructured Ferrous Alloy**: *Weitong Lin*[1]; Linke Huang[1]; Feng Liu[1]; [1]Northwestern Polytechnical University

**3:45 PM Break**

**4:00 PM Invited**
**Multi-scale Modeling for Microstructural Evolution in First-order Phase Transformations**: Kang Wang[1]; Bo Lin[1]; *Feng Liu*[1]; [1]Northwestern Polytechnical University

**4:25 PM**
**Structure - Mechanical Property Relationship in Laser Welded T-250 Maraging Steel Joint**: Devesh Misra[1]; *Kun Li*[1]; [1]University of Texas at El Paso

**4:45 PM**
**Effects of Simulated Post-weld Heat Treatment on Microstructure and Mechanical Properties of 1.25Cr-0.5Mo Steel**: *Yang Shen*[1]; Cong Wang[1]; [1]Northeastern University

**5:05 PM**
**Influence of Austenitizing Temperature and Time on Microstructure and Mechanical Properties of an YP460 Grade Crack Arrest Steel**: *Dan Chen*[1]; Wenqing Jiang[1]; Songsong Xu[1]; Naimeng Liu[1]; Hao Guo[1]; Ye Cui[1]; Yang Zhang[1]; Zhongwu Zhang[1]; [1]Harbin Engineering University

**5:25 PM**
**The Evolution of Microstructure of an High Ni HSLA X100 Forged Steel Slab by Thermomechanical Controlled Processing**: *Hashem Mousavi Anijdan*[1]; M. Sabzi[2]; [1]Young Researchers and Elites Club, Science and Research Branch, Islamic Azad University; [2]Young Researchers and Elite Club, Dezful Branch, Islamic Azad University

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Additive Manufacturing and Advanced Processing of Soft Magnetic Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Wednesday PM
March 14, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* Alex Leary, NASA Glenn

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Effect of Cooling Rate on the Magnetic and Mechanical Properties of Melt Spun Fe-6.5 wt.% Electric Steel**: *Jun Cui*[1]; Gaoyuan Ouyang[1]; Brandt Jensen[2]; Kevin Dennis[2]; Lin Zhou[2]; Wei Tang[2]; Matthew Kramer[2]; Chad Macziewski[1]; Chaochao Pan[1]; [1]Iowa State University; [2]Ames Laboratory

**2:35 PM Invited**
**Microstructural Stability of Additively Manufactured Soft Magnetic Composites**: *Mitra Taheri*[1]; Kyle Matthews[1]; James Frishkoff[1]; Stephen Luckowski[2]; Jeffrey Schutz[2]; [1]Drexel University; [2]US Army ARDEC Picatinny Arsenal

**3:05 PM Invited**
**The Advantages Offered by the Additive Manufacturing Approach in the Production of Soft Magnetic Silicon Steel Parts: from the Fabrication to the Magnetic and Mechanical Characterisation of the Printed Material**: Michele Garibaldi[1]; Ian Ashcroft[1]; Marco Simonelli[1]; Leonidas Gargalis[1]; *Richard Hague*[1]; [1]University of Nottingham

**3:35 PM Break**

**3:55 PM Invited**
**Field-annealed Amorphous and Nanocrystalline Ribbons and Composites with Improved Energy Performance**: *Ivan Skorvanek*[1]; Irena Janotova[2]; Frantisek Andrejka[1]; Branislav Kunca[1]; Jozef Marcin[1]; Peter Svec[2]; Peter Svec Sr[2]; [1]Institute of Experimental Physics; [2]Institute of Physics, SAS

**4:25 PM Invited**
**Comparing Binder Jetting and Laser Metal Deposition for Ni-Mn-based Functional Magnetic Materials**: Jakub Toman[1]; Amir Mostafaei[1]; Katerina Kimes[1]; Erica Stevens[1]; *Markus Chmielus*[1]; [1]University of Pittsburgh

**4:55 PM**
**Application Impact of Magnetic Ribbon Core Strain Annealing**: *Richard Beddingfield*[1]; Kevin Byerly[2]; Subhashish Bhattacharya[1]; Paul Ohodnicki[2]; [1]North Carolina State University; [2]National Energy Technology Labs

**5:15 PM**
**Laser Additive Manufacturing of Magnetic Materials**: Calvin Mikler[1]; *Tushar Borkar*[2]; Raju Ramanujan[3]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]Cleveland State University; [3]Nanyang Technological University

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Pb Free Solder Alloy I

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Wednesday PM
March 14, 2018
Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* Christopher Gourlay, Imperial College London; Mehran Maalekian, AIM Solder

**2:00 PM**
**Altering the Mechanical Properties of Pb-free Solder Alloys by Alloying with Bi and Sb**: *Mehran Maalekian*[1]; Mert Çelikin[2]; Karl Seelig[1]; [1]AIM Metals & Alloys; [2]McGill University

**2:20 PM**
**Study of the Solid-State Diffusion of Bi in Sn – The Effects of β-Sn Grain Orientation**: *Andre Delhaise*[1]; Zhangqi Chen[2]; Doug Perovic[1]; [1]University of Toronto; [2]Ohio State University

**2:40 PM**
**Role of Bi in Microstructural Evolution of Sn-Cu-Ni and Sn-Ag-Cu Solders and their Mechanical Performance**: *Sergey Belyakov*[1]; Takatoshi Nishimura[2]; Keith Sweatman[2]; Tetsuya Akaiwa[2]; Christopher Gourlay[1]; [1]Imperial College London; [2]Nihon Superior Co., Ltd.

**3:00 PM**
**Insights into the Heterogeneous Nucleation of ßSn in Solder Joints**: *Christopher Gourlay*[1]; Zhaolong Ma[1]; Jingwei Xian[1]; Sergey Belyakov[1]; [1]Imperial College London

**3:20 PM Break**

**3:40 PM**
**The Microstructure and Hot Rolling Deformation Mechanism of AuSn Eutectic Alloy**: *Yong Mao*[1]; Jiyang Xie[1]; Yanan Du[1]; Kai Xiong[1]; [1]Yunnan University

**4:00 PM**
**In-situ high-voltage TEM Observations of Polymorphic Phase Transformations in Cu6Sn5 Solder Joints**: Flora Somidin[1]; Hiroshi Maeno[2]; Mohd Arif Anuar Mohd Salleh[3]; Xuan Tran[1]; Stuart McDonald[1]; Syo Matsumura[2]; *Kazuhiro Nogita*[1]; [1]The University of Queensland; [2]Kyushu University; [3]Universiti Malaysia Perlis

## Advanced Real Time Optical Imaging – High Temperature Phenomena

*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, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology

Wednesday PM
March 14, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Il Sohn, Yonsei University; David Alman, US DOE National Energy Technology Laboratory

**2:00 PM**
**Thermal Imaging Furnace for the Investigation of the Molten State**: *Antoine Allanore*[1]; Bradley Nakanishi[1]; [1]Massachusetts Institute of Technology

**2:20 PM Invited**
**High-temperature Microscopy Incorporating Differential Thermal Analysis**: *Rian Dippenaar*[1]; Suk-Chun Moon[1]; Dominic Phelan[1]; [1]University of Wollongong

**2:50 PM Invited**
**Real Time Observation of High Temperature Metallurgical Phenomenon at the University of Leuven**: *Muxing Guo*[1]; [1]KULeuven

**3:20 PM**
**In-situ Microscopic Study of Natural Hematite over Repeated Reduction-oxidation Gas Exposures**: *Anna Nakano*[1]; Jinichiro Nakano[1]; James Bennett[1]; [1]US Department of Energy National Energy Technology Laboratory

**3:40 PM Break**

**4:00 PM Invited**
**Real-time Observation of Solution Growth Interface of SiC Using Alloy Solvent**: *Sakiko Kawanishi*[1]; Takeshi Yoshikawa[2]; Kazuki Morita[2]; [1]Tohoku University; [2]The University of Tokyo

**4:30 PM**
**Insitu Tensile Performance of P91 Steel in $CO_2$ Environment, Utilizing Small Samples and a Confocal Microscope**: *Kyle Rozman*[1]; Jinichiro Nakano[1]; Sajedur Akanda[1]; Omer Dogan[1]; Jeffery Hawk[1]; [1]NETL

**4:50 PM**
**Determining Metastable Phase Transformation Temperature between Al4Sm-beta and Al4Sm-gamma**: *Shihuai Zhou*[1]; Xiong Yang[1]; Fanqiang Meng[1]; Ryan Ott[1]; Matthew Kramer[1]; Ralph Napolitano[1]; [1]Ames Laboratory

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – Solidification and Microstructure II

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

Wednesday PM
March 14, 2018
Room: 231C
Location: Phoenix Convention Center

*Session Chairs:* Leon Prentice, CSIRO; Joseph Newkirk, Missouri University of Science and Technology; Eric Faierson, Quad City Manufacturing Laboratory - Western Illinois University

**2:00 PM Invited**
**Characterization of Titanium Interpenetrating Phase Composites Formed through Additive Manufacturing and Spark Plasma Sintering**: *Eric Faierson*[1]; [1]Quad City Manufacturing Laboratory - Western Illinois University

**2:30 PM Invited**
**In-situ Microstructural Control in Ti-6Al-4V during Selective Laser Melting – from Fine Acicular α' Martensite to Various Forms of Lamellar α+ β** : *Wei Xu*[1]; Edward Lui[2]; Milan Brandt[2]; Ma Qian[2]; [1]Macquarie University; [2]RMIT University

**3:00 PM**
**Effects of Beam Focus and Shape on Microstructure and Defect Characteristics in an E-beam AM Ti-6Al-4V Alloy: A Synchrotron X-ray Micro-CT Study**: *Rakesh Kamath*[1]; Kin-Ling Sham[2]; Hahn Choo[1]; Sean Yoder[3]; Ryan Dehoff[3]; Xianghui Xiao[4]; [1]Department of Materials Science and Engineering, University of Tennessee, Knoxville; [2]University of Tennessee, Knoxville; [3]Manufacturing Demonstration Facility, Oak Ridge National Laboratory; [4]X-ray Science Division, Argonne National Laboratory

**3:20 PM Break**

**3:35 PM**
**Additive Manufacturing of Ti-Cu Alloys**: *Srinivas Aditya Mantri*[1]; Tushar Borkar[1]; James Williams[1]; Rajarshi Banerjee[1]; [1]University of North Texas

**3:55 PM**
**Microstructure, Defect and Mechanical Properties of Gamma TiAl Alloys Additively Manufactured by Selective Electron Beam Melting**: *Kun Yang*[1]; Jian Wang[1]; Huiping Tang[1]; [1]Northwest Institute for Nonferrous Metal Research

## Algorithm Development in Materials Science and Engineering – Atomistic and Micro Scale Algorithms and Models

*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, Missouri University of Science and Technology; Mark Tschopp, Army Research Laboratory; Jonathan Zimmerman, Sandia National Laboratories; Ebrahim Asadi, University of Memphis; Mark Horstemeyer, Mississippi State University

Wednesday PM
March 14, 2018
Room: 130
Location: Phoenix Convention Center

*Session Chair:* Ebrahim Asadi, The University of Memphis

**2:00 PM Invited**
**Development and Parameterization of Phase-field-crystal Models**: David Montiel[1]; Jason Luce[1]; Guanglong Huang[1]; *Katsuyo Thornton*[1]; [1]University of Michigan

**2:30 PM Invited**
**Ordering and Properties of Pure and Binary Two Dimensional Honeycomb Films**: *Ken Elder*[1]; [1]Oakland University

**3:00 PM**
**Computational Performance of Phase Field Calculations using a Matrix-free (Sum-Factorization) Finite Element Method**: *Stephen DeWitt*[1]; Katsuyo Thornton[1]; Shiva Rudraraju[2]; [1]University of Michigan - Ann Arbor; [2]University of Wisconsin - Madison

**3:20 PM**
**Divergent Properties from Divergent Microstructures: The Effect of Polycrystal Instantiation Methods on Macroscopic Materials Properties**: *Jacob Gruber*[1]; Fadi Abdeljawad[2]; Stephen Foiles[2]; Hojun Lim[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]Sandia National Laboratories

**3:40 PM Break**

**4:00 PM Invited**
**Algorithmic Extensions to Phase Field Dislocation Dynamics (PFDD) for Fcc and Bcc metals**: *Abigail Hunter*[1]; Enrique Martinez Saez[1]; Irene Beyerlein[2]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara

**4:20 PM**
**Recent Advances in Polycrystal Plasticity Models and Algorithms: FFT-based and Self-consistent Approaches**: *Ricardo Lebensohn*[1]; [1]Los Alamos National Laboratory

**4:40 PM**
**GPU Accelerated Phase Field Dislocation Dynamics: Application to Bi-metallic Interfaces**: *Adnan Eghtesad*[1]; Kai Germaschewski[1]; Irene J. Beyerlein[2]; Abigail Hunter[3]; Marko Knezevic[1]; [1]University of New Hampshire; [2]University of California, Santa Barbara; [3]Los Alamos National Laboratory

**5:00 PM**
**Discrete Dislocation Dynamics Based Polycrystal Plasticity**: *John Graham*[1]; Laurent Capolungo[2]; Richard LeSar[1]; [1]Iowa State University; [2]Los Alamos National Lab

## Alloy Development and Powder Manufacture for Additive Manufacturing – Powder Development

*Sponsored by:* TMS Materials Processing and Manufacturing Division
*Program Organizers:* Paul Prichard, Kennametal; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; James Foley, Los Alamos National Laboratory

Wednesday PM
March 14, 2018

Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Jim Foley, Los Alamos National Laboratory

**2:00 PM Invited**
**Developing Powder Rheology Relationships for Characterization of Metal Powder Feedstocks Used in Additive Manufacturing**: Scott Meredith[1]; Bellamarie Ludwig[1]; *Todd Palmer*[1]; [1]Penn State

**2:30 PM**
**RF Plasma Powder Metallurgy: An Overview of Applications for Material Development in Additive Manufacturing**: *Jean-Francois Carrier*[1]; [1]Tekna

**2:50 PM**
**Synchrotron Radiation, XPS Depth Profiling and TEM Characterization for Understanding the Powder Microstructures of Some Key Printable Ti materials, and their Implications for Additive Manufacturing**: *Ming Yan*[1]; Yinghao Zhou[1]; Ma Qian[2]; [1]South University of Science and Technology of China; [2]RMIT University

**3:10 PM**
**The Metalysis Process - a Flexible Distributed Manufacture Route for the Production of Novel AM Powders**: *Ian Mellor*[1]; Greg Doughty[1]; Luke Benson Marshall[1]; Melchiorre Conti[1]; Stephen Repper[1]; Vanessa Linley[1]; [1]Metalysis Ltd

**3:30 PM Break**

**3:50 PM Invited**
**Increasing Powder Yields and Quality for Additive Manufacturing by Fundamental Processing Research on Gas Atomization**: *Iver Anderson*[1]; Emma White[1]; Jordan Tiarks[1]; Tim Prost[1]; Trevor Riedemann[1]; David Byrd[1]; [1]Ames Laboratory

**4:20 PM**
**Performance of PTAAM Components for Mining and Energy Applications**: Jose Mercardo Rojas[1]; Dylan Rose[1]; *Tonya Wolfe*[2]; Ahmed Qureshi[1]; Gary Fisher[2]; Hani Henein[1]; [1]University of Alberta; [2]InnoTech Alberta

**4:40 PM**
**Progress toward the Use of Elemental Powders for Additive Manufacturing of Aluminum Alloys**: *Christopher Roberts*[1]; David Bourell[1]; [1]University of Texas at Austin

**5:00 PM**
**Thermal Stability of Laser Sintered Nanostructured Powder**: *Kendrick Mensink*[1]; Sandip Harimkar[2]; Guillermo Aguilar[1]; Suveen Mathaudhu[1]; [1]University of California, Riverside; [2]Oklahoma State University

**5:20 PM**
**Effect of Atomizing Media on Mechanical Properties of 17-4 PH Stainless Steel Additively Manufactured via Selective Laser Melting**: *Milad Ghayoor*[1]; Somayeh Pasebani[1]; Sunil badwe[2]; Harish Irrinki[3]; Sundar Atre[3]; [1]Oregon State University; [2]North American Hoganas; [3]University of Louisville

**5:40 PM**
**Characterization of Metal Additive Manufacturing Surfaces Using Synchrotron X-ray CT and Micromechanical Modeling**: *Christopher Kantzos*[1]; Ross Cunningham[1]; Vahid Tari[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

## Alumina & Bauxite – Processing of Low Grade Bauxite: Flotation and Pretreatment

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Linus Perander, Outotec

Wednesday PM
March 14, 2018

Room: 221A
Location: Phoenix Convention Center

*Session Chair:* Andrei Smirnov, RUSAL ETC

**2:00 PM Introductory Comments**

**2:05 PM**
**Flotation Separation of Pyrite from Refractory High-sulfur Bauxite**: Wencui Chai[1]; *Guihong Han*[1]; Jiongtian Liu[1]; Yanfang Huang[1]; Huilan Chen[1]; Zhen Yan[1]; [1]Zhengzhou University

**2:30 PM**
**Research on the Desulfurization of High Sulfur Bauxite**: *Yanfang Huang*[1]; Dianyuan Dang[1]; Guihong Han[1]; Shuzhen Yang[1]; [1]Zhengzhou University

**2:55 PM**
**Research on the Interaction between 1-butyl-2-mercaptobenzimidazole and Pyrite**: Tongtong Yang[1]; *Guihong Han*[1]; Jiongtian Liu[1]; Yanfang Huang[1]; Wencui Chai[1]; Weijun Peng[1]; [1]Zhengzhou University

**3:20 PM**
**Flotation of Low-grade Bauxite Using Modified Humics as Depressant**: Guihong Han[1]; Zhen Yan[1]; *Yanfang Huang*[1]; Dianyuan Dang[1]; [1]Zhengzhou University

**3:45 PM Break**

**4:00 PM**
**Research on the Adsorption of Humic Acid on Pyrite Surface**: Yanfang Huang[1]; Huilan Chen[1]; *Guihong Han*[1]; [1]Zhengzhou University

**4:25 PM**
**Experimental Investigation on Desiliconization of Low-grade Bauxite by Flotation Process**: *Guihong Han*[1]; Hongyang Wu[1]; Wenjuan Wang[1]; Yanfang Huang; Yanfang Huang[1]; [1]Zhengzhou University

**4:50 PM**
**The Impact of Backwater Iron Ions on Bauxite Flotation**: *Chaojun Fang*[1]; Leming Ou[1]; Qiming Feng[1]; Shichao Yu[1]; Jun Wang[1]; [1]Central South University

## Aluminum Alloys, Processing and Characterization – Simulations and Studies of Processing

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Wednesday PM
March 14, 2018

Room: 221B
Location: Phoenix Convention Center

*Session Chair:* William Golumbfskie, US Naval Surface Warfare Center

**2:00 PM Invited**
**Comparison of ASTM Grid and ISO Digital Image Correlation Methods on Determination of Forming Limit Curves for an Aluminum Alloy**: *Randall Bowers*[1]; Xiyu Wen[2]; Shridas Ningileri[1]; [1]Secat, Inc.; [2]University of Kentucky

**2:30 PM**
**Understanding Large-strain Softening of Aluminum in Shear at Elevated Temperature**: Michael Kassner[1]; *Roya Ermagan*[1]; [1]University of Southern California

**2:50 PM**
**Assessments of Sc-containing Ternary Systems Al-Sc-Ti and Al-Sc-Zr within the Thermodynamic Database for Aluminium Alloys, TCAL5**: Hai-Lin Chen[1]; Qing Chen[1]; *Paul Mason*[2]; [1]Thermo-Calc Software AB; [2]Thermo-Calc Software Inc.

**3:10 PM**
**Multiscale Model for Al-Li Material Processing Simulation under Forging Conditions**: *Luke Borkowski*[1]; Alexander Staroselsky[1]; [1]United Technologies Research Center

**3:30 PM Break**

**3:50 PM**
**Investigation of Effect of Aging Treatment on Deformation Behavior of Al-Mg-Si Alloy Using Quasi-2D Polycrystalline Sample**: *Jiang Zheng*[1]; Lin Zhu[1]; Haoge Shou[1]; Jinsong Rao[1]; [1]Chongqing University

**4:10 PM**
**Development of Innovative Aluminum Alloys with High Mechanical Properties**: *Jozef Medved*[1]; Stanislav Kores[2]; Maja Voncina[1]; [1]University of Ljubljana, Faculty of Natural Sciences and Engineering; [2]Talum d.d.

**4:30 PM**
**A General Formulation of Eutectic Silicon Morphology and Processing History**: *José Spinelli*[1]; William Hearn[2]; Abdoul-Aziz Bogno[2]; Hani Henein[2]; [1]Federal University of São Carlos; [2]University of Alberta

**4:50 PM**
**Evaluation of Hot Tearing Susceptibility of 6000 Series Aluminum Alloys Using Constrained Solidification Test**: Leonel Stermann[1]; *Martín Iraizoz*[1]; [1]ALUAR

## Aluminum Reduction Technology – Fundamentals, Electrolyte Chemistry & Market

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Wednesday PM
March 14, 2018

Room: 221C
Location: Phoenix Convention Center

*Session Chair:* Zlatko Cus, TALUM d.d.

**2:00 PM Introductory Comments**

**2:05 PM**
**Current Efficiency in Hall-Héroult Cells: The Role of Mass Transfer at the Cathode**: *Asbjorn Solheim*[1]; Henrik Gudbrandsen[1]; Karen Osen[1]; Ole Edvard Kongstein[1]; Egil Skybakmoen[1]; [1]SINTEF

**2:30 PM**
**Effects of Current Density on Current Efficiency in Low Temperature Electrolysis with Vertical Electrode Structure**: *Shengzhong Bao*[1]; Dengpeng Chai[1]; Zhirong Shi[1]; Junwei Wang[1]; Guisheng Liang[1]; Yanan Zhang[1]; [1]Zhengzhou Non-ferrous Metals Research Institute Co. Ltd of CHALCO

**2:55 PM**
**Evaluating Effects of Future Shared Mobility and Electrification Trends on Key Intermediate Indicator of Aluminum Transportation Demand: US Vehicle Fleet Size**: *Suhrid Deshmukh*[1]; Rich Roth[1]; Michele Bustamante[1]; [1]MIT

**3:20 PM**
**Improvement in Smelter Process Analysis through EGA Lab Modernization**: Najeeba Aljabri[1]; Salma Almehairi[1]; Shamsa Falasi[1]; Yazeed Yabroudi[1]; Frank Feret[1]; *Tapan Sahu*[1]; Almero Eybers[1]; [1]Dubal

**3:45 PM Concluding Comments**

## Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials – Fe-based Alloys and High-entropy Alloys

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee
*Program Organizers:* Haiming Wen, Missouri University of Science and Technology; Simon Ringer, The University of Sydney; Gregory Thompson, University of Alabama; Arun Devaraj, Pacific Northwest National Laboratory; Keith Knipling, U.S. Naval Research Laboratory; Gang Sha, Nanjing University of Science and Technology; David Seidman, Northwestern University; Chantal Sudbrack, QuesTek Innovations, LLC

Wednesday PM
March 14, 2018

Room: 124A
Location: Phoenix Convention Center

*Funding support provided by:* CAMECA Instruments, Inc.

*Session Chairs:* Chantal Sudbrack,QuesTek Innovations, LLC; Gang Sha, Nanjing University of Science and Technology

**2:00 PM**
**Application of APT in Understanding Thermal Embrittlement of a Duplex Stainless Steel**: *Sha Gang*[1]; [1]Nanjing University of Science and Technology

**2:20 PM**
**Issues with Atom Probe Quantification of Nitrogen in Steels**: *Frederic Danoix*[1]; Raphaële Danoix[2]; Andrius Martinavicius[3]; Mohamed GOUNE[4]; Hugo Van Lendeghem[5]; François Vurpillot[2]; [1]CNRS - Université de Rouen; [2]Normandie Université; [3]Normandie Université & IJL Nancy; [4]ICMCB Bordeaux; [5]Université Grenoble Alpes

**2:40 PM**
**Investigation of Carbon Redistribution in Martensite during Room Temperature Aging by Correlative TEM and APT**: *Wenjun Lu*[1]; Michael Herbig[1]; Christian Liebscher[1]; Lutz Morsdorf[1]; Ross Marceau[2]; Gerhard Dehm[1]; Dierk Raabe[1]; [1]Max Planck Institute for Iron Research; [2]Deakin University

**3:00 PM**
**Long-range Ordered Nanoscale Domains in an Fe-Co-Mo Maraging Steel, an Atom Probe Microscopy and Neutron Diffraction Study**: *Sophie Primig*[1]; Felix Theska[1]; Christoph Turk[2]; Anna Ceguerra[3]; Simon Ringer[3]; [1]UNSW Sydney; [2]Boehler Edelstahl GmbH & Co KG; [3]The University of Sydney

**3:20 PM Break**

**3:40 PM**
**Grain Boundary Chemistry of Dual Main Phase Nd-Ce-Fe-B As-sintered Magnets Revealed by Atom Probe Tomography**: *Hansheng Chen*[1]; Rui Han[2]; Shengzhi Dong[2]; Fan Yun[1]; Jiangtao Qu[1]; Simon Ringer[1]; Wei Li[2]; Rongkun Zheng[1]; [1]The University of Sydney; [2]Central Iron and Steel Research Institute

**4:00 PM**
**Correlative Transmission EBSD-APT Analysis of Grain Boundaries in Additively Manufactured Nickel-base Superalloy Inconel-738LC**: *Avinash Hariharan*[1]; Jeroen Risse[2]; Eric Jägle[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Fraunhofer-Institut für Lasertechnik ILT

**4:20 PM**
**Secondary Phase and Precipitate Characterization of a Fe25Co25Ni25Al10Ti15 HEA Using Atom Probe Tomography**: *Andrew Hoffman*[1]; Haiming Wen[1]; [1]University of Missouri S&T

**4:40 PM**
**Nanoscale Phase Separation and Precipitation in AlCoCrFeNi High Entropy Alloys as Studied by Atom Probe Tomography**: *Keith Knipling*[1]; Joshua Tharpe[2]; Peter Liaw[2]; [1]U.S. Naval Research Laboratory; [2]University of Tennessee

## Biodegradable Materials for Medical Applications – Magnesium Alloys II

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Jaroslaw Drelich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund; Jan Seitz, Syntellix AG; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California-Riverside

Wednesday PM
March 14, 2018
Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Diego Mantovani, Laval University; Mauricio Vedani, Polytechnic of Milano

**2:00 PM Keynote**
**Is Corrosion Fatique Relevant for Biodegradable Magnesium Implants?**: *Frank Witte*[1]; [1]Charite - Universitätsmedizin Berlin

**2:40 PM Invited**
**Microstructure Properties and In-vitro Degradation Behavior of the Bioresorbable Magnesium Alloy ZNdK100**: *Christian Klose*[1]; Rainer Eifler[1]; Hans Jürgen Maier[1]; [1]Leibniz Universität Hannover

**3:10 PM**
**Microstructure and Mechanical Properties of Mg-Gd Alloys as Biodegradable Implant Materials**: *Yiyi Lu*[1]; Yuanding Huang[1]; Frank Feyerabend[1]; Regine Willumeit-Römer[1]; Karl-Ulrich Kainer[1]; Norbert Hort[1]; [1]Helmholtz-Zentrum Geesthacht

**3:30 PM Break**

**3:50 PM Invited**
**Influence of Casting on Microstructure and Corrosion of Mg-Ca-Zn Alloys for Biomedical Application**: *Daniela Zander*[1]; Naemi Zumdick[1]; [1]RWTH Aachen University

**4:20 PM**
**Osteosynthesis in a Growing Ovine Model using Bioresorbable Rare-earth-free Magnesium Screws**: Johannes Eichler[1]; Patrick Holweg[1]; Leopold Berger[2]; Martina Cihova[2]; Nicholas Donohue[1]; *Nicole Grün*[1]; Jörg Löffler[2]; Annelie Weinberg[1]; [1]Medical University of Graz; [2]ETH Zuerich

**4:40 PM**
**Osteosynthesis in an Osteoporotic Rat Model Using Magnesium-based Pins**: *Nicole Gruen*[1]; Daniela Hirzberger[1]; Johannes Eichler[1]; Nicholas Donohue[1]; Annelie-Martina Weinberg[1]; [1]Medical University of Graz

**5:00 PM**
**Development of Porous and Biodegradable Hydroxyapatite/Mg Alloy Composite as Biodegradable Implants for Orthopaedic Applications**: *Jae-Young Jung*[1]; Yajur Maker[1]; Sung Sik Hur[1]; Steven Naleway[2]; Gracia Innocentia[1]; Kathy Kang[1]; Marc Meyers[1]; Shu Chien[1]; Joanna McKittrick[1]; [1]University of California, San Diego; [2]The University of Utah

## Biological Materials Science – Biomaterials and Biomedical Applications II

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

Wednesday PM
March 14, 2018
Room: 225B
Location: Phoenix Convention Center

*Session Chairs:* Jing Du, Penn State University; Steven Naleway, University of Utah

**2:00 PM**
**Anchoring Tannic Acid to a Polymeric Backbone - a Novel Burn Wound Treatment**: *Matthew Korey*[1]; [1]Purdue University

**2:20 PM**
**The Study of the Effects of Cancer Drugs on the Structure and Mechanical Properties of Triple Negative Breast Cancer Cells (TNBCs)**: *Vanessa Uzonwanne*[1]; John Obayemi[1]; Jingjie Hu[2]; Ali Salifu[1]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute; [2]Princeton University

**2:40 PM**
**Nanocomposite Heating Probes for Thermoablation of Cancerous Cells**: *Kwabena Kan-Dapaah*[1]; Nima Rahbar[2]; Wole Soboyejo[2]; [1]Dept. of Biomedical Engineering, University of Ghana; [2]Worcester Polytechnic Institute

**3:00 PM**
**An Anatomic Breast Phantom Mimicking Varying Levels of Radiographic Tissue Density for Translational Investigation of Contrast-enhanced Imaging Using Targeted Nanoparticles**: *Lisa Irimata*[1]; Tyler Finamore[1]; Tyler Curtis[1]; Tracy Vargo-Gogola[1]; Ryan Roeder[1]; [1]University of Notre Dame

**3:20 PM**
**Automatic Shape-based Cell Identification in Arabidopsis Thaliana Cotyledons Using 3D Moment Invariants**: *Ryan Harrison*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**3:40 PM Break**

**3:55 PM**
**Cryo-drawn of CP Ti: A New Material for Medical Applications**: *Mikael Grehk*[1]; Pasi Kangas[1]; Guocai Chai[1]; Lars Wikström[1]; [1]Sandvik Materials Technology

**4:15 PM**
**A Novel Approach of Polymer Grafting on Selective Laser Melted Titanium Alloy Hip Implants for Improved Lubricity and Biocompatibility**: *Subir Ghosh*[1]; Sylvester Abanteriba[1]; Shadi Houshyar[1]; [1]RMIT University

**4:35 PM**
**Bio-functional Design for Metallic Biomaterials: Cu-bearing Metallic Biomaterials**: *Ling Ren*[1]; Ke Yang[1]; [1]Institute of Metal Research CAS

**4:55 PM**
**The Effect of the Thickness of the Magnetic Biological Patch on the Accumulation Mechanism of Magnetic Particles**: *Lanlan Cai*[1]; Kai Yang[1]; Yongyong Gong[1]; Jiaqi Ma[2]; Zheyong Huang[2]; Ning Pei[1]; [1]Shanghai University; [2]Zhongshan Hospital, Fudan University

**5:15 PM**
**A Novel In Vitro Fatigue Test for Biomimetic Implants Made of UHMWPE**: *Marina Knyazeva*[1]; Dario Porchetta[1]; Ronja Scholz[1]; Frank Walther[1]; [1]TU Dortmund University

## Building an ICME Infrastructure: Developing Tools that Integrate Across Length and Time Scales to Accelerate Materials Design – ICME Gap Analysis: Multiscale Modeling and Characterization of Structural Materials: II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Carelyn Campbell, National Institute of Standards and Technology; Mark Carroll, Federal Mogul Powertrain; Adam Hope, Thermo-Calc Software; Hojun Lim, Sandia National Laboratories; Myoung-Gyu Lee, Korea University; Amy Clarke, Colorado School of Mines; Dongwon Shin, Oak Ridge National Laboratory

Wednesday PM
March 14, 2018
Room: 132C
Location: Phoenix Convention Center

*Session Chair:* Hojun Lim, Sandia National Laboratories

**2:00 PM Invited**
**Accelerating the Process-structure-property Discovery Cycle**: *Brad Boyce*[1]; Joseph Michael[1]; [1]Sandia National Laboratories

**2:40 PM Invited**
**Yield Stress, Proportional Limit: Do They Exist?**: *Robert Wagoner*[1]; [1]Ohio State University

**3:20 PM Break**

**3:35 PM Invited**
**Modeling Plastic Anisotropy of Textured Polycrystalline Materials**: *Oana Cazacu*[1]; Nitin Chandola[1]; [1]University of Florida

**4:15 PM Invited**
**Prediction of Hole Expansion Ratio Using Microstructure Based Dual-scale Finite Element Approach**: *Heung Nam Han*[1]; Siwook Park[1]; Jinwook Jung[1]; Sung Il Kim[2]; Seok-Jong Seo[2]; Myoung-Gyu Lee[3]; [1]Seoul National University; [2]POSCO; [3]Korea University

**4:55 PM Invited**
**Differences between Measured and Simulated Elastic Strain States Using High Energy X-ray Diffraction in Titanium Using Crystal Plasticity Models**: *Thomas Bieler*[1]; Chen Zhang[1]; Harsha Phukan[1]; Philip Eisenlohr[1]; Martin Crimp[1]; Carl Boehlert[1]; Fionn Dunne[2]; T. Britton[2]; Armand Beaudoin[3]; Darren Pagan[3]; Peter Kenesei[4]; Jun-Sang Park[4]; Ruqing Xu[4]; Wenjun Liu[4]; [1]Michigan State University; [2]Imperial College; [3]Cornell High Energy Synchrotron Source; [4]Argonne National Laboratory

## Bulk Metallic Glasses XV – Structures and Mechanical Properties II

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Wednesday PM
March 14, 2018
Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Juergen Eckert, Montanuniversität Leoben; Jinn Chu, National Taiwan University of Science and Technology

**2:00 PM Invited**
**Manipulating Structures and Mechanical Properties in Metallic Glasses**: *Juergen Eckert*[1]; [1]Montanuniversität Leoben

**2:20 PM**
**Dynamics of Inherent Structure Energy Evolution in Metallic Glasses**: *Yue Fan*[1]; [1]University of Michigan, Ann Arbor

**2:40 PM Invited**
**Intermediate Temperature Brittleness in Metallic Glasses**: *Jianzhong Jiang*[1]; Chao Wang[1]; Qingping Cao[1]; Xiaodong Wang[1]; Dongxian Zhang[2]; Upadrasta Ramamurty[3]; Ramasubramanian Lakshmi Narayan[4]; [1]Zhejiang University; [2]State Key Laboratory of Modern Optical Instrumentation, Zhejiang University; [3]Department of Materials Engineering, Indian Institute of Science; [4]Carnegie Mellon University

**3:00 PM Invited**
**On the Effect of Sample Size on the Fracture Toughness of Bulk Metallic Glasses**: Bernd Gludovatz[1]; Jamie Kruzic[1]; *Robert Ritchie*[2]; [1]UNSW Sydney; [2]Lawrence Berkeley National Laboratory

**3:20 PM Invited**
**Effects of Annealing and Irradiation on the Mechanical and Microstructural Properties of Bulk Metallic Glass Alloys**: *Jamieson Brechtl*[1]; Miguel Crespillo[1]; Hui Wang[1]; Tengfei Yang[1]; Luis Mora[2]; Yanwen Zhang[1]; Hongbin Bei[2]; Yongqiang Wang[3]; Joerg Neuefeind[2]; Wojciech Dmowski[2]; Takeshi Egami[2]; Peter Liaw[1]; Steven Zinkle[2]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]Los Alamos National Laboratory

**3:40 PM Break**

**3:55 PM Invited**
**Density Evolution, Strain Hardening, and Plastic Flow of a Metallic Glass in a Notched Tensile Test**: Yonghao Sun[1]; Mantong Zhao[1]; Peter Kenesei[2]; Jun-Sang Park[2]; *Todd Hufnagel*[1]; [1]Johns Hopkins University; [2]Argonne National Laboratory

**4:15 PM Invited**
**Thin-film Metallic Glass with Ultra-high Plasticity under Shearing and Nanoindentation at Room Temperature**: Chia-Chi Yu[1]; *Jinn Chu*[1]; J. E. Greene[2]; Peter K. Liaw[3]; [1]National Taiwan University of Science and Technology; [2]University of Illinois at Urbana-Champaign; [3]The University of Tennessee

**4:35 PM Invited**
**Strain Delocalization and Fracture Behaviors of Laminated Metallic Glass Composites**: *Xinghang Zhang*[1]; Zhe Fan[1]; Jian Wang[2]; Jin Li[1]; Haiyan Wang[1]; [1]Purdue University; [2]University of Nebraska, Lincoln

**4:55 PM Invited**
**Strengthening and Toughening via Phase Separation and Beta Relaxation in Zr-based Bulk Metallic Glasses**: *Xidong Hui*[1]; Tuo Wang[1]; Yanhui Liu[2]; [1]University of Science and Technology Beijing; [2]Institute of Physics, Chinese Academy of Sciences

**5:15 PM Invited**
**Tailoring Crystallization Pathways of Metallic Glass Nanorods via Nucleus Starvation**: *Sungwoo Sohn*[1]; Yujun Xie[1]; YeonWoong Jung[2]; Jan Schroers[1]; Judy Cha[1]; [1]Yale University; [2]University of Central Florida

## Cast Shop Technology: Fundamentals of Aluminum Alloy Solidification Joint Session – Cast Shop Technology: Fundamentals of Aluminum Alloy Solidification Joint Session

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* Andre Phillion, McMaster University; Mark Badowski, Hydro Aluminium; Mohsen Asle Zaeem, Missouri University of Science and Technology

Wednesday PM
March 14, 2018
Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Andre Phillion, McMaster University

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**In-situ Study of Solidification Kinetics of Al-Cu and Al-Ce Alloys with Application of Neutron Diffraction**: Joshua Stroh[1]; Tyler Davis[1]; Alexandra McDougall[1]; *Dimitry Sediako*[1]; [1]University of British Columbia

**2:30 PM**
**Quantifying Effects of Grain Refiner Addition on Fe-rich Intermetallics Solidification of Al-Si-Cu Alloys Using In Situ Synchrotron X-ray Tomography**: *Surada Chuaypradit*[1]; Chedtha Puncreobutr[1]; André Phillion[2]; Julie Fife[3]; Peter Lee[4]; [1]Chulalongkorn University; [2]McMaster University; [3]Paul Scherrer Institut; [4]The University of Manchester

**2:55 PM**
**An Investigation on Si Refinement Mechanism of Hypereutectic Al-Si via Applying Ultrasonic Vibrations**: *Reza Haghayeghi*[1]; Leandro De Paula[2]; Eugenio Zoqui[2]; [1]Islamic Azad University; [2]University of Campinas

**3:20 PM**
**Observations of Microhardness and Evolution of Constituents in Al-Zn and Zn-Al Specimens with Columnar-to-Equiaxed Grain Transition**: Roberto Rozicki[1]; Alex Kociubczyk[2]; Gustavo Kramer[2]; *Alicia Ares*[2]; [1]FCEQyN-UNaM; [2]CONICET/FCEQyN-UNaM

**3:45 PM Break**

**4:00 PM**
**Impact of Inlet Flow On Macrosegregation Formation Accounting for Grain Motion and Morphology Evolution in DC Casting Of Aluminium**: *Akash Pakanati*[1]; Knut Omdal Tveito[1]; Mohammed M'Hamdi[2]; Hervé Combeau[3]; Miha Založnik[3]; [1]NTNU; [2]SINTEF; [3]Institut Jean Lamour

**4:25 PM**
**Effects of Microstructure on Hot Cracking Behavior in Al-Zn-Mg-Cu Alloys**: *David Gildemeister*[1]; [1]Arconic Technology Center

**4:50 PM**
**Effective Nanoparticles Feeding Treatment in Casting of A356/ZrO2 Nano-reinforced Composite**: H. Toweri[1]; W. Hoziefa[2]; Adel El-Shabasy[1]; *Iman El Mahallawi*[3]; [1]Ain Shams University; [2]Al-Azhar; [3]Cairo University

## Characterization of Minerals, Metals, and Materials – Characterization Methods II

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Wednesday PM
March 14, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chairs:* Juan Escobedo-Diaz, University of New South Wales; Jeongguk Kim, Korea Railroad Research Institute

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Design of Road Defect Scanning System through Multiple Application of Nondestructive Evaluation (NDE) Techniques**: *Jeongguk Kim*[1]; Jaesun Lee[1]; [1]Korea Railroad Research Institute

**2:25 PM Invited**
**Towards High throughput Quantitative Metallography for Complex Microstructures with Deep Semantic Segmentation Models: A Case Study in Ultrahigh Carbon Steel**: *Brian DeCost*[1]; Toby Francis[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

**2:45 PM**
**Microbeam X-ray Laue Diffraction Analysis of a Fatigue Crack Interaction with Microstructure in Duplex Stainless Steel Using a pnCCD Detector**: *Ali Abboud*[1]; Ullrich Pietsch[1]; Hans-Juergen Christ[1]; Jean-Sébastien Micha[2]; Lothar Strüder[3]; Benjamin Dögnes[1]; [1]University of Siegen; [2]CEA-GrenobleINACSprAM; [3]PNSensor GmbH

**3:05 PM**
**Study on the Toughening Mechanisms of Collagenous Materials by Using Real-time X-ray Characterization and Imaging**: *Wen Yang*[1]; Haocheng Quan[1]; Elizabeth Zimmermann[2]; Eric Schaible[2]; Marc Meyers[1]; Robert Ritchie[3]; [1]University of California, San Diego; [2]Lawrence Berkeley National Laboratory; [3]University of California, Berkeley

**3:25 PM**
**In Situ Diagnostics of Melting/Solidification and Segregation during Crystal Growth by Energy-resolved and Conventional Neutron Imaging**: *Sven Vogel*[1]; Anton S. Tremsin[2]; Drew Onken[3]; Didier Perrodin[4]; Adrian S. Losko[1]; Greg Bizarri[4]; Edith Bourret-Courchesne[4]; [1]Los Alamos National Laboratory; [2]UC Berkeley; [3]Wake Forest University; [4]Lawrence Berkeley National Laboratory

**3:45 PM Break**

**4:00 PM**
**AstroEBSD: A Novel EBSD Pattern Indexing Routine Launched from an Astronomical Approach**: Vivian Tong[1]; Jim Hickey[1]; Alex Foden[1]; Angus Wilkinson[2]; *T Ben Britton*[1]; [1]Department of Materials, Imperial College; [2]Department of Materials, University of Oxford

**4:20 PM**
**Non-destructive Characterization Techniques for Identification of Metal Inclusions in Plastic-bonded Explosives**: *Genevieve Watt*[1]; Adrian Losko[1]; Amanda Duque[1]; Sven Vogel[1]; John Yeager[1]; [1]Los Alamos National Laboratory

**4:40 PM**
**Exploring Thermal Loading of Composites by the Acoustic Emission Technique**: *Frantisek Chmelik*[1]; Michal Knapek[1]; Patrik Dobron[1]; [1]Charles University

**5:00 PM**
**Computational Polarized Light Microscopy Technique for Determining the C-axis Orientation of Uni-axial Materials**: *Ke-Wei Jin*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

## Characterization of Minerals, Metals, and Materials – Characterization of Powder Materials

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Wednesday PM
March 14, 2018
Room: 125A
Location: Phoenix Convention Center

*Session Chairs:* Chenguang Bai, Chongqing University; Rajiv Soman, Purity Survey Analysis

**2:00 PM Introductory Comments**

**2:05 PM**
**Three Dimensional Characterization of Powder Al Alloys and the Effects of Thermal Processing**: *Caitlin Walde*[1]; Danielle Cote[1]; Victor Champagne[2]; Richard Sisson[1]; [1]WPI; [2]US Army Research Laboratory

**2:25 PM**
**Characterization of HPGR Pre-treated Sinter Feed**: *Mingming Zhang*[1]; Kodukula Bhaskar[1]; Marcelo Andrade[1]; [1]ArcelorMittal Global R&D

**2:45 PM**
**Thermogravimetric Analysis on Reduction Behavior of Powdery Dicalcium Ferrite**: *Chengyi Ding*[1]; Xuewei Lv[1]; Gang Li[1]; Chenguang Bai[1]; Senwei Xuan[1]; Kai Tang[1]; Yang Xu[1]; [1]Chongqing University

**3:05 PM**
**MC Carbide Characterization in a High Refractory Content Powder Processed Ni-based Superalloy**: *Stoichko Antonov*[1]; Sammy Tin[1]; [1]Illinois Institute of Technology

**3:25 PM Break**

**3:40 PM**
**Study on Application of Iron Ore Fine in Pelletizing**: *Gele Qing*[1]; Yunqing Tian[1]; Weidong Zhang[1]; Xiangjuan Dong[1]; Wenbin Huang[1]; Yan Zhang[1]; [1]Shougang Research Institute of Techonogly

**4:00 PM**
**Research with Scanning Rate on SLM Property of 316L Stainless Steel Metal Powder**: *Junfu Chen*[1]; [1]Huazhong University of Science and Technology

## Characterization of Minerals, Metals, and Materials – Mechanical Behaviors of Materials

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Wednesday PM
March 14, 2018
Room: 126B
Location: Phoenix Convention Center

*Session Chairs:* Donato Firrao, Politecnico di Torino - DISAT; Tomoko Sano, U.S. Army Research Laboratory

**2:00 PM Introductory Comments**

**2:05 PM**
**Advanced Mechanical Characterization for High Temperature Materials**: Philip Blosser[1]; Andrew Rosenberger[2]; *Michael Shepard*[3]; Jonathan Spowart[2]; Larry Zawada[4]; [1]University of Dayton Research Institute; [2]US Air Force Research Laboratory; [3]MTS Systems Corporation; [4]Universal Technology Corporation

**2:25 PM**
**Characterization of Deformation Mechanisms of Stainless Steels Assisted by Phase Transformation by Means of EBSD Analysis Combined with Nanoindentation**: *Marina Knyazeva*[1]; David Nowak[1]; Frank Walther[1]; [1]TU Dortmund University

**2:45 PM**
**In-situ TEM Study of Precipitation Behavior in Alloy 690-based MA Powders**: *Man Wang*[1]; Heung Nam Han[2]; Hee-Suk Chung[3]; Young Bum Chun[1]; Chang Hee Han[1]; Jinsung Jang[1]; [1]KAERI; [2]Seoul National University; [3]Korea Basic Science Institute

**3:05 PM**
**Determination of Microstructure-based Constitutive Models Using Temperature Rise Distribution in Plane Strain Machining**: Sepideh Abolghasem[1]; *Juan Camilo Osorio Pinzon*[1]; Juan Pablo Casas Rodriguez[1]; [1]Universidad de los Andes

**3:25 PM Break**

**3:40 PM**
**Mechanical Properties and Time-dependent Behavior of Vapor-deposited TPD Glass**: *Chaiyapat Tangpatjaroen*[1]; Diane Walters[1]; Jaritza Gómez[1]; David Grierson[1]; Mark Ediger[1]; Izabela Szlufarska[1]; [1]University of Wisconsin - Madison

**4:00 PM**
**Precipitating Behaviour of Second Phase Particles in Lightweight Fe-Mn-Al-C-N Stainless Steel**: *Wei Hou*[1]; Jingtao Wang[1]; Xiaoyu Han[1]; Jun Bao[1]; [1]Chongqing Universitity

**4:20 PM**
**Local Texture Evolution and Mechanical Performance of Ultra-High-Speed Friction Stir Weld of AA 6111-T4 Sheets**: *Jingyi Zhang*[1]; Yuri Hovanski[2]; Piyush Upadhyay[3]; David Field[1]; [1]Washington State University; [2]Brigham Young University; [3]Pacific Northwest National Laboratory

**4:40 PM**
**Bending Mechanical Behavior of Epoxy Matrix Reinforced with Fique Fabric**: *Marcos Vinícius Ferreira*[1]; Rúben Jesus Sánchez Rodríguez[1]; Maria Carolina Andrade Teles[1]; Gilson Vieira Fernades[1]; Felipe Perissé Duarte Lopes[1]; Sérgio Neves Monteiro[2]; Frederico Margem[1]; [1]State University of the Northern Rio de Janeiro - UENF; [2]Military Institute of Engineering - IME

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Diffusion II

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Wednesday PM
March 14, 2018
Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Qing Jiang, Jilin University; Graeme Murch, The University of Newcastle

**2:00 PM Invited**
**Determination of the Diffusion Mechanisms in Liquid Alloys**: *Graeme Murch*[1]; Irina Belova[1]; [1]The University of Newcastle

**2:30 PM**
**First Principles Molecular Dynamics Study for Oxidation on Ti Surface at Elevated Temperature**: *Somesh Bhattacharya*[1]; Ryoji Sahara[1]; Kyosuke Ueda[2]; Takayuki Naushima[2]; [1]National Institute for Materials Science; [2]Tohoku University

**2:50 PM**
**Properties of Liquid TiAl Alloys from Classical MD Simulation and Comparison to Electrostatic Levitation (ESL) Experiments**: *Brian Novak*[1]; Jonathan Raush[2]; Xiaoman Zhang[1]; Wenjin Meng[1]; Shengmin Guo[1]; Dorel Moldovan[1]; [1]Louisiana State University; [2]University of Louisiana at Lafayette

**3:10 PM**
**Mass and Heat Transport in Ternary Liquid Alloys**: *Irina Belova*[1]; Graeme Murch[1]; [1]University of Newcastle

**3:30 PM Break**

**3:45 PM Invited**
**Design of Fast Ion Conducting Electrode Materials**: *Qing Jiang*[1]; [1]Jilin University

**4:15 PM**
**Theoretical Investigation of Ag-Li-Sb System as the Anode Materials for Lithium-ion Batteries**: *Marcela Trybula*[1]; Monika Bugajska[2]; Przemyslaw Fima[2]; [1]Institute of Metallurgy and Materials Science Polish Academy of Sciences, Krakow, Poland; Department of Materials Science and Engineering, Division of Materials, KTH Royal Institute of Technology, Stockholm, Sweden; [2]Institute of Metallurgy and Materials Science Polish Academy of Sciences

**4:35 PM**
**The Effect of Chemical Doping on the Lithiation Processes of the Crystalline Si Anode: A First-principles Study**: *Chin-Lung Kuo*[1]; [1]National Taiwan University

**4:55 PM**
**Protein Dynamics under Nanoconfinement and Its Contribution to the Toughness of Nacre**: *Arvand Navabi*[1]; Nima Rahbar[1]; [1]Worcester Polytechnic Institute

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Microstructure and Processing Simulations II

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Wednesday PM
March 14, 2018
Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Alan Luo, The Ohio State University; Yongwoo Kwon, Hongik University

**2:00 PM**
**Sintering Dynamics in Direct Write Additive Manufacturing Processes: A Phase Field Model**: *Fadi Abdeljawad*[1]; Dan Bolintineanu[1]; Adam Cook[1]; Harlan Brown-Shaklee[1]; Daniel Kammler[1]; [1]Sandia National Laboratories

**2:20 PM**
**Multi-scale Phase-field Modeling of Microstructure Evolution of Additively Manufactured Metals**: *Lei Chen*[1]; Zhuo Wang[1]; [1]Mississippi State University

**2:40 PM**
**Smoothed Particle Hydrodynamics Simulation of Impact Welding Process**: *Ali Nassiri*[1]; Tim Abke[2]; [1]The Ohio State University; [2]Honda R&D Americas, Inc.

**3:00 PM**
**Study on the Effects of Die Coating Thickness on the Interfacial Heat Transfer Coefficient in Squeeze Casting of Aluminum Alloy**: Feifan Wang[1]; Xuyang Wang[1]; Keyan Wu[1]; *Zhiqiang Han*[1]; [1]Tsinghua University

**3:20 PM**
**Phase Field and Atomistic Simulation to Study Solidification in Undercooled Titanium**: *Sepideh Kavousi*[1]; Brian Novak[1]; Mohammad Dodaran[1]; Dorel Moldovan[1]; [1]Louisiana State University

**3:40 PM Break**

**4:00 PM**
**CALPHAD Coupled Phase Field Modeling of Sigma Phase Precipitation in Commercial 2507 Super Duplex Stainless Steel Alloy**: *Amer Malik*[1]; Jan Jonson[2]; Joakim Odqvist[3]; Staffan Hertzman[1]; [1]Swerea KIMAB AB; [2]Outokumpu Stainless AB; [3]KTH Royal Institute of Technology

**4:20 PM**
**Multi-scale Materials Modeling to Study the Influence of Microscopic Parameters on the Mechanical Properties of DP Steels under Different Strain Rates: Parametric Study and Optimization**: *Tarek Belgasam*[1]; Hussein Zbib[1]; [1]Washington State University

**4:40 PM**
**2D Simulation of Gradient Zone Formation in Cemented Carbides with Conventional and Alternative Binders**: *Armin Salmasi*[1]; Henrik Larsson[1]; Stella Sten[1]; Andreas Blomqvist[2]; [1]KTH Royal institute of technology; [2]Sandvik Coromant R&D

**5:00 PM**
**Continuum Scale Modelling of Diffusion-reaction Processes during Coating Deposition**: *Axel Forslund*[1]; Henrik Larsson[1]; [1]KTH Royal Institute of Technology

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Computational Design: Tools and Data

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

Wednesday PM
March 14, 2018
Room: 131C
Location: Phoenix Convention Center

*Session Chairs:* Yu Zhong, Worcester Polytechnic Institute; Alex Greaney, University of California, Riverside

**2:00 PM Invited**
**Automated Computer Design of Kinematically Active Molecular Materials**: Charles Manion[1]; Laura de Sousa Oliveira[2]; Brady Gibbons[1]; Matthew Campbell[1]; *P Greaney*[2]; [1]Oregon State University; [2]University of California, Riverside

**2:30 PM**
**SEGROcalc: A Software Tool for Integrated Computational Grain Boundary Engineering**: *Daniel Scheiber*[1]; Anatol Drlicek[1]; Nada Kulo[1]; Jürgen Spitaler[1]; Vsevolod Razumovskiy[1]; Lorenz Romaner[1]; [1]Materials Center Leoben Forschungs GmbH

**2:50 PM**
**Error Analysis of Interdiffusion Coefficients from Diffusion Couple Experiments**: *Zhangqi Chen*[1]; Ji-Cheng Zhao[1]; [1]The Ohio State University

**3:10 PM**
**Computational Microstructure Characterization and Reconstruction for Multi-scale Analysis of Multi-phase AHSS**: *Hongshan Zhao*[1]; Han Dong[1]; Wei Li[2]; Xuejun Jin[2]; [1]Shanghai University; [2]Shanghai Jiao Tong University

**3:30 PM Break**

**3:50 PM**
**Quantitative Defect Chemistry Analysis of (La1-xCax)yFeO3±d Perovskite**: *Shadi Darvish*[1]; Yu Zhong[2]; [1]Florida International University; [2]Worcester Polytechnic Institute

**4:10 PM**
**Theoretical Investigation of Vacancy Concentration and its Effect on the Kinetics of B2 – $L2_1$ Ordering in Ni-Co-Mn-In MetaMagnetic Shape Memory Alloys**: *Yuhao Wang*[1]; Daniel Salas[1]; Bharat Medasani[2]; Ibrahim Karaman[1]; Thien Duong[1]; Raymundo Arroyave[1]; [1]Texas A&M University; [2]Pacific Northwest National Laboratory

**4:30 PM**
**Separation Oxide and Fluride and Sulfur Gases with Hydrogen in Aluminium Industry by Carbon Nano Tube (Monte Carlo Simulation)**: *Mohsen Amerisiahooei*[1]; Khirollah Baharvand[1]; Mohammad Yousefi[1]; [1]Islamic Azad University

**4:50 PM**
**Design of a New Multi-element Beta Titanium Alloy Based on D-electron Method**: *Saeed Sadeghpour*[1]; Seyed Mahdi Abbasi[1]; Maryam Morakabati[1]; [1]Malek Ashtar University of Technology

## Computational Materials Science and Engineering for Nuclear Energy – Fundamentals of Radiation Effects I

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Wednesday PM
March 14, 2018
Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* Sergei Dudarev, Culham Centre for Fusion Energy (CCFE); James Morris, Oak Ridge National Laboratory

**2:00 PM Invited**
**Evolution of Grain Boundary Structure and Composition in Irradiated SiC**: *Izabela Szlufarska*[1]; Xing Wang[2]; Hao Jiang[1]; Tomonori Baba[1]; [1]University of Wisconsin; [2]Oak Ridge National Laboratory

**2:30 PM**
**Effects of Oxygen on the Density of States and Elastic Properties of Hafnium—First Principles Calculations**: *Yang Zhang*[1]; Yajie Wen[1]; Naimeng Liu[1]; Hao Guo[1]; Ye Cui[1]; Dan Chen[1]; Zhongwu Zhang[1]; [1]Harbin Engineering University

**2:50 PM**
**Quantitative Phase Field Modeling of Void Growth in Irradiated Solids**: *Anter El-Azab*[1]; [1]Purdue University

**3:10 PM**
**Multiscale Simulations of Sequential Dislocation/Obstacle Interactions in FCC Metals**: *Shuozhi Xu*[1]; David McDowell[2]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Georgia Institute of Technology

**3:30 PM Break**

**3:50 PM**
**Thermomechanical Analysis of the Multi-metallic Layered Composite Fuel Cladding for Improved Accident Tolerance of LWRs**: *Aashique Rezwan*[1]; Michael Tonks[1]; Michael Short[2]; [1]The Pennsylvania State University; [2]Massachusetts Institute of Technology

**4:10 PM**
**The Thermodynamic and Kinetic Properties of Spinels as They Relate to CRUD**: Ghanshyam Pilania[1]; *Blas Uberuaga*[1]; David Andersson[1]; [1]Los Alamos National Laboratory

**4:30 PM**
**Computer Simulations of Dislocation-obstacle Interactions in the Hardening and Recovery of BWR-irradiated 304L SS**: *Justin Hesterberg*[1]; Jesse Carter[2]; Denise Paraventi[2]; Richard Smith[2]; Gary Was[1]; [1]University of Michigan; [2]Naval Nuclear Laboratory

**4:50 PM Invited**
**Interstitial-mediated Diffusion and Aggregation Mechanism for Transmutation Elements Rhenium and Ormium Precipitation in Tungsten**: *Guanghong Lu*[1]; Hongbo Zhou[1]; Yuhao Li[1]; [1]Beihang University

## Computational Method and Experimental Approaches for Model Development and Validation, Uncertainty Quantification, and Stochastic Predictions – Development, UQ and Validation of Classical Potential

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory; Richard Hennig, University of Florida; Avinash Dongare, University of Connecticut; Shawn Coleman, U.S. Army Research Laboratory; Niaz Abdolrahim, University of Rochester; Joseph Bishop, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Li Ma, National Institute of Standards and Technology

Wednesday PM
March 14, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chair:* Fadi Abdeljawad, Sandia National Laboratories

**2:00 PM Invited**
**Machine Learning Methods for Interatomic Potentials: Application to Boron Carbide**: *Michael Widom*[1]; [1]Carnegie Mellon University

**2:30 PM**
**Machine Learnt Interatomic Potentials for Stanene and Germanene to Study Thermal Conductivity and Growth**: *Mathew Cherukara*[1]; Badri Narayanan[1]; Alper Kinaci[2]; Kiran Sasikumar[1]; Stephen Gray[1]; Maria Chan[1]; Subramanian Sankaranarayanan[1]; [1]Argonne National Lab; [2]Northwestern University

**2:50 PM Invited**
**New Advances in Semi-empirical Interatomic Potentials - the Modified Embedded Atom Method (MEAM)**: *Michael Baskes*[1]; [1]Mississippi State University; Los Alamos National Laboratory; UCSD; University of North Texas

**3:20 PM Break**

**3:40 PM Invited**
**Errors of Molecular Dynamics Simulations, and Development of "Accurate" Analytical Bond Order Potentials for Al-Cu-H and Mg-H Systems**: *Xiaowang Zhou*[1]; Brandon C. Wood[2]; Foster E. Michael[1]; Mark. D. Allendorf[1]; Tae Wook Heo[2]; Shinyoung Kang[2]; [1]Sandia National Laboratories; [2]Lawrence Livermore National Laboratory

**4:10 PM**
**Development of a Semi-empirical Potential for Simulation of Ni Solutes Segregated in Ag Grain Boundaries**: *Mikhail Mendelev*[1]; Valery Borovikov[1]; Zhiliang Pan[2]; Frederic Sansoz[2]; [1]Ames Laboratory; [2]University of Vermont

**4:30 PM**
**Calibration of a Titanium Modified Embedded Atom Method Potential to High Temperature Behavior**: *Doyl Dickel*[1]; Mark Tschopp[2]; Mark Horstemeyer[1]; [1]Mississippi State University; [2]Army Research Laboratory

## Computational Thermodynamics and Kinetics – Thermochemistry and Thermomechanics

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

Wednesday PM
March 14, 2018
Room: 128A
Location: Phoenix Convention Center

*Session Chairs:* Maria Chan, Argonne National Laboratory; Shawn Coleman, U.S. Army Research Laboratory

**2:00 PM Invited**
**Oxygen Off-stoichiometry and Defect Entropies in Solar Thermochemical Water Splitting Materials**: *Chris Wolverton*[1]; [1]Northwestern University

**2:30 PM**
**Computationally Tractable Methods for Studying the Roles of Water Molecules on Aqueous Phase Heterogeneous Catalysis**: *Tianjun Xie*[1]; Rachel Getman[1]; [1]Clemson University

**2:50 PM**
**Density Functional Theory Study of Oxygen Reduction Reaction on Non-precious Transition Metal/Nitrogen Doped Carbon Electrocatalysts**: *Guofeng Wang*[1]; Kexi Liu[1]; [1]University of Pittsburgh

**3:10 PM**
**Thermodynamic Stabilization of Precipitates through Interface Segregation: Chemical Effects**: *Sourabh Kadambi*[1]; Srikanth Patala[1]; [1]North Carolina State University

**3:30 PM Break**

**3:50 PM Invited**
**Towards Accurate First Principles Energetics in Transition Metal Compounds**: Yi Xia[1]; Liang Li[1]; *Maria Chan*[1]; [1]Argonne National Laboratory

**4:20 PM**
**Investigation of the Effect of Sintering Aids and Impurities on the Sintering of B4C by Applying the CALPHAD Approach**: *Mohammad Asadikiya*[1]; Yu Zhong[1]; [1]Florida International University

**4:40 PM**
**Investigation of the Thermodynamic Stability of LSM-YSZ Mixture by Applying the CALPHAD Approach**: *Mohammad Asadikiya*[1]; Yu Zhong[1]; [1]Florida International University

**5:00 PM**
**Optimization of Thermo-mechanical Properties of Alloy Systems via a Computational Strengthening Model**: *Derek Tsaknopoulos*[1]; Bryer Sousa[1]; Danielle Cote[1]; Richard Sisson[1]; Victor Champagne[1]; [1]Worcester Polytechnic Institute

## Coupling Advanced Characterization and Modeling Tools for Understanding Fundamental Phase Transformation Mechanisms: An MPMD Symposium in Honor of Hamish Fraser – Session IV

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; Soumya Nag, GE Global Research; Rajarshi Banerjee, University of North Texas

Wednesday PM
March 14, 2018
Room: 127A
Location: Phoenix Convention Center

*Session Chair:* Yunzhi Wang, The Ohio State University

**2:00 PM Invited**
**Applications of Ordering Tie Lines to Represent ALCHEMI Data in Intermetallic Compounds and Complex Oxides**: *Mark Aindow*[1]; Louis Gambino[2]; Yanling Hu[3]; Lichun Zhang[1]; [1]University of Connecticut; [2]Johnson Matthey; [3]Xiamen University of Technology

**2:30 PM Invited**
**Coupled Characterization and Modeling of the Crystallography of Phase Transformations**: *Eric Payton*[1]; Stephen Niezgoda[2]; Adam Pilchak[1]; Gert Nolze[3]; Victoria Yardley[4]; [1]Air Force Research Laboratory; [2]Ohio State University; [3]Federal Institute for Materials Research and Testing (BAM); [4]Ruhr-Universitaet Bochum

**3:00 PM Invited**
**Effects of Ternary Element Additions on the Precipitation of α and ω Phases in Ti-Mo Alloys**: Mariana de Mello[1]; Camilo Salvador[1]; Kaio Campo[1]; *Rubens Caram*[1]; [1]University of Campinas

**3:30 PM Break**

**3:50 PM Invited**
**Progress in the Application of ICME in the Titanium Industry**: *Stephen Fox*[1]; [1]Titanium Metals Corporation

**4:20 PM Invited**
**Phase and Intrinsic Stress Stability in Thin Multilayered Films**: *Gregory Thompson*[1]; Li Wan[1]; Qianying Guo[1]; Xiao-xiang Yu[1]; [1]University of Alabama

**4:40 PM Invited**
**Advances in TiAl- based Alloys**: *Soumya Nag*[1]; Akane Suzuki[1]; Manuel Acosta[2]; Michael Weimer[2]; Bernard Bewlay[1]; [1]GE Global Research; [2]GE Aviation

**5:00 PM Invited**
**How I Learned to Stop Worrying and Love the Metallurgical Play Pen**: *Peter Collins*[1]; [1]Iowa State University

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – 6A:Ni-based Superalloy Development & Properties. 6B: Microstructure & Properties of Co-based Superalloys

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC; Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

Wednesday PM
March 14, 2018

Room: 126A
Location: Phoenix Convention Center

*Session Chairs:* Kevin Bockenstedt, ATI Specialty Materials; Michael Titus, Purdue University

**2:00 PM Invited**
**Design Approaches for Advanced Polycrystalline Ni-base Superalloys**: *Sammy Tin*[1]; [1]Illinois Institute of Technology

**2:30 PM**
**Accelerated Design and Testing of New Nickel Superalloys with Increased Creep Resistance**: Sabin Sulzer[1]; *Roger Reed*[1]; Angus Wilkinson[1]; [1]University of Oxford

**2:50 PM**
**On the Role of Environmental Damage in Selected Ni-based Superalloys**: *Gopal Viswanathan*[1]; Michael Mills[1]; David Mills[2]; [1]The Ohio State University; [2]Rolls-Royce Corporation

**3:10 PM**
**The Extent of Individual Strengthening Mechanisms in Model Quinary Nickel-based Superalloys**: *Amy Goodfellow*[1]; Katerina Christofidou[1]; Enrique Galindo-Nava[1]; Nick Jones[1]; Chad Boyer[2]; Mark Hardy[3]; Howard Stone[1]; [1]University of Cambridge; [2]Canadian Neutron Beam Centre; [3]Rolls-Royce plc

**3:30 PM Break**

**3:50 PM Invited**
**Mechanical Properties and Deformation Mechanisms of Polycrystalline $L1_2$-strengthened Co-based Superalloys**: *Steffen Neumeier*[1]; Lisa Freund[1]; Mathias Göken[1]; [1]Friedrich-Alexander-Universität Erlangen-Nürnberg

**4:20 PM**
**Investigation of Deformation Pathways of Gamma' Phase in Ni-, Co- and Co-Ni-base Superalloys**: *Longsheng Feng*[1]; Duchao Lv[2]; Robert Rhein[3]; Michael Titus[4]; Tresa Pollock[3]; Yunzhi Wang[1]; [1]The Ohio State University; [2]Computherm Llc; [3]University of California, Santa Barbara; [4]Purdue Univeristy

**4:40 PM**
**Grain Boundary Environmental Cracking Resistance in Co/Ni Superalloys**: *Lucy Reynolds*[1]; Ioannis Bantounas[1]; Mark Hardy[2]; David Dye[1]; [1]Imperial College; [2]Rolls-Royce plc

**5:00 PM**
**Lattice Misfit and In Situ Synchrotron Creep Deformation of\947/\947\8242 Co-Al-W-Ta Superalloy Single Crystals**: *Christopher Zenk*[1]; Michael Mills[1]; Mathias Göken[2]; Steffen Neumeier[2]; [1]The Ohio State University; [2]FAU Erlangen-Nürnberg

**5:20 PM**
**Effect of Tertiary Gamma Prime on Dwell Crack Growth Performance of a Recently Developed Co:Ni-base Superalloy**: *Ioannis Bantounas*[1]; Vassili Vorontsov[1]; Suyang Yu[2]; Hangyue Li[2]; Paul Bowen[2]; Mark Hardy[3]; David Dye[1]; [1]Imperial College London; [2]The University of Birmingham; [3]Rolls-Royce Plc

## Deriving Value from Challenging Waste Streams: Recycling and Sustainability Joint Session – Urban Mining and Electronic Waste

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee, TMS: Pyrometallurgy Committee
*Program Organizers:* Elsa Olivetti, Massachusetts Institute of Technology; John Howarter, Purdue University; Fiseha Tesfaye, Åbo Akademi University

Wednesday PM
March 14, 2018

Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* Fiseha Tesfaye, Abo Akademi University; Dirk Verhulst, Consultant, Extractive Metallurgy

**2:00 PM Keynote**
**Novel Technologies for Technospheric and Urban Mining of Rare Earth Elements from Phosphogypsum, Red Mud, Hybrid Car Batteries, and Wind Turbine Magnets**: Yuxiang Yao[1]; Sable Reid[1]; Mugdha Walawalkar[1]; Nina Farac[1]; Feixiong Zhang[1]; Brittny Carter[1]; *Gisele Azimi*[1]; [1]University of Toronto

**2:30 PM Invited**
**Recovery of REE from the Ferrous Fraction of Processed WEEE**: *Gabriella Tranell*[1]; [1]Norwegian University of Science & Technology

**2:55 PM Invited**
**Urban Mining for a Circular Economy: Activities at SINTEF**: Anne Kvithyld[1]; *Ana Maria Martinez*[1]; [1]SINTEF

**3:20 PM Invited**
**Recovery of Copper from Industrial Waste Water by Electrowinning**: *Mari Lundström*[1]; [1]Aalto University

**3:40 PM Break**

**3:55 PM**
**Towards Commercialization of Indium Recovery from Waste Liquid Crystal Display Screens**: *Thomas Boundy*[1]; Patrick Taylor[1]; [1]Colorado School of Mines

**4:15 PM**
**Comminution and Separation of Photovoltaic Panel Materials for Recycling**: *Pamela Bogust*[1]; York Smith; [1]University of Utah

**4:35 PM**
**Recovery of Gallium and Arsenic from Gallium Arsenide Semiconductor Scraps**: Dachun Liu[1]; Guozheng Zha[1]; Liang Hu[1]; *Wenlong Jiang*[1]; [1]Kunming University of Science and Technology

**4:55 PM**
**Engineering, Scientific, and Policy Inputs for Developing a Levelized Cost of Energy Storage Model**: John Howes[1]; *Timothy Ellis*[2]; [1]Redland Energy Group; [2]RSR Technologies, Inc.

**5:15 PM**
**Investigation into the Recovery of Valuable Metals from Waste Mobile Phone Printed Circuit Boards (PCBs) – a Feasibility Study**: *Maryam Ghodrat*[1]; Bijan Samali[1]; [1]Western Sydney University

## Dynamic Behavior of Materials VIII – Effect of Microstructure of Dynamic Response III

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu Fensin, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

Wednesday PM
March 14, 2018
Room: 127B
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:00 PM Invited**
**Characterization of Defect Motion at High Strain Rate In Situ inside a TEM**: *Thomas Voisin*[1]; Michael Grapes[1]; Tian Li[1]; Jonathan Ligda[2]; Nicholas Lorenzo[2]; Brian Schuster[2]; Melissa Santala[1]; Yong Zhang[3]; Xiaolong Ma[3]; Geoffrey Campbell[1]; Timothy Weihs[3]; [1]Lawrence Livermore National Laboratory; [2]Army Research Laboratory; [3]Johns Hopkins University

**2:40 PM**
**A Low-cost, Laboratory-scale Method to Identify Regions of Microstructural Changes in Response to Dynamic Loading Conditions**: *Benjamin Lund*[1]; Judith Schneider[1]; [1]University of Alabama in Huntsville

**3:00 PM**
**Viscous Sliding Flow of Shear Bands in Metals**: *Dinakar Sagapuram*[1]; Koushik Viswanathan[2]; [1]Texas A&M University; [2]Purdue University

**3:20 PM Break**

**3:40 PM Invited**
**Using Dynamic X-ray Imaging to Reveal the Mesoscale of Shock-compressed Granular Materials**: *Daniel Eakins*[1]; [1]Imperial College London

**4:00 PM**
**Spall Failure Mediated by Vacancy Clustering and Subsequent Nano-void Growth**: *Sara Adibi*[1]; Justin Wilkerson[1]; [1]University of Texas at San Antonio

**4:20 PM**
**The Search for the Elusive Supersonic Dislocation**: *Marc Meyers*[1]; Carlos Ruestes[2]; Eric Hahn[3]; Shiteng Zhao[1]; [1]University of California, San Diego; [2]University of Cuyo; [3]Los Alamos National Laboratory

**4:40 PM**
**Amorphization-induced Fragmentation in Ballistically-impacted Boron Carbide**: *Jerry LaSalvia*[1]; V. Domnich[2]; Christopher Marvel[3]; S.D. Walck[1]; Martin Harmer[3]; [1]U.S. Army Research Laboratory; [2]Rutgers University; [3]Lehigh University

**5:00 PM**
**Shear Localization and Microstructural Evolution in Dynamic Deformation Process**: *Na Yan*[1]; Zezhou Li[2]; Shiteng Zhao[2]; Yongbo Xu[3]; Conger Bai[4]; Marc Meyers[2]; [1]Northwestern Polytechnical University; University of California, San Diego; [2]University of California, San Diego; [3]Institute of Metal Research, Chinese Aacademy of Science; [4]Zhejiang University

## Electrode Technology Symposium for Aluminum Production – Anode Forming and Baking

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xianan Liao, Elkem Carbon

Wednesday PM
March 14, 2018
Room: 222C
Location: Phoenix Convention Center

*Session Chair:* Marc Dupuis, GeniSim Inc

**2:00 PM Introductory Comments**

**2:05 PM**
**3D Transient Modelling of a Complete Fire Line for Anode Baking Furnace Design and Optimization**: *Arnaud Bourgier*[1]; Sandra Besson[1]; Jean-Philippe Schneider[1]; [1]Rio Tinto Aluminium

**2:30 PM**
**A Study of Anode Baking Gas Composition**: *Thor Anders Aarhaug*[1]; Trond Brandvik[2]; Heiko Gaertner[1]; Ole Sigmund Kjos[1]; Arne Petter Ratvik[1]; [1]SINTEF Materials and Chemistry; [2]NTNU

**2:55 PM**
**Improved Compaction Method for the Production of Large Scale Anode Paste Samples for Thermo-mechanical Characterization**: *Bowen Chen*[1]; Donald Picard[1]; Soufiane Zaglafi[1]; Houshang Alamdari[1]; Donald Ziegler[1]; Mario Fafard[1]; [1]Laval University

**3:20 PM**
**Systemic Analysis for the Selection of Anode Baking Furnace Refractories**: *Mariana Braulio*[1]; Valerie MacNair[2]; Victor Pandolfelli[3]; [1]4Cast - Technical Consultancy on Refractories; [2]Alcoa; [3]Federal University of São Carlos

**3:45 PM Break**

**4:00 PM**
**Numerical Investigation of the Thermomechanical Behaviour of Anode Butt**: *Simon-Olivier Tremblay*[1]; Daniel Marceau[1]; Patrick Coulombe[2]; Jules Côté[2]; Duygu Kocaefe[1]; [1]University of Québec at Chicoutimi; [2]Aluminerie Alouette Inc

**4:25 PM**
**Method of Defining the Degree of Impregnation of the Dry Aggregate with Pitch in the Process of Anode Production**: *Viktor Buzunov*[1]; Sergey Khramenko[1]; Semyon Zykov[1]; [1]RUSAL "Engeneering and Technological Center"

**4:50 PM**
**Research and Application for Large Scale, High Efficiency and Energy Saving Baking Furnace Technology**: *Liu Chaodong*[1]; Cui Yinhe[1]; Zhou Shanhong[1]; Xu Haifei[1]; Sun Yi[1]; [1]Shenyang Aluminium and Magnesium Engineering and Research Institute Co. Ltd

**5:15 PM**
**Opportunities and Challenges Associated to Green Anode Plant Upgrade for Smelter Amperage Creeping**: *Christophe Bouche*[1]; Bertrand Somnard[1]; Pasquale Calo[1]; Fabienne Virieux[1]; [1]Fives Solios

## Environmentally Assisted Cracking: Theory and Practice – Environmental Degradation of Structural Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Bai Cui, University of Nebraska–Lincoln; Raul Rebak, GE Global Research; Sebastien Dryepondt, Oak Ridge National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Wednesday PM
March 14, 2018

Room: 105A
Location: Phoenix Convention Center

*Session Chairs:* Yiren Chen, Argonne National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

**2:00 PM Invited**
**Cracking Behavior and Fracture Toughness of Irradiated Austenitic Stainless Steels in LWR Environments**: *Yiren Chen*[1]; Bogdan Alexandeanu[1]; Ken Natesan[1]; Yong Yang[2]; Appajosula Rao[3]; [1]Argonne National Laboratory; [2]University of Florida; [3]Nuclear Regulatory Commission

**2:40 PM**
**Environment Induced Degradation in Maraging Steel Grade 18Ni1750**: *Ramkumar Devendranath*[1]; Gopi G[2]; Trilochana Jena[2]; Ravi Prasad Valluri[2]; Nageswara Muktinutalapati[1]; [1]VIT University; [2]DRDL, Hyderabad

**3:00 PM**
**Influence of MC Carbides and γ' on Hydrogen Trapping in Nickel Alloys and Superalloys: Experiment and Alloy Design**: *Franck Tancret*[1]; Miles Stopher[2]; Edern Menou[3]; Gérard Ramstein[1]; Pedro Rivera-Díaz-del-Castillo[4]; [1]Université de Nantes; [2]University of Cambridge; [3]CNRS; [4]University of Lancaster

**3:20 PM Break**

**3:40 PM**
**Correlative 3D Imaging of Iodine-induced Stress Corrosion Cracks in Zr Alloys**: *Alistair Garner*[1]; Conor Gillen[1]; Philipp Frankel[1]; [1]University of Manchester

**4:00 PM**
**Effect of Frequency on Corrosion Fatigue Behavior of Steel 1.4016 in E85 Biofuel up to the Very High Cycle Fatigue Regime**: *Sven Kaefer*[1]; Tobias Melz[1]; [1]Technische Universität Darmstadt

**4:20 PM**
**Phase Field Modeling of Pitting & Crevice Corrosion**: *San-Qiang Shi*[1]; [1]The Hong Kong Polytechnic University

**4:40 PM**
**Role of Nitrogen on Hydride Nucleation and Stability in Pure Niobium by First-principles Calculations**: *Pulkit Garg*[1]; Ilaksh Adlakha[1]; Kiran Solanki[1]; [1]SEMTE

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Fatigue Behaviors in Engineering Materials

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Wednesday PM
March 14, 2018

Room: 125B
Location: Phoenix Convention Center

*Session Chair:* Tongguang Zhai, University of Kentucky

**2:00 PM**
**Subcycle Fatigue Crack Growth Formulation under Positive and Negative Stress Ratios**: Karthik Rajan Venkatesan[1]; *Yongming Liu*[1]; [1]Arizona State University

**2:20 PM**
**Fatigue-assisted Discontinuous Grain Growth in Al Alloys**: *Ramasis Goswami*[1]; C Feng[1]; Syed Qadri[1]; Chandra Pande[1]; [1]Naval Research Laboratory

**2:40 PM**
**Low Cycle Fatigue of Friction Stir Welded Aluminum Lithium 2099**: *Abby Cisko*[1]; Brian Jordon[2]; Zackery McClelland[1]; Paul Allison[2]; Dustin Avery[2]; [1]U.S. Army Engineer Research and Development Center; [2]University of Alabama

**3:00 PM**
**Fatigue of a Transient Liquid Phase Bonded Superalloy for Use in a Microchannel-heat Exchanger**: *Kyle Rozman*[1]; Monica Kapoor[1]; Sajedur Akanda[1]; Omer Dogan[1]; Jeffrey Hawk[1]; [1]NETL

**3:20 PM Break**

**3:40 PM**
**3-D Understanding of Fatigue Crack Initiation from Inclusions in Inconel 718 Alloy**: *Pei Cai*[1]; Yan Jin[1]; Alfonso Ngan[2]; Tongguang Zhai[1]; [1]University of Kentucky; [2]The University of Hong Kong

**4:00 PM**
**Crack Growth under Rolling Contact Fatigue: 3D Characterisation and Modelling**: *Pedro Rivera-Diaz-del-Castillo*[1]; Jakub Rydel[2]; Gael Guetard[3]; Hanwei Fu[1]; Haiwen Luo[4]; [1]Lancaster University; [2]University of Cambridge; [3]Erasteel Kloster AB; [4]University of Science & Technology Beijing

**4:20 PM**
**Modelling Microstructural Alterations in Bearing Steels under Rolling Contact Fatigue**: *Hanwei Fu*[1]; Wenwen Song[2]; Enrique Galindo-Nava[3]; Pedro Rivera-Díaz-del-Castillo[1]; [1]Lancaster University; [2]RWTH Aachen University; [3]University of Cambridge

## Federation of European Materials Societies (FEMS) Keynote Symposium: Energy and Transportation from a European Materials Perspective – Keynote Session II

*Sponsored by:* Federation of European Materials Societies (FEMS)
*Program Organizer:* Brett Suddell, Federation of European Materials Societies (FEMS)

Wednesday PM
March 14, 2018
Room: 228A
Location: Phoenix Convention Center

*Session Chair:* Brett Suddell, Federation of European Materials Societies (FEMS)

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Magnesium Alloys in Transportation: Hidden Champions?!**: *Karl Kainer*[1]; Norbert Hort[2]; [1]Helmholtz-Zentrum Geesthacht, Gemany; [2]Helmholtz-Zentrum Geesthacht

**2:35 PM Invited**
**Recent Advances in Aluminum Product Development for Transportation**: *Timothy Warner*[1]; [1]Constellium C-TEC, France

**3:05 PM Invited**
**Challenges for the Design of Ni-based SX Superalloys Components**: *Jonathan Cormier*[1]; [1]Institut Pprime, ISAE-ENSMA, France

**3:35 PM Break**

**3:55 PM Invited**
**Integrated Computational Materials Engineering (ICME) and Business Decision Support Systems (BDSS) in the Context of Open Innovation and Interdisciplinary Collaboration**: *Donna Dykeman*[1]; James Goddin[1]; Najib Baig[1]; Will Marsden[1]; David Cebon[1]; [1]Granta Design, United Kingdom

**4:25 PM Panel Discussion**
This discussion will be moderated by Pedro Dolabella Portella.

## Frontiers in Solidification Science and Engineering – Effect of Microgravity and/or Convection on Solidification

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee
*Program Organizers:* Mohsen Asle Zaeem, Missouri University of Science and Technology; Damien Tourret, IMDEA Materials Institute; Mohsen Eshraghi, California State University, Los Angeles; Johannes Hötzer, University of Applied Science Karlsruhe

Wednesday PM
March 14, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chairs:* Amber Genau, University of Alabama at Birmingham; Mohsen Asle Zaeem, Missouri University of Science and Technology

**2:00 PM**
**Anomalous Dendrite Growth in Undercooled Al-Ni Melts**: *Dieter Herlach*[1]; Marcus Reinartz[2]; Peter Galenko[2]; Markus Rettenmayr[2]; [1]Deutsches Zentrum für Luft- und Raumfahrt; [2]Friedrich Schiller Universität

**2:20 PM**
**Investigation of the Columnar-to-equiaxed Transition during Solidification in Microgravity**: *Emine Gulsoy*[1]; Yuze Li[2]; Thomas Cool[1]; Zachary Thompson[1]; Nathalie Mangelinck-Noel[2]; Henri Nguyen-Thi[2]; Gerhard Zimmenmann[3]; Laszlo Sturz[3]; [1]Northwestern University; [2]Institut Materialux Microelectronique Nanosciences de Provence; [3]ACCESS e.V

**2:40 PM**
**Liquid Demixing in Undercooled Co-Cu Alloys**: *Matthias Kolbe*[1]; Christoph Dreissigacker[1]; Stefan Burggraf[1]; Mareike Wegener[1]; Florian Kargl[1]; [1]German Aerospace Center

**3:00 PM**
**In Situ Observations and Phase-field Modeling of Three-dimensional Grain-boundary Instability and Solitary Cell Dynamics during Directional Solidification of Binary Alloys**: *Younggil Song*[1]; Fatima Lisboa Mota[2]; Jorge Pereda[2]; Jean-Marc Debierre[2]; Nathalie Bergeon[2]; Rohit Trivedi[3]; Bernard Billia[2]; Alain Karma[1]; [1]Northeastern University; [2]Aix-Marseille Université and CNRS; [3]Iowa State University

**3:20 PM**
**Modeling Dendritic Solidification in Microgravity and Terrestrial Conditions**: *Ryan Lenart*[1]; Mohsen Eshraghi[1]; Sergio Felicelli[2]; [1]California State University, Los Angeles; [2]The University of Akron

**3:40 PM Break**

**4:00 PM**
**Modeling of TEMHD Flow Velocities and Its Influence on Dendritic Growth Velocities in Free Solidification of Pure Metals under Static Magentic Fields**: *Jianrong Gao*[1]; Rijie Zhao[1]; Andrew Kao[2]; Koulis Pericleous[2]; [1]Northeastern University; [2]University of Greenwich

**4:20 PM**
**A Lattice Boltzmann Model with Multiple Grids and Time Steps for Dendritic Solidification**: *Elaheh Dorari*[1]; Mohsen Eshraghi[2]; Sergio Felicelli[1]; [1]University of Akron; [2]California State University, Los Angeles

**4:40 PM**
**Permeability Prediction of Dendrite Structure by Large-scale Phase-field Lattice Boltzmann Simulation**: *Tomohiro Takaki*[1]; Shinji Sakane[1]; Munekazu Ohno[2]; Yasushi Shibuta[3]; Takashi Shimokawabe[3]; Takayuki Aoki[4]; [1]Kyoto Institute of Technology; [2]Hokkaido University; [3]The University of Tokyo; [4]Tokyo Institute of Technology

**5:00 PM**
**A Phase-field Lattice Boltzmann Model for Bubble-dendrite Interaction during Solidification of Binary Alloys**: *Seyed Amin Nabavizadeh*[1]; Mohsen Eshraghi[2]; Sergio Felicelli[1]; [1]The University of Akron; [2]California State University

## High Entropy Alloys VI – Mechanical and Other 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Wednesday PM
March 14, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* Jeffrey Hawk, National Energy Technology Lab; Hyoung Kim, POSTECH

**2:00 PM**
**Investigation of Phase Behavior in Al-Cr-Co-Ni-Ti Multi-principal Element Alloys Using the CALPHAD Approach with Key Experiments**: *Wei Xiong*[1]; Yunhao Zhao[1]; [1]University of Pittsburgh

**2:20 PM Invited**
**Structures, Thermodynamics, and Kinetics of Liquid High-entropy Alloys**: *Michael Gao*[1]; Mike Widom[2]; Lizhi Ouyang[3]; Jeffrey Hawk[1]; [1]National Energy Technology Lab; [2]Carnegie Mellon University; [3]Tennessee State University

**2:40 PM**
**Microstructural Evolution and Mechanical Behavior of NbTaTiV Refractory High-entropy Alloy at Elevated Temperatures**: *Chanho Lee*[1]; Gian Song[2]; Michael Gao[3]; Rui Feng[1]; Peiyong Chen[1]; Yan Chen[2]; Ke An[2]; Wei Guo[4]; Jonathan Poplawsky[4]; Song Li[5]; Alice Hu[5]; Wei Chen[6]; Hahn Choo[1]; Peter Liaw[1]; [1]University of Tennessee; [2]Chemical and Engineering Materials Division, Oak Ridge National Laboratory; [3]National Energy Technology Laboratory/AECOM; [4]Center for Nano-phase Materials Sciences, Oak Ridge National Laboratory; [5]The City University of Hong Kong; [6]The Illinois Institute of Technology

**3:00 PM Invited**
**Strain Rate Dependent Deformation Mechanism of CoCrFeMnNi High-entropy Alloy**: *Hyoung Seop Kim*[1]; Jongun Moon[1]; Sun Ig Hong[2]; Jae Wung Bae[1]; Min Ji Jang[1]; Dami Yim[1]; [1]POSTECH; [2]Chungnam National University

**3:20 PM Invited**
**Microstructure and Mechanical Properties of a Nanostructured High Entropy Alloy Processed via Severe Plastic Deformation**: *Yaojun Lin*[1]; Zhigang Yan[2]; Fei Chen[1]; Enrique Lavernia[3]; [1]Wuhan University of Technology; [2]Yanshan University; [3]University of California, Irvine

**3:40 PM Break**

**4:00 PM Invited**
**Microstructures and Properties of As-Cast AlCrFeMnV, AlCrFeTiV, and AlCrMnTiV High Entropy Alloys**: *Keith Knipling*[1]; Prithvi Narayana[2]; Lily Nguyen[1]; [1]U.S. Naval Research Laboratory; [2]Thomas Jefferson High School for Science and Technology

**4:20 PM**
**Hydrogen Resistance of C-doped and Undoped CoCrFeMnNi High-entropy Alloys**: Hong Luo[1]; *Zhiming Li*[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung

**4:40 PM**
**Mechanical Behavior and Thermal Stability of a Dual-phase Complex High Entropy Alloy**: Benjamin MacDonald[1]; Zhiqiang Fu[1]; Zhiming Li[2]; Weiping Chen[3]; Yizhang Zhou[1]; Dierk Raabe[2]; Horst Hahn[4]; *Enrique Lavernia*[1]; [1]University of California Irvine; [2]Max-Planck-Institut Für Eisenforschung; [3]South China University of Technology; [4]Karlsruhe Institute of Technology

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Wednesday PM
March 14, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* David Shifler, Office of Naval Research; Jeff DeHosson, University of Groningen

**2:00 PM Invited**
**Polymorphism in a High-entropy Alloy**: *Qiaoshi Zeng*[1]; [1]Center for High Pressure Science & Technology Advanced Research

**2:20 PM Invited**
**Twin and Dislocation Evolution for Interrupted Compression Experiments of Alx(CrCoFeNi)1-x High Entropy Alloys (HEAs)**: *Omar Rodriguez*[1]; Haoyan Diao[2]; Peter Liaw[2]; Lin Li[3]; Paul Allison[3]; [1]NASA MSFC; [2]University of Tennessee; [3]The University of Alabama

**2:40 PM Invited**
**Deformation Mechanism of Transformation-induced Plasticity-assisted, Dual-phase High-entropy Alloy (TRIP-DP-HEA) by In-situ Neutron Diffraction**: Sichao Fu[1]; Hongbin Bei[1]; *Ke An*[1]; [1]Oak Ridge National Laboratory

**3:00 PM Invited**
**Abstract Title: Advanced Scanning Electron Microscopy Characterization of the Microstructure of High Entropy Alloys**: *Václav Ocelík*[1]; Jeff DeHosson[1]; [1]University of Groningen

**3:20 PM**
**Combinatorial Assessment of FeMnCoCrAl High Entropy Alloy**: *Marshal Amalraj*[1]; Pradeep Konda Gokuldoss[1]; Jochen Schneider[1]; [1]Materials Chemistry, RWTH Aachen University.

**3:40 PM Break**

**4:00 PM**
**Diffusion in CoCrFeNi Based High Entropy Alloys**: *Abhishek Mehta*[1]; Le Zhou[1]; Esin Schulz[1]; Yongho Sohn[1]; [1]University of Central Florida

**4:20 PM**
**Microstructural Evolution and Resulting Mechanical Behavior in Nanocrystalline CoCrCuFeNi High-entropy Alloys after Heat Treatments**: *Seungjin Nam*[1]; Moon Kim[2]; Jun Yeon Hwang[3]; Hyunjoo Choi[1]; [1]Kookmin University; [2]The University of Texas at Dallas; [3]Korea Institute of Science and Technology

**4:40 PM Invited**
**Effect of Extreme Disorder on the Lattice Dynamics and Phonon Scattering in Concentrated Solid Solution Alloys**: G. Malcolm Stocks[1]; *Sai Mu*[1]; Raina Olsen[1]; Biswanath Dutta[2]; German Samolyuk[1]; Tom Berlijn[1]; Lucas Lindsay[1]; Tilmann Hickel[2]; Bennett Larson[1]; [1]Oak Ridge National Laboratory; [2]Max-Planck-Institut fur Eisenforschung GmbH

**5:00 PM**
**Processing, Microstructure and Mechanical Characterization of MgAlLiZnCaCu High Entropy Alloy**: K. Tun[1]; Tirumalai Srivatsan[2]; A. Yadav[3]; A. Sharma[3]; *Manoj Gupta*; [1]National University of Singapore; [2]University of Akron; [3]National Institute of Technology

**5:20 PM**
**Combinatorial Exploration of High Entropy Alloys**: *Sebastian Kube*[1]; Sungwoo Sohn[1]; Punnathat Bordeenithikasem[1]; Yanhui Liu[2]; Ellen Scanley[3]; Christine Broadbridge[3]; Jan Schroers[1]; [1]Yale University; [2]Chinese Academy of Sciences; [3]Southern Connecticut State University

## High Temperature Corrosion of Structural Materials – Fe-base Alloys, Effect of $CO_2$, and Coatings

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
*Program Organizers:* Kinga Unocic, Oak Ridge National Laboratory; David Shifler, Office of Naval Research; Mark Weaver, University of Alabama; Steve Coryell, Special Metals; James Earthman, University of California, Irvine

Wednesday PM
March 14, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* Mark Weaver, University of Alabama; Stephen Coryell, Special Metals Corporation

**2:00 PM Invited**
**Long-term Behavior of Structural Alloys in Supercritical $CO_2$ at 750°C**: *Bruce Pint*[1]; Robert Brese[1]; James Keiser[1]; [1]Oak Ridge National Laboratory

**2:30 PM**
**Oxidation Resistance of FeCrAl Alloys in Air and Steam from 800 to 1300°C**: *Raul Rebak*[1]; Vipul Gupta[1]; [1]GE Global Research

**3:00 PM**
**A New Facility for Comparing Water Treatments in Ultra-supercritical Steam Boilers**: *Stephen Raiman*[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

**3:20 PM Break**

**3:40 PM**
**The Influence of External Stress on High Temperature Hydrogen Attack (HTHA) Cracking**: *Raymond Thompson*[1]; Dustin Nolen[1]; [1]Vista Engineering

**4:00 PM Invited**
**Electroless Ni-plating in Combination with Diffusion Coatings for Corrosion Protection of Steels for SO2 and Cl-rich High Temperature Environments**: Tobias Meissner[1]; Xabier Montero[1]; Diana Faehsing[1]; *Mathias Galetz*[1]; [1]Dechema Forschungsinsitut

**4:30 PM**
**Thermocouples in Gas Turbines: The Oxidation of Materials for Sensors in Thermal Cyclic Conditions**: *Michele Scervini*[1]; [1]University of Cambridge

## Hume-Rothery Award Symposium: Computational Thermodynamics and Its Implications to Kinetics, Properties, and Materials Design – Early Career Scientist

*Sponsored by:* TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Michael Gao, National Energy Technology Lab; Chelsey Hargather, New Mexico Institute of Mining and Technology; Richard Hennig, University of Florida; James Saal, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

Wednesday PM
March 14, 2018

Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* Zi-Kui Liu, Penn State University; James Saal, QuesTek Innovations

**2:00 PM Invited**
**Scattering Study of Phonon Confinement in Group IV Materials**: *Chen Li*[1]; [1]University of California, Riverside

**2:25 PM Invited**
**Semi-automated CALPHAD Modeling of Alloy Systems**: *Richard Otis*[1]; Brandon Bocklund[2]; Zi-Kui Liu[2]; [1]Jet Propulsion Laboratory; [2]Pennsylvania State University

**2:50 PM Invited**
**High-throughput CALPHAD and its Applications in Materials Design**: *Wei Xiong*[1]; [1]University of Pittsburgh

**3:15 PM Invited**
**Strengthening Mg by Self-dispersed Nano-lamellar Faults**: *William Yi Wang*[1]; Shun-Li Shang[2]; Yi Wang[2]; Kristopher Darling[3]; Bin Tang[1]; Hongchao Kou[1]; Xi-Dong Hui[4]; Suveen Mathaudhu[5]; Laszlo Keckes[3]; Jinshan Li[1]; Zi-Kui Liu[2]; [1]Northwestern Polytechnical University; [2]The Pennsylvania State University; [3]U.S. Army Research Laboratory; [4]University of Science and Technology Beijing; [5]University of California, Riverside

**3:40 PM Break**

**4:00 PM Invited**
**Solute-induced Solid-solution Softening and Hardening in BCC Tungsten**: *Yong-Jie Hu*[1]; Michael Fellinger[2]; Brady Bulter[3]; Yi Wang[4]; Kristopher Darling[3]; Laszlo Kecskes[3]; Dallas Trinkle[2]; Zi-Kui Liu[4]; [1]University of Michigan; [2]University of Illinois at Urbana-Champaign, Urbana; [3]U.S. Army Research Laboratory; [4]The Pennsylvania State University

**4:25 PM Invited**
**Anharmonic Phonons in Cuprite**: *Claire Saunders*[1]; Dennis Kim[1]; Olle Hellman[1]; Hillary Smith[1]; Tian Lan[2]; Doug Abernathy[3]; Brent Fultz[1]; [1]California Institute of Technology; [2]Ginkgo LLC; [3]Oak Ridge National Laboratory

**4:50 PM Invited**
**Diffusion Coefficients of Alloying Elements in Dilute Mg Alloys from First-principles: A Comparative Study of 8-frequency Model, 13-frequency Model, and Kinetic Monte Carlo**: *Bi-Cheng Zhou*[1]; Irina Belova[2]; Shun-Li Shang[3]; Yi Wang[3]; Graeme Murch[2]; Zi-Kui Liu[3]; [1]Northwestern University; [2]The University of Newcastle; [3]The Pennsylvania State University

## Integrative Materials Design III: Performance and Sustainability – Energy and Sustainability Considerations in Integrative Materials Design and Manufacturing

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories; Corbett Battaile, Sandia National Laboratories; Anastasios Gavras, Riley Power

Wednesday PM
March 14, 2018

Room: 132A
Location: Phoenix Convention Center

*Session Chairs:* Anastasios Gavras, Riley Power, Inc.; Pierre-Marie Nigay, Worcester Polytechnic Institute

**2:00 PM Invited**
**Structure/Property Relationships and Failure Mechanisms in Multifunctional Materials: From Metallic Foams to Metallic Thin Films for Stretchable/Flexible Electronics, Solar Cells/LEDs and MEMS**: *Winston Soboyejo*[1]; [1]Worcester Polytechnic Institute

**2:20 PM Invited**
**Electric Vehicle Battery Design for Disassembly in Support of Materials Reuse**: Mikaela DeRousseau[1]; Yan Wang[1]; Diran Apelian[1]; *Brajendra Mishra*[1]; [1]Worcester Polytechnic Institute

**2:40 PM Invited**
**Thermally Reliable Materials of Clay and Organic By-products for Thermal Energy Storage**: *Pierre-Marie Nigay*[1]; Ange Nzihou[2]; Claire White[3]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute; [2]Mines Albi; [3]Princeton University

**3:00 PM Invited**
**Materials Design for Advanced Energy Generating Systems**: *Gabriel Ilevbare*[1]; [1]Idaho National Laboratory

**3:20 PM Invited**
**Characterization of Recycled Additive Manufacturing Product**: *Noah Budiansky*[1]; Joel Forman[1]; Steven Kruzer[1]; Theodoros Koutsoukis[2]; Ryan Spray[1]; [1]Exponent; [2]IPG Photonics, Corp.

**3:40 PM Break**

**3:55 PM Invited**
**Cermets as Model Materials for Integrative Materials Design**: *Sean Agnew*[1]; Liang Dong[1]; Haydn Wadley[1]; [1]University of Virginia

**4:15 PM Invited**
**A New Methodology for Design of Cermets: 'Green' Replacement for Cobalt Binder in WC**: *Heather Murdoch*[1]; Kristopher Darling[1]; [1]Army Research Lab

**4:35 PM**
**Improving Power Plants' Reliability through Root Cause Metallurgical Failure Analysis**: *Anastasios Gavras*[1]; [1]Riley Power Inc.

**4:55 PM Invited**
**Holistic Assessment of Beneficial Use of Industrial Byproducts in Structural Materials**: *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

**5:15 PM Invited**
**"Alternative" Materials in the Green Building and Construction Sector: Examples, Barriers, and Environmental Analysis**: *Gabrielle Gaustad*[1]; Adam Stoker[1]; Kate Krueger[1]; [1]Rochester Institute of Technology

**5:35 PM**
**Integration of Materials Properties in an Architecture, Engineering, and Construction Project**: *Pnina Ari-Gur*[1]; Jiansong Zhang[2]; Xiaoyun Shao[1]; [1]Western Michigan University; [2]Purdue University

## Magnesium Technology 2018 – Primary Production and Casting

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Wednesday PM
March 14, 2018

Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Neale Neelameggham, Ind LLC; Elsa Olivetti, MIT

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Study on Metal Smelting Process under Microwave Irradiation**: *Satoshi Fujii*[1]; Eiichi Suzuki[1]; Naomi Inazu[1]; Shuntaro Tsubaki[1]; Masahiko Maeda[2]; Yuji Wada[1]; [1]Tokyo Institute of Technology; [2]Oricon

**2:25 PM**
**Experimental Study on the Reversion Reaction between Magnesium and CO Vapor in the Carbothermic Reduction of Magnesia under Vacuum**: *Yang Tian*[1]; Yong Deng[1]; Bin Yang[1]; Hai Liu[1]; [1]Kunming University of Science and Technology

**2:45 PM**
**The Electrolytic Production of Magnesium from MgO**: *James Withers*[1]; John Laughlin[1]; Jeffery Babis[1]; [1]ATS-MER, LLC

**3:05 PM**
**Study on the Production of Metallic Magnesium from Nickel - Containing Serpentine**: *Huimin Lu*[1]; Wu Guangzhi[2]; [1]Beihang University; [2]Inner Mongolia Xintai Construction and Installation (Group) Co., Ltd

**3:25 PM Break**

**3:45 PM**
**Fabrication of Mg(OH)2 by Electrolysis Using MgCl2 Aqueous Solution**: *Xijuan Pan*[1]; Zhang Ting'an[1]; Zhihe Dou[1]; Yukun Ren[1]; Guozhi Lyu[1]; Junjie Zhang[1]; Long Wang[1]; Xiuxiu Han[1]; [1]Northeastern University

**4:05 PM**
**The Morphology and Distribution of Al8Mn5 in High Pressure Die Cast AM50 and AZ91**: Guang Zeng[1]; Xiangzhen Zhu[2]; Shouxun Ji[2]; *Christopher Gourlay*[1]; [1]Imperial College London; [2]Brunel University London

**4:25 PM**
**Thermogravimetric Analysis of Simultaneous Decomposition and Formation of MgB2**: *Muhammad Imam*[1]; Ramana Reddy[1]; [1]The University of Alabama

**4:45 PM**
**Empirical Examination of the Formation of Mechanical Properties of Heated Twin-roll-cast Magnesium Strips**: *Claudia Kawalla*[1]; Marie Teuber[1]; Michael Höck[1]; [1]TU Bergakademie Freiberg

**5:05 PM**
**Update on Ballistic Characterization of the Scalability of Magnesium Alloy AMX602**: *Tyrone Jones*[1]; [1]US Army Research Laboratory

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Structural Materials III

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Wednesday PM
March 14, 2018

Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Tyler Gerczak, Oak Ridge National Laboratory; Brian Cockeram, Bechtel-Bettis

**2:00 PM**
**Advanced Manufacturing of HT9 Steel for Extreme Environments**: *Niyanth Sridharan*[1]; Kevin Field[1]; Maxim Gussev[1]; [1]Oak Ridge National Laboratory

**2:20 PM**
**Recrystallization of a Nanostructured Ferritic Alloy after Cold Work**: *Clarissa Yablinsky*[1]; Eda Aydogan[1]; Sven Vogle[1]; G. Robert Odette[2]; David Hoelzer[3]; Connor Rietema[4]; Kester Clarke[4]; Stuart Maloy[1]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara; [3]Oak Ridge National Laboratory; [4]Colorado School of Mines / Los Alamos National Laboratory

**2:40 PM**
**Characterization of the Microstructure and Grain Boundary Character of 14-YWT Nanostructured Ferritic Alloys Following Different Deformation Processing Paths**: *Soupitak Pal*[1]; MD Alam[1]; Stuart Maloy[2]; David Hoelzer[3]; John Lewandowski[4]; G Odette[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory; [3]Oak Ridge National Laboratory; [4]Case Western University

**3:00 PM**
**Fabrication of ODS FeCrAl Tube for Accident Tolerant Fuel Cladding Applications**: *Sebastien Dryepondt*[1]; Caleb Massey[2]; Philip Edmondson[1]; Maxim Gussev[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

**3:20 PM**
**Additive Stainless Steel for Nuclear: From Material Aspects to Quality Part**: *Xiaoyuan Lou*[1]; Raul Rebak[2]; Myles Connor[3]; Francis Bolger[3]; David Webber[3]; Gary Was[4]; Miao Song[4]; Mi Wang[4]; Frederick List[5]; [1]CorroMet LLC; [2]GE Global Research; [3]GE Hitachi Nuclear Energy; [4]University of Michigan; [5]Oak Ridge National Laboratory

**3:40 PM Break**

**4:00 PM Invited**
**Very High Temperature Steam Oxidation of LWR FeCrAl Fuel Cladding**: *Bruce Pint*[1]; [1]Oak Ridge National Laboratory

**4:20 PM**
**A Study on the High Energy Ball Milling and Spark Plasma Sintering of Fe-Cr Based Alloys**: *Arnab Kundu*[1]; Indrajit Charit[1]; Brian Jaques[2]; Chao Jiang[3]; [1]University of Idaho; [2]Boise State University; [3]Idaho National Laboratory

**4:40 PM**
**In-situ Characterization of Dispersoid Evolution during Annealing of ODS FeCrAl Mechanical Alloyed Powders**: *Caleb Massey*[1]; Sebastien Dryepondt[2]; Matthew Frith[2]; Philip Edmondson[2]; Kurt Terrani[2]; Steven Zinkle[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

**5:00 PM**
**Development of Laves and B2 Manipulated Advanced Ferritic Alloys**: *Tianyi Chen*[1]; Lizhen Tan[1]; Ying Yang[1]; Mo-Rigen He[2]; Kumar Sridharan[2]; [1]Oak Ridge National Laboratory; [2]University of Wisconsin-Madison

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Structural Materials IV

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Wednesday PM
March 14, 2018

Room: 103A
Location: Phoenix Convention Center

*Session Chairs:* Raul Rebak, GE Global Research; Ramprashad Prabhakaran, Pacific Northwest National Laboratory

**2:00 PM**
**Low Cycle Fatigue Resistance of Zircaloy-4 under Uniaxial and Torsion Loading**: *Brian Cockeram*[1]; Bruce Kammenzind[2]; [1]NNL Bettis Laboratory; [2]Bechtel-Bettis

**2:20 PM**
**High-temperature Mechanical Properties of Zirconium Hydrides Studied with Nanoindentation**: *Mahmut Cinbiz*[1]; Mehdi Balooch[2]; Xunxiang Hu[1]; Kurt Terrani[1]; Aida Amroussia[3]; [1]UT-Battelle ORNL; [2]University of California, Berkeley; [3]UT-Battelle ORNL and Michigan State University

**2:40 PM**
**Mechanical Property Measurements of Zicaloy Hydride Structure by Using Nanoindentation and Nano Mechanical Raman Spectroscopy**: *Hao Wang*[1]; Vikas Tomar[1]; [1]Purdue University

**3:00 PM**
**Ion Irradiation Effects on the Structure and Thermal Properties of Zirconium Diboride**: *Joseph Graham*[1]; Miguel Crespillo-Almenara[2]; [1]Missouri University of Science and Technology; [2]The University of Tennessee, Knoxville

**3:20 PM**
**Radiation Response of Nanoporous Metals**: *Xinghang Zhang*[1]; Jin Li[1]; Haiyan Wang[1]; [1]Purdue University

**3:40 PM Break**

**4:00 PM**
**Using Synchrotron X-ray Diffraction and Transmission Electron Microscopy to Study the Dislocation Structures Found in Proton Irradiated Zr-Nb Alloys**: *Rebecca Jones*[1]; Tamas Ungar[1]; Philipp Frankel[1]; [1]University of Manchester

**4:20 PM**
**Atom Probe Tomography Study of Microstructural Evolution of Cast Duplex Stainless Steels after 10,000 Hour Thermal Aging**: *Timothy Lach*[1]; Thak Byun[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

**4:40 PM**
**In-situ TEM Observation and MD Simulation of the Radiation Defects near Carbon Nanotube in Aluminum**: *Kang Pyo So*[1]; Penghui Cao[1]; Yang Yang[1]; Mingda Li[1]; Jong Gil Park[2]; Young Hee Lee[2]; Long Yan[3]; Xiaohui Liu[4]; Mike Short[1]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]Sungkyunkwan University; [3]Shanghai Institute of Applied Physics; [4]Shanghai Jiao Tong University

**5:00 PM**
**Effect of Neutron Irradiation on the Mechanical Properties and Microstructure of Friction Stir Processed ODS Alloys**: *Ramprashad Prabhakaran*[1]; Mychailo Toloczko[1]; Yaqiao Wu[2]; Jatu Burns[2]; James Cole[3]; Indrajit Charit[4]; Rajiv Mishra[5]; KL Murty[6]; [1]Pacific Northwest National Laboratory; [2]Boise State University; [3]Idaho National Laboratory; [4]University of Idaho; [5]University of North Texas; [6]North Carolina State University

## Materials for Energy Conversion and Storage – Energy Harvesting I

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Wednesday PM
March 14, 2018

Room: 229B
Location: Phoenix Convention Center

*Session Chair:* Surojit Gupta, University of North Dakota: UND

**2:00 PM Invited**
**Disordered Structure Oxides for Energy Conversion and Storage**: *Ritesh Sachan*[1]; William Weber[2]; Matthew Chisholm[3]; Yanwen Zhang[3]; [1]Army Research Office; [2]University of Tennessee ; [3]Oak Ridge National Laboratory

**2:25 PM**
**Effect of Nano-graphite Dispersion on the Thermal Solar Selective Absorbance of Polymeric-based Coating Material**: *Iman El Mahallawi*[1]; Ahmed Abdel-Rehim[2]; N. Khattab[3]; Nadia Rafat[1]; Hussein Badr[1]; [1]Cairo University; [2]The British University in Egypt; [3]National Research Centre

**2:45 PM**
**Elucidating the Tailoring of Electrical Properties of MoOx Carrier Selective Contacts in Silicon Solar Cells Using Density Functional Theory Calculations**: *Daniel Lambert*[1]; Patrick Burr[1]; Alison Lennon[1]; [1]University of New South Wales

**3:05 PM**
**Synthesis of MoAlB Particulates and Their Porous Derivatives by Selective Deintercalation of Al from MoAlB**: *Surojit Gupta*[1]; Matt Fuka[1]; [1]University of North Dakota

**3:25 PM Break**

**3:40 PM**
**Synthesis, Characterization and Thermoelectric Behavior of Polyaniline and Polyaniline/Nano Filler Material Composites**: Mahmoud Sorour[1]; Hussein Badr[1]; *Iman El Mahallawi*[1]; Ahmed Abdel-Rehim[2]; [1]Cairo University; [2]The British University in Egypt

**4:00 PM**
**Comparison of AlN and TiN Solar Selective Absorber Coatings**: *Iman El Mahallawi*[1]; Hanan Youssef[1]; Hisham Mohamed[2]; Mostafa Shazli[2]; Waleed Khalifa[1]; [1]Cairo University; [2]The British University in Egypt

**4:20 PM**
**Nano-structurally Decorated Fuel Cell Membranes for Improved Performance**: Leila Ladani[1]; *Shiuan Duo Chiang*[1]; Kenneth Reifsnider[1]; Yanhai Du[2]; [1]University of Texas at Arlington; [2]Kent State University

**4:40 PM**
**Nanogalvanic Aluminum Alloys for Power Generation and Self-cannibalizing Robotic Applications**: *Anit Giri*[1]; Anthony Roberts[1]; Joseph Marsico[2]; Chad Hornbuckle[1]; Scott Grendahl[1]; Kris Darling[1]; [1]US Army Research Laboratory; [2]ORISE

**5:00 PM**
**Structure-Reactivity Relationships in Pt-functionalized Graphitic Carbon Nitrides for Solar Hydrogen Production**: *Diane Haiber*[1]; Peter Crozier[1]; [1]Arizona State University

**5:20 PM**
**Electrochemical Characterization of Capacitive Properties of Silicon Carbide-mullite-carbon Composite Electrodes**: *Fatai Aramide*[1]; Patricia Popoola[2]; [1]Federal University of Technology; [2]Tshwane University of Technology

## Materials Processing Fundamentals – Extractive and Recovery Processing

*Sponsored by:* TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
*Program Organizers:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology; Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

Wednesday PM
March 14, 2018

Room: 228B
Location: Phoenix Convention Center

*Session Chairs:* Antoine Allanore, Massachusetts Institute of Technology; Guillaume Lambotte, Boston Electromet

**2:00 PM**
**A Current Efficiency Prediction Model Based on Electrode Kinetics for Iron and Copper during Copper Electrowinning**: *Zongliang Zhang*[1]; Joshua Werner[2]; Michael Free[1]; [1]University of Utah; [2]University of Kentucky

**2:20 PM**
**The $K_2SO_4$-$CaSO_4$ System and Its Role in Fouling and Slagging During High-Temperature Processes**: *Fiseha Tesfaye*[1]; Daniel Lindberg[1]; Leena Hupa[1]; [1]Åbo Akademi University

**2:40 PM**
**Waste Lithium-ion Battery Recycling in JX Nippon Mining & Metals Corporation**: *Yasufumi Haga*[1]; Kazuhiro Hatano[1]; Katsumi Saito[1]; [1]JX Nippon Mining & Metals Corporation

**3:00 PM**
**Recovery of Platinum Group Metals Out of Automotive Catalytic Converters Scrap: A Review on Australian Trends and Challenges**: *Maryam Ghodrat*[1]; Pezhman Sharafi[1]; Bijan Samali[1]; [1]Western Sydney University

**3:20 PM**
**Leaching Recovery of Silver from Used Radiographic Films**: Abraham Adeleke[1]; *Adebayo Adeniyi*[1]; B.O Ibitoye[1]; K.E. Oluwabunmi[2]; [1]Obafemi Awolowo University; [2]Prototype Engineering Development Institute

**3:40 PM Break**

**4:00 PM**
**The Study of Copper Leaching from Conichalcite and Chalcopyrite Using Alternative Lixiviants**: *Junmo Ahn*[1]; Isabel Barton[1]; Doyun Shin[1]; Jaeheon Lee[1]; [1]University of Arizona

**4:20 PM**
**Effect of Chloride Ions on the Copper Extraction Using LIX 984N and Acorga M5910**: *Maria Ruiz*[1]; Jose Risso[1]; Rodrigo Sanchez[1]; Rafael Padilla[1]; [1]University of Concepcion

**4:40 PM**
**$CaCl_2$-$O_2$ Roasting of Stibnite and a Complex Copper Concentrate at 500-650°C**: *Rafael Padilla*[1]; Galo Brito[1]; Maria Ruiz[1]; [1]University of Concepcion

**5:00 PM**
**Research on Sulfur Conversion Behavior in the Oxygen Pressure Acid Leaching Process for the High Indium Sphalerite**: *Liu Yan*[1]; Yangyang Fan[1]; Junfu Qi[1]; Lei Tian[1]; Zhang Ting'an[1]; [1]Northeastern University

## Mechanical Behavior at the Nanoscale IV – Damage, Failure and Fracture

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Wednesday PM
March 14, 2018

Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Josh Kacher, Georgia Tech; Jonathan Zimmerman, Sandia National Laboratories

**2:00 PM Invited**
**Multiscale In Situ Electron Microscopy Investigation of Deformation in Al 6061**: *Josh Kacher*[1]; Yung Suk Yoo[1]; John Emery[2]; Jay Carroll[2]; [1]Georgia Tech; [2]Sandia National Laboratories

**2:30 PM**
**Nanoscale Deformation Behavior in Aluminum Alloys Using Micromechanical Testing and Transmission X-ray Microscopy (TXM)**: C. Shashank Kaira[1]; Tyler Stannard[1]; Vincent De Andrade[2]; Francesco De Carlo[2]; *Nikhilesh Chawla*[1]; [1]Arizona State University; [2]Argonne National Laboratory

**2:50 PM**
**Microstructure and Fracture Toughness of Electrodeposited Ni-W Thick Films Using In-situ Microcantilever Bend Tests**: *Denise Yin*[1]; Christopher Marvel[2]; Richard Vinci[2]; Martin Harmer[2]; [1]Lehigh University; Currently at the U.S. Army Research Laboratory; [2]Lehigh University

**3:10 PM**
**Failure Behavior and Flaw Tolerance of Polycrystalline Yttria-Stabilized Tetragonal Zirconia Nanopillars under Compressive Deformation**: Ning Zhang[1]; *Mohsen Asle Zaeem*[1]; [1]Missouri University of Science and Technology

**3:30 PM Break**

**3:50 PM**
**Investigation of Grain Growth in Nanocrystalline Alloys through Coupled In-situ TEM Fatigue and Crystallographic Orientation Mapping**: *Christopher Barr*[1]; Daniel Bufford[1]; William Mook[1]; Brad Boyce[1]; Khalid Hattar[1]; [1]Sandia National Laboratories

**4:10 PM**
**Estimating the Fracture Toughness of Complex Thermoelectric Materials from Ideal Stress-strain Calculations**: *Matthias Agne*[1]; Guodong Li[1]; G. Jeffrey Snyder[1]; [1]Northwestern University

**4:30 PM**
**Art Skilled Mechanical Behaviors of the Structural Calcites, Aragonites and Organics within Indonesia White-pearl Oyster**: *Guowei Chen*[1]; [1]Beihang University

**4:50 PM**
**Mechanical Behavior of Nanolaminates with Alternating Oxide Layers**: *Jeong-Hyun Woo*[1]; Ju-Young Kim[1]; [1]UNIST

## Multi-material Additive Manufacturing: Processing and Materials Design – Extrusion, Stereolithography, Binder Jetting, and Others

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Hang Yu, Virginia Tech; Nanci Hardwick, Aeroprobe Corporation; Steven Boles, Hong Kong Polytechnic University; Blake Barnett, Army Research Laboratory; Michael Gibson, Desktop Metal

Wednesday PM
March 14, 2018
Room: 232C
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:00 PM Invited**
**Machine, Material, and Toolpath Design for High-throughput Extrusion Additive Manufacturing**: *A. John Hart*[1]; [1]MIT

**2:30 PM Invited**
**Liquid-solid Phase Metamaterials Fabricated by Two-photon Lithography**: Matthew Berwind[1]; Felix Schiebel[2]; *Chris Eberl*[1]; [1]University of Freiburg; [2]Fraunhofer IWM

**3:00 PM**
**Extrusion of Direct-write Inks with Particle Gradients**: *Leanne Friedrich*[1]; Matthew Begley[1]; [1]University of California, Santa Barbara

**3:20 PM Break**

**3:40 PM Invited**
**Realizing Multi-functional Products via Multi-material Additive Manufacturing Processes**: *Christopher Williams*[1]; [1]Virginia Tech

**4:10 PM Invited**
**Fabrication of WC-Co Metal Matrix Composites via Melt Infiltration Using Binder Jet Additive Manufacturing**: *Corson Cramer*[1]; Peeyush Nandwana[1] Amy Elliott[1]; Derek Siddel[1]; Christopher Shafer[1]; Richard Lowden[1]; [1]Oak Ridge National Laboratory

**4:40 PM**
**Processing of High Melting Temperature Polymer with Ceramic Particles as Processing Aid in Selective Laser Sintering**: *Jian Yu*[1]; Lisa Willis[2]; Ricardo Rodriguez[3]; [1]US Army Research Laboratory; [2]Navajo Technical University; [3]3D Systems

**5:00 PM**
**Dynamic Microstructural Control in Printable Colloidal Structures via Acoustic Focusing**: *Drew Melchert*[1]; Leanne Friedrich[1]; Rachel Collino[1]; Tyler Ray[2]; Matthew Begley[1]; Daniel Gianola[1]; [1]University of California, Santa Barbara; [2]Northwestern University

## Perfluorocarbon Generation and Emissions from Industrial Processes – PFC Emissions Accounting Methods and Global Inventory

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* Pascal Lavoie, Light Metals Research Centre - The University of Auckland; David Wong, University of Auckland; Pernelle Nunez, International Aluminium Institute

Wednesday PM
March 14, 2018
Room: 222B
Location: Phoenix Convention Center

*Session Chairs:* Michael Czerniak, Edwards; Pernelle Nunez, International Aluminium Institute

**2:00 PM Introductory Comments**

**2:05 PM**
**Attributing PFC Emissions to Different Industries: How Bottom-up Trends Can Complicate Top-down Analyses**: *Deborah Ottinger*[1]; Stephanie Bogle[1]; [1]USEPA

**2:30 PM**
**Challenges in Estimating Global CF4 and C2F6 Emissions**: *Eleni Michalopoulou*[1]; [1]University of Bristol

**2:55 PM**
**Fluorinated Gas Production: Underestimated Source of PFCs?**: *Deborah Ottinger*[1]; Karen Schaffner[2]; [1]USEPA; [2]RTI International

**3:20 PM**
**An Estimation of PFC Emission by Rare Earth Electrolysis**: *Hanno Vogel*[1]; Bernd Friedrich[2]; [1]TRIMET Aluminium SE; [2]IME Process Metallurgy and Metal Recyling, RWTH Aachen University

**3:45 PM Break**

**4:00 PM**
**Updated Factors for Calculating PFC Emissions from Primary Aluminum Production**: *Jerry Marks*[1]; Pernelle Nunez[2]; [1]J Marks & Associates; [2]International Aluminium Institute

**4:25 PM**
**PFCs from the Chinese Aluminium Sector – Challenges in Emissions Accounting and Further Characteristics**: *David Wong*[1]; Xiping Chen[2]; Bofeng Cai[3]; Xin Bo[3]; Pernelle Nunez[4]; [1]University of Auckland; [2]Central South University Institute; [3]Ministry for Environmental Protection; [4]International Aluminium Institute

## Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XVII – Electromigration and Stability of Electronic Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University; Thomas Reichmann, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Hiroshi Nishikawa, Osaka University; Shien Ping Feng, The University of Hong Kong; Yee-Wen Yen, National Taiwan University of Science & Technology; Song-Mao Liang, Clausthal University of Technology

Wednesday PM
March 14, 2018
Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Ming-Tzer Lin, National Chung Hsing University; Chih-Ming Chen, National Chung Hsing University

**2:00 PM Invited**
**Structural Stability and Chemical Reactivity of Nanoscale Twinning Structure in Copper Nanowires**: Wei-Lun Weng[1]; Jheng-Syun Lee[1]; *Chien-Neng Liao*[1]; [1]National Tsing Hua University

**2:25 PM**
**Alloy Phase Stability under Electric Currents**: *Shih-kang Lin*[1]; Yu-chen Liu[1]; [1]National Cheng Kung University

**2:50 PM**
**Electric Current-induced Slip/Twin Transition: An In Situ EBSD Study**: *Yu-chen Liu*[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

**3:10 PM**
**The Investigation of Electromigration Defects on Cu/Sn and Cu/Ag IMC due to Currents Stress and Temperature**: De-Yu Tseng[1]; Wei-Jhen Chen[1]; Ti-Yuan Wu[1]; *Ming-Tzer Lin*[1]; [1]National Chung Hsing University

**3:30 PM Break**

**3:50 PM**
**A Phase-field Model on Electromigration-induced Transgranular Void Migration in Interconnects**: *Jaykumar Santoki*[1]; Daniel Schneider[1]; Arnab Mukherjee[2]; Michael Selzer[2]; Britta Nestler[1]; [1]Karlsruhe Institute of Technology (KIT); [2]Karlsruhe University of Applied Sciences

**4:10 PM**
**Microstructure Evolution of Al Wire Bonded on Cu Metallization under Electromigration Test**: *Lu Yu Hsien*[1]; Tsau Yan-Wen[1]; Ouyang Fan-Yi[1]; [1]National Tsing Hua University

**4:30 PM**
**On the Existence of a Two-phase Field in Binary α-Cu(Al) Solid Solutions**: *Valery Ouvarov-Bancalero*[1]; Choong-Un Kim[1]; [1]The University of Texas at Arlington

## Phase Transformations and Microstructural Evolution – Phase Transformations in Titanium II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Wednesday PM
March 14, 2018
Room: 129A
Location: Phoenix Convention Center

*Session Chairs:* S. Suresh Babu, University of Tennessee; Yufeng Zheng, The Ohio State University

**2:00 PM**
**On the Deformation Mechanisms of a New Metastable Beta Titanium Alloy with High Strength and High Strain Hardening Rate**: *Junheng Gao*[1]; Mark Rainforth[1]; [1]University of Sheffield

**2:20 PM**
**Dynamic Transformation of Ti-6Al-4V Alloy in theTwo-phase Region**: *Baoqi Guo*[1]; Clodualdo Aranas Jr[1]; John Jonas[1]; [1]McGill University

**2:40 PM**
**On Dual-phase "Strain-transformable" Titanium Alloys for Enhanced Mechanical Properties: Design Principles, Microstructural Optimization and Deformation Mechanisms**: *Lola Lilensten*[1]; Yolaine Danard[1]; Jean-Marc Joubert[2]; Fan Sun[1]; Cédrik Brozek[1]; Loïc Perrière[2]; Philippe Vermaut[1]; Frédéric Prima[1]; [1]Chimie ParisTech — CNRS, Institut de Recherche de Chimie Paris; [2]ICMPE - UMR7182 CNRS-UPEC

**3:00 PM**
**Influence of Sn on Martensitic Phase Transformation and Super-elasticity of Beta Ti Alloys**: *Song Cai*[1]; J Schaffer[1]; [1]Fort Wayne Metals Research Products Corp.

**3:20 PM Break**

**3:40 PM**
**Isothermal Omega Phase Formation in Ti-Nb-Fe Alloys**: *Camilo Fernandes Salvador*[1]; Mariana Dal Bó[1]; Yufeng Zheng[2]; Éder Lopes[1]; Rubens Caram[1]; Hamish Fraser[2]; [1]University of Campinas; [2]The Ohio State University

**4:00 PM**
**Complexion-mediated Martensitic Phase Transformation in Titanium**: *Jian Zhang*[1]; Xiangdong Ding[1]; Dierk Raabe[2]; Jun Sun[1]; [1]Xi'an Jiaotong University; [2]Max-Planck-Institut für Eisenforschung

**4:20 PM**
**Detailed Investigation of Alpha Phase Formation in Metastable Beta Ti Alloys Using Advanced Characterization Techniques**: *Petr Harcuba*[1]; Jana Smilauerova[1]; Jozef Vesely[1]; Pavel Zhanal[1]; [1]Charles University in Prague

**4:40 PM**
**Using Multiparadigmatic Approach in Microstructure Evolution Prediction of Two-Phase Titanium Alloys: Linking Artificial Neural Networks, 2-point Statistics, Multiphase-field Methods and Self-consisting Analytical Models. Building Integrated Computational Materials Engineering (ICME) and Materials Data Infrastructure (MDI)**: *Anton Ektov*[1]; Surya R. Kalidindi[2]; Yuksel C. Yabansu[2]; Xinyi Gong[2]; Jeoung-Han Kim[3]; [1]VSMPO-AVISMA Corp.; [2]Georgia Institute of Technology; [3]Hanbat National University

## Phase Transformations and Microstructural Evolution – Special Topics in Phase Transformations II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

Wednesday PM
March 14, 2018
Room: 124B
Location: Phoenix Convention Center

*Session Chair:* Gregory Thompson, University of Alabama

**2:00 PM**
**B19' Strain Glass Transition and Associated Phase Diagram in Deformed TiNi SMA with Unique Properties**: *Qianglong Liang*[1]; Dong Wang[1]; Jian Zhang[1]; Xiaobing Ren[2]; Yunzhi Wang[3]; [1]Xi'an Jiaotong University; [2]National Institute for Materials Science (NIMS); [3]The Ohio State University

**2:20 PM**
**Evolution of Microstructure and Hardness in Ni-rich NiTi Shape Memory Alloy at Various Thermal Conditions**: *Ben Fraj Boutheina*[1]; Slim Zghal[2]; Zoubeir Tourki[1]; [1]Mechanical Laboratory of Sousse; [2]Laboratory of Multifunctional Materials and Applications

**2:40 PM**
**Effect of Wire Diameter on Phase and Kirkendall Pore Evolution in Titanium Coated Nickel Wires**: *Dinc Erdeniz*[1]; Arun Bhattacharjee[2]; Aaron Yost[1]; David Dunand[1]; Ashley Paz y Puente[2]; [1]Northwestern University; [2]University of Cincinnati

**3:00 PM**
**Tuning Microstructure and Composition of (La0.8Sr0.2)0.98CrxFe1-xO3±d with Using Thermodynamic Modelling**: *Hooman Sabarou*[1]; Yu Zhong[1]; [1]Florida International University

**3:20 PM**
**Sublimation and Self Freezing of Planar Surfaces in Rarefied Atmospheres**: *Rahul Basu*[1]; [1]VTU

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Powder Metallurgy Processes of Various Materials

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

Wednesday PM
March 14, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* Fei Yang, University of Waikato; Pei Sun, University of Utah

**2:00 PM**
**On the Synthesis of Lithium Boron Nitride (Li3BN2): Challenges and Opportunities**: Karan Sahni[1]; *Maziar Ashuri*[1]; Satyanarayana Emani[1]; James Kaduk[1]; Károly Németh[1]; Leon Shaw[1]; [1]Illinois Institute of Technology (IIT)

**2:20 PM**
**Optimization of Manufacturing Process for the High Magnetic Properties of Nd-Fe-B Bonded Magnets Using High-energy Compaction Method**: *Dong-won Shin*[1]; Dong-soo Kim[2]; Jar-myung Koo[1]; Soon-jik Hong[1]; [1]Kongju National University; [2]Convergence Research Center for Development of Mineral Resources

**2:40 PM**
**The Mechanism and Characteristics of Mn-Zn Ferrite Powder Compacts Heated by Microwave**: *Jiamin Zhang*[1]; Jianhong Yi[1]; Guoyou Gan[1]; Kun Ma[1]; Wenjin Ma[1]; [1]Kunming University of Science and Technology

**3:00 PM**
**Effect of Minor Titanium Addition on Copper/Diamond Composites Prepared by Hot Forging**: *Fei Yang*[1]; Wei Sun[1]; Ajit Singh[1]; Leandro Bolzoni[1]; [1]The University of Waikato

**3:20 PM**
**Characterization of the Liquid Phase Sintered Tungsten Heavy Alloys Prepared by an Electrochemically Produced Tungsten Powder**: Mahmut Erol[1]; *Metehan Erdogan*[1]; Ishak Karakaya[2]; [1]Yildirim Beyazit University; [2]Middle East Technical University

**3:40 PM Break**

**4:00 PM**
**Leaching Characteristics of Non Ferrous Metals Recovery from Korean Municipal Solid Waste Incineration Bottom Ash Samples**: Thriveni Thenepalli[1]; *Ahn Ji Whan*[2]; [1]Hanil Cement Co Ltd.,; [2]Korea Research Institute of Geoscience and Mineral Resources(KIGAM)

**4:20 PM**
**Implementation of a Multi-physics Model for Simulating Microstructural Evolution during Sintering**: Sudipta Biswas[1]; Daniel Schwen[2]; *Hao Wang*[1]; Vikas Tomar[1]; [1]Purdue University; [2]Idaho National Laboratory

**4:40 PM Invited**
**Fabrication of Functional Materials Powder by Powder Metallurgical Process, and Investigation of their Bulk Properties**: Babu Madavali[1]; Chul-Hee Lee[1]; Peyala Dharmaiah[1]; Kap-Ho Lee[2]; Jar-Min Koo[1]; *Soon-Jik Hong*[1]; [1]Kongju National University and Institute for Rare Metals; [2]Chungnam National University

**5:10 PM**
**Mechanism and Characteristics of Mn-Zn Ferrite Powder Compacts Heated by Microwave**: *Jiamin Zhang*[1]; Jianhong Yi[1]; Guoyou Gan[1]; Kun Ma[1]; Wenjin Ma[1]; [1]Kunming University of Science and Technology

## Recent Advances in Functional Materials for Printed, Flexible and Wearable Electronics – Printed Electronics and Additive Manufacturing

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Pooran Joshi, Oak Ridge National Laboratory; Nuggehalli Ravindra, New Jersey Institute of Technology; Jud Ready, Georgia Institute of Technology; Amit Pandey, LG Fuel Cell Systems Inc.; Suresh Sitaraman, Georgia Institute of Technology

Wednesday PM
March 14, 2018
Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Pooran Joshi, Oak Ridge National Laboratory; Nuggehalli Ravindra, New Jersey Institute of Technology; Pavel Dutta, University of Houston

**2:00 PM Invited**
**Additive Manufacturing with Aerosol Jet: From Prototyping to Production**: *Kelley McDonald*[1]; M. Schrandt[1]; M. Renn[1]; [1]Optomec, Inc.

**2:30 PM Invited**
**Printable Functional Materials for Smart Fabrics**: *Chih-hung Chang*[1]; Rajiv Malhotra[2]; [1]Oregon State University; [2]Rutgers University

**3:00 PM**
**Recent Advancement on Printed, Stretchable, and Wearable Electronics in 2D Materials**: *Barbara Nichols*[1]; Madan Dubey[1]; Robert Burke[1]; Matthew Chin[1]; Alin Chipara[1]; Alex Mazzoni[1]; Sina Najmaei[1]; Eugene Zakar[1]; [1]U.S. Army Research Laboratory

**3:20 PM Break**

**3:40 PM Invited**
**3D Printing of Soft Ionic Actuators/Sensors for Soft Robotic Applications**: *Kwang Kim*[1]; Sarah Trabia[1]; Zakai Olsen[1]; [1]University of Nevada

**4:10 PM Invited**
**Textile-enabled Wearable Energy Storage Devices**: *Xiaodong Li*[1]; [1]University of Virginia

**4:40 PM Invited**
**3D Printing of Metals and Metal Oxides from Solution for Energy and Biomedical Applications**: *Konstantinos (Kostas) Sierros*[1]; [1]West Virginia University

**5:10 PM Invited**
**3D Electronics and Sensor Circuits by Combining Conventional PCB Technology with Low Temperature Embedding and Forming**: Bart Plovie[1]; Frederick Bossuyt[1]; *Jan Vanfleteren*[1]; [1]Centre for Microsystems Technology, IMEC and Ghent University

## Solar Cell Silicon – Silicon Photovoltaics

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Neale Neelameggham, Ind LLC; York Smith, University of Utah

Wednesday PM
March 14, 2018
Room: 223
Location: Phoenix Convention Center

*Session Chairs:* Shadia Ikhmayies, Al Isra University; Neale Neelameggham, Ind LLC

**2:00 PM Invited**
**Enhancement of Efficiency in Nanostructured-Si Solar Cells by Employing Doped-graphene Transparent Conductive Electrodes**: *Suk-Ho Choi*[1]; [1]Kyung Hee University

**2:40 PM**
**Influence of Chemical and Heat Treatment on the Properties of Disi Raw Sandstones in Jordan**: *Shadia Ikhmayies*[1]; Abdulkader Abed[2]; Belal Amireh[2]; [1]Al Isra University; [2]University of Jordan

**3:00 PM**
**Three-dimensional Crystal-plasticity based Model for Intrinsic Stresses in Multi-junction Photovoltaic**: Khaled Khafagy[1]; *Tarek Hatem*[1]; [1]British University in Egypt

**3:20 PM**
**Ultrathin Crystalline Silicon Solar Cell Preparation through Molten Salt Electrolysis**: *Ji Zhao*[1]; Donald Sadoway[1]; [1]MIT

## Thermal and Mechanical Stability of Nanocrystalline Materials – Joint Session with Non-equilibrium Features of Grain Boundaries

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

Wednesday PM
March 14, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Timofey Frolov, Lawrence Livermore National Laboratory; Jason Trelewicz, Stony Brook University

**2:00 PM Invited**
**Impact of Segregation on Grain Boundary Motion**: *Stephen Foiles*[1]; David Jacobson[2]; Fadi Abdeljawad[1]; Gregory Thompson[2]; [1]Sandia National Laboratories; [2]University of Alabama

**2:30 PM**
**The Influence of Grain Boundary Segregation on the Mechanical Behavior of Nanocrystalline Metals**: Yang Zhang[1]; Wenbo Wang[1]; *Jason Trelewicz*[1]; [1]Stony Brook University

**2:50 PM**
**Sub-ablation Femtosecond Laser Processing of Nanocrystalline Alloys**: *Glenn Balbus*[1]; McLean Echlin[1]; Charlette Grigorian[2]; Timothy Rupert[2]; Tresa Pollock[1]; Daniel Gianola[1]; [1]University of California, Santa Barbara; [2]University of California, Irvine

**3:10 PM Invited**
**Grain Boundary (GB) Complexions: From Developing GB 'Phase' Diagrams to Understanding Embrittlement and Stabilizing Nanoalloys**: *Jian Luo*[1]; [1]University of California, San Diego

**3:40 PM Break**

**4:00 PM Invited**
**Grain Boundary Phase Transformations and their Impact on Thermodynamics and Kinetics**: J. Hickman[1]; *Yuri Mishin*[1]; [1]George Mason University

**4:30 PM**
**Probing the Interfacial-driven Radiation Tolerance of Nanocrystalline Metals**: *Jacob Gruber*[1]; Greg Vetterick[2]; Pranav Suri[2]; Mitra Taheri[2]; Garritt Tucker[2]; [1]Colorado School of Mines; [2]Drexel University

**4:50 PM Invited**
**Irradiation Creep in Nanostructures Measured Using In-situ TEM**: *Shen Dillon*[1]; Khalid Hattar[2]; [1]University of Illinois at Urbana-Champaign; [2]Sandia National Laboratories

## Thermo-mechanical Response of Materials with Special Emphasis on In-situ Techniques – Nanomechanics with Synchrotron Diffraction

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Thin Films and Interfaces Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Sanjit Bhowmick, Bruker Nano Surfaces; Jeff Wheeler, ETH Zurich; María Teresa Pérez Prado, IMDEA Materials Institute; Dongchan Jang, Korea Advanced Institute of Science and Technology; Robert Wheeler, MicroTesting Solutions LLC; Josh Kacher, Georgia Tech

Wednesday PM
March 14, 2018
Room: 101A
Location: Phoenix Convention Center

*Session Chairs:* Bob Wheeler, Micotesting Solutions; Josh Kacher, Georgia Tech

**2:00 PM Invited**
**Experimental Techniques to Asses Long Range Internal Stresses in Plastically Deformed Crystalline Solids**: *Michael Kassner*[1]; Lyle Levine[2]; [1]University of Southern California; [2]NIST

**2:30 PM Invited**
**Mechanical Behavior of Stainless Steel 709 through In-situ Synchrotron Diffraction**: Ryan Smith[1]; *Djamel Kaoumi*[1]; Mahmut Cinbiz[2]; Jun-Sang Park[3]; Jonathan Almer[3]; [1]North Carolina State Univeristy; [2]Oak Ridge National Laboratory; [3]Argonne National Laboratory

**3:00 PM**
**Phase Transformation during Thermal Treatment of Medium Mn Steels Studied by In-situ Synchrotron Experiments and Thermodynamic Modeling**: *Xiaohua Hu*[1]; Kyoo Sil Choi[1]; Guang Cheng[1]; Xin Sun[2]; Josh Mueller[3]; Emmanuel de Moor[3]; Jon Speer[3]; David Matlock[3]; [1]Pacific Northwest National Laboratory; [2]Oak Ridge National Lab; [3]Colorado School of Mines

**3:20 PM**
**"In Situ" Measurement of Electrical Resistivity, Dilatometry and Thermal Analyses of Cast Iron**: *Primoz Mrvar*[1]; Mitja Petric[1]; [1]University of Ljubljana

**3:40 PM Break**

**4:00 PM Invited**
**Studying the Micromechanics of Martensitic Phase Transformatons Using High Energy Diffraction Microscopy**: *Aaron Stebner*[1]; Ashley Bucsek[1]; Jinesh Dahal[1]; Harshad Paranjape[1]; Branden Kappes[1]; [1]Colorado School of Mines

**4:30 PM**
**Emergence and Progression of Abnormal Grain Growth in Minimally Strained Nickel-200**: *Jonathan Madison*[1]; Olivia Underwood[1]; Gregory Thompson[2]; [1]Sandia National Laboratories; [2]University of Alabama

**4:50 PM**
**Order-disorder Transition in 18-carat Gold Studied by In Situ X-ray Scattering**: *Marina Garcia-Gonzalez*[1]; Steven Van Petegem[1]; Ana Diaz[1]; Fanny Lalire[2]; Helena Van Swygenhoven[1]; [1]Paul Scherrer Institut; [2]Varinor

## Ultrafine-grained Materials X – Radiation Tolerance and Particulate Approaches

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Wednesday PM
March 14, 2018
Room: 102C
Location: Phoenix Convention Center

*Session Chair:* Zhiqiang Fu, University of California, Irvine

**2:00 PM Invited**
**On Interfaces and Radiation Damage**: *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory

**2:30 PM Invited**
**Development and Characterization of Nanostructured Steels for Nuclear Applications**: *Haiming Wen*[1]; Andrew Hoffman[1]; Rinat Islamgaliev[2]; Marina Nikitina[2]; [1]Missouri University of Science and Technology; [2]Ufa State Aviation Technical University

**3:00 PM**
**TEM In-situ Mechanical Testing of Proton Irradiated Nanocrystalline Copper Tantalum Alloy**: *Priyam Patki*[1]; Janelle Wharry[1]; Yaqiao Wu[2]; [1]Purdue University; [2]Boise State University

**3:20 PM Break**

**3:40 PM Invited**
**Manufacturing Fine-Grained Mg Rods Utilizing Multi-Pass Caliber-Rolling at Warm Temperatures**: *Taekyung Lee*[1]; Sung Hyuk Park[2]; Jeong Hun Lee[3]; Chong Soo Lee[4]; [1]Pusan National University; [2]Kyungpook National University; [3]Korea Institute of Industrial Technology; [4]POSTECH

**4:10 PM**
**Microstructural Evolution and Mechanical Behavior of a TiC/FeCoNi Composite Fabricated through In Situ Reinforcement Formation**: *Zhiqiang Fu*[1]; Benjamin MacDonald[1]; Zhenfei Jiang[1]; Weiping Chen[1]; Julia Ivanisenko[1]; Yizhang Zhou[1]; Horst Hahn[1]; Enrique Lavernia[1]; [1]University of California, Irvine

**4:30 PM**
**Zirconia Ceramic Toughened Nanocrystalline Iron**: *Guibin Shan*[1]; Yuzeng Chen[1]; Feng Liu[1]; [1]Northwestern Polytechnical University

**4:50 PM**
**Mechano-chemical Synthesis of Nb-oxide Cu Nanocomposites**: *Qun Li*[1]; Xuekun Shang[2]; Robert Averback[1]; Pascal Bellon[1]; [1]UIUC; [2]University of Science and Technology Beijing

## Ultrafine-grained Materials X – Surface Processing and Twinning Phenomena

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Wednesday PM
March 14, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Xinkun Zhu, Kunming University of Science and Technology; Alexander Zhilaev, Fundació CTM Centre Tecnològic

**2:00 PM Invited**
**Surface Structure Transitions during Sliding Contact of Nanostructured Metals**: *Timothy Rupert*[1]; [1]University of California, Irvine

**2:30 PM Invited**
**Nanocrystalline Cu Deformation Characterization Simulations**: *Shawn Coleman*[1]; Daniel Foley[2]; Garritt Tucker[3]; Mark Tschopp[1]; [1]U.S. Army Research Laboratory; [2]Drexel University; [3]Colorado School of Mines

**3:00 PM**
**The Mechanical Properties of Cu-Ni Multilayer Composite Materials**: *Xinkun Zhu*[1]; [1]Kunming University of Science and Technology

**3:20 PM Break**

**3:40 PM Invited**
**Crystal Plasticity of Microstructural Evolution via Twin Boundary Migration in Nanotwinned Metals**: *Shailendra Joshi*[1]; Kartikey Joshi[1]; [1]National University of Singapore

**4:10 PM**
**Fracture Behavior of Bulk Cu with Nanoscale Twins**: S.S. Luo[1]; Z.S. You[2]; *Lei Lu*[1]; [1]Institute of Metal Research, CAS; [2]Nanjing University of Science and Technology

**4:30 PM**
**Study on the Interface of ECAP Cold-welded Cu-Al and Ni-Cu Rods**: *Alexander Zhilyaev*[1]; Th. Werner[2]; Jose-Maria Cabrera[2]; [1]Fundació CTM Centre Tecnològic; [2]Universitat Politècnica de Catalunya

**4:50 PM**
**Production of Bulk Nanograined Si by High-pressure Torsion at Various Pressures**: *Yoshifumi Ikoma*[1]; Terumasa Yamasaki[1]; Katsuhiko Saito[2]; Qixin Guo[2]; Zenji Horita[1]; [1]Kyushu University; [2]Saga University

## 9th International Symposium on High Temperature Metallurgical Processing – Ironmaking, Steelmaking and Casting

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Thursday AM
March 15, 2018
Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Onuralp Yücel, Istanbul Technical University; Ender Keskinkilic, Atilim University

**8:30 AM Introductory Comments**

**8:35 AM**
**Optimization of Exothermic Riser Sleeve Design Parameters**: *Onuralp Yücel*[1]; Ahmet Turan[2]; K. Can Candeger[3]; [1]Istanbul Technical University; [2]Yalova University; [3]Smart Engineering

**8:55 AM**
**Assessment of Gas-Slag-Metal Interaction during a Converter Steelmaking Process**: *Lingling Cao*[1]; Yannan Wang[2]; Qing Liu[1]; Lefei Sun[3]; Sangsang Liao[3]; Weida Guo[4]; Keshe Ren[4]; Bart Blanpain[2]; Muxing Guo[2]; [1]University of Science and Technology Beijing; [2]KU Leuven; [3]Xinyu Iron and Steel Group Co.Ltd; [4]Shandong Iron and Steel Group

**9:15 AM**
**On the Role of Nb on the Texture and Microstructure of a Novel As-rolled Medium Carbon Wear Resistant Slurry Pipeline Steel**: Vahid Javaheri[1]; Tun Tun Nyo[1]; David Porter[1]; *Satish Kumar Kolli*[1]; [1]University of Oulu

**9:35 AM**
**Role of Burden Distribution in Blast Furnace under Reduced Coke Consumption**: Jae Kwon[1]; Ji Lee[1]; *Jeong Han*[1]; [1]Inha University

**9:55 AM Break**

**10:15 AM**
**Viscosity of CaO-$SiO_2$-based Mold Flux with $CeO_2$ for Continuous Casting of RE Alloyed Heavy Rail Steels**: *Zeyun Cai*[1]; Bo Song[1]; Zhen Liu[1]; Xiaokang Cui[1]; Lei Wang[1]; [1]University of Science and Technology Beijing

**10:35 AM**
**A Statistical Analysis of Process Abnormalities in Slab Casting**: *Ender Keskinkilic*[1]; [1]Atilim University

**10:55 AM**
**Effect of Density Difference on Particle Segregation Behaviors at Bell-less Top Blast Furnace with Parallel-type Hopper**: *Yang Xu*[1]; Kaihui Ma[1]; Chengfeng Sun[1]; Zhehan Liao[1]; Jian Xu[1]; Liangying Wen[1]; Chenguang Bai[1]; [1]Chongqing University

**11:15 AM**
**The Effect of Austenitizing Temperature on Hardenability, Precipitation and Mechanical Properties of Boron Bearing Cr-Mo Alloy Steel**: *Yaxu Zheng*[1]; Fuming Wang[1]; Changrong Li[2]; Dan Wu[2]; Xi Chen[1]; Shuai Liu[1]; [1]School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing; [2]School of Materials Science and Engineering, University of Science and Technology Beijing

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Additive Manufacturing of Advanced Light-weight Materials

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Thursday AM
March 15, 2018
Room: 231AB
Location: Phoenix Convention Center

*Session Chairs:* Judy Schneider, University of Alabama in Huntsville; Alex Plotkowski, Oak Ridge National Laboratory

**8:30 AM**
**Al-Ce Alloys for Additive Manufacturing**: *Alex Plotkowski*[1]; Orlando Rios[1]; Zach Sims[2]; Sarah Foster[2]; Hunter Henderson[1]; Ryan Ott[3]; Suresh Babu[2]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee - Knoxville; [3]Ames Laboratory

**8:50 AM**
**Microstructure and Properties of Additively Manufactured Aluminum Alloy 2139**: *Craig Brice*[1]; Milo Kral[2]; Catherine Bishop[2]; Ma Qian[3]; Milan Brandt[3]; Martin Leary[3]; [1]Lockheed Martin Space Systems Company; [2]University of Canterbury; [3]RMIT University

**9:10 AM**
**Parametric Study on Direct Energy Deposition of Aluminum Alloys**: *Parnian Kiani*[1]; Jessica Bui[1]; Kaka Ma[2]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Colorado State University

**9:30 AM**
**Progresses in Wire Arc Additive Manufacturing (WAAM) of Aluminum Alloys Using Modern CMT Deposition System**: *Amin S. Azar*[1]; Hans Fostervoll[1]; Ragnhild Aune[1]; Spyros Diplas[1]; Anette Gunnæs[2]; Martin Løvøy[2]; Tore Andre Kristensen[1]; Mohammed M'Hamdi[1]; [1]SINTEF; [2]UiO

**9:50 AM Break**

**10:10 AM**
**Additive Manufacturing of L12 Strengthened Aluminum Superalloy Addalloy™**: *Seth Griffiths*[1]; Christian Leinenbach[1]; Nhon Vo[2]; Joe Croteau[2]; David Seidman[3]; David Dunand[3]; [1]EMPA; [2]NanoAl LLC; [3]Northwestern University

**10:30 AM**
**The Possibility of Improving the Performance Characteristics of Synthesized Products from Aluminum Alloy Powders**: *Ivan Redkin*[1]; Vladimir Korolev[1]; Aleksandr Evgenov[1]; Dmitriy Ryabov[1]; [1]RUSAL Global Management B. V.

**10:50 AM**
**Heat Resistant Ti Based Alloy with Dispersed TiB Particles Utilizing Additive Manufacturing by Selective Electron Beam Melting**: *Tadashi Fujieda*[1]; Yujie Cui[2]; Kenta Aoyagi[2]; Yuichiro Koizumi[2]; Akihiko Chiba[2]; [1]Hitachi, Ltd.; [2]Tohoku University

**11:10 AM**
**Additive Manufacturing of Niobium Carbide Reinforced Ti6Al4V Metal Matrix Composites Using LENS**: *Jose Avila*[1]; Thomas Gualtieri[1]; Amit Bandyopadhyay[1]; [1]Washington State University

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – Qualification in Additive Manufacturing

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

Thursday AM
March 15, 2018
Room: 230
Location: Phoenix Convention Center

*Session Chairs:* Wesley Everhart, Kansas City National Security Campus; John Carpenter, LANL

**8:30 AM Invited**
**A Methodology for Statistics Based Qualification for Selective Laser Melting of Metals**: *Wesley Everhart*[1]; Elizabeth Fitzgerald[1]; Jordan Herrema[1]; [1]Kansas City National Security Campus

**9:00 AM**
**From Art-to-part: Multidisciplinary Virtual Toolset for Laser Powder-bed Fusion Additive Manufacturing and Multi-Step Post Processing Certification**: *Lang Yuan*[1]; Sam Anand[2]; Santanu Chaudhuri[3]; Susan Moehring[4]; Pinghai Yang[1]; Tyler Nelson[1]; Archak Goel[2]; Omkar Ghalsasi[2]; Botao Zhang[2]; Brian Mercer[3]; Dansong Zhang[3]; Pikee Priya[3]; Dan Scherrer[4]; Radu Pavel[4]; [1]GE Global Research; [2]University of Cincinnati; [3]University of Illinois at Urbana-Champaign; [4]TechSolve

**9:20 AM**
**Material Qualification for Desktop Metal's AM Processing**: *Michael Gibson*[1]; Nihan Tuncer[1]; Brian Kernan[1]; Jesse Cataldo[1]; Shashank Raghu[1]; Anna Trump[1]; Christopher Schuh[2]; Animesh Bose[1]; [1]Desktop Metal; [2]MIT

**9:40 AM**
**Design-to-component, Closed-loop ICME Research and Development for Additively Manufactured Alloys**: *Yongho Sohn*[1]; Ranganathan Kumar[1]; Kevin Coffey[1]; Tengfei Jiang[1]; Rajiv Mishra[2]; [1]University of Central Florida; [2]University of North Texas

**10:00 AM Break**

**10:20 AM Invited**
**Qualification of Wire + Arc Additive Manufacture: Challenges and Outlook**: Paul Colegrove[1]; Stewart Williams[1]; *Filomeno Martina*; [1]Cranfield University

**10:50 AM**
**Additive Manufacturing of Aluminosilicate-polymer and Carbon Composites**: *Pratish Rao*[1]; Krishna Muralidharan[1]; Moe Momayez[1]; Douglas Loy[1]; [1]University of Arizona

**11:10 AM**
**Reshaping Casting Industry by Additive Manufacturing**: *Jinwu Kang*[1]; Chengyang Deng[1]; Haolong Shangguan[1]; Yongyi Hu[1]; [1]Tsinghua University

**11:30 AM**
**Process-structure-property Relationships of Additively Manufactured Model Sandstone**: Kevin Hodder[1]; *John Nychka*[1]; Rick Chalaturnyk[1]; [1]University of Alberta

**11:50 AM**
**Additive Manufacturing of Three-dimensional Carbon Microlattices**: *Akira Kudo*[1]; Federico Bosi[1]; Julia Greer[1]; [1]California Institute of Technology

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Constitutive Behavior II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Irene Beyerlein, University of California Santa Barbara; Wolfgang Pantleon, Technical University of Denmark; Cem Tasan, Massachusetts Institute of Technology

Thursday AM
March 15, 2018
Room: 122B
Location: Phoenix Convention Center

*Session Chairs:* Rodney McCabe, Los Alamos National Laboratory; Benjamin Eftink, Los Alamos National Laboratory

**8:30 AM**
**In-TEM Observation on Twinning in Nano-sized BCC Crystal**: *Scott Mao*[1]; Jiangwei Wang[1]; Christopher Weinberger[2]; Ting Zhu[3]; [1]University of Pittsburgh; [2]Drexel University; [3]Georgia Institute of Technology

**8:50 AM**
**Mechanical Fields due to Double Twinning in Magnesium Alloy AZ31 as Revealed by Explicit Modeling of Twin Lamellae Using a Crystal Plasticity Finite Element Model**: *Milan Ardeljan*[1]; Marko Knezevic[1]; [1]University of New Hampshire

**9:10 AM**
**Intermittent Plasticity Associated with Collective Motion of Dislocation in bcc Alloys**: *Takahito Ohmura*[1]; Takuya Suzuki[1]; [1]National Institute for Materials Science

**9:30 AM**
**Effect of Local Stress on Fault Formation and Propagation within HCP Materials**: *Heather Salvador*[1]; Christopher Lee[1]; Suveen Mathaudhu[1]; [1]University of California, Riverside

**9:50 AM Break**

**10:10 AM**
**A Micromechanical Study for Twin Nucleation in hcp Metals: Development of Analytical Solution to Study Twin Bands Formation**: *Yub Raj Paudel*[1]; Christopher Barrett[1]; Mark Tschopp[2]; Kaan Inal[3]; Haitham El Kadiri[1]; [1]Mississippi State University; [2]US Army Research Laboratory; [3]University of Waterloo

**10:30 AM**
**Quantifying Microstructural Deformation in Cold Sprayed Aluminum-copper Alloy Coatings**: *Tian Liu*[1]; Luke Brewer[1]; Jeffrey Bunn[2]; E. Payzant[2]; Lindsay Kolbus[2]; [1]University of Alabama; [2]Oak Ridge National Lab

**10:50 AM**
**Impact of Microstructural Features on the Grain-orientation Dependent Strain Hardening and Softening Mechanisms in Al-Cu Alloys**: *Brian Milligan*[1]; Dong Ma[2]; Lawrence Allard[1]; Amit Shyam[1]; [1]Materials Science and Technology Division, Oak Ridge National Laboratory; [2]Chemical and Engineering Materials Division, Oak Ridge National Laboratory

**11:30 AM**
**Slip System Kinematic Hardening-based Simulation of Reverse Plasticity in Nanoindentation of ß-tin**: *Zhuowen Zhao*[1]; Aritra Chakraborty[1]; Martin Crimp[1]; Thomas Bieler[1]; Philip Eisenlohr[1]; [1]Michigan State University

**11:10 AM**
**Delayed Cracking and Earing Phenomena in Deep-drawn Stainless Steel Alloys: Interplay among Microstructure, Texture, Transformation Kinetics, Residual Stress, and Load Partitioning**: *Peijun Hou*[1]; Yuan Li[1]; Dongchul Chae[2]; Yang Ren[3]; Ke An[4]; Hahn Choo[1]; [1]University of Tennessee; [2]POSCO Technical Research Laboratory; [3]Argonne National Laboratory; [4]Oak Ridge National Laboratory

## Advanced High-strength Steels – Bainitic and Stainless Steels

*Sponsored by:* TMS Structural Materials Division, TMS: Steels Committee
*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

Thursday AM
March 15, 2018
Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Hung-Wei Yen, National Taiwan University; Mingxin Huang, The University of Hong Kong

**8:30 AM**
**Resetting Aged Duplex Stainless Steels to Hinder Thermal Embrittlement**: *Jaclyn Cann*[1]; Cem Tasan[1]; [1]Massachusetts Institute of Technology

**8:50 AM**
**Design of Carbide-free Bainite Steels by Cool and Partitioning (C&P)**: *Kazuhiko Nishioka*[1]; Gregory Olson[1]; [1]Northwestern University

**9:10 AM**
**Microstructural Characterization of Nanostructured Bainitic Steel under Repeated Frictional Sliding**: *Kritika Singh*[1]; Aparna Singh[1]; [1]Indian Institute of Technology, Bombay, India

**9:30 AM**
**Thermal Stability of Precipitated Austenite in Fe-10Ni-0.1C Steel**: *Ian Harding*[1]; Sharvan Kumar[1]; [1]Brown University

**9:50 AM**
**Relationship of Grain Size and Deformation Mechanism to the Fracture Behavior in High-strength High-ductility Nanostructured Austenitic Stainless Steel**: Devesh Misra[1]; *Yashwanth Injeti*[1]; [1]University of Texas at El Paso

**10:10 AM Break**

**10:25 AM**
**Bio-inspired Hierarchical Steels with Superior Strength and Ductility**: *Shan Cecilia Cao*[1]; Jiabin Liu[2]; Jian Lu[3]; [1]University of California, Berkeley; [2]Zhejiang University; [3]City University of Hong Kong (CityU)

**10:45 AM**
**Design of Duplex Stainless Steels with TRIP Effect: Link between Composition, Phase Stability and Plasticity**: Audrey Lechartier[1]; *Alexis Deschamps*[2]; Marc Mantel[1]; Guillaume Parry[2]; Muriel Veron[2]; [1]Ugitech; [2]Grenoble Institute of Technology

**11:05 AM**
**Wire Drawing at Cryogenic Temperatures: A New Production Rout for High Strength Stainless Steels**: *Mikael Grehk*[1]; Pasi Kangas[1]; Guocai Chai[1]; Lars Wikström[1]; [1]Sandvik Materials Technology

**11:25 AM**
**Elastoplastic Deformation of Micro-constituents in a Duplex Stainless Steel by Cyclic Nanoindentation**: *Yunfei Jia*[1]; Yuanyuan Cui[1]; Fu-Zhen Xuan[1]; [1]East China University of Science and Technology

**11:45 AM**
**Measurements of Mechanical Properties of Age Hardened 18Ni (350) Maraging Steel Using Nanoindentation Stress-strain Analysis**: *Ali Khosravani*[1]; Sepideh Parvinian[1]; Hamid Garmestani[1]; Surya Kalidindi[1]; [1]Georgia Institute of Technology

**12:05 PM**
**Effects of Matrix Microstructure on the Nanoscale Precipitation and Precipitation Strengthening in an Ultra-high Strength Steel**: *Songsong Xu*[1]; Hao Guo[1]; Yu Zhao[1]; Naimeng Liu[1]; Dan Chen[1]; Ye Cui[1]; Yang Zhang[1]; Zhongwu Zhang[1]; [1]Key Laboratory of Superlight Materials and Surface Technology, Ministry of Education ,College of Materials Science and Chemical Engineering, Harbin Engineering University

**12:25 PM Concluding Comments**

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Development and Application of Soft Magnetic Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

Thursday AM
March 15, 2018
Room: 229A
Location: Phoenix Convention Center

*Session Chair:* Hunter Henderson, Oak Ridge National Laboratory

**8:30 AM Introductory Comments**

**8:35 AM Invited**
**Development of Iron-rich (Fe,Ni,Co)-based Nanocrystalline Magnets with Minimized Magnetostriction**: Anthony Martone[1]; Bowen Dong[1]; Song Lan[1]; *Matthew Willard*[1]; [1]Case Western Reserve University

**9:05 AM Invited**
**Accelerated Discovery of Magnetic Alloys with Decreased Critical Materials**: *Ryan Ott*[1]; Fanqiang Meng[1]; Emrah Simsek[1]; Matthew Besser[1]; Matthew Kramer[1]; [1]Ames Laboratory (USDOE)

**9:35 AM Invited**
**Imaging of Magnetic Domain Dynamics at Power Frequency**: *Rudolf Schaefer*[1]; [1]Leibniz Institute for Solid State and Materials Research (IFW) Dresden

**10:05 AM Break**

**10:25 AM Invited**
**Processing of Magnetic Materials Enhanced by Magnetic Fields or Electric Currents**: *Konstantin Skokov*[1]; Oliver Gutfleisch[1]; [1]Technische Universität Darmstadt

**10:55 AM**
**Crystallization Kinetics in (Fe70Ni30)80Nb4Si2B14 Metal Amorphous Nanocomposites (MANCs)**: *Natan Aronhime*[1]; Michael McHenry[1]; [1]Carnegie Mellon University

**11:15 AM**
**Magnetic Domains and Microstructure in Nanocrystalline Soft Magnetic Fe-Si Alloys**: *Trevor Clark*[1]; XiuJuan Jiang[2]; Nicole Overman[2]; Suveen Mathaudhu[1]; [1]University of California, Riverside; [2]Pacific Northwest National Laboratory

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Pb Free Solder Alloy II

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Thursday AM
March 15, 2018
Room: 226C
Location: Phoenix Convention Center

*Session Chairs:* Kazuhiro Nogita, The University of Queensland; Sergey Belyakov, Imperial College London

**8:30 AM**
**Interfacial Reaction of 68In32Bi and 33In67Bi Low Melting Alloy on Cu Substrate**: *Albert T. Wu*[1]; Jyun-Jhe Huang[1]; Chih-Hao Chen[1]; Hsiang-Chuan Chen[2]; Chang-Meng Wang[2]; [1]National Central University; [2]SHENMAO Technology Inc.

**8:50 AM**
**High Temperature Lead-free Die Attach Materials - a Review**: *HongWen Zhang*[1]; Ning-Cheng Lee[1]; Jonathan Minter[1]; [1]Indium Corporation

**9:10 AM**
**Sintered Silver-Indium Bonding Materials for High Temperature Applications**: *Chun An Yang*[1]; C. Robert Kao[1]; Hiroshi Nishikawa[2]; [1]National Taiwan University; [2]Osaka University

**9:30 AM**
**Properties of Joints Formed With Cu-Ni/Sn High Temperature Pb-free Composite Solder Paste**: *Stephanie Choquette*[1]; Iver Anderson[1]; [1]Ames Lab

**9:50 AM**
**The Microstructure and Tensile Properties of Zn-25Sn-xCu-yTi High Temperature Pb-Free Solder Alloy**: *Jeng Chi Lin*[1]; Kwang-Lung Lin[1]; [1]National Cheng Kung University

**10:10 AM Break**

**10:30 AM**
**High Temperature Mechanical Properties of Zn-based High Temperature Lead-free Solders**: *Che-Wei Chang*[1]; Kwang-Lung Lin[1]; [1]National Cheng Kung University

**10:50 AM**
**The Wetting and IMC Growth Behaviors between Zn-25Sn-xCu-yTi High Temperature Pb-free Solder Alloys and Cu**: *Darwin Sarwono*[1]; Kwang-Lung Lin[1]; [1]National Cheng Kung University

**11:10 AM**
**Nucleation, Growth, and Structure of Beta-tin in Tin-based Solders**: *Kathlene Reeve*[1]; Samuel Reeve[1]; Carol Handwerker[1]; [1]Purdue University

## Advanced Real Time Optical Imaging – Iron and Steelmaking II

*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, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology

Thursday AM
March 15, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chairs:* Hiroyuki Shibata, Tohoku University; Jinichiro Nakano, US DOE National Energy Technology Laboratory

**8:30 AM Invited**
**Wetting, Spreading and Penetrating Behavior of Slags in Contact with Refactory Ceramics**: *Yongsug Chung*[1]; [1]Korea Polytechnic University

**9:00 AM Invited**
**Current State Art of Double Hot Thermocouple Technology—Novel Way for the Study of Mold Flux High-temperature Properties**: *Wanlin Wang*[1]; Lei Zhang[1]; Lejun Zhou[1]; [1]Central South University

**9:30 AM Invited**
**In Situ Observation of Dissolution of Oxide Inclusions in Steelmaking Slags**: *Neslihan Dogan*[1]; [1]McMaster University

**10:00 AM Break**

**10:20 AM Invited**
**Investigation of Integrated Recycling Waste Heat and Slag Resources Using Single Hot Thermocouple Technique**: *Zuotai Zhang*[1]; Yongqi Sun[1]; [1]Southern University of Science and Technology

**10:50 AM Invited**
**In-situ Observation of Reduction or Oxidation of Molten CaO-FeOx-$SiO_2$ Oxides at 1573 K**: *Hiroyuki Matsuura*[1]; [1]The University of Tokyo

**11:20 AM**
**Localized Concentration of Metal Cations of Steelmaking Slags and its Visualization Using Confocal Laser Scanning Microscope**: *Il Sohn*[1]; [1]Yonsei University

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – Emerging Methods and Materials

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

Thursday AM
March 15, 2018
Room: 231C
Location: Phoenix Convention Center

*Session Chairs:* Peter Collins, Iowa State University; Craig Brice, Lockheed Martin Space Systems Company; Andrew Baker, The Boeing Company

**8:30 AM Invited**
**Investigation of Fabrication of Ti64 Components Using Hybrid Additive Manufacturing**: *Joseph Newkirk*[1]; Frank Liou[1]; [1]Missouri University of Science and Technology

**9:00 AM**
**Solid-state Additive Manufacturing and Repair of Titanium Alloys**: *Nanci Hardwick*[1]; Chase Cox[1]; [1]Aeroprobe Corporation

**9:20 AM**
**The Effects of Electrically-assisted Ultrasonic Nanocrystal Surface Modification on 3D-printed Ti-6Al-4V Alloy**: Hao Zhang[1]; Jingyi Zhao[1]; Haifeng Qin[1]; Zhencheng Ren[1]; Gary Doll[1]; Yalin Dong[1]; *Chang Ye*[1]; [1]University of Akron

**9:40 AM**
**Insight on Process Development of Titanium Aluminide Alloy(s) during Laser In-situ Alloying**: *Monnamme Tlotleng*[1]; Sisa Pityana[1]; [1]Additive Manufacturing Research Group, Laser Enabled Manufacturing, CSIR

**10:00 AM Break**

**10:15 AM**
**Intrinsic Heat Treatment of Titanium Alloys during Selective Laser Melting**: *Pere Barriobero-Vila*[1]; Joachim Gussone[1]; Jan Haubrich[1]; Stefanie Sandlöbes[2]; Julio Da Silva[3]; Peter Cloetens[3]; Norbert Schell[4]; Guillermo Requena[1]; [1]German Aerospace Center; [2]Department and Chair of Physical Metallurgy and Metal Physics, RWTH Aachen University; [3]European Synchrotron Radiation Facility (ESRF); [4]Helmholtz-Zentrum Geesthacht

**10:35 AM**
**Development of Bio-compatible Beta Ti Alloy Powders for Additive Manufacturing of for Application in Patient-specific Orthopaedic Implants**: *Eugne Ivanov*[1]; Eduardo del-Rio[1]; [1]Tosoh

## Algorithm Development in Materials Science and Engineering – Experimental and Computational Algorithms

*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, Missouri University of Science and Technology; Mark Tschopp, Army Research Laboratory; Jonathan Zimmerman, Sandia National Laboratories; Ebrahim Asadi, University of Memphis; Mark Horstemeyer, Mississippi State University

Thursday AM
March 15, 2018
Room: 130
Location: Phoenix Convention Center

*Session Chairs:* Jonathan Zimmerman, Sandia National Laboratories; Mohsen Asle Zaeem, Missouri University of Science and Technology

**8:30 AM**
**Data Fusion and Mining of In Situ Monitoring Sensors, Process Modeling, and Defect Characterization in Powder Bed Fusion Additive Manufacturing**: *Sean Donegan*[1]; Michael Groeber[1]; Edwin Schwalbach[1]; [1]Air Force Research Laboratory

**8:50 AM**
**Deep Learning and Dynamic Sampling for Smart Data Acquisition in Scanning Electron Microscopy**: Yan Zhang[1]; G. M. Dilshan Godaliyadda[2]; Nicola Ferrier[1]; Emine Gulsoy[3]; Charles Bouman[2]; *Charudatta Phatak*[1]; [1]Argonne National Laboratory; [2]Purdue University; [3]Northwestern University

**9:10 AM**
**Assessment of Heterogeneous Elastic Strains in Polycrystalline Ti-5Al-2.5Sn and Modeling with Taylor Gradient Enhanced Phenomenological Crystal Plasticity Model**: *Chen Zhang*[1]; Philip Eisenlohr[1]; Martin Crimp[1]; Carl Boehlert[1]; Ruqing Xu[2]; Thomas Bieler[1]; [1]Michigan State University; [2]Argonne National Lab

**9:30 AM**
**Segmentation for Large Datasets of X-ray Microscopes by Using a Deep Convolutional Neural Network**: *Xiaogang Yang*[1]; Vincent De Andrade[1]; Francesco De Carlo[1]; Nikhilesh Chawla[2]; C. Shashank Kaira[2]; William Scullin[1]; Doga Gursoy[1]; [1]Argonne National Laboratory; [2]Arizona State University

**9:50 AM Break**

**10:10 AM**
**Hierarchical Simplex Sampling: An Efficient Algorithm for Construction of Diverse Microstructural Sets and Delineation of Properties Closures**: *Oliver Johnson*[1]; Christian Kurniawan[1]; Christopher Schuh[2]; [1]Brigham Young University; [2]Massachusetts Institute of Technology

**10:30 AM**
**Developing a Workflow for Process-structure-property Linkage through Monte Carlo and Direct Numerical Simulations**: *Theron Rodgers*[1]; Joseph Bishop[1]; Jonathan Madison[1]; [1]Sandia National Laboratories

**10:50 AM**
**Concepts, Data Bases and Analysis Tools for Dislocation Micro Structures Across the Length Scales**: *Stefan Sandfeld*[1]; [1]TU Freiberg

**11:10 AM**
**PyCAC: The Concurrent Atomistic-Continuum Simulation Environment**: *Shuozhi Xu*[1]; Thomas Payne[2]; Hao Chen[3]; Yongchao Liu[2]; Liming Xiong[3]; Youping Chen[4]; David McDowell[2]; [1]University of California, Santa Barbara; [2]Georgia Institute of Technology; [3]Iowa State University; [4]University of Florida

## Alloy Development and Powder Manufacture for Additive Manufacturing – Design of Aluminum Alloys

*Sponsored by:* TMS Materials Processing and Manufacturing Division
*Program Organizers:* Paul Prichard, Kennametal; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; James Foley, Los Alamos National Laboratory

Thursday AM
March 15, 2018
Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Paul Prichard, Kennametal

**8:30 AM**
**Aluminium Alloy Design for Selective Laser Melting**: *Paul Rometsch*[1]; Kun Yang[1]; Qingbo Jia[1]; Xinhua Wu[1]; [1]Monash University

**8:50 AM**
**Aluminium Alloy Development for Additive Manufacturing**: *Qingbo Jia*[1]; Paul Rometsch[1]; Sheng Cao[1]; Kai Zhang[1]; John Shurvinton[1]; Tom Jarvis[1]; Xinhua Wu[1]; [1]Monash University

**9:10 AM**
**Bridging the Gap Between Rapid Solidification and the Additive Manufacture of Novel Aluminum Alloys**: *Joe Croteau*[1]; Nhon Vo[1]; Davaadorj Bayansan[1]; David Seidman[1]; David Dunand[1]; [1]NanoAl LLC

**9:30 AM**
**Preventing the Coarsening of $Al_3Sc$ Precipitates by the Formation of a Zr-rich Shell during Laser Metal Deposition**: *Philipp Kürnsteiner*[1]; Markus Benjamin Wilms[2]; Andreas Weisheit[2]; Eric Aimé Jägle[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Fraunhofer-Institut für Lasertechnik

**9:50 AM**
**Hybrid AM Processing Reduces Stresses and Produces Equiaxed Microstructures**: *James Withers*[1]; [1]ATS-MER, LLC

## Aluminum Alloys, Processing and Characterization – Emerging Technologies

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Thursday AM
March 15, 2018
Room: 221B
Location: Phoenix Convention Center

*Session Chair:* Amir Zadeh, Sapa Technology Americas

**8:30 AM Invited**
**In-situ Fitness-for-Service Assessment of Aluminum Alloys Developed for Automotive Powertrain Lightweighting**: Ermia Aghaie[1]; Joshua Stroh[1]; *Dimitry Sediako*[1]; Mathew Smith[1]; [1]University of British Columbia

**9:00 AM Invited**
**Advances in Aluminum Extrusion Alloys and Processes**: *David Lukasak*[1]; Amirreza Sanaty Zadeh[1]; [1]Sapa

**9:30 AM**
**Research on the Effect of the Processing Parameters on Susceptibility of Liquation Cracking of Al Alloys during Refilled Friction Stir Spot Welding**: *Tao Yuan*[1]; Wentao Gong[1]; Yinuo Li[1]; Shujun Chen[1]; [1]Beijing University of Technology

**9:50 AM**
**Factors Influencing the Cast Duration of Horizontal Continuous Ingot Casters**: *Benjamin Jaroni*[1]; Sascha Werner[1]; Elmar Schöll[1]; Georg Scheele[1]; [1]TRIMET Aluminium SE

**10:10 AM Break**

**10:30 AM**
**High Volume Production Validation of Aluminum Tailor-welded Blanks**: *Yuri Hovanski*[1]; Tom Luzanski[2]; Dustin Marshall[2]; Piyush Upadhyay[3]; [1]Brigham Young University; [2]TWB Company; [3]Pacific Northwest National Laboratory

**10:50 AM**
**On Si Redistribution during Friction Stir Processing of Cast Al-7%Si-0.4%Mg Alloys**: *Nelson Affonseca Netto*[1]; Murat Tiryakioglu[1]; [1]University of North Florida

**11:10 AM**
**Equal Channel Angular Pressing of a Newly Developed Precipitation Hardenable Scandium Containing Aluminum Alloy**: *Jahanzaib Malik*[1]; Bilal Mansoor[2]; Wahaz Nasim[1]; Ibrahim Karaman[1]; Dinc Erdeniz[3]; David Seidman[3]; David Dunand[3]; [1]Texas A&M University; [2]Texas A&M University at Qatar; [3]Northwestern University

**11:30 AM**
**Stiffness Improvement Through Alloying Elements in Al Alloys**: Sajjad Amirkhanlou[1]; *Shouxun Ji*[1]; [1]Brunel University London

## Aluminum Reduction Technology – Environment, Gas Treatment & Alumina Transport

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Thursday AM
March 15, 2018
Room: 221C
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**8:30 AM Introductory Comments**

**8:35 AM**
**Improved Abart Gas Treatment and Alumina Handling at the Karmøy Technology Pilot (KTP)**: *Anders Sorhuus*[1]; Sivert Ose[1]; [1]GE Power

**9:00 AM**
**SPL: An Update**: *Rudolf Pawlek*[1]; [1]TS+C

**9:25 AM**
**Bubble Dispersion States in the Zinc Oxide Desulfurization Injection Blow Tank**: *Xuejiao Cao*[1]; Zhang Ting'an[1]; Yan Liu[1]; Yuhao Zhang[1]; Weiguang Zhang[1]; Dongxing Wang[1]; Kun Wang[1]; [1]Northeastern University

**9:50 AM**
**Decision Criteria for Pneumatic Conveying and Distribution of Material**: Arne Hilck[1]; *Jan Paepcke*[1]; Michael Altmann-Rinck[1]; [1]Claudius Peters Projects

**10:15 AM Concluding Comments**

## Atom Probe Tomography for Advanced Characterization of Metals, Minerals and Materials – Nuclear Materials

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nuclear Materials Committee, TMS: Phase Transformations Committee
*Program Organizers:* Haiming Wen, Missouri University of Science and Technology; Simon Ringer, The University of Sydney; Gregory Thompson, University of Alabama; Arun Devaraj, Pacific Northwest National Laboratory; Keith Knipling, U.S. Naval Research Laboratory; Gang Sha, Nanjing University of Science and Technology; David Seidman, Northwestern University; Chantal Sudbrack, QuesTek Innovations, LLC

Thursday AM
March 15, 2018
Room: 124A
Location: Phoenix Convention Center

*Funding support provided by:* CAMECA Instruments, Inc.

*Session Chairs:* Arun Devaraj, Pacific Northwest National Laboratory; Haiming Wen, Missouri University of Science and Technology

**8:30 AM Invited**
**From Imaging to Quantitative Atom Probe Tomography of Irradiated Microstructures**: *Emmanuelle Marquis*[1]; Elaina Anderson[1]; G. Robert Odette[2]; Li-Jen Yu[1]; [1]University of Michigan; [2]University of California, Santa Barbara

**9:05 AM Invited**
**Perspectives for APT Characterisation of Structural Materials for Nuclear Reactor Applications**: *Michael Moody*[1]; Paul Bagot[1]; [1]University of Oxford

**9:40 AM**
**APT Studies of Cu-Mn-Ni-Si Precipitate Phase Selection for the Wide Range of RPV Steel Compositions Irradiated in UCSB ATR-1 & ATR-2**: *Nathan Almirall*[1]; Peter Wells[1]; Takuya Yamamoto[1]; David Gragg[1]; Kirk Fields[1]; G. R. Odette[1]; Randy Nanstad[2]; Keith Wilford[3]; Tim Williams[3]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory; [3]Rolls Royce

**10:00 AM Break**

**10:20 AM Invited**
**A Critical Comparison of APT Characterization of Nanoscale Precipitates in Iron Based Alloys with a Range of Other Techniques**: *G. Robert Odette*[1]; Peter Wells[1]; Nathan Almirall[1]; [1]University of California, Santa Barbara

**10:55 AM**
**Atom Probe Tomography and Correlative Microscopy of Uranium-10 wt% Molybdenum Alloy Nuclear Fuels**: *Arun Devaraj*[1]; Elizabeth Kautz[1]; Curt Lavender[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

## Biodegradable Materials for Medical Applications – Biodegradable Metals

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Jaroslaw Drelich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund; Jan Seitz, Syntellix AG; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California-Riverside

Thursday AM
March 15, 2018

Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Jan-Marten Seitz, Syntellix AG; Petra Maier, University of Applied Sciences Stralsund

**8:30 AM Keynote**
**Fe-based Alloys: A New Class of High Strength Low-degradation Biodegradable Metals for Health Applications**: Sergio Loffredo[1]; Malgorzata Sikora Jasinska[1]; Nicolas Gigueres[2]; Maurizio Vedani[3]; *Diego Mantovani*[1]; [1]Laval University; [2]Quebec Center for Metallurgy; [3]Polytechnic of Milan, Italy

**9:10 AM Invited**
**Fundamentals of the Theory of Biodegradable Metals—Definition, Biodegradability and Biosafety Criteria and its Guidance on Material Design**: *Yufeng Zheng*[1]; [1]Peking University

**9:40 AM Invited**
**Opportunities Offered by Zinc Alloys for Degradable Implants: Recent Trends and Developments**: Ehsan Mostaed[1]; Malgorzata Sikora-Jasinska[1]; Ana Laura Ramirez-Ledesma[1]; Lucie Lévesque[2]; Diego Mantovani[2]; *Maurizio Vedani*[1]; [1]Politecnico di Milano, Dipartimento di Meccanica; [2]Laval University

**10:10 AM Break**

**10:30 AM Invited**
**Progress in Absorbable Wire Technology for Next Generation Devices**: *Adam Griebel*[1]; Jeremy Schaffer[1]; [1]Fort Wayne Metals

**11:00 AM**
**Mechanical Properties of Nanocrystalline Bioresorbable Fe-Mn Alloy**: *Anqi Yu*[1]; Christian Roach[1]; Sina Shahrezaei[1]; David Johnson[2]; Lia Stanciu[2]; Suveen Mathaudhu[3]; [1]UCR; [2]Purdue university; [3]University of California, Riverside

**11:20 AM**
**Effect of Additive Zinc on Mechanical Properties and Degradation Behavior of Magnesium**: *Naoko Ikeo*[1]; Kengo Fujiwara[1]; YooJin Kim[2]; Toshiji Mukai[1]; [1]Kobe University; [2]Brown University

**11:40 AM**
**Visualisation of Implant Failure by Synchrotron Tomography**: *Regine Willumeit-Roemer*[1]; Julian Moosmann[1]; Berit Zeller-Plumhoff[1]; Florian Wieland[1]; Diana Krüger[1]; Björn Wiese[1]; Ann Wennerberg[2]; Niccolò Peruzzi[3]; Silvia Galli[2]; Felix Beckmann[1]; Jörg Hammel[1]; [1]Helmholtz-Zentrum Geesthacht; [2]Faculty of Odontology, Malmö University; [3]Clinical Sciences, Lund University

## Building an ICME Infrastructure: Developing Tools that Integrate Across Length and Time Scales to Accelerate Materials Design – Materials Design Collaboration Platforms and Tools

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Carelyn Campbell, National Institute of Standards and Technology; Mark Carroll, Federal Mogul Powertrain; Adam Hope, Thermo-Calc Software; Hojun Lim, Sandia National Laboratories; Myoung-Gyu Lee, Korea University; Amy Clarke, Colorado School of Mines; Dongwon Shin, Oak Ridge National Laboratory

Thursday AM
March 15, 2018

Room: 132C
Location: Phoenix Convention Center

*Session Chairs:* Mark Carroll, Federal Mogul Powertrain; Chandler Becker, National Institute of Standards and Technology

**8:30 AM Invited**
**The PRISMS Framework: An Integrated Multi-scale Capability for Accelerated Predictive Materials Science**: *John Allison*[1]; [1]University of Michigan

**9:10 AM**
**TAMMAL: High throughput Materials Design Suite**: Raymundo Arroyave[1]; *Anjana Talapatra*[1]; Thien Duong[1]; Woongrak Son[1]; Ruben Villareal[1]; [1]Texas A&M University

**9:30 AM**
**Integrated Computational Materials Engineering (ICME) in Support of Business Decision Making and Open Innovation Through Interdisciplinary Collaboration**: *James Goddin*[1]; Will Marsden[1]; Najib Baig[1]; [1]Granta Design Ltd

**9:50 AM**
**TESSRA: A Cloud-based Multiscale Platform for Modern Alloys Design**: *Tarek Hatem*[1]; Khalil ElKhodary[1]; Ahmed Ali[1]; Khaled Khafagy[1]; AbdelHamid Hamdy[1]; Youssef Ibrahim[1]; Mohamed Hindy[1]; Amir Abdelmawla[1]; [1]TESSRA Technologies

**10:10 AM Break**

**10:30 AM**
**Integrating Materials Microstructure Information into Engineering Design and Manufacturing**: *Dennis Dimiduk*[1]; Marcus Hanwell[2]; Bob O'Bara[2]; TJ Corona[2]; Michael Jackson[1]; Glen Hansen[3]; Sean Donegan[4]; Michael Groeber[4]; [1]BlueQuartz Software, LLC; [2]Kitware, Inc; [3]Sandia National Laboratory; [4]Air Force Research Laboratory

**10:50 AM**
**Enabling Connection of Online Simulation Tools and Databases: nanoHUB.org**: *Sam Reeve*[1]; David Guzman[1]; Ben Haley[1]; Karthik Guda Vishnu[1]; Austin Zadoks[1]; Gustavo Rico[1]; Alejandro Strachan[1]; [1]Purdue University

**11:10 AM**
**Making Materials Science Resources Discoverable and Accessible with the NIST Materials Resource Registry**: *Chandler Becker*[1]; Raymond Plante[1]; Alden Dima[2]; Laura Bartolo[3]; Sharief Youssef[2]; Andrea Medina-Smith[4]; Zachary Trautt[1]; Emily Brown[5]; Benjamin Long[2]; Robert Hanisch[1]; Mary Brady[2]; James Warren[1]; [1]Material Measurement Laboratory, National Institute of Standards and Technology; [2]Information Technology Laboratory, National Institute of Standards and Technology; [3]Center for Hierarchical Materials Design, Northwestern University; [4]Information Services Office, National Institute of Standards and Technology; [5]Chemistry Department, Centre College

**11:30 AM**
**The Materials Commons: A Collaboration Platform and Information Repository for the Global Materials Community**: *Brian Puchala*[1]; Glenn Tarcea[1]; Tracy Berman[1]; Terry Weymouth[1]; John Allison[1]; [1]University of Michigan

**11:50 AM**
**Atomistic Polymer Simulations in the Cloud at nanoHUB.org**: *Benjamin Haley*[1]; Lorena Alzate-Vargas[1]; Chunyu Li[1]; Alejandro Strachan[1]; [1]Purdue University

## Bulk Metallic Glasses XV – Structures and Modeling

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Thursday AM
March 15, 2018
Room: 122A
Location: Phoenix Convention Center

*Session Chair:* Alan Needleman, Texas A&M University

**8:30 AM Invited**
**Nanoglass: An Alternative Path to Harden and Toughen Metallic Glasses by Spatial Patterning of Heterogeneities**: *Mo Li*[1]; [1]Georgia Institute of Technology

**8:50 AM Invited**
**A Combinatorial Approach to Evaluate the Glass-forming Ability of Multi-component Bulk Metallic Glasses**: *Chuan Zhang*[1]; Fan Zhang[1]; Shuanglin Chen[1]; Weisheng Cao[1]; Jun Zhu[1]; Duchao Lv[1]; [1]Computherm

**9:10 AM Invited**
**Effects of Pressure on the Structure and Properties of Metallic Glasses Examined by Computer Simulation**: *Jun Ding*[1]; Mark Asta[2]; Robert Ritchie[1]; [1]Lawrence Berkeley National Laboratory; [2]UC Berkeley

**9:30 AM**
**Composition Dependence and Structural Signature of Beta-relaxation in La-based Metallic Glasses**: *Xiaodong Wang*[1]; Jin Zhang[1]; Qing Yu[1]; Qingping Cao[1]; Jianzhong Jiang[1]; [1]Zhejiang University

**9:50 AM Break**

**10:10 AM Invited**
**Spatial Correlation of Elastic Heterogeneity Tunes the Deformation Behaviors of Metallic Glasses**: Neng Wang[1]; Jun Ding[2]; *Lin Li*[1]; [1]University of Alabama; [2]Lawrence Berkeley National Laboratory

**10:30 AM Invited**
**Deformation in Amorphous Notched Bars; A Discrete Shear Transformation Zone Plasticity Analysis**: *Babak Kondori*[1]; Amine Benzerga[1]; Alan Needleman[1]; [1]Texas A&M University

**10:50 AM Invited**
**The Atomistic Simulation of Stress Relaxation and Creep in a Model Binary Amorphous Solid**: *Peter Derlet*[1]; [1]Paul Scherrer Institut

**11:10 AM**
**Dual-Cluster Formulas for Eutectic-Type Zr-Based Bulk Metallic Glasses**: *Kaiming Han*[1]; Jianbing Qiang[1]; Yingmin Wang[1]; Z. Wang[1]; Qing Wang[1]; Chuang Dong[1]; [1]Dalian University of Technology

**11:30 AM**
**The Mechanism of Free-volume Concentration by Controlling Shear Bands in Bulk Metallic Glasses**: *Zhong Wang*[1]; Shuying Chen[2]; Jiaojiao Li[1]; Junwei Qiao[1]; Peter K. Liaw[2]; [1]Taiyuan University of Technology; [2]The University of Tennessee

## Cast Shop Technology – Casting and Cast House Products

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Mark Badowski, Hydro Aluminium

Thursday AM
March 15, 2018
Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Samuel Wagstaff, Novelis Switzerland SA

**8:30 AM Introductory Comments**

**8:35 AM**
**Experimental Study and Numerical Analysis of Cracking during DC Casting of Large Dimension 7075 Aluminium Billets**: *Kjerstin Ellingsen*[1]; Qiang Du[1]; Mohammed M'Hamdi[1]; Britt-Elin Gihleengen[2]; Rune Ledal[2]; Knut Omdal Tveito[3]; Arild Håkonsen[2]; [1]SINTEF; [2]Hycast; [3]Hydro

**9:00 AM**
**The Benefits of Ultrasonic Treatment of Molten Metal for Slabs Casting at UC RUSAL Facilities**: *Igor Kostin*[1]; Viktor Mann[1]; Aleksandr Krokhin[1]; Aleksandr Sidorov[1]; Viktor Frolov[1]; Sergei Bochvar[1]; Mikhail Motkov[1]; Igor Bobkov[1]; Andrey Danilov[1]; [1]UC RUSAL

**9:25 AM**
**Effect of Ultrasonic Melt-treatment and Cooling Rate on Microstructure of Multi-phase Reinforced Al Alloy**: *Kwangjun Euh*[1]; Jae-Gil Jung[1]; Ju-Hye Kim[1]; Eun-Ji Baek[1]; Jung-Moo Lee[1]; [1]Korea Institute of Materials Science

**9:50 AM**
**XPS Examination of the Oxide-Metal Interface of an Aluminum-Magnesium Alloy Containing Beryllium**: *Nicholas Smith*[1]; Anne Kvithyld[2]; Gabriella Tranell[1]; [1]NTNU; [2]SINTEF

**10:15 AM Break**

**10:30 AM**
**Innovative Technology for a Flawless Rolling Slab Casting Process**: *Evgeny Pavlov*[1]; Dmitry Ivanov[1]; Pavel Gasanov[1]; [1]FSAE HE Siberian Federal University; UniMet LLC

**10:55 AM**
**Robustness of Forged Part Mechanical Properties to Casting, Forging and Heat Treating Process Variation**: Bill Betts[1]; *Lutz Müller*[2]; [1]Novelis; [2]Bharat Forge Aluminiumtechnik GmbH

**11:20 AM**
**Analysis of Laser Marking Performance on Various Non-ferrous Metals**: Alex Fraser[1]; Martin Hartlieb[2]; Julie Maltais[1]; Guy Robert[1]; *Paul Rochette*; [1]Laserax; [2]Viami International

**11:45 AM**
**The Comparison of Intensive Riser Cooling of Castings after Solidification in Three Classic Metals**: *Haolong Shangguan*[1]; [1]Tsinghua University

## Characterization of Minerals, Metals, and Materials – Characterization of Ferrous Materials

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Thursday AM
March 15, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chairs:* Jiann-Yang Hwang, Michigan Technological University; Zhiwei Peng, Central South University

**8:30 AM Introductory Comments**

**8:35 AM**
**Effect of Ball Indentation Test Parameters on Tensile Properties of Grade 92 Steel**: *Dipika Barbadikar*[1]; [1]BITS Pilani Dubai Campus

**8:55 AM**
**Effect of Heat Treatment condition on the Grain Boundary Characteristic Distribution in a Modified 9Cr-2W Steel**: *Hyeongmin Heo*[1]; Junhwan Kim[2]; Sungho Kim[2]; Jongryoul Kim[1]; [1]Hanyang University; [2]KAERI

**9:15 AM**
**Effect of Ultra-supercritical Units Precipitated Phase Ferritic Heat-resistant Steels B Micro-alloyed**: *Yu Lin Ma*[1]; Yue Liu[1]; [1]Northeastern University

**9:35 AM**
**High-temperature Magnetic Properties Study of Melt-spun Fe- (3 - 8 wt.%) Si Alloys**: Vamsi Meka[1]; *Tanjore Jayaraman*[1]; Xiujuan Jiang[2]; Nicole Overman[2]; Suveen Mathaudhu[2]; [1]University of Michigan, Dearborn; [2]Pacific Northwest National Laboratory

**9:55 AM Break**

**10:10 AM**
**The Role of Initial Recrystallized Texture on Dynamic Normal Grain Growth in an Interstitial-free Steel Sheet**: *Ryann Rupp*[1]; Eric Taleff[1]; [1]The University of Texas at Austin

**10:30 AM**
**Using Mechanical Serial Sectioning to Characterize AM 316L Stainless Steel**: *Lily Nguyen*[1]; David Rowenhorst[2]; Richard Fonda[2]; [1]National Research Council / Naval Research Laboratory; [2]Naval Research Laboratory

**10:50 AM**
**In Situ Lab Scale X-Ray Microtomography of a Cast Duplex Stainless Steel**: *Qingdong Zhang*[1]; Sridhar Niverty[2]; Arun Singaravelu[2]; Jason Williams[2]; Tao Jing[1]; Nikhilesh Chawla[2]; [1]Tsinghua University; [2]Arizona State University

## Characterization of Minerals, Metals, and Materials – Mineral Processing and Analysis

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Thursday AM
March 15, 2018
Room: 125A
Location: Phoenix Convention Center

*Session Chair:* Shaoxian Song, Wuhan University of Technology

**8:30 AM Introductory Comments**

**8:35 AM**
**Microstructure and Micromechanics of Shale Rock: Case Study on Marcellus Shale**: *Hui Du*[1]; Mileva Radonjic[1]; [1]Louisiana State University

**8:55 AM**
**Temperature Dependence of the AC Conductivity of an Illitic Clay with Calcite Addition**: *Csaki Stefan*[1]; Ján Ondruška[2]; Patrik Dobron[1]; Viera Trnovcová[2]; Igor Štubna[2]; Tomáš Húlan[2]; Libor Vozár[2]; [1]Charles University; [2]Constantine the Philosopher University

**9:15 AM**
**Humic Acid-based Silica Composite Aerogels--A Preliminary Study**: Guihong Han[1]; Chaolei Lv[1]; *Yongsheng Zhang*[1]; Wei Wang[1]; [1]Zhengzhou University

**9:35 AM**
**Characterization of Non-covalently Functionalized Halloysite**: Danae Francisco[1]; Lucilene Paiva[2]; Wagner Aldeia[2]; Ademar Lugão[1]; *Esperidiana Moura*[1]; [1]Instituto de Pesquisas Energéticas e Nucleares; [2]Institute for Technological Research of State of São Paulo

**9:55 AM Break**

**10:10 AM**
**Characterization and Modification of a Brazilian Bentonite for its Use in Natural Rubber Nanocomposites**: Adriana Almeida Cutrim[1]; Kleberson R. Oliveira Pereira[2]; Fabio Jose Esper[3]; Guillermo Ruperto Martin Cortes[3]; Maria das Gracas Silva Valenzuela[2]; *Francisco Valenzuela-Diaz*[2]; [1]Federal University of Campina Grande; [2]Universidade de Sao Paulo; [3]Centro Universitario Estacio e Universidade de Sao Paulo

**10:30 AM**
**Synchrotron-based XRD and XANES Study of Bornite Leached by Mesophilic Mixed Bacteria**: *Xingxing Wang*[1]; Jun Wang[1]; [1]Central South University

**10:50 AM**
**Adsorption and Surface Area of Bentonite Modified Used as Bleaching Clay**: *Christiano Gianesi Bastos Andrade*[1]; Samuel Marcio Toffoli[1]; Francisco Rolando Valenzuela Diaz[1]; [1]University of São Paulo

**11:10 AM**
**Investigation for Removal of Organic Carbon from Carbonaceous Copper Sulphide Ore and Improving the Recovery of Copper through Flotation**: *Refilwe Magwaneng*[1]; Kazutoshi Haga[1]; Altansukh Batnasan[1]; Atsushi Shibayama[1]; Masato Kosugi[2]; Ryo Kawarabuki[2]; Kohei Mitsuhashi[2]; Masanobu Kawata[2]; [1]Akita University; [2]Nittetsu Mining Co.Ltd

## Characterization of Minerals, Metals, and Materials – Nanostructure and Characterization of Materials

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Thursday AM
March 15, 2018
Room: 126B
Location: Phoenix Convention Center

*Session Chair:* Ramasis Goswami, Naval Research Laboratory

**8:30 AM Introductory Comments**

**8:35 AM**
**Dynamical Diffraction Simulation and Dictionary Indexing of Quasicrystals**: *Saransh Singh*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**8:55 AM**
**Determination of the Five Parameter Grain Boundary Character Distribution of Nanocrystalline Alpha-zirconium Thin Films Using Transmission Electron Microscopy**: *Iman Ghamarian*[1]; Peyman Samimi[2]; Gregory Rohrer[3]; Peter Collins[2]; [1]University of Michigan; [2]Iowa State University; [3]Carnegie Mellon University

**9:15 AM**
**Investigating Internal Domain Wall Transitions in Perpendicular Co/Ni Superlattices Using Lorentz TEM**: *Maxwell Li*[1]; Marc De Graef[1]; Vincent Sokalski[1]; [1]Carnegie Mellon University

**9:35 AM**
**Synthesis of Shuttle-like ZnO Microrods on Glass Substrates Using the Spray Pyrolysis Method**: *Shadia Ikhmayies*[1]; [1]Al Isra University

**9:55 AM**
**Overcoming the Challenges in High Temperature Nanomechanics to 1000C**: *Ben Beake*[1]; Adrian Harris[1]; Tim Jochum[1]; [1]Micro Materials Ltd

**10:15 AM Break**

**10:30 AM**
**Preparation of Nanosheet-montmorillonite Hydrogel for Removing Pb(II) from Water**: Wei Wang[1]; Yunliang Zhao[1]; *Shaoxian Song*[1]; [1]Wuhan University of Technology

**10:50 AM**
**Microwave Synthesis of Co-Ni Ferrite/Graphene Nanocomposite for Microwave Absorption**: *Zhiwei Peng*[1]; Jianhui Peng[1]; Xiaolong Lin[1]; Zhizhong Li[1]; Zhongping Zhu[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University

**11:10 AM**
**Evaluation of Urea Encapsulation by Microcapsules of PHB/MMT and PHB/OMMT Nanocomposites**: *Jessica Arjona*[1]; Francisco Valenzuela-Diaz[1]; Helio Wiebeck[1]; Wang Hui[1]; Maria Silva-Valenzuela[1]; [1]São Paulo University

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Defects and Microstructure

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Thursday AM
March 15, 2018
Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Yasushi Shibuta, The University of Tokyo; Ting Zhu, Georgia Institute of Technology

**8:30 AM**
**In Situ Nanomechanics: Integrating Atomistic Modeling and In Situ Experiment**: *Ting Zhu*[1]; [1]Georgia Institute of Technology

**8:50 AM**
**Atomistic Simulations of the Mechanism of Twinning in FCC Metals and Microtwinning in 2-phase Superalloys**: *Satish Rao*[1]; Wolfram Nohring[2]; Christopher Woodward[3]; Triplicane Parthasarathy[1]; William Curtin[2]; [1]UES Inc.; [2]EPFL; [3]Air Force Research Laboratory

**9:10 AM**
**A Random Walk Model of Screw Dislocation Cross-slip in Face-centered Cubic Solid Solution Alloys**: Wolfram Nöhring[1]; *William Curtin*[1]; [1]École polytechnique fédérale de Lausanne (EPFL)

**9:30 AM**
**First-principles Study of Dislocations in BCC Fe**: *Michael Fellinger*[1]; Anne Marie Tan[1]; Louis Hector[2]; Dallas Trinkle[1]; [1]University of Illinois at Urbana-Champaign; [2]General Motors

**9:50 AM Break**

**10:05 AM Invited**
**Molecular Dynamics Approach to Solidification Microstructure**: *Yasushi Shibuta*[1]; Shinji Sakane[2]; Eisuke Miyoshi[2]; Shin Okita[1]; Tomohiro Takaki[2]; Munekazu Ohno[3]; [1]The University of Tokyo; [2]Kyoto Institute of Technology; [3]Hokkaido University

**10:35 AM**
**Interfacial Structures and Energetics of the Strengthening Precipitate Phase in Creep-resistant Mg-Nd-based Alloys**: *Deep Choudhuri*[1]; R Banerjee[1]; S Srinivasan[1]; [1]University of North Texas

**10:55 AM**
**First Principles Modeling of Non-basal Deformation Modes in Mg-Y Alloys**: *Daniel Buey*[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University

**11:15 AM**
**Ideal Strength and Ductility in Metals from Second- and Third-order Elastic Constants**: *Ian Winter*[1]; Daryl Chrzan[1]; [1]University of Calfifornia, Berkeley

**11:35 AM**
**Development of Molecular Dynamics Methods for the Thermal Characterization of Materials**: Jonathan Severin[1]; *Philippe Jund*[2]; [1]University of Montpellier, Total; [2]University of Montpellier

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Mechanical and Process Simulations

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Thursday AM
March 15, 2018

Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Stephen DeWitt, University of Michigan, Ann Arbor; Fadi Abdeljawad, Sandia National Laboratories

**8:30 AM**
**A Dislocation Density Based Multiscale Characterization of High Pressure Torsion and Cold Rolled Polycrystalline Copper Microstructure**: *Mehdi Hamid*[1]; Maryam Jamalian[1]; Hussein Zbib[1]; David Field[1]; [1]Washington State University

**8:50 AM**
**Crystal Plasticity Modeling of Precipitate-strengthened Alloys with Enhanced Mechanical Properties**: *Benyamin Gholami Bazehhour*[1]; C Shashank Kaira[1]; Ilaksh Adlakha[1]; Nikhilesh Chawla[1]; Kiran N. Solanki[1]; [1]Arizona State University

**9:10 AM**
**Ductile Fracture of Multiphase Steel Sheets under Bending**: *Yu Liu*[1]; Alan Needleman[1]; Ankit Srivastava[1]; [1]Texas A&M University

**9:30 AM**
**Understanding Slip Mediated Plasticity in Hexagonal Close Packed Crystals Using Phase Field Dislocation Dynamics**: *Claire Weaver*[1]; [1]University of California, Santa Barbara

**9:50 AM Break**

**10:10 AM**
**Statistical Behavior of Ideal Grain Growth: An Ultra-large-scale Phase-field Simulation Study**: *Eisuke Miyoshi*[1]; Tomohiro Takaki[1]; Munekazu Ohno[2]; Yasushi Shibuta[3]; Shinji Sakane[1]; Takashi Shimokawabe[3]; Takayuki Aoki[4]; [1]Kyoto Institute of Technology; [2]Hokkaido University; [3]The University of Tokyo; [4]Tokyo Institute of Technology

**10:30 AM**
**Transient Computational Model for the Prediction of Grain Structure Evolution during Bridgman Solidification of Gamma-TiAl Alloys**: *Sara Battaglioli*[1]; Robin Mooney[1]; Anthony Robinson[1]; Shaun McFadden[2]; [1]Trinity College Dublin; [2]Ulster University

**10:50 AM**
**Scaling of Molecular Dynamics Simulations to the Mesoscales Using Quasi Coarse Grained Dynamics**: *Sumit Athikavil Suresh*[1]; Avinash Dongare[1]; [1]University of Connecticut

**11:10 AM**
**Effect of Bricks' Waviness on the Mechanical Response of Nacre-inspired Composites**: *Habibeh Ashouri Choshali*[1]; Sina Askarinejad[1]; Jessica Rosewitz[1]; Nima Rahbar[1]; [1]Worcester Polytechnic Institute (WPI)

## Computational Materials Science and Engineering for Nuclear Energy – Fundamentals of Radiation Effects II

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Chemistry and Physics of Materials Committee
*Program Organizers:* Haixuan Xu, University of Tennessee; Michael Tonks, Pennsylvania State University; Blas Uberuaga, Los Alamos National Laboratory; James Morris, Oak Ridge National Laboratory

Thursday AM
March 15, 2018

Room: 102B
Location: Phoenix Convention Center

*Session Chairs:* Mike Tonks, University of Florida; Jaime Marian, University of California Los Angeles

**8:30 AM Invited**
**Molecular Dynamics Simulations of Effects of Stacking Fault Energies on Defect Formation Process in FCC Metals**: *Taira Okita*[1]; Mitsuhiro Itakura[2]; Daiki Nakanishi[1]; Tomoya Kawabata[1]; [1]University of Tokyo; [2]Japan Atomic Energy Agency

**9:00 AM**
**Morphological Study of Dispersion Phases in Heterogenous Waste Form Materials for Efficient Nuclear Waste Containment**: *Krutarth Patel*[1]; Fazle Rabbi[1]; Kenneth Reifsnider[1]; Md Riaz Kayser[1]; Rassel Raihan[1]; [1]University of Texas at Arlington Research Institute

**9:20 AM**
**Phase Field Modeling of Grain Boundary Evolution in Porous Oxides: Grain Growth and Pore Mobility Effects**: *Anter El-Azab*[1]; Karim Ahmed[1]; [1]Purdue University

**9:40 AM**
**Phase Transformation in Zirconium Oxide – A Mesoscale Study**: *Mahmood Mamivand*[1]; Mohsen Asle Zaeem[2]; Haitham El Kadiri[3]; [1]Boise State University; [2]Missouri University of Science and Technology; [3]Mississippi State University

**10:00 AM Break**

**10:20 AM**
**Grain Growth and Grain Subdivision in Triuranium Disilicide, a Potential Light Water Reactor Fuel**: *Amani Cheniour*[1]; Michael Tonks[1]; Jie Lian[2]; Yongfeng Zhang[3]; [1]Pennsylvania State University; [2]Rensselaer Polytechnic Institute; [3]Idaho National Laboratory

**10:40 AM Invited**
**Using Computational Modeling to Interpret Experimental Measurements of Irradiation Induced Hardening in Metals**: *Jaime Marian*[1]; [1]University of California, Los Angeles

**11:10 AM**
**Molecular Dynamics Study of Defect-grain Boundary Interactions in Irradiated PyC-like Configuration**: *Rong Li*[1]; Li Yang[2]; Bing Liu[3]; Daniel Schappel[2]; Brian Wirth[4]; [1]Tsinghua University, University of Tennessee; [2]University of Tennessee; [3]Tsinghua University; [4]University of Tennessee, Oak Ridge National Laboratory

## Computational Method and Experimental Approaches for Model Development and Validation, Uncertainty Quantification, and Stochastic Predictions – UQ of Quantum Calculations (DFT and Other Approaches)

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory; Richard Hennig, University of Florida; Avinash Dongare, University of Connecticut; Shawn Coleman, U.S. Army Research Laboratory; Niaz Abdolrahim, University of Rochester; Joseph Bishop, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Li Ma, National Institute of Standards and Technology

Thursday AM
March 15, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chairs:* Francesca Tavazza, National Institute of Standard and Technology; Sugata Chowdhury, National Institute of Standard and technology

**8:30 AM Invited**
**Uncertainty Quantification for Solute Transport Modeling**: *Dallas Trinkle*[1]; [1]University of Illinois, Urbana-Champaign

**9:00 AM**
**Uncertainty Quantification of the Effect of Charge Noise on Silicon Quantum Dots**: *Erin Barker*[1]; Nathan Baker[1]; Marvin Warner[1]; Jennifer Webster[1]; Nicole Nichols[1]; Tim Shippert[1]; [1]Pacific Northwest National Laboratory

**9:20 AM**
**Utilizing Error in First-principle Lattice Constants to Discover Novel Low-dimensional Materials**: *Kamal Choudhary*[1]; Francesca Tavazza[1]; [1]National Institute of Standards and Technology

**9:40 AM Invited**
**Extending the Reach of DFT to Molecular Simulations Using Neural Networks**: *John Kitchin*[1]; [1]Carnegie Mellon University

**10:10 AM Break**

**10:30 AM**
**Correlations of Numerical Precision in Material Properties Derived from Density Functional Theory**: *Joshua Gabriel*[1]; Faical Yannick Congo[2]; Alex Sinnott[1]; Kiran Matthew[3]; Thomas Allison[2]; Francesca Tavazza[2]; Richard Hennig[1]; [1]University of Florida; [2]National Institute of Standards and Technology; [3]Lawrence Berkeley National Lab

**10:50 AM**
**Lattice Thermal Conductivity: Uncertainty Quantification in First Principles Predictions and Experimental Validation**: Yi Xia[1]; James Hodges[2]; Mercouri Kanatzidis[2]; *Maria Chan*[1]; [1]Argonne National Laboratory; [2]Northwestern University

**11:10 AM**
**Benchmarking Density Functional Theory Based Methods to Predict Optical and Electronics Properties of 2H-TaX2 (X=S, Se)**: *Sugata Chowdhury*[1]; Kamal Choudhary[1]; Angela Hight Walker[1]; Francesca Tavazza[1]; [1]National Institute of Standard and Technology

## Computational Thermodynamics and Kinetics – Phase Field

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

Thursday AM
March 15, 2018
Room: 128A
Location: Phoenix Convention Center

*Session Chair:* Alphonse Finel, ONERA

**8:30 AM Invited**
**A Sharp Interface Phase Field Method**: *Alphonse Finel*[1]; Yann Le Bouar[2]; Benoît Dabas[1]; [1]ONERA; [2]CNRS

**9:00 AM**
**A Phase Field Theory Based Study of the Role of Microalloying Elements in Determining the Microstructural Stability of Al-Cu Alloys**: *Patrick Shower*[1]; James Morris[2]; Dongwon Shin[2]; Balasubramaniam Radhakrishnan[2]; Lawrence Allard[2]; Jonathan Poplawsky[2]; Amit Shyam[2]; [1]The Bredesen Center for Interdisciplinary Research and Graduate Education at Oak Ridge National Laboratory and the University of Tennessee; [2]Oak Ridge National Laboratory

**9:20 AM**
**Effect of Melt Composition on Morphological Evolution during Liquid Metal Dealloying**: *Longhai Lai*[1]; Bernard Gaskey[2]; Jonah Erlebacher[2]; Alain Karma[1]; [1]Northeastern University; [2]Johns Hopkins University

**9:40 AM**
**Quantitative Evaluation of Interaction between Grain Boundary and Second-phase Particle at the Coherent Interface**: *Kunok Chang*[1]; Junhyun Kwon[1]; Chang-Kyu Rhee[1]; [1]Korea Atomic Energy Research Institute

**10:00 AM Break**

**10:20 AM**
**Phase Field of Modeling of Pore Annihilation in Nickel-base Superalloys during Hot Isostatic Pressing**: *Yann Le Bouar*[1]; Antoine Ruffini[1]; Benoit Dabas[1]; Alphonse Finel[1]; Alexander Epishin[2]; Thomas Link[2]; Gert Nolze[3]; Bernard Fedelich[3]; Titus Feldmann[3]; Bernard Viguier[4]; Dominique Poquillon[4]; [1]LEM, CNRS/ONERA; [2]T/U Berlin; [3]BAM, Berlin; [4]CIRIMAT

**10:40 AM**
**Application of Limited Solubility Model for Predicting Physicochemical Properties in Ternary Systems with Miscibility Gap**: *Zhigang Yu*[1]; Kuo-Chih Chou[1]; Haiyan Leng[1]; [1]Shanghai University

## Deriving Value from Challenging Waste Streams: Recycling and Sustainability Joint Session – Industrial Streams I

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee, TMS: Pyrometallurgy Committee
*Program Organizers:* Elsa Olivetti, Massachusetts Institute of Technology; John Howarter, Purdue University; Fiseha Tesfaye, Åbo Akademi University

Thursday AM
March 15, 2018
Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* Mingming Zhang, ArcelorMittal Global R&D; Randolph Kirchain, MIT

**8:30 AM Introductory Comments**

**8:35 AM**
**Behavior of Co, Ni and Precious Metals in Copper Converting Process: Experimental Study**: Keiran Holland[1]; *Dmitry Sukhomlinov*[1]; Ville Naakka[2]; Ari Jokilaakso[1]; Pekka Taskinen[1]; [1]Aalto University; [2]Boliden Harjavalta

**8:55 AM**
**Recycling of EAF Dust through Source Separation**: *Naiyang Ma*[1]; [1]ArcelorMittal

**9:15 AM**
**A Sustainable Methodology for Recycling Electric Arc Furnace Dust**: *Joseph Hamuyuni*[1]; Petteri Halli[1]; Fiseha Tesfaye[2]; Maria Leikola[1]; Mari Lundström[1]; [1]Aalto University ; [2]Åbo Akademi University

**9:35 AM Invited**
**Thermal Separation and Leaching of Valuable Elements from Waste-derived Ashes**: *Daniel Lindberg*[1]; Emil Vainio[1]; Patrik Yrjas[1]; [1]Åbo Akademi University

**10:00 AM Break**

**10:15 AM**
**Mechanisms for Advancing Recovery of Resources from Small Sized End-of-life (EoL) Equipment**: *Fiseha Tesfaye*[1]; Azadeh Rostami[2]; Joseph Hamuyuni[2]; Daniel Lindberg[1]; Guven Akdogan[3]; Pekka Taskinen[2]; Leena Hupa[1]; [1]Åbo Akademi University; [2]Aalto University; [3]Stellenbosch University

**10:40 AM**
**Different Methods for the Characterization of Ash Compositions in Co-firing Boilers**: *Jan-Erik Eriksson*[1]; Tooran Khazraie[1]; Leena Hupa[1]; [1]Åbo Akademi University

**11:00 AM**
**Upgrading the Copper Value in a Waste Copper Smelter Dust with the Falcon Gravity Concentrator**: *Daniel Okanigbe*[1]; Abimbola Popoola[1]; [1]Tshwane University of Technology

**11:20 AM**
**An Electrochemical Procedure for Copper Removal from Regenerated Pickling Solutions of Steel Plants**: *Esra Karakaya*[1]; Mustafa Aras[2]; Sedef Cift Karagul[3]; Merve Kolay Ersoy[3]; Ishak Karakaya[1]; [1]Middle East Technical University; [2]MEGAP Co.; [3]Borusan Technology Development and R&D Co.

**11:40 AM**
**Utilization CFA-derived Tobermorite Fiber as Crystallization Revulsive in Autoclaved Concrete Block Production**: *Pengxu Cao*[1]; Jun Luo[1]; Guanghui Li[1]; Yijia Dong[1]; Mingjun Rao[1]; Zhiwei Peng[1]; [1]Central South University

## Environmentally Assisted Cracking: Theory and Practice – Environmentally Assisted Cracking in Aluminum Alloys

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Bai Cui, University of Nebraska–Lincoln; Raul Rebak, GE Global Research; Sebastien Dryepondt, Oak Ridge National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Thursday AM
March 15, 2018
Room: 102A
Location: Phoenix Convention Center

*Session Chairs:* Jennifer Locke, The Ohio State University; Bai Cui, University of Nebraska–Lincoln

**8:30 AM Invited**
**Metallurgical Factors and Changes Driving Susceptibly to Environment Assisted Cracking in Aluminum Alloys**: Allison Akman[1]; Rebecca Bay[1]; Leslie Bland[1]; David Schrock[1]; *Jennifer Locke*[1]; [1]The Ohio State University

**9:10 AM**
**Incorporating Detailed Experimental Grain Boundary ß-phase (Mg2Al3) Observations to Improve Sensitization Modeling of Aluminum AA5XXX Alloys**: *Matthew Steiner*[1]; Ruifeng Zhang[2]; Nick Birbilis[2]; Sean Agnew[3]; [1]University of Cincinnati; [2]Monash University; [3]University of Virginia

**9:30 AM**
**Sensitization Effects on Tensile Behavior in 5XXX Series Aluminum Alloys: Environmentally Enhanced Cracking**: *Benjamin Palmer*[1]; John Lewandowski[1]; [1]Case Western Reserve University

**9:50 AM Break**

**10:10 AM**
**Effect of 3D Crystallographic Orientation and Microstructure on the Evolution of Corrosion in Aluminum Alloys**: Tyler Stannard[1]; Hrishikesh Bale[2]; Nicolas Gueninchault[3]; Jeff Gelb[2]; Arno Merkle[2]; Erik Lauridsen[3]; *Nikhilesh Chawla*[1]; [1]Arizona State University; [2]Carl Zeiss X-Ray Microscopy; [3]Xnovo Technology ApS

**10:30 AM**
**Effect of Mechanical Deformation on the Corrosion Behavior in Al 7075 – Ti6Al4V Galvanic Joint**: *Chaitanya Kale*[1]; Ilaksh Adlakha[1]; Soundarya Srinivasan[1]; Kiran Solanki[1]; [1]Arizona State University

**10:50 AM**
**3D Microstructural and Electrochemical Characterization of Accelerated Corrosion in Aluminum Alloys**: *Sridhar Niverty*[1]; Chaitanya Kale[1]; Ilaksh Adlakha[1]; Kiran Solanki[1]; Nikhilesh Chawla[1]; [1]Arizona State University

**11:10 AM Invited**
**Remote Laser Surface-desensitization of Severely Sensitized Aluminum Alloys**: Leimin Deng[1]; Chenfei Zhang[1]; Shiding Sun[1]; Bai Cui[1]; *Yongfeng Lu*[1]; [1]University of Nebraska, Lincoln

**11:50 AM Concluding Comments**

## Frontiers in Solidification Science and Engineering – Solidification Microstructures, Defects, Processing Methods, and Advanced Imaging

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee
*Program Organizers:* Mohsen Asle Zaeem, Missouri University of Science and Technology; Damien Tourret, IMDEA Materials Institute; Mohsen Eshraghi, California State University, Los Angeles; Johannes Hötzer, University of Applied Science Karlsruhe

Thursday AM
March 15, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chairs:* Ashwin Shahani, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology

**8:30 AM**
**Solidification, Processing, and Characterization of High Entropy Alloys**: Nicholas Derimow[1]; Abraham Munitz[2]; Louis Santodonato[3]; *Reza Abbaschian*[1]; [1]University of California, Riverside; [2]Nuclear Research Center-Negev; [3]Oak Ridge National Laboratory

**8:50 AM**
**The Elimination of a Surface Defect in Traditional Open Sand Casting of Lead**: *Arun Prabhakar*[1]; Konstantinos Salonitis[1]; Mark Jolly[1]; [1]Cranfield University

**9:10 AM**
**Graphite Morphology in Directionally Solidified Cast Iron**: *Subhojit Chaktaborty*[1]; Amber Genau[1]; [1]University of Alabama at Birmingham

**9:30 AM**
**A Novel Counter Gravity Casting Approach with High-energy Efficiency**: *Kostas Georgarakis*[1]; Jeremy Vian[1]; Alan Heaume[1]; Emanuele Pagone[1]; Konstantinos Salonitis[1]; Mark Jolly[1]; [1]Cranfield University

**9:50 AM**
**Solidification of Aluminum Alloy A7050 Processed by Spray Forming: From Droplets to Dense Deposits**: *Claudemiro Bolfarini*[1]; Guilherme Zepon[1]; Walter Botta[1]; Lucas Otani[1]; Claudio Kiminami[1]; [1]Universidade Federal de São Carlos

**10:10 AM Break**

**10:30 AM**
**Solidification of Magma: From Crystal Growth to Bubble Formation**: *Peter D. Lee*[1]; Biao Cai[1]; Matthew Pankhurst[1]; [1]The University of Manchester

**10:50 AM**
**Probing the Growth and Dissolution Pathways of Quasicrystals in Real-time**: Insung Han[1]; Xianghui Xiao[2]; *Ashwin Shahani*[1]; [1]University of Michigan; [2]Argonne National Laboratory

**11:10 AM**
**Application of Fast X-ray Radiography to the In Situ and Real-time Observation of Ni-based Alloy Directional Solidification**: *Guillaume Reinhart*[1]; Lara Abou-Khalil[1]; Vincent Maguin[2]; Gildas Guillemot[3]; Charles-André Gandin[3]; Vincent Fernandez[4]; Elodie Boller[4]; David Grange[5]; Ngadia Taha Niane[5]; Nathalie Mangelinck[1]; Henri Nguyen-Thi[1]; [1]IM2NP-CNRS-Aix-marseille University; [2]SAFRAN, CEMEF, Mines ParisTech; [3]CEMEF, Mines ParisTech; [4]ESRF; [5]SAFRAN

**11:30 AM**
**Disrupting Solidification Microstructures via Magnet Fields Revealed by High Speed Synchrotron X-ray Tomography**: *Biao Cai*[1]; Andrew Kao[2]; Koulis Pericleous[2]; Peter Lee[1]; [1]University of Manchester; [2]University of Greenwich

## High Entropy Alloys VI – Mechanical and Other 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Thursday AM
March 15, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* Karin Dahmen, University of Illinois at Urbana Champaign; Xie Xie, FCA US LLC

**8:30 AM Invited**
**Corrosion, Erosion, and Wear Behavior of High Entropy Alloys**: Aditya Ayyagari[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

**8:50 AM Invited**
**Creep Behavior of Single Phase FCC Medium and High Entropy Alloys**: *Kyle Rozman*[1]; Martin Detrois[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; [1]NETL

**9:10 AM**
**Serrated Flow and Creep Behavior under Nanoindentation Experiments in an Al0.5CoCrCuFeNi HEA High-entropy Alloy**: *Shuying Chen*[1]; Xie Xie[1]; Weidong Li[1]; Jamieson Brechtl[1]; Guangfeng Zhao[2]; Peizhen Li[2]; Fuqian Yang[2]; Junwei Qiao[3]; Karin Dahmen[4]; Peter Liaw[1]; [1]University of Tennessee, Knoxville; [2]The University of Kentucky; [3]Taiyuan University of Technology; [4]University of Illinois at Urbana Champaign

**9:30 AM Invited**
**Mechanical and Corrosion Properties of CoCrFeNiTi-based High-entropy Alloy Additive Manufactured Using Selective Laser Beam Melting**: *Tadashi Fujieda*[1]; Meichuan Chen[1]; Hiroshi Shiratori[1]; Kosuke Kuwabara[1]; Kenta Yamanaka[2]; Yuichiro Koizumi[2]; Akihiko Chiba[2]; Seiichi Watanabe[3]; [1]Hitachi, Ltd.; [2]Tohoku University; [3]Hokkaido University

**9:50 AM Break**

**10:05 AM Invited**
**Single-crystal Mechanical Properties of the Equiatomic CrMnFeCoNi High-entropy Alloy with the FCC Structure**: *Haruyuki Inui*[1]; Norihiko Okamoto[2]; Easo George[3]; [1]Kyoto University; [2]Tohoku University; [3]Oak Ridge National Laboratory

**10:25 AM Invited**
**Fracture Behavior of Nanocrystalline BCC High-entropy Alloys**: *Yuan Xiao*[1]; Huan Ma[1]; Ralph Spolenak[1]; Jeffrey Wheeler[1]; [1]ETH zürich

**10:45 AM**
**Effect of Ti Addition on Microstructure and Properties of CoCrFeMnNi High Entropy Alloys**: *Shikai Wu*[1]; Ye Pan[1]; [1]Southeast University

**11:05 AM Invited**
**Oxidation Behavior of High Entropy Materials**: *Pratik Ray*[1]; Matthew Kramer[1]; [1]Ames Laboratory, US-DOE

**11:45 AM Invited**
**Strategies for Design, Modelling and Optimisation of High Entropy Alloys**: *Pedro Rivera-Diaz-del-Castillo*[1]; Isaac Toda[2]; Edern Menou[3]; Gérard Ramstein[3]; Franck Tancret[3]; [1]Lancaster University; [2]Materalia Group; [3]Institut des Matériaux de Nantes - Jean Rouxel

**11:25 AM Invited**
**Elevated-temperature Tensile and Creep Behavior of Equiatomic Ni-Cr-Co**: *Connor Slone*[1]; Michael Mills[1]; [1]The Ohio State University

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Thursday AM
March 15, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* M. Troparevsky, Oak Ridge National Laboratory; G. Stocks, Oak Ridge National Laboratory

**8:30 AM Invited**
**First-principles Phonon Approach to High Entropy Alloys**: *Yi Wang*[1]; Shun-Li Shang[1]; Zi-Kui Liu[1]; Long-Qing Chen[1]; [1]The Pennsylvania State University

**8:50 AM Invited**
**Melts of High-entropy Alloys: Atomic Diffusion and Electronic/Atomic Structure from Ab Initio Simulation**: *Jun Ding*[1]; Mark Asta[2]; Robert Ritchie[1]; [1]Lawrence Berkeley National Laboratory; [2]University of California, Berkeley

**9:10 AM Invited**
**A Comprehensive Analysis and Modeling of the Serration Behavior in High Entropy Alloys and Other Material Systems**: *Jamieson Brechtl*[1]; Xie Xie[1]; Shuying Chen[1]; Haoyan Diao[1]; Bilin Chen[1]; Yunzhu Shi[1]; Karin Dahmen[2]; Peter Liaw[1]; Steven Zinkle[1]; [1]University of Tennessee; [2]University of Illinois Urbana-Champaign

**9:30 AM**
**First-principles Calculations of Stacking Fault Energies in Quinary High-entropy Alloy Systems**: *Alexandra Scheer*[1]; Joshua Strother[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

**9:50 AM**
**Phonon Broadening in High Entropy Alloys**: *Fritz Körmann*[1]; Yuji Ikeda[2]; Blazej Grabowski[3]; Marcel Sluiter[4]; [1]Delft University of Technology, Max-Planck-Institut für Eisenforschung GmbH; [2]Kyoto University; [3]Max-Planck-Institut für Eisenforschung GmbH; [4]Delft University of Technology

**10:10 AM Break**

**10:30 AM Invited**
**Effect of Extreme Chemical Disordering on Vacancies in a High Entropy Alloy**: *Congyi Li*[1]; George Stocks[2]; Brian Wirth[3]; Steve Zinkle[3]; [1]Bredesen Center; [2]Oak Ridge National Lab; [3]University of Tennessee, Knoxville

**10:50 AM Invited**
**Enhancing the Predictive Capabilities of Ab Initio Methods Towards the Search for Novel Multi-component Alloys**: *M. Claudia Troparevsky*[1]; [1]Oak Ridge National Laboratory

**11:10 AM Invited**
**Short-range Order in Multicomponent Solid-solution Alloys**: *Zongrui Pei*[1]; Markus Eisenbach[1]; G. Malcolm Stocks[1]; [1]Oak Ridge National Laboratory

**11:30 AM Invited**
**Multi-functional Optimization for Tailoring Properties in Multi-component Alloys**: *Aayush Sharma*[1]; Rahul Singh[1]; Ganesh Balasubramanian[1]; [1]Iowa State University

**11:50 AM Invited**
**Percolation Effects in Atomic Transport due to Vacancy Diffusion in Random Binary Alloys**: *Yury Osetskiy*[1]; Laurent Béland[2]; Alexander Barashev[1]; Yanwen Zhang[1]; [1]Oak Ridge National Laboratory; [2]MIT-CNRS

## High Temperature Corrosion of Structural Materials – Hot Corrosion, Materials Developed for Corrosive Environments at Elevated Temperatures, and Ti-alloys I

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
*Program Organizers:* Kinga Unocic, Oak Ridge National Laboratory; David Shifler, Office of Naval Research; Mark Weaver, University of Alabama; Steve Coryell, Special Metals; James Earthman, University of California, Irvine

Thursday AM
March 15, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chairs:* James Earthman, University of California, Irvine; David Shifler, Office of Naval Research

**8:30 AM Invited**
**New Insights on Deposit-induced Hot Corrosion**: *Brian Gleeson*[1]; Patrick Brennan[1]; Emily Kistler[1]; [1]University of Pittsburgh

**9:00 AM**
**Evaluation of Hot Corrosion Resistance of Marine Alloys under Burner Rig Test Using Advanced Characterization Techniques**: *Maryam Zahiri Azar*[1]; Daniel Mumm[1]; Kliah Soto Leytan[1]; [1]The University of California, Irvine

**9:20 AM**
**Evaluation of Type I Hot Corrosion of Marinized Materials through Low Velocity Burner Rig Testing**: *Kliah Soto Leytan*[1]; Max Venaas[1]; Daniel Mumm[1]; Vincent McDonell[1]; [1]University of California, Irvine

**9:40 AM**
**Hot Corrosion Degradation of Turbine Materials Subject to Mixed-mode Exposures and Complex Corrosion Environments**: *Daniel Mumm*[1]; Kliah Soto Leytan[1]; Maryam Azar[1]; [1]University of California, Irvine

**10:00 AM Break**

**10:20 AM**
**Hot Corrosion of Alloy 617 OCC in Simulated USC Power Plant Environment**: *Arivazhagan Natarajan*[1]; Hari P R[1]; Nageswara Rao M[1]; Pavan A H V[2]; [1]VIT University; [2]BHEL R&D Hyderabad

**10:40 AM**
**Mechanism of High Temperature Corrosion of Steel by Naphthenic Acids and Sulfidation**: *Peng Jin*[1]; Winston Robbins[1]; Gheorghe Bota[1]; [1]Institute for Corrosion and Multiphase Technology (ICMT), Ohio University

**11:00 AM**
**Evolution of Thermally Grown Oxides in Novel Co-based γ-γ' Superalloys**: *Colin Stewart*[1]; Akane Suzuki[2]; Tresa Pollock[1]; Carlos Levi[1]; [1]University of California, Santa Barbara; [2]GE Global Research

**11:20 AM**
**Effect of Titanium Addition on Microstructure and Oxidation Behaviour of Nb-Si-Mo Alloys at 1300°C**: *Kasturi Sala*[1]; Rahul Mitra[1]; [1]IIT Kharagpur

## Magnesium Technology 2018 – Deformation Mechanisms

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Thursday AM
March 15, 2018
Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Vineet Joshi, Pacific Northwest National Laboratory - PNNL; Kristián Máthis, Charles University

**8:30 AM Introductory Comments**

**8:35 AM**
**In-situ Neutron Diffraction and Acoustic Emission during the Biaxial Loading of AZ31 Alloy**: *Jan Capek*[1]; Tobias Panzner[2]; Karl Sofinowski[2]; Daria Drozdenko[1]; Kristián Máthis[1]; [1]Charles University; [2]Paul Scherrer Institut

**8:55 AM**
**Dislocations in Mg Alloys with Rare-earth Element Addition**: *Zhiqing Yang*[1]; [1]Institute of Metal Research

**9:15 AM**
**Measurement of Twin Formation Energy Barriers Using Nudged Elastic Band Molecular Statics**: *Deepesh Giri*[1]; Christopher Barrett[1]; Haitham El Kadiri[1]; [1]Mississippi State University

**9:35 AM**
**Twin-slip Interaction at Low Stress Stage Deformation in an AZ31 Mg Alloy**: *Peng Chen*[1]; Bin Li[1]; Duke Culbertson[1]; Yanyao Jiang[1]; [1]University of Nevada, Reno

**9:55 AM Break**

**10:15 AM**
**Thermo-mechanical Treatment of Extruded Mg-1Zn Alloy: Cluster Analysis of AE Signals**: *Patrik Dobron*[1]; Daria Drozdenko[1]; Marius Hegedus[1]; Juraj Olejnák[1]; Klaudia Horváth[2]; Jan Bohlen[3]; [1]Charles University; [2]Czech Academy of Sciences, Nuclear Physics Institute; [3]Helmholtz-Zentrum Geesthacht

**10:35 AM**
**The Effect of Initial Texture on Deformation Behaviors of Mg Alloys under Erichsen Test**: Jaiveer Singh[1]; Min-Seong Kim[1]; *Shi-Hoon Choi*[1]; [1]Sunchon National University

**10:55 AM**
**Deformation and Recrystallization Mechanisms and their Influence on the Microstructure Development of Rare Earth Containing Magnesium Sheets**: *Changwan Ha*[1]; Sangbong Yi[1]; Jan Bohlen[1]; Xiaohua Zhou[2]; Heinz-Günter Brokmeier[2]; Norbert Schell[1]; Dietmar Letzig[1]; Karl Ulrich Kainer[1]; [1]Helmholtz-Zentrum Geesthacht; [2]Clausthal University of Technology

**11:15 AM**
**Microstructure, Mechanical Properties and Deformation Behavior of Mg-Gd-Y-Zn-Zr Alloy**: Devesh Misra[1]; *Kun Li*[1]; [1]University of Texas at El Paso

**11:35 AM**
**Acoustic Emission Study of High Temperature Deformation of Mg-Zn-Y Alloys with LPSO Phase**: *Klaudia Horváth*[1]; Daria Drozdenko[1]; Kristián Máthis[1]; Gerardo Garcés[2]; Patrik Dobron[1]; [1]Charles University, Prague; [2]CENIM-CSIC

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Modeling

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Thursday AM
March 15, 2018
Room: 103A
Location: Phoenix Convention Center

*Session Chairs:* Shenyang Hu, Pacific Northwest National Laboratory; Wahyu Setyawan, Pacific Northwest National Laboratory

**8:30 AM Invited**
**A New Physically Based, Quantitatively Predictive Low Flux-high Fluence Model of RPV Embrittlement**: *G. Robert Odette*[1]; Takuya Yamamoto[1]; Peter Wells[1]; Nathan Almirall[1]; [1]University of California, Santa Barbara

**8:50 AM**
**A Unified Model for Irradiation Creep and Stress-free Growth in Zirconium Alloys**: *Jesse Carter*[1]; John Hack[2]; Richard Smith[1]; [1]Bettis Laboratory, NNL; [2]Bettis Laboratory, NNL (deceased)

**9:10 AM**
**Dislocation Dynamics of Alloys for High Temperature Nuclear Reactors**: *Venkata Annamareddy*[1]; Jacob Eapen[1]; [1]North Carolina State University

**9:30 AM**
**Kinetic Evolution of Transmutation Helium Accumulation at Y-Ti-O Oxides in Nanostructured Ferritic Alloys under Irradiation**: Chris Nellis[1]; *Celine Hin*[1]; [1]Virginia Tech

**9:50 AM**
**Effect of Grain Elastic Anisotropy on Stress Intensification at Intergranular Stress Corrosion Cracking Iinitiation Sites in Austenitic Stainless Steels and Nickel-based Alloys in Light Water Reactor Environment**: *Jean Claude van Duysen*[1]; Gabriel De Bellefon[2]; [1]University of Tennessee - Knoxville; [2]University of Wisconsin Madison

**10:10 AM Break**

**10:30 AM**
**Implementation and Validation of a Physically-based Fuel Cladding Oxidation Model in BISON Nuclear Fuel Performance Code**: *Léo Borrel*[1]; Adrien Couet[1]; [1]University of Wisconsin-Madison

**10:50 AM**
**New Insights on Denuded Zone Formation in Polycrystalline Materials**: *Enrique Martinez Saez*[1]; Osman El-Atwani[1]; Blas Uberuaga[1]; Erika Esquivel[1]; [1]Los Alamos National Laboratory

**11:10 AM**
**Characterizing and Modelling Precipitation in Zirconium Alloys**: *Zaheen Shah*[1]; Joseph Robson[1]; Michael Preuss[1]; Magnus Limbäck[2]; Mattias Alm[3]; [1]University of Manchester; [2]Westinghouse Electric Sweden AB; [3]AB Sandvik Materials Technology

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Structural Materials V

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Thursday AM
March 15, 2018
Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Kumar Sridharan, University of Wisconsin; Matthew Steiner, University of Cincinnati

**8:30 AM**
**Impact of Low Dose Ion Irradiation on Raman Spectra and Thermal Conductivity in 3C-SiC**: *Vinay Chauhan*[1]; Xinpeng Du[1]; Changdong Wei[1]; Ji-Cheng Zhao[1]; Marat Khafizov[1]; [1]The Ohio State University

**8:50 AM**
**Fabrication of PyC/SiC Diffusion Couples Using Fluidized Bed CVD Techniques for Radiation Enhanced Diffusion Testing**: *Brian Jolly*[1]; Tyler Gerczak[1]; Anne Campbell[1]; Austin Schumacher[1]; [1]Oak Ridge National Laboratory

**9:10 AM**
**Corrosion of SiC with Cr, CrN, and TiN Coatings in High Temperature Water**: *Stephen Raiman*[1]; Peter Doyle[2]; Caen Ang[1]; Kurt Terrani[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

**9:30 AM**
**Creep Related Microstructural Evolution of Alloy 617-based ODS Alloy**: *Jinsung Jang*[1]; Man Wang[1]; Heung Nam Han[2]; Chang Hee Han[1]; Woo Gon Kim[1]; [1]KAERI; [2]Seoul National University

**9:50 AM Break**

**10:10 AM**
**Multiscale Irradiation Effects of Tungsten Based Materials for Nuclear Power**: *Osman El-Atwani*[1]; Erika Esquivel[1]; Mert Efe[2]; Eda Aydogan[1]; Stuart Maloy[1]; [1]Los Alamos National laboratory; [2]Middle East Technical University

**10:30 AM**
**Investigation on the Damage Mechanism of Plasma-materials Interface by Multi-scale Electron Microscopy Methods**: *Kun Wang*[1]; Chad Parish[1]; Russell Doerner[1]; Matthew Baldwin[1]; Fred Meyer[1]; [1]Oak Ridge National Laboratory, UT-Battelle

**10:50 AM**
**Radiation Tolerance of Equiatomic Multicomponent Single Phase Alloys Subjected to Ion Irradiation at 16 K**: *Gihan Velisa*[1]; Elke Wendler[2]; Ke Jin[1]; Hongbin Bei[1]; William Weber[3]; Yanwen Zhang[1]; [1]Oak Ridge National Laboratory; [2]Friedrich-Schiller-Universität Jena, Institut für Festkörperphysik; [3]University of Tennessee

**11:10 AM**
**Radiation Resistant Elemental Combination High Entropy Complex Concentrated Alloys for Nuclear Applications**: *James Withers*[1]; [1]ATS-MER, LLC

**11:30 AM**
**Investigation of the Role of Cr and Cr Carbides at Grain Boundaries in Alloy 600 for Stress Corrosion Cracking**: *Hi Vo*[1]; Peter Chou[2]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Electric Power Research Institute

## Materials for Energy Conversion and Storage – Energy Storage III

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Thursday AM
March 15, 2018
Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Partha Mukherjee , Purdue University; Leela Arava, Wayne State University

**8:30 AM**
**Mechanistic Understanding of Transport-mechanics Interactions in Li-S Cathodes**: *Aashutosh Mistry*[1]; Partha Mukherjee[1]; [1]Purdue University

**8:50AM**
**Monolayers of Transition Metal Diselenides as Anchoring Surface for Lithium-sulfur Batteries**: Naresh Thangavel[1]; Nirul Masurkar[1]; *Leela Mohana Reddy Arava*[1]; [1]Wayne State University

**9:10 AM Invited**
**Multiparadigm Computational Approaches to Assess and Optimize Rechargeable Battery Electrodes**: *Alejandro Franco*[1]; [1]Université de Picardie Jules Verne

**9:35 AM Invited**
**Surface Chemistry Evolution on Cathodes Characterized by In Situ XPS and AES**: *Shen Dillon*[1]; [1]University of Illinois at Urbana-Champaign

**10:00 AM Break**

**10:15 AM Invited**
**The Transition from Unfavorable Lithium Plating to Destructive Lithium Dendrites**: *Corey Love*[1]; Rachel Carter[1]; [1]U.S. Naval Research Laboratory

**10:40 AM Invited**
**New Challenges to Future Battery System for Automotive Application**: *Yuichiro Tabuchi*[1]; [1]Nissan Motor Co., Ltd

**11:05 AM**
**Electrochemical Characterization of Lithium Diffusion in Ordered Nanoporous Carbons via Voltage-relaxation GITT**: *Waruni Jayawardana*[1]; Christopher Carr[1]; Eric Majzoub[1]; [1]University of Missouri St. Louis

**11:25 AM**
**Electrodeposition of Manganese/Cobalt Alloys for Solid Oxide Fuel Cell Interconnect Application**: Junwei Wu; *Xingbo Liu*[1]; [1]West Virginia University

## Mechanical Behavior at the Nanoscale IV – Crystallite Effects and the Nanoscale

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Thursday AM
March 15, 2018
Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Marisol Koslowski, Purdue University; Yu Zou, MIT

**8:30 AM Invited**
**Stress Relaxation Mechanisms in Thin Films**: *Marisol Koslowski*[1]; Xiaorong Cai[1]; [1]Purdue University

**9:00 AM**
**Synthesis and Mechanical Characterization of Metallic Films with Precisely Tailored Multimodal Microstructures**: *Rohit Berlia*[1]; Ehsan Izadi[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

**9:20 AM**
**A New Method for Selecting Grain Boundary Sets for Comparison of Decohesion Behavior in Molecular Dynamics Simulations**: *Doruk Aksoy*[1]; Remi Dingreville[2]; Douglas Spearot[1]; [1]University of Florida; [2]Sandia National Laboratories

**9:40 AM**
**Texture Dependent Grain Rotations in Ultrafine-grained Al Films Revealed by In Situ TEM with Automated Crystal Orientation Mapping**: *Ehsan Izadi*[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

**10:00 AM Break**

**10:20 AM**
**ECCI Analysis ff Dislocation Slip Transfer across Grain Boundaries in Commercially Pure Titanium**: *Songyang Han*[1]; Martin Crimp[1]; [1]Michigan State University

**10:40 AM**
**Mechanical Properties of Nanocrystalline Aluminum: Atomistic Simulations and Experimental Verification**: *Wenwu Xu*[1]; Xiaoyan Song[2]; Lilian Dávila[3]; [1]San Diego State University; [2]Beijing University of Technology; [3]University of California, Merced

**11:00 AM**
**Effect of Twist Boundary Stability of Dislocation Network under Unloading**: *Jamie Gravell*[1]; Ill Ryu[1]; [1]University of Texas at Dallas

**11:20 AM**
**Anatomizing Deformation Mechanisms in Metals at the Low End of the Nanoscale**: *Rainer Birringer*[1]; Christian Braun[1]; Michael Deckarm[1]; Andreas Leibner[1]; [1]Saarland University

## Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XVII – Phase Stability of Advanced Electronic Interconnection II

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University; Thomas Reichmann, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Hiroshi Nishikawa, Osaka University; Shien Ping Feng, The University of Hong Kong; Yee-Wen Yen, National Taiwan University of Science & Technology; Song-Mao Liang, Clausthal University of Technology

Thursday AM
March 15, 2018
Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Jae-Ho Lee, Hongik University; Chao-hong Wang, National Chung Cheng University

**8:30 AM Invited**
**Nanoparticles and Nanowires Based on Ag and Cu in Printed Electronics and Transparent Electrode**: *Hyuck Mo Lee*[1]; [1]KAIST

**8:50 AM**
**Minor P-doping in the Electroplated Co(P) Layer to Strongly Suppress IMC Formation in Lead-free Solder Joints**: *Chao-hong Wang*[1]; Che-yang Lin[1]; [1]National Chung Cheng University

**9:10 AM**
**Fabrication and Characterization of (111)-oriented and Nanotwinned Cu by Periodic Reverse Electrodeposition**: *Kuan-Ju Chen*[1]; [1]National Chiao Tung University

**9:30 AM**
**Inter-diffusion at Ag/Cu Interface**: *Erh-Ju Lin*[1]; Cheng-Yi Liu[1]; [1]National Central University

**9:50 AM Break**

**10:10 AM**
**Effects of Electrochemical Parameters on the Physical Properties of Ni-Co Electroplating**: Yong-Su Lee[1]; Hong-Wook Chun[1]; *Jae-Ho Lee*[1]; [1]Hongik University

**10:30 AM**
**Electrochemical Etching of Solder Resist to Improve Adhesion of Electroless Copper Plating in PCB**: Jong-Chan Choi[1]; *Jae-Ho Lee*[1]; [1]Hongik University

**10:50 AM**
**Dissolution Kinetic of Ni Wire in Sn and Sn3.5Ag Solder**: *Jyun Yang Wang*[1]; Cheng Yi Liu[1]; [1]National Central University

**11:10 AM**
**The Study of Interfacial Reactions between Sn and C194 Alloy**: Pei-Yu Chen[1]; *Chih-Hung Lin*[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science & Technology, Dep. of Materials Sci. & Eng.

**11:30 AM**
**Effect of Ag Additives on Dissolution Kinetic of Cu Wire in Sn and Sn3.5Ag Solder**: *YiXuan Lin*[1]; ChengYi Liu[1]; [1]National Central University

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Titanium Powder Metallurgy and Additive Manufacturing I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

Thursday AM
March 15, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* Dr Ben Thomas, University of Sheffield; Dr Josef Stráský, Charles University

**8:30 AM**
**Characterization and Heat Treatment of Ti-6Al-4V Powders for Use in Cold Spray Deposition**: *Satish Bhattiprolu*[1]; Grant Crawford[1]; [1]South Dakota School of Mines and Technology

**8:50 AM**
**FAST-forge: From Rutile Sand to Novel Titanium Alloy Aerospace Component in 3 Steps**: *Nick Weston*[1]; Luke Benson Marshall[2]; Olga Bylya[3]; Malgorzata Rosochowska[3]; Sam Evans[4]; Martin Jackson[1]; [1]University of Sheffield; [2]Metalysis; [3]University of Strathclyde; [4]Safran Landing Systems

**9:10 AM**
**Densification of Near-net Shape Turbine Blades in TiAl by Spark Plasma Sintering**: *Thomas Voisin*[1]; Jean-Philippe Monchoux[2]; Marc Thomas[3]; Alain Couret[2]; [1]Lawrence Livermore National Laboratory; [2]CNRS; CEMES (Centre d'Elaboration de Matériaux et d'Etudes Structurales); [3]ONERA/DMSM

**9:30 AM**
**Cost-effective Titanium Alloy Components for Internal Combustion Engine Valve Trains**: *Nick Weston*[1]; Ben Thomas[1]; Martin Jackson[1]; [1]University of Sheffield

**9:50 AM Break**

**10:10 AM Invited**
**Producing High-quality Titanium Alloy by a Cost-effective Route Combining Fast Heating and Hot Processing**: *Fei Yang*[1]; Stiliana Raynova[1]; Ajit Singh[1]; Qinyang Zhao[1]; Carlos Romero Villarreal[1]; Leandro Bolzoni[1]; [1]University of Waikato

**10:40 AM Invited**
**Novel Continuous Extrusion of Titanium Powders for Wire Applications**: *Ben Thomas*[1]; Martin Jackson[1]; [1]University of Sheffield

**11:10 AM**
**Microstructure and Phase Transformations in Ti15Mo Alloy Prepared by Cryogenic Milling and SPS**: *Josef Stráský*[1]; Jirí Kozlík[1]; Petr Harcuba[1]; Kristína Václavová[1]; Tomáš Chráska[1]; Miloš Janecek[1]; [1]Charles University

## Recent Advances in Functional Materials for Printed, Flexible and Wearable Electronics – 2D/3D Sensors and Devices

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Pooran Joshi, Oak Ridge National Laboratory; Nuggehalli Ravindra, New Jersey Institute of Technology; Jud Ready, Georgia Institute of Technology; Amit Pandey, LG Fuel Cell Systems Inc.; Suresh Sitaraman, Georgia Institute of Technology

Thursday AM
March 15, 2018
Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Jud Ready, Georgia Institute of Technology; Amit Pandey, LG Fuel Cell Systems Inc.; Megan Cordill, Erich Schmid Institute

**8:30 AM Invited**
**Transparent Field Effect Biosensors Printed on Highly Curved Surfaces**: *Gregory Herman*[1]; [1]Oregon State University

**9:00 AM Invited**
**Single-crystalline-like Semiconductor Films on Flexible Substrates: A Route towards Roll-to-roll Manufacturing of High-performance Electronic Devices**: *Pavel Dutta*[1]; M. Rathi[1]; D. Khatiwada[1]; Yan Yao; Y. Gao[1]; S. Sun[1]; Y. Li[1]; S. Pouladi[1]; J. Ryou[1]; Eduard Galstyan[1]; Venkat Selvamanickam[1]; [1]University of Houston

**9:30 AM**
**3-D Printed Polymer-based Gas Sensors**: *Patrick Dzisah*[1]; Nuggehalli Ravindra[1]; [1]New Jersey Institute of Technology

**9:50 AM Break**

**10:10 AM Invited**
**Integrated and Flexible Biosensors for Point-of-care Diagnostics**: *Vinay Gupta*[1]; [1]University of Delhi

**10:40 AM**
**High Performance Sensors and Antennas by 2D and 3D Printing of Nanoparticles**: *Md Taibur Rahman*[1]; Arya Rahimi[2]; Subhanshu Gupta[2]; Luke Renaud[2]; Deuk Heo[2]; C. V. Ramana[3]; Rahul Panat[1]; [1]Carnegie Mellon University; [2]Washington State University; [3]University of Texas at El Paso

**11:00 AM Invited**
**Microheater Array Powder Sintering: A New Process for Printed Electronics**: Nicholas Holt[1]; Lucas Marques[1]; Austin Van Horn[1]; *Wenchao Zhou*[1]; [1]University of Arkansas

**11:30 AM Invited**
**3D Printed Anodes for Al-air Batteries**: Y. Yu[1]; M. Chen[1]; S. Wang[1]; C. Hills[2]; J. Pooran[3]; *Anming Hu*[1]; [1]University of Tennessee; [2]Sichuan University; [3]Oak Ridge National Laboratory

## Solar Cell Silicon – Silicon Recycling, Refining, and Impurity Removal

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Neale Neelameggham, Ind LLC; York Smith, University of Utah

Thursday AM
March 15, 2018
Room: 223
Location: Phoenix Convention Center

*Session Chairs:* Leili Tafaghodi, University of British Columbia; Jijun Wu, Kunming University of Science and Technology

**8:30 AM Invited**
**Review of Solar Silicon Recycling**: *York Smith*[1]; [1]University of Utah

**9:10 AM**
**Removal Impurities from Metallurgical Silicon by Slag Treatment Combined with Acid Leaching**: Zhenfei Xia[1]; *Jijun Wu*[1]; Wenhui Ma[1]; Kuixian Wei[1]; Yun Lei[1]; [1]Kunming University of Science and Technology

**9:30 AM**
**Structure Nature of Boron Removal from Silicon in Slagging Refining: A Raman Spectroscopy and NMR Spectroscopy Study**: *Guoyu Qian*[1]; Zhi Wang[1]; [1]Institute of Process Engineering, Chinese Academy of Sciences

**9:50 AM Break**

**10:10 AM**
**Boron Removal from Ferrosilicon Alloy via Slag Treatment**: *Ali Hosseinpour*[1]; Leili Tafaghodi[1]; [1]University of British Columbia

**10:30 AM**
**The Mechanism of Boron Removal from Silicon Alloy by Electric Field Using Slag Treatment**: *Junhao Liu*[1]; Zhi Wang[1]; Zhi Ge[1]; Bing Du[1]; [1]Institute of Process Engineering, Chinese Academy of Sciences

## Thermal and Mechanical Stability of Nanocrystalline Materials – Mechanical Stability and Deformation Behavior

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

Thursday AM
March 15, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Timothy Rupert, University of California Irvine; Christian Brandl, Karlsruhe Institute of Technology

**8:30 AM Invited**
**Modulating Stability and Strength in Nanocrystalline FCC Metals: The Effects of Microstructure, Composition and Interfacial Character**: Jacob Gruber[1]; *Garritt Tucker*[1]; [1]Colorado School of Mines

**9:00 AM**
**Grain Boundary Stability Governs Hardening and Softening in Extremely-fine Nano-grained Metals**: Jian Hu[1]; *Yinong Shi*[1]; Xavior Sauvage[2]; Gang Sha[3]; K. Lu[1]; [1]Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences; [2]Normandie University, UNIROUEN, INSA Rouen, CNRS, Groupe de Physique des Matériaux; [3]Herbert Gleiter Institute of Nanoscience, Nanjing University of Science and Technology

**9:20 AM**
**Insights into Deformation Induced Grain Boundary Migration in Ultrafine-grained Metals from a Strain Path Change – Does Texture Play a Role?**: *Oliver Renk*[1]; Pradipta Ghosh[1]; Reinhard Pippan[1]; [1]Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

**9:40 AM Invited**
**Effect of Temperature on the Deformation Response of Grain Boundary Networks**: *Diana Farkas*[1]; [1]Virginia Tech

**10:10 AM Break**

**10:30 AM**
**Initiation and Stagnation of Room-temperature Strain-induced Grain Coarsening in Thin Au Films**: *Oleksandr Glushko*[1]; Rafael Soler[2]; Gerhard Dehm[2]; [1]Erich Schmid Institute; [2]Max-Planck-Institut für Eisenforschung

**11:50 AM Invited**
**Commonalities in the Structure and Plastic Deformation in Disordered Materials and Interfaces**: Glenn Balbus[1]; Daniel Strickland[2]; Daniel Magagnosc[2]; Robert Ivancic[2]; Andrea Liu[2]; *Daniel Gianola*[1]; [1]University of California, Santa Barbara; [2]University of Pennsylvania

## Thermal and Mechanical Stability of Nanocrystalline Materials – Nanotwin and Oxide Induced Stabilization

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

Thursday AM
March 15, 2018
Room: 127C
Location: Phoenix Convention Center

*Session Chairs:* Eric Homer, Brigham Young University; Jessica Krogstad, University of Illinois, Urbana-Champaign

**8:30 AM**
**Effects of Nanotwinning and Nanocrystallinity on the Precipitation Behavior of a Ni-Mo-Cr Superalloy**: *Megan Emigh*[1]; Jessica Krogstad[1]; [1]University of Illinois at Urbana Champaign

**8:50 AM**
**The Mechanism of Anisotropic Single-crystal Growth in Nanotwinned Copper**: *I-Hsin Tseng*[1]; Chih Chen[1]; Yun-Ting Hsu[1]; Jih-Perng Leu[1]; Tu King-Ning[2]; [1]National Chiao Tung University; [2]University of California, Los Angeles

**9:10 AM**
**Thermal Cycling Test of Integrated Fan-out Wafer Level Package with Highly (111)-oriented Nano-twinned Copper**: *Li Yu-Jin*[1]; Ying Ju Chen[1]; Kuan Ju Chen[1]; Chih Chen[1]; [1]National Chiao Tung Unirversity

**9:30 AM**
**In-situ TEM Study of the Effects of W Solutes on Irradiation Induced Detwinning in Cu**: *Gowtham Sriram Jawaharram*[1]; Khalid Hattar[2]; Robert Averback[1]; Shen Dillon[1]; [1]University of Illinois Urbana-Champaign; [2]Sandia National Laboratories

**9:50 AM Break**

**10:10 AM Invited**
**Design Tough Nanoceramics by Reducing Grain Boundary Energy**: *Ricardo Castro*[1]; [1]University of California, Davis

**10:40 AM**
**Effect of Nanoscale Oxide Dispersion on Thermal Stability of Severely Deformed Fe-Y Alloy**: *Anna Weiss*[1]; Stephen Kachur[1]; Yoosuf Picard[1]; Bryan Webler[1]; [1]Carnegie Mellon University

**11:00 AM**
**A Microstructural Approach toward Improving the Nano Grain Size Stability of Fe14Cr4Hf Alloy**: *Peiman Shahbeigi Roodposhti*[1]; Sina Shahbazmohamadi[1]; [1]University of Connecticut

## Ultrafine-grained Materials X – High Pressure Torsion and Equal Channel Angular Extrusion/ Pressing Studies

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Thursday AM
March 15, 2018
Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Megumi Kawasaki, Oregon State University; Güney Güven Yapici, Özyegin University

**8:30 AM**
**Role of Alloy Properties in Forced Chemical Mixing of Cu-X-Mo Ternary Alloys (X=Ni, Ag)**: *Nisha Verma*[1]; Robert S Averback[1]; Pascal Bellon[1]; [1]University of Illinois, Urbana-Champaign

**8:50 AM**
**Micro-mechanical Response of Gamma-based TiAl Intermetallic Compound Processed by High-pressure Torsion**: *Megumi Kawasaki*[1]; Jae-Kyung Han[2]; Xi Li[3]; Rian Dippenaar[3]; Klaus-Dieter Liss[4]; [1]Oregon State University; [2]Hanyang University; [3]University of Wollongong; [4]Australian Nuclear Science and Technology Organisation

**9:10 AM**
**High-pressure Torsion of Copper-molybdenum Composites**: *Julian Rosalie*[1]; Zaoli Zhang[1]; Reinhard Pippan[1]; [1]Erich Schmid Institute for Materials Science

**9:30 AM**
**Phase Transformations and Aging Behavior of Pure Ti and Ti-6Al-7Nb Processed by High-pressure Torsion**: *Jorge Cubero-Sesin*[1]; Joaquín González-Hernández[1]; Alejandro Martínez[1]; Elena Ulate-Kolitsky[1]; Mildred Chaves[1]; Fernando Alvarado[1]; Héctor Agüero[1]; Mauricio Castro[1]; Daniela Murillo[1]; Jose Vega-Baudrit[1]; Kaveh Edalati[2]; Zenji Horita[2]; [1]Instituto Tecnológico de Costa Rica; [2]Kyushu University

**9:50 AM**
**The Effect of Bismuth on Microstructure Evolution in Ultrafine-grained Copper**: Anna Kosinova[1]; Boris Straumal[2]; Askar Kilmametov[2]; *Eugen Rabkin*[1]; [1]Technion; [2]Karlsruhe Institute of Technology

**10:10 AM Break**

**10:30 AM**
**Mechanical Properties and Microstructures of a TiZr Alloy for Dental Implants**: *Mathew Hayne*[1]; Casey Davis[1]; Rilee Meagher[1]; Peter Rovira[1]; Dean Wenger[1]; Gordon Campbell[1]; Michaela Rillings[1]; Kyle Haines[1]; Lenka Kunèická[2]; Radim Kocich[2]; Florian Dalla Torre[3]; Terry Lowe[1]; [1]Colorado School of Mines; [2]Technical University of Ostrava; [3]Institut Straumann AG

**10:50 AM**
**Strategies to Improve the Fatigue Crack Growth Behavior of SPD-processed Metals**: *Anton Hohenwarter*[1]; Thomas Leitner[1]; [1]Department of Materials Physics, Montanuniversität Leoben, Austria

**11:10 AM**
**High-pressure Torsion as a Novel Technique for Processing High Strength Zn-based Alloys**: *David Hernandez Escobar*[1]; Hakan Yilmazer[2]; Carl Boehlert[1]; Megumi Kawasaki[3]; [1]Michigan State University; [2]Yildiz University; [3]Hangyang University

**11:30 AM**
**Effect of Subgrain Structure on Superplasticity of Ultrafine-grained Ti-6Al-4V**: *Chong Soo Lee*[1]; Daehwan Kim[1]; Chan Hee Park[2]; Jae Keun Hong[2]; [1]POSTECH; [2]KIMS

## Ultrafine-grained Materials X – Texture Studies and Microstructural Evolution

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Thursday AM
March 15, 2018
Room: 102C
Location: Phoenix Convention Center

*Session Chairs:* Georgy Raab, Ufa State Aviation Technical University; Werner Skrotzki, Dresden University of Technology

**8:30 AM**
**Crystal Plasticity Modeling of Tensile and Cyclic Behavior of Ultrafine Grained Films: Effects of Crystallographic Texture**: Saul Opie[1]; Ehsan Izadi[1]; Jagannathan Rajagopalan[1]; *Pedro Peralta*[1]; [1]Arizona State University

**8:50 AM**
**Development of Ultrafine Grain Structure with Weak Texture in New Mg-4Li-1Ca Alloy by Equal Channel Angular Pressing (ECAP)**: *Saurabh Nene*[1]; B Kashyap[2]; N Prabhu[2]; Y. Estrin[3]; T. Al-Samman[4]; [1]IITB-Moansh Research Academy; [2]IIT Bombay; [3]Moansh University; [4]RWTH Aachen University

**9:10 AM**
**Effect of Texture on Inhomogeneous Shear in ECAP**: Laura Lienshoeft[1]; Julius Huhn[1]; Philipp Frint[2]; Martin Franz-Xaver Wagner[2]; *Werner Skrotzki*[1]; [1]Dresden University of Technology; [2]Chemnitz University of Technology

**9:30 AM**
**The Influence of Microstructure Characteristics on Plastic Deformation Mechanisms in Severely Deformed Aluminium**: *Witold Chrominski*[1]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology

**9:50 AM**
**High Shear Deformation to Enhance Properties of a Bioabsorbable Magnesium Alloy**: *Casey Davis*[1]; Joel Grzenia[1]; Jake Edick[2]; Tamás Ungár[3]; Terry Lowe[1]; [1]Colorado School of Mines; [2]nanoMAG LLC; [3]Eötvös University

**10:10 AM Break**

**10:30 AM**
**Effect of SPD Processing Combined with Ultrasound on Structure Transformation in a Low-alloyed Chromium Bronze**: *Georgy Raab*[1]; Tibor Donic[2]; Denis Aksenov[1]; Rashid Asfandiyarov[1]; [1]Ufa State Aviation Technical University; [2]University of Žilina

**10:50 AM**
**Structural Stability of Ultra-fine Grained Metastable Beta Titanium Alloys**: *Kristina Vaclavova*[1]; Josef Strasky[1]; Anna Terynkova[1]; Josef Vesely[1]; Petr Harcuba[1]; Irina Semenova[2]; Veronika Polyakova[2]; Milos Janecek[1]; [1]Charles University; [2]Ufa State Aviation Technical University

**11:10 AM**
**Microstructure of Refined Ti15Mo Alloy for Biomedical Use**: Anna Terynková[1]; Josef Stráský[1]; Kristína Václavová[1]; *Miloš Janecek*[1]; Michal Landa[2]; Michaela Janovská[2]; Irina Semenova[3]; Veronika Polyakova[3]; [1]Charles University; [2]Institute of Thermomechanics; [3]Ufa State Aviation Technical University

**11:30 AM**
**Issues of Intermetallic and Precipitates Segregation inside Adiabatic Shear Bands of SPD-processed Al 6061**: *Ramatou Ly*[1]; Karl T. Hartwig[1]; Homero Castaneda[1]; [1]Texas A&M University

## 9th International Symposium on High Temperature Metallurgical Processing – Agglomeration and Direct Reduction of Complex Iron Ores

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Thursday PM
March 15, 2018
Room: 227B
Location: Phoenix Convention Center

*Session Chairs:* Tao Jiang, Central South University; Hongming Long, Anhui University of Technology

**2:00 PM Introductory Comments**

**2:05 PM**
**Carbothermic Direct Reduction of Chromite Using a Segregation Catalyst for the Production of Ferrochrome**: *Dawei Yu*[1]; Dogan Paktunc[1]; [1]CanmetMINING

**2:25 PM**
**Effect of Modified Humic Acid (MHA) Binder on Roasting Behavior Mongolian Tumurtei Iron Concentrate Briquettes**: Bayaraa S[1]; *Guanghui Li*[1]; Mingjun Rao[1]; Tao Jiang[1]; [1]Central South University

**2:45 PM**
**Enhancement of Yield by Improvement of Iron Ore Sinter Strength of Weak Layer in Sinter Bed**: *Chong-Lyuck Park*[1]; Wan-Sung Kim[1]; [1]POSCO

**3:05 PM**
**Study on Direct Reduction Melting Separation-leaching Process of Disposal Rare Earth Composite Iron Ore**: Tengfei Ma[1]; *Xue-feng She*[1]; Fu Feng[1]; Jiongsong Wang[1]; [1]University of Science and Technology Beijing

**3:25 PM Break**

**3:45 PM**
**Reduction Behavior of Garnierite Using Methane by Roasting-Magnetic Separation Method**: Li Bo[1]; *Yindong Yang*[2]; Mansoor Barati[2]; Alexander McLean[2]; Yonggang Wei[1]; [1]Kunming University of Science and Technology; [2]University of Toronto

**4:05 PM**
**Effect of Calculation Method of CaO Addition on Liquid Phase Fluidity**: Lixin Qian[1]; Tiejun Chun[1]; Zhengwei Yu[1]; Huan Wang[1]; Yifan Wang[1]; *Hongming Long*[1]; Ping Wang[1]; [1]Anhui University of Technology

**4:25 PM**
**Effect of Carbon Coating on Magnetite Reduction**: Wu-feng Jiang[1]; *Su-ju Hao*[2]; Yu-zhu Zhang[1]; [1]North China University of Science and Technology; [2]Michigan Technological University

**4:45 PM**
**Optimization Method for Iron Ore Blending Based on the Sintering Basic Characteristics of Blended Ore**: Li Ning[1]; Li Jiaxin[1]; Long Hongming[1]; Chun Tiejun[1]; Mu Gutian[1]; *Yu Zhengwei*[1]; Wang Ping[1]; [1]Anhui University of Technology

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Advanced Characterization and Innovative Applications

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

Thursday PM
March 15, 2018
Room: 231AB
Location: Phoenix Convention Center

*Session Chairs:* Eric Lass, National Institute of Standards and Technology; Kathryn Small, Drexel University

**2:00 PM**
**Dynamics of Laser Powder Bed Fusion Additive Manufacturing Process**: Qilin Guo[1]; Luis Escano[1]; Cang Zhao[2]; Lianghua Xiong[1]; Seyed Mohammad Hassan Hojjatzadeh[1]; Tao Sun[2]; *Lianyi Chen*[1]; [1]Missouri University of Science and Technology; [2]Argonne National Lab

**2:20 PM**
**Effect of Heat Treatment on the Microstructural Evolution of a Nickel-based Superalloy Produced by Powder Bed Fusion Laser Sintering**: *Fan Zhang*[1]; Lyle Levine[1]; Andrew Allen[1]; Eric Lass[1]; Mark Stoudt[1]; Greta Lindwall[1]; Michael Katz[1]; Maureen Williams[1]; Carelyn Campbell[1]; [1]National Institute of Standards and Technology

**2:40 PM**
**Porosity Analysis of AM Powder Based on Machine Learning Approach and In-situ Annealing Technique for Observation of Property Evolution of AM Material**: *He Liu*[1]; Yufeng Shen[1]; Ross Cunningham[1]; R.M Suter[1]; A. D. Rollett[1]; [1]Carnegie Mellon University

**3:00 PM**
**Thermally-induced Microstructural Evolution of Additively Manufactured Inconel 718 via In-situ Bragg-edge Neutron Radiography and Diffraction**: *Gian Song*[1]; Hassina Billeux[1]; Jean Bilheux[1]; Jiao Lin[1]; Qingge Xie[1]; Ke An[1]; Alexandru Stoica[1]; Louis Santodonato[1]; Ryan Dehoff[1]; Michael Kirka[1]; Sarma Gorti[1]; Balasubramaniam Radhakrishnan[1]; Anton Tremsin[2]; [1]Oak Ridge National Laboratory; [2]University of California, Berkeley

**3:20 PM Break**

**3:40 PM**
**Residual Strain Characterization of Additively Manufactured Ni Superalloy Using HR-EBSD Analysis**: *Kathryn Small*[1]; Jacob Hochhalter[2]; Ryan Carpenter[3]; Stephen Luckowski[3]; Matthew Clemente[3]; Elias Jelis[3]; Brian Jackson[4]; David Fullwood[4]; Mitra Taheri[1]; [1]Drexel University; [2]NASA Langley Research Center; [3]U.S. Army ARDEC; [4]Brigham Young University

**4:00 PM**
**Properties and Microstructure in Thick Plate Inconel 718 Produced by Electron Beam Wire Feed**: Brent Waters[1]; Jill Wen[2]; *Michael Miles*[2]; David Fullwood[2]; [1]Toyota Motor Manufacturing; [2]Brigham Young University

**4:20 PM**
**Investigation of the SLM Process to Fabricate Multiperforated Plates in Aeroengines**: *Marc Thomas*[1]; Cécile Davoine[1]; Océane Lambert[1]; Fabienne Popoff[1]; Philippe Reulet[1]; Olivier Léon[1]; Axel Vincent[1]; [1]ONERA

**4:40 PM**
**Localized Porosity Control for Heat Pipe Manufacturing**: *Scott Roberts*[1]; Eric Sunada[1]; Stefano Cappucci[1]; Ben Furst[1]; Andre Pate[1]; [1]JPL/NASA

## Advanced Real Time Optical Imaging – Iron and Steelmaking III

*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, Tohoku University; Antoine Allanore, Massachusetts Institute of Technology

Thursday PM
March 15, 2018
Room: 123
Location: Phoenix Convention Center

*Session Chair:* Il Sohn, Yonsei University

**2:00 PM Invited**
**Wettability of Graphite-alumina Composites against Molten CaO-$SiO_2$-$Al_2O_3$-MgO Slags**: *Noritaka Saito*[1]; Kunihiko Nakashima[1]; [1]Kyushu University

**2:30 PM Invited**
**In-situ Observation of Sulfide Formation during Solidification in Fe-Cr-Ni-Mn-S Alloys**: *Kazuo Nakama*[1]; [1]Sanyo Special Steel

**3:00 PM**
**Observations of Ferrite Formation and Growth in Inclusion-engineered Low Alloy Steels during In-situ Heat Treatments**: *Wangzhong Mu*[1]; Peter Hedström[1]; Hiroyuki Shibata[1]; Pär Jönsson[1]; Keiji Nakajima[1]; [1]KTH Royal Institute of Technology

**3:20 PM Panel Discussion**

**3:40 PM Break**

**4:00 PM Panel Discussion**

## Algorithm Development in Materials Science and Engineering – Applications of Microscale Algorithms and Models

*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, Missouri University of Science and Technology; Mark Tschopp, Army Research Laboratory; Jonathan Zimmerman, Sandia National Laboratories; Ebrahim Asadi, University of Memphis; Mark Horstemeyer, Mississippi State University

Thursday PM
March 15, 2018
Room: 130
Location: Phoenix Convention Center

*Session Chair:* Mark Horstemeyer, Mississippi State University

**2:00 PM**
**A Dislocation-based Finite Element Modelling of Hydrogen Embrittlement in High-strength Steel Alloys**: Amir Abdelmawla[1]; *Tarek Hatem*[1]; Dierk Raabe[2]; [1]British University in Egypt; [2]Max-Planck-Institut fur Eisenforschung

**2:20 PM**
**Simulation of Multi-component Microstructure Evolution Coupling Phase Field and Tensor Decomposition Techniques**: *Yuan Yuan*[1]; Fusheng Pan[1]; Nico Vervliet[2]; Lieven Delathauwer[2]; Nele Moelans[2]; [1]Chongqing University; [2]KU Leuven

**2:40 PM**
**Crack-tip Simulation Validations by XGP Multiscale Methods**: *Jinghong Fan*[1]; Ross Stewart[2]; Taolong Xu[3]; [1]Alfred University; [2]Corning Inc.; [3]Southwest Petroleum University

**3:00 PM**
**Three Dimensional Trefftz Voronoi Cell Finite Elements with Cylindrical Elastic/Rigid Inclusions &/or Voids for Micromechanical Modeling of Heterogeneous Materials**: *Guannan Wang*[1]; Leiting Dong[2]; Satya Atluri[1]; [1]Texas Tech University; [2]Beihang University

**3:20 PM**
**Phase Field Approach to Fracture and Interaction of Fracture and Phase Transformation**: *Hossein Jafarzadeh*[1]; Valery Levitas[2]; Gholam Hossein Farrahi[1]; Mahdi Javanbakht[3]; [1]Sharif University of Technology; [2]Iowa State University; [3]Isfahan University of Technology

## Alloy Development and Powder Manufacture for Additive Manufacturing – Design of Ni and Fe Alloys

*Sponsored by:* TMS Materials Processing and Manufacturing Division
*Program Organizers:* Paul Prichard, Kennametal; Sudarsanam Babu, The University of Tennessee, Knoxville; Peter Collins, Iowa State University; James Foley, Los Alamos National Laboratory

Thursday PM
March 15, 2018
Room: 232B
Location: Phoenix Convention Center

*Session Chair:* Suresh Babu, Oak Ridge National Laboratory

**2:00 PM**
**Current Understanding and Status of Ni-base Superalloys for Additive Manufacturing: Towards Alloy Development for AM**: *Michael Kirka*[1]; [1]Oak Ridge National Laboratory

**2:20 PM**
**Microstructure Development in Isolated Melt Pools of Electron Beam Melted Inconel 718**: *Andrew Polonsky*[1]; Narendran Raghavan[2]; William Lenthe[1]; McLean Echlin[1]; Michael Kirka[2]; Ryan Dehoff[2]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Oak Ridge National Laboratory

**2:40 PM**
**Fabrication of Hastelloy X by Electron Beam Melting and Selective Laser Melting**: *Sebastien Dryepondt*[1]; Mike Kirka[1]; Frederic List[1]; [1]Oak Ridge National Laboratory

**3:00 PM**
**Alloy Design Strategies for the Adaptation of Non-weldable Compositions for Additive Manufacturing**: *Tim Prost*[1]; Ralph Napolitano[2]; Emma White[2]; Michael Kirka[3]; Ryan Dehoff[3]; Iver Anderson[2]; [1]US DOE Ames Laboratory; [2]Iowa State University/Ames Laboratory; [3]Oak Ridge National Laboratory

**3:20 PM Break**

**3:40 PM**
**Laser Engineered Net Shaping (LENS) of High Entropy Alloys**: *Andrew Kustas*[1]; Mark Wilson[1]; Shaun Whetten[1]; Dave Keicher[1]; Michael Chandross[1]; Ping Lu[1]; Allen Roach[1]; Nicolas Argibay[1]; [1]Sandia National Laboratories

**4:00 PM**
**Designing Fe-Ni-Al and Fe-Ni-Ti Maraging Steels for In-situ Precipitation Hardening during Laser Metal Deposition**: *Philipp Kürnsteiner*[1]; Markus Benjamin Wilms[2]; Andreas Weisheit[2]; Eric Aimé Jägle[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Fraunhofer-Institut für Lasertechnik

**4:20 PM**
**High Entropy Alloys for Additive Manufacturing**: *Minh-Son Pham*[1]; [1]Imperial College London

## Aluminum Reduction Technology – Cell Technology Development

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Thursday PM
March 15, 2018
Room: 221C
Location: Phoenix Convention Center

*Session Chair:* Sergey Akhmetov, Emirates Global Aluminium

**2:00 PM Introductory Comments**

**2:05 PM**
**Very Low Energy Consumption Cell Designs: The Cell Heat Balance Challenge**: *Marc Dupuis*[1]; [1]GéniSim Inc

**2:30 PM**
**APXe Cell Technology: 7 Years of Low Energy Operation**: *Sebastien Becasse*[1]; Bertrand Allano[1]; Yves Caratini[1]; Olivier Martin[1]; Denis Tinka[1]; [1]Rio Tinto

**2:55 PM**
**Development and Industrial Application of NEUI600 High Efficiency Aluminum Reduction Cell**: *Yungang Ban*[1]; Jihong Mao[1]; Yu Mao[1]; Jing Liu[1]; Gaoqiang Chen[1]; [1]Northeastern University Engineering & Research Institute Co. Ltd

**3:20 PM**
**RA-550 Cell Technology: UC RUSAL's New Stage of Technology Development**: *Andrey Zavadyak*[1]; Iliya Puzanov[1]; Vitaly Platonov[1]; Vitaly Pingin[1]; Viktor Mann[1]; [1]RUSAL ETC LLC

**3:45 PM Break**

**4:00 PM**
**DX+ Ultra Industrial Version: Preheat Start up and Early Operation**: Michel Reverdy[1]; *Abdalla Alzarooni*[1]; Nadia Ahli[1]; Alexander Arkhipov[1]; Sajid Hussain[1]; Sergey Akhmetov[1]; Kamel Alaswad[1]; [1]Emirates Global Aluminium (EGA)

**4:25 PM**
**Selecting Technology for Achieving 300,000 T/Year - Why Do We Need to Compete Pot Technology?**: Sahala Sijabat[1]; *Rainaldy Harahap*[1]; Ari Sukotjo[1]; Faisal Hidayat[1]; Ivan Yudho[1]; [1]PT Inalum (Persero)

**4:50 PM**
**AP44 Development at Alma**: Pascal Thibeault[1]; *Louis Guimond*[1]; Véronique Dassylva-Raymond[1]; Joseph Langlais[1]; René Gariépy[1]; Olivier Martin[1]; [1]Rio Tinto

**5:15 PM**
**EGA New D20+ Technology with Reduced Energy Consumption**: *Ali Jassim*[1]; Ali Alzarouni[1]; Sergey Akhmetov[1]; Yousuf Ahli[1]; Alexander Arkhipov[1]; Abdallah Al Jaziri[1]; [1]Emirates Global Aluminium

**5:40 PM Concluding Comments**

## Biodegradable Materials for Medical Applications – Polymers and Glasses

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Jaroslaw Drelich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund; Jan Seitz, Syntellix AG; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California-Riverside

Thursday PM
March 15, 2018
Room: 226A
Location: Phoenix Convention Center

*Session Chairs:* Huinan Liu, University of California Riverside; Jaroslaw Drelich, Michigan Technological University

**2:00 PM Keynote**
**Development of a Bioresorbable Vascular Scaffold for Treating Coronary Artery Disease: A Case Study**: *Mary Beth Kossuth*[1]; [1]Abbott Vascular

**2:40 PM Invited**
**Surface Modification of Biomaterials by Plasma-based Technology**: *Paul Chu*[1]; [1]City University of Hong Kong

**3:10 PM**
**Study on Polylactide-coconut Fibre for Biomedical Applications**: *Oluwashina Gbenebor*[1]; Rasaq Atoba[1]; Emmanuel Akpan[2]; Abraham Aworinde[3]; Samuel Olaleye[1]; Samson Adeosun[1]; [1]University of Lagos; [2]Institut fur Verbundwerkstoffe; [3]Department of Mechanical Engineering, Covenant University

**3:30 PM Break**

**3:50 PM**
**Biocompatibility of Biodegradable Mg-Zn-Ca Metallic Glass**: *Carlos Elias*[1]; Daniel Fernandes[1]; Celso Resende[1]; Ana Almeida[1]; Heraldo Elias[1]; [1]Instituto Militar de Engenharia

**4:10 PM**
**Biodegradable Borate Glass for Wound Healing and Bone Regeneration Implants via Boronizing**: *Bakr Rabeeh*[1]; Nora Abu Bakr[1]; Mahmoud M. Abu Elkhair[1]; [1]German University in Cairo, GUC

**4:30 PM**
**Progress on Bioabsorbable Zn Alloys for Vascular Stent Applications**: *Ehsan Mostaed*[1]; Jaroslaw Drelich[1]; [1]Michigan Technological University

## Building an ICME Infrastructure: Developing Tools that Integrate Across Length and Time Scales to Accelerate Materials Design – Integration Tools and Methods for Linking Processing-structure-property Relationships

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
*Program Organizers:* Carelyn Campbell, National Institute of Standards and Technology; Mark Carroll, Federal Mogul Powertrain; Adam Hope, Thermo-Calc Software; Hojun Lim, Sandia National Laboratories; Myoung-Gyu Lee, Korea University; Amy Clarke, Colorado School of Mines; Dongwon Shin, Oak Ridge National Laboratory

Thursday PM
March 15, 2018
Room: 132C
Location: Phoenix Convention Center

*Session Chairs:* Adam Hope, Thermo-Calc; Carelyn Campbell, National Institute of Standards and Technology

**2:00 PM Invited**
**Current Status of ICME Infrastructure in the Aerospace Industry**: *Vasisht Venkatesh*[1]; X. Liu[1]; R. Noraas[1]; A. Peles[1]; S. Mosbah[1]; David Furrer[1]; [1]Pratt & Whitney

**2:40 PM**
**Modeling the Microstructural Evolution and Yield Strength in an Advanced Die Casting Aluminum Alloy**: *Qianying Shi*[1]; Tracy Berman[1]; John Allison[1]; [1]University of Michigan

**3:00 PM**
**A Coupled Experimental and Computational Investigation of Creep-resistant Mg-RE-Zn Alloy**: *Deep Choudhuri*[1]; S Srinivasan[1]; M Gibson[1]; R Banerjee[1]; [1]University of North Texas

**3:20 PM**
**Quantitative Approaches to Identification and Characterization of Microtexture Regions in Titanium Alloys**: *Sean Donegan*[1]; Adam Pilchak[1]; Ashley Wissel[1]; [1]Air Force Research Laboratory

**3:40 PM Break**

**4:00 PM Invited**
**Integration of ICME Tools for the Design of Co-base Single Crystals**: Robert Rhein[1]; Colin Stewart[1]; Sean Murray[1]; Mike Titus[1]; Carlos Levi[1]; *Tresa Pollock*[1]; [1]University of California, Santa Barbara

**4:40 PM**
**Coupled Crystal Plasticity-phase Field Method to Model Crack Initiation and Propagation in Ti64 Alloys**: *Jiahao Cheng*[1]; Somnath Ghosh[1]; [1]Johns Hopkins University

**5:00 PM**
**Uncertainty Quantification and Propagation through CALPHAD Thermodynamics and Integrated Computational Materials Engineering (ICME)**: *Jeff Doak*[1]; Abhinav Saboo[1]; Dana Frankel[1]; Nick Hatcher[1]; James Saal[1]; Greg Olson[1]; [1]QuesTek Innovations

## Bulk Metallic Glasses XV – Modeling and Thermal Properties

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Thursday PM
March 15, 2018
Room: 122A
Location: Phoenix Convention Center

*Session Chairs:* Karin Dahmen, University of Illinois at Urbana Champaign; Weidong Li, The University of Tennessee, Knoxville

**2:00 PM Invited**
**Theoretical Analysis of Shear-band Arrangements in Notched Bulk Metallic Glasses**: *Weidong Li*[1]; Yanfei Gao[1]; Hongbin Bei[2]; [1]The University of Tennessee; [2]Oak Ridge National Laboratory

**2:20 PM Invited**
**Influence of Nanoscale Structural Heterogeneity on Shear Banding in Metallic Glasses**: *Pengyang Zhao*[1]; Ju Li[2]; Jinwoo Hwang[1]; Yunzhi Wang[1]; [1]The Ohio State University; [2]MIT

**2:40 PM Invited**
**Unique Crystallization Dynamics by Flash DSC in Zn-based Metallic Glass**: *Meng Gao*[1]; John Perepezko[1]; [1]University of Wisconsin-Madison

**3:00 PM**
**Tuning Metallic Glass Characteristics via Manipulating Icosahedral Order and Packing Density**: *Geunhee Yoo*[1]; Eunsoo Park[1]; Ke-Fu Yao[2]; Chaewoo Ryu[1]; Jungsoo Lee[1]; JiaLun Gu[2]; [1]Seoul National University; [2]Tsinghua University

**3:20 PM Break**

**3:40 PM**
**Features of Interfaces in a Cu-Zr-Al Based Metallic Glass Obtained by Densification of Amorphous Powders**: *Jean-Marc Pelletier*[1]; Sandrine Cardinal[1]; Qing Wang[2]; Guoqiang Xie[3]; Jichao Q[4]; [1]INSA-Lyon; [2]City University; [3]Shenzhen Graduate School; [4]NPWU

**4:00 PM**
**Isochronal Crystallization Kinetics of Fe – Based Amorphous Alloy Powder**: Tanaji Paul[1]; Archana Loganathan[2]; Arvind Agarwal[2]; *Sandip Harimkar*[1]; [1]Oklahoma State University; [2]Florida International University

**4:20 PM**
**Relationship between STZ Properties, Beta Relaxation and Ductility of Metallic Glasses**: *Tianjiao Lei*[1]; Luis DaCosta[1]; Michael Atzmon[1]; [1]University of Michigan

**4:40 PM**
**Fictive Temperature Controlling Ductility in Metallic Glasses**: *Jittisa Ketkaew*[1]; Eran Bouchbinder[2]; Jan Schroers[1]; [1]Yale University; [2]Weizmann Institute of Science

## Bulk Metallic Glasses XV – Structures and Characterization

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

Thursday PM
March 15, 2018
Room: 121C
Location: Phoenix Convention Center

*Session Chairs:* Robert Maass, University of Illinois at Urbana-Champaign; Xie Xie, FCA US LLC

**2:00 PM Invited**
**Aging Dynamics around a Shear Band in a Metallic Glass**: *Robert Maass*[1]; Stefan Kuechemann[1]; Chaoyang Liu[1]; Eric Dufresne[2]; Jeremy Shin[1]; [1]University of Illinois at Urbana-Champaign; [2]Argonne National Laboratory

**2:20 PM Invited**
**A Total Scattering Study of Thermal Expansion of Bulk Metallic Glasses**: *Dong Ma*[1]; Alexandru Stoica[1]; [1]Oak Ridge National Laboratory

**2:40 PM Invited**
**Deformation Induced Structural Relaxation in La-based BMGs**: *Hui Wang*[1]; Wojciech Dmowski[1]; Zengquan Wang[1]; Jichao Qiao[2]; Rongjie Xue[3]; Meng Gao[3]; Hongbin Bei[4]; Takeshi Egami[4]; [1]University of Tennessee, Knoxville; [2]Northwestern Polytechnical University; [3]Chinese Academy of Sciences; [4]Oak Ridge National Laboratory

**3:00 PM Invited**
**Nanostructure Characterization and Fracture Toughness Properties of a Thermomechanically Processed Zr-based Bulk Metallic Glass**: *Jamie Kruzic*[1]; Bosong Li[1]; Simon Ringer[2]; Keita Nomoto[2]; Shenghui Xie[3]; [1]UNSW Sydney; [2]The University of Sydney; [3]Shenzhen University

**3:20 PM Break**

**3:35 PM Invited**
**Effect of Co Addition on Martensitic Transformation in a B2-containing CuZr-based BMG Composite Revealed by In Situ Neutron Diffraction**: *Gian Song*[1]; Dong Ma[1]; Ke An[1]; Chanho Lee[2]; Shuying Chen[2]; Peter Liaw[2]; Sung-Hwan Hong[3]; Ki Buem Kim[3]; [1]Oak Ridge National Laboratory; [2]University of Tennessee, Knoxville; [3]Sejong University

**3:55 PM Invited**
**Local Dynamics in Metallic Liquids Studied by Inelastic Neutron Scattering**: *Zengquan Wang*[1]; Wojciech Dmowski[1]; Hui Wang[1]; Takeshi Egami[1]; Kenneth Kelton[2]; [1]University of Tennessee, Knoxville; [2]Washington University in St. Louis

**4:15 PM**
**DSC Studies of the Transformations of Short-range Orders in Pd-Ni-P BMGs**: *L. Wang*[1]; X. Wang[1]; Hin Wing Kui[1]; [1]The Chinese University of Hong Kong

**4:35 PM Invited**
**Solid State Joining of AMZ4 Bulk Metallic Glass to Crystalline Alloys by Power Ultrasonics**: Frank Balle[1]; *Michael Becker*[1]; Alexander Kuball[2]; Ralf Busch[2]; Isabella Gallino[2]; [1]University of Kaiserslautern; [2]Saarland University

**4:55 PM**
**Shear-band Thickness and Cavitation in a Zr-based Metallic Glass**: *Chaoyang Liu*[1]; Vladimir Roddatis[2]; Peter Kenesei[3]; Robert Maass[1]; [1]University of Illinois at Urbana-Champaign; [2]University of Goettingen; [3]Argonne National Laboratory

## Cast Shop Technology – Continuous Casting

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Mark Badowski, Hydro Aluminium

Thursday PM
March 15, 2018
Room: 222A
Location: Phoenix Convention Center

*Session Chair:* Kai Karhausen, Hydro Aluminium Rolled Products GmbH

**2:00 PM Introductory Comments**

**2:05 PM**
**Continuous Casted Aluminum Flat Products Corrosion Characteristic According to Downstream Process**: *Ali Ulus*[1]; Gökhan Orhan[2]; Gökçe Hapçi Agaoglu[2]; Sadik Kaan Ipek[1]; Hamdi Ekici[1]; [1]Teknik Aluminium; [2]Istanbul University

**2:30 PM**
**Controlling the Microstructural Evolution during Soft Annealing of Cold Rolled Twin-roll Cast AlMnMg Alloys by Homogenization Heat Treatment**: *Onur Meydanoglu*[1]; Cemil Isiksaçan[1]; Mert Günyüz[1]; Hatice Mollaoglu Altuner[1]; [1]Assan Alüminyum San. ve Tic. A.S.

**2:55 PM**
**Investigation of Elemental Distribution in the Sheet Sections after Aluminum Continuous Sheet Casting, Cold Rolling and Heat Treatment Processes**: *Ali Ulus*[1]; Ebubekir Koç[2]; Zafer Çagatay Öter[2]; Sadik Kaan Ipek[1]; Hamdi Ekici[1]; [1]Teknik Aluminium; [2]Fatih Sultan Mehmet University

**3:20 PM**
**Tailoring the Materials Properties with a Holistic Approach From Casting to Back Annealing**: *Cemil Isiksaçan*[1]; Onur Meydanoglu[1]; Onur Birbasar[1]; Mert Gülver[1]; [1]Assan Alüminyum San. ve Tic. A.S.

## Characterization of Minerals, Metals, and Materials – Thermal Processing and Analysis

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

Thursday PM
March 15, 2018
Room: 122C
Location: Phoenix Convention Center

*Session Chair:* John Carpenter, Los Alamos National Laboratory

**2:00 PM Introductory Comments**

**2:05 PM Invited**
**Buildup Formation Mechanism of Carbon Sleeve in Continuous Annealing Furnace for Silicon Steel**: *Mingsheng He*[1]; Guohua Xie[1]; Xuecheng Gong[1]; Wangzhi Zhou[1]; Jing Zhang[1]; Jian Xu[1]; [1]Wuhan Iron & Steel Co., Ltd.

**2:25 PM**
**Effect of Casting Speed on Hot Ductility and Precipitation Kinetics of Micro-alloyed Steels during Continuous Casting**: Hossam Ibrahim[1]; *Heinz Palkowski*[1]; [1]Clausthal University of Technology

**2:45 PM**
**In-situ Measurement System for Prediction of the Hot Tearing Tendency of Steel**: *Michel Wurlitzer*[1]; Babette Tonn[1]; [1]Clausthal University of Technology

**3:05 PM**
**Pulse Parameter Characterization in Microdrilling of Maraging Steel 300 Alloy**: *Shivraj Narayan Yeole*[1]; Nunna Nagabhushana Ramesh[2]; Banoth Balu Naik[3]; Ramya Alluru[1]; [1]VNR Vignana Jyothi Institute of Engineering & Technology; [2]Anurag Group of Institutions; [3]JNTU College of Engineering

**3:25 PM**
**Physical and Chemical Properties of Melt-spun $Fe_{bal}Si_x$ (x = 3-8 wt. %) Soft Magnetic Ribbons**: Nicole Overman[1]; *Xiujuan Jiang*[1]; Ravi Kukkadapu[1]; Trevor Clark[2]; Timethy Roosendaal[1]; Gregory Coffey[1]; Jeffrey Shield[3]; Suveen Mathaudhu[1]; [1]Pacific Northwest National Laboratory; [2]University of California-Riverside; [3]University of Nebraska-Lincoln

**3:45 PM Break**

**4:00 PM**
**Interpretation of Coal Quality Using Laboratory Based Features over VNIR Bands**: *Nafisa Begum*[1]; Debashish Chakravarty[1]; Bhabani Das[1]; [1]IIT Kharagpur

**4:20 PM**
**Characterization of Coke-making Coals of High Reactivity from Northwest China**: *Qiang Wu*[1]; Zizong Zhu[1]; Guojing Shi[1]; Feng Wang[1]; Yangyang Xie[1]; [1]Chongqing University

**4:40 PM**
**Spherical Nanoindentation Investigation on Ti-Pt-Ni-Hf Shape Memory Alloys**: *Ali Khosravani*[1]; Manu Mohan[2]; Dipankar Banerjee[2]; Surya Kalidindi[1]; [1]Georgia Institute of Technology; [2]Indian Institute of Science

**5:00 PM**
**The Anodic Behavior of Electro-Deoxidation of Titanium Dioxide in Calcium Chloride Molten Salt**: *Pingsheng Lai*[1]; Meilong Hu[1]; Leizhang Gao[1]; Zhengfeng Qu[1]; Chenguang Bai[1]; [1]Chongqing University

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Thermodynamics

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Thursday PM
March 15, 2018
Room: 131A
Location: Phoenix Convention Center

*Session Chairs:* Ying Chen, Tohoku University; Joerg Neugebauer, Max-Planck-Institut fuer Eisenforschung

**2:00 PM Invited**
**Modelling Structural Materials in Realistic Environments by Ab Initio Thermodynamics**: Joerg Neugebauer[1]; Fritz Koermann[1]; Blazej Grabowski[1]; *Tilmann Hickel*[1]; Mira Todorova[1]; [1]Max-Planck-Institut fuer Eisenforschung

**2:30 PM**
**Improvement of Energy Models for Magnetic Alloys and Nanoalloys**: *Christine Goyhenex*[1]; Mariem Sansa[2]; Jacques René Eone II[1]; Guy Tréglia[3]; Bernard Legrand[4]; Adnene Dhouib[5]; Fabienne Ribeiro[6]; [1]Institut de Physique et Chimie des Matériaux de Strasbourg; [2]LSAMA; [3]CINaM; [4]CEA, DEN, Service de Recherches de Métallurgie Physique; [5]College of Science, Dammam; [6]IRSN

**2:50 PM**
**Absolute Value Estimation of Thermodynamic Properties in Ni-Al Alloys Using a First Principles Renormalized Potential**: *Ryoji Sahara*[1]; Toshio Osada[1]; Swastibrata Bhattacharyya[2]; Kaoru Ohno[2]; [1]National Institute for Materials Science; [2]Yokohama National University

**3:10 PM**
**Phase Stability and Martensitic Transitions in NiTi from First Principles Simulations**: *Justin Haskins*[1]; John Lawson[2]; [1]AMA Inc, NASA Ames Research Center; [2]NASA Ames Research Center

**3:30 PM Break**

**3:45 PM**
**Phase Stability and Chemical Composition of Nanoprecipitates: A First Principles Study for the Example of Kappa Carbides**: *Tilmann Hickel*[1]; Poulumi Dey[1]; Biswanath Dutta[1]; Martin Friák[2]; Joerg Neugebauer[1]; [1]Max-Planck-Institut fuer Eisenforschung GmbH; [2]Academy of Sciences of the Czech Republic

**4:05 PM Invited**
**Stability and Effects of Substitutional Elements in $NdFe_{12}$-based Compounds**: *Ying Chen*[1]; Arkapol Saengdeejing[1]; [1]Tohoku University

**4:35 PM**
**Non-equilibrium Simulations of 4H Silicon Carbide**: *Rachel Flanagan*[1]; Eric Hahn[2]; Shiteng Zhao[1]; Carlos Ruestes[3]; Chris Wehrenberg[4]; Bruce Remington[4]; Marc Meyers[1]; [1]UCSD; [2]Los Alamos National Laboratories; [3]National University of Cuyo, Mendoza; [4]Lawrence Livermore National Laboratories

**4:55 PM**
**On the Behavior of Liquid Ga Precipitates in Solid Al**: *Sanket Navale*[1]; Michael Demkowicz[2]; [1]Massachusetts Institute of Technology; [2]Texas A&M University

**5:15 PM**
**Thermodynamics of Pb-Sn System in Molecular Dynamics Simulations**: *Seyed-Alireza Etesami*[1]; Ebrahim Asadi[1]; [1]University of Memphis

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Transport

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Thursday PM
March 15, 2018
Room: 131B
Location: Phoenix Convention Center

*Session Chairs:* Xingqiu Chen, Institute of Metal Research, Chinese Academy of Science; Wenqing Zhang, Southern Unversity of Science and Technology

**2:00 PM Invited**
**Lattice Dynamics and Thermal Transport in Part-crystalline Part-liquid Materials through Molecular Dynamics Simulations**: *Wenqing Zhang*[1]; Hongliang Yang[2]; Yancheng Wang[2]; [1]Southern Unversity of Science and Technology; [2]SICCAS

**2:30 PM**
**Thermal Transport in Ni-containing FCC Concentrated Solid Solutions from First Principles**: *German Samolyuk*[1]; Sai Mu[1]; Sebastian Wimmer[2]; Sergiy Mankovsky[2]; Hubert Ebert[2]; Malcolm Stocks[1]; [1]Oak Ridge National Laboratory; [2]Ludwig-Maximilians-Universitat Munchen

**2:50 PM**
**A Predictive Computational Route to Quantitatively Evaluate the Effect of Doping on Reducing Thermal Conductivity of Ceramic Oxides**: Guoqiang Lan[1]; *Jun Song*[1]; [1]McGill University

**3:10 PM**
**Thermoelectric Model of High ZT Nanoengineered Bulk Silicon for High Temperature Applications**: *Seyed Aria Hosseini*[1]; Jackson Harter[2]; Devin Coleman[1]; Todd Palmer[2]; Lorenzo Mangolini[1]; Alex Greaney[1]; [1]University of California, Riverside; [2]Oregon State University

**3:30 PM Break**

**3:45 PM Invited**
**Topological Nodal Lines in Metals**: *Xing-Qiu Chen*[1]; [1]Institute of Metal Research, Chinease Academy of Sciences

**4:15 PM**
**Formation of Arsenene p-n Junctions via Organic Molecular Adsorption**: *Gao Nan*[1]; [1]Changchun University

**4:35 PM**
**Computational Approach to the Magnetic Properties of Ga-added Nd-Fe-B Sintered Magnets**: *Yasutomi Tatetsu*[1]; Shinji Tsuneyuki[2]; Yoshihiro Gohda[1]; [1]Tokyo Institute of Technology; [2]The University of Tokyo

**4:55 PM**
**Cu Substituted CeCo5: New Optimal Permanent Magnetic Material with Reduced Criticality**: Rajiv Chouhan[1]; *Durga Paudyal*[1]; [1]Critical Materials Institute, Ames Laboratory, U. S. Department of Energy

**5:15 PM**
**First-principles-based Novel Materials Design for Pb-free Perovskite Solar Cell**: *Donghwa Lee*[1]; [1]Pohang University of Science and Technology (POSTECH)

## Computational Method and Experimental Approaches for Model Development and Validation, Uncertainty Quantification, and Stochastic Predictions – UQ and Validation of Mesoscale Simulations

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory; Richard Hennig, University of Florida; Avinash Dongare, University of Connecticut; Shawn Coleman, U.S. Army Research Laboratory; Niaz Abdolrahim, University of Rochester; Joseph Bishop, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Li Ma, National Institute of Standards and Technology

Thursday PM
March 15, 2018
Room: 132B
Location: Phoenix Convention Center

*Session Chair:* Joseph Bishop, Sandia National Laboratories

**2:00 PM Invited**
**Dynamic Failure of High Energy Materials: Uncertainty Quantification and Stochastic Predictions**: *Marisol Koslowski*[1]; Nicolo Grilli[1]; Camilo Duarte Cordon[1]; Akshay Dandekar[1]; [1]Purdue University

**2:30 PM**
**Overcoming Singularities within Rate-independent Crystal Plasticity to Enable Realistic Latent Hardening**: *Milovan Zecevic*[1]; Marko Knezevic[1]; [1]University of New Hampshire

**2:50 PM**
**Bayesian Linear Regression and Kriging Methods for Uncertainty Quantification in Process-structure-property Linkages of Low Carbon Steels and Superalloys**: *Yuksel Yabansu*[1]; Almambet Iskakov[1]; Sudhir Rajagopalan[2]; Anna Kapustina[2]; Surya Kalidindi[1]; [1]Georgia Institute of Technology; [2]Siemens Energy Inc

**3:10 PM Invited**
**Parametrically Homogenized Models of Deformation and Failure of Metals and Alloys with Uncertainty-quantification**: *Somnath Ghosh*[1]; [1]Johns Hopkins University

**3:40 PM Break**

**4:00 PM**
**The Current State of Phase Field Benchmark Problems Developed by CHiMaD/NIST**: *Andrea Jokisaari*[1]; Daniel Wheeler[2]; Peter Voorhees[1]; Jonathan Guyer[2]; James Warren[2]; Olle Heinonen[3]; [1]Northwestern University; [2]National Institute of Standards and Technology; [3]Argonne National Laboratory

**4:20 PM**
**Property Localization: Quantifying the Uncertainty of Inferred Constitutive Models for Grain Boundaries**: *Christian Kurniawan*[1]; Oliver Johnson[1]; [1]Brigham Young University

## Deriving Value from Challenging Waste Streams: Recycling and Sustainability Joint Session – Industrial Streams II

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee, TMS: Pyrometallurgy Committee
*Program Organizers:* Elsa Olivetti, Massachusetts Institute of Technology; John Howarter, Purdue University; Fiseha Tesfaye, Åbo Akademi University

Thursday PM
March 15, 2018
Room: 224B
Location: Phoenix Convention Center

*Session Chairs:* John Howarter, Purdue; Elsa Olivetti, MIT

**2:00 PM Introductory Comments**

**2:05 PM**
**Tannic Acid as a Flame Retardant - Deriving Value from Leather Tanning Waste**: *Matthew Korey*[1]; John Howarter[1]; [1]Purdue University

**2:25 PM**
**Kinetic Investigations on the Recovery of Residues from the Stainless Steel Industry**: *Manuel Leuchtenmueller*[1]; [1]University of Leoben

**2:45 PM**
**Rapid Removal of Pb(II) from Acid Wastewater Using Vanadium Titanium-bearing Magnetite Particles Coated by Humic Acid**: *Manman Lu*[1]; Yuanbo Zhang[1]; Zijian Su[1]; Bingbing Liu[1]; Guanghui Li[1]; Tao Jiang[1]; [1]Central South University

**3:05 PM**
**Study of the Synthesis of $MgAl_2O_4$ Spinel Refractory from Waste Chromium Slag of a Chrome Plant in China**: *Meng Jinxia*[1]; [1]University of Science and Technology Beijing

**3:25 PM Break**

**3:40 PM**
**An Eco-friendly Extraction Method for Recovery of Valuable Metals from Spent Ni-W/$Al_2O_3$-$SiO_2$ Catalysts**: *Wenqiang Wang*[1]; Shengming Xu[1]; [1]Tsinghua University

**4:00 PM**
**Effect of Ferrosilicon on Reduction of $Cr_2O_3$ in Steelmaking Slags**: *Yue Yu*[1]; Jianli Li[1]; [1]Wuhan University of Science and Technology

**4:20 PM**
**Complete Recycling of Waste Diamond Cutting Tools by an Electrochemical Method**: Tansu Altunbasak[1]; Mehmet Kul[2]; Ishak Karakaya[1]; *Esra Karakaya*[1]; [1]Middle East Technical University; [2]Cumhuriyet University

## Frontiers in Solidification Science and Engineering – Computational Modelling of Solidification: From Nano to Macro Scales

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee
*Program Organizers:* Mohsen Asle Zaeem, Missouri University of Science and Technology; Damien Tourret, IMDEA Materials Institute; Mohsen Eshraghi, California State University, Los Angeles; Johannes Hötzer, University of Applied Science Karlsruhe

Thursday PM
March 15, 2018
Room: 126C
Location: Phoenix Convention Center

*Session Chairs:* Johannes Hötzer, Karlsruhe University of Applied Sciences; Mohsen Eshraghi, California State University, Los Angeles

**2:00 PM**
**A Quantitative Phase-field Crystal Model to Study Particle Coarsening in Binary Systems**: *Ahmad Nourian-Avval*[1]; Ebrahim Asadi[1]; [1]University of Memphis

**2:20 PM**
**Phase-field Modelling of Intermetallic Solidification**: *Andrew Mullis*[1]; Peter Jimack[1]; Peter Bollada[1]; [1]University of Leeds

**2:40 PM**
**Variational Formulation of a Quantitative Phase-field Model for Non-isothermal Solidification in Multi-component Alloys and its Applications**: *Munekazu Ohno*[1]; Tomohiro Takaki[1]; Yasushi Shibuta[2]; [1]Hokkaido University; [2]The University of Tokyo

**3:00 PM**
**Multi-GPU Phase-field Simulation of Growth, Motion and Collision of Multiple Dendrites**: *Shinji Sakane*[1]; Tomohiro Takaki[1]; Munekazu Ohno[2]; Yasushi Shibuta[3]; Takashi Shimokawabe[3]; Takayuki Aoki[4]; [1]Kyoto Institute of Technology; [2]Hokkaido University; [3]The University of Tokyo; [4]Tokyo Institute of Technology

**3:20 PM Break**

**3:40 PM**
**Multiscale Dendritic Needle Network Model for Dendritic Solidification with Liquid Convection**: *Damien Tourret*[1]; [1]IMDEA Materials Institute

**4:00 PM**
**Mesoscopic Envelope Model for Equiaxed and Columnar Dendritic Growth Coupled with Flow**: *Alexandre Viardin*[1]; Miha Zaloznik[2]; Youssef Souhar[3]; Markus Apel[1]; Hervé Combeau[2]; [1]ACCESS e.V; [2]IJL; [3]ENSAM

**4:20 PM**
**Simulation of Macrosegregation and Columnar to Equiaxed Transition in a Solidification Benchmark Problem**: *Mahdi Torabi Rad*[1]; Christoph Beckermann[1]; [1]University of Iowa

## High Entropy Alloys VI – Alloy Development and Applications 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

Thursday PM
March 15, 2018
Room: 121B
Location: Phoenix Convention Center

*Session Chairs:* Mitra Taheri, Drexel University; Eun Park, Seoul National Univerisity

**2:00 PM Invited**
**Processing and Characterization of High Entropy Alloys for Extreme Environments**: *Mitra Taheri*[1]; Elaf Anber[1]; Haoyan Diao[2]; Christopher Barr[3]; Shang-Hao Huang[1]; Peter Liaw[2]; Leslie Lamberson[1]; Junpeng Liu[4]; Yong Zhang[4]; [1]Drexel University; [2]University of Tennessee; [3]Sandia National Laboratory; [4]University of Science and Technology Beijing

**2:20 PM**
**Derivation of Non-equiatomic MnFeCoNiCu High Entropy Alloy and its Relation to the Equiatomic Counterpart**: *Artashes Ter-Isahakyan*[1]; Azin Akbari[1]; Thomas Balk[1]; [1]University of Kentucky

**2:40 PM**
**Optimization of Strength and Ductility in Mo-Ta-Nb-V-Ti BCC High Entropy Alloys**: *Sang Jun Kim*[1]; Hyun Seok Oh[1]; Eun Soo Park[1]; [1]Seoul National Univerisity

**3:00 PM**
**Development of Oxidation Resistant Refractory High Entropy Alloys for High Temperature Applications: Recent Results and Development Strategy**: *Bronislava Gorr*[1]; Franz Mueller[1]; Hans-Juergen Christ[1]; Hans Chen[2]; Alexander Kauffmann[2]; Dorothée Vinga Szabó[2]; Ruth Schweiger[2]; Martin Heilmaier[2]; [1]University Siegen; [2]Karlsruhe Institute of Technology

**3:20 PM Break**

**3:40 PM Invited**
**Solution Strengthening in FCC High Entropy Alloys**: *Celine Varvenne*[1]; Satish Rao[2]; Wolfram Nohring[3]; William Curtin[3]; [1]Aix-Marseille University-CNRS; [2]Air Force Research Laboratory; [3]EPFL

**4:00 PM**
**Resistance Spot Welding of Dissimilar FeCoNiCrCu0.5 High Entropy Alloys-to-AISI 304L Stainless Steel: Microstructural Evolution and Metallurgy Mode Analysis**: *Jia-Chi Li*[1]; Chun-Ming Lin[1]; Cheng-Shun Chen[1]; [1]National Taipei University of Technology

**4:20 PM**
**Manipulation of Deformation Mechanism in FCC HEA by Al Addition**: *Kook Noh Yoon*[1]; Hyun Seok Oh[1]; Eun Soo Park[1]; [1]Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University

**4:40 PM**
**Evolution of the Solid Solution Strengthening in FCC Multi-component Alloys: Towards High Entropy Alloys Design**: *Guillaume Bracq*[1]; Mathilde Laurent-Brocq[1]; Loïc Perrière[1]; Rémi Pirès[1]; Jean-Marc Joubert[1]; Ivan Guillot[1]; [1]ICMPE

**5:00 PM**
**Role of Copper in Nucleation and Stabilization of Ordered L12 Precipitates in HEAs**: *Bharat Gwalani*[1]; Rajarshi Banerjee[1]; [1]University of North Texas Denton

## High Entropy Alloys VI – Mechanical and Other Properties III

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

Thursday PM
March 15, 2018
Room: 121A
Location: Phoenix Convention Center

*Session Chairs:* Che-Wei Tsai, National Tsing Hua University; Bernd Gludovatz, UNSW Sydney

**2:00 PM**
**Elastic Stability and Lattice Distortion of Refractory High Entropy Alloys**: *Bojun Feng*[1]; Michael Widom[1]; [1]Carnegie Mellon University

**2:20 PM**
**Flow Stress and Activation Volume of FCC Metals and Low to Medium Entropy Alloys**: *Takahiro Kunimine*[1]; Kosei Tsujikawa[1]; Chihiro Watanabe[1]; Ryoichi Monzen[1]; [1]Kanazawa University

**2:40 PM**
**Screening of Structure and Properties of FCC Thin Film HEAs Using Compositional Gradient Samples**: *Azin Akbari*[1]; Artashes Ter-Isahakyan[1]; T. Balk[2]; [1]University of Kentucky

**3:00 PM**
**Effects of Solidification Conditions on Microstructure and Properties of the CoCrFeMnNi Family of HEAs**: *Anna Fraczkiewicz*[1]; Tomasz Stasiak[1]; Jerzy Latuch[2]; Dariusz Oleszak[2]; [1]MINES St-Etienne; [2]Warsaw Technical University

**3:20 PM Break**

**3:40 PM Invited**
**On the Damage Tolerance of TRIP, TWIP and Dual-phase High-entropy Alloys**: *Bernd Gludovatz*[1]; Hyunseok Oh[2]; Eun Soo Park[2]; Robert Ritchie[3]; [1]UNSW Sydney; [2]Seoul National University; [3]Lawrence Berkeley National Laboratory

**4:00 PM Invited**
**Effect of NiAl Precipitates on Grain Refinement in AlxCoCrFeNi High Entropy Alloys**: *Hiroyuki Yasuda*[1]; Hiroyuki Miyamoto[1]; Ken Cho[1]; Takeshi Nagase[1]; [1]Osaka University

**4:20 PM**
**Effect of NbC on Microstructure and Mechanical Properties of Selected HEA Alloys from CoCrFeMnNi Family**: *Julia Olszewska*[1]; Adrianna Lozinko[1]; Julia Olszewska[2]; Jean Denis Mithieux[2]; Anna Fraczkiewicz[1]; [1]MINES St Etienne; [2]APERAM

**4:40 PM**
**Plastic Behavior of a CoCrFeMnNi Alloy under Monotonic-tension and Low-cycle-fatigue Loading**: *Yu-Lun Jao*[1]; Stefanus Harjo[2]; E-Wen Huang[1]; [1]National Chiao Tung University; [2]Japan Proton Accelerator Research Complex (J-PARC)

## High Temperature Corrosion of Structural Materials – Hot Corrosion, Materials Developed for Corrosive Environments at Elevated Temperatures, and Ti-alloys II

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
*Program Organizers:* Kinga Unocic, Oak Ridge National Laboratory; David Shifler, Office of Naval Research; Mark Weaver, University of Alabama; Steve Coryell, Special Metals; James Earthman, University of California, Irvine

Thursday PM
March 15, 2018
Room: 227C
Location: Phoenix Convention Center

*Session Chair:* To Be Announced

**2:00 PM Invited**
**High Temperature Degradation Mechanisms of Ceramic Matrix Composites: BN Effects**: *Elizabeth Opila*[1]; [1]University of Virginia

**2:30 PM**
**Oxidation Resistance of AlN Modified $ZrB_2$ -SiC Ultra High Temperature Ceramics**: *Gaoyuan Ouyang*[1]; Pratik Ray[2]; Matthew Kramer[2]; Mufit Akinc[1]; [1]Iowa State University; [2]Ames Laboratory

**2:50 PM**
**Protection of Ti Based Materials Against High Temperature Oxidation by the Fluorine Effect**: *Alexander Donchev*[1]; Mathias Galetz[1]; [1]Dechema-Forschungsinstitut

**3:10 PM**
**Stability of Protective Oxide Scales Formed on Pure Titanium with Silicon-bearing Films**: *Kathleen Chou*[1]; Peng-Wei Chu[1]; Carlos Levi[2]; Emmanuelle Marquis[1]; [1]University of Michigan; [2]University of California, Santa Barbara

**3:30 PM Break**

**3:50 PM**
**Studies on Isothermal and Cyclic Oxidation Behavior of Titanium Aluminide Coating Developed by Laser Cladding**: Jyotsna Dutta Majumdar[1]; *Anupama Dutta*[1]; [1]Indian Institute of Technology Kharagpur

**4:10 PM**
**Effect of Near Service Environmental Conditions on the High Temperature Damage Behavior of an Intermetallic TiAl Alloy**: *Christian Löffl*[1]; Holger Saage[1]; Mathias Göken[2]; [1]University of Applied Sciences Landshut; [2]Friedrich-Alexander-University Erlangen-Nürnberg

**4:30 PM**
**Kinetics of Pack-aluminized Coating Layer on Ti-6Al-4V Alloys and Oxidation Behaviors of the Coated Alloy**: Jinsoo Park[1]; Kwangsoo Choi[2]; Minkyu Kim[2]; *Joon Sik Park*[2]; [1]Instech Co. Ltd.; [2]Hanbat National University

**4:50 PM**
**CALPHAD Based Modelling of Oxidation**: Sedigheh Bigdeli[1]; Reza Naraghi[2]; Lina Kjellqvist[2]; Amanda Persdotter[3]; Lars Höglund[1]; Torbjörn Jonsson[3]; *Henrik Larsson*[1]; [1]KTH Royal Institute of Technology ; [2]Thermo-Calc Software; [3]Chalmers University of Technology

## Magnesium Technology 2018 – Thermo-Mechanical Processing

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

Thursday PM
March 15, 2018
Room: 224A
Location: Phoenix Convention Center

*Session Chairs:* Kiran Solanki, Arizona State University; Vineet Joshi, Pacific Northwest National Laboratory - PNNL

**2:00 PM Introductory Comments**

**2:05 PM**
**Mechanical Properties of Thermo-mechanically Treated Extruded Mg-Zn-based Alloys**: *Daria Drozdenko*[1]; Patrik Dobron[1]; Juraj Olejnák[1]; Marius Hegedüs[1]; Klaudia Horváth[1]; Jan Bohlen[2]; [1]Charles University; [2]Helmholtz-Zentrum Geesthacht

**2:25 PM**
**Strengthening of a Biodegradable Mg-Zn-Ca Alloy ZX50 after Processing by HPT and Heat Treatment**: *Andrea Ojdanic*[1]; Erhard Schafler[1]; Jelena Horky[2]; Michael Zehetbauer[1]; Dmytro Orlov[3]; [1]University of Vienna; [2]AIT Austrian Institute of Technology; [3]University of Nova Gorica

**2:45 PM**
**The Recrystallization and Grain Growth Behavior of Unalloyed Mg and a Mg-Al Alloy**: *Aeriel Murphy*[1]; John Allison[1]; [1]University of Michigan

**3:05 PM**
**Microstructure and Mechanical Properties of Mg-7.71Gd-2.39Nd-0.17Zr Alloy after the Different Heat Treatments**: *Shifeng Luo*[1]; Guangyu Yang[1]; Lei Xiao[1]; Wanqi Jie[1]; [1]State Key Laboratory of Solidification Processing, Northwestern Polytechnical University

**3:25 PM Break**

**3:45 PM**
**Strain Heterogeneity Structures in Wrought Magnesium AZ31 under Reversed Loading**: *Cahit Aydiner*[1]; [1]Bogazici University

**4:05 PM**
**Influence of Low Temperature Forging on Microstructure and Low Cycle Fatigue Behavior of Cast AZ31B Mg Alloy**: D. Toscano[1]; *Sugrib Shaha*[1]; S. Behravesh[1]; H. Jahed[1]; Bruce Williams[2]; [1]University of Waterloo; [2]CanmetMATERIALS, Natural Resources Canada

**4:25 PM**
**Superplasticity in a Chip-consolidated $Mg_{97}Zn_1Y_2$ Alloy with LPSO Phase**: *Kazuha Suzawa*[1]; Shin-ichi Inoue[1]; Yoshihito Kawamura[1]; Michimasa Miyanaga[2]; Katsuhito Yoshida[2]; Nozomu Kawabe[2]; Michiaki Yamasaki[1]; [1]Kumamoto University; [2]Sumitomo Electric Industries, LTD.

**4:45 PM**
**Technological Solutions to Apply Magnesium Bulk Materials in Dynamic Bending and Axial Compression Load Cases**: *Elmar Beeh*[1]; Friedrich Horst[1]; Philipp Strassburger[1]; William Altenhof[2]; Ping Zhou[3]; Michael Worswick[3]; Samuel Kim[3]; [1]DLR- Institute of Vehicle Concepts; [2]University of Windsor; [3]University of Waterloo

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Structural Materials VI

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

Thursday PM
March 15, 2018
Room: 104B
Location: Phoenix Convention Center

*Session Chairs:* Clarissa Yablinsky, Los Alamos National Laboratory; Peter Hosemann, University of California, Berkeley

**2:00 PM**
**Chemical Compatibility of Refractory Carbides with Hydrogen at Very High Temperatures Relevant for Nuclear Thermal Propulsion Applications**: *Kelsa Benensky*[1]; Steven Zinkle; Kurt Terrani[2]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory

**2:20 PM**
**Dynamic Strain Aging in Alloy 709 (Fe-25Ni-20Cr)**: *Abdullah Alomari*[1]; Korukonda Murty[1]; Nilesh Kumar[1]; [1]North Carolina State University

**2:40 PM**
**High Temperature Strength Characterization of Alloy 709**: *Nicholas Shaber*[1]; Harrison Pugesek[1]; Jose Ramirez[1]; Martin Taylor[1]; Robert Stephens[1]; Gabriel Potirniche[1]; Indrajit Charit[1]; [1]University of Idaho

**3:00 PM**
**Irradiation Effects on Fe-9%Cr Grain Boundary Strength Measured via In-situ TEM Testing**: Jennifer Watkins[1]; Brian Jaques[1]; *Allyssa Bateman*[1]; Yaqiao Wu[1]; Indrajit Charit[2]; Janelle Wharry[3]; Kayla Yano[1]; Wen Jiang[4]; Chao Jiang[4]; [1]Boise State University; [2]University of Idaho; [3]Purdue University; [4]Idaho National Laboratory

**3:20 PM**
**Metallurgical Analysis of Ti Addition with Ta in Reduced Activation Ferritic-martensitic Steel**: *HanKyu Kim*[1]; Ji-Won Lee[1]; Joon-Oh Moon[2]; Chang-Hoon Lee[2]; Hyun-Uk Hong[1]; [1]Changwon National University; [2]Korea Institute of Materials Science

**3:40 PM Break**

**4:00 PM**
**Effect of Cold Working on the Corrosion and Carburization Behavior of Alloy 800HT in High Temperature $CO_2$ Environment**: *Gokul Obulan Subramanian*[1]; Sung Hwan Kim[1]; Ho Jung Lee[2]; Changheui Jang[1]; [1]KAIST; [2]Central Research Institute, KHNP

**4:20 PM**
**In-situ Testing of Fouling-resistant Coatings for PWR Fuel Cladding**: *Max Carlson*[1]; Alexander Slocum[1]; Michael Short[1]; [1]Massachusetts Institute of Technology

**4:40 PM**
**The Effect of Dpa and Dpa Rate on the Strength and Precipitates Stability in Ion-irradiated Inconel 718**: *Hi Vo*[1]; Laurent Capolungo[2]; John Graham[3]; Nathan Almirall[4]; Scott Tumey[5]; Stuart Maloy[2]; G. Robert Odette[4]; Peter Hosemann[1]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory; [3]Iowa State University; [4]University of California, Santa Barbara; [5]Lawrence Livermore National Laboratory

**5:00 PM**
**Void Swelling Reduction through Deformation Twinning in Austenitic Stainless Steels**: *Gabriel De Bellefon*[1]; Jean Claude van Duysen[2]; Todd Allen[1]; Kumar Sridharan[1]; [1]University of Wisconsin Madison; [2]University of Tennessee

## Materials for Energy Conversion and Storage – Energy Storage IV

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

Thursday PM
March 15, 2018
Room: 229B
Location: Phoenix Convention Center

*Session Chairs:* Partha Mukherjee, Purdue University; Leela Arava, Wayne State University

**2:00 PM Invited**
**Understanding Hollow Metal Oxide Nanomaterial Formation with In Situ Transmission Electron Microscopy**: Lei Yu[1]; Ruixin Han[1]; Xiahan Sang[2]; Jue Liu[2]; Amita Patel[1]; Katherine Page[2]; *Beth Guiton*[1]; [1]University of Kentucky; [2]Oak Ridge National Laboratory

**2:25 PM**
**Are We There Yet? — Predicting the Theoretical Limit for Na Storage of in Hard Carbon Anodes**: Clement Bommier[1]; Woochul Shin[2]; Wesley Surta[2]; Michelle Dolgos[2]; Xiulei Ji[2]; *P Greaney*[3]; [1]Princeton University; [2]Oregon State University; [3]University of California, Riverside

**2:45 PM**
**Evaluation of Thin-film Aluminum Anodes for Lithium-ion Batteries**: Mohammad Hossein Tahmasebi[1]; Dominik Kramer[2]; Reiner Mönig[3]; *Steven Boles*[1]; [1]Department of Electrical Engineering, The Hong Kong Polytechnic University; [2]Helmholtz Institute Ulm for Electrochemical Energy Storage (HIU); [3]Institute for Applied Materials, Karlsruhe Institute of Technology (KIT)

**3:05 PM Invited**
**Exploring the Impact of Transport Properties on the Cycling Dynamics of Redox-active Polymers Using Multi-scale Modeling**: *Kyle Smith*[1]; [1]University of Illinois at Urbana-Champaign

**3:30 PM Break**

**3:45 PM**
**Hydrogen Storage Using Alane Stabilized via Surface Functionalization of Nanoporous Ordered Hard Carbons**: *Waruni Jayawardana*[1]; Christopher Carr[1]; Xander Benziger[2]; Paul Jelliss[2]; Hongyang Zou[3]; Samuel Emery[3]; Mark Conradi[3]; Eric Majzoub[1]; [1]University of Missouri- St. Louis; [2]Saint Louis University; [3]Washington University in St. Louis

**4:05 PM Invited**
**Biomass-derived Lithium-sulfur Batteries with Enhanced Capacity and Extended Lifespan**: *Xiaodong Li*[1]; [1]University of Virginia

**4:30 PM**
**Novel N-rGO Sandwiched Biphasic Sn-SnSb Alloy Nanocomposite for Use as High Performance Anode in Li-ion Battery**: *Sambedan Jena*[1]; Arijit Mitra[1]; S B Majumder[1]; Siddhartha Das[1]; [1]Indian Institute of Technology, Kharagpur

**4;50 PM**
**Hydrogen Evolution Reaction Characteristics of WS2 Electrocatalysts Synthesized via Electrophoretic Deposition from WO3 Colloidal Solution**: *Kyu Hwan Lee*[1]; Sung Mook Choi[1]; Nosang Myung[2]; [1]Korea Institute of Matarials Science; [2]UC Riverside

## Mechanical Behavior at the Nanoscale IV – Atomistic Simulations

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

Thursday PM
March 15, 2018
Room: 101C
Location: Phoenix Convention Center

*Session Chairs:* Lucas Hale, NIST; Seunghwa Ryu, KAIST

**2:00 PM**
**How Strongly Does Calculation Method Influence Atomistic Predictions of Mechanical Properties?**: *Lucas Hale*[1]; Chandler Becker[1]; Zachary Trautt[1]; [1]National Institute of Standards and Technology

**2:30 PM**
**The Effect of the Misfit Dislocation on the In-plane Shear Response of the Ferrite/Cementite Interface**: Jaemin Kim[1]; Keonwook Kang[2]; *Seunghwa Ryu*[1]; [1]KAIST; [2]Yonsei University

**2:50 PM**
**Understanding Effect of Grain Boundaries on Deformation and Strength of Yttria-stabilized Tetragonal Zirconia Bicrystals**: *Ning Zhang*[1]; Mohsen Asle Zaeem[1]; [1]Missouri University of Science and Technology

**3:10 PM**
**Molecular Dynamics Study on Temperature-dependent Screw Dislocation Behavior in Body-centered Cubic Metal Nanopillars**: *Gyuho Song*[1]; Seok-Woo Lee[1]; [1]University of Connecticut

**3:30 PM Break**

**3:50 PM**
**Size Dependent Strength and Plasticity in Nanocrystalline Metals with Amorphous Grain Boundary**: *Afzal Hossain Neelav*[1]; Chuang Deng[1]; [1]University of Manitoba

**4:10 PM**
**Effect of Ag and Zr Solutes on Dislocation Emission from the S11(332) [110] Symmetric Tilt Grain Boundary in fcc Cu.**: *Valery Borovikov*[1]; Mikhail Mendelev[1]; Alexander King[1]; [1]The Ames Laboratory

## Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XVII – Phase Stability of Energy Materials

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University; Thomas Reichmann, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Hiroshi Nishikawa, Osaka University; Shien Ping Feng, The University of Hong Kong; Yee-Wen Yen, National Taiwan University of Science & Technology; Song-Mao Liang, Clausthal University of Technology

Thursday PM
March 15, 2018
Room: 227A
Location: Phoenix Convention Center

*Session Chairs:* Yu Zhong, Worcester Polytechnic Institute; Songmao Liang, Clausthal University of Technology

**2:00 PM Invited**
**Predication of the Intrinsic Properties of Multi-component Electrodes for Li-ion Batteries from Aspect of Thermodynamics**: *Dajian Li*[1]; Weibin Zhang[1]; Thomass Reichmann[1]; Damian Cupid[1]; [1]Karlsruhe Institute of Technology

**2:25 PM**
**Phase Equilibria of the Li-Si-C System for Advanced Anodes in Li-ion Batteries**: *Song-Mao Liang*[1]; Artem Kozlov[1]; Martin Drüe[2]; Markus Rettenmayr[2]; Rainer Schmid-Fetzer[1]; [1]Clausthal University of Technology; [2]Friedrich Schiller University

**2:45 PM**
**High-entropy Oxides Li(Ni0.2Mn0.2Co0.2Zn0.2Cu0.2)O2 as Cathode Materials for Lithium-ion Batteries**: *Po-wei Huang*[1]; Ralph Nicolai Nasara[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

**3:05 PM**
**Liquidus Projection of Quaternary Ge-Sn-Co-Sb System and Thermoelectric Properties of Sn/Ge Doped Skutterudite CoSb3**: *Ping-Yuan Deng*[1]; Hsin-Jay Wu[1]; [1]Department of Materials and Optoelectronic science, National Sun Yat-sen University

**3:25 PM Invited**
**Phase Equilibria and Thermodynamic Assessment of the Mo-Nb-Re Ternary System**: *Shao-yu Yen*[1]; Shu-chang Wu[1]; M. Anshar Makhraja[1]; Kai-Chi Lo[2]; An-Chou Yeh[2]; Kyosuke Yoshimi[3]; Chuan Zhang[4]; Shih-kang Lin[5]; [1]Department of Materials Science and Engineering, National Cheng Kung University; [2]Department of Materials Science and Engineering, National Tsing Hua University; [3]Department of Materials Science, Graduate School of Engineering, Tohoku University; [4]CompuTherm LLC; [5]Department of Materials Science and Engineering, National Cheng Kung University; Center for Micro/Nano Science and Technology, National Cheng Kung University

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Titanium Powder Metallurgy and Additive Manufacturing II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

Thursday PM
March 15, 2018
Room: 225A
Location: Phoenix Convention Center

*Session Chairs:* James D. Paramore, United States Army Research Laboratory; Professor Xin Lu, University of Science of Technology Beijing

**2:00 PM Keynote**
**Powder Metallurgy of Titanium – Past, Present, and Future**: *Zhigang Fang*[1]; Pei Sun[1]; [1]University of Utah

**2:40 PM Invited**
**Selective Laser Melting Based Additive Manufacturing (SLM-AM) of Commercially Pure Titanium (CP-Ti): Development of Cost-affordable Ti Powder for AM , and High-strength As-printed CP-Ti**: *Ming Yan*[1]; Yuhang Hou[1]; Dawei Wang[1]; [1]South University of Science and Technology of China

**3:10 PM Invited**
**Powder Metallurgy Porous Ti-10Mo Alloy for Orthopedic Applications: Structure Characterization, Mechanical Properties, Vitro Cytotoxicity and Vivo Osteointegration**: *Xin Lu*[1]; Wei Xu[1]; Xuanhui Qu[1]; [1]University of Science and Technology, Beijing

**3:40 PM Break**

**4:00 PM Invited**
**Utilizing Hydrogen for Improved Properties of Titanium Alloys Produced via Powder Metallurgy**: *James Paramore*[1]; Brady Butler[1]; Jonathan Ligda[1]; Z. Zak Fang[2]; Matthew Dunstan[1]; [1]United States Army Research Laboratory; [2]University of Utah

**4:30 PM**
**Microstructure of $Y_2O_3$ Stabilized UFG CP Ti Prepared by Cryomilling and Spark Plasma Sintering**: *Jirí Kozlík*[1]; Josef Stráský[1]; Petr Harcuba[1]; Miloš Janecek[1]; [1]Charles University

**4:50 PM**
**Hot Deformation Behaviors of Powder Metallurgy Ti-6Al-4V Alloy with Different Microstructures**: *Pei Sun*[1]; Omar Kergaye[1]; Z. Zak Fang[1]; Ali Yousefiani[2]; Austin Mann[2]; [1]University of Utah, Dept of Metallurgical Engineering; [2]The Boeing Company

## Recent Advances in Functional Materials for Printed, Flexible and Wearable Electronics – Material, Process Integration, and Characterization

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Pooran Joshi, Oak Ridge National Laboratory; Nuggehalli Ravindra, New Jersey Institute of Technology; Jud Ready, Georgia Institute of Technology; Amit Pandey, LG Fuel Cell Systems Inc.; Suresh Sitaraman, Georgia Institute of Technology

Thursday PM
March 15, 2018
Room: 226B
Location: Phoenix Convention Center

*Session Chairs:* Suresh Sitaraman, Georgia Institute of Technology; Anming Hu, University of Tennessee; Kostas Sierros, West Virginia University

**2:00 PM Invited**
**Challenges in Gravure and Direct-write Printing of Nano-colloidal Inks**: *P. Randall Schunk*[1]; Nelson Bell[1]; Adam Cook[1]; [1]Sandia National Laboratories

**2:30 PM**
**Room-temperature Aerosol Deposition of PLZT Films on Polymer Substrates**: *U. (Balu) Balachandran*[1]; [1]Argonne National Laboratory

**2:50 PM**
**Nondestructive Examination Study in P(VDF-TrFE) Filter System and PM2.5 Spatial Resolution Technology by Using Synchrotron Transmission X-ray Microscopy**: *E-wen Huang*[1]; Hui-Tzu Yeh[1]; Chun-Chieh Wang[2]; Wei-Chieh Huang[1]; [1]National Chiao Tung University; [2]National Synchrotron Radiation Research Center

**3:10 PM Invited**
**Delaminated Inkjet Printed Lines with Improved Electro-mechanical Behavior**: *Megan Cordill*[1]; [1]Erich Schmid Institute of Materials Science

**3:40 PM Break**

**4:00 PM**
**Stretchable Wirings Prepared with PU and Silver Flakes**: *Cai-Fu Li*[1]; Hao Zhang[1]; Wanli Li[1]; Zhi-Quan Liu[1]; Katsuaki Suganuma[1]; [1]Osaka University

**4:20 PM**
**Structural-resolved Study of Piezoelectric Properties of P(VDF-TrFE) Films**: Ying-Jhih Wang[1]; *E-Wen Huang*[1]; Wen-Tsung Chuang[2]; Wen-Ching Ko[3]; Jun-Yi Ke[4]; [1]National Chiao Tung University; [2]National Synchrotron Radiation Research Center; [3]Industrial Technology Research Institute; [4]National Taiwan University

**4:40 PM**
**Ultrafast Pulsed Light Sintering of Thermoelectric Nanoparticles**: Roozbeh Danaei[1]; Mostafa Ahmadzadeh[1]; Courtney Hollar[2]; Tony Varghese[2]; Craig Owen[1]; Md Sadeq Saleh[3]; Grant Norton[1]; John McCloy[1]; Yanliang Zhang[4]; *Rahul Panat*[3]; [1]Washington State University; [2]Boise State University; [3]Carnegie Mellon University; [4]University of Notre Dame

**5:00 PM Invited**
**Materials Integration for Flexible Electronics: Cu-interconnects, Supercapacitors**: *Tolga Aytug*[1]; M. Rager[1]; F. Brown[1]; W. Higgins[1]; H. Wang[1]; Z. Hood[1]; C. Rouleau[1]; Pooran Joshi[1]; [1]Oak Ridge National Laboratory

## Solar Cell Silicon – Silicon Production, Crystallization, and Properties

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Neale Neelameggham, Ind LLC; York Smith, University of Utah

Thursday PM
March 15, 2018
Room: 223
Location: Phoenix Convention Center

*Session Chairs:* York Smith, University of Utah; Wenzhou Yu, Chongqing University

**2:00 PM Invited**
**Solar Silicon by Direct Carbothermic Reduction - Review and Outlook**: *Jan-Philipp Mai*[1]; Neda Rezaii[1]; [1]JPM Silicon GmbH

**2:40 PM**
**Thermo-Calc of the Phase Diagram of the Fe-Si System**: *Shadia Ikhmayies*[1]; [1]Al Isra University

**3:00 PM**
**Crystal Growth Mechanism of Si in Hypereutectic Al-Si Melt during the Electromagnetic Directional Solidification**: Jie Li[1]; *Wenzhou Yu*[1]; Xuewei Lv[1]; [1]Chongqing University

**3:20 PM**
**Thermo-Calc of the Phase Diagram of Calcium Silicon (Ca-Si) System**: *Shadia Ikhmayies*[1]; [1]Al Isra University

## Thermal and Mechanical Stability of Nanocrystalline Materials – Composites and Heterophase Interfaces

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

Thursday PM
March 15, 2018
Room: 128B
Location: Phoenix Convention Center

*Session Chairs:* Heather Murdoch, Army Research Laboratory; Fadi Abdeljawad, Sandia National Laboratories

**2:00 PM Invited**
**Interfaces in HCP/BCC Structural Nanocomposites**: *Irene Beyerlein*[1]; [1]University of California, Santa Barbara

**2:30 PM**
**Exploring the Thermal Evolution of Nanomaterials: From Nanometallic Multilayers to Nanostructures**: *J. Sebastian Riano*[1]; Andrea Hodge[1]; [1]University of Southern California

**2:50 PM**
**Mechanical and Thermal Stability of Nanocrystalline High-entropy Alloys**: *Yu Zou*[1]; Jeffrey Wheeler[2]; Huan Ma[2]; Ralph Spolenak[2]; [1]University of Toronto; [2]ETH Zurich

**3:10 PM Invited**
**Thermal Stability of Thin Ni-Fe Films on Sapphire**: Amit Sharma[1]; Aakash Kumar[2]; David Srolovitz[2]; *Eugen Rabkin*[1]; [1]Technion; [2]University of Pennsylvania

**3:40 PM Break**

**4:00 PM Invited**
**Sensitization in Grain Size Gradients – Investigating the Effects of Low Temperature, Long Term Annealing on the Corrosion and Mechanical Response of Nanocrystalline Aluminum Alloys**: *Heather Murdoch*[1]; Denise Yin[1]; B. Hornbuckle[1]; Joseph Labukas[1]; [1]Army Research Laboratory

**4:30 PM**
**Microstructure Characterization and Mechanical Properties of Nanostructured Low Activation Steel Produced by Surface Mechanical Attrition Treatment**: *Wenbo Liu*[1]; Di Yun[1]; Chaohui He[1]; Chi Zhang[2]; Zhigang Yang[2]; [1]Xi'an Jiaotong University; [2]Tsinghua University

**4:50 PM Invited**
**Insights from Variable Temperature and Ultra-high Strain Rate Nanomechanical Testing of Model Nanocrystalline and Nanocomposite Materials Realized by Either Inert Gas Condensation or Alternating Atomic Layer Deposition, Sputtering and Inert Gas Condensation of Nanoparticles**: Laszlo Petho[1]; Rachel Schoeppner[1]; Mikhail Polyakov[1]; Juri Wehrs[1]; Keith Thomas[1]; *Johann Michler*[1]; [1]Empa, Materials Science and Technology

## Ultrafine-grained Materials X – Bulk Processing and Applications

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Thursday PM
March 15, 2018

Room: 103B
Location: Phoenix Convention Center

*Session Chairs:* Terry Lowe, Colorado School of Mines; Malgorzata Lewandowska, Warsaw University of Technology

**2:00 PM**
**The Path to Generating Bulk Nanocrystalline Parts for Mechanical Testing**: *B. Hornbuckle*[1]; Thomas Luckenbaugh[1]; Anthony Roberts[1]; Anit Giri[1]; Joseph Marsico[1]; Scott Grendahl[1]; Kris Darling[1]; [1]U.S. Army Research Laboratory

**2:20 PM**
**Shear Assisted Processing and Extrusion (ShAPE): Bulk Property Enhancement through Tailored Microstructure**: *Scott Whalen*[1]; Jens Darsell[1]; Nicole Overman[1]; Vineet Joshi[1]; Suveen Mathaudhu[1]; [1]Pacific Northwest National Laboratory

**2:40 PM**
**Development of SPD Techniques for the Fabrication of Long-length Rods from UFG Materials**: *Georgy Raab*[1]; Ruslan Valiev[1]; E. Fakhretdinova[1]; A. Raab[1]; [1]Ufa State Aviation Technical University

**3:00 PM**
**Fabrication of Ultrafine Grained Plates with Low Anisotropy of Mechanical Properties**: Malgorzata Lewandowska[1]; *Marta Ciemiorek*[1]; Witold Chrominski[1]; Lech Olejnik[1]; [1]Warsaw University of Technology

**3:20 PM**
**Improving Mechanical and Functional Properties of Conductive Nanostructured Aluminum Alloys**: *Maxim Murashkin*[1]; Nikolay Belov[2]; Georgy Raab[3]; Ruslan Valiev[3]; [1]Institute of Physics of Advanced Materials, Ufa State Aviation Technical University; [2]National University of Science and Technology "MISIS"; [3]Ufa State Aviation Technical University

**3:40 PM Break**

**4:00 PM**
**Nanostructured SPD-processed Ti-Nb-based Alloys for Load-bearing Implant Applications**: *Mariana Calin*[1]; Stefan Pilz[1]; Annett Gebert[1]; Michael Zehetbauer[2]; Jürgen Eckert[3]; [1]IFW Dresden; [2]Vienna University; [3]Montanuniversität Leoben

**4:20 PM**
**Corrosion Behavior of Ultrafine Grained Aluminum and Magnesium Alloys**: *Gaurav Argade*[1]; Rajiv Mishra[1]; [1]University of North Texas

**5:00 PM**
**Mechanical Properties and Microstructures of a TiZr Alloy for Dental Implants**: *Mathew Hayne*[1]; Casey Davis[1]; Rilee Meagher[1]; Peter Rovira[1]; Dean Wenger[1]; Gordon Campbell[1]; Michaela Rillings[1]; Kyle Haines[1]; Lenka Kunèická[2]; Radim Kocich[2]; Florian Dalla Torre[3]; Terry Lowe[1]; [1]Colorado School of Mines; [2]Technical University of Ostrava; [3]Institut Straumann AG

## 2018 Technical Division Student Poster Competition – Extraction and Processing Division (EPD) Graduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPG-1: Diffusion of Cr in the Alloys during Corrosion in MgCl2-KCl Molten Salt**: *Yuxiang Peng*[1]; Ramana Reddy[1]; [1]The University of Alabama

**SPG-2: Electrochemical Reduction of Metal Oxides in Molten Salt**: *Meng Shi*[1]; Haiyan Zhao[1]; Shelly Li[2]; [1]University of Idaho; [2]Idaho National Laboratory

**SPG-3: Nano Computed Tomography Characterization of Additive Manufactured Metal**: *Oluwaseun Adewumi*[1]; [1]North Carolina A&T University

**SPG-4: Teaching Applied in the Characterization of SAE 1020 Steel Corrosion in Atmospheric Test and Salt Spray Testing**: *Gonçalo Siqueira*[1]; Emílio Silva[2]; Gabriel Santo[2]; Allan Muniz de Souza[2]; [1]University of São Paulo; [2]Fatec Itaquera

**SPG-5: Thermodynamic Properties of Silicon-boron Binary Alloys Determined Using EMF Measurements**: *Muhammad Imam*[1]; Ramana Reddy[1]; [1]The University of Alabama

## 2018 Technical Division Student Poster Competition – Functional Materials Division (FMD) Graduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPG-6: Characterization of Magnetic Microstructure in Co-Pt Nano-chessboards**: *Isha Kashyap*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**SPG-7: Determination of Crystalline Domains Alignment in the Cellulose Nanocrystal Films with an Improved Birefringence Technique**: *Reaz Chowdhury*[1]; Jeffrey Youngblood[1]; [1]Purdue University

**SPG-8: Fabrication of Acoustic Devices for Sensing Applications**: *Lokesh Rana*[1]; Reema Gupta[1]; Monika Tomar[1]; Vinay Gupta[1]; [1]University of Delhi

**SPG-9: Hygroscopic Swelling Determination of Cellulose Nanocrystal (CNC) Films by Polarized Light Microscope Digital Image Correlation**: *Shikha Shrestha*[1]; Jairo Diaz[1]; Siavash Ghanbari[1]; Jeffrey Youngblood[1]; [1]Purdue University

**SPG-10: Integrated Coplanar Pd-$SnO_2$ Hetrostructures Based CNG/PNG Sensor for Wireless Detection**: *Avneet Singh*[1]; Anjali Sharma[2]; Monika Tomar[3]; Vinay Gupta[1]; [1]University Of Delhi; [2]Atma Ram Sanatan Dharma College; [3]Miranda House

**SPG-11:Microstructural Stability of SSC Fibrous Cathode with Embedded SDC Particles for Solid Oxide Fuel Cells Operating on Hydrogen**: *Sewook Lee*[1]; Sangho Park[1]; Dongwook Shin[1]; [1]Hanyang university

**SPG-12: Microstructure and Texture Behavior of P-type Bi2Te3-Sb2Te3 Alloy by Hot Extrusion**: *Hyo-Sang Yoo*[1]; YongHo Kim[1]; HyeonTaek Son[1]; [1]Korea Institute of Industrial Technology

**SPG-13: Oxidative Unzipping and Transformation of High Aspect Ratio Boron Nitride Nanotubes into White Graphene Oxide Platelets**: *Pranjal Nautiyal*[1]; Archana Loganathan[1]; Richa Agrawal[1]; Benjamin Boesl[1]; Chunlei Wang[1]; Arvind Agarwal[1]; [1]Florida International University

**SPG-14: Oxide Rate of (111), (100) and Random Copper Films at Low Temperatures for the Application of Cu-to-Cu Direct Bonding**: *Chih-Han Tseng*[1]; Chih Chen[1]; [1]National Chiao Tung University

**SPG-15: Synthesis and Evaluations of Photocatalytic Activity of Au/ZnO/Silk Textile Hybrid Layered Structure for Flexible Multifunction Device Applications**: *Wan-Ting Chiu*[1]; Yuma Tahara[2]; Chun-Yi Chen[1]; Tso-Fu Mark Chang[1]; Tomoko Hashimoto[2]; Hiromichi Kurosu[2]; Masato Sone[1]; [1]Tokyo Institute of Technology; [2]Nara Women's University

**SPG-16: Synthesis and Processing of NaSICON/Polymer Membranes**: *Shan-Ju Chiang*[1]; Caihong Liu[1]; Leon Shaw[1]; [1]Wanger Institute for Sustainable Energy Research / Illinois Institute of Technology

**SPG-17: Using Cellulose Nanocrystals (CNCs) with Portland Cements – Effect on Rheology**: *Francisco Montes*[1]; [1]Purdue University

**SPG-18: Zinc Oxide Thin Film for Application to Surface Plasmon Resonance Based Meningitidis DNA Detection**: *Gurpreet Kaur*[1]; Monika Tomar[2]; Vinay Gupta[1]; [1]Department of Physics & Astrophysics, University of Delhi; [2]Miranda House, University of Delhi

## 2018 Technical Division Student Poster Competition – Functional Materials Division (FMD) Undergraduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPU-1: Determination of the Activation Temperatures of Group III and IV Metals via XPS**: *Ryan Schalip*[1]; [1]Sandia National Laboratories

**SPU-2: Fluorescence of Functionalized Carbon Nano-onions for Bioimaging Applications**: *Jenna Severson*[1]; Grant Crawford[2]; Mingrui Liu[2]; [1]Montana State University; [2]South Dakota School of Mines and Technology

**SPU-3: Synthesis and Characterization of Chitosan-based Composites Containing $TiO_2$ Nanoparticles and Their Antibacterial Activity**: *Amanda Quintero Garcia*[1]; John Lopez Calero[1]; Yamalis Lopez Massa[1]; Christian McRoberts Amador[1]; Katyria Torres Mora[1]; John Soto Vargas[1]; Zuleika Oquendo Berrios[1]; Kenneth Serrano Rodriguez[1]; Karimar Amador Martinez[1]; Luis Orta Rodriguez[1]; Claralys Hernadez Santiago[1]; Oscar Marcelo Suarez[1]; [1]University of Puerto Rico, Mayaguez

## 2018 Technical Division Student Poster Competition – Light Metals Division (LMD) Graduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPG-19: Effect of Magnetic Field on the Tensile Properties of Friction Stir Processed 1100 Aluminum Alloy**: *Hitesh Adhikari*[1]; Rajiv Mishra[1]; [1]University of North Texas

**SPG-20: Modelling of Precipitate Evolution and Yield Strength of a Friction Stir Welded Al-Cu-Li Alloy**: *Barnali Mondal*[1]; Aniket Dutt[2]; Rajiv S. Mishra[1]; [1]University of North Texas; [2]University of Pittsburgh

## 2018 Technical Division Student Poster Competition – Light Metals Division (LMD) Undergraduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPU-4: A Computational Study of Phase Evolution and Stability in Multi-Rare Earth Mg-Alloys**: *Adam Shaw*[1]; Gregory Pomrehn[2]; Aurora Pribram-Jones[3]; Kevin Laws[4]; Lori Bassman[1]; [1]Harvey Mudd College; [2]The Boeing Company; [3]Lawrence Livermore National Lab; [4]The University of New South Wales

**SPU-5: Fabrication of Novel Aluminum Welding Fillers Reinforced with NbB2 Nanoparticles**: Oscar Marcelo Suarez[1]; Andres Calle[1]; *Cristina Crespo Roldan*[1]; [1]Material Advantage

## 2018 Technical Division Student Poster Competition – Materials Processing and Manufacturing Division (MPMD) Graduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPG-21: A General Multiphase Model for Macrosegregation and Columnar to Equiaxed Transition in Alloy Solidification**: *Mahdi Torabi Rad*[1]; Christoph Beckermann[1]; [1]The University of Iowa

**SPG-22: Effects of Strain Localization & Processing on the Corrosion of Nanostructured Aluminum**: *Ramatou Ly*[1]; Karl Hartwig[1]; Homero Castaneda Lopez[1]; [1]Texas A&M University

**SPG-23: Effects of Variable and Constant Sealing Force Techniques for Studying the Formability Using Square Cup Die in Hydroforming of Cryorolled Al-Mg Alloy Sheets in FE Simulation**: *Fitsum Feyissa*[1]; Digavalli Ravi[1]; [1]Indian Institute of Technology Delhi

**SPG-24: Fatigue Behavior of Ultrafine Grained Al0.3CoCrFeNi High Entropy Alloy**: *Kaimiao Liu*[1]; Mageshwari Komarasamy[1]; Bharat Gwalani[1]; Mishra Rajiv[1]; [1]University of North Texas

**SPG-25: In-situ Strengthening of High Entropy Alloys by Friction Stir Processing**: *Tianhao Wang*[1]; [1]University of North Texas

**SPG-27: Microfract: An Image Based Code for Micro-crack Path Prediction for Multi-phase Materials**: *Siddhartha Srivastava*[1]; Veera Sundararahavan[1]; [1]University of Michigan

**SPG-28: Microstructure and Mechanical Properties of Inconel 718 Produced by Selective Laser Melting: Sample Orientation Dependence and Effects of Post Heat Treatments**: *Dunyong Deng*[1]; Ru Peng[1]; Johan Moverare[1]; [1]Linkoping University

**SPG-29: The Effect of Co Content on Fabrication of Full-scale High-performance Alnico Magnets with Near-final Shape**: *Emily Rinko*[1]; Liangfa Hu[2]; Iver Anderson[2]; Aaron Kassen[3]; Emma White[2]; Wei Tang[2]; Lin Zhou[2]; Matthew Kramer[2]; [1]Iowa State University ; [2]Ames Laboratory; [3]Iowa State University

**SPG-30: Towards a Standardized Technique of Determining Nanoindentation Derived Stress-Strain Curves of Metal Powder Particles**: *Bryer Sousa*[1]; Matthew Gleason[1]; Jeremy Schreiber[2]; Danielle Cote[1]; Victor Champagne[3]; [1]Worcester Polytechnic Institute; [2]Penn State's Applied Research Lab; [3]U.S. Army Research Laboratory

## 2018 Technical Division Student Poster Competition – Materials Processing and Manufacturing Division (MPMD) Undergraduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPU-6: Influence of Volumetric Energy Density on Defect Formation and Crystallographic Texture Development in 3-D Printed Hastelloy-X**: *Austin Ngo*[1]; Kin Ling Sham[1]; Peijun Hou[1]; Sebastien Dryepondt[2]; Xianghui Xiao[3]; Hahn Choo[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]Argonne National Laboratory

**SPU-7: Investigating Damping Performance of Powder Bed Fused Inconel 718 with Unfused Internal Features**: *Thaddeus Crowe*[1]; Christopher Howard[2]; Ross Cefalu[3]; Onome Scott-Emuakpor[4]; Tommy George[4]; Casey Holycross[4]; Bryan Langley[4]; Ryan O'Hara[5]; [1]Ohio University; [2]Stanford University; [3]Georgia Institute of Technology; [4]Aerospace Systems Directorate (AFRL/RQTI); [5]Air Force Institute of Technology

**SPU-8: Laser Brazing of Nickel Superalloys with a Ni-Mn-Fe-Co-Cu High Entropy Alloy Nanopaste**: *Samantha Lang*[1]; Denzel Bridges[1]; Anming Hu[1]; [1]University of Tennessee

**SPU-9: Optimization of Anodization Parameters for Production of Titanium Dioxide Nanotube Arrays**: *Alec Mittelstadt*[1]; [1]University of Utah

**SPU-10: Porous Metal from Selective Dissolution of Al-Cu-Mg Alloy**: *Keishlyann Báez Cruz*[1]; Juan Vargas[2]; Oscar Suárez[1]; Johnattan Díaz[1]; [1]University of Puerto Rico at Mayagüez; [2]University of Puerto Rico at Mayague

## 2018 Technical Division Student Poster Competition – Structural Materials Division (SMD) Graduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPG-31: A Mechanism Study of Electromigration Effect: An In Situ Current Stressing Study**: *Yu-chen Liu*[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

**SPG-32: A Phase-field Study on the Role of Lattice Misfit on the Microstructural Stability in Ni-based Single Crystal Superalloys**: *Harikrishnan Rajendran*[1]; Jean-Briac le Graverend[1]; [1]Texas A&M University

**SPG-33: Effects of Ar Ion Irradiation on Microstructural and Mechanical Properties of Zr-0.33wt.% Sn Alloy Probed through PAS, GI-XRD, Pico-indentation and TEM**: *Aruna Devi*[1]; [1]Bhabha Atomic Research Centre

**SPG-34: Geometrical Effect on the Energetic Size Effect Law**: *Mohamed Refat*[1]; Pere Maimi[1]; [1]AMADE, University of Girona

**SPG-35: Low Cycle Fatigue Behaviour and Micromechanics of a Beta Titanium Alloy Ti-5Al-5Mo-5V-3Cr**: *Mainak Sen*[1]; Swati Suman[1]; Trideep Banerjee[1]; Sujoy Kar[1]; [1]Indian Institute of Technology

**SPG-36: Markov Random Field Approach For Three-dimensional Microstructure Reconstruction**: *Iman Javaheri*[1]; Veera Sundararaghavan[1]; [1]University of Michigan

**SPG-37: MgO-$MgCr_2O_4$ Based Age-hardened Bulk Polycrystalline Oxide 'Ceramic Alloys'**: *Udit Kumar*[1]; Luv Gurnani[1]; Amartya Mukhopadhyay[1]; [1]Indian Institute of Technology (IIT) Bombay

**SPG-38: Microstructural Characterization of W-ODS Materials for Nuclear Applications**: *Ryan DeMott*[1]; Alan Xu[2]; Dhriti Bhattacharyya[2]; Sophie Primig[1]; [1]UNSW; [2]ANSTO

**SPG-39: Prediction of Single Crystal Properties of Aluminum-Lithium Alloy Using a Stochastic Inverse Model**: *Srihari Sundar*[1]; Pinar Acar[2]; Veera Sundararaghavan[1]; [1]University of Michigan, Ann Arbor; [2]Virginia Tech

**SPG-40: Radiation Resistant Nanostructured 304 Austenitic Steel Prepared Using ECAP and HPT**: *Andrew Hoffman*[1]; Haiming Wen[1]; [1]University of Missouri S&T

**SPG-41: Simulating Dislocation Patterning at the Micro Scale Using the Schnakenberg Model**: *Aaditya Lakshmanan*[1]; Veera Sundararaghavan[1]; [1]University of Michigan, Ann Arbor

**SPG-42: The Microstructure Characterization and Precipitate Simulation of G115 Heat Resistance Steel during Creep**: *Yunhe Yu*[1]; Chi Zhang[1]; Zhengdong Liu[2]; Hao Chen[1]; Zhigang Yang[1]; [1]Tsinghua University, China; [2]China Iron and Steel Research Institute, China

## 2018 Technical Division Student Poster Competition – Structural Materials Division (SMD) Undergraduate Students

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**SPU-11: Effect of Alumina Nanoparticles on the Portevin-Le Chatelier Phenomenon in Al-Mg Alloys**: *Monica Diaz Pares*[1]; David Florian-Algarin[1]; Xiaochun Li; Hongseok Choi[2]; Oscar Suarez[1]; [1]University of Puerto Rico at Mayaguez ; [2]Clemson University

**SPU-12: Influence of Titanium Substrate Surface Preparation on the Growth of Titanium Dioxide Nanotubes**: *Sabrina Curley*[1]; Jevin Meyerink[2]; Grant Crawford[2]; [1]The University of Alabama; [2]South Dakota School of Mines and Technology

**SPU-13: Method to Increase Data Throughput of a Single Bending Fatigue Test**: *Ross Cefalu*[1]; Christopher Howard[2]; Thaddeus Crowe[3]; Onome Scott-Emuakpor[4]; Tommy George[4]; Casey Holycross[4]; [1]Georgia Institute of Technology; [2]Stanford University; [3]Ohio University; [4]Aerospace Systems Directorate (AFRL/RQTI)

**SPU-14: Structure and Ductility in Multicomponent B2-ordered Intermetallic Compounds**: *Bailey Meyer*[1]; Kyla Scott[1]; Patrick Conway[2]; Lori Bassman[1]; Kevin Laws[2]; [1]Harvey Mudd College; [2]University of New South Wales

## 2018 Technical Division Young Professional Poster Competition – Extraction and Processing Division (EPD)

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**YP-1: A Scalable Gibbs Energy Minimization Model for Solvent Extraction Systems**: *Chukwunwike Iloeje*[1]; Diane Graziano[1]; Joseph Cresko[2]; [1]Argonne National Laboratory; [2]Department of Energy

**YP-2: Application of Nanometric Zinc Oxide-containing Organic Film Evaluation Techniques to Radiation Cure through the Scanning Vibrating Electrode Technique - SVET Process**: *Gonçalo Siqueira*[1]; Hélio Wiebeck[1]; Rocio Bendezú[1]; Fabio Esper[1]; Leonardo Silva[1]; Wanderley Da Costa[1]; [1]University of São Paulo

**YP-3: Novel Synthesis of Various CaxSr1-xO Solid Solutions Using Polymer Complex Method (PCM) for Transesterfication Process**: *Maria Lourdes Potestades*[1]; Wen-Dung Hsu[1]; Masahiro Yoshimura[1]; Shih-Kang Lin[1]; [1]National Cheng Kung University

## 2018 Technical Division Young Professional Poster Competition – Functional Materials Division (FMD)

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**YP-4: Polymer-ceramic Composite Coating for Promoting Bioactive Bone Formation of Bioabsorbable Metal**: *Yukyoung Kim*[1]; Min-Ho Lee[2]; [1]Institute of Oral Bioscience and BK 21 Program; [2]Institute of Oral Bioscience and BK 21 Program

**YP-5: Study of Structural and Electronic Properties of Hetero-interface for Photovoltaic Applications**: *Rabi Khanal*[1]; Nicholas Ayers[1]; Soumik Banerjee[2]; Samrat Choudhury[1]; [1]University of Idaho; [2]Washington State University

**YP-6: Toward Designing Flexible Two-dimensional Tin+1Cn MXenes for Multifunctional Applications**: *Ning Zhang*[1]; Mohsen Asle Zaeem[1]; [1]Missouri University of Science and Technology

## 2018 Technical Division Young Professional Poster Competition – Materials Processing and Manufacturing Division (MPMD)

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**YP-7: Effect of the Extrusion Conditions on the Microstructure and Residual Stress Distribution of Extruded AZ31B Magnesium Alloy**: *Yong Lian*[1]; Jin Zhang[1]; Xiaoming Cui[1]; Xiaomin Yuan[1]; [1]University of Science and Technology Beijing

**YP-8: Joining Lightweight Dissimilar Alloys by Using Electron Beam Welding**: *Affaan Moosa*[1]; Iain Todd[1]; Brad Wynne[1]; [1]The University of Sheffield

**YP-9: Thermodynamic Properties of Mg-Si Alloys**: *Mallikharjuna Bogala*[1]; Ramana Reddy[2]; [1]University of South Carolina; [2]The University of Alabama

## 2018 Technical Division Young Professional Poster Competition – Structural Materials Division (SMD)

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

**YP-10: A Holistic Proposal for the Conversion of Metallurgical Residues into Low $CO_2$ Foot-print Building Materials**: *Remus Ion Iacobescu*[1]; Yiannis Pontikes[1]; [1]KU Leuven

**YP-11: Corrosion Protection of Aluminum Alloy in Salt Solution with Polymer Nanocomposite Coatings**: *Junqing Zhang*[1]; Md Fazlay Rabbey[1]; Caleb Smith[1]; Cheng-fu Chen[1]; Lei Zhang[1]; [1]University of Alaska Fairbanks

**YP-12: Ga-doping Effect upon Sn-0.7Cu/Cu Interfacial Reactions and the Investigation of Sn-Cu-Ga Phase Diagram**: *Chih-han Yang*[1]; Yu-chen Liu[1]; Kuo Yi-kai[1]; Lin Shih-kang[1]; [1]National Cheng Kung University

**YP-13: Reversible Devitrification in Amorphous $As_2Se_3$ under Pressure**: *Azkar Saeed Ahmad*[1]; Jianzhong Jiang[2]; [1]Southern University of Science and Technology (SUSTech); [2]Zhejiang University

## 9th International Symposium on High Temperature Metallurgical Processing – Poster Session I

*Sponsored by:* TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

*Session Chair:* Xuewei Lv, Chongqing University

**D-1: Atomistic Insight into Structural Role of Boron in High Temperature CaO-SiO2 Slag System**: *Mengyi Zhu*[1]; [1]RWTH Aachen University

**D-3: Effect of Chemical Components of Mould Flux on Dissolution Rate of Al2O3 into Molten Flux for High Manganese High Aluminum Steel**: *Kun-peng Xu*[1]; Ya-bing Zhang[1]; Qian Wang[1]; Sheng-ping He[1]; [1]Chongqing University

**D-4: Effect of Temperature on Oxidation Behavior of Cr-Mo-V Steel with Different Cr Contents for High-speed Train Brake Discs**: *Dan Wu*[1]; Fuming Wang[1]; Changrong Li[1]; Yaxu Zheng[1]; Wei Shen[1]; [1]School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

**D-6: Evolution of Al-Ti-Mg-O Inclusions during Refining and Casting Process of Interstitial Free Steel**: *Xiao Pengcheng*[1]; Xiaoyan Wu[1]; Liguang Zhu[1]; Qingjun Zhang[1]; Yihua Han[1]; [1]North China University of Science and Technology

**D-7: Experimental Study on Carburization of Higher Vanadium-bearing Hot Metal**: *Deng Ma*[1]; [1]Central Iron and Steel Research Group

**D-9: Influence On The Crystallization Phase Of Mold Flux By Magnetic Fields**: *LuMing Zhao*[1]; Li Zhao[1]; Yu Wang[1]; [1]Chongqing University

**D-10: Kinetics Study on Limestone Decomposition in Early Converter Slag**: Nan Wang[1]; Haohua Deng[1]; Min Chen[1]; Ming Chen[1]; Ying Wang[1]; *Cuihuan Huang*[1]; [1]Northeastern University

**D-11: Mathematical Modeling and Analysis of Converter Slagging and Steelmaking Process by Replacing Part of Lime With Limestone**: *Haohua Deng*[1]; Nan Wang[1]; Min Chen[1]; Lei Xu[1]; [1]Northeastern University

**D-12: Research of Digital Platform and Process Guidance Model in EAF Steelmaking Process**: Lingzhi Yang[1]; Rong Zhu[2]; Kai Dong[2]; Guangsheng Wei[2]; *Zeshi Yang*[1]; [1]Central South University; [2]University of Science and Technology Beijing

**D-13: Research on Factors Affecting and Prediction Model of Silicon Content in Hot Metal of Corex**: *Bingjie Wen*[1]; ShengLi Wu[1]; Heng Zhou[1]; Jiacong Zhang[1]; Kai Gu[1]; [1]University of Science and Technology Beijing

**D-14: Research on the Long Life Blowpipe Liner of BF Air Supply Apparatus**: *Li Zhu*[1]; Keng Wu[1]; Wenlong Zhan[2]; Guoyou Liu[3]; Kai Wang[3]; Yulin Guo[4]; [1]University of Science and Technology Beijing; [2]University of Science and Technology Liaoning; [3]Shouqin Metal Materials Co.Ltd.; [4]Beijing Yaxinda Industry and Trade Co., LTD.

**D-15: Selection of Viscosity Model of Chromium-Containing Converter Slag and Investigation of the Effect of Compositions on Viscosity**: *Bing Huang*[1]; Mingmei Zhu[1]; Peng Zhu[1]; [1]Chong Qing University

**D-17: Study on Grain Size and Porosity of the Produced Lime from Limestone in Early Converter Slag**: *Guangzong Zhang*[1]; Nan Wang[1]; Min Chen[1]; Haohua Deng[1]; Xiaoao Li[1]; [1]Northeastern University

**D-18: Study on the Volatilization of Sb2S3 in Vacuum**: Heng Xiong[1]; Zhengen Zhou[1]; Bin Yang[1]; Dachun Liu[1]; *Baoqiang Xu*[1]; Deng Yong[1]; Yang Jia[1]; [1]Kunming University of Science and Technology

**D-19: The Effects of $ZrO_2$, $Y_2O_3$ and $Sc_2O_3$ on the Properties of Mould Fluxes for High Manganese High Aluminum Steels**: *Shaoda Zhang*[1]; Qian Wang[1]; Lilong Zhu[1]; Shengping He[1]; [1]Chongqing University

**D-20: Thermodynamic Calculation on Reactivity between Slag and High Mn-high Al Steel**: *Chun-jiang Guo*[1]; Shengping He[1]; Ya-Bing Zhang[1]; Qian Wang[1]; [1]ChongQing University

**D-22: Viscosity of Mould Flux under Electromagnetic Field**: *Li Zhao*[1]; Yu Wang[1]; Luming Zhao[1]; [1]Chongqing University

## 9th International Symposium on High Temperature Metallurgical Processing – Poster Session II

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

*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; Mark Kennedy, Proval Partners SA; Dean Gregurek, Rhi Ag; Shijie Wang, Rio Tinto Kennecott Utah Copper; Baojun Zhao, The University of Queensland; Onuralp Yücel, ITU; Ender Keskinkilic, Atilim University; Jerome Downey, Montana Tech of the University of Montana; Zhiwei Peng, Central South University; Rafael Padilla, University of Concepcion

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*Session Chair:* Mingjun Rao, Central South University

**D-23: Alumino-thermic Reduction of SrO and $SrCO_3$**: *Selim Ertürk*[1]; Rasit Sezer[2]; Cuneyt Arslan[1]; [1]Istanbul Technical University; [2]Karadeniz Technical University

**D-25: Analysis of Operational Parameters Affecting the Degree of Metalization of DRI in a Reduction Shaft of the COREX Process and Improvement Measures**: Shengli Wu[1]; *Jiacong Zhang*[1]; Mingyin Kou[1]; Bingjie Wen[1]; Heng Zhou[1]; [1]University of Science and Technology Beijing

**D-26: Dechlorination of Zinc Oxide Dust by Microwave Rosating with RSM Optimization**: *Aiyuan Ma*[1]; Tingfang Xie[2]; Guo Jiang[2]; Xuemei Zheng[1]; Libo Zhang[3]; Jinhui Peng[3]; [1]School of Chemistry and Materials Engineering, Liupanshui Normol University; [2]Yunnan Chihong Zn & Ge Co., Ltd; [3]Yunnan Provincial Key Laboratory of Intensification Metallurgy, Key Laboratory of Unconventional Metallurgy, Ministry of Education

**D-27: Effect of TiO2 on the Viscous Behavior of High Alumina Blast Furnace Slag**: *Zhiming Yan*[1]; Zhengde Pang[1]; Xuewei Lv[1]; Guibao Qiu[1]; Chenguang Bai[1]; [1]Chongqing University

**D-28: Fundamental Research on the Iron Nugget Process from Carbon Composite Pellet**: *Shihan Zhang*[1]; Guang Wang[1]; Yaxing Du[1]; Jingsong Wang[1]; Qingguo Xue[1]; [1]University of Science & Technology Beijing

**D-30: Influence of Coke Quality on Main Technical Indexes of Blast Furnace**: *Kai Gu*[1]; Shengli Wu[1]; Mingyin Kou[1]; Heng Zhou[1]; Laixin Wang[1]; Shun Yao[1]; Binbin Du[1]; [1]University of Science and Technology Beijing

**D-31: Kinetic Analysis of Blast Furnace Dust Recycling with Flash Reduction Process at High Temperature**: *Jin Xu*[1]; Jianhua Xin[1]; Nan Wang[1]; Min Chen[1]; Hui Li[1]; Ming Chen[1]; [1]School of Metallurgy, Northeastern University

**D-32: Novel Utilization Technology of Low Grade Nb-bearing Iron Concentrate from Bayan Obo Ore in China**: *Guang Wang*[1]; Jingsong Wang[1]; Qingguo Xue[1]; [1]University of Science and Technology Beijing

**D-33: Preparation and Characterization of Iron-coke Briquette**: *Pei-ye Yan*[1]; Hui-qing Tang[1]; [1]University of Science and Technology Beijing

**D-34: Preparation of Direct Reduced Iron Using Crumb Rubber Powder**: *Xiufeng Fu*[1]; Huiqing Tang[1]; Zhiwei Yun[1]; [1]State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing

**D-35: Preparation of Oxidized Pellets with Chrome Ore**: *Ming-feng Ye*[1]; Guang-liang Wu[1]; [1]Central South University

**D-36: Research and Application of Sintering Surface Steam Spraying Technology for Energy Saving and Quality Improvement**: *Pei Dong*[1]; [1]Shougang China

**D-37: Study on Bonding Mechanism of Sinter Grate Bar**: *Pei Dong*[1]; [1]Shougang China

**D-38: Optimizing Iron Ore Matching for Sintering Based on High Temperature Characteristic Numbers**: *Yong Zhao*[1]; Keng Wu[1]; Wenlong Zhan[2]; Chunen Zhu[1]; Xiaodong Du[1]; [1]University of Science and Technology Beijing; [2]University of Science and Technology Liaoning

**D-39: Mineral Composition and Microstructure Changes of Iron Ore Sinter during the Gas-Solid Reduction**: *Xia Zhao*[1]; Ze-jun Ma[2]; Yan-juan Yang[3]; Yong Zhao[2]; Wen Pan[2]; [1]Shougang Institute of Technology; [2]Shougang Research Institute of Technology; [3]Shougang Technician College

**D-40: Roasting Kinetics of Molybdenite Concentrates**: *Selçuk Kan*[1]; Kagan Benzesik[1]; Onuralp Yücel[1]; [1]Istanbul Technical University

**D-41: Study on Direct Reduction of Low-grade Iron Ore-coal Mini-pellets in Coal-based Rotary Kiln**: *Zhikai Liang*[1]; Zhucheng Huang[1]; Lingyun Yi[1]; Tao Jiang[1]; Biao Lu[1]; Ronghai Zhong[1]; [1]Central South University

**D-42: Study on Influences of Different Ti-bearing Materials on MgO-bearing Pellets Metallurgical Properties**: Yan Zhang[1]; *Gele Qing*[1]; Wenbin Huang[2]; Yunqing Tian[1]; Wenwang Liu[2]; Ming Li[2]; Luyao Zhao[1]; Li Ma[1]; Haoyu Cai[1]; [1]Shougang Research Institute of Technology; [2]Shougang Jingtang United Iron and Steel Co. Ltd

**D-43: Supergravity Separation of Pb and Sn from Waste Printed Circuit Boards**: *Long Meng*[1]; Zhe Wang[1]; Yiwei Zhong[1]; Kuiyuan Chen[1]; Zhancheng Guo[1]; [1]Uinversity of Science and Technology Beijing

**D-44: The Effect of Temperature and Additive on Transport and Transformation of P of High-phosphorus Iron Ore during Carbothermic Reduction**: *Yuanyuan Zhang*[1]; Qingguo Xue[1]; Guang Wang[1]; Jingsong Wang[1]; [1]University of Science and Technology Beijing

**D-45: Thermodynamic Calculations on Direct Reduction of Chromium-bearing Vanadium Titanium Magnetite**: *Wenchao He*[1]; Xuewei Lv[1]; Xueqin Li[1]; Yu Zhang[1]; [1]Chongqing University

## Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* James Cole, Idaho National Laboratory; Peter Hosemann, University of California, Berkeley; Julie Tucker, Oregon State University; Elaine West, Knolls Atomic Power Laboratory

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**F-1: Current Status of In-situ Tritium Measurements from TMIST-3A**: *Walter Luscher*[1]; David Senor[1]; Kevin Clayton[2]; Gary Hoggard[2]; [1]Pacific Northwest National Laboratory; [2]Idaho National Laboratory

**F-2: Dose Effect on the Irradiation Induced Loop Density and Burgers Vector in Ion-irradiated Alloy T91 Irradiated In-situ in a TEM**: *Djamel Kaoumi*[1]; Ce Zheng[1]; [1]North Carolina State Univeristy

**F-3: Grain Boundary Influence on Displacement Cascades in ZrC**: Raul Florez Meza[1]; *Joseph Graham*[1]; [1]Missouri University of Science and Technology

**F-4: In Situ TEM Study on the Radiation Response of Nanotwinned-nanovoid Cu**: *Cuncai Fan*[1]; Youxing Chen[2]; Jin Li[3]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Los Alamos National Laboratory; [3]Texas A&M University

**F-5: Investigation of Helium-Defect Interactions in Tungsten through Coordinated Modeling and Experiment**: *Jie Qiu*[1]; Xunxiang Hu[2]; Brian Wirth[1]; [1]University of Tennessee; [2]ORNL

**F-6: Irradiation Response of Twin Boundaries in Face-centered Cubic Metals with Low Stacking Fault Energy**: *Jin Li*[1]; Youxing Chen[2]; Kaiyuan Yu[3]; Cuncai Fan[1]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Los Alamos National Laboratory; [3]China University of Petroleum-Beijing

**F-7: Radiation Response in Single-phase Concentrated Solid Solution Alloys**: *Chenyang Lu*[1]; Taini Yang[1]; Lumin Wang[1]; Yanwen Zhang[2]; Fei Gao[1]; Ke Jin[2]; Hongbin Bei[2]; William Weber[3]; [1]University of Michigan; [2]Oak Ridge National Laboratory; [3]University of Tennessee

**F-8: Self-organization of Helium Precipitates into Elongated Channels within Metal Nano-layers**: *Di Chen*[1]; Nan Li[1]; Dina Yuryev[2]; Kevin Baldwin[1]; Michael Demkowicz[3]; Yongqiang Wang[1]; [1]Los Alamos National Laboratory; [2]Department of Materials Science and Engineering, Massachusetts Institute of Technology; [3]Department of Materials Science and Engineering, Texas A&M University

**F-9: Studying the Influence of In Situ Proton Irradiation on Corrosion in Molten Salt**: *Weiyue Zhou*[1]; Michael Short[1]; [1]Massachusetts Institute of Technology

**F-10: Swelling Quantification of High Dose Helium Implantation in Different Materials Using a Helium Ion Beam Microscope**: *Manfred Virgil Ambat*[1]; David Frazer[1]; Mehdi Balooch[1]; Yun Yang[1]; Peter Hosemann[1]; [1]University of California, Berkeley

**F-11: The Role of Oxides in Nanostructured Ferritic Alloys and Fe-Y2Ti2O7 Bilayers: Interfaces, Helium Partitioning and Bubble Formation**: *Tiberiu Stan*[1]; Yuan Wu[2]; Jim Ciston[3]; Takuya Yamamoto[2]; Yongquiang Wang[4]; Richard Cox[5]; Robert Odette[2]; [1]Northwestern University; [2]University of California, Santa Barbara; [3]Lawrence Berkeley National Laboratory; [4]Los Alamos National Laboratory; [5]Pacific Northwest National Laboratory

## Accident Tolerant Fuels for Light Water Reactor – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Nuclear Materials Committee
*Program Organizers:* Lingfeng He, Idaho National Laboratory; Andrew Nelson, Los Alamos National Laboratory; Kumar Sridharan, University of Wisconsin; Peng Xu, Westinghouse Electric Company

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**F-12: High Temperature Oxidation Behavior of Zirconium Silicides and their Coating by Laser Cladding on the Zircaloy-4 Tube**: *JaeJoon Kim*[1]; Hyun Gil Kim[2]; Ho Jin Ryu[1]; [1]KAIST; [2]KAERI

**F-13: Optimization of Process Parameters for Thin-wall Tube Fabrication of FeCrAl Alloys**: *Zhiqian Sun*[1]; Yukinori Yamamoto[1]; [1]Oak Ridge National Laboratory

**F-19: Chromium-based Accident-tolerant Fuel Concept**: *Koroush Shirvan*[1]; Yifeng Che[1]; Arunkumar Seshadri[1]; Martin Sevecek[1]; Malik Wagih[1]; Anil Gurgen[1]; Mohammad Shahin[1]; Bren Philips[1]; [1]Massachusetts Institute of Technology

## Additive Manufacturing of Metals: Establishing Location Specific, Processing-Microstructure-Property-Relationships III – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Phase Transformations Committee, TMS: Shaping and Forming Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Eric Lass, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology; Judith Schneider, University of Alabama at Huntsville; Lee Semiatin, US Air Force Research Laboratory; Behrang Poorganji, GE Additive; Clay Houser, QuesTek Innovations

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*Session Chair:* Eric Lass, National Institute of Standards and Technology

**A-1: Additive Manufacturing of Oxide Dispersion Strengthened (ODS) Steel via Selective Laser Melting**: *Hannah Coe*[1]; Somayeh Pasebani[1]; [1]Oregon State University

**A-2: Aluminium-molybdenum System by Friction Stir Surface Alloying Process**: Mahesh V.P.[1]; *Amit Arora*[1]; [1]Indian Institute of Technology Gandhinagar

**A-3: Application of the Small Punch Test to Estimate the Mechanical Properties of Additive Manufactured Materials**: *Sean Davies*[1]; Robert Lancaster[1]; Spencer Jeffs[1]; Henry Illsley[1]; Gavin Baxter[2]; [1]Swansea University; [2]Rolls-Royce plc

**A-4: Bead Formation in Powder Bed Melting of Inconel Material**: Leila Ladani[1]; *Jafar Razmi*[2]; [1]University of Texas at Arlington; [2]University of Hartford

**A-5: Deformation Mechanism of Inconel 718 Made by Additive Manufacturing and Investigated by In-situ Neutron Diffraction**: *Qingge Xie*[1]; Yan Chen[1]; Alexandru Dan Stoica[1]; Gian Song[1]; Sarma Gorti[1]; Radhakrishnan Balasubramaniam[1]; Hassina Z Bilheux[1]; Michael M Kirka[1]; Ryan R Dehoff[1]; Jean-Christophe Bilheux[1]; Louis J. Santodonato[1]; Ke An[1]; [1]UT Battelle LLC

**A-6: Design and Testing of Thin-walled Elements of Additively Manufactured**: *Jalil Alidoost*[1]; Kevin Hemker[1]; James Guest[1]; Matthew Begley[2]; [1]Johns Hopkins University; [2]University of California, Santa Barbara

**A-7: Direct Laser Cladding an Emerging Technique for Development of Component**: *Jyotsna Dutta Majumdar*[1]; [1]Indian Institute of Technology Kharagpur

**A-9: Effects of Different Laser Parameters on Microstructure and Melt Pool of Additively Manufactured 316L Stainless Steel**: *Filippo Vecchiato*[1]; Mark Wenman[1]; Paul Hooper[1]; [1]Imperial College London

**A-10: Effects of Gas Pressure on Melt Track Shape and Quality in SLM**: *Jonathan Gibbs*[1]; Christoph Meier[1]; Ryan Penny[1]; Stuart Baker[1]; Yu Zou[1]; Johannes Weinberg[1]; Reimar Weissbach[1]; Martin Feldmann[1]; A. John Hart[1]; [1]MIT

**A-11: Efficiency of Use of High-strength Aluminum Powders at the Press of Details of the Aerospace Equipment**: *Ivan Redkin*[1]; Aleksander Evgenov[1]; Vladimir Korolev[1]; Dmitriy Ryabov[1]; [1]RUSAL Global Management B. V.

**A-12: Enhancement of Density and Pseudoelasticity of a Cu-Al-Ni-Mn Shape-memory Alloy Produced by Selective Laser (Re)Melting**: *Tobias Gustmann*[1]; Holger Schwab[1]; Uta Kühn[1]; Simon Pauly[1]; [1]IFW Dresden

**A-13: In-situ Synchrotron Transmission X-ray Microscopy and Self-consistent Modeling for Mechanical Behavior Study of Addictive Manufacturing Ti6Al4V Implants**: Kuan Ying Tseng[1]; *E-Wen Huang*[1]; Chun Chieh Wang[2]; Pei Yi Tsai[3]; Shin Yi Huang[3]; Nan Yow Chen[4]; [1]National Chiao Tung University; [2]National Synchrotron Radiation Research Center; [3]Biomedical Technology and Device research Laboratories, Industrial Technology Research Institute; [4]National Center for High-Performance Computing

**A-14: In Operando High-speed X-ray Imaging of Inconel 625 during Laser Powder Bed Fusion Additive Manufacturing**: Enyu Guo[1]; Chu Lun Alex Leung[1]; Robert Atwood[2]; *Peter Lee*[1]; [1]University of Manchester; [2]Diamond Light Source Ltd

**A-15: Local Micro-structure of Inconel Material Fabricated Using Powder Bed Laser Melting Process**: Leila Ladani[1]; *Ali Keshavarz*[1]; [1]University of Texas at Arlington

**A-16: Microstructural Investigation of Inconel 625 – Inconel 738 Functionally Graded Material Fabricated by Laser Metal Deposition**: *Abhishek Ramakrishnan*[1]; Chaitanya Amilkanthwar[1]; Arpit Sethi[1]; Guru Dinda[1]; [1]Wayne State University

**A-17: Microstructure Evolution of Metallic Parts Influenced by Rapid Solidification during Additive Manufacturing**: *Matjaz Godec*[1]; Elena Chernyshova[2]; Jaka Burja[1]; Barbara Šetina Batic[1]; Bojan Podgornik[1]; [1]Institute of Metals and Technology; [2]National Institute of Chemistry

**A-18: On the Relationships between Process Parameters, Microstructure and Properties of Selectively Laser-melted Ti-6V-4V**: *Jonathan Stef*[1]; Angéline Poulon-Quintin[1]; Mohamed Gouné[1]; [1]ICMCB-CNRS

**A-19: Understanding Silicon Reinforcement in Ti6Al4V to Enhance Wear Resistance**: *Jose Avila*[1]; Zumurda Alrawahi[1]; Susmita Bose[1]; Amit Bandyopadhyay[1]; [1]Washington State University

**A-20: X-ray Powder Diffraction of Additively Manufactured (3D Printed) Inconel-718**: Ryan Collette[1]; *Donna Guillen*[2]; Mohamed Elbakhshwan[3]; Lynne Ecker[3]; Jeff King[1]; [1]Colorado School of Mines; [2]Idaho National Laboratory; [3]Brookhaven National Laboratory

## Additive Manufacturing of Metals: Fatigue and Fracture – Poster Session

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

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*Session Chair:* Nikolas Hrabe, National Institute of Standards and Technology

**A-21: Creep and Thermomechanical Fatigue of Functionally Graded Inconel 718 Produced by Additive Manufacturing**: *V.A. Popovich*[1]; E. V. Borisov[2]; V. Heurtebise[3]; T. Riemslag[1]; A. A. Popovich[2]; V. Sh. Sufiiarov[2]; [1]Delft University of Technology; [2]Peter the Great Saint-Petersburg Polytechnic University; [3]SIGMA Clermont

**A-22: Effect of Loading Direction and Heat Treatment on Fatigue Crack Growth Rate of CoCrW Alloy Additively Manufactured by Selective Laser Melting**: *Ho Won Lee*[1]; Dong Jun Lee[1]; Seong-Hoon Kang[1]; Dongkyu Kim[2]; [1]Korea Institute of Materials Science; [2]Korea Atomic Energy Research Institute

## Additive Manufacturing: Building the Pathway towards Process and Material Qualification – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS Extraction and Processing Division, TMS: Mechanical Behavior of Materials Committee, TMS: Process Technology and Modeling Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas - Austin; Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology; James Sears, Carpenter Technology Coporporation; Christopher Tuck, University of Nottingham

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**A-23: Additive Manufacturing on Satellites: Current State, Future Applications, Gaps and Needs, and Transition Strategies**: *Ben Jafek*[1]; Alexander Jafek[2]; [1]Brigham Young University; [2]University of Utah

**A-24: AM Informatics – Optimizing Additive Manufacturing through Effective Use of Materials and Process Information**: *Najib Baig*[1]; James Goddin[1]; Will Marsden[1]; [1]Granta Design

**A-25: Applied Machine Vision and Machine Learning to the Characterization and Qualification of Additive Manufacturing Powder Feedstock**: *Anna Smith*[1]; Brian DeCost[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

**A-26: Characterization of Additive Manufactured Microstructures Using Ultrasonic Measurements**: Hualong Du[1]; *Paul Panetta*[1]; Lisa Deibler[2]; Bradley Jared[2]; [1]Applied Research Associates, Inc.; [2]Sandia National Lab

**A-27: Effect of Build Geometry on the Microstructure and Tensile Properties of 17-4 PH Stainless Steel Parts Prepared by Selective Laser Melting**: *Yu Sun*[1]; Mark Aindow[1]; Rainer Hebert[1]; [1]University of Connecticut

**A-28: Effects of Atomizing Pressure, Melt Temperature and Flow Rate on the Particle Size and Yield of Gas Atomized Aluminum Alloy Powders for Additive Manufacturing**: *Sharon Park*[1]; Le Zhou[1]; Edward Dein[1]; Yongho Sohn[1]; [1]University of Central Florida

**A-30: The Influence of FDM Build Parameters on the Mechanical Properties of 3D-printed ABS**: *Celeste Brown*[1]; Kemar Hibbert[1]; [1]Howard University

**A-31: Understanding Properties and Effects of Reused Metal Powder in the LENS DED Process**: *Katherine Terrassa*[1]; Sen Jiang[1]; Joshua Yee[2]; Nancy Yang[2]; Julie M. Schoenung[1]; [1]University of California, Irvine; [2]Sandia National Laboratories

## Advanced Magnetic Materials for Energy and Power Conversion Applications – Poster Session - Magnetism in Energy Applications

*Sponsored by:* TMS Functional Materials Division, TMS: Magnetic Materials Committee, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Orlando Rios, Oak Ridge National Laboratory; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory; Alex Leary, NASA Glenn; Ian Ashcroft, University of Nottingham; Tanjore V. Jayaraman, University of Michigan, Dearborn

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**B-1: A Study on Microstructure of Nb-Ti Based Alloy with Strain and Heat-treatment**: *Yong-Ho Kim*[1]; Hyo-Sang Yoo[1]; Hyeon-Taek Son[1]; Duk-Young Hwang[2]; [1]Korea Institute of Industrial Technology; [2]KAT Ltd.

**B-3: Development of Filaments for 3D Printing from Recycled Materials**: Helena Khazdozian[1]; Juan Manzano[2]; Igor Slowing[1]; *Ikenna Nlebedim*[1]; [1]Ames Laboratory; [2]Iowa State University

**B-4: High Temperature Performance of Dy-free $Nd_2Fe_{14}B$ Based-permanent Magnets**: *Kinjal Gandha*[1]; Wei Tang[1]; Cajetan Nlebedim[1]; [1]Ames Laboratory

**B-5: Investigating an Exchange-spring Magnet for Direct-drive Wind Turbine Generators**: Helena Khazdozian[1]; Scott McCall[2]; Aditya Vedantam[3]; Devin Imholte[4]; Ananth Iyer[5]; *Ikenna Nlebedim*[1]; [1]Ames Laboratory; [2]Lawrence Livermore National Laboratory; [3]University at Buffalo; [4]Idaho National Laboratory; [5]Purdue University

**B-6: Tuning of Magnetic Properties of Heusler-type Glass-coated Microwires**: Valentina Zhukova[1]; Mihail Ipatov[1]; Juan del Val[1]; *Arcady Zhukov*[2]; [1]University of Basque Country; [2]Basque Country University and Ikerbasque

## Advances in Additive Manufacturing of Titanium and Titanium Based Alloys – Poster Session

*Sponsored by:* TMS: Additive Manufacturing Committee
*Program Organizers:* Peter Collins, Iowa State University; Leon Prentice, CSIRO; Andrew Baker, The Boeing Company; Craig Brice, Lockheed Martin Space Systems Company

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**A-32: Validation of a High Integrity Joining/ Repair Process for Aerospace Materials**: *Aran Johal*[1]; Helen Davies[1]; Peter Davies[1]; Silvia Marchisio[2]; [1]Swansea University; [2]Rolls Royce plc

## Aluminum Alloys, Processing and Characterization – Poster Session I - Development of Aluminum Alloy Processing

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

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**C-1: Aluminum Matrix Composites**: *Cameron Shackleford*[1]; [1]Oak Ridge National Laboratory

**C-2: Effect of Mg on Microstructure and Mechanical Property of Al-B Alloy**: *Jae-Ik Cho*[1]; Cheol-Woo Kim[1]; Min-Suk Oh[1]; Jung-Han Kim[1]; [1]Korea Institute of Industrial Technology

**C-3: Effects of ZnO Nanoparticles and its Decomposition on the Mechanical Behavior of A356 Gravity Casting Alloy**: *Jeheon Jeon*[1]; Donghyun Bae[1]; [1]Yonsei University

**C-4: Investigation on Mechanochemical Behavior of Al-Nb-B/$B_2O_3$ System Reactive Mixtures to Synthesize Metal Matrix Composites**: *Petra Hanusova*[1]; [1]Brno University of Technology, Faculty of Mechanical Engineering

**C-5: High Thermal Conductivity Aluminum Alloy for High Pressure Die Casting**: *Cheol Woo Kim*[1]; Jae-Ik Cho[1]; Jung-Han Kim[1]; Min-Suk Oh[1]; Young-Chan Kim[1]; [1]KITECH

**C-6: Study on the Process Parameters of Preparing Al-Mg-Sc Alloy by Electrodeposition**: *Hao Ren*[1]; Li Jidong[1]; Wang Yiyong[1]; [1]University of Science and Technology Liaoning

**C-7: Formation Mechanism of Surface Segregation in Heated Mold Continuous Casting Al–Cu Alloy**: *Jihui Luo*[1]; [1]Yangtze Normal University

**C-8: A Study on the Thermal Conductivity of Aluminum Die Casting Products with the Variation of Cooling Rate**: *TaekWon Oh*[1]; JeHeon Jeon[1]; DongHyun Bae[1]; [1]Yonsei University

**C-9: Mitigation of ß-AlFeSi Intermetallic Formation on Spray Formed 319 Aluminum Alloy with Different Iron Content**: *Lucas Otani*[1]; Michele Matsuo[2]; Guilherme Zepon[2]; Claudio Kiminami[2]; Walter Botta[2]; Claudemiro Bolfarini[2]; [1]Postgraduate Program in Materials Science and Engineering (PPGCEM); [2]Federal University of São Carlos (UFSCar)

**C-10: The Influence of Microstructure Length Scale on Dry Sliding Wear Behaviour of Monotectic Al-3.2Bi-3Cu Alloy**: Vitor Pinotti[1]; Rodrigo Reyes[1]; Conrado Afonso[1]; Luiz Casteletti[2]; *José Spinelli*[1]; [1]Federal University of São Carlos; [2]University of São Paulo

**C-11: Effect of Mg and Cu Additions into ADC12 on the Mechanical Properties during Heat Treatment after Die-casting**: *JaeHwang Kim*[1]; JiWoo Im[1]; [1]Korea Institute of Industrial Technology

**C-12: Friction Stir Welding of High Strength Al-7050 and Mg-WE43 Alloys**: *Saurabh Nene*[1]; Michael Frank[1]; Rajiv Mishra[1]; R. Brennan[2]; K. Cho[2]; [1]University of North Texas; [2]U.S. Army Research Laboratory

**C-13: Grain Size Modelling and Simulation during Hot Torsion of AW6082 Aluminium Alloy**: *Sanjeev Kumar*[1]; Jules Franz Thierry Simonet Fotso[1]; Friedrich Krumphals[1]; Cecilia Poletti[1]; [1]Graz University of Technology, Graz Austria

**C-14: A Comparison of Strain Profiles Obtained by Nanoindentation and Glancing Angle X-ray Diffraction in Hot Rolled Aluminum-magnesium Alloys**: *Sepideh Parvinian*[1]; Eric Hoar[1]; David Tavakoli[1]; Hamid Garmestani[1]; [1]Georgia Institute of Technology

**C-15: Direct Preparation of Pure Al and Si from Al-Si3O Alloy by Molten Salts Electrolysis**: Guolong Liu[1]; Zheng Wang[1]; Wei Liu[1]; *Saijun Xiao*[1]; [1]Anhui University of Technology

**C-16: Effect of Electromagnetic Stirring on the Distribution of Primary Silicon in Hypereutectic Aluminum Alloys Billet**: *Jong Ho Kim*[1]; [1]Research Institute of Industrial Science and Technology

## Aluminum Alloys, Processing and Characterization – Poster Session II - Characterizations of Aluminum Alloys

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Xiyu Wen, University of Kentucky

Monday PM
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Room: Hall CD
Location: Phoenix Convention Center

**C-17: Development of V-arm Manufacturing Technology for Heavy Truck Using High Vacuum Die Casting Technology**: Min Seok Moon[1]; *MyeongHan Yoo*[1]; JoonHyuk Song[1]; JeHa Oh[1]; NaRa Park[1]; GunSung Chung[1]; DongChul Chung[1]; Young Choi[2]; [1]Korea Institute of Carbon Convergence Technology; [2]Korea Institute of Industrial Technology

**C-18: Effect of Alloying Elements on Microstructure Adjacent to Grain Boundaries in Al-Mg-Si Based Alloys**: *Shingo Ishizawa*[1]; Shigeru Kuramoto[1]; Goroh Itoh[1]; [1]Ibaraki University

**C-19: Effect of Mg Amount on Interface Reaction between Molten Al Alloy and Tool Steel**: *Young-Ok Yoon*[1]; Seong-Ho Ha[1]; Bong-Hwan Kim[1]; Hyun-Kyu Lim[1]; Shae K. Kim[1]; [1]Korea Institute of Industrial Technology

**C-20: Effect of Stacking Fault Energy on the Deformation Behavior of Al-Mg-(Zn) Alloy Sheets**: *Juhee Yun*[1]; Sangjun Lee[1]; Donghyun Bae[1]; [1]Yonsei University

**C-21: Effects of Extrusion and Heat Treatment Conditions on Microstructure and Mechanical Properties of an Al-Zn-Mg-Cu-Er Alloy**: S. Kord[1]; *Mohammad Alipour*[2]; M. H. Siadati[1]; Masumeh Kord[3]; Praveennath G. Koppad[4]; [1]Faculty of Materials Science and Engineering, K. N. Toosi University of Technology; [2]Department of Materials Science and Engineering, University of Tabriz; [3]Department of Biomaterial, Pasteur Institute of Iran; [4]Department of Mechanical Engineering, CMR Institute of Technology

**C-22: Effects of Rare Earth Er Additions on Microstructure and Mechanical Properties of an Al-5Cu-2Mg Alloy**: S. Kord[1]; *Mohammad Alipour*[1]; M. H. Siadati[1]; Masumeh Kord[2]; [1]Department of Materials Engineering, Faculty of Mechanical Engineering, K.N. Toosi University of Technology; [2]Department of Biomaterial, Pasteur Institute of Iran

**C-23: Effects of Rare Earth Er Additions on Microstructure and Mechanical Properties of an Al-Zn-Mg-Cu Alloy**: S. Kord[1]; *Mohammad Alipour*[2]; M. H. Siadati[1]; Masumeh Kord[3]; Praveennath G. Koppad[4]; [1]Faculty of Materials Science and Engineering, K. N. Toosi University of Technology; [2]Department of Materials Science and Engineering, University of Tabriz; [3]Department of Biomaterial, Pasteur Institute of Iran; [4]Department of Mechanical Engineering, CMR Institute of Technology

**C-24: Particle Stimulated Texture Development in the Al-Si-Mg Alloy Sheets Containing Transition Metals**: *Kwangmin Choi*[1]; Sangjun Lee[1]; Donghyun Bae[1]; [1]Yonsei University

**C-25: Microstructure and Mechanical Properties of Three Dissimilar Aluminum Alloys by Accumulative Roll-bonding Process**: *Jung-Han Kim*[1]; Min-Suk Oh[1]; Cheol-Woo Kim[1]; Jae-Ik Cho[1]; Hyeon-Taek Son[1]; [1]Korea Institute of Industrial Technology

**C-27: Precipitation Processes and Strengthening Mechanisms in Al-Mg-Si Alloy Extruded to High Strains**: *Witold Chrominski*[1]; Malgorzata Lewandowska[1]; [1]Warsaw University of Technology

**C-30: Study of Variable and Constant Blank Holding Force Techniques in Hydroforming of Cryorolled Aluminum-magnesium Alloy Sheets**: *Fitsum Feyissa*[1]; Ravi Dagavalli[1]; [1]Indian Institute of Technology Delhi

**C-31: Study on Fe-rich Phase in Al-Mg-Fe and Al-Mg-Mn-Fe Alloys**: *Xiangzhen Zhu*[1]; Shouxun Ji[1]; [1]Brunel University London

**C-32: The Effect of Waiting Time after Furnace Exit on Mechanical Properties of AA6082 Rod Profile**: *Osman Celik*[1]; [1]Istanbul Technical University

## Aluminum Reduction Technology – Poster Session

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Abdalla Zarouni, Emirates Global Aluminium

Monday PM
March 12, 2018

Room: Hall CD
Location: Phoenix Convention Center

*Session Chair:* Zlatko Cus, TALUM d.d.

**C-33: Current Distribution on the Anode Bottom of the Aluminium Cell in the Complicated Conditions of Electrolysis**: *Peter Polyakov*[1]; Nikita Sharypov[1]; Illiya Puzanov[2]; Andrey Zavadyak[2]; Yuriy Mikhalev[1]; Andrey Polyakov[1]; Andrey Yasinskiy[1]; Jan Voushel[1]; [1]Siberian Federal University; [2]JC RUSAL

**C-34: Investigate the Causes of Hole in Pots**: *Mohsen Amerisiahooei*[1]; Tayeb Kamali[2]; [1]Islamic Azad University; [2]Almahdi Hormozal Aluminium Smelter

**C-35: Potline Start up without Anode Effect Frequency**: *Mohsen Amerisiahooei*[1]; Babak Bahman Nejad[2]; [1]Islamic Azad University; [2]Almahdi Hormozal Aluminium Smelter

**C-36: Restarting Electrochemical Cell with a Cold Metal (D18 Cell)**: *Mohsen Amerisiahooei*[1]; Tayeb Kamali[2]; [1]Islamic Azad University; [2]Almahdi Hormozal Aluminium Smelter

**C-37: The Impact of One Pot Tap out on the Secondary Alumina in Line Production**: *Mohsen Amerisiahooei*[1]; Tayeb Kamali[2]; [1]Islamic Azad University; [2]Almahdi Hormozal Aluminium Smelter

**C-38: The Influence of Potassium Additive on Cryolite Molten Salt Structure and Transport Properties**: Hongliang Zhang[1]; *Tianshuang Li*[1]; Jie Li[1]; Kena Sun[1]; Fengqi Ding[1]; Zhong Zou[1]; [1]Central South University

**C-39: Thermo-electrical Modeling of an Aluminum Reduction Cell**: *Mohsen Amerisiahooei*[1]; Borzou Baharvand[2]; [1]Islamic Azad University; [2]Almahdi Hormozal Aluminium Smelter

## Cast Shop Technology – Poster Session

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizer:* Mark Badowski, Hydro Aluminium

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Room: Hall CD
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**C-40: Electrochemical Characterization of Al-Li-Cu-Mg Alloys**: *Alicia Ares*[1]; Silvina Ramos[1]; Claudia Méndez[2]; [1]CONICET/FCEQyN-UNaM; [2]FCEQyN-UNaM

**C-41: Evaluation of Stress Relief Processes Used on High Pressure Aluminum Die Casting Dies**: *Thomas Watkins*[1]; Philip Maziasz[1]; Ercan Cakmak[1]; Jeffrey Cornett[1]; James Saylor[2]; [1]Oak Ridge National Laboratory; [2]Toyota | Bodine Aluminum TN

**C-42: Introduction and Distribution of Non-metallic Nanoparticles in Aluminum Melt**: Anton Khrustalev[1]; *Aleksander Vorozhtsov*[1]; Marina Khmeleva[1]; Ilya Zhukov[1]; Vladimir Promakhov[1]; [1]Tomsk State University

**C-43: Shaping the Mechanical Properties of AlSi30 Alloy Cast by Rapid Solidification**: *Boguslaw Augustyn*[1]; Marcin Szymanek[1]; Dawid Kapinos[1]; Sonia Boczkal[1]; [1]Institute of Non Ferrous Metals

**C-44: Study of the Effect of the Surface-roughness of Dies and Tooling for HPDC on Soldering**: Federico Simone Gobber[1]; Andrea Pisa[1]; Daniele Ugues[1]; Silvia Lombardo[2]; *Mario Rosso*[1]; [1]Politechnico di Torino; [2]FOMT

## Cast Shop Technology: Fundamentals of Aluminum Alloy Solidification Joint Session – Poster Session

*Sponsored by:* TMS Light Metals Division, TMS: Aluminum Committee
*Program Organizers:* Andre Phillion, McMaster University; Mark Badowski, Hydro Aluminium; Mohsen Asle Zaeem, Missouri University of Science and Technology

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**C-45: Homogenization Treatment of High-strength Aluminum Alloy with Casting Processes**: *Myounggyun Kim*[1]; [1]RIST

## Cast Shop Technology: Recycling and Sustainability Joint Session – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Mark Badowski, Hydro Aluminium; Elsa Olivetti, Massachusetts Institute of Technology

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**C-46: Precious Technology; Recycling of Titanium from Medical Implant Industry, Challenges and Opportunities**: *Erdogan Teke*[1]; M. Özgür Seydibeyoglu[1]; [1]Izmir Katip Celebi University

**C-47: Promotion of Separation of Two Phase Liquid Metals by Applying Mechanical Vibration**: *Yuichiro Murakami*[1]; Shuji Tada[1]; Mingjun Li[1]; Isao Matsui[1]; Naoki Omura[1]; [1]Advanced Industrial Science and Technology

## Coupling Experiments and Modeling to Understand Plasticity and Failure – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Michael Sangid, Purdue University; Philip Eisenlohr, Michigan State University; Matthew Miller, Cornell University; Paul Shade, Air Force Research Laboratory

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*Session Chair:* Michael Sangid, Purdue University

**E-1: A Domain Decomposition Parallel Implementation of an Elasto-visco-plastic Fast Fourier Transform Micromechanical Solver with Spectral Database Constitutive Representation**: *Adnan Eghtesad*[1]; Timothy Barrett[1]; Kai Germaschewski[1]; Ricardo A. Lebensohn[2]; Rodney J. McCabe[2]; Marko Knezevic[1]; [1]University of New Hampshire; [2]Los Alamos National Laboratory

**E-2: An Image Based Finite Element Model for Ni-based Superalloys Using a Two Scale Constitutive Model Accounting for Morphological Distributions of γ' Precipitates**: *George Weber*[1]; Maxwell Pinz[1]; Akbar Bagri[1]; Somnath Ghosh[1]; [1]Johns Hopkins University

**E-3: Annealing-detwinning due to Thermal Fluctuation of Incoherent Twin Boundary**: Hao Sun[1]; *Chandra Singh*[1]; [1]University of Toronto

**E-4: Finite Element Simulation of Global Plastic Behavior of Supercritical CO2 Exposed P91 Metal-weld under Tensile Loading**: *Sajedur Akanda*[1]; Monica Kapoor[1]; Kyle Rozman[1]; Ömer Dogan[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

**E-5: Grain-scale Investigations of Deformation Heterogeneities in Aluminum Alloys**: *Baran Güler*[1]; Tuncay Yalçinkaya[1]; Mert Efe[1]; [1]Middle East Technical University

**E-6: In-situ Characterization of Microstructural Damage in QP980 Steel**: *Diyar Salehiyan*[1]; Javad Samei[1]; David Wilkinson[1]; [1]McMaster University

**E-7: In Situ Mechanics at Atomic Scale – Experimental vs. Computational Molecular Dynamics**: *Scott Mao*[1]; [1]University of Pittsburgh

**E-8: Influence of the Aluminum Microstructure in Electronic Components on their Failure Behavior: Experiments and Crystal Plasticity Simulations**: *Ewald Werner*[1]; Felix Meier[1]; [1]Technical University of Munich

**E-9: Internal State Variable Plasticity-damage Modeling of AISI 4140 Steel Including Microstructure-property Relations: Temperature and Strain Rate Effects**: *Reda Nacif el Alaoui*[1]; Luke Peterson[1]; Mark Horstemeyer[1]; [1]Mississippi State University

**E-10: Investigation of Deformation Mechanisms in Columnar Aluminum**: *Marissa Linne*[1]; Samantha Daly[2]; [1]University of Michigan; [2]UCSB

**E-11: Mechanism-based Modeling of Solute Strengthening: Application to Thermal Creep in Zr Alloy**: *Wei Wen*[1]; [1]Los Alamos National Laboratory

**E-12: Molecular Dynamics (MD) Evaluation of the Effect of Titanium Oxide Stoichiometry on Fracture**: *Natalia Tymiak Carlson*[1]; [1]Bettis Atomic Power Laboratory

**E-13: New Approach for Modeling Texture Effect on Macroscopic Plastic Properties of Metals**: *Nitin Chandola*[1]; Oana Cazacu[1]; Benoit Revil-Baudard[1]; [1]University of Florida

**E-14: Rate Processes in Dislocation Dynamics: Effects on Dislocation Microstructure and Comparison with X-ray and TEM Data**: *Anter El-Azab*[1]; [1]Purdue University

**E-15: Strain Bursts Induce Quasi-elastic Non-linear Average Response in Nanopillar Compression**: *Hengxu Song*[1]; Stefanos Papanikolaou[2]; [1]Johns Hopkins University; [2]West Virginia University

**E-16: Strain Field Mapping and Modeling Around Laser-induced Keyhole Defects in Ti-7Al under Cyclic Loading**: *Rachel Lim*[1]; Yufeng Shen[1]; Christopher Kantzos[1]; He Liu[1]; Robert Suter[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

**E-17: Using Machine Learning Approaches towards Quantifying the Deformation History of Crystals: Examples from Discrete Dislocation Dynamics**: *Michail Tzimas*[1]; Stefanos Papanikolaou[1]; Hengxu Song[1]; Andrew Reid[2]; Stephen Langer[2]; [1]West Virginia University; [2]National Institute of Standards and Technology

## Deformation and Damage Mechanisms in High Temperature Ni, Co and Fe-based Superalloys – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: High Temperature Alloys Committee
*Program Organizers:* Mark Hardy, Rolls-Royce plc; Kevin Bockenstedt, ATI Specialty Materials; Chantal Sudbrack, QuesTek Innovations, LLC; Michael Titus, Purdue University; Kinga Unocic, Oak Ridge National Laboratory; Yukinori Yamamoto, Oak Ridge National Laboratory

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**E-18: Atomistic Modeling of Segregation and Diffusion in Ni-based Superalloys**: *You Rao*[1]; Maryam Ghazisaeidi[1]; [1]The Ohio State University

**E-19: Effect of Rhenium on Deformation Mechanisms during Creep in Ni-based Single-crystal Superalloys**: *Vincent Huleux*[1]; Loïc Naze[1]; Vladimir Esin[1]; Vincent Maurel[1]; Virginie Jaquet[2]; Jérémy Rame[2]; [1]Centre des Matériaux des Mines de Paris; [2]Safran Tech

**E-20: Exploring Thermo-mechanical Deformation Mechanism of a NiAl-Cr(Mo) Superalloy by In-situ Neutron Diffraction**: *Dunji Yu*[1]; Ke An[1]; Xu Chen[2]; Hongbin Bei[1]; [1]Oak Ridge National Laboratory; [2]Tianjin University

**E-21: Mechanical and Microstructural Evaluation of Friction Welded Future Nickel Disk Alloys**: *Kate Franklin*[1]; [1]University of Birmingham, UK

**E-23: Prediction of Incipient Melting Map and γ' Features of Ni-base Superalloys Using Molecular Orbital Method**: *Mohammad Mostafaei*[1]; S. M. Abbasi[1]; [1]Malek Ashtar University of Technology

**E-24: Predictive Equations of the Elastic Modulus for Individual γ and γ' Phases in the Ni-Al-W System**: *Takuma Saito*[1]; Makoto Osawa[2]; Tadaharu Yokokawa[2]; Toshiharu Kobayashi[2]; Hiroshi Harada[2]; Kyoko Kawagishi[2]; Yuhi Mori[1]; Shinsuke Suzuki[1]; [1]Waseda University, School of Fundamental Science and Engineering; [2]National Institute for Materials Science (NIMS)

**E-25: Probing the Effects of Alloying Elements on Creep Properties Using Simplified Alloy Chemistries**: *Ashton Egan*[1]; Jiashi Miao[1]; Maryam Ghazisaedi[1]; Yunzhi Wang[1]; Stephen Niezgoda[1]; Michael Mills[1]; [1]The Ohio State University

**E-26: Tensile Properties and Fracture Behavior of ATI 718Plus Alloy at Room and Elevated Temperatures**: *Micheal Kattoura*[1]; Seetha Ramaiah Mannava[1]; Dong Qian[2]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]University of Texas at Dallas

## Deriving Value from Challenging Waste Streams: Recycling and Sustainability Joint Session – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee, TMS: Pyrometallurgy Committee
*Program Organizers:* Elsa Olivetti, Massachusetts Institute of Technology; John Howarter, Purdue University; Fiseha Tesfaye, Åbo Akademi University

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**B-7: Bacterial Degradation of Free Cyanide in Alkaline Medium Using *Bacillus Licheniformis* Strain**: *Amzy Vallenas Arévalo*[1]; Carlos Rosario[1]; Denise Espinosa[1]; Jorge Tenório[1]; [1]University of Sao Paulo

**B-8: Determination of Limiting Current Density of a Solution with Copper, Zinc and EDTA from the Effluent of Brass Electrodeposition**: Kayo Barros[1]; Jorge Tenório[1]; *Denise Espinosa*[1]; [1]University of São Paulo (USP)

**B-9: Effect of the pH on the Recovery of Al3+, Co2+, Cr3+, Cu2+, Fe3+, Mg2+, Mn2+, Ni2+ and Zn2+ by Purolite S950**: *Isadora Perez*[1]; Mónica Maria Correa[1]; Jorge Alberto Tenório[1]; Denise Espinosa[1]; [1]University of São Paulo

**B-10: Evaluation of the Occurrence of Fouling and Scaling on the Membrane HDX 200 for the Treatment of the Effluent of Brass Electrodeposition with EDTA as Complexing Agent**: Kayo Barros[1]; Jorge Tenório[1]; *Denise Espinosa*[1]; [1]University of São Paulo (USP)

**B-11: High Temperature Crystallization Kinetics of MgSO4.H2O**: Kristine Wanderley[1]; Denise Espinosa[1]; *Jorge Tenório*[1]; [1]LAREX, University of São Paulo (USP)

**B-12: Incorporation of Rubber Waste Powder from Scrap Tires into Heavy Clay Ceramics**: *Carlos Maurício Vieira*[1]; Rosane Toledo[1]; Juliana Soares de Faria[1]; Sergio Neves Monteiro[2]; [1]State University of the North Fluminense; [2]Military Engineering Institute

**B-14: Preparation of Glass-ceramic from Titanium-bearing Blast Furnace Slag by "Petrurgic" Method**: *Kuiyuan Chen*[1]; Yu Li[1]; Long Meng[1]; Yaodong Yi[1]; Zhancheng Guo[1]; [1]University Of Science And Technology Beijing

**B-16: Recovery of Copper from Nickel Laterite Leach Waste by Chemical Reduction Using Sodium Dithionite**: Amilton Botelho Junior[1]; Iara Anes[1]; Mariana Alves de Carvalho[1]; Denise Espinosa[1]; *Jorge Tenório*[1]; [1]University of São Paulo

**B-17: Recovery of Nickel and Cobalt from a Waste Zone of Nickel Laterite Ore Using a Mixture of Extractants in Solvent Extraction Technique**: *Paula Aliprandini*[1]; Mónica Jimenez Correa[1]; Jorge Tenório[1]; Denise Espinosa[1]; [1]University of Sao Paulo

**B-18: Rural Water Pollution and its Strategies in China**: *Li Zhaohua*[1]; Zhang Jin[1]; Zhao Liya[1]; Chen Hongbing[1]; [1]Hubei University

**B-19: Study on the Passivation Effect of Cr6+ in the Waste Water of the Blood Meal**: *Chen Hongbing*[1]; Li Yadong[1]; Li Sitong[1]; Shu Fangfang[1]; Wang Nan[1]; [1]Hubei University

**B-20: Mechanical Behavior of White Ordinary Portland Cement Paste with Iron Oxide Powders Containing Arsenic**: *Manuela Castañeda Montoya*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

## Dynamic Behavior of Materials VIII – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Saryu, Los Alamos National Laboratory; George Gray, Los Alamos National Laboratory; Naresh Thadhani, Georgia Institute of Technology; Kenneth Vecchio, University of California, San Diego; Marc Meyers, University of California, San Diego

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**E-27: Constitutive Model for Dynamic Tensile Behaviour and the Dynamic Tensile Ductile Fracture Behaviour of Press-hardening Steels**: *Xing Wei*[1]; Jianhua Mo[1]; [1]WISCO

**E-28: Development of a Dynamic Materials Processing and Testing Equipment**: *Anupam Vivek*[1]; Stephen Niezgoda[1]; Alexander Koenig[1]; Geoffrey Taber[1]; Glenn Daehn[1]; [1]Ohio State University

**E-29: Dynamic Response of AA2519-T8 Aluminum Alloy under High Strain Rate Loading**: Gbadebo Owolabi[1]; Adewale Olasumboye[1]; *Temitayo Daramola*[1]; Horace Whitworth[1]; [1]Howard University

**E-30: Effect of Stain Rate on the Compressive Behavior and Energy Absorption of Woven Flax-epoxy Laminate Composites**: *Jianxing Hu*[1]; Sha Yin[1]; Jun Xu[1]; [1]Beihang University

**E-31: Fragmentation in Ni-Al**: Andrew Marquez[1]; Zezhou Li[1]; Christopher Braithwaite[2]; Timothy Weihs[3]; Nicholas Krywopusk[3]; David Gibbins[3]; *Marc Meyers*[1]; [1]University of California, San Diego; [2]Cambridge University; [3]Johns Hopkins University

**E-32: Microstructural Evolution in Fe-10Ni-0.1C Steel during Dynamic Deformation**: *Ian Harding*[1]; Sharvan Kumar[1]; [1]Brown University

**E-33: New Insights to the Bonding Mechanisms in Metal-ceramic Composite Cold Spray**: Rohan Chakrabarty[1]; *Jun Song*[1]; [1]McGill University

**E-34: Prediction of Joint Properties Obtained in the High Velocity Impact Welding of Dissimilar Metals**: *Varun Gupta*[1]; Kyoo Sil Choi[1]; Anupam Vivek[2]; Yu Mao[2]; Xin Sun[3]; Glenn Daehn[2]; [1]Pacific Northwest National Laboratory; [2]Ohio State University; [3]Oak Ridge National Laboratory

**E-35: Shock-induced Mechanical Response and Substructural Evolution of Ti–6Al–4V Alloy**: *Yu Ren*[1]; Shimeng Zhou[2]; Zhiyong Xue[1]; Chengwen Tan[3]; [1]North China Electric Power University; [2]No. 52 Institute of China Ordnance Industries; [3]Beijing Institute of Technology

**E-36: The Effect of Mercerization of Sisal Fibers on the Ballistic Performance of Epoxy / Sisal Composites**: *Luís Carlos Silva*[1]; Sérgio Neves Monteiro[1]; [1]IME

**E-37: The Use of Circumferentially Notched Tension Specimen for Fracture Toughness Assessment of High Strength Steels**: *V.A. Popovich*[1]; T. Opraus[1]; M. Janssen[1]; B. Hu[1]; A. C. Riemslag[1]; [1]Delft University of Technology

## Energy Technologies and $CO_2$ Management Symposium – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee
*Program Organizers:* Ziqi Sun, Queensland University of Technology; Cong Wang, Northeastern University; Donna Guillen, Idaho National Laboratory; Tao Wang, Nucor Steel; Neale Neelameggham, Ind LLC; John Howarter, Purdue University

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**B-21: A Novel Preparation of $Bi_2O_3$ and Their Potent Photocatalytic Activity under Visible-light Irradiation**: Jun Chen[1]; *Jing Zhan*[1]; [1]Central South University

**B-22: CaxSr1-xO Heterogeneous Catalysts Using Polymer Complex Method (PCM) for Biodiesel Production**: *Maria Lourdes Potestades*[1]; Shih-Kang Lin[1]; Wen-Dung Hsu[1]; Masahiro Yoshimura[1]; [1]National Cheng Kung University

**B-23: Energy Conservation in Sintering Ignition Process Based on Comprehensive Ignition Intensity**: *Wen Pan*[1]; Xia Zhao[2]; Si-bin Zhang[3]; Jun-hua Zhao[4]; Huai-ying Ma[1]; Zhi-xing Zhao[1]; [1]Shougang Research Institute of Technology; [2]Shougang Institute of Technology; [3]Chief Engineer Office Shougang Group co., LTD; [4]Beijing Shougang co., LTD

**B-24: Study of Seperation between Carbon Dioxide and Hydrogen by Carbon Nanotube in Aluminium Industry (Monte Carlo Simulation)**: *Mohsen Amerisiahooei*[1]; Khirollah Mehrani[1]; Mohammad Yousefi[1]; [1]Islamic Azad University

**B-25: Study on Energy Utilization of High Phosphorus Oolitic Hematite by Gas-based Shaft Furnace Reduction and Electric Furnace Smelting Process**: *Hui Sun*[1]; [1]Beijing Shenwu Environment & Energy Technology Co.,Ltd.

## Environmental Challenges and Opportunities for the Magnesium Industry: Recycling and Sustainability Joint Session – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Magnesium Committee, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Elsa Olivetti, Massachusetts Institute of Technology; Neale Neelameggham, Ind LLC

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**C-48: Repaired Algorithm for Nonlinear to Predict the Displacement of Copper Ion in the Absorbtion System of Treated Steel Slag**: *Zhu Shu Jing*[1]; [1]Michigan Technological University

## Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, 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:* Ashley Spear, University of Utah; Jean-Briac le Graverend, Texas A&M University; Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

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**E-40: Fatigue of the Beta Ti-15Mo and Ti-12Mo-6Zr-2Fe Alloys Treated above Beta Transus**: Leonardo Campanelli[1]; Murilo Santos[1]; Paulo Sergio da Silva[1]; *Claudemiro Bolfarini*[1]; [1]Federal University of São Carlos

**E-41: Prediction and Fatigue Response of Ti-6Al-4V Alloy with Surface Modified by Chemical Treatment**: *Cesar Escobar Claros*[1]; Paulo Sergio Pereira da Silva[1]; Leonardo Campanelli[1]; Tales Ferreira[1]; Diego Pedreira Oliveira[1]; Claudemiro Bolfarini; Claudemiro Bolfarini[1]; [1]Universidade Federal de São Carlos

## Fracture: 65 Years after the Weibull Distribution and the Williams Singularity – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Brad Boyce, Sandia National Laboratories; Ellen Cerreta, Los Alamos National Laboratory; Jacob Hochhalter, NASA LaRC; Jonathan Zimmerman, Sandia National Laboratories

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**E-42: High Temperature Cracking Damage of Calcium Aluminate Cements**: *John Zapata*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

**E-43: On the Experimental Evaluation of the Fracture Toughness of Shape Memory Alloys**: *Behrouz Haghgouyan*[1]; Ceylan Hayrettin[1]; Theocharis Baxevanis[2]; Ibrahim Karaman[1]; Dimitris Lagoudas[1]; [1]Texas A&M University; [2]University of Houston

## Magnesium Alloy Development: An LMD Symposium in Honor of Karl Kainer – Poster Session

*Sponsored by:* TMS Light Metals Division, TMS: Magnesium Committee
*Program Organizers:* Norbert Hort, Helmholtz-Zentrum Geesthacht; Alan Luo, The Ohio State University

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**C-49: Corroding Magnesium Implants – a New Class of Biomaterials**: *Frank Witte*[1]; [1]Charite - Universitätsmedizin Berlin

**C-50: Development and Characterization of Mg-4Zn-0.5Ca-0.16 Mn (wt. %) Alloy for Biomedical Applications**: *Partha Duley*[1]; Souriddha Sanyal[1]; Tapas Kumar Bandyopadhyay[1]; Sumantra Mandal[1]; [1]Indian Institute of Technology Kharagpur

**C-51: Development of Ultralight and Ultrafine Grained Mg-4Li-1Ca Alloy for Biomedical and Lightweight Applications**: *Saurabh Nene*[1]; B Kashyap[2]; N Prabhu[2]; Y. Estrin[3]; T. Al-Samman[4]; [1]IITB-Moansh Research Academy; [2]IIT Bombay; [3]Moansh University; [4]RWTH Aachen University

**C-52: Effect of Al Addition on the Microstructure and Compressive Properties of Mg-based AZ31 Alloy**: *Md Ershadul Alam*[1]; Victor Hernandez[1]; Zephyr Li[1]; Irene Beyerlein[1]; AbdelMagid Hamouda[2]; Manoj Gupta[3]; [1]University of California, Santa Barbara; [2]Qatar University; [3]National University of Singapore

**C-53: Magnesium Nanocomposites, Progress and Potential**: *Andrew Sherman*[1]; Nick Farkas[1]; David Wolf[1]; [1]Terves Inc

**C-54: Metal Injection Molding (MIM) of Mg-alloys**: *Martin Wolff*[1]; Johannes Schaper[1]; Michael Dahms[2]; Thomas Ebel[1]; Regine Willumeit-Römer[1]; Thomas Klassen[3]; [1]Helmholtz-Zentrum Geesthacht; [2]University of Applied Sciences, FH-Flensburg; [3]Helmut Schmidt University, Hamburg

**C-55: Microstructure Evolution and Mechanical Properties of Thin Strip Twin Roll Cast (TRC) Mg Sheet**: Xinliang Yang[1]; *Chamini Mendis*[1]; Jayesh Patel[1]; Zhongyun Fan[1]; [1]Brunel University London

**C-56: Orientation and Length Scale Effect in Deformation Mechanism in Pure Magnesium**: *Ali Khosravani*[1]; Surya Kalidindi[1]; [1]Georgia Institute of Technology

**C-57: Precipitate Strengthening Mechanisms in Different Mg Alloys by In Situ Synchrotron X-ray Diffraction**: *Xiaoqin Zeng*[1]; Leyun Wang[1]; Jie Wang[1]; Bijin Zhou[1]; Wen Wen[2]; [1]Shanghai Jiao Tong University; [2]Shanghai Synchrotron Radiation Facility

**C-58: The Effect of Shearable Plate-shaped Precipitates on the Strength of Mg Alloys**: *Sean Agnew*[1]; Jishnu Bhattacharyya[1]; Fulin Wang[1]; [1]University of Virginia

## Magnesium Technology 2018 – Poster Session

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

*Program Organizers:* Dmytro Orlov, Lund University; Vineet Joshi, Pacific Northwest National Laboratory; Kiran Solanki, Arizona State University; Neale Neelameggham, Ind LLC

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*Session Chairs:* Vineet Joshi, Pacific Northwest National Laboratory - PNNL; Neale Neelameggham, IND LLC

**C-59: A Microtomography Analysis of Damage and Fracture in Notched AZ31**: *Babak Kondori*[1]; Thilo Morgeneyer[2]; Amine Benzerga[1]; [1]Texas A&M University; [2]MINES ParisTech

**C-60: Combustion of Regolith/Magnesium Mixtures for the Fabrication of Construction Materials on the Moon and Mars**: *Sergio Cordova*[1]; Armando Delgado[1]; Evgeny Shafirovich[1]; [1]The University of Texas at El Paso

**C-61: Deformation Mechanism of a Mg-Zn-Y Alloy Containing Large Long-period-stacking-ordered Structures under Shock Wave**: *Fan Zhang*[1]; Chengwen Tan[2]; Mingwei Chen[3]; [1]Tohoku University; [2]Beijing Institute of Technology; [3]Johns Hopkins University

**C-62: Deformation Processing of AZ31 and ZK60 Using a Novel Tube-equal Channel Angular Pressing (t-ECAP) Technique**: *Abhinav Srivastava*[1]; Bilal Mansoor[2]; Matthew Vaughan[1]; Karl Hartwig[1]; Ibrahim Karaman[1]; [1]Texas A&M University; [2]Texas A&M University at Qatar

**C-63: Deformation Twinning in Shock Compressed UFG Mg**: *Chaitanya Kale*[1]; Cyril Williams[2]; Jonathan Ligda[2]; B. Hornbuckle[2]; Kiran Solanki[1]; [1]Arizona State University; [2]U.S. Army Research Laboratory

**C-64: Effect of Calcium on Resistance to Oxidation of Magnesium Alloys (AZ91)**: Hassan Saghafianlarijani[1]; *Shima Paridari*[1]; Ghasem Eisaabadi.B[2]; [1]Iran University of Science and Technology; [2]Arak University

**C-65: Effect of Confined Rolling on Microstructure and Mechanical Properties of Magnesium Alloys**: *Pavitra Krishnan*[1]; Hanin Elathram[1]; Qiuming Wei[1]; Laszlo Kecskes[2]; [1]University of North Carolina at Charlotte; [2]Weapons and Materials Research Directorate, US Army Research Laboratory

**C-66: Effect of Heat Treatment on the Grain Growth Kinetics and Mechanical Properties in Shear Assisted Processing and Extrusion (ShAPETM) ZK60 Tube**: *Vineet Joshi*[1]; Scott Whalen[1]; Derek Neal[1]; Arun Devaraj[1]; Nicole Overman[1]; Curt Lavender[1]; [1]Pacific Northwest National Laboratory

**C-67: Effect of Micro-alloyed Neodynium on the Microstructure and Texture of Magnesium-zinc-calcium Alloys**: *Yang Liu*[1]; Jing Su[1]; Amjad Javaid[2]; Tim Skszek[3]; Stephen Yue[1]; [1]McGill University; [2]CanmetMATERIALS; [3]Magna International

**C-68: Effects of Ageing Treatment on the Microstructure and Mechanical Properties of Mg-Li Based Alloys**: *Mingyu Fan*[1]; Ye Cui[1]; Yang Zhang[1]; Hao Guo[1]; Zhongwu Zhang[1]; [1]Key Laboratory of Superlight Materials and Surface Technology, Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University

**C-69: Evolution of Microstructure and Mechanical Properties during the Casting and Rolling of the ZEK100 Sheet**: *Amjad Javaid*[1]; Frank Czerwinski[1]; [1]CANMET Materials

**C-70: Hot Forging Behavior of Mg-8Al-4Ba-4Ca (ABaX844) Alloy and Validation of Processing Map**: *K.P. Rao*[1]; C. Dharmendra[1]; Y.V.R.K. Prasad[2]; Hajo Dieringa[3]; Norbert Hort[3]; [1]City University of Hong Kong; [2]processingmaps.com; [3]Helmholtz-Zentrum Geesthacht

**C-71: Influence of Hot Rolling on Microstructure and Mechanical Properties Thixo-Casts Obtained from Mixed E21 and WE43 Magnesium Granules**: *Lukasz Rogal*[1]; P. Bobrowski[1]; A. Tarasek[1]; M. Szlezynger[1]; [1]Institute of Metallurgy and Materials Science

**C-72: Interaction of Glide Dislocations with Extended Precipitates in Mg-Nd Alloys**: *Zhihua Huang*[1]; John Allison[1]; Amit Misra[1]; [1]University of Michigan

**C-73: Macro and Micro C/A Ratios Induced by Solute Atoms in Mg Via Ab Initio Calculations**: *Gang Zhou*[1]; Hao Wang[1]; Chunguang Bai[1]; [1]IMR

**C-74: Microstructure and Mechanical Behavior of ECAP-processed Magnesium at the Ice-water Temperature**: Dai Zuo[1]; *Diaoyu Zhou*[1]; Taotao Li[1]; Wei Liang[1]; Fuqian Yang[2]; [1]Taiyuan University of Technology; [2]University of Kentucky

**C-75: Microstructure and Mechanical Properties of Magnesium-metal Laminated Nanocomposites**: *Soodabeh Azadehranjbar*[1]; Jeffrey Shield[1]; Jian Wang[1]; [1]University of Nebraska-Lincoln

**C-76: Nanostructured Mg-Gd Alloy Processed by ARB Processing**: *Xuan Luo*[1]; Zongqiang Feng[1]; Tianlin Huang[1]; Guilin Wu[1]; Xiaoxu Huang[1]; [1]Chongqing University

**C-77: Rate and Temperature Dependent Deformation Behavior of WE43 Magnesium-rear Earth Alloy: Experiments and Crystal Plasticity Modeling**: *Marko Knezevic*[1]; Saeede Ghorbanpour[1]; Milan Ardeljan[1]; Brandon McWilliams[2]; [1]University of New Hampshire; [2]US Army Research Laboratory

**C-78: Twin and Compressive Response of Nano-sized $Al_2O_3$ Added Mg-based AZ41 and AZ51 Alloys**: *Md Ershadul Alam*[1]; Zephyr Li[1]; Victor Hernandez[1]; Irene Beyerlein[1]; Manoj Gupta[2]; Abdel Magid Hamouda[3]; [1]University of California, Santa Barbara; [2]National University of Singapore; [3]Qatar University

**C-79: Understanding of Dynamic Recrystallization Characteristics of ZEK100 Magnesium Alloy Sheet during Warm Forming**: *Jing Su*[1]; Yang Liu[1]; Timothy Skszek[2]; Stephen Yue[1]; [1]McGill; [2]Magna International

## Materials and Fuels for the Current and Advanced Nuclear Reactors VII – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nuclear Materials Committee
*Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory; Anne Campbell, Oak Ridge National Laboratory

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**F-14: Asymptotic Expansion Homogenization of the Stiffness Tensor and Thermal Conductivity of a 2D Exemplar-guided Digital Reconstruction of an Al3Hf-Al Microstructure with Comparison to Experiment**: *William Harris*[1]; Donna Guillen[2]; Javier Morales[3]; [1]Massachusetts Institute of Technology; [2]Idaho National Laboratory; [3]University of Texas at San Antonio

**F-15: Characterization of Stress and Microstructure of Zr-4 alloy Processed by Pulsed Laser**: *Junkai Liu*[1]; Yang Du[1]; Hang Zang[1]; Wenbo Liu[1]; Di Yun[1]; [1]Xi'an Jiaotong University

**F-18: Experimentally Determined Properties of U-Pu-Zr Alloys: What Do We Know and How Well?**: *Dawn Janney*[1]; Cynthia Adkins[1]; [1]Idaho National Laboratory

## Materials for Energy Conversion and Storage – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
*Program Organizers:* Amit Pandey, LG Fuel Cell Systems Inc.; Guihua Yu, The University of Texas at Austin

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**B-26: A New Economical Method for Fabricating High-purity Bi2O3 via Extraction-precipitation Stripping and Post Annealing**: Jun Chen[1]; *Jing Zhan*[1]; [1]Central South University

**B-28: In Situ Imaging and Spectroscopy of Nanostructured Pt/$CeO_2$ Catalysts Performing CO Oxidation**: *Josh Vincent*[1]; [1]Arizona State University

**B-29: Thermal Conductivity and Thermal Expansion of $Ba(Ce_{0.8-x}Zr_xY_{0.2})O_{3-\delta}$ Applicable for an Electrolyte of Solid Oxide Fuel Cells**: *Hirotomo Sumikawa*[1]; Ken Kurosaki[2]; Yuji Ohishi[1]; Hiroaki Muta[1]; Shinsuke Yamanaka[3]; [1]Graduate School of Engineering, Osaka University; [2]Graduate School of Engineering, Osaka University, and JST, PRESTO; [3]Graduate School of Engineering, Osaka University, and Research Institute of Nuclear Engineering, University of Fukui

## Materials Processing Fundamentals – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
*Program Organizers:* Guillaume Lambotte, Boston Electromet; Antoine Allanore, Massachusetts Institute of Technology; Jonghyun Lee, Iowa State University; Samuel Wagstaff, Novelis

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**D-46: DEM Simulation of Dispersion of Cohesive Particles by Spontaneous Inter-particle Percolation in a 3D Random Packed Bed**: *Heng Zhou*[1]; Shengli Wu[1]; Mingyin Kou[1]; Shun Yao[1]; Bingjie Wen[1]; Kai Gu[1]; Feng Chang[1]; [1]University of Science and Technology Beijing

**D-47: Effects of High Energy Ag7+ Ion Irradiation on the Magnetic and Topographical Properties of Amorphous Co–Fe Thin Films**: *Imaddin Al-Omari*[1]; G. Pookat[2]; T. Hysen[2]; S.H. Al-Harthi[1]; R. Lisha[2]; D.K. Avasthi[3]; M.R. Anantharaman[2]; [1]Sultan Qaboos University; [2]Cochin University of Science & Technolog; [3]Inter University Accelerator Centre, Aruna Asaf Ali Marg

**D-48: Effects of Mn Content on the Formation of Nanoscale Precipitates and Matrix Microstructure in the Ultra-high Strength Steels**: *Songsong Xu*[1]; Yu Zhao[1]; Hao Guo[1]; Naimeng Liu[1]; Xinghao Wei[1]; Zhongwu Zhang[1]; [1]Key Laboratory of Superlight Materials and Surface Technology, Ministry of Education ,College of Materials Science and Chemical Engineering, Harbin Engineering University

**D-49: Ground-based Experiments Using an Electrostatic Levitator and Numerical Modeling of Convection Inside Electromagnetically-levitated Molten Iron-cobalt Droplets in Support of Space Experiments**: *Jonghyun Lee*[1]; Michael SanSoucie[2]; [1]Iowa State University; [2]NASA Marshall Space Flight Center

**D-50: Hybrid Modeling for Endpoint Carbon Content Prediction in EAF Steelmaking**: Wei Guangsheng[1]; Zhu Rong[1]; Yang Lingzhi[2]; *Tang Tianping*[1]; [1]University of Science & Technology Beijing; [2]Central South University

**D-51: Time Evolution of the Microstructure of ZA27 during Heat Treatment Applied in the SIMA Process**: Wilky Desrosin[1]; Gerardo Héctor Rubiolo[2]; *Carlos Enrique Schvezov*[3]; [1]IMAM (UNaM-CONICET) - Inst. Sabato-UNSAM; [2]Inst. Sabato - UNSAM; [3]IMAM (UNaM-CONICET)

**D-57: Structural and Deformation Behavior of Different Hematite Ore Pellets**: *Saikat Kuila*[1]; Tarun Kundu[1]; [1]Indian Institute of Technology Kharagpur

## Phase Transformations and Microstructural Evolution – Poster Session I

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

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**N-14: Bainite Transformation in Medium Carbon Microalloyed Steel**: *Sachin Kumar*[1]; Shiv Singh[1]; [1]IIT Kharagpur, India

**N-15: Changes in Microstructures and Mechanical Properties in T92 during Long-term Aging Treatment**: *Cheoljun Bae*[1]; Rosa Kim[1]; Jongryoul Kim[1]; [1]Hanyang University

**N-16: Effect of Precipitation on Creep Properties of Ferritic Steels**: Maribel Saucedo-Muñoz[1]; Arturo Ortiz-Mariscal[1]; Shin-Ichi Komazaki[2]; *Victor Lopez-Hirata*[1]; [1]Instituto Politecnico Nacional (ESIQIE); [2]Kagoshima University

**N-17: Effects of Additional Elements on the Phase Stability and Precipitation Behavior of C14 Laves Phase in High Cr Ferritic Alloys**: *Ko Kato*[1]; Yaw Wang Chai[1]; Yoshisato Kimura[1]; [1]Tokyo Institute of Technology

**N-18: Evolution of Microstructure in High Strength Bainitic Steel**: *Sk Hasan*[1]; Shiv Singh[1]; [1]IIT Kharagpur

**N-19: Nucleation and Growth of Austenite in a Fe-12Mn-3Al-0.06C Medium-Mn Steel Annealed at 585°C**: Jake Benzing[1]; Lutz Morsdorf[2]; *Alisson Kwiatkowski da Silva*[2]; Dirk Ponge[2]; Dierk Raabe[2]; James Wittig[1]; [1]Vanderbilt University; [2]Max-Planck-Institut für Eisenforschung GmbH

**N-21: Physical Metallurgy of Segregation and Austenite Reversion in Medium Mn Steels**: *Alisson Kwiatkowski da Silva*[1]; Dirk Ponge[1]; Gerhard Inden[1]; Baptiste Gault[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

## Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
*Program Organizers:* Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Zak Fang, University of Utah; Bowen Li, Michigan Technological University

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**D-52: High-temperature Mechanical Properties of Powder Forged Ti-6Al-4V Alloys**: *Sung Ho Lee*[1]; Youngmoo Kim[1]; Young-Beom Song[1]; Young-Sam Kwon[2]; [1]Agency for Defense Development; [2]Cetatech Co.

**D-53: Magnesiothermic MASHS and Pressureless Sintering of Diborides of Zirconium and Hafnium**: *Sergio Cordova*[1]; Evgeny Shafirovich[1]; [1]The University of Texas at El Paso

## Rare Metal Extraction & Processing – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee
*Program Organizers:* Hojong Kim, The Pennsylvania State University; Bradford Wesstrom, Freeport-McMoRan Copper & Gold; Shafiq Alam, University of Saskatchewan; Takanari Ouchi, The University of Tokyo; Gisele Azimi, University of Toronto; Neale Neelameggham, Ind LLC; Shijie Wang, Rio Tinto Kennecott Utah Copper; Xiaofei Guan, ShanghaiTech University

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*Session Chairs:* Hojong Kim, The Pennsylvania State University; Bradford Wesstrom, Freeport-McMoRan

**D-55: Experimental Modeling of Nodulation in Copper Electrorefining**: *Yuya Nakai*[1]; Ken Adachi[1]; Atsushi Kitada[1]; Kazuhiro Fukami[1]; Kuniaki Murase[1]; [1]Kyoto University

**D-56: Extraction of Vanadium from Vanadium-containing APV-precipitated Wastewater by W/O Microemulsion System**: *Yun Guo*[1]; Hong-Yi Li[1]; Minmin Lin[1]; Bing Xie[1]; [1]Chongqing University

## Thermal and Mechanical Stability of Nanocrystalline Materials – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Jason Trelewicz, Stony Brook University; Daniel Bufford, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Jessica Krogstad, University of Illinois, Urbana-Champaign; Christian Brandl, Karlsruhe Institute of Technology

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**E-44: Control of Thermal Expansivity in Electroformed Fe-Ni Alloys for the Fine Metal Mask**: *Yong Bum Park*[1]; In Gyeong Kim[1]; [1]Sunchon National University

**E-45: Thermomigration of Cu-Sn and Ni-Sn Intermetallic Compounds during Reliability Test in SnAg Solder Joints**: *Po-Ning Hsu*[1]; [1]National Chiao Tung University

## 2018 Symposium on Functional Nanomaterials: Discovery and Integration of Nanomaterials – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Nanomaterials Committee
*Program Organizers:* Stephen McDonnell, University of Virginia; Chang-Yong Nam, Brookhaven National Laboratory; Lanxia Cheng, University of Texas Dallas; Dong Lin, Kansas State University; Wenda Tan, University of Utah

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**M-1: A Novel Adsorption-reduction Method for the Preparation of Nano-Bi@super P Composites**: *Chao Yang*[1]; Zhongliang Tian[1]; Yanqing Lai[1]; [1]Central South University

**M-2: Co/Pd Multilayered Nanodot Formation by Block Copolymer Templating**: *Subhadra Gupta*[1]; Allen Owen[1]; Hao Su[1]; [1]University of Alabama

**M-3: Controlling Domain Wall Structure and Behavior in Magnetic Nanowires**: *Liwei Geng*[1]; Yongmei Jin[1]; [1]Michigan Technological University

**M-6: Electrosynthesis of CuNP'S from E-Waste**: *Pedro Ramirez Ortega*[1]; Mauricio Islas Hernández[1]; Laura García Hernández[1]; Mizraim Flores Guerrero[1]; [1]Universidad Tecnológica de Tulancingo

**M-7: Experimental Investigation of the Effect of ZnO-Citrus Sinensis Nano-additive on the Electrokinetic Deposition of Zinc on Mild Steel in Acid Chloride**: *Oluseyi Ajayi*[1]; Olasubomi Omowa[1]; Olugbenga Omotosho[1]; Oluwabunmi Abioye[1]; Esther Akinlabi[2]; Stephen Akinlabi[2]; Abiodun Abioye[1]; Felicia Owoeye[1]; Sunday Afolalu[1]; [1]Covenant University, Cananland, Ota; [2]University of Johannesburg

**M-8: Formation of Quantum Dots-based Concentric Rings on Polymer-based Nanocomposite Films**: Shaofu Zhang[1]; Weiling Luan[1]; Shaofeng Yin[1]; *Wenxin Cao*[2]; Fuqian Yang[2]; [1]Key Laboratory of Pressure Systems and Safety (MOE), School of Mechanical and Power Engineering, East China University of Science and Technology; [2]University of Kentucky

**M-9: In-situ Studies of Transition Metal Dichalcogenides Grown by Molecular Beam Epitaxy**: *Peter Litwin*[1]; Keren Freedy[1]; Stephen McDonnell[1]; [1]University of Virginia

**M-10: Obtaining of Iron Nanoparticles (Fe NP's) for Treatment of Water Contaminated with As**: *Daniel Barron Romero*[1]; Mizraim Uriel Flores Gerrero[1]; Iván Alejandro Reyes Domínguez[2]; Laura García Hernández[1]; Pedro Alberto Ramírez Ortega[1]; Angelina Gonzales Rosas[1]; Marcos Joel Cruz[1]; Nancy M. Escamilla[1]; [1]Universidad Tecnológica de Tulancingo; [2]Universidad Autónoma de San Luis Potosí

**M-11: Soybean-derived Activated Carbon for Supercapacitors**: *Wenxin Cao*[1]; Fuqian Yang[1]; [1]University of Kentucky

**M-12: Synthesis of Gold Nanoparticles Using the Extract of Sedum Praeltum and its Deposition on a Ceramic Substrate**: *Laura Garcia-Hernandez*[1]; Begoña Aguilar-Pérez[1]; Jaqueline Ramírez-Castro[1]; Pedro Alberto Ramírez-Ortega[1]; Diana Arenas-Islas[1]; Mizraim Uriel Flores-Guerrero[1]; [1]Universidad Tecnológica de Tulancingo

## Advanced Characterization Techniques for Quantifying and Modeling Deformation – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Shaping and Forming Committee

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

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**I-1: 4D Imaging of Deformation in Polymeric Foams Using X-ray Synchrotron Tomography**: *Arun Sundar Sundaram Singaravelu*[1]; Oldrich Sevecek[2]; Michal Kotoul[2]; Brian Patterson[3]; Xianghui Xiao[4]; Nikhilesh Chawla[1]; [1]Arizona State University; [2]Brno University of Technology; [3]Los Alamos National Laboratory; [4]Advanced Photon Source

**I-2: Compression Testing of Single Crystals of β-$Si_3N_4$ on Micron Meter Scale by Means of FIB Machining Combined with EBSD Orientation Mapping**: *Nobuyuki Kadota*[1]; Haruyuki Inui[1]; Norihiko Okamoto[1]; Isao Tanaka[1]; You Zhou[2]; Hideki Hyuga[2]; Kiyoshi Hirao[2]; [1]Kyoto University; [2]AIST

**I-3: Correlative Microscopy in Materials Science**: Will Harris[1]; *Jeff Gelb*[1]; Tobias Volkenandt[2]; Leah Lavery[1]; [1]Carl Zeiss X-ray Microscopy; [2]Carl Zeiss Microscopy

**I-4: Development of a Constitutive Model for Plastic Deformation in Single Crystal Niobium**: *Eureka Pai Kulyadi*[1]; Philip Eisenlohr[1]; [1]Chemical Engineering and Materials Science, Michigan State University

**I-5: Distribution of Cr Atoms in a Strained and Strain-relaxed Fe89.15Cr10.75 Alloy: Mössbauer Effect Study**: *Stanislaw Dubiel*[1]; Jan Zukrowski[1]; [1]AGH University of Science and Technology

**I-6: Extending EBSD's Phase Differentiation Capabilities Through the Dictionary Approach**: *Farangis Ram*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

**I-7: Influence of Strain Rate and Microstructure on the Substructure Evolution and Properties of Ti-407**: *Zachary Kloenne*[1]; Gopal Viswanathan[1]; Matthew Thomas[2]; Hamish Fraser[1]; Michael Lorreto[3]; [1]The Ohio State University; [2]TIMET; [3]University of Birmingham

**I-8: Investigating Internal Lattice Strains in DMLS IN718 Material in the as Built and Post-processed Conditions**: *Priya Ravi*[1]; Diwakar Naragani[1]; John Rotella[1]; Peter Kenesei[2]; Jonathan Almer[2]; Michael Sangid[1]; [1]Purdue University; [2]Argonne National Laboratory

**I-9: Time-dependent Characterization at the Mesoscale: The MaRIE Project at Los Alamos National Laboratory**: *Cris Barnes*[1]; Ellen Cerreta[1]; [1]Los Alamos National Laboratory

**I-10: Toward Development of an Optimum Biaxial Tensile Test Specimen Design**: *Dilip Banerjee*[1]; Mark Iadicola[1]; Adam Creuziger[1]; Evan Rust[1]; [1]National Institute of Standards and Technology

## Advanced High-strength Steels – Poster Session

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

*Program Organizers:* M.X. Huang, The University of Hong Kong; Tilmann Hickel, Max-Planck-Institut fuer Eisenforschung GmbH; Amy Clarke, Colorado School of Mines; Cem Tasan, Massachusetts Institute of Technology; Young-Kook Lee, Yonsei University; Matthias Militzer, The University of British Columbia

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**G-1: Abnormal Deformation Heating and Dynamic Strain Aging in DP Steels at Forming Relevant Strain Rates and Temperatures**: *Mert Efe*[1]; Caner Simsir[2]; [1]Middle East Technical University; [2]Atilim University

**G-2: Correlationship of the Microstructural Features and Mechanical Properties with the Sliding Wear Resistance of a High Strength Low Alloy Steel**: *Jayanta Mondal*[1]; Karabi Das[1]; Siddhartha Das[1]; [1]Indian Institute of Technology Kharagpur

**G-3: Effect of Feeding Ca–Ba–RE–Zr and Ca-Si Composite Effect of Wire Injection to Liquid Steel on the Properties of Advanced High-strength Steel**: *Zhizheng Yang*[1]; [1]BaoWu Steel China

**G-4: Effect of Reheating Temperature and Cooling Treatment on the Microstructure, Texture and Impact Transition Behavior of Heat Treated Naval Grade HSLA Steel**: *Md. Basiruddin Sk.*[1]; Abhijit Ghosh[1]; Nirmalya Rarhi[2]; R. Balamuralikrishnan[2]; Debalay Chakrabarti[1]; [1]IIT Kharagpur; [2]Defence Metallurgical Research Laboratory

**G-5: Microstructural Evolution and Mechanical Properties of a Prototype 0.15C-6Mn-1Si-1Al Third Generation Steel**: *Vivek Patel*[1]; Joseph McDermid[1]; Frank Goodwin[2]; [1]McMaster University; [2]International Zinc Association

**G-6: Numerical Investigations of the Effects of Subtitionnal Elements on the Interface Conditions during Partitioning in Q&P Steels**: *Steve Gaudez*[1]; Sébastien Allain[1]; Julien Teixeira[1]; Mohamed Gouné[2]; Michel Soler[3]; Frédéric Danoix[4]; [1]Institut Jean Lamour; [2]ICMCB; [3]Arcelormittal Maizières Research SA; [4]GPM

**G-7: Quantitative Analysis of External Selective Oxidation of a CMnSi Advanced High Strength Steel Using a Novel Approach**: *Mary Story*[1]; Bryan Webler[1]; [1]Carnegie Mellon University

**G-8: Reactive Wetting of Advanced High Strength Steels by a Zn-Al-Mg Bath**: *Danielle De Rango*[1]; Joseph McDermid[1]; [1]McMaster University

**G-9: Solidification Cracking in High-strength Low Alloy Steels**: *Maddie McAllister*[1]; Eric Gulliver[1]; Michael Kottman[1]; Badri Narayanan[1]; [1]Lincoln Electric

**G-10: Steels for Elevated Temperature Application**: *Zixin Huang*[1]; [1]University of Cambridge

**G-11: Strain Rate Dependence of Tensile and Serration Behaviors of an Austenitic Fe-22Mn-0.7C Twinning-induced Plasticity Steel**: *Byoungchul Hwang*[1]; Seung-Yong Lee[2]; Sang-In Lee[1]; [1]Seoul National University of Science and Technology; [2]Korea Institue of Science and Technology

**G-12: The Technology Study of Silicon Reduction of Chromite Powder in Microwave Field**: *Hua Liu*[1]; [1]Kunming University of Science and Technology

## Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
*Program Organizers:* Yan Li, Intel; Tae-Kyu Lee, Portland State University; Albert T. Wu, National Central University; Kwang-Lung Lin, National Cheng Kung University; Chih Chen, National Chiao Tung University; Won Sik Hong, Korea Electronics Technology Institutue(KETI); Mehran Maalekian, AIM Metals & Alloys; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

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*Session Chairs:* Fan-Yi Ouyang, National Tsing Hua University; Fu Guo, Beijing University of Technology

**K-1: Flexible Electrodes Based on the Carbon/Polymer Composite for Wearable Devices**: *Sungwook Mhin*[1]; Sehoon Yoo[1]; Kyoung Ryeol Park[1]; Jae Eun Jeon[1]; [1]Korea Institute of Industrial Technology

**K-2: Lead-free Nano-Solder Pastes for the Soldering of Cu-Cu Thin Wires**: *Edward Fratto*[1]; Evan Wernicki[1]; Yang Shu[1]; Fan Gao[1]; Zhiyong Gu[1]; [1]University of Massachusetts Lowell

**K-3: Mechanical Properties and IMC Morphology of Sn-58Bi Solder Including Sn-decorated MWCNTs**: *Hyun-Joon Park*[1]; Kyung-Deuk Min[1]; Choong-Jae Lee[1]; Seung-Boo Jung[1]; [1]Sunkyunkwan University

**K-4: Theoretical and Experimental Study of Intermetallic Compound Grown by Electromigration, Thermomigration and Chemical Diffusion for Sn-0.7Cu Solders**: Sung-Min Baek[1]; Min-Hyeok Heo[2]; *Namhyun Kang*[2]; Cheolmin Oh[3]; [1]Samsung Eletro-Mechanics; [2]Pusan National University; [3]Korea Electronics Technology Institute

## Alloys and Compounds for Thermoelectric and Solar Cell Applications VI – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Soon-Jik Hong, Kongju National University and Institute for Rare Metals; Philippe Jund, Université Montpellier 2; Lan Li, Boise State University; Takao Mori, National Institute for Materials Science (NIMS) ; Hsin-jay Wu, National Sun Yat-sen University; Tiejun Zhu, Zhejiang University

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*Session Chair:* Sinn-wen Chen, National Tsing Hua University

**K-5: Compressive Creep Behavior of Hot-pressed TAGS-85**: Ming-Chiang Chang[1]; *Matthias Agne*[1]; Richard Michie[1]; David Dunand[1]; G. Jeffrey Snyder[1]; [1]Northwestern University

**K-6: Determination of the Mg-Si-Sn Ternary Phase Diagram to Evaluate Phase Stability of Thermoelectric $Mg_2(Si,Sn)$ Compound**: *Natsumi Kaneko*[1]; Yosuke Kubo[1]; Yoshisato Kimura[1]; Yong-Hoon Lee[2]; Hiroyuki Matsunami[2]; Hirokuni Hachiuma[2]; [1]Tokyo Institute of Technology; [2]KELK Ltd.

**K-7: Effect of Precipitates on Thermoelectric Properties in Nickel Based Alloy**: *Tomoyuki Kanatani*[1]; Hiroaki Muta[1]; Yuji Ohishi[1]; Ken Kurosaki[2]; Shinsuke Yamanaka[3]; [1]Graduate School of Engineering, Osaka University; [2]Graduate School of Engineering, Osaka University and JST, PRESTO; [3]Graduate School of Engineering, Osaka University and Research Institute of Nuclear Engineering, University of Fukui

**K-8: Improved Thermoelectric Properties of Bismuth-magnesium Eutectic Alloy by Melt Spinning and Spark Plasma Sintering**: *Mohd Natashah Bin Norizan*[1]; Hiroaki Muta[1]; Yuji Ohishi[1]; Ken Kurosaki[1]; Shinsuke Yamanaka[1]; [1]Osaka University

**K-9: Phase Diagrams of Ternary Zn-Sb-In Systems and Thermoelectric Properties of (Cu, In)-doped Zn4Sb3 Doped Zn4Sb3**: *Su Hui Yi*[1]; Hsin-jay Wu[1]; You-Kai Su[1]; [1]National Sun Yat-sen University

**K-10: Study of Cobalt Silicide by Grain Boundary Engineering**: *Wang Yunxia*[1]; Muta Hiroaki[1]; Ohishi Yuji[1]; Kurosaki Ken[1]; Yamanaka Shinsuke[1]; [1]Osaka University

**K-11: The Phase Diagram of Ge-Te-Sb and Enhanced Thermoelectric Properties of (Sb, In)-doped GeTe**: *Yi-Fen Tsai*[1]; Hsin-Jay Wu[1]; Jie-Ru Deng[1]; [1]Department of Materials and Optoelectronic Science, National Sun Yat-sen University

**K-12: ZnO Synthesis on the Au Metallized Silk Textile for Flexible Photocatalyst Application**: *Wan-Ting Chiu*[1]; Yuma Tahara[2]; Chun-Yi Chen[1]; Tso-Fu Mark Chang[1]; Tomoko Hashimoto[2]; Hiromichi Kurosu[2]; Masato Sone[1]; [1]Tokyo Institute of Technology; [2]Nara Women's University

## Biodegradable Materials for Medical Applications – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Jaroslaw Drelich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund; Jan Seitz, Syntellix AG; Norbert Hort, Helmholtz-Zentrum Geesthacht; Huinan Liu, University of California-Riverside

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**H-2: Development of Biodegradable Operative Zinc Clips for Ligation**: *Jeffrey Brookins*[1]; Jan-Marten Seitz[2]; Jeremy Goldman[1]; Jaroslaw Drelich[1]; [1]Michigan Technological University; [2]Syntellix AG

**H-3: Long Term Biocompatibility of Zinc and its Alloys for Absorbable Vascular Scaffolds**: *Roger Guillory*[1]; Jaroslaw Drelich[1]; Jeremy Goldman[1]; [1]Michigan Technological University

## Biological Materials Science – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
*Program Organizers:* Steven Naleway, University of Utah; Vinoy Thomas, University of Alabama at Birmingham; Holly Martin, Youngstown State University; Jing Du, Pennsylvania State University

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*Session Chairs:* Steven Naleway, University of Utah; Thomas Vinoy, University of Alabama, Birmingham; Holly Martin, Youngstown State University; Jing Du, Penn State University

**H-5: Characterizing the Collagen Structure of Armored Carapace of the Boxfish**: *Sean Garner*[1]; [1]University of Californi, San Diego

**H-6: Density and Vessel Distribution Interactions in the Impact Resistance of Wood**: *Albert Matsushita*[1]; Joanna McKittrick[1]; Yunlan Zhang[2]; Pablo Zavattieri[2]; [1]University of California, San Diego; [2]Purdue University

**H-7: Freeze Casting of Bioinspired Porous Ring Structures through Ultrasound Directed Self-assembly**: *Taylor Ogden*[1]; Milo Prisbrey[1]; Isaac Nelson[1]; Bart Raeymaekers[1]; Steven Naleway[1]; [1]Department of Mechanical Engineering, University of Utah

**H-8: Numerical Investigation of Force Network in 3D Heterogeneous Cellularized ECM**: *Hanqing Nan*[1]; Yang Jiao[1]; [1]Arizona State University

**H-9: Transparent Teeth of Deep-sea Dragonfish**: *Audrey Velasco-Hogan*[1]; [1]UCSD

## Bladesmithing 2018 – Poster Session

*Program Organizers:* Bharat Jasthi, South Dakota School of Mines and Technology; Roxana Ruxanda, Emerson; Garry Warren, University of Alabama; Michael West, South Dakota School of Mines and Technology; Eric Schmidt, Vallourec; Samuel Wagstaff, Novelis

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**O-1: Determining the Composition of Mystery Recycled Steel using SEM**: *Brandon Ohl*[1]; Jon Callirgos[1], Maddox Dockins[1], Neil MacDonald[1], Roman Madoerin[1]; [1]University of North Texas

## Bulk Metallic Glasses XV – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Yunfeng Shi, Rensselaer Polytechnic Institute; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; Jianzhong Jiang, Zhejiang University; Robert Maass, University of Illinois at Urbana-Champaign

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**G-13: A First-order Liquid-liquid Phase Transition in Undercooled Molten Pd-Ni-P Alloys**: *Xingchen Wang*[1]; Y. Lo[1]; Zhenduo Wu[1]; W. Zhou[1]; Hin Wing Kui[1]; [1]The Chinese University of Hong Kong

**G-14: Atomic Structure and Properties of CuZrAl Metallic Glasses and Composites**: *Ivan Kaban*[1]; [1]IFW Dresden

**G-15: Compositional Effect on Temperature-induced Atomic Structure Evolution in Liquid Ga-In, Ga-Sn and In-Sn Alloys**: *Qing Yu*[1]; Xiaodong Wang[1]; Yu Su[1]; Dongxian Zhang[1]; Qingping Cao[1]; Jianzhong Jiang[1]; [1]Zhejiang University

**G-17: Correlation between Structural Heterogeneity and Serrated Flow Behavior of Zr-based Metallic Glass**: *LeHua Liu*[1]; ZhiYuan Liu[2]; PeiJie Li[1]; [1]Tsinghua University; [2]ShenZhen University

**G-18: Effect of Pressure on Viscous Deformation during Spark Plasma Sintering of Fe – Based Bulk Amorphous Alloy**: *Tanaji Paul*[1]; Sandip Harimkar[1]; [1]Oklahoma State University

**G-19: Fictive Temperature Controlling Ductility in Metallic Glasses**: *Jittisa Ketkaew*[1]; Eran Bouchbinder[2]; Jan Schroers[1]; [1]Yale University; [2]Weizmann Institute of Science

**G-20: Formation and Properties of Pd-Cu-Ag-Au-Si Glassy Alloys**: *El-Sayed Shalaan*[1]; Akihisa Inoue[2]; Fahad Al-Marzouki[1]; Saleh Al-Heniti[1]; Abdullah Obaid[1]; [1]King Abdulaziz University; [2]Josai International University

**G-21: Formation of Zr-Cu-Al-Ag-Ti Bulk Metallic Glass Composites with Deformation Induced Martensitic Transformation**: *Haotian Nan*[1]; Iain Todd[1]; [1]The University of Sheffield

**G-22: Friction and Wear Behavior of Ti-based In-situ Dendrite Amorphous Composites**: *Jian Shang*[1]; [1]Liaoning University of Technology

**G-23: Friction and Wear Behaviour of Ti-based Bulk Metallic Glass Composites**: *Fufa Wu*[1]; [1]Liaoning University of Technology, China

**G-24: Influence of Composition on Glass Formation and Structure in Zr-Al-Ni Alloys**: *Juan Wang*[1]; Peter Tsai[1]; Anupriya Agrawal[1]; Katharine Flores[1]; [1]Washington University in Saint Louis

**G-25: On Quantifying Amorphous to Crystalline Phase Transition during Micro Milling Zr-based Bulk Metallic Glasses**: *David Yan*[1]; [1]San José State University

**G-26: Probabilistic Modelling and Simulation of Microstructural Evolution in Zr Based Bulk Metallic Glass Matrix Composites during Solidification**: *Muhammad Musaddique Ali Rafique*[1]; [1]RMIT University

**G-27: Short-term Oxidation Behavior of Zr53.8Cu29.1Ni7.3Al9.8 Bulk Metallic Glass at High Temperature in Dry Air**: *Haiyang Li*[1]; [1]Northeastern University

**G-28: Spark Plasma Sintering of Ni Reinforced Fe Based Bulk Metallic Composites**: *Himabindu Kasturi*[1]; Tanaji Paul[1]; Sandip Harimkar[1]; [1]OSU

**G-29: Temperature Dependent Plastic Deformation of Bulk Metallic Glasses**: *Chandra Sekhar Meduri*[1]; Golden Kumar[1]; [1]Texas Tech University

**G-30: The Shape of the Liquid Metastable Miscibility Gap in Undercooled Molten Pd-Ni-P Alloys**: *Yongxing Nie*[1]; Hin Wing Kui[1]; [1]Chinese University of Hong Kong

**G-32: X-ray Diffraction Studies of the First-order Liquid-liquid Phase Transition in Undercooled Molten Pd-Ni-P**: *Ka Chung*[1]; X. Wang[1]; Hin Wing Kui[1]; [1]The Chinese University of Hong Kong

**G-58: Tracking Metastable Phase Selection during Devitrification in a Metallic Glass**: *Lin Zhou*[1]; Fanqiang Meng[1]; Shihuai Zhou[1]; Taehoon Kim[1]; Ryan Ott[1]; Ralph Napolitano[1]; Matthew Kramer[1]; [1]Ames Lab

## Characterization of Minerals, Metals, and Materials – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Bowen Li, Michigan Technological University; Jian Li, CanmetMATERIALS; Shadia Ikhmayies, Al Isra University; Mingming Zhang, ArcelorMittal Global R&D; Eren Kalay, METU; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Donato Firrao, Politecnico di Torino - DISAT; Andrew Brown, UNSW Australia; Chenguang Bai, Chongqing University; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Ramasis Goswami, Naval Research Laboratory; Jeongguk Kim, Korea Railroad Research Institute

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

**I-11: Addition of Dregs in Mixed Mortar: Evaluation of Physical and Mechanical Properties**: Rodrigo Santos[1]; Rita de Cássia Alvarenga[1]; *Beatryz Mendes*[1]; José Maria Carvalho[1]; Leonardo Pedroti[1]; Afonso Azevedo[1]; [1]Universidade Federal de Viçosa

**I-12: Adhesion Study at Advanced Ages in Multipurpose Mortars**: Markssuel Marvila[1]; Jonas Alexandre[1]; *Afonso Azevedo*[1]; Euzébio Zanelato[1]; Sergio Monteiro[2]; Gustavo Xavier[1]; Melissa Goulart[1]; Beatriz Mendes[3]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia; [3]Universidade Federal de Viçosa

**I-14: Applications and Opportunities of Nanomaterials in Construction and Infrastructure**: *Henry Colorado*[1]; Oscar Jaime Restrepo Baena[2]; Juan Nino[3]; [1]Universidad de Antioquia; [2]Universidad Nacional de Colombia; [3]University of Florida

**I-15: Automated Optical Serial Sectioning Analysis of Phases in a Medium Carbon Steel**: *Veeraraghavan Sundar*[1]; Satya Ganti[1]; Bryan Turner[1]; [1]UES Inc.

**I-16: Ballistic Performance Evaluation of a Mutlilayered Armor System with PALF/Epoxy Composite**: Fernanda da Luz[1]; *Sergio Monteiro*[1]; [1]Military Institute of Engineering, IME

**I-17: Ballistic Test of Multilayered Armor with Intermediate Polyester Composite Reinforced with Fique Fabric**: Artur Camposo Pereira[1]; *Sergio Neves Monteiro*[1]; Foluke Salgado de Assis[1]; [1]Instituto Militar de Engenharia

**I-18: Intergranular Cracking of High Strength Extruded Brass Alloys**: *Athanasios Vazdirvanidis*[1]; George Pantazopoulos[1]; [1]ELKEME S.A.

**I-19: Characterization of a Brazilian Bentonite for its Use in the Oil and Gas Industry**: Adriana Almeida Cutrim[1]; Margarita Bobadilla[2]; Kleberson R. Oliveira Pereira[2]; Fabio Jose Esper[3]; Guillermo Ruperto Martin Cortes[3]; Maria das Gracas Silva Valenzuela[2]; *Francisco Valenzuela-Diaz*[2]; [1]Federal University of Campina Grande; [2]Universidade de Sao Paulo; [3]Centro Universitario Estacio e Universidade de Sao Paulo

**I-20: Characterization of Different Clays for the Optimization of Mixtures for the Production of Ceramic Artifacts**: *Afonso Azevedo*[1]; Jonas Alexandre[2]; Euzébio Zanelato[2]; Markssuel Marvila[2]; Leonardo Pedroti[3]; Gustavo Xavier[2]; Diogo Santos[2]; Sergio Monteiro[4]; Marcelo Peixoto[1]; [1]IFF; [2]UENF; [3]UFV; [4]IME

**I-21: Characterization of Polyester Composite Reinforced with Fique Fiber Functional Groups by Infrared Spectroscopy**: Artur Camposo Pereira[1]; *Sergio Neves Monteiro*[1]; Foluke Salgado de Assis[1]; [1]Instituto Militar de Engenharia

**I-22: Characterization of Tensile Properties of Epoxy Matrix Composites Reinforced with Fique Fabric Fiber**: *Maria Carolina Teles*[1]; Felipe Lopes[1]; Sérgio Monteiro[2]; Djalma Souza[1]; [1]State University of the Northern Rio de Janeiro; [2]IME

**I-23: Clay Smectite Synthetic: Characterization and Application in Nanocomposites**: Thamyres de Cavalho[1]; Edermarino Hidebrando[2]; Roberto Neves[2]; *Francisco Diaz*[1]; [1]Polytechnic School of the University of São Paulo; [2]Federal University of Pará

**I-24: Comparison of Performance between Granite Waste Pigments Based Paints and Soils Pigments Based Paints**: Márcia Maria Lopes[1]; Rita de Cássia Alvarenga[1]; Leonardo Pedroti[1]; *Beatryz Mendes*[1]; Fernando Cardoso[1]; Afonso Azevedo[2]; [1]Universidade Federal de Viçosa; [2]UENF

**I-25: Comparison of the Analytical and Experimental Temperatures in the Process of Machining an Intexable Steel**: Victor Souza[1]; *Niander Cerqueira*[2]; Juliana Ladeira[1]; Ricardo Sanches[1]; Jarilson Silva[1]; Afonso Azevedo[2]; Luis Felipe Silva[1]; [1]Uni Redentor; [2]Universidade Estadual Do Norte Fluminense Darcy Ribeiro - UENF

**I-26: Development and Characterization of Recycled-HDPE/EVA Foam Reinforced with Babassu Coconut Epicarp Fiber Residues**: Mariana Arantes[1]; Julyana Santana[1]; Francisco Valenzuela-Díaz[2]; Vijay Rangari[3]; Olgun Guven[4]; *Esperidiana Moura*[1]; [1]Instituto de Pesquisas Energéticas e Nucleares; [2]Universidade de São Paulo; [3]Tuskegee University; [4]Hacettepe University

**I-27: Effects of Civil Construction Waste on Properties of Lining Mortars**: *Afonso Azevedo*[1]; Jonas Alexandre[2]; Gustavo Xavier[2]; Beatryz Mendes[3]; Sergio Monteiro[4]; Niander Cerqueira[2]; [1]IFF; [2]UENF; [3]UFV; [4]IME

**I-28: Electron Beam Effect on Mechanical and Thermical Properties of DGEBA/EPDM Compound**: Anderson Mesquita[1]; Ian Cavalcante[1]; *Leonardo Silva*[1]; [1]Instituto de Pesquisas Energéticas e Nucleares - IPEN

**I-29: Epoxy Adhesive Joint for Metal Parts**: *Fabio Garcia Filho*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering - IME

**I-30: Evaluation of Microcapsules of PBSL/MMT-K and PBSL/OMMT-K Nanocomposites**: *Bianca Michel*[1]; Maria das Graças Silva-Valenzuela[1]; Francisco Valenzuela-Diaz[1]; Wang Hui[1]; Hélio Wiebeck[1]; [1]Polytechnic Scholl of University of São Paulo

**I-31: Evaluation of the Projectile's Loss of Energy in Polyester Composite Reinforced with Fique Fiber and Fique Fabric**: Artur Camposo Pereira[1]; *Sergio Neves Monteiro*[1]; Foluke Salgado de Assis[1]; [1]Instituto Militar de Engenharia

**I-32: Evaluation of the Quality of Concrete with Waste of Construction and Demolition**: Niander Cerqueira[1]; *Victor Souza*[1]; Afonso Azevedo[2]; Renan Vicente[1]; Anna Carolina Rabello[1]; Amanda Camerini[1]; André Gomes[1]; [1]Uni Redentor; [2]UENF

**I-33: Experimental Investigation of Low-velocity Ballistic Impact Response of Closed Cell Aluminium Foams for Various Shaped Projectile Tips**: Md Ashraful Islam[1]; *Md Abdul Kader*[1]; Paul Hazell[1]; Juan Escobedo-Diaz[1]; Andrew Brown[1]; [1]UNSW Canberra

**I-34: Evaluation of Two Different Pulsed Plasma Nitriding Conditions on Steel Properties**: *Fabio Garcia Filho*[1]; Gabriel De Carvalho[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering - IME

**I-35: Flexural Mechanical Characterization of Polyester Composites Reinforced with Jute Fabric**: Foluke de Assis[1]; *Sergio Monteiro*[1]; Artur Pereira[1]; [1]Military Institute of Engineering

**I-36: Grain Boundary Engineering through Thermo-mechanical Processing and its Implication on Sensitization in Alloy 600H**: *Chandra Kaithwas*[1]; Pallabi Bhuyan[1]; Sumanta Pradhan[1]; Sumantra Mandal[1]; [1]IIT Kharagpur

**I-37: Influence of Coupling Agent on the Modification Effects of Vanadium Tailing as a Polymer Filler**: *Tiejun Chen*[1]; Min Lu[1]; PeiWei Hu[1]; [1]Wuhan University of Science and Technology

**I-38: Influence of Electron-beam Irradiation on the Properties of LDPE/EDPM Blend Foams**: *Julyana Santana*[1]; Marcus Seixas[2]; Vijay Rangari[3]; Francisco Valenzuela-Díaz[2]; Helio Wiebeck[2]; Esperidiana Moura[4]; [1]Instituto de Pesquisas Energeticas e Nucleares IPEN/SP; [2]Metallurgical and Materials Engineering Department, Polytechnic School, University of Sao Paulo; [3]Department of Materials Science and Engineering, Tuskegee University; [4]Center for Chemical and Environmental Technology (CQMA), Nuclear and Energy Research Institute – Sao Paulo

**I-39: Influence of the Areal Density of Layers in the Ballistic Response of a Multilayered Armor System Using Box-behnken Statistical Design**: *Fábio Braga*[1]; Pedro Henrique Lopes[1]; Fernanda Luz[1]; Édio Lima Jr.[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering (IME)

**I-40: Influence of the Blocks and Mortar's Compressive Strength on the Flexural Bond Strength of Concrete Masonry**: Gustavo Nalon[1]; Rita Alvarenga[1]; Leonardo Pedroti[1]; Marcelo Alves[1]; Roseli Martins[1]; Carol Santos[2]; Igor Andrade[1]; *Beatryz Mendes*[1]; [1]Federal University of Viçosa; [2]University of Sao Paulo

**I-41: Influence of Two Solubilization Conditions at 718 Superalloy Hardness and Microstructure**: *Fabio Garcia Filho*[1]; Dian De Oliveira[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering - IME

**I-42: Irradiation Influence on the Properties of HMS-Polypropylene Clay/AgNPs Nanocomposites**: Washington Oliani[1]; *Duclerc Parra*[1]; Vijaya Rangari[2]; Nilton Lincopan[3]; Ademar Lugao[1]; [1]Nuclear Energy Research Institute – IPEN/USP; [2]Tuskegee University; [3]Department of Microbiology, Institute of Biomedical Sciences, University of Sao Paulo

**I-43: Limit Speed Analysis and Absorbed Energy in Multilayer Armor with Epoxy Composite Reinforced with Mallow Fibers and Mallow and Jute Hybrid Fabric**: Lucio Nascimento[1]; *Sérgio Monteiro*[1]; Luis Henrique Louro[1]; Édio Lima Jr.[1]; Fábio Braga[1]; Fernanda Luz[1]; Jheison Santos[1]; Rubens Marçal[1]; Hugo Freitas[1]; [1]Instituto Militar de Engenharia

**I-44: Mechanical Characterization of Concrete Blocks with Addition on Residual Waste from the Marble Benefit**: *Niander Cerqueira*[1]; Victor Souza[2]; Leonardo Pinheiro[2]; Victor Pinho[2]; Afonso Azevedo[1]; Luis Felipe Silva[2]; [1]Universidade Estadual Do Norte Fluminense Darcy Ribeiro - UENF; [2]Uni Redentor

**I-45: Mechanical, Thermal and Electrical Properties of Polymer (Ethylene Terephthalate - PET) Filled with Carbon Black**: Anderson Mesquita[1]; *Leonardo Silva*[1]; Leila Miranda[2]; [1]Instituto de Pesquisas Energéticas e Nucleares - IPEN/USP; [2]Universidade Presbiteriana Mackenzie - UPM

**I-46: Mineralogical Analysis of A Chrome Ore from South Africa**: *Ming-feng Ye*[1]; Guang-liang Wu[1]; [1]Central South University

**I-47: Multilayered Armors with Piassava Fiber Composite**: *Fabio Garcia Filho*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering - IME

**I-48: Oxidation Behavior of Ti-based Bulk Metallic Glasses at Different Temperatures**: *Haiyang Li*[1]; [1]Northeastern University

**I-49: Pilot Trial of Detoxification of Chromium Slag in Cyclone Furnace and Preparation of Glass-ceramics with the Water-quenched Melt**: *Guizhou Zhao*[1]; Lingling Zhang[1]; Daqiang Cang[1]; [1]University of Science and Technology, Beijing

**I-50: Preparation of Refractory Material from Ferronickel Slag**: Foquan Gu[1]; *Zhiwei Peng*[1]; Huimin Tang[1]; Lei Ye[1]; Weiguang Tian[2]; Guoshen Liang[2]; Mingjun Rao[1]; Yuanbo Zhang[1]; Guanghui Li[3]; Tao Jiang[1]; [1]Central South University; [2]Guangdong Guangqing Metal Technology Co.Ltd; [3]Central South University School of Minerals Processing and Bioengineering

**I-51: Process Improvement Study on the Gradation Uniformity of Steel Slag Asphalt Concrete Aggregate**: *Canhua Li*[1]; Ming-sheng He[2]; Huo-guo Pang[1]; Xiao-dong Xiang[1]; Xin-wei Jiang[1]; Hong-bo Jin[3]; [1]Wuhan University of Technology,China; [2]Frontier Technology Institute of Wuhan Branch of Bao-steel Central Research Institute of Wuhan Iron and SteelCo.,Ltd; [3]Anhui Transport Consulting & Design Institute Co.,Ltd.

**I-52: Recycling of Polypropylene**: *Fabio Garcia Filho*[1]; Sergio Monteiro[1]; [1]Military Institute of Engineering - IME

**I-53: Research on the Interaction of Humic Acid with Iron Minerals**: *Guihong Han*[1]; Shengpeng Su[1]; Yijun Cao[1]; Yanfang Huang[1]; Xiangyu Song[1]; [1]Zhengzhou University

**I-54: Serial Sectioning as a Characterization Method for Carbon Fiber Composites**: *Veeraraghavan Sundar*[1]; Issa Hakim[2]; Satya Ganti[1]; Bryan Turner[1]; [1]UES Inc.; [2]Univeristy of Dayton

**I-55: Study of Different Process Additives Applied to Polypropylene**: Patricia Poveda[1]; Juliana Molari[2]; Deborah Brunelli[2]; *Leonardo Silva*[1]; [1]Instituto de Pesquisas Energéticas e Nucleares - IPEN/CNEN-SP; [2]Instituto Tecnológico de Aeronáutica - ITA

**I-56: Study of the Durability of Mortars with Effluent Sludge from Paper Industry Exposed to Salt Spray**: *Afonso Azevedo*[1]; Jonas Alexandre[2]; Gustavo Xavier[2]; Euzébio Zanelato[2]; Markssuel Marvila[2]; Niander Cerqueira[2]; Beatryz Mendes[3]; Sergio Monteiro[4]; [1]IFF; [2]UENF; [3]UFV; [4]IME

**I-57: Study of the Incorporation of Residue of Ornamental Rocks in Ceramic Tiles**: Markssuel Marvila[1]; Jonas Alexandre[1]; *Afonso Azevedo*[1]; Euzébio Zanelato[1]; Sergio Monteiro[2]; Wellington Junior[1]; [1]Universidade Estadual do Norte Fluminense Darcy Ribeiro; [2]Instituto Militar de Engenharia

**I-58: Study of the Incorporation of Smectite in Powder Coating**: *Maria das Graças Silva-Valenzuela*[1]; Francisco Valenzuela-Diaz[2]; Simeão Ferreira[1]; [1]Federal University of ABC; [2]University of São Paulo

**I-59: Study of the Mineralogical Composition of the Tailings of Coscotitlán, Hidalgo, Mexico**: Aislinn Teja Ruiz[1]; Julio Cesar Juárez[1]; Martín Reyes[1]; Leticia Hernández C.[1]; *Mizraim Uriel Flores G.*[1]; Iván Alejandro Reyes D.[1]; Miguel Perez[1]; Raúl Moreno Tovar[1]; [1]Universidad Autónoma del Estado de Hidalgo

**I-60: Study of Viability of the Addition of Sawing Residue in the Production of Structural Concrete**: *Niander Cerqueira*[1]; Victor Souza[2]; Victor Bartolazzi[2]; André Gomes[2]; [1]Universidade Estadual Do Norte Fluminense Darcy Ribeiro - UENF; [2]Uni Redentor

**I-61: The Effect of Transition Metals in Devitrification of Al-TM-RE Marginal Glass Forming Alloys**: Mustafacan Kutsal[1]; Bengisu Yasar[1]; *Eren Kalay*[1]; [1]METU

**I-62: The Influence of Clay Reinforcement on the Properties of Recycled Polymer Foams**: Mariane Oide[1]; Julyana Santana[1]; Renate Wellen[2]; Francisco Valenzuela-Díaz[3]; Olgun Guven[4]; *Esperidiana Moura*[1]; [1]Instituto de Pesquisas Energéticas e Nucleares; [2]Universidade Federal da Paraíba (UFPB) ; [3]Universidade de São Paulo; [4]Hacettepe University

**I-63: The Mechanical and Thermal Properties of Bulk FeB**: *Mitsuyuki Sugizaki*[1]; Yuji Ohishi[1]; Fumihiro Nakamori[1]; Hiroaki Muta[1]; Ken Kurosaki[2]; Shinsuke Yamanaka[3]; [1]Graduate School of Engineering, Osaka University; [2]Graduate School of Engineering, Osaka University & JST, PRESTO; [3]Graduate School of Engineering, Osaka University and Research Institute of Nuclear Engineering, University of Fukui

**I-64: The Quality of Tiles in Red Ceramic in Northwest of Rio de Janeiro and Southeast of Minas Gerais**: Niander Cerqueira[1]; *Priscila Celebrini*[2]; Dienifer Konzen[3]; Melissa Oliviera[3]; Afonso Azevedo[1]; Mairyanne Souza[1]; Victor Souza[3]; [1]Universidade Estadual Do Norte Fluminense Darcy Ribeiro - UENF; [2]IME; [3]Uni Redentor

**I-65: The Use of Polymeric Residues of High Density Polyethylene, in Substitution of Large Aggregate in Different Dosages in the Self-compacting Non-Structural Concrete**: Thiago Silva[1]; Alex Sandro Silva[1]; *Michel Oliveira*[1]; Jose Carlos Bueno[1]; Niander Cerqueira[2]; André Viana[1]; [1]Uni Redentor; [2]Universidade Estadual Do Norte Fluminense Darcy Ribeiro - UENF

**I-66: Structural, Spectroscopic, Magnetic, and Thermal Characterizations of a Magnetite Ore from the Nagaland Region, India**: Ritayan Chatterjee[1]; Dinabandhu Ghosh[2]; Surajit Biswas[3]; Sandeep Agarwal[4]; P.K. Mukhopadhyay[5]; *Saikat K. Kuila*[6]; [1]Heritage Institute of Technology Kolkata; [2]Jadavpur University; [3]University of Kalyani; [4]Ningbo Institute of Material Technology and Engineering; [5]S. N. Bose National Centre for Basic Sciences; [6]IIT Kharagpur

## Computational Design and Simulation of Materials (CDSM 2018): Atomistic Simulations – Poster Session

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Dallas Trinkle, University of Illinois, Urbana-Champaign; Panthea Sepehrband, Santa Clara University; Ting Zhu, Georgia Institute of Technology; Xing-Qiu Chen, Institute of Metal Research, Chinease Academy of Sciences; Qing Jiang, Jilin University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

Tuesday PM
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Room: Hall CD
Location: Phoenix Convention Center

**L-2: Atomic Structure and Electronic Properties of Hybrid Halide Perovskite Surface for Photovoltaic Applications**: *Rabi Khanal*[1]; Sheila Briggs[1]; Nicholas Ayers[1]; Taufique Mohammad[2]; Soumik Banerjee[2]; Samrat Choudhury[1]; [1]University of Idaho; [2]Washington State University

**L-3: Atomicrex - the General Purpose Tool for Constructing Atomic Interaction Models**: *Alexander Stukowski*[1]; Paul Erhart[2]; [1]Darmstadt University of Technology; [2]Chalmers University of Technology

**L-4: Atomistic Simulations of Carbon Diffusion and Segregation in a-Iron Grain Boundaries**: Mohamed Hindy[1]; *Tarek Hatem*[1]; Jaafar El-Awady[2]; [1]British University in Egypt; [2]Johns Hopkins University

**L-6: Composition and Measurement Dependent Thermal Conductivity of Graphene Oxide**: *Thomas Zhang*[1]; Chandra Singh[1]; [1]University of Toronto

**L-7: Deformation Studies of Pd-Pt Alloy Nanowire Using Molecular Dynamics Simulations**: *Jay Krishan Dora*[1]; Natraj Yedla[2]; Sudipto Ghosh[1]; [1]IIT Kharagpur; [2]Nit Rourkela

**L-8: Effect of Pre-existing Defects in the Parent FCC Phase on the Martensitic Transformation in Pure Fe: A Molecular Dynamics Study**: *Shivraj Karewar*[1]; Jilt Sietsma[1]; Maria Santofimia[1]; [1]TU Delft

**L-9: Effect of Precipitation on Grain Boundary Diffusion in Al-based Alloy**: Sergiy V. Divinski[1]; Vladislav Kulitcki[1]; Bengue Tas Kavakbasi[1]; *Ankit Gupta*[2]; Yulia Buranova[1]; Tilmann Hickel[2]; J Neugebauer[2]; Gerhard Wilde[1]; [1]Institute of Materials Physics, University of Muenster; [2]Max-Planck Institute for Iron Research

**L-10: First-principles Investigation of Vanadium Segregation at (111) Twins in MgAl2O4-spinel**: *Venkateswara Rao Manga*[1]; Tom Zega[1]; Keith Runge[1]; Krishna Muralidharan[1]; [1]University of Arizona

**L-11: Formation of Fivefold Twins during Rapid Solidification of Aluminum, and Twinning/Detwinning in Solidified Aluminum by Tensile Deformation**: Avik Mahata[1]; *Mohsen Asle Zaeem*[1]; [1]Missouri University of Science and Technology

**L-12: Insights into the Effect of Zr on O-contaminated $MoSi_2$ Grain Boundaries from Density Functional Theory Calculations**: *Hui Zheng*[1]; Richard Tran[1]; Balachandran Radhakrishnan[1]; Shyue Ping Ong[1]; [1]University of California, San Diego

**L-13: Interface Design for Carbide and Nitride Precipitates in Ferritic and Austenitic Steels: First-principles Approach**: *Oleg Kontsevoi*[1]; Gregory Olson[1]; [1]Northwestern University

**L-15: On the Deformation Mechanisms and Scaling Law of Three-dimensional Nanoporous Metals**: *Lijie He*[1]; Niaz Abdolrahim[1]; Haomin Liu[1]; [1]University of Rochester

**L-16: Optimizing Processing Parameter in Laser Sintering Process by Molecular Dynamics Simulation**: *Bowen Deng*[1]; David Hobbs[1]; Bruce Madigan[1]; [1]Montana Tech of the University of Montana

**L-17: Pair Correlations in Metal Nanocrystals**: *Alberto Flor*[1]; Paolo Scardi[1]; [1]University of Trento

**L-18: Peak Intrinsic Thermal Conductivity in Non-metallic Solids and New Interpretation of Experimental Data for Argon**: *Ahmed Hamed*[1]; Anter El-Azab[1]; [1]Purdue University

**L-19: Predicting the Electronic Structure of CeO2 Grain Boundaries for Comparison with Atomic Resolution EELS**: *Tara Boland*[1]; [1]Arizona State University

**L-21: Twinning and Phase Transformation in Single Crystal Ti Subjected to Multiaxial Loading Situations: Comparison of Interatomic Potentials**: Sunil Rawat[1]; *Nilanjan Mitra*[1]; [1]Indian Institute of Technology Kharagpur

**L-22: Understanding the Effect of Solid-solution on Mg Alloys' High Plastic Anisotropy**: *Eleftherios Andritsos*[1]; Guy Skinner[1]; Anthony Paxton[1]; [1]King's College London

## Computational Design and Simulation of Materials (CDSM 2018): Meso/Macroscale Simulations – Poster Session

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Katsuyo Thornton, University of Michigan; Mohsen Asle Zaeem, Missouri University of Science and Technology; Richard Hennig, University of Florida; Chengjia Shang, University of Science and Technology Beijing; Tong-Yi Zhang, Shanghai University; Zi-Kui Liu, The Pennsylvania State University; Alan Luo, The Ohio State University

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**L-23: A Crystal Plasticity Finite Element Simulation of Deformation Behavior Using a Real Microstructure-based RVE in a Dual-phase Steel**: *Jinwook Jung*[1]; Sang Sub Han[1]; Siwook Park[1]; MoonKi Bae[2]; Seung-Hyun Hong[2]; Kyu Hwan Oh[1]; Heung Nam Han[1]; [1]Seoul National University; [2]Hyundai Motor Group

**L-24: A Finite Element Simulation for Induction Heat Treatment of Drive Shaft Considering Transformation Plasticity**: *Siwook Park*[1]; Jinwook Jung[1]; Si-yup Lee[2]; Heung Nam Han[1]; [1]Department of Materials Science and Engineering, Seoul National University; [2]Automotive Research and Development Division, Hyundai Motor Group, Hwaseong-si

**L-25: A Quantitative Study of Strain Glass Transition of NiTi-base Shape Memory Alloys**: *Chuanxin Liang*[1]; Dong Wang[1]; Zhao Wang[2]; Yunzhi Wang[3]; [1]Xi'an Jiaotong University; [2]Guangxi University; [3]The Ohio State University

**L-26: Phase Field Study on the Formation of Lath Martensite**: *Mingyu Cho*[1]; Pil-Ryung Cha[1]; Dong-Uk Kim[2]; Moon-Gi Bae[3]; Soon-Woo Kwon[3]; Min-Woo Kang[3]; Seung-Hyun Hong[3]; [1]Kookmin University; [2]University of Michigan; [3]Hyundai Kia Motors Namyang Institute

## Computational Design and Simulation of Materials (CDSM 2018): Computational Design of Materials – Poster Session

*Sponsored by:* Chinese Society for Metals
*Program Organizers:* Alan Luo, The Ohio State University; Suveen Mathaudhu, University of California, Riverside; Yong Du, Central South University; Raymundo Arroyave, Texas A & M University; Dianzhong Li, Institute of Metal Research, Chinese Academy of Sciences; Zi-Kui Liu, The Pennsylvania State University

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**L-30: Diffusion Couple Experiments to Support the Development of a Diffusion Mobility Database for the Co-Al-W-Ni-Cr-Ta System**: *Kil-won Moon*[1]; Greta Lindwall[1]; Maureen Williams[1]; Carelyn Campbell[1]; Peisheng Wang[2]; Ursula Kattner[1]; [1]National Institute of Standards and Technology; [2]Northwestern University

## Computational Materials Discovery and Optimization – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Richard Hennig, University of Florida; Houlong Zhuang, Arizona State University; Arunima Singh, Lawrence Berkeley National Laboratory; Eric Homer, Brigham Young University; Francesca Tavazza, National Institute of Standards and Technology

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March 13, 2018

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Location: Phoenix Convention Center

**L-27: Computational Design of Fatigue-resistant NiTi-based Shape Memory Alloys**: *Chuan Liu*[1]; Gregory Olson[1]; [1]Northwestern University

## Computational Method and Experimental Approaches for Model Development and Validation, Uncertainty Quantification, and Stochastic Predictions – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory; Richard Hennig, University of Florida; Avinash Dongare, University of Connecticut; Shawn Coleman, U.S. Army Research Laboratory; Niaz Abdolrahim, University of Rochester; Joseph Bishop, Sandia National Laboratories; Fadi Abdeljawad, Sandia National Laboratories; Li Ma, National Institute of Standards and Technology

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**L-28: Extending the Angular-embedded Atom Method (A-EAM) Framework to an Al-Mg-Si Ternary System**: *Sumit Athikavil Suresh*[1]; Avinash Dongare[1]; [1]University of Connecticut

## Computational Thermodynamics and Kinetics – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee
*Program Organizers:* Elif Ertekin, University of Illinois; Shawn Coleman, U.S. Army Research Laboratory; Brent Fultz, California Institute of Technology; Richard Hennig, University of Florida; Suveen Mathaudhu, University of California, Riverside

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**N-2: Compare the Energies of Different Structures in Aluminium Electrochemical Cell**: *Mohsen Amerisiahooei*[1]; Khirollah Mehrani[1]; Mohammad Yousefi[1]; [1]Islamic Azad University

**N-3: First-principles Calculations of Non-dilute Solute Diffusion Coefficients in the Ag-Au System**: *Harrison Lee*[1]; Chelsey Hargather[1]; John O'Connell[1]; Shun-Li Shang[2]; Zi-Kui Liu[2]; [1]New Mexico Institute of Mining and Technology; [2]The Pennsylvania State University

**N-4: Interface Stability between $Yb_{14}MgSb_{11}$ and Ni Electrode: A Combined Study from First-principles Phonon Calculations, Thermodynamic Modeling, and Experiments**: *Jorge Paz Soldan Palma*[1]; Yi Wang[1]; Zi-Kui Liu[1]; Kurt Star[2]; Vilapanur Ravi[3]; Samad Firdosy[2]; Jean-Pierre Fleurial[2]; [1]Pennsylvania State University; [2]Jet Propulsion Laboratory; [3]California State Polytechnic University

**N-5: Manganese Influence on Equilibrium Partition Coefficient and Phase Transformation in Peritectic Steel**: *Huabiao Chen*[1]; Mujun Long[1]; Wenjie He[1]; Dengfu Chen[1]; Huamei Duan[1]; Yunwei Huang[1]; [1]Chongqing University

**N-6: Mathematical Modeling on the Fluid Flow and Desulfurization during KR Hot Metal Treatment**: *Chao Fan*[1]; Lifeng Zhang[2]; Qingcai Liu[1]; Dayong Chen[1]; [1]Chongqing University; [2]University of Science and Technology Beijing

## Design for Mechanical Behavior of Architectured Materials via Topology Optimization – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Additive Manufacturing Committee
*Program Organizers:* Natasha Vermaak, Lehigh University; Andrew Gaynor, U.S. Army Research Laboratory

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*Session Chairs:* Natasha Vermaak, Lehigh University; Andrew Gaynor, ARL

**L-29: Mechanical Properties of Work Hardened Steel Multilayers with Bimodal Grain Size**: *Marcin Kwiecien*[1]; Janusz Majta[2]; [1]AGH; [2]Akademia Górniczo-Hutnicza im. Stanislawa Staszica w Krakowie

## Environmentally Assisted Cracking: Theory and Practice – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee
*Program Organizers:* Bai Cui, University of Nebraska–Lincoln; Raul Rebak, GE Global Research; Sebastien Dryepondt, Oak Ridge National Laboratory; Srujan Rokkam, Advanced Cooling Technologies, Inc.

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**J-1: SCC Property Evolution of X70 Pipeline Steel in Simulated Deep-sea Environments**: Zixuan Yang[1]; *Jinxu Li*[1]; [1]University of Science and Technology Beijing

## Frontiers in Advanced Functional Thin Films and Nanostructured Materials – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Ritesh Sachan, Army Research Office; Srinivasa Rao Singamaneni, The University of Texas at El Paso; Haiyan Wang, Purdue University; Nuggehalli Ravindra, New Jersey Institute of Technology; Raj Singh, Oklahoma State University; Amit Pandey, LG Fuel Cell Systems Inc.

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Funding support provided by: Quantum Design and Radiant Technologies

**M-13: Anisotropic Magnetic Properties in $BiFeO_3/SrRuO_3$ and La0.7Ca0.3MnO3/SrRuO3 Heterostructures**: *Srinivasa Rao Singamaneni*[1]; S. Nori[2]; L. M. Martinez[1]; Jose Delgado[1]; D Kumar[3]; John Prater[4]; Jay Narayan[2]; [1]The University of Texas at El Paso; [2]North Carolina State University; [3]North Carolina A&T State University; [4]Army Research Office

**M-14: Characterizing Nitrogen-vacancy (NV) Centers in Diamond Nanostructure Formed by Pulsed Laser Annealing Technique at Room Temperature and Ambient Pressure**: *Anagh Bhaumik*[1]; Ritesh Sachan[2]; Jagdish Narayan[1]; [1]North Carolina State University; [2]Materials Science Division, Army Research Office

**M-15: How Good those are Mechanically Exfoliated $MoS_2$ Mono Layered Devices at the Atomic Level?**: *L. M. Martinez*[1]; C. Saiz[1]; J. van Tol[2]; Srinivasa Rao Singamaneni[1]; [1]The University of Texas at El Paso; [2]National High Magnetic Field Laboratory

**M-16: Magnetic Anisotropy in Ni/VO2 Heterostructures**: Srinivasa Rao Singamaneni[1]; Gabrielle M. Foley[2]; S Nori[2]; *Cosio Adrian*[1]; D Kumar[3]; John Prater[4]; Jay Narayan[2]; [1]The University of Texas at El Paso; [2]North Carolina State University; [3]North Carolina A&T State University; [4]Army Research Office

**M-17: Nitrogen Vacancy Induced Room-temperature Ferromagnetism in TiN Epitaxial Thin Films via Ultrafast Laser Melting:** *Siddharth Gupta*[1]; Ritesh Sachan[2]; Adele Moatti[1]; Jagdish Narayan[1]; [1]North Carolina State University; [2]Materials Science Division, Army Research Office

**M-18: Q-carbon Tribological Coatings on WC and Tool Steel**: *Alexander Niebroski*[1]; Anagh Bhaumik[1]; Punam Pant[1]; Jagdish Narayan[1]; [1]North Carolina State University

**M-19: Synthesis and Mechanical Behavior of a Freestanding, Nanocrystalline NiTi Film under Cyclic Tensile Deformation**: *Paul Rasmussen*[1]; Jagannathan Rajagopalan[1]; Rohit Sarkar[1]; [1]Arizona State University

## Frontiers in Solidification Science and Engineering – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee
*Program Organizers:* Mohsen Asle Zaeem, Missouri University of Science and Technology; Damien Tourret, IMDEA Materials Institute; Mohsen Eshraghi, California State University, Los Angeles; Johannes Hötzer, University of Applied Science Karlsruhe

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*Session Chair:* Mohsen Asle Zaeem, Missouri University of Science and Technology

**N-7: A Microstructural Approach toward Improving the Phase Stability of Planar Structure of the Peritectic Pb-Bi Alloys**: *Peiman Shahbeigi Roodposhti*[1]; Harold Brody[1]; [1]University of Connecticut

**N-9: Numerical Investigation of Macrosegregation Mechanisms in DC Casting for Different Alloy Systems**: *Akash Pakanati*[1]; Mohammed M'Hamdi[2]; Hervé Combeau[3]; Miha Založnik[3]; [1]NTNU; [2]SINTEF; [3]Institut Jean Lamour

**N-10: Solidification Study of Spray-formed Cast Irons**: *Guilherme Zepon*[1]; Julia Fernandes[1]; Lucas Otani[2]; Claudemiro Bolfarini[1]; [1]Department of Materials Engineering - Federal University of São Carlos; [2]Graduate Program of Materials Science and Engineering - Federal University of São Carlos

**N-11: Study on the Formation and Control of TiN Inclusion in Mushy Zone for High Ti Microalloyed Steel**: *Tao Liu*[1]; Dengfu Chen[1]; Wenjie He[1]; Mujun Long[1]; Lintao Gui[1]; Huamei Duan[1]; Junsheng Cao[1]; [1]Chongqing University

## General Poster Session – Poster Session

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**O-2: A Mesoscale Model to Isolate Grain Boundary Effects in Material Failure**: *Sabine Zentgraf*[1]; [1]University of Colorado, Colorado Springs

**O-3: Additive Manufacturing of Epoxy Resin Matrix Reinforced with Magnetic Particles**: *Jose Rua*[1]; Henry Colorado[1]; [1]Universidad de Antioquia

**O-4: Admixture Optimization in Concrete Using Superplasticizers**: *Andrea Munoz*[1]; Sergio Cifuentes[2]; Henry Colorado[1]; [1]Universidad de Antioquia; [2]Conasfaltos S. A.

**O-5: Analysis of Plastic Deformation in Ti-Zr-Ni Quasicrystals**: *Geunhee Yoo*[1]; Eunsoo Park[1]; Chaewoo Ryu[1]; Jinyeon Kim[1]; [1]Seoul National University

**O-6: Ball Milling of Machine Chips as an Alternative Feedstock for Additive Manufacturing**: Jessica Bui[1]; *Parnian Kiani*[1]; Kaka Ma[2]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Colorado State University

**O-7: Bayesian Inference Based Uncertainty Quantification and Propagation Analysis of a Polycrystal Plasticity Finite Element Model Used for High Cycle Fatigue Analysis of Ti-6Al-4V**: *Ritwik Bandyopadhyay*[1]; Kartik Kapoor[1]; Barron Bichon[2]; Michael Sangid[1]; [1]Purdue University; [2]Southwest Research Institute

**O-8: Characterization Study of Binder-jet Printed of TiC-Aluminum Cermet**: *Cindy Waters*[1]; Cameron Shackleford[1]; [1]NCA&T State University

**O-10: Control of Prior Particle Boundary Formation in Hot Iso-statically Pressed Nickel-based Superalloys**: *Benjamin Georgin*[1]; Brian Welk[1]; Hamish Fraser[1]; [1]Center for Accelerated Maturation of Materials, The Ohio State University

**O-12: Development of a Cu-alloy Seed Buffer Layer for Solder Bump Flip Chip Application**: *Chon-Hsin Lin*[1]; [1]Asia-Pacific Institute of Creativity

**O-13: Direct Metal Write of Aluminum Alloys with Enhanced Surface Stability**: *Hunter Henderson*[1]; Michael Kesler[1]; Max Neveau[2]; Zachary Sims[2]; Wiliam Carter[1]; Scott McCall[3]; Lonnie Love[1]; Brian Post[1]; Randall Lind[1]; Mark Jaster[4]; David Weiss[5]; Orlando Rios[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]Lawrence Livermore National Laboratory; [4]PrintSpace 3D; [5]Eck Industries

**O-14: Effect of Colony Size on Tensile Fracture Behavior in Lamellar and Bi-lamellar Microstructures of Ti-6Al-4V Alloys**: *Jangho Yi*[1]; Yan Chong[1]; Nobuhiro Tsuji[2]; [1]Department of Materials Science & Engineering, Kyoto University; [2]Elements Strategy Initiative for Structural Materials (ESISM), Kyoto University

**O-16: Effect of Surface Treatment of Copper and its Alloys on the Antimicrobial Properties of the Surfaces**: *Monika Walkowicz*[1]; Piotr Osuch[1]; Beata Smyrak[1]; Andrzej Mamala[1]; Tadeusz Knych[1]; Anna Rozanska[2]; Agnieszka Chmielarczyk[2]; Dorota Romaniszyn[2]; Malgorzata Bulanda[2]; [1]AGH University of Science and Technology; [2]Jagiellonian University Medical College

**O-17: Effect of Tin Content on Microstructure and Mechanical Properties of High Carbon Steels**: *Lei Zhang*[1]; Hong-po Wang[1]; Cong-xiao Li[1]; Yu Wang[1]; Yi-yi Shu[2]; Yuan-hua Zhou[2]; [1]Chongqing University; [2]Chongqing Iron and Steel Co. Ltd.

**O-18: Enhancement of Thermoelectric Properties of Mechanically Alloyed Bi0.4Sb1.6Te3 Nanocomposites by Addition of γ-Al2O3 Particles**: *Pee-Yew Lee*[1]; [1]National Taiwan Ocean University

**O-19: Evaluation of the Formation of Intermetallic Compounds in Aluminum-steel Joints According to the Joining Method**: *Jose Rua*[1]; Edwar Torres[1]; [1]Universidad de Antioquia

**O-20: Fabrication of Nb-Si-B Alloys by Solidification Process and SPS Process**: *Myung-Jin Suk*[1]; Seong Lee[2]; Sung-Tag Oh[3]; Young Do Kim[4]; [1]Kangwon National University; [2]Agency for Defence Development; [3]Seoul National University of Science and Technology; [4]Hanyang University

**O-21: Fatigue Strength Characteristics of Tandem Gas Metal Arc Welding in Automotive Chassis Parts**: *Jaesoo Lee*[1]; Jong-deok Seo[1]; Dong-yoon Kim[2]; Dongcheol Kim[2]; Munjin Kang[2]; Young-min Kim[2]; [1]Shynyoung; [2]KITECH

**O-22: Functional Requirements for Expected Properties of Antimicrobial Touch Surfaces Based on Copper and its Alloys**: Monika Walkowicz[1]; *Piotr Osuch*[1]; Andrzej Mamala[1]; Beata Smyrak[1]; Tadeusz Knych[1]; Anna Rozanska[2]; Agnieszka Chmielarczyk[2]; Dorota Romaniszyn[2]; Malgorzata Bulanda[2]; [1]AGH University of Science and Technology; [2]Jagiellonian University Medical College

**O-23: Gold Nanoparticles on Multilayer Graphene Sheets for Surface Enhanced Raman Spectroscopy of Glucose**: *Laila Al-qarni*[1]; Zafar Iqbal[1]; [1]New Jersey Institute of Technology

**O-25: High Strain Rate Deformation of Automobile Grade Steels**: *Anindya Das*[1]; Soumitro Tarafder[1]; S Sivaprasad[1]; Debalay Chakrabarti[2]; [1]CSIR - National Metallurgical Laboratory,India; [2]Indian Institute of Technology, Kharagpur, India

**O-26: Highly Ordered Nickel Cobalt Sulfide Nanowires Grown Woven Kevlar Fiber Composites**: *Hyung Park*[1]; [1]Ulsan National Institute of Science and Technology

**O-28: Hot Isostatic Pressing and Laser Additive Manufacturing of Niobium-Based Refractory Powders**: *Calvin Mikler*[1]; Hamish Fraser[1]; Brian Welk[1]; Gopal Viswanathan[1]; [1]The Ohio State University

**O-30: In-process Microstructure Tuning in Solid-state Ambient Condition Metal Additive Manufacturing**: *Anagh Deshpande*[1]; Keng Hsu[1]; [1]University of Louisville

**O-31: In-situ TEM Micocantilever Measurements of $Al_2O_3$- $SmAlO_3$ Interfacial Toughness**: *Yonghui Ma*[1]; Jiahu Ouyang[1]; Shen Dillon[2]; [1]Harbin Institute of Technology; [2]University of Illinois at Urbana-Champaign

**O-32: Indentification of Gases Evolved during Firing Processes of Oxide Ceramics by Means of Thermal Analysis Coupled to Mass Spectrometry**: *Ekkehard Post*[1]; [1]NETZSCH Geraetebau GmbH

**O-33: Influence of Cold Spray on the Microstructure and Residual Stress of Resistance Spot Welded Steel-Mg**: *Sugrib Shaha*[1]; Bahareh Marzbanrad[1]; Hamid Jahed[1]; [1]University of Waterloo

**O-34:Investigation of Adiabatic Heat Rise and its Effect on Flow Stresses and Microstructural Changes during High Strain Rate Deformation of Ti6Al4V Alloy**: *Ashish Dawari*[1]; [1]Bharat Forge Ltd, Pune

**O-35: Investigation of Susceptibility of A533B SAteel to Temper Embrittlement**: *Mikhail Sokolov*[1]; [1]Oak Ridge National Laboratory

**O-36: Investigation of the Material Dependence in the Promotion of Clathrate Hydrate Nucleation**: *Christina Cox*[1]; Ahmad Majid[1]; Carolyn Koh[1]; [1]Colorado School of Mines

**O-38: Microstructural Influence on Cracking Resistance of Ti-6Al-4V ELI Alloy at Sour Environment**: *Gyeong Hyeon Jang*[1]; [1]GIFT POSTECH

**O-39: Microstructure and Mechanical Properties of Al-Mg Based Alloy Sheets Processed by Cold Rolling**: *Hyeon-Taek Son*[1]; Yong-Ho Kim[1]; Hyo-Sang Yoo[1]; [1]Korea Institute of Industrial Technology

**O-40: Nanostructured Steel Susceptibility to Sulfide Stress Cracking**: *Arash Shadravan*[1]; Raymundo Case[1]; [1]Texas A&M University

**O-41: Optimisation of Celestite Leaching by Using Respond Surface Methodology**: *Rasit Sezer*[1]; Aysegul Bilen[2]; Selim Ertürk[2]; Cüneyt Arslan[2]; [1]Karadeniz Technical University; [2]Istanbul Technical University

**O-42: Real Time Estimation of Resistance Spot Weld Quality by Using Artificial Neural Network**: *Munjin Kang*[1]; Dongcheol Kim[1]; In-sung Hwang[1]; Young-Min Kim[1]; [1]KITECH

**O-44: Resistance Spot Weldability of 980MPa Grade Steel with 24% Elongation**: *Taekyung Kim*[1]; In-sung Hwang[2]; Dongcheol Kim[2]; Munjin Kang[2]; Young-Min Kim[2]; [1]Asan; [2]KITECH

**O-45: Rheological and Fatigue Resistance of High Strength and High Conductivity Cu-Ag Alloys Wires**: *Kinga Korzen*[1]; Andrzej Nowak[1]; Eliza Sieja-Smaga[1]; Artur Kawecki[1]; Tadeusz Knych[1]; Andrzej Mamala[1]; Beata Smyrak[1]; Bartosz Jurkiewicz[1]; [1]AGH University of Science and Technology

**O-46: Robust Accumulation of Research Foundational Knowledge in the Thermo Material Sciences**: *James Kahelin*[1]; [1]Planarity

**O-47: Scoping the Response of Materials under Fission and Fusion Conditions via Inventory Simulations**: *Mark Gilbert*[1]; [1]CCFE

**O-48: Study of Temperature Dependent Elastic Properties of SnSe Using Resonant Ultrasound Spectroscopy**: *Ashoka Karunarathne*[1]; Joseph Gladden[1]; Gautam Priyadarshan[1]; Pai-Chun Wei[2]; Yang-Yuan Chen[2]; Sriparna Bhattacharya[3]; Apparao Rao[3]; [1]University of Mississippi; [2]Academia Sinica; [3]Clemson University

**O-50: Study on the High-frequency Heat Treatment Process for the Dual Phase High-pressure Pipe Fabrication**: Min Seok Moon[1]; *MyoungHan You*[1]; JoonHyuk Song[1]; JeHa Oh[1]; DongChul Jung[1]; Kwang-Seok Kim[2]; [1]Korea Institute of Carbon Convergence Technology; [2]Korea Institute of Industrial Technology

**O-51: Superelastic Scaffolds Prepared by Sintering of Metal Fibers for Biomedical Applications**: *Tae-hyun Nam*[1]; Shuanglei Li[1]; [1]Gyeongsang National University

**O-52: Synthesis and Characterization of Novel Phosphonated and Sulfonated Poly(styrene-isobutylene-styrene) Membranes for Fuel Cell and Protective Clothing Applications**: *Eduardo Ruiz Colón*[1]; Maritza Pérez Pérez[1]; David Suleiman[1]; [1]University of Puerto Rico at Mayagüez

**O-55: The Effect of Complexion Transitions on Single Grain Boundary Fracture Toughness of Alumina**: *Lin Feng*[1]; Shen Dillon[1]; [1]University of Illinois at Urbana-Champaign

**O-56: The Effect of Cooling Rate on Microstructure and Physical Properties for Alloy 625 Casting**: *Jaihyun Park*[1]; Yeungju Kim[1]; [1]RIST

**O-57: The Effect of Thermal Treatment on Microstructure and Mechanical Properties of Infiltrated TiB2-steel Composites**: *Helen Dilman*[1]; Or Rahamim[1]; Shmuel Hayun[1]; Nachum Frage[1]; [1]Ben Gurion University of Negev

**O-58: The Influence of Frequency on Ultrasonic Vibration-assisted Laser Atomization of TI-alloy**: *Seyyed Habib Alavi*[1]; Geremiah Charles[2]; Sandip Harimkar[1]; [1]Oklahoma State University; [2]Arizona State University

**O-59: Effect of Trace Elements on Microstructure and Material Properties of an Aluminium Alloy**: Thomas Pabel[1]; Tose Petkov[1]; H. Schroettner[2]; Mihaela Albu[3]; A. Rossmann-Perner[3]; *Peter Schumacher*[4]; [1]Austian Foundry Research Institute; [2]Graz University of Technology; Graz Centre for Electron Microscopy; [3]Graz Centre for Electron Microscopy; [4]Austrian Foundry Research Institute; University of Leoben

**O-60: Ultra-high Strength and High Conductivity Cu-Ag Alloys Wires Designed for the Construction of High Magnetic Fields Generators**: *Eliza Sieja-Smaga*[1]; Artur Kawecki[1]; Tadeusz Knych[1]; Andrzej Mamala[1]; Kinga Korzen[1]; Krystian Franczak[1]; Grzegorz Kiesiewicz[1]; Pawel Kwasniewski[1]; [1]AGH University of Science and Technology

**O-61: Wear Behavior of Additive Manufactured Orthopedic Ceramics**: *Jessica Hammitt-Schiltz*[1]; [1]University of Notre Dame

**O-62: Optimizing Microstructure, Strength and Ductility of Medium-Entropy NiCoCr and Ni-Base Superalloy IN740H**: *Leah Mills*[1]; Sherri Youssef[1]; Taylor Thomas[1]; Connor Slone[1]; Michael Mills[1]; Easo George[2]; [1]The Ohio State University; [2]Oak Ridge National Laboratory

**O-63: Tuning the Luminescence Properties of Eu3+ Doped $SiO_2$ Glasses by Additions of Amino Acids**: *Javier Hernández-Paredes*[1]; [1]Universidad de Sonora

**O-64: Design for Thermal Cooling System Using Novel Gallium-$C_{60}$ Composite Material**: *Angelo Karavolos*[1]; [1]De Astris Generation LLC

## High Entropy Alloys VI – 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; Xie Xie, FCA US LLC; Gongyao Wang, Alcoa Technical Center; E-Wen Huang, National Chiao Tung University; Tirumalai Srivatsan, The University of Akron

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**G-33: Ab Initio Assisted Design of Quinary Dual-phase High-entropy Alloys with Transformation-induced Plasticity**: Zhiming Li[1]; *Fritz Körmann*[2]; Blazej Grabowski[1]; Jörg Neugebauer[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Delft University of Technology, Max-Planck-Institut für Eisenforschung GmbH

**G-34: Ab Initio Calculations of the Structure and Elastic Properties of Low Density High Entropy Alloys**: *Natalia Koval*[1]; Maite Alducin[1]; Iñaki Juaristi[1]; Ricardo Díez Muiño[1]; [1]Materials Physics Center, MPC/CFM

**G-35: Contribution of Lattice Distortion to Solid Solution Strengthening in a Group of Body-centered Cubic (bcc) High Entropy Alloys**: *Hans Chen*[1]; Alexander Kauffmann[1]; Stephan Laube[1]; In-Chul Choi[1]; Ruth Schwaiger[1]; Franz Müller[2]; Bronislava Gorr[2]; Hans-Jürgen Christ[2]; Martin Heilmaier[1]; [1]Karlsruhe Institute of Technology (KIT); [2]University of Siegen

**G-36: Development of HEA Foam with Ultra-low TC and High Strength**: *Kook Noh Yoon*[1]; Khurram Yaqoob[2]; Je In Lee[1]; Jin Yeon Kim[1]; Eun Soo Park[1]; [1]Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University; [2]School of Chemical and Materials Engineering, National University of Sciences and Technology

**G-37: Development of High Entropy Alloy Coating Layer Using DC Magnetron Sputtering**: *Young Seok Kim*[1]; Hae Jin Park[1]; Sang Chul Mun[1]; Sung Hwan Hong[1]; Hyo Soo Lee[2]; Jin Kyu Lee[3]; Ki Buem Kim[1]; [1]Sejong University; [2]Korea Institute of Industrial Technology (KITECH); [3]Kongju National University

**G-38: Development of NbMoTaW Refractory High Entropy Alloys Matrix Composites Containing Nano-scale Oxides**: *Aeran Roh*[1]; Daeyoung Kim[1]; Seungjin Nam[1]; Hyunjoo Choi[1]; [1]Kookmin University

**G-39: Development of Transition Metal High-entropy Silicides**: *Sang Jun Kim*[1]; Hyun Seok Oh[1]; Eun Soo Park[1]; [1]Seoul National Univerisity

**G-40: Effect of TiB2 Addition on Tribological Properties of (AlCrFeMnV)100-xBix(x = 5 and 10) High Entropy Alloys**: *Surekha Yadav*[1]; Arvind Kumar[1]; Krishanu Biswas[1]; [1]IIT Kanpur

**G-41: Effects of Additional Elements on the Microstructure and Mechanical Properties of High Entropy Alloys Based on TiZrHfNiCu System**: *Hae Jin Park*[1]; Young Seok Kim[1]; Sung Hwan Hong[1]; Ki Buem Kim[1]; [1]Sejong University

**G-42: First-principles Calculations of Stacking Fault Energies in Refractory BCC High-entropy Alloy Systems**: *Joshua Strother*[1]; Alexandra Scheer[1]; Chelsey Hargather[1]; [1]New Mexico Institute of Mining and Technology

**G-43: High Thermal Stability and Sluggish Crystallization Kinetics of High-entropy Bulk Metallic Glasses**: *Ming Yang*[1]; Xiongjun Liu[1]; Qing Du[1]; Yuan Wu[1]; Hui Wang[1]; Z.P. Lv[1]; [1]University of Science and Technology Beijing

**G-44: Martensite Reinforced High Entropy Titanium Alloy with Multiple Deformation Mechanisms**: *Yuhe Huang*[1]; Iain Todd[1]; [1]University of Sheffield

**G-45: Measurement and Optimization of FeCoNiCrCu0.5 High Entropy Alloys-to-AISI 304L Stainless Steel Parameters of Dissimilar Resistance Spot Welds for Affecting Microstructural and Properties Using Hybrid Abductor Induction Mechanism**: *Jia-Chi Li*[1]; Chun-Ming Lin[1]; Cheng-Shun Chen[1]; [1]National Taipei University of Technology

**G-46: Microstructure and Magnetic Properties of FeNiCuMnTiSnx High Entropy Alloys**: *Liang Liu*[1]; [1]Liaoning University of Technology

**G-48: Microstructure of a New Ti-containing High Entropy Alloy**: *Van Thuong Nguyen*[1]; Liqing Huang[1]; Ma Qian[2]; Jin Zou[1]; [1]The University of Queensland; [2]RMIT University

**G-49: On the Evolution of Texture and Microstructure during Rolling of Dual Phase Al16Co21Cr21Fe21Ni21 High Entropy Alloy**: *Rani Agarwal*[1]; Reshma Sonkusare[1]; Krishanu Biswas[1]; Nilesh Prakash Gurao[1]; [1]IIT Kanpur

**G-50: SIM Transformation and Superelasticity of TiZrHfAlNb High Entropy Alloys**: *Lu Wang*[1]; Qinjia Wang[1]; Xidong Hui[1]; [1]University of Science and Technology Beijing

**G-51: Synthesis of FeCrVNbMn High Entropy Alloy by Mechanical Alloying and Study of their Microstructure and Mechanical Properties**: *Ajay Kumar P.*[1]; Chandra Perugu[2]; [1]University of Wisconsin Milwaukee; [2]Indian Institute of Science, Bangalore India

**G-52: Thermal and Structural Characterization of Magnetic High Entropy Alloys for Magnetocaloric Applications**: *Alice Perrin*[1]; [1]Carnegie Mellon University

**G-53: Understanding the Deformation Behavior of CoCuFeMnNi High Entropy Alloy by Investigating Mechanical Properties of Binary, Ternary and Quaternary Alloy Subsets**: *Saumya Jha*[1]; Rani Agarwal[2]; Reshma Sonkusare[2]; Krishanu Biswas[2]; Nilesh Gurao[2]; [1]NIT Durgapur; [2]IIT Kanpur

## High Temperature Corrosion of Structural Materials – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee
*Program Organizers:* Kinga Unocic, Oak Ridge National Laboratory; David Shifler, Office of Naval Research; Mark Weaver, University of Alabama; Steve Coryell, Special Metals; James Earthman, University of California, Irvine

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**J-2: An Analysis of Oxidation Mechanisms and their Influence on the Life of a Nickel-based Superalloy**: *David Lewis*[1]; Mark Whittaker[1]; Daniel Child[2]; [1]Swansea University; [2]Rolls-Royce plc.

**J-3: Effects of Post-Weld Heat Treatment(PWHT) Time on Pitting Behavior in Modified 9Cr-1Mo Steel Welds**: *Byungrok Moon*[1]; Sungyong Ahn[2]; Namhyun Kang[1]; Ikmin Park[1]; Kwangho Kim[3]; Kyungmox Cho[1]; [1]Pusan National University; [2]Doosan Heavy Industries and Construction; [3]GFHIM, Pusan National University

**J-4: Flame Resistance and YSZ and Pack Cementation Coated Steel**: Kwangsoo Choi[1]; Minkyu Kim[1]; Jong won Lee[1]; *Joon Sik Park*[1]; [1]Hanbat National University

**J-5: Great Performance of Nanostructured Multilayers (Ti-Cr-N) on P92 Steel for High Oxidation Temperature**: S. Castañeda[1]; *Francisco Pérez Trujillo*[1]; [1]Complutense University of Madrid

**J-6: High-temperature Coatings for Protection of Steels in Contact with a Novel Molten Salt under Static and Flow-accelerated Conditions for CSP Applications**: V. Encinas-Sánchez[1]; M. Lasanta[1]; M. de Miguel[1]; G. García-Martín[1]; *Francisco Pérez Trujillo*[1]; [1]Complutense University of Madrid

**J-7: Investigating Intergranular Corrosion of Stainless Steel Using Hard X-ray Nanoprobe**: *Simerjeet Gill*[1]; Kotaro Sasaki[1]; Zhixiu Liang[1]; Hugh Isaacs[1]; Mingyuan Ge[1]; Yong Chu[1]; Kim Kisslinger[1]; Lynne Ecker[1]; [1]Brookhaven National Lab

**J-8: Oxidation in Pure Steam Atmosphere at High Temperature of Protective Coatings: Influence of Pressure and the Architecture**: A. Illana[1]; M. Gutiérrez[2]; I. Baraibar[2]; S. Mato[1]; *Francisco Pérez Trujillo*[1]; A. Agüero[2]; [1]Complutense University of Madrid; [2]Instituto Nacional de Técnica Aeroespacial

**J-9: Oxide Performance of Alumina Forming Alloys for Coking Environments**: *Kao Yang*[1]; [1]University of Wisconsin - Milwaukee

**J-10: Role of Titanium on the Oxidation of Ni-based Superalloys**: *Mary Taylor*[1]; Hugh Evans[1]; [1]The University of Birmingham

**J-11: The Effect of Corrosion Damage on the High Temperature Fatigue Behaviour of a Ni-alloy for Disc Rotor Applications**: *Michael Dowd*[1]; [1]Swansea

## Mechanical Behavior at the Nanoscale IV – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
*Program Organizers:* Christopher Weinberger, Colorado State University; Qian Yu, University of Michigan, Ann Arbor; Garritt Tucker, Colorado School of Mines; Nan Li, Los Alamos National Laboratory; Yu Zou, ETH Zurich; Jonathan Zimmerman, Sandia National Laboratories; Scott Mao, University of Pittsburgh

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Location: Phoenix Convention Center

*Session Chairs:* Christopher Weinberger, Colorado State University; Garritt Tucker, Colorado School of Mines

**M-20: High-strength and High-conductivity Sheets for High Field Bitter Magnets**: *Eliza Sieja-Smaga*[1]; Kinga Korzen[1]; Artur Kawecki[1]; Tadeusz Knych[1]; Krystian Franczak[1]; Marek Gnielczyk[1]; Szymon Kordaszewski[1]; Bartosz Jurkiewicz[1]; [1]AGH University of Science and Technology

**M-21: Plastic Flow in Cutting of Metals at Small Length Scales**: *Gan Feng*[1]; Dinakar Sagapuram[1]; [1]Texas A&M University

## Mechanical Characteristics and Application Properties of Metals and Non-metals for Technology: An EPD Symposium in Honor of Donato Firrao – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS: Materials Characterization Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Jiann-Yang Hwang, Michigan Technological University; Bowen Li, Michigan Technological University; Pasquale Russo Spena, Free University of Bozen-Bolzano

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**N-12: Alumina Feeding System Changes in Aluminum Electrochemical Cell with D18 Technology for Energy Efficiency (Case Study: Almahdi-Hormozal Aluminum Smelter)**: *Mohsen Amerisiahooei*[1]; Borzou Baharvand[2]; [1]Islamic Azad University; [2]Almahdi Hormozal Aluminium Smelter

**N-13: Young's Modulus and Hardness of Metal Amorphous Nanocomposites (MANCS) Determined by Nanoindentation**: *Yuval Krimer*[1]; Michael McHenry[1]; [1]Carnegie Mellon University

## Metal-Matrix Composites Innovations, Advances and Applications: An SMD Symposium in Honor of William C. Harrigan, Jr. – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Srivatsan Tirumalai, The University of Akron; Yuzheng Zhang, Gamma Alloys, LLC; William Harrigan, Gamma Technology, LLC

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*Session Chairs:* Yuzheng Zhang, Gamma Alloys; Tirumalai Srivatsan, The University of Akron

**G-54: In-situ TiB Reinforced Titanium Matrix Composites with a Network-woven Architecture Design**: *Liqing Huang*[1]; Van Thuong Nguyen[1]; Ma Qian[2]; Jin Zou[1]; [1]The University of Queensland; [2]RMIT University

**G-55: Influence of Graphene Nanoplatelet Reinforcements on Microstructural Development and Wear Behavior of An Aluminum Alloy Nanocomposite**: *Mohammad Alipour*[1]; Reza Eslami Farsani[1]; Yu. A. Abuzin[2]; [1]Department of Materials Engineering, Faculty of Mechanical Engineering, K.N. Toosi University of Technology, Tehran, Iran; [2]Faculty of Materials Science and Engineering, National University of Science & Technology (MISIS)

**G-56: Microstructures and Thermal Properties of Ag-carbon/Cu Composite Fabricated by Friction Stir Processing**: *Hyo-Soo Lee*[1]; Ki Buem Kim[2]; Jae-Ha Kim[1]; Yeo Reum Lee[1]; [1]KITECH; [2]Sejong University

**G-57: Strengthening Behavior of Ti/MWCNTs Composites with Modified Interfacial Structure by Utilizing Mechanical Milling**: *Miran Joo*[1]; Donghyun Bae[1]; [1]Yonsei University

## Nanocomposites V: Structure-Property Relationships in Nanostructured Materials – Poster Session

*Sponsored by:* TMS Structural Materials Division, TMS: Composite Materials Committee
*Program Organizers:* Meisha Shofner, Georgia Institute of Technology; Nikhilesh Chawla, Arizona State University

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**M-22: Effects of Surface-treated Graphene Nanoplatelets on the Flexural Properties of Basalt Fibers/Epoxy Composite**: *S. Navid Hosseini Abbandanak*[1]; S.M. Hossein Siadati[1]; Reza Eslami-Farsani[1]; [1]K. N. Toosi University of Technology

**M-23: Manufacturing Method and Characterization of Mechanical Properties of Laminated Metal Nanocomposites with Graded Layer Thickness**: *Wojciech Dera*[1]; Dariusz Jarzabek[1]; Cezary Dziekonski[1]; [1]Institute of Fundamental Technological Research Polish Academy of Sciences

**M-24: Microstructure and Mechanical Properties of High Conductivity Nanostructured Cu-Ag Alloys Wires**: *Eliza Sieja-Smaga*[1]; Artur Kawecki[1]; Tadeusz Knych[1]; Beata Smyrak[1]; Kinga Korzen[1]; Bartosz Jurkiewicz[1]; Marek Gnielczyk[1]; Justyna Grzebinoga[1]; [1]AGH University of Science and Technology

**M-25: On the Tensile Properties of Surface-treated Graphene Nanoplatelets/ Basalt Fibers/ Epoxy Nanocomposite System**: *S. Navid Hosseini Abbandanak*[1]; S.M. Hossein Siadati[1]; Reza Eslami-Farsani[1]; [1]K. N. Toosi University of Technology

**M-26: Pathways for Engineering Boron Nitride Nanotube Based High-strength Aluminum Composites**: *Pranjal Nautiyal*[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

## Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XVII – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Alloy Phases Committee
*Program Organizers:* Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Chih-Ming Chen, National Chung Hsing University; Thomas Reichmann, Karlsruhe Institute of Technology; Yu Zhong, Worcester Polytechnic Institute; Hiroshi Nishikawa, Osaka University; Shien Ping Feng, The University of Hong Kong; Yee-Wen Yen, National Taiwan University of Science & Technology; Song-Mao Liang, Clausthal University of Technology

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Location: Phoenix Convention Center

*Session Chairs:* Shih-kang Lin, National Cheng Kung University; Yee-wen Yen, National Taiwan University of Science and Technology

**K-13: Interfacial Reactions between Lead-free Solders and Cu-xZn Alloys**: *Chih-Hung Lin*[1]; William Yu[1]; Pei-Yu Chen[1]; Guan-Da Chen[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science and Technology

**K-14: Microstructure and Optical Properties of Cr1-xAlxN Films Synthesized by Reactive Magnetron Sputtering**: Ting-Kan Tsai[1]; Shu-Wei Yang[1]; *Yu Ru Li*[1]; [1]Nation Formosa University

**K-15: The Electromigration Effect Revisited: An In Situ SEM and SR-based XRD Study**: *Yu-chen Liu*[1]; Shih-kang Lin[1]; [1]National Cheng Kung University

**K-20: The Role of Retained Structures in Phase Transition and Piezoelectric Properties of PMN-PT Single Crystals**: *Hooman Sabarou*[1]; Vadym Drozd[1]; Dehua Huang[2]; Yu Zhong[1]; [1]Florida International University; [2]Navy Undersea Warfare Center

## Phase Transformations and Microstructural Evolution – Poster Session II

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
*Program Organizers:* Gregory Thompson, University of Alabama; Mark Aindow, University of Connecticut; Sudarsanam Babu, The University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas; Tushar Borkar, Cleveland State University; Hai Chen, Tsinghua University; Paul Gibbs, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Ashwin Shahani, University of Michigan; Yufeng Zheng, The Ohio State University

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**N-23: Deformation Twins Induced by High-density Pt2Mo-type Superlattice Mediated Portevin-Le Chatelier-like Effect in Ni-Cr-Mo Alloy**: *Yuan Liang*[1]; Hu Rui[2]; Gao Xiangyu[2]; [1]Shaanxi University of Science and Technology; [2]Northwestern Polytechnical University

**N-24: Effect of Film Thickness on Anisotropic Grain Growth in Electroplated (111) Nanotwinned Cu**: *Chih-Han Tseng*[1]; Chih Chen[1]; [1]National Chiao Tung University

**N-25: Impact of D019 Ordering in Hf-Sc-Ti-Zr Based Hexagonal Solid Solutions upon Addition of Al and Nb**: *Lukasz Rogal*[1]; P. Bobrowski[1]; Fritz Körmann[2]; Blazej Grabowski[3]; [1]Institute of Metallurgy and Materials Science; [2]Delft University of Technology; [3]Max-Planck-Institut für Eisenforschung

**N-26: Influence of Deformation and Heat Treatment on the Microstructure Evolution in the Nickel Superalloy 625**: *Simon Malej*[1]; Jožef Medved[2]; Franc Tehovnik[1]; Jaka Burja[1]; Franci Vode[1]; Arh Boštjan[1]; Barbara Šetina Batic[1]; Elena Chernyshova[3]; Matjaž Godec[1]; [1]Institute of Metals and Technology; [2]Faculty of Natural Sciences and Engineering; [3]National Institute of Chemistry

**N-27: Microstructural Evolution and Compositional Homogenization of As-cast Multicomponent Low Re-containing Ni-based Single Crystal Superalloy during Stepwise Solution and Aging Heat Treatments**: *Xianglin Su*[1]; Qingyan Xu[1]; Baicheng Liu[1]; [1]Tsinghua University

**N-28: Microstructural Evolution of a New Beta Titanium Alloy during the Beta Annealing, Slow Cooling and Aging Process**: *Saeed Sadeghpour*[1]; Seyed Mahdi Abbasi[1]; Maryam Morakabati[1]; [1]Malek Ashtar University of Technology

**N-29: Microstructural Evolution of Ti-Mo and Ti-Mo-Fe Alloys during Continuous Heating and Aging Heat Treatments**: *Mariana Mello*[1]; Camilo Salvador[1]; Kaio Campo[1]; Rubens Caram[1]; [1]University of Campinas

**N-31: Study of Phase Transitions in Metastable β-Ti Alloy by Various In-situ Techniques**: *Pavel Zhánal*[1]; Petr Harcuba[1]; Jana Šmilauerová[1]; Lukáš Horák[1]; Jozef Veselý[1]; Michal Hájek[1]; Miloš Janecek[1]; [1]Charles University in Prague

**N-32: The Deformation-induced ß-a Martensite Transformation in a Metastableb Zr-Ti Alloy**: *Zhongni Liao*[1]; Baifeng Luan[1]; Qing Liu[1]; [1]Chongqing University

## Recent Advances in Functional Materials for Printed, Flexible and Wearable Electronics – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Pooran Joshi, Oak Ridge National Laboratory; Nuggehalli Ravindra, New Jersey Institute of Technology; Jud Ready, Georgia Institute of Technology; Amit Pandey, LG Fuel Cell Systems Inc.; Suresh Sitaraman, Georgia Institute of Technology

Tuesday PM
March 13, 2018

Room: Hall CD
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*Session Chair:* Pooran Joshi, Oak Ridge National Laboratory

**K-16: Highly Stretchable Metallic Interconnects on Polymer Substrates: Architecture and Mechanisms**: *Yeasir Arafat*[1]; Rahul Panat[1]; Indranath Dutta[1]; [1]Washington State University

## Recent Developments in Biological, Structural and Functional Thin Films & Coatings – Poster Session

*Sponsored by:* TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
*Program Organizers:* Adele Carradò, Université de Strasbourg IPCMS; Nancy Michael, University of Texas at Arlington; Ramana Chintalapalle, University of Texas - El Paso; Heinz Palkowski, Clausthal University of Technology; Nuggehalli Ravindra, New Jersey Institute of Technology; Vikas Tomar, Purdue University; Gerald Ferblantier, Strasbourg University - ICube Laboratory

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**H-11: Effect of Interaction of CO Gas Molecules on Schottky Barrier Modulation of Pt-SnO2 Nanostructure Device**: *Avneet Singh*[1]; Monika Tomar[1]; Vinay Gupta[1]; [1]University of Delhi

**H-12: Nickel Oxide Thin Film Based Electrode for Cholesterol Monitoring Using Electrochemical Biosensor**: *Gurpreet Kaur*[1]; Monika Tomar[1]; Vinay Gupta[1]; [1]University of Delhi

**H-13: Zinc Oxide Thin Film as a Guiding Layer for Love Wave Acoustic Biosensors**: *Lokesh Rana*[1]; Reema Gupta[1]; Monika Tomar[1]; Vinay Gupta[1]; [1]University of Delhi

## Solar Cell Silicon – Poster Session

*Sponsored by:* TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
*Program Organizers:* Shadia Ikhmayies, Al Isra University; Neale Neelameggham, Ind LLC; York Smith, University of Utah

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**K-17: High Temperature Pressure Filtration Applying for Separation of Silicon and Liquation Agent**: *Tianyang Li*[1]; Zhancheng Guo[1]; [1]University of Science and Technology Beijing

**K-18: Leaching of Indium from ITO Present in Amorphous Silicon Photovoltaic Modules**: Pedro Forastieri de Almeida Prado[1]; *Jorge Alberto Soares Tenório*[1]; Denise Crocce Romano Espinosa[1]; [1]University of São Paulo

**K-19: The Effect of Rapid Heat Treatment on Crystal Defect Evolution and Electrical Properties of the Original High Efficient Polycrystalline Silicon**: Hongyuan Shen[1]; Longzhong Gao[1]; *Kuiixan Wei*[1]; Wenhui Ma[1]; Shaoyuan Li[1]; [1]Kunming University of Science and Technology

## Surface Engineering for Improved Corrosion Resistance – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Rajeev Gupta, The University of Akron; Sandip Harimkar, Oklahoma State University; Carlos Schvezov, Institute of Materials of Misiones; Arvind Agarwal, Florida International University

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**J-12: Effect of Coating Composition on Microstructure and Corrosion Resistance of Zn-Mg-Al Hot-dip Alloy Coated Steel Sheets**: *Min-suk Oh*[1]; Jung-Han Kim[1]; Jae-Ik Cho[1]; Cheol-Woo Kim[1]; [1]Korea Institute of Industrial Technology

## Surface Interactions in Materials – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
*Program Organizers:* Carlos Schvezov, Institute of Materials of Misiones; Sandip Harimkar, Oklahoma State University; Rajeev Gupta, The University of Akron

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**M-27: Effect of Ultrasonic Vibration Assisted Laser Surface Texturing and Melting of Ti-6Al-4V ELI (Biomedical) Alloys on their Microstructural Evolution and Tribological Properties**: *Sourabh Biswas*[1]; Seyyed Habib Alavi[1]; Sandip Harimkar[1]; [1]Oklahoma State University

**M-28: Effects of Various Surface Treatment Methods on the Flexural Properties of Fiber Metal Laminates**: *S. Navid Hosseini Abbandanak*[1]; Hamed Aghamohammadi[1]; Reza Eslami-Farsani[1]; S.M. Hossein Siadati[1]; [1]K. N. Toosi University of Technology

## Ultrafine-grained Materials X – Poster Session

*Sponsored by:* TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
*Program Organizers:* Suveen Mathaudhu, University of California, Riverside; Irene Beyerlein, University of California, Santa Barbara; Avinash Dongare, University of Connecticut; Chong Soo Lee, POSTECH; Terry Lowe, Colorado School of Mines; Srikanth Patala, North Carolina State University; Lee Semiatin, US Air Force Research Laboratory; Jason Trelewicz, Stony Brook University; Janelle Wharry, Purdue University; Caizhi Zhou, Missouri University of Science and Technology

Tuesday PM
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**M-29: Effect of Microalloying Additions on the Continuous Recrystallization during Severe High Strain-rate Plastic Deformation**: Janusz Majta[1]; Carl Trujillo[2]; Ellen Cerreta[2]; Marcin Kwiecien[1]; *Krzysztof Muszka*[1]; [1]AGH University of Science and Technology; [2]Los Alamos National Laboratory

**M-30: Manufacturing Method and Material Characterization of Nanocrystalline Nickel Coatings with Gradient Grain Sie**: *Cezary Dziekonski*[1]; [1]Institute of Fundamental Technological Research

**M-31: Possibility of Manifestation of Dynamic Strain Aging under Severe Plastic Deformation of Low-carbon Steels**: *Georgy Raab*[1]; Gennady Aleshin[1]; Arseniy Raab[1]; [1]Ufa State Aviation Technical University

**M-32: Study of Densification and Microstructure of Cu-C Composite Prepared by Mechanical Alloying**: *Evanildo Nunes*[1]; Franciné Costa[2]; Suveen Mathaudhu[3]; [1]UCR; [2]UFRN; [3]University of California, Riverside

**M-33: Aging-induced Microstructure and Texture Evolution of AA 6201 after High Shear Deformation**: *Rilee Meagher*[1]; Casey Davis[1]; Joel Grzenia[1]; Peter Rovira[1]; Gordon Campbell[1]; Mathew Hayne[1]; Tamás Ungár[2]; Shenjia Zhang[3]; Terry Lowe[1]; [1]Colorado School of Mines; [2]Eötvös University; [3]General Cable Technologies Corporation

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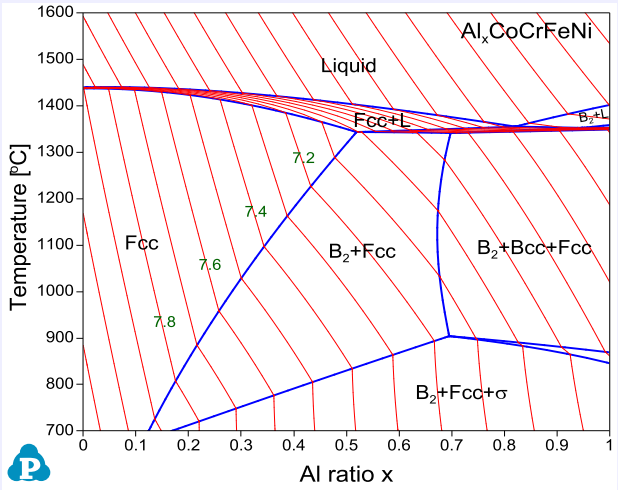
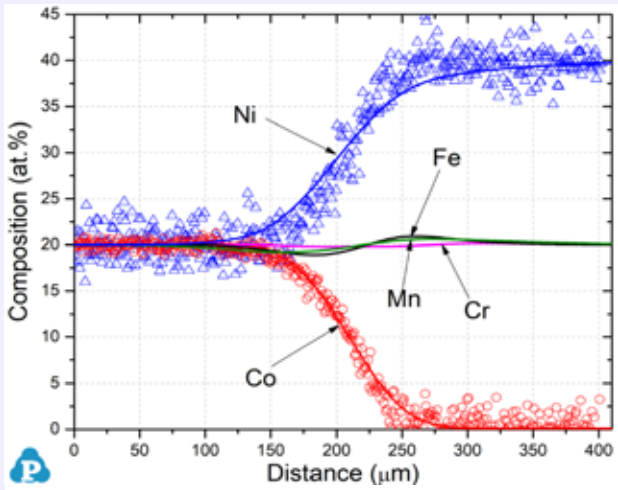
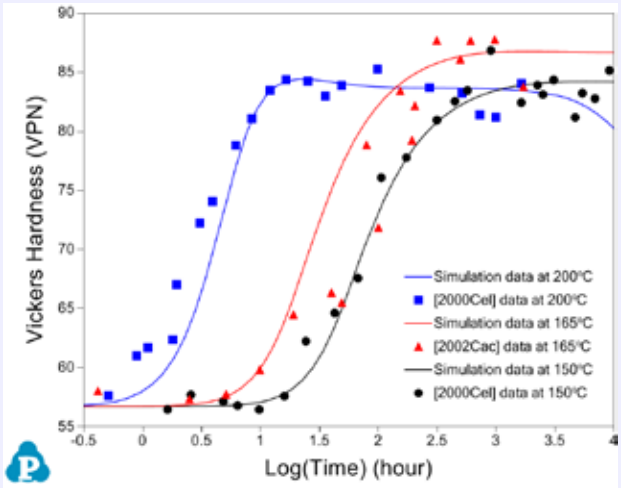


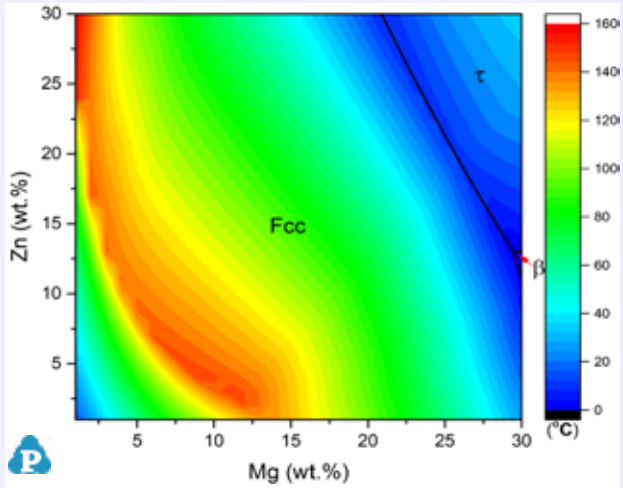

Design of light-weight high entropy alloys by phase diagram with density contour lines




Simulated concentration profiles of multi-component diffusion couple with experimental data




Simulated hardness curves of AZ91 alloy

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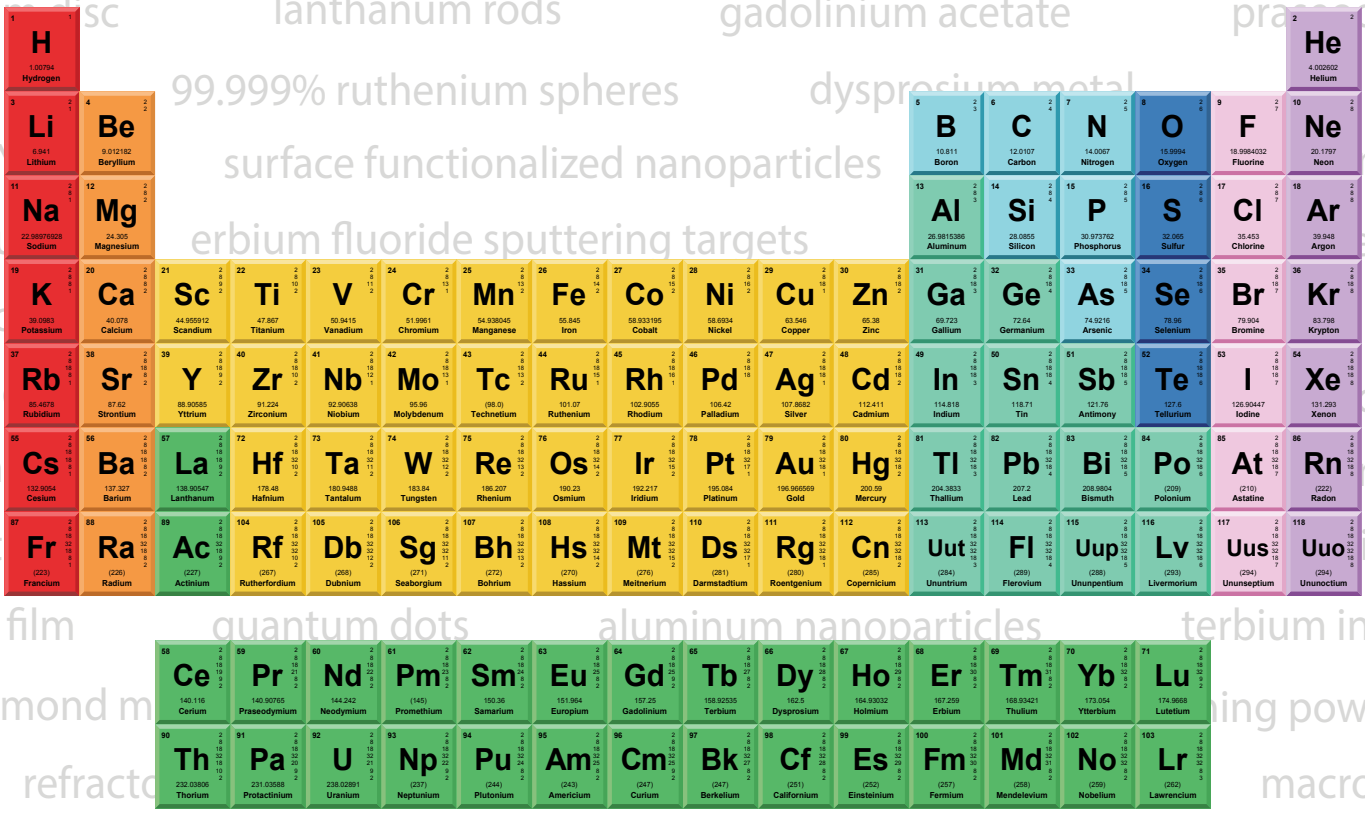


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