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

**Program Organizers:** Terry Xu, UNC Charlotte; Nitin Chopra, The University of Alabama; Jung-Kun Lee, University of Pittsburgh; Jiyoung Kim, University of Texas; V. U. Unnikrishnan, The University of Alabama

Monday AM Room: 211 Location: Music City Center

Session Chairs: Terry Xu, UNC Charlotte; Swastik Kar, Northeastern University

8:30 AM Invited
From 2D to 3D: Smart Materials and their Combinatorial Structures for Advanced Applications: *Swastik Kar*; 1Northeastern University

9:00 AM Invited
3-D Graphene Structures Synthesized by Catalyst-free Chemical Vapor Deposition: *Zhengwei Fan*; Kaiyuan Li1; Xufan Li1; 1University of Georgia

9:30 AM Highly Uniform Synthesis of Large-Area, Few-Layer WSe2: *Philip Campbell*1; Alexey Tarasov1; Corey Joiner1; Meng-Yen Tsai1; Georges Pavlidis1; Samuel Graham1; Jud Ready1; Eric Vogel1; 1Georgia Institute of Technology

9:50 AM Low Temperature Synthesis of Graphite on Ni Films Using Inductively Coupled Plasma Enhanced CVD: *Jaebeom Lee*1; Lanxia Cheng1; Antonio T.Lucero1; Kayoung Yen2; Hoseok Nam2; Jiyoung Kim3; 1University of Texas at Dallas; 2Kookmin University

10:10 AM Break

10:30 AM Invited
The Impact of Interfaces on the Integration of 2D Materials into Nanoelectronics: *Stephen McDonnell*1; Keren Freedy1; Angelica Azcat1; Christopher Smyth2; Rafik Addou2; Christopher Hinkle2; Robert Wallace2; 1University of Virginia; 2University of Tennessee

11:00 AM Invited
Plasmonic Hot Electron Induced Photocurrent Response at MoS2-Metal Junctions: *Yaqiong Xu*1; Tu Hong1; Bhim Chamlagain1; Shuren Hu1; Sharon Weiss1; Zhixian Zhou2; 1Vanderbilt University; 2Wayne State University

11:30 AM Deposition and Characteristics of Al based Gate Dielectrics with Ozone Treatment for MoS2 Applications: *Lanxia Cheng*1; Jaebeom Lee1; Antonio Lucero1; Youngchul Byun1; Jiyoung Kim1; 1University of Texas at Dallas

11:50 AM Anisotropic Photocurrent Response at Black Phosphorous-MoS2 p-n Heterojunctions: *Tianjiao Wang*1; Tu Hong1; Bhim Chamlagain1; Hsun-Jen Chuang2; Zhixian Zhou2; Ya-Qiong Xu1; 1Vanderbilt University; 2Wayne State University

7th International Symposium on High Temperature Metallurgical Processing — Energy Efficient 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; P. Chris Pistorius, Carnegie Mellon University; Gerardo Alvear Flores, Xstrata Technology; Onuralp Yücel, ITU; Liyuan Cai, Central South University; Baojun Zhao, The University of Queensland; Dean Gregurek, RHI AG; Varadarajan Seshadri, Universidade Federal de Minas Gerais

Monday AM Room: 105B Location: Music City Center

Session Chairs: Jiann-Yang Hwang, Michigan Technological University; Yousef Mohassab, University of Utah

8:30 AM Introductory Comments

8:35 AM Flash Reduction of Magnetite and Hematite Concentrates with Hydrogen in a Lab-Scale Reactor for a Novel Ironmaking Process: *Yousef Mohassab*1; Mohamed Elzohiery2; Hong Yong Sohn2; 1University of Utah; 2University of Utah

8:55 AM Investigation of Coal Tar Pitch Binder for the Production of Formed Coal Briquettes for COREX from High Volatile Coal Powder: *Yang Yong-bin*1; Wang Ya-xuan1; 1Central South University

9:15 AM Upgrading of Iron-rich Titanium Ores using a Molten Salt Process: *Farzin Fatollahi-Fard*1; Petrus Pistorius1; 1Carnegie Mellon University

9:35 AM Direct Electrolytic Production of Mo-Si-Ti-C Composites from their Oxides/Sulfide/Carbon Mixture Precursor in Molten Salt: *Xingli Zou*1; Xionggang Lu1; Qian Xu2; Hongwei Cheng2; Shuhua Geng2; Zhongfu Zhou2; 1State Key Laboratory of Advanced Steel, Shanghai University, 2Institute of Mathematics and Physics, Aberystwyth University

9:55 AM Advanced Oxygen Lances for Safer Furnace Tapping Operations: *Peter Sylvén*1; Darwin Morales1; 1Envisicom AB; 2Trefimet S.A.

10:15 AM Break

10:30 AM Reduction Kinetics of Magnetite Concentrate Particles with H2 + CO at 1200 to 1600 °C Relevant to a Novel Ironmaking Process: *Mohamed Elzohiery*1; Yousef Mohassab2; Jagannath Pal1; Shengqin Zhang1; Hong Yong Sohn1; 1University of Utah; 2University of Utah

10:50 AM Solar-driven Carbothermal Zine Recycling: *Nikolaos Tsouganatos*1; Christian Wreckert1; Aldo Steinfeld1; 1Solar Technology Laboratory, Paul Scherrer Institute; 2Department of Mechanical and Process Engineering, ETH Zurich

11:10 AM Preparing Silicide Layers on Metallic Substrates Using Molten Oxide Electrolysis: *Hideaki Sasaki*1; Masafumi Maeda1; 1Institute of Industrial Science, The University of Tokyo
Additive Forming of Components - Tailoring Specific Material Properties in Low Volume Production — Overview
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee Program Organizers: Judith Schneider, University of Alabama at Huntsville; Mark Stoudt, National Institute of Standards and Technology; Kester Clarke, Los Alamos National Laboratory; Lee Semiatin, US Air Force Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology; Eric Lass, National Institute of Standards and Technology; Paul Mason, Thermo-Calc Software Inc.

Monday AM Room: 205B Location: Music City Center
Session Chairs: Mark Stoudt, NIST; Lee Semiatin, US Air Force Research Laboratory

8:30 AM Invited
A Roadmap for Developing the Next Generation of Additive Manufacturing Materials: Todd Palmer1; Greg Dillon1; Gary Messing1; Rich Martukanitz1; Tim Simpson1; Ross Brindle2; Greg Hildeman2; Jared Kosters2; 1Penn State; 2Nexight Group LLC
9:00 AM Invited
Challenges in Using AM Components in Industrial Applications: John Lewandowski1; 1Case Western Reserve University
9:30 AM Invited
Additive Manufacturing of Metals: The Devil in the Details: Lyle Levine2; 1National Institute of Standards and Technology
10:00 AM Break
10:20 AM Invited
New Alloy Systems for Direct Metal Powderbed Processes: Tim Horn1; Ola Harrysson1; Harvey West1; 1North Carolina State University
10:50 AM Invited
Multimodal Correlated Datasets to Understand Location Specific Processing State for Additive Manufacturing: Edwin Schwalbach1; Michael Gрошcer; Ryan Dehoff; Vincent Paquit2; Norman Schehl1; William Porter1; Dennis Buchanan1; Reji John1; 1Air Force Research Laboratory; 2Oak Ridge National Laboratory; 3University of Dayton Research Institute
11:20 AM Invited
Prediction of Porosity Caused by Insufficient Melt Pool Overlap: P. Chris Pistorius1; Ming Tang1; 1Carnegie Mellon University
11:50 AM Invited
Simulation and Modeling of the Metal Laser Powder Bed Fusion Process to Accelerate Certification: Wayne King1; 1Lawrence Livermore National Laboratory

Additive Manufacturing: Building the Pathway towards Process and Material Qualification — Connections between Processing and Microstructures I
Sponsored by: TMS Extrusion and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Powder Materials Committee, TMS: Process Technology and Modeling Committee Program Organizers: John Carpenter, Los Alamos National Laboratory; Allison Beese, Pennsylvania State University; David Bourell, University of Texas; Reginald Hamilton, The Pennsylvania State University; Edward Herderick, GE; Rajiv Mishra, University of North Texas; James Sears, GE GRC

Monday AM Room: 205A Location: Music City Center
Session Chairs: Tony Rollett, Carnegie Mellon Univ.; Joe McKeown, Lawrence Livermore National Lab

8:30 AM Invited
Measuring Porosity in Additively Manufactured Materials via Synchrotron–based 3D X-ray Microtomography: Suraj Rao1; Ross Cunningham1; Tugce Ozturk1; Anthony Rollett1; 1Carnegie Mellon University
9:00 AM Characterization of Internal Defects and Their Effect on Mechanical Properties of Stainless Steel 304L Components Manufactured through Laser-based Directed Energy Deposition: Allison Beese1; Zhaqing Wang1; Todd Palmer1; 1Pennsylvania State University
9:20 AM Microstructure Evolution, Tensile Properties, and Fatigue Crack Growth Mechanisms in Ti-6Al-4V Alloys Fabricated by Electron Beam Melting: Haze Galarraga1; Diana Lados1; Ryan Dehoff2; Michael Kirka1; 1Worcester Polytechnic Institute; 2Worcester Polytechnic Institute; 3Oak Ridge National Laboratory
9:40 AM XRM: Tomography and 3D Grain Mapping for Additive Manufacturing Qualification: Leah Lavery1; Arno Merkle1; William Harris1; Christian Holzner1; 1Carl Zeiss X-ray Microscopy, Inc.
10:00 AM Break
10:20 AM Invited
Microstructure Evolution during Laser-Induced Rapid Alloy Solidification: Joseph McKeown1; Jean-Luc Fattebert1; Aurelien Perron1; John Roehling1; Patrice Turchi1; 1Lawrence Livermore National Laboratory
10:50 AM Stress State and Strain Rate Dependence of an Electron Beam Additive Manufactured Ti6Al4V: Omar Rodriguez1; Paul Allison1; Wilburn Whittington2; David Francis2; Oscar Rivera3; Kevin Chou1; Xibing Gong1; Todd Butler1; Jedediah Burroughs1; 1The University of Alabama; 2Mississippi State University; 3US Army ERDC
11:10 AM Structure / Property (Constitutive and Dynamic Strength / Damage) Characterization of Additively Manufactured 316L SS: George Gray1; Veronica Livescu1; Carl Trujillo1; John Carpenter1; Thomas Lienert1; Saryu Fensin1; 1Los Alamos National Laboratory
11:30 AM Understanding the Relationships Between Solidification Microstructure and Mechanical Properties of Additively Manufactured Ti-6Al-4V: Ross Cunningham1; Sneha Narra1; Jack Beuth1; Anthony Rollett1; 1Carnegie Mellon University
Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session I

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

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Marko Knesevic, University of New Hampshire; Wolfgang Pantleon, Technical University of Denmark; Thomas Bieler, Michigan State University; Khaled Hattar, Sandia National Laboratories; Irene Beyerlein, Los Alamos National Laboratory

Monday AM  Room: 103B
February 15, 2016  Location: Music City Center

Session Chairs: Brad Boyce, Sandia National Laboratories; Michael Mills, The Ohio State University

8:30 AM Invited
Revealing Deformation Mechanisms in Superalloys Using STEM-Based Imaging and Spectroscopy: Michael Mills1; Tim Smith1; Yunzhi Wang1; Stephen Niezgoda1; ‘The Ohio State University

9:00 AM Application of a Spectral Method Framework to Interrogate the Influences of Experimental Uncertainty on Crystal Plasticity: Philip Eisenlohr1; Pratheek Shanthraj1; Martin Diehl1; Chen Zhang1; Thomas Bieler1; Franz Roters1; Ruiqing Xu1; ‘Michigan State University; ‘Max-Planck-Institut für Eisenforschung GmbH; ‘Argonne National Laboratory

9:20 AM Investigation of Microstructural Stability of CuNb Composites under High-pressure Torsion (HPT): Samikshya Sabed1; Irene Beyerlein1; Elvan Ekiz2; Pascal Bellon2; Anthony Rollett1; ‘Carnegie Mellon University; ‘Los Alamos National Laboratory; ‘University of Illinois at Urbana-Champaign

9:40 AM Multiscale Modeling of IN718 Superalloy Based on Micropillar Compression and Computational Homogenization: Jon Molina-Aldareguia1; Bin Gan1; Aitor Cruzado1; Marcos Jiménez1; Javier Llorca1; Javier Segurado1; ‘IMDEA Materials Institute

10:00 AM Break

10:20 AM Invited
Quantifying Grain-Scale Deformation for Direct Comparison to Crystal Plasticity Predictions: Brad Boyce1; Hoon Lim1; Jay Carroll1; Thomas Buchheit1; Corbett Battaile1; ‘Sandia National Labs

10:50 AM Invited
Using Synchrotron Radiation to Characterize Deformation: Anthony Rollett1; Robert Suter1; ‘Carnegie Mellon University

11:20 AM Probing Grain Boundary Mechanics in alpha-titanium Using Nanoindentation and Boundary-sensitive Crystal Plasticity Modeling: Yang Su1; Claudio Zambaldi1; David Mercier1; Philip Eisenlohr1; Thomas Bieler1; Martin Crimp1; ‘Michigan State University; ‘Max-Planck-Institut für Eisenforschung

11:40 AM Strength Distribution in a Spalled Material and Its Dependence on Local Microstructure: Shraddha Vacchani1; Carl Trujillo1; Ellen Cerreta1; George Thompson III1; ‘Los Alamos National Laboratory

12:00 PM Automated Correlative Tomography of an Aluminum 7075 Alloy Spanning Length Scales and Modalities: Arno Merkle1; Nikhilseh Chawla2; Sudhanshu Singh2; ‘Carl Zeiss X-ray Microscopy; ‘Arizona State University

12:20 PM Mechanical properties and Characterization of Microstructural Gradients with Various Gamma Prime Distributions in Low Solvus High Refractory (LSHR) Nickel Base Superalloy: Samuel Kuhre1; John Sosa1; Hamish Fraser1; ‘The Ohio State University


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

Program Organizers: Raju Ramanujan, Nanyang Technological University; Matthew Willard, Case Western Reserve University; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory

Monday AM  Room: 209C
February 15, 2016  Location: Music City Center

Session Chairs: Raju Ramanujan, NTU; Francis Johnson, GE Global Research

8:30 AM Introductory Comments

8:40 AM Invited
Magnetic Anisotropy in Nanocomposites — What More Do We Know, What Questions Remain?: Michael McHenry1; ‘Carnegie Mellon University

9:10 AM Invited
Nucleation Mediated Nanostructures in Soft Magnetic Fe-Si-B Based Alloys (Invited): Tushar Borkar1; Talukder Alam1; Sameehan Joshi1; Shravana Katakam1; Xi Chen1; Narendra Dahotre1; Raju Ramanujan1; Rajarshi Banerjee1; ‘University of North Texas; ‘Nanyang Technological University

9:40 AM Advanced Magnetic Materials for High Power Density, High Efficiency Electrical Systems: Francis Johnson1; ‘GE Global Research

10:00 AM Break

10:20 AM Application of Soft Magnetic Nanocomposites in Power Electronics: Alex Leary1; Michael McHenry1; ‘Carnegie Mellon University

10:40 AM Design of Nano-crystalline Soft Magnetic Alloys: Electronic Structure: Jhoon Park1; Yang-Ki Hong1; Woncheol Lee1; Seok Bae1; Seong-Gon Kim1; Chul-Jin Choi1; ‘The University of Alabama; ‘LG Innotek; ‘Mississippi State University; ‘Korea Institute of Materials Science

11:00 AM Cation Disorder in Nanoparticle and Thin Film Ferrite Systems: Vincent Harris1; ‘Northeastern University
**Advanced Materials in Dental and Orthopedic Applications — Session I**

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

*Program Organizers*: Tolou Shokuhfar, University of Illinois at Chicago; Luis Rocha, UNESP, Univ. Estadual Paulista, Faculdade de Ciências; Grant Crawford, South Dakota School of Mines and Technology; Terry Lowe, Colorado School of Mines; Ana Ribeiro, National Institute of Metrology Quality and Technology; Reginald Hamilton, The Pennsylvania State University

**Monday AM**

*Room: 206A  Location: Music City Center*

**Session Chairs**: Tolou Shokuhfar, Michigan Technological University; Cimara Ferreira, University of Tennessee; Grant Crawford, South Dakota School of Mines & Technology

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**8:30 AM  Keynote**

The Growing Orthopedic Infection Problem: Can Anything Stop It?  
*Thomas Webster*¹; ¹Northeastern University

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**8:45 AM  Invited**

Surface Treatments and Dental Implant Infections:  
*Cimara Ferreira*¹; ¹UTHSC College of Dentistry

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**9:05 AM  Invited**

Surface Amorphization of NiTi Alloy Induced by Ultrasonic Nanocrystal Surface Modification for Biomedical Applications:  
*Xiaoning Hou*¹; ¹Michigan Technological University; ¹University of Akron

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**9:20 AM  Invited**

Mechanically Strong TiO₂ Nanotubes for Hip Implants:  
*Sweetu Patel*¹; ¹University of Akron

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**9:35 AM  Invited**

Towards High Figure of Merit zT>1 for p-type FeNbSb Half-Heusler Thermoelectric Materials:  
*Tiejun Zhu*¹; ¹University of Michigan

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**9:50 AM  Invited**

Examining the Effects of Three Biologically Compatible Solvents on the Behavior of Chitosan Bonded to Titanium:  
*Holly Baker*¹; ¹University of Arizona; ¹ETH Zurich

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**10:05 AM  Invited**

Mechanically Strong TiO₂ Nanotubes for Hip Implants:  
*Masaaki Nakai*¹; ¹Tohoku University

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**10:20 AM  Invited**

In-Vivo Performance and Characterization of Nanostructured Orthopedic Surfaces:  
*Craig Friedrich*¹; ¹University of Akron

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**10:35 AM  Invited**

In-Vivo Performance and Characterization of Nanostructured Orthopedic Surfaces:  
*Joana Villanueva*¹; ¹South Dakota School of Mines and Technology; ¹Humboldt State University

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**10:50 AM  Invited**

Surface Amorphization of NiTi Alloy Induced by Ultrasonic Nanocrystal Surface Modification for Biomedical Applications:  
*Xiaoning Hou*¹; ¹University of Akron
Monday AM  Room: 207A
February 15, 2016  Location: Music City Center

Session Chairs: Francois Barthelat, McGill University; Paul Allison, University of Alabama

8:30 AM  Introductory Comments

8:35 AM  Invited

Structural Design Elements in Biological Materials: Application to Bioinspiration: Marc Meyers1; Steve Naleway1; Joanna McKittrick1; Michael Porter2; 1University of California, San Diego; 2Clemson University

9:15 AM  Invited

Flexible Dermal Armor in Arapaima, Coelacanth, and Alligator Gar: Vincent Sherman1; Haocheng Quan1; Wen Yang2; Robert Ritchie3; Marc Meyers1; 1University of California, San Diego; 2ETH Zurich; 3Lawrence Berkeley National Laboratory

9:35 AM  Invited

A Comparison of the Microstructure of Teleost Fish Scales: Sandra Murcia1; Ellen Lavoie1; Alex Ossa2; Dwayne Arola1; 1University of Washington; 2Universidad Eafit

9:55 AM  Invited

Bio-inspired Flexible Armors with 3D Printed Tailored Architectures: Roberto Martini1; David Van Zyl1; Francois Barthelat1; 1McGill University

10:15 AM  Break

10:35 AM  Invited

On the Exceptional Deformability and Toughness of Snake Eggshells: Yin Chang1; Po-Yu Chen2; 1National Tsing Hua University

10:55 AM  Invited

Why the Seahorse Tail is Square: Michael Porter1; Dominique Adriaens1; Ross Hatton1; Marc Meyers1; Joanna McKittrick1; 1Clemson University; 2Ghent University; 3University of Oregon; 4University of California, San Diego

11:35 AM  Invited

Paddlefish Rostrum as a Structure for Bioinspiration: Analysis and Modeling of the Stress State and Strain Rate Dependence Behavior of Cartilage: Jeremiah Deang1; Mark Horstemeyer1; Lakiesha Williams1; Ed Perkins2; Paul Allison3; Guillermo Riveros3; 1INSA-Lyon; 2Northwestern Polytechnical University; 3Virginia Tech

11:15 AM  Invited

Lightweight Biological Composites: The Relationship between the Structure and Function of the Feather Vane and Inspired Designs: Tarah Sullivan1; Steven Herrera2; David Kisailus3; Vlad Lubarda4; Marc Meyers1; 1University of California, San Diego; 2University of California, Riverside

Session Chairs: Francois Barthelat, McGill University; Paul Allison, University of Alabama

8:30 AM  Keynote

Towards a Commercial Metallic Glass Technology: William Johnson1; Marios Demetriou2; 1California Institute of Technology

9:00 AM  Invited

A Research on Micro/Nano Imprinting of Metallic Glasses: Ke-Fu Yao1; Xue Liu1; Jia-Lun Gu1; 1Tsinghua University

9:25 AM  Invited

Using Femtosecond Pulsed Laser Irradiation to Magnetically Pattern the Surface of Non-Ferromagnetic Amorphous Steel: Maria D Barò1; H. Y. Zhang1; Y.P. Feng1; D. Nieto2; G.M. O’Connor2; E. García-Lecina3; C. McDaniel1; J. Díaz-Marcos2; M. T. Flores-Arias2; E. Pellicer3; J. Sort4; 1Universitat Autònoma de Barcelona; 2University of Santiago de Compostela; 3National University of Ireland; 4IK4-CIDETEC; 5Universitat de Barcelona

9:45 AM  Invited

Densification of a Cu-Zr-Al Metallic Glass Powder by Spark Plasma Sintering: Sandrine Cardinal1; Jean-Marc Pelletier1; Guillaume Bonnefont2; Jichao Qiao2; Guoqiang Xie3; 1INSA-Lyon; 2Northwestern Polytechnical University; 3Tohoku University

10:10 AM  Break

10:25 AM  Invited

Design and Implementation of BMG and BMG Composites in NASA Robotics Applications: Douglas Hofmann1; Scott Roberts1; 1NASA JPL/Caltech

10:45 AM  Invited

Synthesis of Nanoporous Structure by Dealloying of Al-based Amorphous Alloys: Kang Chul Kim1; Woo Chul Kim1; Kyung Ho Kong1; Chamil I Kim1; Won Tae Kim2; Do Hyung Kim1; 1Yonsei University; 2Cheongju University

11:05 AM  Invited

Synthesis of Bulk Amorphous Co-C Alloys: Hesham Elmkharram1; A. Aning2; 1Virginia Tech

11:25 AM  Invited

Temperature-dependent Average Nearest-Neighbor Distance in Metallic Melts: Jianzhong Jiang1; X.D. Wang1; Q. Yu1; Q.P. Cao1; D.X. Zhang1; 1Zhejiang University

Session Chairs: William Johnson, Caltech; Peter Liaw, The University of Tennessee
Bulk Processing of Nanostructured Powders and Nanopowders by Consolidation — Session I
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
Program Organizers: Deliang Zhang, Shanghai Jiao Tong University; Bowen Li, Michigan Technological University; Stephen Mashi, Michigan Technological University

Monday AM Room: 210
February 15, 2016 Location: Music City Center

Session Chairs: Deliang Zhang, Shanghai Jiao Tong University; Katsuyoshi Kondoh, Osaka University

8:30 AM Introductory Comments
8:35 AM Keynote
Nano-duplex Alloys: a Family of Stable Nanocrystalline Materials Amenable to Rapid Sintering: Christopher Schuh; MIT

9:15 AM Invited
Bulk Processing of Nanostructured Powders for Functional Materials with Hierarchical Structure Inspired by Natural Species: Di Zhang; Wang Zhang; Jiajun Gu; Shenmin Zhu; Huilan Su; Qinglei Liu; Shanghai Jiao Tong University

9:45 AM Invited
Fracturing Mechanism of Carbon Nanotubes Reinforced Aluminum Matrix Composites: Katsuyoshi Kondoh; Biao Chen; Lei Jia; Junko Imai; Hiashi Imai; Tohoku University

10:15 AM Break
10:35 AM Invited
The Key Issues in Fabrication of Ultrafine Structured Metallic Materials and Metal Matrix Nanocomposites by Thermomechanical Consolidation of Nanostructured Powders: Deliang Zhang; Dengshan Zhou; Jiamiao Liang; Xun Yao; Yifeng Zheng; Shanghai Jiao Tong University

11:05 AM Invited
Modified Strain Rate Regime in Consolidated Ultrafine Copper Powders with Silver Micro-alloying: Yannick Champion; Julie Bourgon; Xavier Sauvage; CNRS

11:35 AM Invited
Microstructures and Mechanical Properties of Ultrafine Grained Al-7Si-0.3Mg Alloy Produced by Thermomechanical Consolidation of a Milled Powder: Jiamiao Liang; C. Kong; Md Zakaria Quadir; Yifeng Zheng; X. Yao; Paul Munroe; Deliang Zhang; Shanghai Jiao Tong University; University of New South Wales

11:55 AM Invited
Spark Plasma Sintering of Nanostructured AA5083 Powder with Varying Cryomilling Duration: Frank Kellogg; Benjamin Boesl; Clara Hofmeister; Anit Giri; Yongho Sohn; Kyu Cho; Brandon Mewilliams; Bowhead Science and Technology; Florida International University; University of Central Florida; TKC Global; US Army Research Laboratory

CFD Modeling and Simulation in Materials Processing — Iron And Steelmaking (Tundish, Casting, Converter, Blast Furnace)
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Laurendu Nastac, The University of Alabama; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, University of Illinois at Urbana-Champaign; Miaooyong Zhu, Northeastern University; Andreas Ludwig, Montanuniversitaet Leoben, Dep. Metallurgy; Adrian Sabau, Oak Ridge National Laboratory; Kouis Pericleous, University of Greenwich; Hervé Combeau, Université de Lorraine Nancy

Monday AM Room: 207D
February 15, 2016 Location: Music City Center

Session Chair: Lifeng Zhang, Beijing University of Science and Technology

8:30 AM Invited
On the Importance of Modeling 3D Shrinkage Cavities for the Prediction of Macrosegregation in Steel Ingot: Andreas Ludwig; Menghuai Wu; Abdellah Kharicha; University of Leoben, Dep. Metallurgy

8:55 AM
Computational Fluid Dynamic Simulations of a Laboratory Flash Reactor Relevant to a Novel Flash Ironmaking Process: Yousef Mohassab; Deqiu Fan; Hong Yong Sohn; University of Utah; University of Utah

9:15 AM
Fluid Flow and Inclusion Motion in A Five-strand Continuous Casting Tundish: Abulikemu Yasen; Dongteng Pan; Lifeng Zhang; University of Science and Technology Beijing

9:35 AM
Liquid Steel Flow and Interactions with Nonmetallic Phases in the Continuous Casting Tundish Using CFD & Physical Modeling: Christopher Eastman; Peter Glaws; Dongbu Cao; TimkenSteel Corporation

9:55 AM Break
10:15 AM
Simulation of Heat Transfer in Slab Continuous Casting Mold and New Formation Mechanism of Shell Hot Spots: Zhao-zen Cai; Miao-yong Zhu; Northeastern University

10:35 AM
Computational Investigation of Splashing Behaviors in Steelmaking Converter: Quang Li; Mingming Li; Zongshu Zou; Northeastern University

10:55 AM
Simulation of Air Entrainment in High Pressure Die Casting Applications: Juergen Jakumeit; Julian Gänz; Herfried Behnken; Access e.V.; CD-adapco

11:15 AM
Numerical Simulation of the Multiphase Flow in the Single-Tundish System: Shupei Liu; Bo Wang; Zhihlang Yang; Shuai Feng; Kongfang Feng; Jinyin Xie; Jieyu Zhang; Shanghai University

11:35 AM
CFD Analysis of Blast Furnace Operating Condition Impacts on Operational Efficiency: Tyamo Okosun; Armin Silaen; Guangwu Tang; Bin Wu; Chen Zhou; Purdue University Calumet

11:55 AM
Numerical and Experimental Investigation of Vertical Twin Roll Strip Casting Process: Yuvraj Patil; Sudipto Ghosh; Ajayakumar Shukla; Indian Institute of Technology
Characterization of Minerals, Metals, and Materials — Method Development
Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Jian Li, CanmetMATERIALS; Donato Firmao, Politecnico di Torino - DISAT; Mingming Zhang, ArcelorMittal Global R&D; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Chenguang Bai, Chongqing University

Monday AM
February 15, 2016
Location: Music City Center
Room: 103A

Session Chairs: Andrew Brown, UNSW Australia; Carl Cady, Los Alamos National Laboratory

8:30 AM
Effect of Poisson’s Ratio on Stress/Strain Concentration at Circular Holes in Elastic Plates Subjected to Biaxial Loading: Three Dimensional Finite Element Analysis: Amr Abd Elfattah1; Hossam El-Din Sallam2; Jazan University

8:50 AM
On the Use of Higher Order Moment Invariants in the Classification of Microstructural Shapes: Ryan Harrison1; Marc De Graef1; Carnegie Mellon University

9:10 AM
The Spacing Transform: Application and Validation: William Monroe1; Charles Monroe1; Robin Foley2; UAB

9:30 AM
DigiM Porosimetry: A Web Based Image to Simulation Portal for Material Characterization: Shawn Zhang1; Cheney Zhang2; DigiM Solution LLC; McCall Middle School

9:50 AM
Measuring Fracture Toughness Using Digital Image Correlation: Carl Cady1; Cheng Liu1; Manuel Lovato1; Los Alamos National Laboratory

10:10 AM Break

10:25 AM
Nondestructive Materials Characterization in 3D by Laboratory Diffraction Contrast Tomography: Christian Holzner1; Arno Merkle1; Leah Lavery2; Erik Lauridsen3; Peter Reschig2; Michael Feser1; Carl Zeiss X-ray Microscopy, Inc.; Xnovo Technology ApS

10:45 AM
Speckle Measurements in Deformation Experiments and Dilatometry: Alexander Makitska1; Linseis

11:05 AM
A Unified Dictionary Approach for the Indexing of Electron Diffraction Modalities: Saransh Singh1; Marc De Graef1; Carnegie Mellon University

11:25 AM
Facile Measurements of Single-crystal Elastic Constant Tensor Properties from Polycrystalline Samples: Xinpeng Du1; Ji-Cheng Zhao1; Ohio State University

11:45 AM
Methodology for Determining Spall Damage Mode Preference in Shocked FCC Polycrystalline Metals from 3-D X-Ray Tomography: Andrew Brown1; Quan Pham1; Pedro Peralta; Brian Patterson2; Juan P. Escobedo-Diaz; Sheng-Nian Luo; Darcie Dennis-Koller; Ellen Cerreta1; Darrin Byler1; Aaron Koskelo1; Xianghui Xiao1; UNSW Australia; Arizona State University; Los Alamos National Laboratory; The Peac Institute of Multiscale Sciences; Argonne National Laboratory
Computational Materials Engineering for Nuclear Reactor Applications — Understanding Nuclear Fuel Behavior
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Danny Perez, Los Alamos National Laboratory; Dallas Trinkle, University of Illinois, Urbana-Champaign; Maryam Ghazisaeidi, Ohio State University; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Monday AM  Room: 101D  Location: Music City Center
Session Chair: To Be Announced

8:30 AM Invited
Development of the NEAMS Fuels Product Line: Steven Hayes 1; 1Idaho National Laboratory

9:10 AM
Computational Materials Engineering for Reactor Applications Using the Open-Source MOOSE Framework: Michael Tonks 2; Daniel Schwen 2; 1Pennsylvania State University; 1Idaho National Laboratory

9:30 AM
Cluster Dynamics Modeling of Extended Defects in Irradiated UO2 with Off-stoichiometry Considerations: Sarah Khalil 1; Todd Allen 1; Anter El-Azab 2; 1UW - Madison; 1Idaho National Lab; 1Purdue University

9:50 AM Break

10:10 AM
3D Phase Field Simulation of Grain Growth in Porous UO2: Karim Ahmed 1; Yongfeng Zhang 2; Todd Allen 1; Michael Tonks 1; Anter El-Azab 2; 1Idaho National Laboratory; 1Purdue University

10:30 AM Invited
Multi-scale Simulation of Fission Gas Diffusion in UO2 Nuclear Fuel: David Andersson 1; 1Los Alamos National Laboratory

11:10 AM
Thermodynamic Modeling of Complex Oxide Phases in U-M-O Systems where M = Ce, Nd, Pr, La, Y, Gd, and Th: Jacob McMurray 1; Dongwon Shin 1; Stewart Voit 1; Robbie Brese 1; Ben Stone 1; Suengmin Lee 1; Theodore Besmann 1; 1Oak Ridge National Laboratory; 1Los Alamos National Laboratory; 1Pacific Northwest National Laboratory; 1University of South Carolina

11:30 AM
One Dimensional Migration and Gas Bubble Superlattice Formation in UMO Metal Fuels—a Phase-field Model: Shenyang Hu 1; Douglas Burkes 1; Curt Lavender 1; David Senor 1; Zhijie Xu 1; 1Pacific Northwest National Laboratory

11:50 AM
PCI Analysis of a Commercial PWR using Bison-CASL Fuel Performance Code: Nathan Capps 1; Wenfeng Lui 1; Joe Rashid 1; Brian Wirth 1; 1University of Tennessee; 1Anatech

Computational Methods for Spatio-temporal Scale-bridging: from Atomistics to Mesoscale — Bridging Timescales
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Danny Perez, Los Alamos National Laboratory; Dallas Trinkle, University of Illinois, Urbana-Champaign; Maryam Ghazisaeidi, Ohio State University; Srujan Rokkam, Advanced Cooling Technologies, Inc.

Monday AM  Room: 209A  Location: Music City Center
Session Chairs: Normand Mousseau, Université de Montréal; Danny Perez, Los Alamos National Laboratory

8:30 AM
Characterization and Quantification of Crack Tip Plasticity in Crystalline Materials at Experimentally Achievable Strain Rate: Subhendu Chakraborty 1; Jiaxi Zhang 1; Somanth Ghosh 1; 1Johns Hopkins University

8:50 AM
Accelerating Ring-Polymer Molecular Dynamics Simulation: A Parallel-Replica Dynamics Approach: Chuan-Yuang Lu 1; Danny Perez 1; Arthur Voter 1; 1Stanford University; 1Los Alamos National Laboratory

9:10 AM
Development of Accelerated Reactive Molecular Dynamics Framework for Chemically Reactive Systems: Srujan Rokkam 1; Tapan Desai 1; John Lawson 1; Peter Cross 1; Richard Burns 1; 1Advanced Cooling Technologies, Inc.; 1NASA Ames Research Center; 1Naval Air Warfare Center; 1Naval Air Warfare Center

9:30 AM Invited
From Nanosecond to Second: Following Long-time Off-lattice Atomistic Dynamics with the Kinetic Activation-relaxation Technique: Normand Mousseau 1; 1Université de Montréal

10:30 AM Break

10:20 AM
Further Development of the Local Hyperdynamics Method for Accelerated Molecular Dynamics: Dipanjan Ray 1; Danny Perez 1; Arthur Voter 1; 1Los Alamos National Laboratory

10:40 AM Invited
Increasing the Power of Accelerated Molecular Dynamics Methods: Arthur Voter 1; 1Los Alamos National Laboratory

11:10 AM
Atomistic Modeling of Radiation Damage over Long Timescales: Laurent K Beland 1; Yuri N Osetsky 1; German D. Samolyuk 1; Roger E Stoller 1; 1Oak Ridge National Laboratory

11:30 AM
Using Speculative Parallelization to Enhance Temperature Accelerated Dynamics Simulations: Richard Zamora 1; Danny Perez 1; Arthur Voter 1; 1Los Alamos National Laboratory

11:50 AM
Multiscale Diffusion Method for Simulations of Long-Time Defect Evolution with Application to Dislocation Climb: Kristopher Baker 1; William Curtin 1; 1EPFL

12:10 PM
Sublattice Parallel Replica Dynamics: Enrique Martinez Saez 1; Blas Uberuaga 1; Arthur Voter 1; 1LANL
Computational Thermodynamics and Kinetics — Defect Thermodynamics and Diffusion I
Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Charudatta Phatak, Argonne National Laboratory; Doga Gursoy, Argonne National Laboratory; Emin Gulsoy, Northwestern University; Yang Jiao, Arizona State University; Gulsoy, Northwestern University; Yang Jiao, Arizona State University; Doga Gursoy, Argonne National Laboratory; Emine Gulsoy, Northwestern University; Yang Jiao, Arizona State University
Monday AM  Room: 102A
February 15, 2016  Location: Music City Center
Session Chair: Emin Gulsoy, Northwestern University

8:30 AM Invited
Integrated Imaging: The Sum is Greater than the Parts: Amanda Petford-Long; 1Argonne National Laboratory

9:00 AM
Digital Representation of Materials Grain Structure from Four-Dimensional X-ray Microtomography Data: Ashvin Shahani; 1; Xianghui Xiao; 1; Peter Voorhees1; 1Northwestern University; 1Argonne National Laboratory

9:20 AM
In Situ Synchrotron Quantification of Evolving Solidification Microstructures in Ni and Co Based Alloys: Mohammed Azeem1; Peter Lee1; Peter Rockett2; Loic Courtois2; Shyamprasad Karagadde2; Fenglin Yi2; Rahman Khandaker1; David Dye1; Robert Atwood1; 1Manchester University; 2Oxford University; 2IT Bombay; 1Imperial College, London; 1Diamond Light Source

9:40 AM
Three-Dimensional Characterization of Failure Mechanisms in Commercial Li-Ion Batteries: Jeff Gelb1; Paul Shearing2; Donal Finnegan2; Dan Brett1; 1San Jose State University; 2University College London

8:30 AM Invited
Effect of K-point Convergence on Derived Properties for Pure Crystals: Thomas Allison1; 1NIST

9:10 AM
Searching Transition States under Model-Form Uncertainty in Density Functional Theory Simulation: Lijuan He1; Yan Wang2; 1Georgia Institute of Technology

9:30 AM Invited
Assessing the Accuracy of DFT Formation Energies: Chris Wolverton1; 1Northwestern University

10:10 AM Break

10:30 AM Invited
Quality Control: Has Your DFT Code Been A-approved?: Kurt Lejaeghere1; Veronique Van Speybroeck2; Ward Poelmans3; Stefaan Cottenier1; 1Ghent University

11:10 AM
Density-Functional Theory Energy Density Method: Extracting Information and Identifying Finite-size Errors: Bora Lee1; Min Yu2; Dallas Trinkle1; 1University of Illinois, Urbana-Champaign; 1University of Wisconsin

Computational Methods for Uncertainty Quantification, Model Validation, and Stochastic Predictions — Uncertainty Quantification and Accuracy of DFT Calculations
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; Richard Hennig, University of Florida; Mark Tschopp, Army Research Laboratory; Li Ma, NIST
Monday AM  Room: 207C
February 15, 2016  Location: Music City Center
Session Chair: Thomas Allison, NIST

8:30 AM Invited
Impact of Varying Oxygen Stoichiometry on Electrochromic Behavior in WO3: Wennie Wang1; Anderson Janotti1; Chris Van de Walle1; 1University of California, Santa Barbara

10:00 AM Break

10:20 AM Invited
First Principles Calculations of Lattice Parameters and Elastic Constants of Fe Phases Containing Solute: Michael Fellinger1; Louis Hector Jr2; Dallas Trinkle1; 1University of Illinois at Urbana-Champaign; 2General Motors R&D Center

10:50 AM
Exploration into the Kinetics of Ultra-light Magnesium Alloys: Philipp Alimeninov1; Ian Parker2; Michele Manuel1; 1University of Florida

11:30 AM
Develop a Diffusivity Database for Mg Alloys Using Diffusion Multiples and Liquid-Solid Diffusion Couples: Wei Zhong1; Wei-Hua Sun1; Alan A Luo1; Ji-Cheng Zhao1; 1The Ohio State University

11:50 AM
Light Element Diffusion in Mg Using First Principles Calculations: Anisotropy and Elastodiffusion: Ravi Agarwal1; Dallas Trinkle1; 1University of Illinois, Urbana-Champaign

Driving Discovery: Integration of Multi-Modal Imaging and Data Analysis — Session I
Sponsored by: TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee
Program Organizers: Charudatta Phatak, Argonne National Laboratory; Doga Gursoy, Argonne National Laboratory; Emin Gulsoy, Northwestern University; Yang Jiao, Arizona State University
Monday AM  Room: 102A
February 15, 2016  Location: Music City Center
Session Chair: Emin Gulsoy, Northwestern University

8:30 AM Keynote
Integrated Imaging: The Sum is Greater than the Parts: Amanda Petford-Long; 1Argonne National Laboratory

9:00 AM
Digital Representation of Materials Grain Structure from Four-Dimensional X-ray Microtomography Data: Ashvin Shahani; 1; Xianghui Xiao; 1; Peter Voorhees1; 1Northwestern University; 1Argonne National Laboratory

9:20 AM
In Situ Synchrotron Quantification of Evolving Solidification Microstructures in Ni and Co Based Alloys: Mohammed Azeem1; Peter Lee1; Peter Rockett2; Loic Courtois2; Shyamprasad Karagadde2; Fenglin Yi2; Rahman Khandaker1; David Dye1; Robert Atwood1; 1Manchester University; 2Oxford University; 2IT Bombay; 1Imperial College, London; 1Diamond Light Source

9:40 AM
3D and 4D Characterization of Failure Mechanisms in Commercial Li-Ion Batteries: Jeff Gelb1; Paul Shearing2; Donal Finnegan2; Dan Brett1; 1San Jose State University; 2University College London

8:30 AM Invited
Doping on the Valley of Hydrogen Solubility: A Route to Design Hydrogen Resistant Zirconium Alloys: Mostafa Youssef1; Ming Yang1; Bilge Yildiz1; 1Massachusetts Institute of Technology

9:00 AM
Investigation of the Ionic Conductivity of e-ZrO2 by Applying the CALPHAD Approach: Mohammad Asadi-Kiyavash1; Yu Zhong1; 1MME Department of Florida International University

9:20 AM
Identification of Bulk Oxide Defects in an Electrochemical Environment: Defect Stability Phase Diagrams: Mira Todorovi1; Joerg Neugebauer1; 1Max-Planck-Institut fuer Eisenforschung GmbH
Emerging Interconnect and Pb-free materials for Advanced Packaging Technology — Tin Whisker; Intermetallic Compound I

Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Albert T. Wu, National Central University; Yan Li, Intel; Kazuhiro Nogita, The University of Queensland; Christopher Gourlay, Imperial College London

Monday AM | Room: 201A
February 15, 2016 | Location: Music City Center

Session Chairs: Christopher Gourlay, Imperial College London; Babak Arfaei, Binghamton University

8:30 AM | Invited
Modeling the Growth of Whiskers under Thermally-induced Strain: Eric Chason1; Fei Pe1; 1Brown University

8:55 AM | Invited
Mitigation of Sn Whisker Growth by Dopant Addition: Indranath Dutta1; Babak Talebanpour1; Sherin Bhassysavantha1; Lutz Meinshausen1; Soumik Banerjee2; Bhaskar Majumdar2; Washington State University; 2National Institute of Standards and Technology

9:15 AM | Invited
Synchrotron Radiation X-ray Measurement on Residual Stress in Sn Films and Kinetic Analysis of Sn Whiskers Growth: Hau Chen1; Hsin Yi Lee1; Ching Shun Ku2; Albert T. Wu1; 1National Central University; 2National Synchrotron Radiation Research Center

9:35 AM | Invited
In Situ FIB/SEM Tensile Testing of Tin (Sn) Whiskers: Renuka Vallabhaneni1; Ehsan Izadi1; Carl Mayer1; Sudhanshu Singh1; C. Shashank Kaira2; Jagannathan Rajagopalan2; Nikhil Chawla2; 1Arizona State University

10:00 AM | Break

10:20 AM | Invited
Multi-scale, Multi-Model Analysis of Deformation Behavior in Metallic Materials by X-ray Microtomography, FIB, and EBSD: James Mertens1; Antony Kirubanandham1; Sudhanshu Singh1; Arno Merkle2; Xianghui Xiao2; Yang Jiao1; Nikhil Shew Chawla1; 1Arizona State University; 2Carl Zeiss; 3Advanced Photon Source, Argonne National Laboratory

10:50 AM | Invited
Integrated Multimodal Imaging of Cathodes for Lithium-Ion Batteries: Chauadatta Phatak1; Doga Gursoy1; Emine Gulsoy1; Lynn Trahey1; Vincent De Andrade1; 1Argonne National Laboratory

11:10 AM | Invited
Correlation of Multi-modal Chemical Imaging with Computational Simulations for Energy Materials: Arun Devraj1; Robert Colby1; Craig Szymanski1; Jie Bao1; Zhijie Xu1; Vijay Murugesan1; Tolek Tyliszczak1; Sumithramipillai Thevuthasan1; Pacific Northwest National Lab; Lawrence Berkeley National Laboratory; Qatar Environment and Energy Research Institute; John Gourlay, Imperial College London; Christopher Gourlay, Imperial College London; Babak Arfaei, Binghamton University; Fei Pei1; 1Brown University

11:40 AM | Invited
Mitigation of Sn Whisker Growth by Dopant Addition: Indranath Dutta1; C. M. Gourlay2; H. Yasuda3; A. Sugiyama4; T. Nagira1; S. D. McDonald1; K. Nogita1; School of Mechanical and Mining Engineering, University of Queensland; Imperial College; Kyoto University; Osaka Sangyo University; Osaka University

11:50 AM | Invited
Study on Molten Salt CO2 Capture and Electrochemical Transformation: Dihua Wang1; 1Boise State University; 2National Institute of Standards and Technology

8:30 AM | Invited
CO2 Reduction in Metallurgical and Gasification Industries Using Slag Byproduct: Jinichiro Nakano1; James Bennett1; Anna Nakano2; 1US Department of Energy National Energy Technology Laboratory

8:50 AM | Invited
CO2 Reduction in the Cement Industry by Chemical Synthesis Processes: Juan Restrepo1; Oscar Restrepo1; Jorge Tobon1; 1Universidad Nacional de Colombia

9:10 AM | Invited
Effect of Surface Finish on the Formation of Intermetallic Compounds during Rework Soldering: In-situ Real-time Observations: M. A. A. Mof Faisal1; C. M. Gourlay2; H. Yasuda3; A. Sugiyama4; T. Nagira1; S. D. McDonald1; K. Nogita1; School of Mechanical and Mining Engineering, University of Queensland; Imperial College; Kyoto University; Osaka Sangyo University; Osaka University

9:50 AM | Invited
Study on Molten Salt CO2 Capture and Electrochemical Transformation (MSSC-ET): Dihua Wang1; 1Wuhan University

9:50 AM | Invited
Research on Greenhouse Gas Emission of Solid Dust Recovery Using Rotary Hearth Furnace Process in China: Hong-Qiang Liu1; Jian-Xun Fu1; Si-Yu Liu1; State Key Laboratory of Advanced Special Steels, Shanghai University

10:10 AM | Break

10:30 AM | Invited
Effect of Cations on Carbon Dioxide Sorption in Manganese Dioxide Octahedral Molecular Sieves: Izaak Williamson1; Winnie Wong-Ng2; Lan Li1; Boise State University; National Institute of Standards and Technology
8:10 AM
Thermodynamic Analysis of Hydrogen Production from Cog-Steam Reforming Process Using Blast Furnace Slag as Heat Carrier: Wenjun Duan1; Qingbo Yu1; Junxiang Liu1; Qin Qin1; 1Northeastern University

8:30 AM Keynote
Advances in Modeling of Fatigue Thresholds: Huseyin Sehitoglu1; Piyas Chowdhury2; Sertan Alkan3; 1University of Illinois

9:10 AM Invited
Quantifying Dislocation Microstructure and Point Defect Evolutions during Cyclic Loading: Ahmed Hussein1; Jaafar El-Awady1; 1Johns Hopkins University

9:50 AM Statistical Analysis of Elastic Stress Field at Surface of Ti6Al4V Polycrystals Predicted by Finite Elements Simulations: Loic Signor1; Van Truong Dang1; Patrick Villeda1; Samuel Hemeny1; 1Pprime Institute (CNRS - ISAE/ENSMA - Poitiers University)

11:10 AM
Microstructure-Sensitive Investigation of Aluminum 2024 Fatigue Precursors using Acoustic Emission (Note: This presentation will also appear in the poster session.): Brian Wisner1; Antonios Kontsos1; 1Drexel University

11:30 AM
Investigation of Nonmetallic Inclusion-driven Failures: Diwakar Naragani1; Michael Sangid1; Paul Shade1; Jay Schuren1; Hemant Sharma1; Jun-Sang Park1; Peter Kenesei1; Joel Bernier1; Todd Turner1; 1Purdue University; 2Air Force Research Laboratory; 3Argonne National Laboratory; 4Lawrence Livermore National Laboratory

Frontiers in Solidification: An MPMD Symposium in Honor of Michel Rappaz — Keynote/Nucleation
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Wilfried Kurz, EPFL; Jon Dantzig, EPFL and University of Illinois; Alain Karma, Northeastern University; Jeffrey Hoyt, McMaster University

Monday AM Room: 105A February 15, 2016 Location: Music City Center
Session Chairs: Wilfried Kurz, EPFL; Alain Karma, Northeastern University

8:30 AM Introductory Comments -- Wilfried Kurz; EPFL

8:45 AM Keynote
Nonequilibrium Physics in Materials Research: James Langer1; 1University of California, Santa Barbara

9:20 AM Keynote
Bridging Multiple Length Scales in Solidification Modeling: What Can We Do, and What’s Worth Doing?: Robert Sekerka1; 1Carnegie Mellon University

9:55 AM Break

10:15 AM Invited
A Criterion for Wavelength Selection in Pattern Forming Systems: Jeffrey Hoyt1; Ken Elder2; 1McMaster University; 2Oakland University

10:40 AM Invited
Influence of Icosahedral Ordering in the Liquid on Nucleation of a Solid: Atomistic Simulation Investigations: Jun Ding1; Mark Asta2; Jeffrey Hoyt1; 1Lawrence Berkeley National Laboratory; 2University of California, Berkeley; 3McMaster University

11:05 AM Invited
Solid Precipitate Nucleation: Advances in Theory and Simulation Methods: Baron Peters1; 1University of California, Santa Barbara

11:30 AM Invited
Structural and Compositional Templating for Heterogeneous Nucleation: Zhongyuan Fan1; 1Brunel University

Session Chair: Antonios Kontsos, Drexel University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Identification of Fatigue Precursors and Their Effect on Local/Global Plasticity and Fracture
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky; Ashley Spear, University of Utah

Monday AM Room: 213 February 15, 2016 Location: Music City Center

8:30 AM Keynote
Solute Precipitate Nucleation: Advances in Theory and Simulation: Jun Ding1; Mark Asta2; Jeffrey Hoyt1; 1Lawrence Berkeley National Laboratory; 2University of California, Berkeley; 3McMaster University

9:10 AM Invited
Effects in Metallic Structures under Dynamic Loading: Mehdi Nehrabadi1; Daniel Cole1; Brian Wisner1; Antonios Kontsos1; 1Army Research Laboratory; 2Drexel University

9:50 AM Statistical Analysis of Elastic Stress Field at Surface of Ti6Al4V Polycrystals Predicted by Finite Elements Simulations: Loic Signor1; Van Truong Dang1; Patrick Villeda1; Samuel Hemeny1; 1Pprime Institute (CNRS - ISAE/ENSMA - Poitiers University)

10:10 AM Invited
Multidisciplinary Approach for Capturing Fatigue Damage Precursor Effects in Metallic Structures under Dynamic Loading: Ed Habtour1; Daniel Cole1; Brian Wisner1; Antonios Kontsos1; 1Army Research Laboratory; 2Drexel University

10:50 AM Invited
Detecting the Precursor to Fatigue Crack Initiation in Nanocrystalline Ni-Fe Using Synchrotron Diffraction: Brad Boyce1; Timothy Furnish1; 1Sandia National Labs

11:30 AM
Investigation of Nonmetallic Inclusion-driven Failures: Diwakar Naragani1; Michael Sangid1; Paul Shade1; Jay Schuren1; Hemant Sharma1; Jun-Sang Park1; Peter Kenesei1; Joel Bernier1; Todd Turner1; 1Purdue University; 2Air Force Research Laboratory; 3Argonne National Laboratory; 4Lawrence Livermore National Laboratory

Session Chair: Antonios Kontsos, Drexel University
High-Temperature Systems for Energy Conversion and Storage — Ceramic Reliability I
Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Amit Shyam, Oak Ridge National Laboratory; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory
Monday AM  Room: 104E
February 15, 2016  Location: Music City Center
Session Chairs: Amit Pandey, RRLGFCS; Amit Shyam, ORNL

8:30 AM Introductory Comments
8:35 AM Keynote
Thermal Spray as an Additive and Layered Manufacturing Technology for Applications in Energy Systems: Sanjay Sampath; Stony Brook University
9:10 AM
Composition and Temperature Dependence of Fracture Behavior of Diffusion Aluminide Bond Coats: Nagamani Jaya Balila; Md Zafir Alam; Sanjib Bhowmick; Dipak K Das; Samir Kamar; S. A. Syed Asif; Vikram Jayaram; MPIE GmbH; Johns Hopkins University; Hysitron Inc.; DMRL; IISc
9:30 AM Invited
Synchrotron-Based X-ray Imaging of Energy Conversion and Storage Materials: Wilson Chiu; University of Connecticut
9:55 AM Break
10:15 AM
Ultraviolet Digital Image Correlation (UV-DIC) for Measuring Full-Field Strains at Extreme Temperatures: Ryan Berke; Utah State University
10:35 AM Invited
Hidden Information in Standard Characterization of Ceramics: James Zimmermann; Corning
11:00 AM Break
11:00 AM Introductory Comments Michael E. Manley
8:40 AM Keynote
The Origin of Entropy in Materials: Brent Fultz; California Institute of Technology
9:20 AM Invited
Vibrational Entropy and Chemical Configurations: Experimental Quantification and Their Correlation: Matthew Lucas; California Institute of Technology, Oak Ridge National Laboratory, and Air Force Research Laboratory
9:50 AM
X-ray and Neutron Scattering Studies of Lattice Vibrations and Thermodynamic Phase Stability in Vanadium Dioxide: John Budai; Jiawang Hong; Olivier Delaire; Michael Manley; Chen Li; Jonathan Tischler; Ayman Said; Bogdan Leu; Douglas Abernathy; Eliot Specht; Lynn Boanter; Oak Ridge National Laboratory; Argonne National Laboratory
10:10 AM Break
10:30 AM Invited
Harnessing Materials Properties and Data for Accelerated Design: Kristin Persson; UC Berkeley
11:00 AM Invited
Thermodynamics and Thermal Transport Near Lattice Instabilities: Olivier Delaire; Oak Ridge National Laboratory
11:30 AM Invited
Electronic Transitions upon Compression: From Changes of the Fermi Surface Topology to Crossings of Core Levels: Igor Abrikosov; Marcus Ekhholm; Qingguo Feng; Leonid Pourokovski; Mikhail Katsnelson; John Wills; Alexey Tal; Natalia Dubrovinskaia; Leonid Dubrovinsky; Linköping University; Ecole Polytechnique; Radboud University; Los Alamos National Laboratory; NUST ‘MISIS’; University of Bayreuth
ICME Infrastructure Development for Accelerated Materials Design: Data Repositories, Informatics, and Computational Tools — Applications
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Dongwon Shin, Oak Ridge National Laboratory; Jiadong Gong, QuesTek Innovations; Shengyen Li, National Institute of Standards and Technology; Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory

Monday AM  Room: 207B
February 15, 2016  Location: Music City Center
Session Chairs: Jiadong Gong, QuesTek Innovations; Dongwon Shin, Oak Ridge National Laboratory

8:30 AM Keynote
Genomic Data Infrastructure for Computational Materials Design: Greg Olson1; 1Northwestern University & QuesTek Innovations

9:10 AM
An ICME Approach to the Investigation of the Relationship between Processing Parameters and Microstructure Development in an Extruded ZE20 Magnesium Alloy: Joy Forsmark1; Mei Li1; Raj Mishra2; Plumeri John3; Richard Michie3; Ahmad Chamanfar4; Wojciech Misiolek5; Zachary McClelland6; Andrew Oppedal6; Mark Horstemeyer7; Stephen Horstemeyer7; Xianfeng Ma8; John Allison9; Scott Sutton9; Alan Luo9; Eric Nyberg9; Nes Abdulrahman10; Ford Motor Company; 2General Motors; 3Lehigh University; 4University of Michigan; 5Pacific Northwest National Labs; 6Mississippi State University; 7Pacific State University; 8Ohio State University; 9Pacific Northwest National Labs; 10Mag Specialties Inc

9:40 AM Keynote
An ICME Approach to Generation Three Advanced High Strength Steel Development: Louis Hector Jr1; 1General Motors

10:20 AM Break

10:40 AM
An Integrated Model for Prediction of Yield Stress in Al-7Si-Mg Cast Alloys: Chen Rui1; Xu Qingyan1; Liu Baicheng1; 1Tsinghua University

11:00 AM
Web Based Nano-materials Design Platform for Li Ion Battery: Min-Ho Lee1; Sang-Soo Han1; Kwang-Ryeol Lee1; 1KIST

11:20 AM
3D Digital Representations of Knitted Textile Architectures: Daniel Criste1; Dani Liu2; Krzysztof Mazur2; Shane Esola3; Genevieve Dion3; David Breen3; Antonios Kontos3; 1Department of Mechanical Engineering & Mechanics, Drexel University; 2Westphal College of Media Arts & Design, Drexel University; 3College of Computing and Informatics, Drexel University

Light Metals Keynote — Pushing Boundaries -- Innovative Thinking in Light Metals Production
Program Organizer: TMS2016 Administration

Monday AM  Room: 202A
February 15, 2016  Location: Music City Center
Session Chair: Margaret Hyland, University of Auckland

8:30 AM Introductory Comments

8:40 AM Keynote
Aluminum: Modern, Innovative, Attractive: Martin Iffert1; 1Trimet Aluminium

9:20 AM Keynote
Lightweighting: What is the Future for the Automotive Industry?: Stephane Delalande1; 1PSA Peugeot Citroen

10:00 AM Concluding Comments

Magnesium Technology 2016 — Keynote Session
Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Alok Singh, National Institute for Materials Science; Kiran Solanki, Arizona State University; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Monday AM  Room: 204
February 15, 2016  Location: Music City Center
Session Chairs: Alok Singh, National Institute for Materials Science; Kiran Solanki, Arizona State University

8:30 AM Introductory Comments

8:40 AM Keynote
Challenges for Implementation of Magnesium into More Applications: Karl Kainer1; 1Helmholtz-Zentrum Geesthacht

9:20 AM Keynote
Development of Magnesium Alloys for High Speed Trains in China: Eric Nyberg1; Jian Peng2; Neale Neelameggham3; 1Pacific Northwest National Laboratory; 2Chongqing University; 3Ind LLC

9:55 AM Break

10:15 AM Keynote
Korea’s R&D Activities Towards the Application of Wrought Mg Alloys: Nack J. Kim1; 1POSTECH

10:50 AM Keynote
Mg Alloys Strengthened by Complex Phases: Eiji Abe1; Alok Singh2; 1University of Tokyo; 2National Institute for Materials Science

11:25 AM Keynote
Developments in High Magnesium-content Bulk Metallic Glasses and Future Possibilities: Kevin Laws1; Karl Shamlaye2; Jörg Löffler3; Michael Ferry4; 1University of New South Wales; 2ETH Zurich
Material Design Approaches and Experiences IV — Material Design Tools and Models
Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee
Program Organizers: Akane Suzuki, GE Global Research; Ji-Cheng Zhao, The Ohio State University; Michael Fahrmann, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing
Monday AM  Room: 208A
February 15, 2016  Location: Music City Center
Session Chairs: Ji-Cheng Zhao, Ohio State University; Akane Suzuki, GE Global Research

8:30 AM Invited
A Quantitative Description of Hierarchical Microstructure for Materials Engineering Design: Dennis Dimiduk1; Sean Donegan1; Michael Groeber2; Adam Pilchak1; Shesh Srivatsa1; 1BlueQuartz Software, LLC; 2Air Force Research Laboratory; 3Srivatsa Consulting, LLC

9:00 AM Invited
Decision Support Strategies in Design of Hierarchical Alloy Systems: David McDowell1; 1Georgia Institute of Technology

9:30 AM
A Novel Computational Tool Linking Microstructure and Properties for Thermomechanical Processes: Pengyang Zhao1; Thaddeus Song En Low1; Yunzhi Wang1; Stephen Niezgoda1; 1The Ohio State University

9:50 AM Invited
High Temperature Statistical Mechanics to Enable Alloy Design: Antón Van der Ven1; John Thomas2; Brian Puchala2; Anirudh Raju Natarajan2; John Gorti3; 1University of California Santa Barbara; 2University of Michigan

10:10 AM Invited
Further Developments of CALPHAD Based Tools for Alloy Design: Paul Mauson1; Kaisheng Wu1; Chao Jiang1; Qing Chen1; Johan Bratberg2; Anders Engstrom3; 1Thermo-Calc Software Inc.; 2Thermo-Calc Software AB

11:10 AM Invited
Integrated Computational Materials Engineering for Precipitation Modeling of Multi-Component Alloys: Weisheng Cao1; Fan Zhang1; Shuanglin Chen1; Chuan Zhang1; Jun Zhu1; 1CompuTherm

Materials and Fuels for the Current and Advanced Nuclear Reactors V — Fuels I
Sponsored by: TMS Structural Materials Division, 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
Monday AM  Room: 101A
February 15, 2016  Location: Music City Center
Session Chair: Ramprashad Prabhakaran, Pacific Northwest National Laboratory

8:50 AM Characterization via Transmission Electron Microscopy of the Diffusional Interactions between U-10Mo and AA6061 Alloys at 600°C: Emmanuel Perez1; Dennis Keiser1; Yong-ho Sohn2; 1Idaho National Laboratory; 2University of Central Florida

9:10 AM
Chemical Dependence of the Amorphization Behavior of the UMoAl Interaction Layer in Dispersion Fuels: Laura Janison1; Bei Ye1; Sumit Bhattacharya2; Abdellatif Jacout1; 1Argonne National Laboratory; 2Northwestern University

9:30 AM The Effect of Grain Size on the Homogenization Kinetics and Eutectoid Decomposition in U-10 wt% Mo Alloys: Vineet Joshi1; Curt Lavander1; Zhijie Xu1; Dean Paxton1; Douglas Burkes1; 1Pacific Northwest National Laboratory

9:50 AM Swift Heavy Ion Irradiation Induced Interactions in the UMo/XAl Trilayer System: Hsin-Yin Chiang1; Winfried Petry2; S.-H. Park2; M. Mayer3; K. Schmid1; M. Belden1; U. Boesenberg4; R. Jungwirth5; G. Falkenberg6; Tobias Zweifel7; 1Technische Universität München / FRM II; 2Ludwig-Maximilians-Universität München; 3Max-Planck-Institut für Plasmaphysik; 4Deutsches Elektronen-Synchrotron

10:10 AM Break

10:30 AM Microstructure-based Finite Element Analysis of the Effect of Homogenization on the U-10Mo/Zr Interface: Ayoub Souliani1; Zhijie Xu1; Vineet Joshi1; Colleen McInnis1; Curt Lavander1; Doug Burkes1; 1Pacific Northwest National Laboratories

10:50 AM Miniature Bulge Test for Measuring HIPed Aluminum/Aluminum and Aluminum/Uranium Interfacial Fracture Toughness: Manuel Lovato1; Cheng Xiu1; Kester Clarke1; David Alexander1; Wiliam Blumenthal1; 1Los Alamos National Laboratory

11:10 AM Recrystallization and Texture Development in Rolled U-10 wt% Mo Alloys: Vineet Joshi1; Curt Lavander1; Ayoub Souliani1; David Field2; Doug Burkes1; 1Pacific Northwest National Laboratory; 2Washington State University

11:30 AM The Thermal Properties of Fresh and Spent U-Mo Fuels: An Overview: Winfried Petry1; Tanja Huber1; Harald Breitkreutz1; Christian Reiter1; Stefan Elgeti2; Douglas Burkes1; Amanda Casella1; Andrew Casella1; Frances Smith1; Daniel Wachs1; 1Technische Universität München / FRM II; 2Max-Plank-Institute for Plasmaphysics; 3Pacific Northwest National Laboratory; 4Idaho National Laboratory

11:50 AM Corrosion Studies on U-10Mo Fuel for Research Reactor Applications: Ramprashad Prabhakaran1; Levi Gardner1; Vineet Joshi1; Curt Lavander1; Douglas Burkes1; 1Pacific Northwest National Laboratory; 2Utah State University
Materials and Fuels for the Current and Advanced Nuclear Reactors V — Structural Materials I

Sponsored by: TMS Structural Materials Division, 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

Monday AM  Room: 101B
February 15, 2016  Location: Music City Center

Session Chair: Raul Rebak, GE Global Research

8:30 AM
Atomic-level Characterization of the Metal-oxide Interface of a Zircaloy–4 Cladding from Commercial LWR Irradiated Fuel: Philip Edmondson1; Chad Parial2; Tyler Gerczak1; Keith Leonard1; Arthur Motta1; Kurt Terrani1; 1Oak Ridge National Laboratory; 2Penn State University

8:50 AM
Synchrotron Characterization of Oxidation in Nuclear Claddings for LWR Applications: Simerjeet Gill1; Mohamed Elbakshwan1; Raul Rebak2; Lynne Ecker2; Brookhaven National Laboratory; 1GE Global Research, Schenectady

9:10 AM
Transitions in Creep Mechanisms of HANA 4 — Applications to Dimensional Change Predictions during Dry Storage: Boopathi Kombaiah1; Korkunda Linga Murty1; North Carolina State University

9:30 AM
Atom Probe Examinations of Zircaloy Irradiated at Nominally 358C: Brian Cockeram1; Phil Edmondson1; Keith Leonard2; Jim Hollenbeck1; 1Bechtel-Bettis; 2Oak Ridge National Laboratory

9:50 AM
AI-Ti-Cr Coating on Zr Alloys for Enhancing Accident Tolerance of Fuel Claddings: Jeong-Yong Park1; Il-Hyun Kim1; Hyun-Gil Kim1; Yang-Ii Jung1; Dong-Jun Park1; Jung-Won Park1; Yang-Hyun Koo1; Korea Atomic Energy Research Institute

10:10 AM Break

10:30 AM
Irradiation Memory Effects in Zirconium Alloy Corrosion: Jason Gruber1; Bechtel Marine Propulsion Corporation

10:50 AM
Synthesis and Characterization of Magnetron Sputtered Cr2AlC Coatings to Improve Oxidation Resistance of Zirconium Alloys: Maulik Patel1; Yueying Wu1; Devin Roberts1; Philip Rack1; Jonna Partezana1; Robert Comstock1; Kurt Sickafus1; University of Tennessee

11:10 AM
Comparison of Zirconium Oxidation Behavior under Oxygen-rich Gaseous and High Humidity Environments via In-situ TEM: Wayne Harlow1; Mitra Taheri1; Drexel University

11:30 AM
Study of Microstructural Evaluation and Thermal Creep Behavior of Heat-Treated Zr-Excel Pressure Tube Materials: Kazi Ahmed1; Levente Balogh1; Yasir Idrises1; David Kerr1; Mark Daymond1; Queens University

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Mechanical Behavior at the Nanoscale III — In-situ Characterization of Nanoscale Materials

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

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Daniel Gianola, University of California, Santa Barbara; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology; Harold Park, Boston University; Garrett Tucker, Drexel University; Jiangwei Wang, University of Pittsburgh

Monday AM  Room: 214
February 15, 2016  Location: Music City Center

Session Chair: Jonathan Zimmerman, Sandia National Laboratories

8:30 AM Invited
In Situ TEM Characterization on Deformation of FeCoNiMnCr High Entropy Alloy: Qian Hu1; Ziliao Zhang1; Jiangwei Wang2; Scott X. Mao3; Robert O. Ritchie4; 1University of Michigan, Ann Arbor; 2Zhejiang University; 3University of Pittsburgh; 4University of California, Berkeley

9:10 AM
Anisotropy in Nanolamellar Pearlitic Steels Investigated at the Micron Scale: Marlene Kapp1; Anton Hohenwarter2; Stefan Wurster2; Bo Yang3; Reinhard Pippart4; Erich Schmid Institute of Materials Science; 1Montanuniversitat Leoben

9:30 AM
In Situ Study of Oxygen’s Influence on Deformation Twinning in Alpha-Titanium: Rachel Traylor; Josh Kacher; Max Poschmann; Mark Asta; Daryl Chrzan; Andrew Minor; University of California Berkeley

9:50 AM
Growth and Stress-induced Transformation of Zinc Blende AlN Layers in Al-AlN-TiN Multilayers: Nan Li1; Satyesh Yadav1; Shuai Shao1; Jiansheng Wang1; Xiang-Yang Liu1; Amit Misra1; Los Alamos National Laboratory; 1University of Nebraska-Lincoln; 2University of Michigan

10:10 AM Break

10:30 AM
In Situ Nanomechanics: Ting Zhu1; Georgia Institute of Technology

10:50 AM
Correlating In and Ex Situ Nanomechanical Measurements: Douglas Stauffer1; Eric Hintzla1; William Gerberich1; S.A. Syed Asif1; Hysitron Inc.; Chemical Engineering & Materials Science, University of Minnesota

11:10 AM
Enhancing Ductility of Metal-Metal (BCC-HCP) and Metal-Ceramic Multilayered Nano-composites: Siddhartha Pathak1; William Mook2; Youxin Chen1; Nan Li1; Jon Baldwin1; Irene Beyerlein1; Nathan Mara1; Los Alamos National Laboratory; Sandia National Laboratory

11:30 AM
In Situ Atomic-scale Observation of Twinning Dominated Deformation in Nanoscale BCC Bi-crystals: Scott Mao1; Jiangwei Wang1; Zhi Zeng2; Christopher Weinberger2; Ze Zhang2; Ting Zhu1; University of Pittsburgh; 1Georgia Institute of Technology; 2Sandia National Laboratories; 3Zhejiang University
Metal and Polymer Matrix Composites II — Polymer Matrix Composites
Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizer: Nikhil Gupta, New York University

Monday AM  Room: 110A  Location: Music City Center

Session Chair: To Be Announced

8:30 AM Invited
Effect of Spatial Distribution of Borosilicate Particles in Polypropylene Matrix Composites Using X-Ray Microtomography: Somya Singh; James Mertens; C. Shashank Kaira; Heecho Li; Sudhanshu Singh; Yang Jiao; Nikhilsh Chawla; Arizona State University

8:50 AM Invited
Multifunctional Polymer Matrix Nanocomposites toward Microwave Absorption: Qiangliang He; Jiang Guo; Xingru Yan; Zhanhua Guo; University of Tennessee

9:10 AM Development of a Composite Material Filament for Lightweight 3D Printed Components: Steven Zeltmann; Nikhil Gupta; Mritunjay Doddamaneni; New York University; National Institute of Technology, Karnataka

9:30 AM Degradation Study of High Melt Strength Polypropylene/Clay Nanocomposites in Environmental and Accelerated Conditions: Luiz Komatsu; Washington Oliani; Ademar Lugao; Duclerc Parra; Vijaya Rangari; Nuclear and Energy Research Institute

9:50 AM The Role of Titania Surface on the Degradation Behavior of LLDPE Composites: Hamilton Viana; Patricia Poveda; Leonardo Silva; College of Engineering - University Center of Santo Andre; IPEN - University of Sao Paulo

10:10 AM Break

10:30 AM Invited
Polymer to Ceramic Transformation of Polysilazane Wrapped Nanotubes and their Applications in Energy-Based Devices: Gurpreet Singh; Kansas State University

10:50 AM Laser Pulse Heating of Carbon Nanotube Composites: Stephen Bartolucci; Michael Miller; Karen Supan; Jeffrey Warrender; ARDEC-Benet Laboratories; Norwich University

11:10 AM Nanotube Sheet - Graphite Hybrid Nanocomposite for Damage Detection: Jiukun Li; Sirish Namilae; ERAU

11:30 AM Progressive Damage and Failure Analysis of Composite Structures for Wind Turbine Blades and Airplane Fuselage Using Multiscale Synergistic Damage Mechanics Approach: Chandra Veer Singh; John Montesano; University of Toronto

8:30 AM Introductory Comments

8:35 AM Invited
An Overview of Some Major Recent Advances in Nanostructured Ferritic Alloys for Nuclear Energy Service: G. Robert Odette; University of California Santa Barbara

9:05 AM Invited
Point Defect-fluxes to Interfaces during Irradiation: Shen Dillon; Shimin Mao; University of Illinois at Urbana-Champaign

9:35 AM Microstructural Investigation of Radiation Effects in Nanoscale Stable Precipitation-Strengthened Steels: Clarissa Yablinsky; Osman Anderoglu; Semyon Vaynman; Yip-Wah Chung; Morris Fine; Kristin Tippey; John Speer; Kip Findley; Omer Dogan; Paul Jablonski; Stuart Maloy; Amy Clarke; Kester Clarke; Los Alamos National Laboratory; Northwestern University; Colorado School of Mines; National Energy Technology Laboratory

9:55 AM Determination of Kr-Ion Irradiation-damage Tolerance of Ultra-Fine Grain 316L SS Alloys Processed by Novel SPD Methods: Mauricio Cordillo; Jörg Wiezorek; University of Pittsburgh

10:15 AM Break

10:35 AM Invited
Radiation Stability of High Dose Irradiated Nanostructured Alloys and the Development of Novel Alloy Concepts: Peter Hosemann; Nathan Bailey; Manuel Abad; David Frazer; Rachel Connick; Joanna Szornel; Scott Parker; Daniel Kiener; Mychailo Toloczko; University of California Berkeley; Montana university; Pacific Northwest National Laboratory

11:05 AM Probing Nanoscale Damage Gradients in Irradiated Materials with Spherical Nanoinindentation: Nathan Mara; Siddhartha Pathak; Yongqiang Wang; Russ Doerner; Surya Kalidindi; Los Alamos National Laboratory; University of California, San Diego; Georgia Institute of Technology

11:25 AM On the Nano-Oxide Phase in MA957 and FCDR NFA-1: Yuan Wu; Stephan Kraemer; souptik Pal; George Odette; Nathan Bailey; Peter Hosemann; James Ciston; UCSC; UCB; LBL

11:45 AM First Principles Study on Helium Bubble Formation at the Y-Ti-N/C Enriched Nano-precipitates in 14YWT: Yingye Gan; David Hoelzer; Clemson University; Argonne National Laboratory; Oak Ridge National Laboratory

www.tms.org/TMS2016
Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials

XV — Electromigration & Electric Current Effects

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Shih-kang Lin, National Cheng Kung University; Jie-Ho Lee, Hongik University; Ikuo Ohnuma, National Institute for Materials Science (NIMS); Chih-Ming Chen, National Chung Hsing University; Yee-Wen Yen, National Taiwan Univ of Science & Tech; Shien Ping Feng, The University of Hong Kong; Clemens Schmutterer, Fraunhofer Institute

Monday AM  Room: 109
February 15, 2016  Location: Music City Center

Session Chairs: Ming-Tzer Lin, National Chung Hsing University; Ikuo Ohnuma, National Institute for Materials Science (NIMS)

8:30 AM Invited
Development of High Strength and High Electrical Conductivity of Cu-Ni-Al Alloys: Kiyohito Ishida1; Takashi Miyamoto1; Ikuo Ohnuma2; Toshihiro Omori3; Ryuouksue Kaunuma3; 1Tohoku University

9:00 AM Invited
Material Issues in Memristive Devices: Jianhua Yang1; 1University of Massachusetts, Amherst

9:30 AM
The Kinetic Analysis of Co-Sn Binary System: Chieh-Fu Chen1; Mu-Tao Chen1; Fan-Yi Ouyang1; 1National Tsing Hua University

9:50 AM Break

10:10 AM
Morphological Stability of Interfaces under Electromigration Condition: Insights from Phase-field Study: Arnab Mukherjee1; Kumar Ankit2; Britta Nestler2; 1Karlsruhe University of Applied Sciences; 2Karlsruhe Institute of Technology

10:30 AM
Stress and Currents Density Effects on Copper-Tin Intermetallic Compound Formation: Yue-Lin Lee1; Chou-Cheng Wu1; S.-F. Lin1; Ming-Tzer Lin1; 1National Chung Hsing University

10:50 AM
A New Insight on the Electromigration Effect: Strain-induced Atomic Migration under Current Stressing: Yu-chen Liu1; Yong-si Yu1; Shang-Jui Chiu1; Yen-Ting Liu1; Hsin-Yi Lee1; Shih-kang Lin1; 1National Cheng Kung University; 2National Synchrotron Radiation Research Center

11:10 AM
Effects of Electromigration on the p-Bi2Te3/Sn Interfacial Reactions: Chih Fan Lin1; Hsing-Ting Chan1; Yee-Wen Yen1; Chih-Ming Chen1; 1National Chung Hsing University; 2National Taiwan University of Science and Technology

11:30 AM
Failure Mechanism of Cu6Sn5 Microbumps under Current Stressing: Yi Cheng Chu1; Chih Chen1; Chau-Jie Zhan1; Yu-wei Huang1; 1Department of Materials Science & Engineering, National Chiao Tung University; 2Assembly and Reliability Department/EOL/ITRI

Phase Transformations and Microstructural Evolution — Phase Transformations - Fundamentals - Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Sudarshanam Babu, The University of Tennessee, Knoxville; Dhirli Bhattacharyya, ANSTOP; Yunzhi Wang, Ohio State University; Osman Anderoglu, Los Alamos National Laboratory; Juan P. Escobedo-Díaz, UNSW Australia; Jessica Krosgstad, University of Illinois, Urbana-Champaign; Long Qing Chen, Penn State University; Monica Kapoor, University of Alabama; Amy Clarke, Los Alamos National Laboratory; Gregory Thompson, University of Alabama

Monday AM  Room: 107B
February 15, 2016  Location: Music City Center

Session Chair: Stephen Niezgoda, The Ohio State University

8:30 AM
γ’ in Co-Al-W; Why Won’t It Just Go Away?: Eric Lass1; 1National Institute of Standards and Technology

9:00 AM
Study of Phase Precipitation in Binary Systems using Diffusion Multiples and Simulations: Qiaofu Zhang1; Ji-Cheng Zhao1; 1The Ohio State University

9:20 AM
Study of Phase Transformation, Recovery and Recrystallization in Ti-5Al-5V-5Mo-3Cr Alloy and Their Effects on Dilatometric Response: Mainak Sen1; Swati Suman2; Amit Bhattacharjee3; Sujoy Kar4; 1Indian Institute Of Technology; 2Defence Metallurgical Research Laboratory, Hyderabad.

9:40 AM
The Effect of Excess Energy in the Simulation of Dendritic Growth Using the Phase Field Model Coupled with a CALPHAD Database: Kerboub Abdelhak1; Belbacha El Djemai2; 1University Hadj- Lakhdar Batna

10:00 AM Break

10:20 AM
Supersaturation and Decay: The Life of Vacancies during Precipitation: Alexis Deschamps1; De Geuser Frederic2; 1Grenoble Institute of Technology

11:00 AM
The Stability of the Moving Boundary in Spherical and Planar Geometries and its Relation to Nucleation and Growth: Rahul Basu1; 1SAIT , VTU

11:20 AM
Modification of Phase Evolution Pathways in Nanocrystalline Metallic Thin Films: Megan Emigh1; Pralav Shetty2; Jessica Krosgstad3; 1University of Illinois, Urbana-Champaign

11:40 AM
Symmetry Breaking and Pathway Degeneracy during Structural Phase Transformations: Yipeng Gao1; Suliman Dregia1; Yunzhi Wang1; 1The Ohio State University
Phase Transformations and Microstructural Evolution — Phase Transformations in Fe-Alloys - Session I

8:30 AM
Combined Atom Probe Tomography and Electron Microscopy Investigation of Intermediate Carbides Precipitation from Supersaturated Virgin Fe-Ni-C Martensites: Frederic Danoix1; Sophie Cazottes2; Mohamed Goune3; Helena ZAPOLSKY4; Sebastien Allain5; Philippe Maugis6; CNRS 1Université de Rouen; 2MATEIS INSA Lyon; 3ICMCB Bordeaux; 4IJL Université de Lorraine; 5Aix-Marseille Université IM2NP

9:00 AM
Ballistic Martensite: Nicholas Wengrenovich1; Greg Olson1; 1Northwestern University

9:20 AM
Boron Segregation and its Effects in Boron Containing Steels: Kara Luitjohan1; David Johnson1; Volkan Ortalan1; 1Purdue University

9:40 AM
Carbide Evolution during Quenching and Partitioning of Steel Studied by Mössbauer Spectroscopy: Dean Pierce1; Dan Coughlin2; Amy Clarke2; Don Williamson3; Jonathan Poplawsky4; Kester Clarke5; John Speer6; David Matlock7; Emmanuel De Moor8; 1Advanced Steel Processing and Products Research Center, Colorado School of Mines; 2Materials Science and Technology Division, Los Alamos National Laboratory; 3Department of Physics, Colorado School of Mines; 4Materials Science and Technology Division, Oak Ridge National Laboratory

10:00 AM
Atomistic Modeling of Interfaces of Cementite and Ferrite: Matthew Gutzewitsch1; Christopher Weinberger2; 1Drexel University

10:20 AM Break

10:40 AM
Correlation of Microstructure to Creep Properties of Fe-30Cr-3Al Alloys Strengthened by Laves Phase: Benjamin Shassere1; Yukinori Yamamoto2; Sudarsanam Babu3; 1University of Tennessee; 2Oak Ridge National Laboratory

11:00 AM
High Temperature Spheroidization of Cementite in a 2C-4Cr Ultrahigh Carbon Steel: Matthew Hecht1; Yoosuf Picard2; Bryan Weberl3; 1Carnegie Mellon University

Phase Transformations in Multi-component Systems: An MPMD Symposium Honoring Gary R. Purdy — Interaction of Alloying Elements with Stationary and Migrating Interfaces

8:30 AM Invited
Towards a Unified Analysis of Migrating Austenite/Ferrite Interfaces in Steels: John Agren1; 1Royal Institute of Technology

9:00 AM Invited
New Insights into Alloying Elements Interaction with Migrating α-ferrite/+austenite Interface in Fe-C-Mn System: Goune Mohamed1; Frederic Danoix2; Xavier Sauvage3; Didier Huin4; 1ICMCB-Bordeaux; 2Université de Rouen; 3Université de Lorraine; 4Aix-Marseille Université IM2NP

9:30 AM
Solute Drag in a 40 Years Perspective: Bo Sundman1; 1CEA Saclay

9:50 AM
On the Question of Solute Atom Trajectories during Dynamic Segregation: Glenn Hibbard1; 1University of Toronto

10:10 AM Break

10:30 AM Invited
The Effect of C and N on the Cyclic Partial Phase Transformation Behaviour in an Mn Containing Steel: Sybrand van der Zwaag1; Hussein Farahani2; Hatem Zurob3; 1Technical University Delft

11:00 AM
Grain Boundary Segregation in Phase Separating Nanocrystalline Alloys: The Role of Competing Processes on Microstructure Evolution: Fadi Abdeljawad1; Stephen Foiles2; Blythe Clark3; 1Sandia National Laboratories

11:20 AM
Solute Interactions at the Ferrite-Austenite Interphase Boundary: Brian Langelier1; 1Sandia National Laboratories

11:40 AM Panel Discussion

Rare Metal Extraction & Processing Symposium — Rare Earth Elements / Base & Rare Metals I

8:30 AM Keynote
The Search Minerals Direct Extraction Process for Rare Earth Element Recovery: David Dreisinger1; Niels Verbaan2; Mike Johnson2; 1Univ of B.C.; 2SGS Minerals Services

Monday AM Room: 106A
February 15, 2016 Location: Music City Center

Session Chairs: Harald Oosterhof, Umicore; Takanari Ouchi, KTH, Royal Institute of Technology
9:05 AM
Hydrometallurgical Extraction of Rare Earth Elements and Phosphorous from Low Grade Mine Tailings: Sebastiaan Peelman; 1Delft University of Technology

9:30 AM
Fluorination Behavior of Uranium and Zirconium Mixture for Fuel Debris Treatment: Nobuaki Sato; Akira Kirishima; Tetsuo Fukasawa; 1IMRAM; 2Hitachi-GE Nuclear Energy

9:55 AM Invited
Hydrometallurgical Recovery of Rare Earth Metals from Spent FCC Catalysts: Marco Wenzel; K. Schnaars; N. Kelly; K. Gloc; Jan Weigand; S. Robles M; K. Kretschmer; Phuc Nguyen Le; Dang Thanh Tung; Nguyen Huu Luong; Tran Vinh Loc; Dang Van Sy; 1TU Dresden; 2Delta Engineering & Chemistry GmbH; 3Vietnam Petroleum Institute; 4LILAMA EME

10:20 AM Break

10:40 AM
Direct Solvent Extraction of Nickel from Sulfuric Acid Leach Solutions of Low Grade and Complicated Nickel Resources Using a Novel Extractant of HBL110: Li Zeng; Guiqing Zhang; Liansheng Xiao; Zuoying Gao; Central South University

11:05 AM
Preparation and Analysis of Nd2O3 Doped Apatite Concentrate for Pyrometallurgical Recovery of Rare Earth Element: Tianshing San; Mark William Kennedy; Kai Tang; Gabriella Tranell; Ragnhild A. Aune; 1KTH; 2Proval Partners SA; 3SINTEF Materials and Chemistry; 4Norwegian University of Science and Technology (NTNU)

Recent Advancement on Stretchable and Wearable Electronics — Session I
Sponsored by: TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee, TMS: Nanomaterials Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Pooran Joshi, ORNL; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Jiahua Zhu, The University of Akron; Nuggehalli Ravindra, New Jersey Institute of Technology; Catherine Dubourdieu, CNRS - INL; Madan Dubey, US Army Research Lab

Monday AM
February 15, 2016
Location: Music City Center
Room: 205C
Session Chairs: Pooran Joshi, ORNL; Nuggehalli Ravindra, New Jersey Institute of Technology; Madan Dubey, US Army Research Lab

8:30 AM
3D Printing Liquid Metals at Room Temperature for Fabrication of Functional, Stretchable, and Soft Electronics: Dishki Parekh; Collin Ladd; Michael Dickey; 1North Carolina State University

8:50 AM Invited
Inkjet Printed Metal Oxide Thin Film Transistors: Chih-hung Chang; 1Oregon State University

9:15 AM Invited
Laser Writing and Photonic Reduction of High Performance Supercapacitors on Flexible Substrates: Anning Hu; 1University of Tennessee

9:40 AM Invited
Low-Cost Inkjet Process for Printing Embedded Electronics: Christopher Schmitt; Wenchao Zhou; 1University of Arkansas

10:05 AM Break

10:25 AM Invited
New Paradigms for Enabling Printing of Flexible Optoelectronics through Engineered Metal-organic Inks and Direct Writing: Konstantinos (Kostas) Siemeris; 1West Virginia University

10:50 AM Invited
Ultrasonic Spray Printing for High-performance Flexible Organic Field-effect Transistors and Hybrid Perovskite Solar Cells: Kai Xiao; Sanjib Das; Ming Shao; Bin Yang; Iong Keum; Ilia Ivanov; Gong Gu; Tolga Aytug; Pooran Joshi; Christopher Rouleau; David Geohagan; 1Oak Ridge National Laboratory; 2University of Tennessee

11:15 AM Invited
Wireless Gas Sensing with NFC-enabled Mobile Device: Tuo Ji; Yichuan Zhao; Forrest Sheng Bao; Jiuhua Zhu; 1The University of Akron

11:40 AM
Mechanical Stability of Printed Metallizations on Polymer Substrates: Oleksandr Glushko; Megan Cordill; Andreas Klug; Emil List-Kratochvil; 1Erich Schmid Institute; 2Erich Schmid Institute; 3NanotecCenter Weiz; 4NanotecCenter Weiz

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Biomedical and Energy Applications
Sponsored by: TMS Functional Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nancy Michael, University of Texas at Arlington; Adele Carrado, IPCMS; Heinz Palkowski, TU Clausthal; Nuggehalli Ravindra, New Jersey Institute of Technology; Chintalapalle Ramana, University of Texas at El Paso

Monday AM
February 15, 2016
Location: Music City Center
Room: 206B
Session Chairs: Adele Carrado, IPCMS; Nuggehalli Ravindra, NJIT; Ramana Chintalapalle, University of Texas at El Paso

8:30 AM
Iron Oxide Nanoparticles - Biomedical Applications: Natali Gendelberg; Nuggehalli Ravindra; 1New Jersey Institute of Technology

8:50 AM
Thin Films and Coatings for Absorbptive Removal of Antimicrobials, Antibiotics, and Other Pharmaceuticals: David Cocke; 1Andrew Gomes; Saiful Islam; Gary Beall; 1Lamar University; 2Texas State University

9:10 AM
Surface Functionalization of Titanium Surfaces to Design Innovative Hybrid and Biocompatible Materials: Melania Reggente; Irene Bonafede; Geneviève Pourroy; Patrick Masson; Marco Rossi; Heinz Palkowski; Adele Carrado; 1Université de Strasbourg; 2Sapienza University of Rome; 3Clausthal University of Technology

9:30 AM
Surface Functionalization of Titanium Substrates for Improving Osseointegration: Quang Van Le; Mathilde Graudel; Geneviève Pourroy; Caroline Fischer; Koenig Géraldine; Leandro Jacomine; Jacques Faerber; Fabienne Perrin-Schnait; Adele Carrado; 1Université de Strasbourg - CNRS IPCMS; 2Université de Strasbourg - CNRS ICS; 3Université de Strasbourg, Faculté de Médecine; 4Université de Strasbourg - CNRS ICS; 5Université de Strasbourg

9:50 AM Break

10:10 AM
Effect of Post-Heat Treatment on the Electrochemical Performance of Sandwich Structured Cu/Sn/Cu Electrode: Burcin Bilici; Deniz Polat; Ozgul Keles; 1ITU
8:30 AM Introductory Comments - Refractory Metals Overview, Applications & Direction
8:50 AM The Initiation and Propagation of Dynamic Abnormal Grain Growth in Refractory Metals: Philip Noell; Eric Taleff; 'University of Texas at Austin, Dept of Mechanical Engr
9:10 AM Introduction of Precisely Controlled Microstructural Defects into SRF Cavity Nb Sheet and Their Impact on Local Superconducting Properties: Mingmin Wang; Di Kang; Zuhawn Sung; Peter Lee; Anatoliy Polyanskii; Christopher Compton; Thomas Bieler; 'Michigan State University; 'Florida State University
9:30 AM Effect of Silicon on Texture of Niobium: Abhishek Bhattacharyya; Marc Abouaf; 'H.C. Starck, Inc.
9:50 AM Manufacturing of Bulk Ultrafine Grain Tungsten from Nanocrystalline Tungsten Powder and Its Potential Application for Nuclear and Fusion Reactors: Chai Ren; Z. Zak Fang; Huan Zhang; Dean Buchenauer; Robert Kolasiniski; 'University of Utah; 'Sandia National Laboratory
10:10 AM Break

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Gary Rozak, HC Stark; Eric Taleff, Univ. Texas; Ivi Smid, Penn State
Monday AM Room: 106B
February 15, 2016 Location: Music City Center
Session Chairs: Eric Taleff, University of Texas at Austin; Brian Cockeram, Bechtel Marine Propulsion Corp

8:55 AM Bauxite Residue for Phosphorus Removal from Waste Water: Gamini Mendis; Amanda Brock; Kai Gao; Indrajeet Chaubey; Ron Turco; John Howarter; 'Purdue University
9:20 AM Modelling the Electromagnetic Processing of Recycled Silicon Dust: Georgi Djambazov; Koulis Pericleous; Valdis Bojarevics; Michele Forzan; Fabrizio Dughiero; 'University of Greenwich; 'University of Padua
9:45 AM Potential Contribution to the Supply of Silver by the Recycling of Industrial Residues from Zn, Pb and Cu Plants: Stefan Steinlechner; 'University of Leoben

REWAS 2016 — Enabling & Understanding Sustainability - Ferrous & Non-ferrous Metals Processing
Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Bart Bianpain, KU Leuven; Anne Kvithyld, SINTEF; Christina Meskers, Umicore Precious Metals Refining; Elsa Olivetti, Massachusetts Institute of Technology; Jeffrey S. Spangenberger, Argonne National Laboratory; Diran Apelian, Worcester Polytechnic Institute; Brajendra Mishra, Colorado School of Mines; Neale Neelameggham, Ind LLC
Monday AM Room: 104B
February 15, 2016 Location: Music City Center
Session Chairs: Bart Blanpain, KU Leuven; Naiyang Ma, ArcelorMittal

8:30 AM Recycling of Poly-Metallic Residues from Metal Industry – Current Status and Future Developments: Juergen Antrekwitsch; 'University of Leoben

10:55 AM Evaluation of Reactor REOv-01 with Ti Electrode for Electrochemical Recovery of Ag from Industrial Wastes: Pedro Ramírez Ortegá; Victor Reyes Cruz; Maria Veloz Rodriguez; Diana Arenas Islas; Laura Garcia Hernández; Mizzaim Flores Guerreró; Luis García Lechuga; 'Universidad Tecnológica de Tulancingo
MONDAY AM

11:45 AM
Mini Mill Solutions in the Recycling of Electric Arc Furnace Dust – the 2sDR Process: Gernot Rößler; Christoph Pichler; Stefan Steinlechner; Juergen Antrekowitsch; 'Montanuniversitaet Leoben

REWAS 2016 — Understanding & Enabling Sustainability - (Rechargeable) Batteries
Sponsored by:
Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Bart Blanpain, KU Leuven; Anne Kvithyld, SINTEF; Christina Meskers, Unicore Precious Metals Refining; Elsa Olivetti, Massachusetts Institute of Technology; Jeffrey S. Spangenberger, Argonne National Laboratory; Diran Apelian, Worcester Polytechnic Institute; Brajendra Mishra, Colorado School of Mines; Neale Neelameggham, Ind LLC

Monday AM
February 15, 2016
Location: Music City Center

Session Chairs: John Howarter, Purdue University; Gabrielle Gaustad, Rochester Institute of Technology

8:30 AM
Roadmap for the Lifecycle of Advanced Battery Chemistries: Timothy Ellis; 'RSR Anode Group and RSR Technologies

8:55 AM
Portland Cement with Battery Waste Contents: Henry A. Colorado; 1Universidad de Antioquia

9:20 AM
Automotive Lithium-ion Battery Recycling: A Thermodynamic Evaluation: Reza Beheshti; Ragnhild Aune; 'KTH; 'NTNU

9:45 AM
Life Cycle Analysis Summary for Automotive Lithium-ion Battery Production and Recycling: Jennifer Dunn; Linda Gaines; Jarod Kelly; Kevin Gallagher; 'Argonne National Laboratory

Thermodynamic Applications, Optimizations and Simulations in High-Temperature Processes: An EPD Symposium in Honor of Christopher W. Bale’s 70th Birthday — Steelmaking/Ferrous Applications
Sponsored by:TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee
Program Organizers: In-Ho Jung, McGill University; Arthur Pelton, Ecole Polytechnique; Patrice Chartrand, Ecole Polytechnique; Phillip Mackey, P.J. Mackey Technology; David Robertson, Missouri S&T; P Taskinen, Alto Univ; Malin Selleby, KTH Royal Institute of Technology

Monday AM
February 15, 2016
Location: Music City Center

Session Chairs: Arthur Pelton, Ecole Polytechnique; Youn-Bae Kang, Postech

8:30 AM Keynote
The Application of FactSage to Steelmaking Operations: Predictions and Actual Results: Eugene Pretorius; 'Nucor Steel

9:10 AM
Thermodynamic and Experimental Investigations of High Temperature Refractory Corrosion by Molten Slags: Christoph Wagner; Christine Wenzl; Dean Gregurek; Daniel Kreuzer; Stefan Luidold; Holger Schrneritsch; 'RHI AG; 'University of Leoben

9:30 AM
Design Principles for Fluorine-free Mold Fluxes Based on Thermodynamic Calculations: Jungwook Cho; 'Pohang University of Science and Technology

9:50 AM
Perspectives of FactSage® for Application in Continuous Casting Mold Flux Developments: Il Sohn; 'Yonsei University

10:10 AM Break

10:30 AM
A Kinetic Ladle Furnace Process Simulation Model: Marie-Aline Van Ende; In-Ho Jung; 'McGill University

10:50 AM
Applications of Computational Thermodynamics to Predict the Refractory-slag-metal Reaction Equilibria at High Temperatures: Joohyun Park; 'Hanyang University

11:10 AM
Rapid Dissolution of Quicklime into Molten Slag by Internally Formed Gas: Nobuhiko Maruoka; Hiroshi Nogami; 'Tohoku University

11:30 AM
A Dynamic Flux Dissolution Model for Oxygen Steelmaking: Ameya Kadroškar; Nils Andersson; Nesilhan Dogan; 'McMaster University

Transforming the Diversity Landscape — Significance and Impact
Sponsored by:TMS: Education Committee
Program Organizers: Natalie Larson, University of California, Santa Barbara; Wennie Wang, University of California, Santa Barbara; David Hwang, University of California, Santa Barbara

Monday AM
February 15, 2016
Location: Music City Center

Session Chairs: Natalie Larson, University of California, Santa Barbara; Wennie Wang, University of California, Santa Barbara; David Hwang, University of California, Santa Barbara

8:30 AM Invited
Diversity Beyond the Numbers: Fostering and Sustaining Diversity in the Minerals, Metals, and Materials Professions: Elizabeth Holm; 'Carnegie Mellon University

9:10 AM Invited
Diversity Leads to Innovation: Cammy Abernathy; 'University of Florida

9:30 AM Invited
Understanding and Addressing the Patterns of Bias in STEM Environments: Kristen Constant; 'Iowa State University

10:10 AM Break

10:30 AM
Securing the Future of American Public Research Universities by Increasing the Number of Under-represented Minorities in STEM: Aeriel Murphy; 'University of Michigan

10:50 AM
The Impact of Coaching, Mentoring, and Sponsorship on Diversity: Kathleen Chou; 'The Boeing Company
Ultrafine Grained Materials IX — Grain Boundary 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, Los Alamos National Laboratory; Roberto Figueiredo, Federal University of Minas Gerais; Zenji Horita, Kyushu University; Megumi Kawasaki, Hanyang University; Qizhen Li, Washington State University; Hans Roven, Norwegian University of Science and Technology (NTNU); Timothy Rupert, University of California, Irvine

Monday AM Room: 209B
February 15, 2016 Location: Music City Center
Session Chairs: Timothy Rupert, University of California, Irvine; Suveen Mathaudhu, University of California, Riverside

8:30 AM Invited
Grain Boundaries in Severely Deformed Metallic Materials: Gerhard Wilde1; 1University of Muenster

9:00 AM Invited
In-situ Observations of Mechanical Instability and Deformation Mechanisms in Nanocrystalline Thin Films: Kevin Henker1; Paul Rottmann1; Suman Dasgupta1; 1Johns Hopkins University

9:30 AM
Nanocrystalline Grain Boundary Network Evolution: Ying Chen1; 1Rensselaer Polytechnic Institute

9:50 AM
A Simple Mechanical Model for Grain Boundary Sliding that Accounts for the Effect of Size Distribution of Grains on the Yield Strength at Quasistatic and Dynamical Loading: Elijah Borodin1; Alexander Mayer1; 1Chelyabinsk State University

10:10 AM Break

10:30 AM Invited
Stress-assisted Grain Growth in Nanocrystalline Metals Inhibited by Grain Boundary Segregation: Yang Zhang1; Garritt Tucker2; Jason Trelewicz3; 1Stony Brook University; 2Drexel University

11:00 AM Invited
Dynamic Behavior and Microstructural Evolution of Nanocrystalline and Ultrafine Grained Cu-Ta Alloys: S Turnage1; M. Rajagopalan1; K Darling2; Kiran Solanki1; 1Arizona State University; 2ARL

11:30 AM
Mechanisms of Grain Boundary Diffusion in Severely Deformed Materials: Sergii Divinsky1; Gerhard Wilde1; 1University of Muenster

11:50 AM
Grain Boundary Motion, Solute Drag and Precipitation in Al Alloys Processed by SPD: Xavier Sauvage1; Yana Nasedkina1; Elena Bobruk2; Maxim Murashkin1; Nariman Enikeev1; Ruslan Valiev1; 1University of Rouen, CNRS; 2IPAM-USATU

2016 Functional Nanomaterials: Emerging Nanomaterials and Techniques for 3D Architectures — Unique Techniques to Create 3D Architectures I
Sponsored by: TMS Functional Materials Division, TMS: Nanomaterials Committee
Program Organizers: Terry Xu, UNC Charlotte; Nitin Chopra, The University of Alabama; Jung-Kun Lee, University of Pittsburgh; Jiyoung Kim, University of Texas; V. U. Unnikrishnan, The University of Alabama

Monday PM Room: 211
February 15, 2016 Location: Music City Center

Session Chairs: Jiyoung Kim, UT Dallas; Johnson Samuel, Rensselaer Polytechnic Institute

2:00 PM Invited
Invited Talk: A Hybrid 3D Printing Technique for Laminated Polymer Nanocomposite Architectures: Johnson Samuel1; 1Rensselaer Polytechnic Institute

2:30 PM Invited
Scaled-Up Microscale and Nanoscale 3-D Electrochemical Printing of Solid Metal Structures: Minfeng Yu1; 1Georgia Institute of Technology

3:00 PM
3D Pick and Place Sintering Nanoprinter: Max Carlson1; Ka-Yen Yau1; Robert Simpson1; Michael Short1; 1Massachusetts Institute of Technology; 2Singapore University of Technology and Design

3:20 PM
NANO-manufacturing Process Using Electro-fountain Pen Nanolithography: Ben Luce1; Indranath Dutta1; 1Washington State University

3:40 PM Break

4:00 PM Invited
High Throughput Reactive Printing Compatible Approaches for In-situ Manufacturing of Nanomaterials: Ghassan Jabbour1; Hyung Choi1; Tianlei Zhou1; 1University of Nevada Reno

4:20 PM Invited
Invited Talk: Inorganic Infiltration in Polymer Templates via Atomic Layer Deposition: Pathway for Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures: Chang-Yong Nam1; 1Brookhaven National Laboratory

4:50 PM
3-Dimensional Nanostructures in Bulk Monolithic Solids by Enhanced High Pressure Sintering: James Wollmershauser1; Boris Feigelson1; Kedar Manandhar1; 1Naval Research Laboratory; 2ASEE Postdoctoral Fellowship Program

5:10 PM
Electron Beam Induced Deposition: A Direct Write Method for Nanoscale 3-Dimensional Architectures: Brett Lewis1; Robert Winkler2; Jason Fowlkes1; Michael Stanford1; Harald Plank2; Philip Rack1; 1University of Tennessee; 2Graz University of Technology; 3Oak Ridge National Laboratory

5:30 PM
Nanostructuring Vanadium Dioxide for 3D Silicon Photonics Devices: Robert Marvel1; Thomas Campbell2; Richard Haglund1; 1Vanderbilt University; 2Murray State University

www.tms.org/TMS2016
7th 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; P. Chris Pistorius, Carnegie Mellon University; Gerardo Alvear Flores, Xstrata Technology; OnurAL Yücel, ITU; Liyuan Cai, Central South University; Baojun Zhao, The University of Queensland; Dean Gregurek, RHI AG; Varadarajan Seshadri, Universidade Federal de Minas Gerais

Monday PM  Room: 105B
February 15, 2016  Location: Music City Center

Session Chairs: Dean Gregurek, RHI AG; Ender Keskinkilic, Attilim University

2:00 PM Introductory Comments

2:05 PM
Active Oxidation and Fume Formation from Liquid SiMn: Ida Kero1; Gabriella Tranell2; Dmitry Sizovskiy2; 1SINTEF; 2Norwegian University of Science and Technology

2:25 PM
Research on Enrichment of MFe and RO Phase from Converter Steel Slag by Super Gravity: Chong Li1; Jintao Gao1; Zhancheng Guo1; 1University of science and technology Beijing

2:45 PM
Volatilization of Rhenium from Molybdenite Concentrate by Oxidative Roasting: Guanghui Li1; Song Sun1; Zhiwei Peng1; Linfeng Zhou1; Yuanbo Zhang1; 1School of Minerals Processing and Bioengineering, Central South University

3:05 PM
Kinetic Investigation of the Electric Furnace Copper Slag Treatment: Stephan Steinacker1; Juergen Antrekowitsch1; 1Montanuniversitaet Leoben

3:25 PM
The Extraction of Zinc from Willemite by Calcified-roasting and Ammonia-leaching Process Based on Phase Reconstruction: Wei Chen1; Yufeng Guo1; Feng Chen1; Tao Jiang1; Xudong Liu1; 1Central South University

3:45 PM Break

4:00 PM
An Investigation on Antimony Production by Using Niederschlag Process: Sedef Basag1; Ahmet Turan1; OnurAL Yücel1; 1Istanbul Technical University; 2Yalova University

4:20 PM
Oxygen-rich Side Blow Bath Smelting Technology — History and New Developments in China: Lin Chen1; Wei Chen1; Hui Xiao1; Tianzu Yang1; Weifeng Liu1; Duchao Zhang1; 1Central South University

4:40 PM
Carbon Refractories in an Oxidizing Process? Copper Smelting in an Outotec® Ausmelt TSL Furnace with a UCAR® Chill-Kote™ Refractory System: Jacob Wood1; Stefanie Creedy1; Peter Duncanson1; 1Outotec Pty Ltd.; 2GrafTech International

5:00 PM
Enrichment of Gold in Low Grade Copper Matte from Arsenical Refractory Gold Concentrate via Matte Smelting Method: Zhang Duchao1; Xiao Qingkai1; Yang Tianzhu1; Liu Weifeng1; Chen Lin1; 1Central South University

Additive Forming of Components - Tailoring Specific Material Properties in Low Volume Production — Additive Manufacturing of Ni-Based Alloys
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Judith Schneider, University of Alabama at Huntsville; Mark Stoudt, National Institute of Standards and Technology, Kester Clarke, Los Alamos National Laboratory; Lee Semiatin, US Air Force Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology; Eric Lass, National Institute of Standards and Technology; Paul Mason, Thermo-Calc Software Inc.

Monday PM  Room: 205B
February 15, 2016  Location: Music City Center

Session Chairs: Judy Schneider, University of Alabama at Huntsville; Sundarsanam Babu, University of Tennessee

2:00 PM Invited
ICME Approach to the Materials Challenges in Additive Manufacturing of Components: Jiadong Gong1; David Snyder1; Greg Olson1; Jason Sebastian1; 1QuesTek Innovations

2:30 PM Invited
Powder-bed Fabrication of the High-temperature Ni-base Superalloy LSRH: Chantal Sudbrack1; Michael Kirka2; Ryan DeHoff1; Robert Carter2; S. Lee Semiatin1; Timothy Gabb1; 1NASA Glenn Research Center; 2Oak Ridge National Laboratory; 3Air Force Research Laboratory

2:50 PM
Microstructural Evolution of Inconel 625 Manufactured through Direct Metal Laser Sintering Technique of Additive Manufacturing: Yaukov Idel1; Lyle Levine1; Sudah Chervadhu1; Eric Lass1; Mark Stoudt1; Carolyn Campbell1; Li Ma1; 1National Institute of Standards and Technology

3:10 PM
Microstructural Characterization and Process Mapping in Beam-Based Additive Manufacturing of Inconel 625: Luke Sheridan1; Thomas Watkins1; Nathan Klingbeil1; 1Air Force Research Laboratory; 2Oak Ridge National Laboratory; 3Air Force Research Laboratory

3:30 PM Break

3:50 PM Invited
Rationalization of Advanced Site-specific Microstructure Control within Additive Manufactured Components: Michael Kirka1; Ryan DeHoff1; Michael Goin1; Michael Pearce1; Hassina Bilheux1; Louis Santodonato1; Suresh Babu1; 1Oak Ridge National Laboratory; 2University of Tennessee-Knoxville

4:20 PM
Residual Stress Determination of Additively Manufactured Inconel 718 Specimens: Thomas Watkins1; Ryan DeHoff1; Philip Maziasz1; James Neumann1; Vinod Nangia1; 1ORNL; 2Honeywell Aerospace

4:40 PM
Direct Writing of Nickel Super Alloy (N5) Single Crystal: Yichen Wang1; Jeongyong Choi1; Jyoti Mazumder1; 1University of Michigan

5:00 PM
Controlling Microstructure of In738LC Superalloy during Selective Laser Melting (SLM) Process: Hossein Meidani1; Thomas Etter1; Fabian Geiger1; Roman Engell1; 1GE Switzerland

5:20 PM
Effect of Heat Treatment on the Microstructure, Texture and Elastic Anisotropy of a Nickel-based Superalloy Processed by Direct Laser Deposition: Rocío Munoz Moreno1; Divya Vadegadde Duggappa1; Sarah Driver1; Trevor Illston1; Scarlett Baker1; Howard J. Stone1; 1University of Cambridge; 2Materials Solutions; 3Materials Solutions
Additive Manufacturing: Building the Pathway towards Process and Material Qualification — Connections between Processsing and Microstructures II

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee, TMS: Powder Materials Committee, TMS: Process Technology and Modeling Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Allison Beebee, Pennsylvania State University; David Bourell, University of Texas; Reginald Hamilton, The Pennsylvania State University; Edward Herderick, GE; Rajiv Mishra, University of North Texas; James Sears, GE GRC

Monday PM
February 15, 2016
Room: 205A
Location: Music City Center

Session Chairs: Josh Sugar, Sandia National Laboratory; Ryan Dehoff, Oak Ridge National Lab

2:00 PM
Characterization and Detection of Pores in Direct Laser Deposited Ti-6Al-4V via Neutron Radiography and Real-Time Thermographic Inspection: W. Young1; Garrett Marshall1; Scott Thompson1; Nima Shamsaei2; Steven Daniewicz2; 1Mississippi State University

2:20 PM Invited
Building Design and Optimization Tools for Additive and Near-net Shape Processes: Josh Sugar1; Arthur Brown1; Lauren Beghini1; Samuel Subia2; Daryl Dagel1; David Keicher1; Kyle Allen1; Thomas Reynolds2; Dorian Balch1; Chris San Marchi1; 1Oak Ridge National Laboratory; 2Sandia National Labs, Livermore, CA

2:50 PM
Qualification Methodology for A6Si10Mg Spaceflight: Bryan McENERney1; R. Dillon1; John Borgonia1; Andrew Shapiro-Scharlotta1; 1Jet Propulsion Laboratory

3:10 PM
Spatial Control of Solidification Microstructure in the Electron Beam Melting of Ti-6Al-4V: Sneha Narra1; Ross Cunningham1; Daniel Christiansen1; Jack Beath1; Anthony Rollett1; 1Carnegie Mellon University

3:30 PM Break

3:50 PM Invited
Automated In-situ Defect Detection and Geometry Validation on the ARCAM Q10 System: Ryan Dehoff1; Vincent Paquet2; Michael Kirka1; Edwin Schwalbach1; Michael Grober2; Michael Goin1; Michael Pearce1; 1Oak Ridge National Laboratory; 2Wright-Patterson AFRL

4:20 PM
Microstructural Characterization of Additively Manufactured Metals: Terry Holeninger1; Pallas Papin1; Thomas Liennert1; John Carpenter1; 1Los Alamos National Laboratory

4:40 PM
Microstructural Analysis of IN 625 and MAR-M 247 Components Fabricated Using Powder Bed Additive Manufacturing: Yi Li1; Ji-Cheng Zhao1; 1The Ohio State University

5:00 PM
Anisotropy in Mechanical Properties of Ti-6Al-4V: A Comparison between Mill-annealed and Additively Manufactured Alloys: Rupalee Mulay1; Jeffrey Florando1; Mukul Kumar1; 1Lawrence Livermore National Laboratory

5:20 PM
Oxide, Porosity and Fatigue Performance of A6Si10Mg Parts Produced by Selective Laser Melting: Ming Tang1; Petrus Pistorius1; 1Carnegie Mellon University

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session II

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

Program Organizers: Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire; Wolfgang Panteleon, Technical University of Denmark; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Irene Bayerlein, Los Alamos National Laboratory

Monday PM
February 15, 2016
Room: 103B
Location: Music City Center

Session Chairs: Nan Li, Los Alamos National Laboratory; Roumen Petrov, Ghent University

2:00 PM Invited
Structural Analysis of In-field Loaded Railway Steel: Roumen Petrov1; Jun Wu1; Loic Malet1; Stephan Godet1; Jiti Sietsma1; 1Ghent University; 2Delft University of Technology; 1Universite Libre de Bruxelles

2:30 PM Invited
Physical Analysis of High Resolution Single Grain and Subgrain Diffraction Profiles: Ulrich Lienert1; Wolfgang Panteleon2; Gábor Ribár1; Tamás Ungár3; 1Deutsches Elektronen-Synchrotron; 2Technical University of Denmark; 3Eötvös University Budapest

3:00 PM
Multiaxial Strain Path Changes in Grain Boundary Dominated Polycrystalline Materials: In-situ Observations during XRD and SEM: Antoine Guitt1; Alex Bollhalder1; Steven Van Petegem1; Daniel Grolimund1; Antonio Cervellino1; Helena Van Swygenhoven1; 1Paul Scherrer Institut

3:20 PM Break

3:40 PM Invited
Designing High Fracture Toughness Nanocomposites via In Situ TEM Approach: Nan Li1; Satyesh Yadav1; Xiang-Yang Liu1; Richard Hoagland2; Nathan Mara1; Amit Misra1; Jian Wang1; 1Los Alamos National Laboratory; 2University of Michigan, Ann Arbor

4:10 PM
Tracking Subgrains during Strain Path Changes by High Resolution Reciprocal Space Mapping: Christian Wejdemann1; Henning Friis Poulsen1; Ulrich Lienert1; Wolfgang Panteleon1; 1Technical University of Denmark; 2DESY Photon Science

4:30 PM
Post Processing Effects on EBSD based Dislocation Density Measurements: Stuart Wright1; David Field1; Matthew Nowell1; 1EDAX; 2Washington State University

4:50 PM
Dark Field X-Ray Microscopy for Studies of Very Low Angle Boundaries: Sonja Ahl1; Hugh Simons1; Anders Jakobsen1; Frederik Stöhr1; Yubin Zhang1; Wolfgang Panteleon1; Dorte Juul Jensen1; Henning Poulsen1; 1Technical University of Denmark

5:10 PM
Quantifying the Local and Global Misorientation Distributions as a Function of Crystallographic Orientation and Level of Plastic Strain in Polycrystalline Materials by Utilizing EBSD Mapping: Yahid Khadem1; Thomas Bieler1; Carl Boehlert1; 1Michigan State University

5:30 PM
Plasticity Mechanisms in Hafnium Nitride at Room and Elevated Temperature: Katherine Vinsan1; Xiao-Xiang Yu1; Christopher Weinberger1; Gregory Thompson1; 1The University of Alabama; 2Drexel University
Advanced Magnetic Materials: An FMD Symposium in Honor of Michael E. McHenry — Thin Films, Processing, Characterization
Sponsored by: TMS Functional Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Raju Ramanujan, Nanyang Technological University; Matthew Willard, Case Western Reserve University; Francis Johnson, GE Global Research; Paul Ohodnicki, National Energy Technology Laboratory

Monday PM  Room: 209C
February 15, 2016  Location: Music City Center

Session Chairs: Manfred Wuttig, University of Maryland; Jun Ding, National University of Singapore

2:00 PM  Invited
Often Overlooked Aspects of the Symmetry of Magnetic Materials: David Laughlin1; 1ALCOA Professor of Physical Metallurgy: Carnegie Mellon University

2:30 PM  Invited
Current Trends in Giant Magnetoimpedance Materials Research: M.H. Phan2; 2University of South Florida

3:00 PM  Invited
Magnetic Field Mapping at the Nanoscale in the Transmission Electron Microscope: Rafal Dunin-Borkowski3; Jan Caron1; Jörn Ungermann1; 1Forschungszentrum Jülich

3:30 PM  Break

3:50 PM  Invited
Magnetic Materials and Minerals in Planetary Exploration: Marina Diaz Micheleena1; 1INTA

4:20 PM  Invited
Artificial Magnetic Lattices and Their Applications: Mitsuteru Inoue1; 1Toyohashi University of Technology

4:50 PM  Invited
Processing and Characterization of Magnetic Materials for Magnetic Refrigeration, High Frequency Power Conversion, and High Temperature Electrical Machine Applications: Matthew Lucas1; 1Air Force Research Laboratory

5:10 PM  Break

5:10 PM  Invited
Preparation and Characterization Fe-Pt and Fe-Pt-M (M=B, Si) Microwires: Valentina Zhukova1; Ahmed Talaat1; Juan del Val1; Mihail Ipatov1; Arcady Zhukov2; 2Basque Country University, UPV/EHU, San Sebastian, Spain; 3Basque Country University and Ikerbasque

Advanced Materials in Dental and Orthopedic Applications — Session II
Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS: Biomaterials Committee
Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Luis Rocha, UNESP, Univ. Estadual Paulista, Faculdade de Ciências; Grant Crawford, South Dakota School of Mines and Technology; Terry Lowe, Colorado School of Mines; Ana Ribeiro, National Institute of Metrology Quality and Technology; Reginald Hamilton, The Pennsylvania State University

Monday PM  Room: 206A
February 15, 2016  Location: Music City Center

Session Chairs: Paulo Lisboa-Filho, School of Sciences, UNESP - Universidade Estadual Paulista; Luis Rocha, Universidade Estadual Paulista

2:00 PM  Invited
Dental and Orthopedic Implants with Surface TiO2 Nanotubes for Enhanced Osseo-Integration: Sungbo Jin1; Dan Justin1; Garrett Smith2; Gary Johnston3; 1Nanovation Partners; 2Nasseo, Inc.

2:25 PM  Invited
Vanadium Interactions in Biological Systems: Paulo Lisboa-Filho2; 2UNESP - Sao Paulo State University

2:50 PM  Invited
Overview of Degradation Phenomena in Dentistry and Orthopedics: Luis Rocha1; Fernando Oliveira2; Sofia Oliveira1; Maria Rana1; Mathew Mathew2; Tolou Shokuhfar3; Ana Ribeiro4; 1University of Illinois at Chicago; 2Univ. Estadual Paulista, Faculdade de Ciências; 3MEMS-Uminho, Center MicroElectroMechanical Systems, Universidade do Minho; 4Rush University Medical Center; 5University of Illinois at Chicago; 3National Institute of Metrology Quality and Technology

3:15 PM  Invited
Interfacial Properties of Cellulose Nanocrystals for Biomedical Applications: Reza Shahbazian-Yassar1; 1Michigan Technological University

3:40 PM  Break

3:55 PM  Invited
Polymeric Coating for Optimization of Drug Release from Drug-Loaded Surfaces: Ashang Hanlekhian1; Sweetu Patel1; Tolou Shokuhfar1; 1Michigan Tech; 2University of Illinois at Chicago

4:15 PM  Invited
Titanium Oxide Nano-bio Interactions: Repercussions in Health Effects: Ana Ribeiro1; Sara Gemini-Piperi1; Wenderson Souza1; Renata Travassos1; Leandro Lengrubner1; Renata Carvalho1; André Rossi1; Tolou Shokuhfar1; Luis Rocha1; Jacques Werckmann1; José Granjeiro1; 1INMETRO; 2Welcome Trust Centre for Molecular Parasitology, University of Glasgow; 3Centro Brasileiro de Pesquisas Fisica; 4UIC; 5UNESP-BAURU

4:40 PM  Invited
Development of Novel Beta Ti-Mo-Zr Alloys for Orthopedic Applications: Raul Araújo1; Pedro Kuroda1; Mariana Lourenço1; Gabriela Suarez1; Diego Correa1; Fabio Vicente1; Carlos Grandini1; 1UNESP - Univ. Estadual Paulista

5:05 PM  Invited
One-step Anodic Deposition of HA with Ag Nanoparticles on Titanium for Anti-bacterial and Bioactive Implant: Gye-Won Kim1; Ki-Ryong Shin1; Yeon-Sung Kim1; Young-Gun Ko1; Dong-Hyuk Shin1; 1Hanyang University; 2Yeungnam University

5:25 PM  Invited
Diagnostics and Dental Materials for Crack Mitigation in Natural Teeth: Cheryln Sheets1; James Earthman1; 1Newport Coast Oral-Facial Institute; 2University of California, Irvine
Alloys and Compounds for Thermoelectric and Solar Cell Applications IV — Session II
Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, CRISMAT laboratory; Stephane Gorsse, ICMCB-CNRS; Yoshisato Kimura, Tokyo Institute of Technology; Lan Li, Boise State University; CW Nan, Tsinghua University; G. Jeffrey Snyder, Northwestern University; Hsin-jay Wu, National Sun Yat-Sen University

Monday PM  Room: 103C  Location: Music City Center
Session Chairs: Lan Li, Boise State University; Franck Gascoin, Ensicaen University of Caen

2:00 PM Invited
Structural Studies and High Performance on Mg2Si-based Ternary and Quaternary Materials for Thermoelectric Power Generation: Theodora Kyратzή; 1University of Cyprus

2:20 PM Invited
Synthesis of Higher Manganese Silicide via Low Energy Ball Milling and Reactive Sintering: Franck Gascoin1; CRISMAT Laboratory

2:40 PM Invited
Exploring the Role of Disorder in Discovering New Materials: Entropy Stabilized Oxides: Stefano Cartarolo2; Jon-Paul Maria3; 'Duke University; 'North Carolina State University

3:00 PM Invited
Perspectives for High Temperature Thermoelectrics: Takao Mori1; 'National Institute for Materials Science (NIMS)

3:20 PM Invited
Microstructure, Texture and Incommensurability of Higher Manganese Silicide: Stephane Gorsse1; Solange Vivès2; 'ICMCB-CNRS

3:40 PM Break

4:00 PM Invited
First-Principles Investigation on Improving Thermoelectric Materials: Lan Li1; Izaak Williamson2; 'Boise State University

4:20 PM Invited
Modeling the Properties of Thermoelectric Materials via First Principles Simulations: Philippe Jaud1; Kinga Niedziolka1; Patrick Hermet1; Jean-Claude Tédéac1; 'Montpellier University

4:40 PM Nanostucturing Silicon Base Materials and Its Impacts on the Thermoelectric Properties: Teruyuki Ikeda1; 'Baraki University

5:00 PM Invited
Crystal Chemistry, Phase Diagrams, and Thermoelectric Properties of the Ca-M-Co-O (M=Sr, Zn, La, Nd, and Sm) Systems: Winnie Wong-Yu1; William Law2; Guangyao Liu3; Qing Huang3; Yonggao Yan4; Joshua Martin5; James Kaduk1; 'NIST; 'China University of Geosciences; 'Wuhan University of Technology; 'Illinois Institute of Technology

5:20 PM The Ga and In Coupling Effects in the Doping of the CoSb3 Compound: Pe-Hun Lin1; Sinn-wen Chen2; Ssu-ming Tseng3; Yinghu Tang4; G. Jeffrey Snyder5; 'National Tsing Hua University; 'Materials Science, California Institute of Technology; 'Department of Materials Science and Engineering, Northwestern University

Alumina & Bauxite — Bauxite and Alternative Raw Materials
Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Paul McGlade, GHD

Monday PM  Room: 203A  Location: Music City Center
Session Chair: Natasha Haggard, Bechtel

2:00 PM Introductory Comments

2:05 PM An Improved Lime Sinter Process to Produce Al2O3 from Low-grade Al-containing Resources: Yongpan Tian1; Xiaolin Pan2; Huiyan Ju3; Yuejiao Han4; Ganfeng Tu5; Shiwen Bi6; 'Northeastern University

2:30 PM Investigation of Flotation Behaviors of Refractory High Silica Bauxite: Guihong Han1; Lulu Liu2; Yanfang Huang3; Shuzhen Yang1; Dianyuan Dang1; 'Zhengzhou University

2:55 PM Break

3:15 PM Study on Effective Extraction of Al and Fe from High-iron Bauxite through ‘Calcification-carbonization’ Method: Zhang Weiguang1; Zhang Ting-an2; Lv Guozhi2; Zhang Xuhua2; Zhu Xiaofeng2; Wang Yanxiu2; Wang Long1; 'Northeastern University

3:40 PM Ways to Improve of Aluminium Content Raw Material Treatment by Sintering Method: I. J. Lipić1; Vladimir Kazakov2; 'Saint Petersburg State Polytechnical University

Aluminum Alloys, Processing and Characterization — Alloy Development and Applications
Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Steven Long, Kaiser Aluminum Corporation

Monday PM  Room: 201B  Location: Music City Center
Session Chair: Zhengdong (Steven) Long, Kaiser Aluminum

2:00 PM Introductory Comments

2:05 PM Characterization of Near-Net Shape Castable Rare Earth Modified Aluminum Alloy for High Temperature Application: Zachary Sims1; Orlando Rios2; 'Oak Ridge National Laboratory

2:30 PM On the Effects of Alloying Element Range on the Mechanical Properties of Recycled Aluminum Alloy EN AB-46000: Izudin Dugic1; Felix Henriksson1; Conrad Strebel1; Ozkan Kosmaz2; Salem Seifeddine1; 'Linnaeus University

2:55 PM Phase and Thermal Stability Analysis of Al-Fe-V-Si-Y Alloys After Solidification at Intermediate Cooling Rates: Ryan Marshall1; Robert Field2; Krish Krishnamurthy2; Michael Kaufman1; 'Colorado School of Mines; 'Honeywell

3:20 PM Break

3:35 PM Microstructure and Phase Evolution in A201 Alloys with Additions of Si: Suan Abd El Majid1; Menachem Bamberger2; Alexander Katsman3; 'Technion
4:00 PM  High Temperature Creep Evolution in Al-Si Alloys Developed for Automotive Powertrain Applications - A Neutron In-situ Study on hkl-plane Creep Response: 
Dmitry Sediako1; Wojciech Kasprzak2; Frank Czerwinski3; Ahmed Nabawy4; Amir R. Farkooshi5; ‘Canadian Nuclear Laboratories; ‘CanmetMATERIALS; ‘McGill University

Aluminum Reduction Technology — Cell Technology & Design
Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Stephan Broek, Hatch Ltd
Monday PM  Room: 202C  Location: Music City Center
10:00 AM  Introductory Comments
10:05 AM  Conception of a “Dream Cell” in Aluminium Electrolysis: 
Peter Poljakov1; Andrey Kluchantsiev2; Andrey Yasinsky1; Yury Popov3; 1Siberian Federal University; 2LLC ETC RUSAL; 3Light Metals Ltd

Technical Program

10:30 AM  The Impact of the Cavity on the Top Heat Losses in Aluminium Electrolysis
Cells: Francois Allard1; Martin Désilets1; Marc LeBreux2; Alexandre Blais1; 1Université de Sherbrooke; 2Rio Tinto Alcan

10:55 AM  Rio Tinto AP44 Cell Technology Development at Alma Smelter: Pascal Thibeault1; Louis Guimond2; Herve Mezin2; 1RioTinto Alcan

11:20 AM  Break

11:35 AM  Hydro’s Cell Technology Path towards Specific Energy Consumption below 12 kWh/kg: Martin Segatz1; Jorund Hop1; Pierre Reny1; Håvard Gikling1; 1Hydro Aluminium

4:00 PM  The Successful Implementation of DUBAL DX+ Technology at EMAL: 
Michel Reverdy1; Sajid Hussain2; Qassim Galadari3; Jean-Luc Faoudou1; Abdalla Al Zarouni1; Nadia Ahli1; Ibrahim Al Ali1; Shaikha Al Shehhi1; Bijan Malladeh1; Muna Abdulla1; Vinod Nair1; 1Emirates Global Aluminium (EGA)

Biological Materials Science Symposium — Biomaterials I
Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Francois Barthelat, McGill University; Kajal Katti, North Dakota State University; Paul Allison, University of Alabama; Rajendra Kasinath, DePuy Synthes Products, LLC
Monday PM  Room: 207A  Location: Music City Center
2:00 PM Invited
Biomimetic Hard-to-Soft Interfaces: Guiding Osteogenesis to Infection
Free Implants: Candan Tamerler1; 1University of Kansas

2:40 PM  Biomimetic Remineralization Strategies towards Novel Dental Health Care: Mehmet Sarikaya1; Hanson Fong1; Candan Tamerler2; Sami Dogan3; 1University of Washington; 2University of Kansas

3:00 PM  Chemotherapeutic-Induced Surface Degradation of Subcutaneous Venous Access Ports - A Preliminary Comparative In-Vitro and In-Vivo Study: Maren Kirknes Fossum1; Charlotta Tegnestedt2; Kristina Dahlberg2; Emma Strömberg3; Javier Sanchez1; Hakan Wallen1; Annelie Liljegren1; Claes Frostell1; Gunilla Björling2; Ragnhild E. Aune3; 1Norwegian University of Science and Technology (NTNU); 2The Swedish Red Cross University College; 3Stockholm South General Hospital; 4KTH-Royal Institute of Technology; 5Karolinska Institutet

3:20 PM Break

3:40 PM  Electrochemical Properties of Microarc Oxidation Coating on Biocompatible Magnesium Alloy: Jing Zhang1; Jiyang Liu2; Zhe Lu2; Yeon-Gil Jung3; Chengyun Ning3; 1Indiana University - Purdue University Indianapolis; 2Changwon National University; 3South China University of Technology

4:00 PM  Biochemical Characterisation of Rhizophora mangle L. Leaf: Prospect as a Natural-Green Inhibitor of Steel-Rebar Corrosion in Marine/Saline Service-Environment: Joshua Okeniyi1; Olubanke Ogunlana2; Elizabeth Okeniyi1; Taiwo Owoeye1; Oluseyi Ogunlana1; 1Covenant University, Ota, Nigeria; 2Crawford University, Igbesa, Nigeria

Bulk Metallic Glasses XIII — 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; Yefei Gao, University of Tennessee; Jianzhong Jiang, Zhejiang University; Gongyao Wang, Alcoa Technical Center
Monday PM  Room: 101E  Location: Music City Center
2:00 PM Keynote
Production of Amorphous Materials by Supersonic Spray Drying: Esther Amstad1; David Wetz2; Frans Spaepen3; 1Harvard School of Engrg & Appl Sciences

2:30 PM  Dissolution of Low Solubility Elements during Arc Melting: Scott Roberts1; Douglas Hofmann2; 1JPL

2:50 PM  Invited
Consolidation of Blended Powders by Severe Plastic Deformation to Form Amorphous Metal Matrix Composites: Saveen Mathaudhu1; K. Theodore Hartwig2; Ibrahim Karaman1; 1University of California Riverside; 2Texas A&M University

3:15 PM  Invited
Variations in Glass Transition during Vitrification: Chae Woo Ryu1; Eun Soo Park2; Guen Woo Lee3; Andreas Meyer3; 1Seoul National University; 2Korea Research Institute of Standards and Science; 3Deutsches Zentrum für Luft- und Raumfahrt (DLR)

3:35 PM  A Novel Technique for Thermoplastically Forming Functional BMG Parts with Complex 3D Geometries and Multi-scale Features: Phil Meagher1; David Jarvis2; Wayne Voice2; David Browne1; 1University College Dublin; 2European Space Agency
3:55 PM Break

4:10 PM

Bulk Metallic Glasses Composites Produced via Severe Plastic Deformation: Lisa Kraemer1; Verena Maier1; Karoline Kornout1; Daria Setman1; Yannick Champion1; Reinhard Pippan1; ‘Erich Schmidt-Institute of Materials Sciences, Austrian Academy of Sciences; ‘Physics of Nanostructured Materials, Faculty of Physics, University of Vienna; ‘Institut de Chimie et des Matériaux Paris-Est, Université Paris-Est Créteil

4:30 PM Invited

Porous Bulk Metallic Glasses for Application as Biomedical Materials: Guoqiang Xie1; Fengxiang Qin1; Ichiro Seki1; Wei Wang2; ‘Tohoku University; ‘Tokyo Medical and Dental University

4:50 PM

Glass-forming Ability and Mechanical Properties of a Zr52.8Cu29.1Ni7.3Al9.8Y1 Bulk Metallic Glass Prepared by Hereditary Process: Shuaidan Lu1; ‘Northeastern University

5:10 PM

High Density Ni-based Metallic Glasses Formed by Spark Plasma Sintering: Henry Neilson1; Alex Petersen2; Joseph Poone2; Gary Shiflet2; John Lewandowski2; ‘Case Western Reserve University; ‘University of Virginia

Bulk Processing of Nanostructured Powders and Nanopowders by Consolidation — Session II

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

Program Organizers: Deliang Zhang, Shanghai Jiao Tong University; Bowen Li, Michigan Technological University; Stephen Mashl, Michigan Technological University

Monday PM

Room: 210

Location: Music City Center

Session Chairs: Zhiqiang Li, Shanghai Jiao Tong University; Jürgen Eckert, IFW Dresden

2:00 PM Keynote

Bulk Processing of Nanostructured Advanced Materials: J. Eckert1; R.N. Shahid1; P. Wang1; K. G. Prashanth1; M. Stoica1; S. Scudino1; Deliang Zhang1; ‘IFW Dresden; ‘Shanghai Jiao Tong University

2:40 PM Invited

Bulk Nanostructured Al Synthesized by Consolidation of Al Nanopowders: Yaojun Liu1; Xuejian Liu1; Bocong Xu1; ‘Wuhan University of Technology; ‘Yanshan University

3:10 PM Invited

Bulk Nano Materials with Exceptional Properties Developed by High Energy Ball Milling and Spark Plasma Sintering: Srinivasa Marty Budaraju1; ‘IIT Madras

3:40 PM Break

4:00 PM

Processing of Steel-magnesium Composites by Compaction of Mg Powders through Severe Plastic Deformation: Xavier Sauvage1; Julien Nguyen1; Olivier Bouazziz1; ‘University of Rouen, CNRS; ‘LEM3 - University of Loraine

4:20 PM

Dynamic Cu Grain Growth of Mechanically Milled Nanostructured Cu-5vol.%Al2O3 Powder Particles during Hot Extrusion: Dengshan Zhou1; Deliang Zhang1; Paul Munroe2; Charlie Kong1; Wei Zeng1; ‘Shanghai Jiao Tong University; ‘University of New South Wales

4:40 PM

Shock Wave Consolidation of Hierarchical Copper Powders Consisting of Nano/ultrafine Particles and Micro Agglomerates, and the Mechanical Properties of Synthesized Bulk: Dong-Hyun Ahn1; Wooyeol Kim1; Lee Ju Park1; Hyoung Seop Kim2; ‘POSTECH; ‘Agency for Defense Development (ADD)

Cast Shop Technology: An LMD Symposium in Honor of Wolfgang Schneider — Direct Chill Casting

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

Program Organizer: Mohamed Hassan, Masdar Institute of Science and Technology

Monday PM

Room: 202A

February 15, 2016

Location: Music City Center

Session Chair: Matthew Krane, Purdue University

2:00 PM Introductory Comments

2:05 PM Keynote

35 Years of Contributions to Cast Shop Research and Development — Honoring Prof. Dr. Wolfgang Schneider: Gerd-Ulrich Gruen1; ‘Hydro Aluminium Rolled Products GmbH

2:25 PM

Effect of Liquid Metal Distribution on the Flow Field and Macrosegregation during Direct Chill Casting of Aluminum Alloy 7050: John Coleman1; Kyle Fezi1; Matthew Krane1; ‘Purdue University

2:50 PM

Aluminum Billets D.C. Casting: Level-pour vs. Fall-pour: A Techno-historical Approach: Plácido García Pérez1; ‘Civil and Environmental Engineering, Universidad de Santiago de Chile

3:15 PM

Hot Tearing in DC Casting Ingot of 7XXX Aluminum Alloys: Nobukito Sakaguchi1; ‘UACJ Corporation

3:40 PM Break

3:55 PM

Initial Development of Micro-Shrinkage Crack during Early Stages of Direct Chill Casting of Al-4.5%Cu Alloy: Mostafa El-Bealy1; ‘Clausthal University of Technology

4:20 PM

Successful Implementation of a New Rolling Slab Casting Technology, AFM, within Hydro: Arild Hakonsen1; Terje Iveland1; Magne Boge1; Stian Rørvik1; ‘Hyecast AS; ‘Hydro Aluminium

4:45 PM

Uncertainty Propagation in Numerical Modeling of Direct Chill Casting: Kyle Fezi1; Matthew Krane1; ‘Purdue University

5:10 PM

The Study Conditions Occurrence of Hot Tearing in the Billets Alloy EN AW6060 Produced with the Process of Direct Chill Casting: Ivica Buljeta1; Ana Beroš1; Zdenka Brodarac2; ‘Faculty of Metallurgy and Materials Science; ‘University of Zagreb, Faculty of Metallurgy
CFD Modeling and Simulation in Materials Processing — Microstructure Evolution

**Sponsored by:** TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

**Program Organizers:** Laurens Nastac, The University of Alabama; Lifeng Zhu, Northeastern University; Andreas Ludwig, Montana State University; Hervé Combeau, Université de Lorraine Nancy

**Monday PM  Room: 207D  Location: Music City Center**

**Session Chairs:** Hervé Combeau, École des Mines Nancy; Miaoyong Zhu, The Northeastern University

2:00 PM Invited

**Microporosity Prediction in Aluminum DC Casting:** Laurent Heyvaert1; Hervé Combeau2; Miha Založnik3; Philippe Jarry2; Emmanuel Waz2; 1Institut Jean Lamour; 2ICTEC, Constellium Technology Center

2:25 PM

**Simulation of Structure Evolution of 2-D Liquid Metal Using a Lattice Boltzmann Front Tracking Method:** Zhaokun Cao; Yang Yu1; Hongjie Luo; Cong Wang1; 1Northeastern University, China

2:45 PM

**Modeling the Multicomponent Columnar-to-Equiaxed Transition of Alloy 625:** Kyle Ffeit1; Matthew Krane1; 1Purdue University

3:05 PM

**Validation of a Model for the Columnar to Equiaxed Transition with Melt Convection:** Mahdi Torabi Rad; Christoph Beckermann1; 1University of Iowa

3:25 PM

**Performance Optimization and Evaluation of a 3D CA-FVM Model for Dendritic Growth of Fe-C Alloy:** Weiling Wang2; Sen Luo1; Miaoyong Zhu1; 1Northeastern University

3:45 PM Break

4:05 PM

**Multiscale Modeling of the Solidification Structure Evolution of Continuously Cast Steel Blooms and Slabs:** Laurentiu Nastac2; Pilvi Oksman1; Mikko Kärkkäinen1; Seppo Louhenkilpi1; 1The University of Alabama; 2Aalto University

4:25 PM

**Simulation of Flows and Instabilities during Crystal Growth via the Traveling Heater Method:** Jeff Peterson1; Jeffrey Derby2; 1University of Minnesota

4:45 PM

**Prediction of Microstructure Evolution of Hot Forged AISI 4140 Steel by Numerical Simulation:** Tiago Colombo1; Alberto Brito2; Lirio Schaeffer3; 1Universidade Federal de Rio Grande do Sul

5:05 PM

**Numerical Simulation of Dendritic Growth of Fe-C Binary Alloy with Natural Convection:** Sen Luo1; Weiling Wang1; Miaoyong Zhu1; 1Northeastern University

5:25 PM

**Localized Strengthening of Al-based Alloys by Automatized Optimization of Laser Heat Treatment:** Andreas Ludwig1; Tobias Holzmann1; 1University of Leoben

5:45 PM

**Understanding Freeze Casting Solidification Process:** Santiago Gil-Duran1; Edgar Alexander Ossa Henao1; 1Universidad EAFIT

Characterization of Minerals, Metals, and Materials — Minerals

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

**Program Organizers:** Shadia Ikhamayely, Al Isra University; Bowen Li, Michigan Technological University; John Carpenter, Los Alamos National Laboratory; Jiaan-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Jian Li, CanmetMATERIALS; Donato Ferrao, Politecnico di Torino - DISAT; Mingming Zhang, ArcelorMittal Global R&D; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Chenguang Bai, Chongqing University

**Monday PM  Room: 102B  Location: Music City Center**

**Session Chairs:** Bowen Li, Michigan Technological University; Zhiwei Peng, Central South University

2:00 PM

**Characterization of Magnesite from Tsakasimptah Nigeria for Glass Making:** Zainab Aliyu1; Adele Garkida1; Edwin Ali1; Muhammad Dauda1; 1Ahmadu Bello University

2:20 PM

**High Temperature Thermal Analysis and Calorimetry Applied to the Characterization and Thermodynamic Studies of Feldspars and Feldspathoids:** Kristina Lilova1; Link Brown1; 1Setaram Inc.

2:40 PM

**Study On Coal Minerals Phase Transformations under Different Coking Conditions:** Qi Shuo1; Zheng Shengfu2; Zhang Pengqi2; Qiu Guibao2; Zhang Qingyun3; 1Chongqing University

3:00 PM

**Electrical Effect and Influence Factors of Tourmaline:** Qi Lu2; Bowen Li1; Feng Bai1; 1China University of Geosciences; 2Michigan Technological University

3:20 PM Break

3:35 PM

**Wettability of Pyrolytic Graphite by Molten Blast Furnace Slag Bearing TiO2:** Yanhui Liu1; Xuewei Lv1; Chenguang Bai1; Baohua Li1; 1School of Materials Science and Engineering, Chongqing University

3:55 PM

**Dielectric Properties and Microwave Heating Characteristics of Nickel-copper Ore:** Liu Chenhui1; Inhui Peng1; TianCheng Liu1; Junming Guo1; 1Yunman Minzu University; 2Yunman Minzu University

4:15 PM

**Evaluation of White Bentonite Modified by Acid Attack:** Cristiano Giansi Bastos Andrade1; Danilo Marin Fermino1; Marcos Fernandes Gonza; Francisco Rolando Valenzuela Diaz1; 1University of Sao Paulo
Characterization of Minerals, Metals, and Materials — Processing and Corrosion

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

Program Organizers: Shadiia Ikhmayies, Al Ira University; Bowen Li, Michigan Technological University; John Carpenter, Los Alamos National Laboratory; Jiann-Yang Hwang, Michigan Technological University; Sergio Monteiro, Military Institute of Engineering; Jian Li, CanmetMATERIALS; Donato Frraro, Politecnico di Torino - DISAT; Mingming Zhang, ArcelorMittal Global R&D; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Chenguang Bai, Chongqing University

Monday PM  Room: 103A  Location: Music City Center

Session Chairs: Jian Li, CanmetMATERIALS; Prathmesh Joshi, Visvesvarayya National Institute of Technology (V.N.I.T.)

2:00 PM
Characterization of Iron Oxide Scale Formed in Naphthenic Acid Corrosion: Peng Jin1; Winston Robbins2; Gheorghe Bota3; Srdjan Nesic4; 1Institute for Corrosion and Multiphase Technology (ICMT), Ohio University

2:20 PM
Transport of Chloride Ions through Modulated Concrete Microstructures: Batric Pestic1; 1University of Idaho

2:40 PM
Effect of Cold Work on the Corrosion Resistance of an Austenitic Stainless Steel: Jian Li5; Pei Liu6; 1CanmetMATERIALS

3:00 PM
Microstructural Evolution of Single Ni2TiAl or Hierarchical NiAl/ Ni2TiAl Precipitates in Fe-Ni-Al-Cr-Ti Ferritic Alloys during Thermal Treatment: Gian Song1; Yanfei Gao1; Zhiqian Sun1; Jonathan Poplawsky1; Peter Liaw1; 1University of Tennessee, Knoxville; 2Oak Ridge National Laboratory

3:20 PM
The Chemical Composition and Micro-mechanical Properties of Cooling γ’ Precipitates in a Polycrystalline Nickel Alloy: Muzi Li1; Fiorn Dunne1; Barbara Shollock1; 1Imperial College London

3:40 PM  Break

3:55 PM
Ferronickel Preparation from Nickeliferous Laterite by Rotary Kiln-electric Furnace Process: Guanghui Li1; Hao Jia1; Jun Luo1; Zhiwei Peng1; Yuanbo Zhang1; Tao Jiang1; 1School of Minerals Processing and Bioengineering, Central South University

4:15 PM
Characterization of Copper-Manganese-Aluminum-Magnesium Mixed Oxysyroxide and Oxide Catalysts for Redox Reactions: Arnab Baks1; David Cocco1; Andrew Gomes1; John Gossage1; Mark Riggs2; Gary Beall2; Hylton McWhinney3; 1Lamar University; 2Texas State University; 3Prairie View A&M University

4:35 PM
Pyrolysis of Active Fraction of Humic Substances-based Binder for Iron Ore Pelletizing: Guishong Han1; Dao Zhang1; Yanfang Huang1; Longjie Xing1; Lulu Liu1; Wencui Chai1; Tao Jiang1; 1Zhengzhou University; 2Central South University

4:55 PM
Determination of Processing-Microstructure-Relationships in SPD-Processed 316L SS using Nano-Scale Resolution Automated Crystal Orientation Mapping in the TEM: Mauricio Gondillo1; Jörg Wiezorek1; 1University of Pittsburgh

5:15 PM
Stamping Versus Wire Electrical Discharge Machining (WEDM) of HIPERCO® 50 Alloy Laminates – A Comparative Study of Their Magnetic Properties and Cut-edge Characteristics: Tanjore Jayaraman1; 1Carpenter Technology Corporation

Computational Materials Engineering for Nuclear Reactor Applications — Zirconium Cladding Behavior

Sponsored by: Program Organizers: Michael Tonks, Idaho National Laboratory; Julie Tucker, Oregon State University; Mark Tschopp, Army Research Laboratory; Richard Williamson, Idaho National Laboratory

Monday PM  Room: 101D  Location: Music City Center

Session Chair: To Be Announced

2:00 PM  Invited
An Overview of the Fuel, Materials and Chemistry Focus Area within the CASL Energy Innovation Hub: Chris Stanek1; 1Los Alamos National Laboratory

2:40 PM
Computer Modeling of Hydrogen and Oxygen Transport during Zirconium Corrosion: Xian-Ming Bai1; Yongfeng Zhang1; Michael Tonks1; 1Idaho National Laboratory

3:00 PM
Molecular Dynamics Simulations on Homogeneous Hydride Nucleation in Alpha-Zr: Yongfeng Zhang1; Xianming Bai1; Jianguo Yu1; Michael Tonks1; 1Idaho National Lab

3:20 PM  Break

3:40 PM
Stochastic Modeling of the Corrosion of Zirconium and Its Alloys: Theory and Application to Autoclave Corrosion: William Howland1; 1Bechtel Marine Propulsion Company

4:00 PM  Invited
Coupled Micro/Meso/Macro Modeling of the Crud Source Term in Light Water Reactors: Penghui Cao1; Michael Short1; Derek Gaston1; Daniel Wells1; 1MIT; 2Electric Power Research Institute (EPRI)

4:40 PM
Coupled PWR Oxidation Modeling with the HOGNOSE Code: Andrew Dykhuis1; Michael Short1; 1Massachusetts Institute of Technology

5:00 PM
Multiscale Modeling of the Coherency Loss of Hydrides in 945Zr: Marc-Antoine Louchez1; Guy Oum1; Ludovic Thibaut1; Rémy Besson1; Alexandre Legris1; 1Université de Lille

5:20 PM
Validation of BISON Calculation of Hydrogen Distribution by Comparison to Experiment: Evrard Lacroix1; Arthur Motta1; 1Pennsylvania State University
Computational Methods for Spatio-temporal Scale-bridging: from Atomistics to Mesoscale — Scale-Bridging Methods for Plasticity

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

**Program Organizers:** Danny Perez, Los Alamos National Laboratory; Dallas Trinkle, University of Illinois, Urbana-Champaign; Maryam Ghazisaeidi, Ohio State University; Srujan Rokkam, Advanced Cooling Technologies, Inc.

**Monday PM  Room:** 209A

**February 15, 2016  Location:** Music City Center

**Session Chairs:** Carlos Tome, Los Alamos National Laboratory; Maryam Ghazisaeidi, Ohio State University

2:00 PM  Invited

**A Quantized Crystal Plasticity Model for Nanocrystalline Metals: Connecting Atomistic Simulations and Physical Experiments:** Lin Li1; Paul Christodoulou2; Peter Anderson2; 1University of Alabama; 2The Ohio State University

2:20 PM  Invited

**A Systematic Framework for Predicting Twinning in Hexagonal Close-packed Materials:** Dingyi Sun1; Mauricio Ponga1; Kaushik Bhattacharya2; Michael Ortiz2; 1California Institute of Technology

2:40 PM  Invited

**Atomistic Modeling at Experimental Strain Rates and Time Scales:** Harold Park1; 1Boston University

3:10 PM  Break

3:30 PM  Invited

**Coarse-grained Models for Reducing Complexity in the Description of Crystal Plasticity:** Roman Groger1; 1Academy of Sciences of the Czech Republic

5:00 PM  Invited

**The Strength and Deformation Behavior of Nickel Based Superalloy Microcrystals through Discrete Dislocation Dynamics Simulations:** Ahmed Hussein1; Satish Rao2; Triplicane Parthasarathy3; Jaafar Elawady4; Michael Uchic5; 1Johns Hopkins University; 2EPFL; 3UES Inc.; 4WPAFB

5:20 PM  Invited

**Evaluation of Strain Localizations on AA-7050 Using CP-FFT and EBSD:** Andrea Nicolas1; Alberto Mello2; Michael Sangid3; 1Purdue University

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Computational Methods for Uncertainty Quantification, Model Validation, and Stochastic Predictions — Empirical Interatomic Potentials: Development and Validation

**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; Richard Hennig, University of Florida; Mark Tschopp, Army Research Laboratory; Li Ma, NIST

**Monday PM  Room:** 207C

**February 15, 2016  Location:** Music City Center

**Session Chair:** To Be Announced

2:00 PM  Invited

**Advancements in Methods for Materials Discovery and Validation:** Susan Sinnott1; 1Penn State University

2:30 PM  Invited

**Atomistic Study of Carbon Nanotubes: Effect of Cut-off Distance:** S. Thamaraikannan1; S.C. Pradhan2; 1Department of Aerospace Engineering, Indian Institute of Technology Kharagpur

2:50 PM  Invited

**Database Optimization for Empirical Interatomic Potentials:** Pinchaos Zhang1; Dallas Trinkle1; 1University of Illinois, Urbana-Champaign

3:20 PM  Break

3:40 PM  Invited

**Development of the ReaxFF Force Field for Complex Materials and Interfaces:** Adri van Duin1; Weiwei Zhang1; Yun-Kyung Shin1; Sungwook Hong1; Jeoon Yeon1; Metin Aktulga1; 1Penn State; 2Michigan State University

4:30 PM  Invited

**Quantifying Model-Form Uncertainty in Molecular Dynamics Simulation:** Anh Tran1; Yan Wang1; 1Georgia Institute of Technology

4:50 PM  Invited

**Using Correlations between Materials Properties in Potential Development Procedure for Metals:** Mikhail Mendelev1; 1Ames Laboratory

5:20 PM  Invited

**MEAM Potential for Boron Suboxide (B6O):** Mehul Bhatia1; Kiran Solanki1; Mark Tschopp2; 1Arizona State University; 2U.S. Army Research Laboratory,
Computational Thermodynamics and Kinetics — Defect Thermodynamics and Diffusion II  
**Sponsored by:** TMS Structural Materials Division, TMS Functional Materials Division, TMS: Chemistry and Physics of Materials Committee  
**Program Organizers:** Dane Morgan, University of Wisconsin - Madison; Shawn Coleman, U.S. Army Research Laboratory; Xiang-Yang Liu, Los Alamos National Lab; Chris Wolverton, Northwestern University  
Monday PM  Room: 208B  
February 15, 2016  Location: Music City Center  
**Session Chairs:** Nicole Benedek, Cornell University; Henry Wu, University of Wisconsin - Madison  

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<tr>
<td>2:00 PM</td>
<td>Invited Engineering High and Constant Cation Diffusivity in Oxides through Percolation Theory</td>
<td>Gerbrand Ceder1; Jinhyk Lee2; Alex Urban2; 1University of California, Berkeley; 2MIT</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Cation Diffusion Path in Ionic Structures — A Pathfinder Algorithm to Precondition NER Calculations and a Fast Approximate Barrier Calculation Method</td>
<td>Zaqin Rong1; Daniil Kitchaev1; Pieremanuele Canepa1; Gerbrand Ceder1; 2MIT</td>
</tr>
<tr>
<td>2:50 PM</td>
<td>Fast Li-ion Transport Kinetics in LiBH4-based Solid-state Electrolytes</td>
<td>Zhenpeng Yao1; Kyle Michel1; Yongsheng Zhang1; Christopher Wolverton1; 1Northwestern University</td>
</tr>
<tr>
<td>3:10 PM</td>
<td>The Role of Grain Boundaries for Lithium Diffusion in Graphite</td>
<td>Christopher Shumeiko1; Edmund Webb2; Garrit Tucker2; 2Lehigh University; 1Drexel University</td>
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<td>3:50 PM</td>
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<td>3:50 PM</td>
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<tr>
<td>4:20 PM</td>
<td>Enhancement of Ionic Transport in Complex Oxides through Soft Lattice Modes and Epitaxial Strain</td>
<td>Nicole Benedek1; 1Cornell University</td>
</tr>
<tr>
<td>4:40 PM</td>
<td>Kinetics Investigation of Titanium-Based Multicomponent Systems Using Liquid-Solid Diffusion Couples</td>
<td>Zhi Liang1; Changdong Wei1; Alan Luo1; Ji-Cheng Zhao1; James Williams1; Anil Sachdev2; 1The Ohio State University; 2General Motors</td>
</tr>
<tr>
<td>5:00 PM</td>
<td>Molecular Dynamics Study of Unexpected, Anisotropic Diffusion through Nickel-based Alloys and Oxides</td>
<td>Penghui Cao1; Michael Short1; Daniel Wells2; 1Massachusetts Institute of Technology; 2Electric Power Research Institute</td>
</tr>
<tr>
<td>5:20 PM</td>
<td>Effect of Solute Atoms on Dislocation Motion in Mg: An Electronic Structure Perspective</td>
<td>Tomohito Tsu1; Daryl Chrzan2; 1Japan Atomic Energy Agency; 2University of California Berkeley</td>
</tr>
<tr>
<td>5:40 PM</td>
<td>Numerical Analysis Evaluation of Solutions to the Diffusion Equation for Binary Interdiffusion Situations</td>
<td>Irina Belova1; Tanvir Ahmed1; 1University of Newcastle</td>
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</tbody>
</table>

Driving Discovery: Integration of Multi-Modal Imaging and Data Analysis — Session II  
**Sponsored by:** TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee  
**Program Organizers:** Charudatta Phatak, Argonne National Laboratory; Doga Gursoy, Argonne National Laboratory; Emine Gulsoy, Northwestern University; Yang Jiao, Arizona State University  
Monday PM  Room: 102A  
February 15, 2016  Location: Music City Center  
**Session Chair:** Charudatta Phatak, Argonne National Laboratory  

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<th>Time</th>
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<th>Authors</th>
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<tr>
<td>2:00 PM</td>
<td>Invited Neutrons, Materials and Data Challenges: Thomas Proffen1; 1Oak Ridge National Laboratory</td>
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<td>2:30 PM</td>
<td>Methodology for Reconstruction of Samples Analyzed with Simultaneous Neutron and X-ray Imaging: Jacob LaManna1; Daniel Hussey1; Eli Baltic1; David Jacobson1; 1National Institute of Standards and Technology</td>
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<td>2:50 PM</td>
<td>Invited Real Time Analysis, Interpretation and Experimental Steering for Electron Microscopy: Kerstin Kleese van Dam1; 1Pacific Northwest National Laboratory</td>
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<td>3:20 PM</td>
<td>Break</td>
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<td>3:40 PM</td>
<td>Invited Bingham Mixture Model for Efficient Microtexture Estimation from Discrete Orientation Data: Stephen Nieszgoda1; Eric Magnuson1; 1The Ohio State University</td>
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<td>4:10 PM</td>
<td>Modeling Multi-modal Images of Photocatalysis on Cu2O: Liang Li1; Yimin Wu1; Yuzi Liu1; Jeffrey Guest1; Tijana Rajh1; Ian McNulty1; Zhonghou Cai1; Maria Chan1; 1Argonne National Laboratory</td>
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<td>4:30 PM</td>
<td>Invited Recognizing Patterns from Experimental Data: Daniela Ushizima1; 1Lawrence Berkeley National Laboratory</td>
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<td>5:00 PM</td>
<td>Structure Quantification, Property Prediction and 4D Reconstruction Using Limited X-ray Tomography Data: Hechao Li1; Somya Singh1; C. Kaira1; James Mertens1; Nikhilesh Chawla1; Yang Jiao1; 1Arizona State University</td>
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<td>5:20 PM</td>
<td>Error Analysis of Near-field High Energy Diffraction Microscopy: David Menasche1; Paul Shade; Robert Suter1; 1Carnegie Mellon University</td>
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Electrode Technology — Electrode Materials and Characterization  
**Sponsored by:** TMS Light Metals Division, TMS: Aluminum Committee  
**Program Organizer:** Angelique Adams, Alcoa Inc  
Monday PM  Room: 202B  
February 15, 2016  Location: Music City Center  
**Session Chair:** Marvin Lubin, Rain CII Carbon  

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<th>Time</th>
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<td>2:00 PM</td>
<td>Introductory Comments</td>
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<td>2:10 PM</td>
<td>Characterization of Carbon Anode Materials by Image Analysis: Xianai Huang1; Duygu Kocaefe1; Dipankar Bhattacharay1; Yasar Kocaefe1; Brigitte Morais1; 1University of Quebec at Chicoutimi; 2Aluminerie Alouette Inc.</td>
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2:35 PM
Electrochemical Reactivity and Wetting Properties of Anodes Made from Anisotropic and Isotropic Cokes: Camilla Sommerseth1; Rebecca Thorne2; Arne Ratvik1; Espen Sandnes1; Stein Ratvik1; Lorentz Lossius1; Hogne Linga1; Ann Svensson1; 1Norwegian University of Science and Technology, NTNU; 2Norsk Institutt for Luftforsking; 3SINTEF Materials and Chemistry; 4Hydro Aluminium AS

3:00 PM
Study of the Wetting of Coke by Different Pitches: Ying Lu1; Duygu Kocaefe1; Yasar Kocaefe1; Dipankar Bhattacharyay1; Xian-Ai Huang2; Brigitte Morais2; 1University of Quebec at Chicoutimi; 2Aluminerie Alouette Inc.

3:25 PM
Quantification of Sodium Present in Dry Aggregates and Anodes: Julie Burean1; Duygu Kocaefe1; Dipankar Bhattacharyay1; Yasar Kocaefe1; Brigitte Morais2; 1University of Quebec at Chicoutimi; 2Aluminerie Alouette Inc.

3:50 PM
Break

4:05 PM
Interfacial Boundary between Carbon Anodes and Molten Salt Electrolyte: Wojciech Gebarowski1; Camilla Sommerseth1; Arne Petter Ratvik1; Stein Ratvik1; Espen Sandnes1; Lorentz Petter Lossius1; Hogne Linga1; Ann Mari Svensson1; 1NTNU - Norwegian University of Science and Technology; 3SINTEF Materials and Chemistry; 4Hydro Aluminium AS

4:30 PM
Measurement of the Electric Current Distribution in an Anode: Marc-Alain Andoh1; Duygu Kocaefe1; Dipankar Bhattacharyay1; Yasar Kocaefe1; Daniel Marceau1; Brigitte Morais1; 1University of Quebec at Chicoutimi; 3SINTEF Materials and Chemistry; 4Hydro Aluminium AS

4:55 PM
Identifying Alternative Formulations for Transient Liquid Phase Bonding: John Holaday1; Carol Handwerker2; 1Purdue University; 2MIT

5:45 PM
Wafer Level Au-Sn TLP Bonding from Eutectic Composition: Serkan Yilmaz1; Eypu Can Demir1; Oguzhan Temel1; Tayfun Akin1; Even Kalay1; 1METU

Energy Technologies and Carbon Dioxide Management — Session II
Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS Energy Committee
Program Organizers: Li Li, Cornell University; Donna Guillen, Idaho National Laboratory; Neale Neelameggham; Ind LLC; Lei Zhang, University of Alaska Fairbanks; Jingxi Zhu, Carnegie Mellon University; Nawshad Haque, CSIRO; Dirk Verhulst, Consultant, Extractive Metallurgy; Soumendra Basu, Boston University; Tao Wang, Nucor Steel; Xuan Liu, Carnegie Mellon University

Monday PM Room: 104D
February 15, 2016 Location: Music City Center
Session Chairs: Cong Wang, Northeastern University; Zuotai Zhang, Peking University; Xuan Liu, Carnegie Mellon University

2:00 PM Invited
Heat Recovery from High Temperature Slags: Chemical Methods: Zuotai Zhang1; Yongqi Sun1; 1Peking University

2:30 PM Invited
Development of Fluorine-Free Mold Flux Based on CaO-SiO2-B2O3 Slag System: Lejun Zhou1; Wanhao Wang1; 1Central South University

3:00 PM
Corrosion Fatigue of X46Cr13 in CCS Environment: Anja Pfennig1; Marcus Wolf1; Thomas Böllinghaus1; 1HTW Berlin; 2BAM Federal Institute of Materials Research and Testing

3:20 PM
Power Generation by Organic Rankine Cycle from Low Temperature Waste Heat of Metallurgical Industry: Xu Zhang1; Hao Bai2; Bing Li2; Xin Zhang2; 1State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; 2China International Engineering Consulting Corporation

3:40 PM Break
Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — 3-D Effects of Microstructure on Fatigue Damage

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

Program Organizers: Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky; Ashley Spear, University of Utah

Monday PM  Room: 213
February 15, 2016  Location: Music City Center

Session Chair: Tongguang (Tony) Zhai, University of Kentucky

2:00 PM Invited
Federation of European Materials Societies (FEMS) International Scholar Presentation: Finite Element Simulations of Short Fatigue Crack Propagation in Three Dimensional Microstructures Obtained by X-ray Tomography: Henry Proudhon1; Jia Li1; Erembert Nizery1; Jean-Yves Buffiere2; Wolfgang Ludwig3; Samuel Forest1; ‘MINES ParisTech; ‘INSA Lyon

2:20 PM Invited
A 3-D Understanding of the Anisotropy in Fatigue Crack Nucleation in an AA7075 T651 Al Alloy Plate: Yan Jin1; Lin Yang1; Pei Cai1; Jiagang Xu1; Wei Sun2; Donovan Leonard3; Fuqian Yang1; Yang-Tse Cheng1; Tongguang Zhai1; ‘University of Kentucky; ‘Oak Ridge National Laboratory

2:40 PM Invited
How to Quantify the Grain Boundary Resistance against Slip Transfer Experimentally by Combination of Geometric and Stress Approach Using Stage-I-fatigue Cracks: Michael Marx1; Florian Schaefer1; Alain Knorr1; Christian Motz2; ‘Saarland University

3:00 PM
3D Characterization of the Propagation of Physically Small Fatigue Cracks in Forged High Strength Steels: Pablo Lorenzino1; Catherine Verdu1; Jean-Yves Buffiere1; ‘Univesite de Lyon INSA LYON

3:20 PM
Quantitative Effects of Texture and Grain Size on Short Fatigue Crack Growth in High Strength Al Alloys by a 3D Microstructural-based Model: Pei Cai1; Tongguang Zhai1; Yan Jin1; Wei Wen1; ‘University of Kentucky; ‘Novelis Global Research and Technology Center

3:40 PM Break

4:00 PM Invited
Understanding of Fatigue Crack Formation in Ni Superalloy with Inclusions Using HR-EBSD and HR-DIC: Jun Jiang1; Jie Yang2; Tianian Zhang1; Yu Wang3; Fionn Dunne1; Ben Britton1; ‘Imperial College London; ‘Beijing Institute of Aeronautical Materials; ‘Imperial College London; ‘Beijing Institute of Aeronautical Materials

4:20 PM Invited
TEM Studies of the Evolution of Dislocation Configurations under Cyclic Loading in Al Alloys: Ramasis Goriswami1; Chandra Pande1; ‘Naval Research Laboratory

4:40 PM
Fatigue in Titanium: Dislocation Mechanisms, Initiation, Hydrogen and Alpha2: David Dye1; Trevor Lindley1; Tamara Chapman1; Anna Radecka1; Edward Saunders1; Paul Bagot1; Adrian Walker1; Thomas Martin1; David Rugg1; ‘Imperial College; ‘Rolls-Royce; ‘Oxford University

5:00 PM
Dislocation Patterns under Cyclic Loading in Multiple Slip: Shengxu Xia1; Anter El-Azab1; ‘Purdue University

Frontiers in Solidification: An MPMD Symposium in Honor of Michel Rappaz — Microstructure I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Wilfried Kurz, EPFL; Jon Dantzig, EPFL and University of Illinois; Alain Karma, Northeastern University; Jeffrey Hoyt, McMaster University

Monday PM  Room: 105A
February 15, 2016  Location: Music City Center

Session Chairs: Ingo Steinbach, Ruhr-University Bochum; Peter Voorhees, Northwestern University

2:00 PM Invited
Phase-field Crystal Modeling of Crystal Nucleation Including Homogeneous and Heterogeneous Processes, and Growth Front Nucleation: Laszlo Granasz1; Frigyes Podmaniczky1; Gyula Toth1; ‘Wigner Research Centre for Physics

2:25 PM Invited
Multiscale Modeling of Columnar to Equiaxed Transition: Alain Karma1; Pierre-Antoine Geslin1; ‘Northeastern University

2:50 PM Invited
Dendrite Orientation Transitions in Al-Zn Alloys: Jon Dantzig1; Alexandre Durussel1; Michel Rappaz1; ‘University of Illinois; ‘Novelis Inc.; ‘EPFL

3:15 PM Invited
Phase-field Simulations of Dendritic Sidebranching in Three Dimensions: Mathis Plapp1; Alain Karma1; ‘CNRS/Ecole Polytechnique; ‘Northeastern University

3:40 PM Break

4:00 PM Invited
Evolution of the Specific Solid-liquid Interface Area in Directional Solidification: Christoph Beckermann1; Hieram Neumann-Heyme1; Kerstin Eckert1; ‘University of Iowa; ‘Technical University Dresden

4:25 PM Invited
Study of Solidification Phenomena Using Phase Field Crystal Models: Bernadine Jugdutt1; Nana Ofori-Opoku1; Harith Humadi2; Jeffrey Hoyt1; Nikolas Provatas1; ‘McGill University; ‘McMaster University
4:50 PM
Multi-scale Experiments and Modeling of Metal Alloy Solidification Dynamics: Amy Clarke1; Damien Tournet1; Seth Imhoff1; John Gibbs1; Younggil Song2; Alain Karma2; Kamel Fezzaa2; Paul Gibbs1; Daniel Coughlin1; John Roehling1; Joseph McKee2; Jon Kevin Baldwin1; 1Los Alamos National Laboratory; 2Northeastern University; 1‘Argonne National Laboratory; 2‘Lawrence Livermore National Laboratory

5:10 PM
Atomistic, Experimental and Simulation Investigation on the Modification of Al-Si Alloys: Jiehua Li1; Peter Schumacher1; 1University of Leoben

High-Temperature Systems for Energy Conversion and Storage — Recent Advancements in Solid Oxide Fuel Cell Technology I
Sponsored by: TMS Functional Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Amit Shyam, Oak Ridge National Laboratory; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory

Monday PM  Room: 104E
February 15, 2016  Location: Music City Center
Session Chairs: Paul Ohodnicki, NETL; Kathy Lu, Virginia Tech

2:00 PM Introductory Comments
2:05 PM Keynote
Department of Energy Office of Fossil Energy’s Solid Oxide Fuel Cells Program: Shailesh Vora1; 1U.S. Department of Energy

2:40 PM
A Thermodynamics and Density Functional Theory Based Approach to Design Alloys with Passivating Oxide Layer for Silver-free SOFC Braze Application: Tridip Das1; Quan Zhou1; Jason Nicholas1; Thomas Bieler1; Yue Qi1; 1Michigan State University

3:00 PM Invited
Perovskite-type Cathode Materials and Coatings for Solid Oxide Fuel Cells: Kathy Lu1; Kris Shen1; 1Virginia Tech

3:25 PM Break

3:45 PM Invited
Solid Oxide Fuel Cell - Energy Storage Hybrid Devices: Shriram Ramanathan1; 1Harvard Univ

4:10 PM Invited
Three-Dimensional Reconstruction of Solid Oxide Fuel Cell Electrodes: Mark De Guire1; Harshil Parikh1; Naima Hilli1; Arthur Heuer1; 1Case Western Reserve University

4:35 PM
High Temperature Electroceramic Oxide Based Nanomaterial Research and Development for Solid Oxide Fuel Cell and Embedded Sensing Applications: Paul Ohodnicki1; Kirk Gerdes1; Shiwoo Lee1; Harry Abernathy1; Yueling Fan1; Yuhua Duan1; Michael Buric1; Zsolt Poole1; 1National Energy Technology Laboratory

4:55 PM
Spark Plasma Sintering of Ceramic Composites for Solid Oxide Fuel Cell and Hydrogen Separation Applications: Kyle Brinkman1; Siwei Wang1; Yufei Liu1; Jian He1; Fanglin Chen2; 1Clemson University; 2University of South Carolina

Hume-Rothery Award Symposium:
Thermodynamics of Materials — Structure
Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee
Program Organizers: Ursula Kattner, National Institute of Standards and Technology; Michael Manley, Oak Ridge National Laboratory

Monday PM  Room: 107A
February 15, 2016  Location: Music City Center
Session Chairs: Beatriz Roldan Cuenya, Ruhr University Bochum; Raphael Hermann, Oak Ridge National Laboratory

2:00 PM Invited
Charting the Elastic Properties of Crystalline Inorganic Compounds: Maarten de Jong1; Wei Chen1; Tom Angsten1; Anthony Gamst1; Randy Notestine1; Gerbrand Ceder1; Kristin Persson1; Mark Asta1; 1University of California, Berkeley; 2‘Lawrence Berkeley National Laboratory; 3‘University of California, San Diego

2:30 PM Invited
Elasticity of Metallic Glasses, Crystals, and Glass Forming Liquids: William Johnson1; 1California Institute of Technology

3:00 PM Invited
Thermodynamic Properties and Vibrational Dynamics of Pt and Fe Nanoparticles: Size, Shape, Support, and Adsorbate Effects: Beatriz Roldan Cuenya1; 1Department of Physics, Ruhr University Bochum

3:30 PM Break

3:50 PM Invited
High-throughput Computational Search for Strengthening Precipitates in Alloys: Chris Wolverton1; 1Northwestern University

4:20 PM
First-principles Modelling of Grain Boundary Phase in Nd-Fe-B Permanent Magnet: Ying Chen1; Arkapol Saengdeejing1; Masashi Matsuura1; Satoshi Satoshi Sugimoto1; 1Tohoku University

4:40 PM Invited
Hydrides and Hydrogen Pipe Diffusion in Palladium: First Principles, Kinetic Monte Carlo, and Neutron Scattering: Dallas Trinkle1; Emily Schiavone1; Brent Heuser1; 1University of Illinois, Urbana-Champaign

5:10 PM
Ab-initio Modeling of Quasielastic Neutron Scattering of Hydrogen Pipe Diffusion in Palladium: Emily Schiavone1; Dallas Trinkle1; 1University of Illinois at Urbana-Champaign
ICME Infrastructure Development for Accelerated Materials Design: Data Repositories, Informatics, and Computational Tools — Tool Integration
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Carolyn Campbell, National Institute of Standards and Technology; Dongwon Shin, Oak Ridge National Laboratory; Jiadong Gong, QuesTek Innovations; Shengyen Li, National Institute of Standards and Technology; Francesca Tavazza, National Institute of Standards and Technology; Mark Tschopp, Army Research Laboratory
Monday PM  Room: 207B  Location: Music City Center
Session Chairs: Sheng Yen Li, NIST; Mark Tschopp, U.S. Army Research Laboratory
February 15, 2016

In Operando Nano- and Micro-mechanical Characterization of Materials with Special Emphasis on In Situ Techniques — Mechanical Characterization of Materials at Small Length Scales
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Sanjit Bhownick, Hysitron Inc.; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Vikas Tomar, Purdue University; Vikram Jayaram, Indian Institute of Science; Benjamin Morrow, Los Alamos National Laboratory; Paul Shade, Air Force Research Laboratory; Weizhong Han, Xi’an Jiaotong University; Arief Budiman, Singapore University of Technology and Design
Monday PM  Room: 212  Location: Music City Center
Session Chairs: Sanjit Bhownick, Hysitron, Inc.; Vikram Jayaram, Indian Institute of Science
February 15, 2016

2:00 PM Keynote
PRISMS: An Integrated Predictive Multi-Scale Capability for the Materials Community: John Allison; Larry Aagesen; Samantha Daly; Krishna Gartikipati; Vikram Gavini; Margaret Hedstrom; H. Jagadish; J. Wayne Jones; Emmanuelle Marquis; Amit Misra; Brian Puchala; Shiva Rudraraju; Veera Sundararaghavan; Srayva Tamma; Glenn Tarcia; Katsuyo Thornton; Anton Van der Ven; University of Michigan; University of California-Santa Barbara

2:40 PM
MIDAS: A Workflow Tool for Improving Materials Strength Modeling: Jeffrey Florando; Nathan Barton; Kevin Durrenberger; Peter Norquist; Lawrence Livermore National Laboratory

3:00 PM Invited
Towards an ICME Methodology: Current Activities in Europe: Georg Schmitz; Access e.V. at the RWTH Aachen

3:50 PM Invited
The Materials Data Facility - Data Services to Advance Materials Science Research: I. Foster; R. Ananthakrishnan; Ben Blaizskik; K. Chard; J. Pruyne; J. Towns; S. Tuecke; University of Chicago; Argonne National Laboratory; University of Chicago; University of Illinois at Urbana-Champaign (UIUC)

4:20 PM Invited
Materials Data Management and Chaining of Multiprocess Modeling under the Framework of ICME: Jianzheng Guo; Alain Jacot; ESI US R&D; Calceom ESI SA

4:50 PM
Automated Convergence Checks with the Python Based Workbench Python: Jan Janssen; Tilmann Hickel; Joerg Neugebauer; Max-Planck-Institut fuer Eisenforschung GmbH

2:00 PM Keynote
Indentation: Evolution and Application: Brian Lawn; National Institute of Standards and Technology

2:40 PM
Hardness Anisotropy of Single Crystal Calcite Indented with Three-sided Indenters: Shefford Baker; Joseph Carloni; Mathias Werner; Miki Kunitake; Lara Estroff; Sanjit Bhownick; Ryan Major; Ryan Stromberg; Syed Asif; Thomas Wyrobek; Cornell University; Hysitron Inc.; Hysitron, Inc.

3:00 PM
The Exponent 3/2 Instead of 2 on h for Conical/Pyramidal Indentation: Physical Foundation and Unprecedented Applications: Gerd Kaupp; University of Oldenburg

3:20 PM
New Methodology to Accurately Measure the Onset of Yield Point: Amit Pandey; Robert Wheeler; Amit Shyam; Thomas Stoughton; Oak Ridge National Laboratory; MicroTesting Solutions LLC; General Motors

3:40 PM Break

4:00 PM Invited
Layer Thickness Effects on the Strength and Deformation Mechanisms of Al/SiC Nanolaminates: Jon Molina-Aldeguide; Lingwei Yang; Carl Mayer; Javier Llorea; Nikhil Sheela; IMDIA Materials Institute; Arizona State University

4:30 PM
Micro-scale Fracture Behavior of Co Based Metallic Glass Thin Films: Nagaman Jaya Balila; Mathias Koehler; Volker Schnabel; Dierk Raabe; Jochen Schneider; Christoph Kirchlechner; Gerhard Dehm; MPIE GmbH; RWTH Aachen

4:50 PM
Ascertaining the Role of Microstructure on Fatigue Crack Initiation and Propagation in Rene-88 DT Ni-base Superalloy at Room Temperature: Zafir Ali; David Eastman; Thomas Straub; Jessica Krogstad; Chris Eber; Kevin Hemker; Johns Hopkins University; Fraunhofer Institute for Mechanics of Materials, Freiburg, Germany; University of Illinois Urbana Champaign

5:10 PM
Unveiling 3D Deformations in Carbon Fiber Reinforced Polymer Composites by Coupled micro X-Ray Computed Topography and Volumetric Digital Image Correlation: Brendan Croom; Wei-Ming Wang; Jingjing Li; Xiaodong Li; University of Virginia; University of Hawaii at Manoa
### Magnesium Technology 2016 — Keynote Session Part II and Primary Production and Recycling

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

**Program Organizers:** Alok Singh, National Institute for Materials Science; Kiran Solanki, Arizona State University; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

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<td>Monday PM</td>
<td>Room: 204</td>
<td>Location: Music City Center</td>
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**Session Chairs:** Neale R Neelameggham, IND LLC; Dmytro Orlov, Lund University; Kiran Solanki, Arizona State University

2:00 PM Keynote
A Perspective: Potential Growth in the Global Magnesium Industry – Where is our Research Leading Us?: Martyn Alderman; 'Magnesium Elektron

2:40 PM
Study on Mechanism of Magnesia Production by Reversion Reaction Process in Vacuum: Yang Tian; 'Kunming University of Science and Technology

3:00 PM
Thermodynamic Description of Reactions between Mg and CaO: Rainer Schmid-Fetzer; Artem Kozlov; Björn Wiese; Chamini Mendis; Domonkos Tolnai; Karl Kainer; Norbert Hort; ' Clausthal University of Technology; 'Helmholtz-Zentrum Geesthacht

3:20 PM Break

3:40 PM
Atomic-level Mechanisms of Magnesium Oxidation: Sandra Gardonio; Mattia Fanetti; Dmytro Orlov; 'University of Nova Gorica; 'Lund University

4:00 PM Poster Pitches

### Material Design Approaches and Experiences IV — Superalloys

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

**Program Organizers:** Akane Suzuki, GE Global Research; Ji-Cheng Zhao, The Ohio State University; Michael Fahrmann, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

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<td>Monday PM</td>
<td>Room: 208A</td>
<td>Location: Music City Center</td>
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**Session Chairs:** David Dye, Imperial College; Sammy Tin, Illinois Institute of Technology

2:00 PM Invited
Precipitate Phase Stability in High Nb Containing Ni-base Superalloys: Sammy Tin; 'Illinois Institute of Technology

2:30 PM Invited
Progress in Polycrystalline Co/Ni Superalloys: David Dye; Matthias Knop; T. Lindley; Vasili Vorontsov; Farah Ismail; B. Shollock; Mark Hardy; 'Imperial College London; 'Rolls-Royce plc

3:00 PM
Stability of Carbides in Advanced Polycrystalline Ni-base Superalloys: Stoichko Antonov; Sammy Tin; 'Illinois Institute of Technology

3:20 PM Break

3:40 PM Invited
Development of γ’ Strengthened Co-Based Superalloys - Phase Stability and Applications: Kiyohito Ishida; 'Tohoku University

4:10 PM
Alloying Effects on Oxidation Mechanisms in Polycrystalline Co-Ni-Al-W-Ta Base Superalloys: Farah Ismail; Barbara Shollock; Trevor Lindley; David Dye; Mark Hardy; 'Imperial College London; 'WMG, University of Warwick; 'Rolls-Royce plc

### Materials and Fuels for the Current and Advanced Nuclear Reactors V — Fuels II

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

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<td>Monday PM</td>
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**Session Chair:** Jon Carmack, Idaho National Laboratory

2:00 PM
Characterization of High Burnup Structure in LWR Irradiated Urania: Kurt Terrani; Philip Edmondsson; Chad Parish; Tyler Gerczak; Charles Baldwin; Keith Leonard; 'Oak Ridge National Laboratory

2:20 PM
Migration of Lanthanides in U-Zr Alloy Fuel under a Thermal Gradient: Yeon Soo Kim; T. Wieczek; E. O’Hare; J. Fornter; J. S. Cheon; B. O. Lee; 'Argonne National Laboratory; 'KAERI

2:40 PM
TEM Investigation of Phases Formed in Ternary U-Pu-Zr Systems: Assel Aikaliyeva; James Madden; Cynthia Papesh; 'Idaho National Laboratory

3:00 PM
3D Microstructural Characterization of UO2+x Using High-energy X-rays: Reeju Pokhare; Donald Brown; 'Los Alamos National Laboratory

3:20 PM
Modeling Solute Segregation during Solidification of U-Mo Alloys: Matthew Steiner; Elena Garlea; Sean Agnew; 'University of Virginia; 'Y-12 National Security Complex

3:40 PM Break

4:00 PM
High Resolution Electron Microscopy Examination of Fission Product Precipitates in Triso Coated Particles: Isabella van Rooyen; Terry Holesinger; Haiming Wen; 'Idaho National Laboratory; 'Los Alamos National Laboratory

4:20 PM
Correlation of Fission Product Transport to Grain Boundary Character in Neutron Irradiated Tristructural Isotopic Coated Nuclear Fuel Particles: Haiming Wen; Isabella van Rooyen; 'Idaho National Laboratory

4:40 PM
Microstructure Characterization of TRISO Fuels by Atom Probe Tomography: Y. Wu; I van Rooyen; H Wen; J Burns; J Madden; 'Boise State University; 'Idaho National Laboratory

5:00 PM
Comprehensive EBSD Analysis of the SiC Layer from AGR-1 and AGR-2 Constituent TRISO Fuel Batches: Tyler Gerczak; John Hunn; 'Oak Ridge National Laboratory

5:20 PM
Advanced Fuels by Field Assisted Sintering Technology – Fuel Properties Characterization and Accident Tolerance: Jie Lian; Tiankai Yao; 'Rensselaer Polytechnic Institute
Materials and Fuels for the Current and Advanced Nuclear Reactors V — Structural Materials II

Sponsored by: TMS Structural Materials Division, 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

Monday PM  Room: 101B
February 15, 2016  Location: Music City Center

Session Chair: Clarissa Yablinsky, Los Alamos National Laboratory

2:00 PM
Grain Orientation Factor and Stress Corrosion Crack Initiation in Neutron-irradiated Austenitic Stainless Steels: Maxim Gusev1; Kevin Field1; Jeremy Bushy1; Kale Stephenson2; Gary Was1; 'Oak Ridge National Laboratory; 'University of Michigan

2:20 PM
Effect of Irradiation on Primary Water Stress Corrosion Cracking Behavior of Alloy 718 Subjected to Different Heat Treatments: Mi Wang1; Silva Chinthaka2; Miao Song1; Gary Was1; 'University of Michigan; 'Oak Ridge National Laboratory

2:40 PM
Irradiation-induced Microstructure of Precipitate Hardened Nickel Based Alloy: Miao Song1; Mi Wang1; David Woodley1; Zhijie Jiao1; Gary Was1; 'University of Michigan

3:00 PM
In-pile Creep of High Purity SiC and Selected FeCrAl Alloys: Yutai Katoh1; Kurt Terrani1; Yukinori Yamamoto1; Lance Sned1; Torill Karlson2; 'Oak Ridge National Laboratory; 'Halden Reactor Project

3:20 PM
A TEM Study of the Effect of Neutron Irradiation on the Microstructure of Fe-Cr Alloys: Dhriti Bhattacharyya1; Yuan Wu1; Joel Davis1; Robert Harrison1; Emmanuelle Marquis1; Takuya Yamamoto2; Peter Wells1; Mukesh Bachhav1; G. Robert Odette1; 'ANSTO; 'University of California, Santa Barbara; 'University of Michigan

3:40 PM Break

4:00 PM
Thermal Desorption Spectroscopy of High Fluence Irradiated Ultrafine and Nanocrystalline Tungsten: Helium Trapping and Desorption Correlated with Morphology: Osman El-Atwani1; Chase Taylor2; James Frishkoff1; Mitra Taheri1; 'Drexel University; 'Idaho National Laboratory

4:20 PM
Precipitation in Stainless Steels under Irradiation in Light Water Reactors Condition: Mahnood Manivand1; Ying Yang1; Dane Morgan1; 'University of Wisconsin-Madison; 'Oak Ridge National Laboratory

4:40 PM
Phase-Specific Nanoindentation of Wear-Resistant Alloys for Nuclear Power Plant Applications: Peter Anderson1; Marc Doran1; Ryan Smith1; David Gandy1; Suresh Babu1; 'The Ohio State University; 'Electric Power Research Institute; 'University of Tennessee

5:00 PM
Design of Radiation Tolerant Materials via Interface Engineering: Weizhong Han1; 'CAMP-Nano, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University

Mechanical Behavior at the Nanoscale III — Mechanical Behaviors and Defect Dynamics of Nanostructured Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Daniel Gianola, University of California, Santa Barbara; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology; Harold Park, Boston University; Garritt Tucker, Drexel University; Jiangwei Wang, University of Pittsburgh

Monday PM  Room: 214
February 15, 2016  Location: Music City Center

Session Chair: Ting Zhu, Georgia Institute of Technology

2:00 PM Invited
Nanodomains in Nickel Enable Simultaneous High Strength and Ductility: “Self-Precipitation Hardening” without Second-Phase Precipitates: Evan Mai1; 'Johns Hopkins University

2:40 PM
Deformation Mechanisms and Instabilities in Metallic Multilayer on the Nanoscale: Stefan Sandfeld1; Danial Pourjafar2; Ruth Schwaiger2; 'University of Erlangen (FAU); 'Karlsruhe Institute of Technology (KIT)

3:00 PM
The Origins of High Hardening and Low Ductility in Magnesium: Zhaoxuan Wu1; William Curtin2; 'Institute of High Performance Computing, A*STAR; 'Ecole Polytechnique Federale de Lausanne

3:20 PM
Transition of Deformation Modes in Hollow Cu-Zr Metallic Glass Nanolattices: Seok-Woo Lee1; Mehdi Zadeh2; David Chen1; Yong-Wei Zhang2; Julia Greer1; 'University of Connecticut; 'Institute of High Performance Computing, A*STAR; 'California Institute of Technology

3:40 PM Break

4:00 PM Invited
Microstructural Stability under Wear of Binary Nanocrystalline Alloys with Improved Thermal Stability: Blythe Clark1; Nicolas Argibay2; Brad Boyce1; Timothy Furnish1; Michael Dugger2; Michael Chandross3; Christopher Schuh1; 'Sandia National Laboratories; 'Massachusetts Institute of Technology

4:40 PM
Investigation of Creep in Nanocrystalline CuTa: B. Hornbuckle1; Mansa Rajagopalan1; Scott Turnage2; Anthony Roberts1; Kiran Solanki1; Laszlo Kecskes1; Kris Darling1; 'U.S. Army Research Laboratory; 'Arizona State University

5:00 PM
Mechanical Scaling Behavior of Nanopopular Gold Based on 3D Structural Analysis and Indentation-based Testing: Kaixiong Hu1; Markus Ziehmer1; Ke Wang1; Erica Lilleoidden1; 'Helmholtz-Zentrum Geesthacht; 'Hamburg University of Technology
Metal and Polymer Matrix Composites II — Metal Matrix Nanocomposites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee
Program Organizer: Nikhil Gupta, New York University

Monday PM  Room: 110A  Location: Music City Center

Session Chair: To Be Announced

2:00 PM Keynote
Effect of Defects on the Intrinsic Strength and Stiffness of Graphene: Nikolai Koratkar1; 2Rensselaer Polytechnic Institute

2:40 PM Invited
Super-strong Light Metals by Populous Dispersed Nano-elements: Xiaochun Li1; 1University of California

3:00 PM Invited
Toughening of Aluminum Matrix Nanocomposites via Spatial Arrays of B,C Spherical Nanoparticles: Lin Jiang1; Hanry Yang1; Joshua Yee1; Xuan Mo2; Dalong Zhang3; Troy Topping2; Enrique Lavernia1; Julie Schoenung3; 1University of California, Davis; 2California State University, Sacramento

3:20 PM Invited
Progresses in Light Metal Multiscale Composites by Cryogenic Nanostructuring: Kyu Cho1; 1US Army Research Laboratory

3:40 PM Break

4:00 PM Invited
Processing and Properties of Amorphous Alloy Matrix Nanocomposites: Sandip Harimkar1; 1Oklahoma State University

4:20 PM Invited
Self-Lubricating Aluminum Matrix Nanocomposites Reinforced by Graphene Nanoplatelets: Meyram Tabandeh-Khorshidi1; Emad Omrani; Pradeep Menezes2; Pradeep Rohatgi1; 1University of Wisconsin Milwaukee; 2University of California, Santa Barbara; 3University of Science and Technology Beijing; 4Northeastern University

4:40 PM Invited
Mechanical Properties of Amorphous Metallic Alloys at High Strain Rate: Dung Luong1; 1New York University

5:00 PM Invited
Nano-particle Assisted Processing for Immiscible Alloys: Chezheng Cao1; Liyian Chen1; Jiaquan Xu1; Weiqing Liu1; Xiaochun Li1; 1University of California, Los Angeles; 2Harbin Institute of Technology

5:20 PM Invited
Effect of Nano-particle Addition on Grain Structure Evolution of Friction Stir Processed Al 6061 during Post-weld Annealing: Junfeng Guo1; Bing Yang Lee1; Zhenglin Du2; Guijun Bi1; Ming Jen Tan2; Jun Wei1; 1Singapore Institute of Manufacturing Technology (SIMTech); 2Nanyang Technological University

Nanostructured Materials for Nuclear Applications — Session II

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Nuclear Materials Committee, TMS: Nanomaterials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Cheng Sun, Los Alamos National Laboratory; Michael Demkowicz, Massachusetts Institute of Technology; Amit Misra, University of Michigan; Osman Anderoglu, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratories

Monday PM  Room: 101C  Location: Music City Center

Session Chairs: Osman Anderoglu, Los Alamos National Laboratory; Mikhail Sokolov, Oak Ridge National Laboratory

2:00 PM Invited
The History and Recent Progress in Development of the Advanced ODS 14YWT Ferritic Alloy for Radiation Tolerance: David Hoelzer1; Kevin Field1; Kinga Unocic1; Thak Sang Byun2; Jeoung Han Kim1; Stuart Maloy4; 1Oak Ridge National Laboratory; 2Pacific Northwest National Laboratory; 3Hanbat National Laboratory; 4Los Alamos National Laboratory

2:30 PM
Deformation Mechanisms of ODS Nanostructured Ferritic Steels: Mercedes Hernández-Mayoral1; Elvira Oñorbe1; Marta Serrano1; 1CIEMAT

2:50 PM
Microstructure and Strengthening Mechanism of Austenitic ODS Steels for High-Temperature Nuclear Applications: Yinbin Mao1; Kun Mo2; Zhangjian Zhou2; Xiang Liu1; Kuan-Che Lan1; Guangming Zhang1; Jun-Sang Park1; Jonathan Almer2; James Stubbins1; 1University of Illinois at Urbana-Champaign; 2Argonne National Laboratory; 3University of Science and Technology Beijing

3:10 PM Invited
Processing and Properties of Nanostructured Fe-Cr Alloys: Thak Sang Byun2; David Hoelzer; Hee Joon Jung; Jeoung Han Kim1; Stuart Maloy4; 1Pacific Northwest National Laboratory; 2Oak Ridge National Laboratory; 3Hanbat National Laboratory; 4Los Alamos National Laboratory

3:40 PM Break

4:20 PM
The Mechanical Properties of a PM2000 Oxide-Dispersion-Strengthened Alloy Tested by High Temperature Nanoindentation Testing: Ude Hangen1; Asta Richter; Chun-Liang Cheng1; Doug Stauffer1; 1Hysitron, INC.; 2University of Applied Sciences Wildau; 3National Dong-Hwa University

4:40 PM
Irradiation Induced Changes to Nano-particles in F/M ODS: Tianyi Chen1; Jonathan Giga1; Eda Aydogan1; Di Chen1; Xuemei Wang1; Shigeharu Ukal1; Frank garner1; Lin Shao1; 1Texas A&M University; 2Hokkaido University; 3Radiation Effects Consulting

5:00 PM
The Roles of Oxide Interfaces and Grain Boundaries in Helium Management in Nano-structured Ferritic Alloys: A First Principles Study: Yong Jiang1; Litong Yang1; Jian Xu1; G. Odette1; Yuan Wu2; Takuya Yamamoto2; Zhangjian Zhou1; Zheng Lu1; 1Central South University; 2University of California, Santa Barbara; 3University of Science and Technology, Beijing; 4Northeastern University
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<th>Time</th>
<th>Session</th>
<th>Presenters</th>
<th>Affiliations</th>
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<td>2:00 PM</td>
<td><strong>Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials</strong> XV — Thermoelectric, Solar-cell, Fuel-cell &amp; Battery Materials</td>
<td>sponsored by: TMS Functional Materials Division, TMS Structural 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; Ikuo Ohnuma, National Institute for Materials Science (NIMS); Chih-Ming Chen, National Chung Hsing University; Yee-Wen Yen, National Taiwan Univ of Science &amp; Tech; Shien Ping Feng, The University of Hong Kong; Clemens Schmetterer, Fraunhofer Institute</td>
<td>Program Organizers: Shih-kang Lin, National Cheng Kung University; Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, National Institute for Materials Science (NIMS); Chih-Ming Chen, National Chung Hsing University; Yee-Wen Yen, National Taiwan Univ of Science &amp; Tech; Shien Ping Feng, The University of Hong Kong; Clemens Schmetterer, Fraunhofer Institute</td>
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<td><strong>Monday PM</strong> Room: 109 Location: Music City Center Session Chairs: Shih-kang Lin, National Cheng Kung University; Chih-Ming Chen, National Chung Hsing University</td>
<td><strong>2:00 PM Invited</strong> Interfacial Reactions in the Ni/Ag-Sb and Ni/Ag-Ge Couples: Sinn-wen Chen; Ling-chieh Chen; Jen-chieh Wang; Po-han Lin; National Tsing Hua University</td>
<td><strong>2:20 PM</strong> Thermal Stabilities and Properties of AgBiS2 and AgBi3S5; a Review and Experimental Study: Fiseha Tesfaye; Daniel Lindberg; Åbo Akademi University</td>
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<td><strong>2:40 PM Interfacial Reactions between Tin and Ni-coated Bi2Te3:</strong> Yu-Chen Tseng; Chih-Ming Chen; National Chung Hsing University</td>
<td><strong>3:00 PM Liquidus projection and thermoelectric property of (Cu,Ag)-Ga–Te Thermoelectric Materials:</strong> Yen-Te Cho; Tzung-Jin Dung; Hsin-jay Wu; Department of materials and Optoelectronic Science, National Sun Yat-Sen University</td>
<td><strong>3:20 PM Phase Equilibria of Thermoelectric Ag-Bi-Se System:</strong> Cheng Hao-Yen; Hsin-Jay Wu; National Sun Yat-Sen University</td>
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<td><strong>3:40 PM Break</strong></td>
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<td><strong>4:00 PM</strong> A Significant Improvement in the Electrocatalytic Stability of N-doped Graphene Nanosheets used as a Counter Electrode for Iodide/triiodide based Dye-sensitized Solar Cells and [Co(bpy)3]3+/2+ based Porphyrin-sensitized Solar Cells:** Zhai Peng; Feng Shien-Ping; The University of Hong Kong</td>
<td><strong>4:20 PM</strong> Formula Optimization of Titanium Dioxide Paste for Dye-sensitized Solar Cells: Chih Chung Wu; Ting Chien Liu; Chih Ming Chen; National Chung Hsing University</td>
<td><strong>4:40 PM</strong> Ab Initio Mechanistic Study on the Charging/Discharging Behaviors of the Layered-layered Lithium-rich Composite Cathode for Lithium-ion Batteries: Yu-cheng Chuang; Ping-chun Tsai; Shih-kang Lin; Department of Materials Science and Engineering, National Cheng Kung University, Taiwan</td>
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<td><strong>5:00 PM</strong> Investigation on the Phase Stability of Perovskite in La-Sr-Cr-Ce-O System and Its Long-term Operation:** Hooman Sabarou; Shadi Darvish; Yu Zhong; Florida International University</td>
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Phase Transformations and Microstructural Evolution — Phase Transformations in Fe-Alloys - Session II
Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Sudarsanam Babu, The University of Tennessee, Knoxville; Dhruti Bhattacharyya, ANSTO; Yunzhi Wang, Ohio State University; Osman Anderoglu, Los Alamos National Laboratory; Juan P. Escobedo-Diaz, UNSW Australia; Jessica Krogstad, University of Illinois, Urbana-Champaign; Long Qing Chen, Penn State University; Monica Kapoor, University of Alabama; Amy Clarke, Los Alamos National Laboratory; Gregory Thompson, University of Alabama

Monday PM  Room:  108
February 15, 2016  Location:  Music City Center

Session Chair: Amy Clarke, LANL

2:00 PM  Characterization of Transition Carbide Formation in Steels Processed by Quenching and Tempering or Quenching and Partitioning: Daniel Coughlin1; Amy Clarke1; Dean Pierce2; Jonathan Poplawsky3; Omer Dogan4; Paul Jablonski 4; Virginia Judge; John Speer; Emmanuel De Moor; Kester Clarke1;  1Los Alamos National Laboratory; 2ASPPRC Colorado School of Mines; 3Oak Ridge National Laboratory; 4National Energy Technology Laboratory

2:30 PM  Simulated Welding Heat Affected Zone of a SAF2507 Super-duplex Stainless Steel by Gleeble Simulator: Lilia Olaya-Luengas1; Juan A. Pozo-Morejon; Ivani S. de Bott1; 1PUC-Rio; 2Universidad Central “Marta Abreu” de Las Villas

2:50 PM  Microstructural Evolution and Embrittlement of Thermally Aged Cast Duplex Stainless Steels: Sarah Mburu1; R. Kolli1; Samuel Schwarm1; Daniel Perea2; Jia Liu2; Arielle Eaton; Sreeramanurthy Ankem;  1University of Maryland; 2Pacific Northwest National Laboratory

3:10 PM  Role of Alloying Elements on Thermal Stability of Duplex Stainless Steel: David Garfinkel1; Jonathan Poplawsky; Wei Guo; George Young; Julie Tucker; Oregon State University; Oak Ridge National Laboratory; Knolls Atomic Power Laboratory

3:30 PM  Break

3:50 PM  The Study of Lead Segregation Behavior of the Heterogeneous Nucleation in Steel: Lu Xiong1; Hongpo Wang1; 1Chongqing University

4:10 PM  The Microstructure of As-Quenched 12Mn Steel: John Morris1; Christopher Kinney1; Liang Qi2; Ken Pytlewski1; Armen Khachatryan1; Nac Kim1; 1University of California Berkeley; 2University of Michigan; 3POSTECH

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee
Program Organizers: Hatem Zurob, McMaster University; Annika Borgenstam, KTH, Royal Institute of Technology; Tadashi Furuhara, Tohoku University; Wenzheng Zhang, Tsinghua University; Christopher Hutchinson, Monash University; Robert Hackenberg, Los Alamos National Laboratory

Monday PM  Room:  110B
February 15, 2016  Location:  Music City Center

Session Chairs: John Ågren, KTH, Royal Institute of Technology; Hatem Zurob, McMaster University

2:00 PM  Invited Carbon Enrichment in Austenite during Ferrite and Bainite Transformations in Fe-Mn-C Based Alloys: Goro Miyamoto1; Tadashi Furuhara1; Tohoku University

2:30 PM  Incomplete Bainite Transformation in Fe-0.4C-3Si Alloy: Huidong Wu1; Goro Miyamoto1; Zhigang Yang1; Chi Zhang1; Tadashi Furuhara1; Tohoku University; Tsinghua University

2:50 PM  Particularities of Kinetics of Austenite Decomposition above and below Martensite-Start Temperature in the Carbide Free Low Alloyed Steel: Igor Yakubtsov1; Gary Purdy2; 1Integrity Testing Laboratory Inc; 2McMaster University

3:10 PM  On the Feathery Structure of Bainite: Jiaqing Yin1; Annika Borgenstam1; Mats Hillert1; 1KTH Royal Institute of Technology

3:30 PM  Break

3:50 PM  Invited Analysis of Mo Effect on the Kinetics of Ferrite and Bainitic Ferrite Formation: Jining Zhu1; Zhigang Yang1; Chi Zhang1; Congyu Zhang1; Hao Chen1; Tsinghua University

4:20 PM  Modelling the Condition of Upper and Lower Bainite Formation: Ze nan Yang1; Wei Xu2; Zhi gang Yang1; Chi Zhang1; Hao Chen1; Sybrand van der Zwaag1; 1School of Materials Science and Engineering, Tsinghua University; 2Faculty of Aerospace Engineering, TU Delft

4:40 PM  Effect of Boron on the Bainitic Transformation Kinetics after Ausforming Process: Mingxin Huang1; Binbin He1; Wei Xu2; 1The University of Hong Kong; 2Northeastern University

5:10 PM  Panel Discussion
**Rare Metal Extraction & Processing Symposium — Rare Earth Elements / Base & Rare Metals II**

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

*Program Organizers:* Shafiq Alqam, University of Saskatchewan; Hojong Kim, Penn State University; Neale Neelameggham, Ind LLC; Takanari Ouchi, MIT; Harald Oosterhof, Umicore

Monday PM  
Room: 106A  
February 15, 2016  
Location: Music City Center

**Session Chairs:** Shafiq Alqam, University of Saskatchewan; Hojong Kim, The Pennsylvania State University

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**2:00 PM Keynote**

**Recovery of Yttrium and Neodymium from Copper Pregnant Leach Solutions by Solvent Extraction:** Rebecca Copp; Brent Hiskey; 1University of Arizona

**3:25 PM**

**Calcined Nanocrystalline Layered Double Hydroxides for the Removal of Arsenate and Arsenite:** Eman Wahbah; Youssef Mohassab; Manoranjan Misra; Monalisa Panda; 1University of Utah; 2University of Utah

**3:00 PM**

**Experimental Study on Valuable Metals Dissolution from Copper Slag by Hydrothermally Treated Garlic Waste Gel:** Ying Sun; 1Princeton University

**3:25 PM**

**Adsorption of Platinum and Palladium from Hydrochloric Acid Media:** Hongmin Zhu; Shafiq Alqam; 1University of Science and Technology Beijing

**3:50 PM Break**

**4:10 PM**

**Pressure Oxidation Leaching of Gold-antimony Alloy:** Dong Aichun; 1Jiangsu University, China

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**Recent Advancement on Stretchable and Wearable Electronics — Session II**

*Sponsored by:TMS Functional Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee, TMS: Nanomaterials Committee, TMS: Thin Films and Interfaces Committee*

*Program Organizers:* Pooran Joshi, ORNL; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Jiahua Zhu, The University of Akron; Nuggehalli Ravindra, New Jersey Institute of Technology; Catherine Dubourdieu, CNRS - INL; Madan Dubey, US Army Research Lab

Monday PM  
Room: 205C  
February 15, 2016  
Location: Music City Center

**Session Chairs:** Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Kai Xiao, Oak Ridge National Laboratory; Wenchao Zhou, University of Arkansas

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**2:00 PM Keynote**

**A New Architecture for Flexible Large-area Electronic Systems:** Sigurd Wagner; Warren Rieutort-Louis; Josue Sanz-Robinson; Tiffany Moy; Liechao Huang; Yingzhe Hu; Yasmin Afzar; James Sturm; Naveen Verma; 1Princeton University

**2:30 PM Invited**

**Materials Integration for Flexible Electronics:** Tohga Aydog; Pooran Joshi; Matthew Rager; 1Oak Ridge National Laboratory

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**Recent Developments in Biological, Structural, Functional Thin Films and Coatings — Thin Films and Coatings II**

*Corrosion and Wear Applications*

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

*Program Organizers:* Nancy Michael, University of Texas at Arlington; Adele Carradd, IPCMS; Heinz Palkowski, TU Clausthal; Nuggehalli Ravindra, New Jersey Institute of Technology; Chintalapalle Ramana, Univ of Texas at El Paso

Monday PM  
Room: 206B  
February 15, 2016  
Location: Music City Center

**Session Chairs:** Heinz Palkowski, Clausthal Univ of Technology/ Institute of Metallurgy; Nancy Michael, Univ of Texas at Arlington

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**2:00 PM Keynote**

**Grain Boundary Segregation Effects on Post-Coalescence Thin Film Growth:** Tyler Kaub; Gregory Thompson; 1University of Alabama

**2:20 PM**

**Influence of Interfacial Structure on the Phase Stability and Growth Stress in Cu/Nb Multilayered Films:** Qianying Guo; Li Wan; Richard Martens; Gregory Thompson; 1University of Alabama

**2:40 PM**

**Optimizing Coating Growth by Gas Jet Assisted Physical Vapor Deposition Using Through-process Simulations:** Theron Rodgers; Hengbei Zhao; Haydn Wadley; 1Sandia National Laboratories; 2University of Virginia

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**2:55 PM Invited**

**Post Processing and In Situ Processing for Low Thermal Budget Integration of Electronic Materials on Flexible Substrates:** Joo Hyon Noh; Pushpa Pudasaini; Pooran Joshi; Philip Rack; 1University of Tennessee; 2Oak Ridge National Laboratory

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**3:20 PM Invited**

**RF Devices based on 2D Materials for Flexible and Wearable Electronics:** Matthew Chin; Alex Mazzoni; Pankaj Shah; Robert Burke; Madan Dubey; Barbara Nichols; 1U.S. Army Research Laboratory

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**3:45 PM Break**

**4:10 PM Invited**

**Self-sensing Ionic Polymer-metal Composite Soft Robotic Actuator Integrated with Gallium-indium Alloy:** Sarah Trabia; Viljar Palmre; Kwang Kim; 1University of Nevada, Las Vegas; 2University of Nevada, Las Vegas; 3University of Texas, Houston Medical School

**4:30 PM**

**DFT Approach to Electronic and Optical Properties of Foldable and Stretchable Graphene:** Yan Chu; Yan Liu; Nuggehalli Ravindra; 1New Jersey Institute of Technology

**4:50 PM**

**Flexible Copper Clad Laminate prepared by Roll-to-Roll Additive Manufacturing:** Bing An; Xinlin Xie; Mingzhi Gao; 1Huazhong U. of Sci. & Tech.; 2Zhuhai Richview Electronics Ltd.

**5:10 PM**

**Silver Nanowire Networks for Flexible Electromagnetic Interface Shields:** Ece Alpungan; Sahin Coskun; Arcan Dericioglu; Husnu Unalan; 1Middle East Technical University

**5:30 PM**

**Wearable Energy Storage Devices from Cotton T-shirts:** Zan Gao; Ningning Song; Yunya Zhang; Xiaodong Li; 1University of Virginia
3:00 PM
Comparing Two Steel Surface Treatments on the Bonding of Chitosan and the Resulting Corrosion Protection: Holly Martin; Stephen Cornich; Jacob Millerleile; Snejana Balaz; ‘Department of Chemical Engineering, Youngstown State University; ‘Department of Physics and Astronomy, Youngstown State University

3:20 PM
Break

3:40 PM
On the Boronizing Response of NiCrMo Alloys in Use for Wear and Corrosive Service: Manuel Maraya; Virendra Singh; ‘Schlumberger Technology Corporation

4:00 PM
The Investigation on the Intermetallic Layer of Hot-dipping Al-10Si Alloy with 22MnB5 and DC51 Substrate: Weidong Hu; Wende Dan; Wangjun Peng; Guangxin Wu; Qing Du; Jieyu Zhang; ‘Shanghai University

4:20 PM
The Wetting Behavior of Fe-Si and Fe-Mn Alloy with Al-10%Si Coating: Wende Dan; Guangxin Wu; Bo Zhang; Qing Du; Weidong Hu; Jieyu Zhang; Wangjun Peng; ‘Shanghai University; ‘Guiyang Institute of Industry Technology

4:40 PM
Thermally-Assisted Interfacial Diffusion in High Phosphorous Nickel Plating on a 4140 Low-alloy Steel: Virendra Singh; Manuel Maraya; Tatiana Ayers; ‘Schlumberger

5:00 PM
Invited
Harvesting Light from Crystalline-Silicon via Processing Of Stressed Interface with Sol-Gel Based Silica: Sufian Abedrabbo; Anthony Fiory; Nuggehalli Ravindra; ‘The Petroleum Institute; University of Jordan; ‘New Jersey Institute of Technology

Refractory Metals 2016 — Deformation of Refractory Metals and Processing & Properties of Refractory Metal Compounds
Sponsored by:TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Gary Rozak, HC Starck; Eric Taleff, Univ. Texas; Iví Smid, Penn State

Monday PM  Room: 106B
February 15, 2016  Location: Music City Center

Session Chairs: Iví Smid, Pennsylvania State University; Kevin Jaansalu, Royal Military College of Canada

2:00 PM
On Plasticity of Polycrystalline Rhenium at Room Temperature: Peter Panfilov; Yuri Gomostyrev; Vitalii Pilyugin; Alexander Yermakov; ‘Ural Federal University; ‘Institute of Quantum Materials Science; ‘Institute of Metaphysics of the Ural Branch of the RAS

2:20 PM
Thermally Activated Deformation Processes in Body-Centered Cubic Cr – How Microstructure Influences Strain-Rate Sensitivity: Verena Maiér; Anton Hohenwarter; Reinhard Pippant; Daniel Kiener; ‘Austrian Academy of Science; ‘Montanuniversität Leoben

2:40 PM
Mechanical Properties of Cold-rolled Tungsten at Different Strain Rates: Qiuming Wei; Laszlo Kecskes; ‘University of North Carolina at Charlotte; ‘US-ARL

3:00 PM
Fracture of Severely Plastically Deformed Niobium and Tantalum: Anton Hohenwarter; ‘Department of Materials Physics, Montanuniversität Leoben, Austria

3:20 PM
Stress Accommodation in Plastic Zone Ahead Crack Tip in Iridium: Peter Panfilov; Mikhail Gutkin; Elijah Borodin; Elena Lyapunova; ‘Ural Federal University; ‘Institute of Problems of Mechanical Engineering of the RAS

3:40 PM
Break

3:55 PM
High Temperature Properties of Directionally Solidified Nb-rich Nb-Si-Cr Eutectics: Florian Gang; Martin Heilmayer; ‘Karlsruhe Institute of Technology

4:15 PM
Improving the Performance of Nb-Silicide Based Refractory Alloys through a Novel Crude Cubicle Directional Solidification: Hongsheng Ding; Kun He; Shiqiu Liu; Yongwang Kang; Jingjie Guo; ‘Harbin Institute of Technology

4:35 PM
Microstructure and Properties of a Ternary Eutectic Mo-Si-B Alloy: Georg Hasemann; Florian Gang; Martin Palm; Iuri Bogomoil; Manja Krüger; ‘Otto-von-Guericke University Magdeburg; ‘Karlsruhe Institute of Technology; ‘Max-Planck-Institut für Eisenforschung GmbH; ‘National Technical University of Ukraine “KPI”

4:55 PM
Size Effect of Intermetallic Compounds on Fracture Toughness of Mo-Si-B Alloys: Jong Min Bunny; Su-Ryong Bang; Myung-Jin Suk; Sung-Tag Oh; Young Do Kim; ‘Hanyang University; ‘Kangwon National University; ‘Seoul National University of Science and Technology

5:15 PM
Reactive Spark Plasma Sintering of Tungsten Borides Using Elemental Tungsten and Boron Powders: Govind Choudhary; Ravi Kumar; ‘Indian Institute of Technology (IIT),Madras

REWAS 2016 — Enabling & Understanding Sustainability - Building Materials & Slag Valorization
Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Bart Blanpain, KU Leuven; Anne Kvithyld, SINTEF; Christina Meskers, Umicore Precious Metals Refining; Elsa Olivetti, Massachusetts Institute of Technology; Jeffrey S. Spangenberger, Argonne National Laboratory; Diran Apelian, Worcester Polytechnic Institute; Brajendra Mishra, Colorado School of Mines; Neale Noelmaneggham, Ind LLC

Monday PM  Room: 104C
February 15, 2016  Location: Music City Center

Session Chairs: Dirk Verhulst, Consultant, Extractive Metallurgy; Elsa Olivetti, Massachusetts Institute of Technology

2:00 PM
Inorganic Polymers from Metallurgical Slags: High Performance Materials that Offer a Sustainable Alternative: Yiannis Pontikes; Silviana Onisi; Remus Ion Iacobescu; Lubica Kriskova; Bart Blanpain; ‘KU Leuven

2:25 PM
Valorization of Bauxite Residue in a Technologically Realistic, Financially Viable Process: Are We Getting There?: Yiannis Pontikes; Efthymios Balomenos; Peter Tom Jones; Koen Binnemans; ‘KU Leuven; ‘NTUA

2:50 PM
Energy Generation from Waste Slags: Beyond Heat Recovery: Jinichiro Nakano; James Bennett; Anna Nakano; ‘US Department of Energy National Energy Technology Laboratory

3:40 PM  Break

4:00 PM  Session: "Accounting for Life Cycle Inventories: The Case of US Portland Cement Production in the U.S." Xin Xu; Jeremy Gregory; Randolph Kirchain; Massachusetts Institute of Technology.

4:40 PM  Break

5:00 PM  Session: "Mitigating Supply Risk of Critical and Strategic Materials: The Role of Trade Policies" Tasken Xhaxollari; Michele Bustamante; Gabrielle Gaustad; Rochester Institute of Technology.

5:40 PM  Break

6:00 PM  Session: "Sustainable Processing of Phosphogypsum Waste Stream for the Recovery of Valuable Rare Earth Elements" Mugdha Walawalkar; Gisele Azimi; Connie Nichol; University of Toronto; Agrium Inc.

5:15 PM  Invited Talk: "Characteristics of Light Rare Earths from Korean Coal Power Plants" Ahn Ji Whan; Theneppali Thriveni; Korea Institute of Geosciences and Mineral Resources (KIGAM).

Thermodynamic Applications, Optimizations and Simulations in High-Temperature Processes: An EPD Symposium in Honor of Christopher W. Bale’s 70th Birthday — Software/Programming

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee

Program Organizers: In-Ho Jung, McGill University; Arthur Pelton, Ecole Polytechnique; Patrice Chartrand, Ecole Polytechnique; Phillip Mackey, P.J. Mackey Technology; David Robertson, Missouri S&T; Paskinen, Alta Univ; Malin Selleby, KTH Royal Institute of Technology

Monday PM  Room: 106C
February 15, 2016  Location: Music City Center

Session Chairs: David Robertson, Missouri Univ. S&T; Gunnar Eriksson, GTT Technologies

2:00 PM  Keynote Session: "FactSage — Past, Present and Future" Christopher Bale; Ecole Polytechnique

2:40 PM  Session: "Combining Thermodynamics, Education, and Software — A Neglected but Productive Combination" Art Morris; Thermart Software

3:00 PM  Session: "CALPHAD, Materials Design, and Materials Genome®: Zi-Kui Liu; The Pennsylvania State University

3:20 PM  Session: "Simulation of the Precipitation Kinetics of Aluminum Alloys and Magnesium Alloys" Fan Zhang; Weisheng Cao; Chuan Zhang; Shuanglin Chen; Jun Zhu; Rainer Schmid-Fetzer; CompuTherm; Claushal University of Technology, Institute of Metallurgy

4:00 PM  Break

4:40 PM  Session: "Paraequilibrium Phase Diagrams: Arthur Pelton; Perti Koukkari; Risto Pajare; Gunnar Eriksson; Ecole Polytechnique; VTT Technical Research Centre of Finland; GTT-Technologies

5:00 PM  Session: "PolySection Projection Phase Diagrams with Applications to Heat Treating: John Morral; The Ohio State University

5:40 PM  Session: "Calculation of Property Contour Diagrams: Shuanglin Chen; Weisheng Cao; Fan Zhang; Chuan Zhang; Jun Zhu; CompuTherm, LLC

www.tms.org/TMS2016  
TECHNICAL PROGRAM  
121
5:00 PM  Invited
Identifying Optimal Conditions for Alloys and Process Design Using the Mesh Adaptive Direct Search Algorithm: Aimen Gheribi1; Jean-Philippe Harvey2; Patrice Chartand1; Eve Belisle1; Chris Bale1; Arthur Pelton1; 1Ecole Polytechnique de Montreal; 2McGill University

Transforming the Diversity Landscape — Taking Action
Sponsored by:TMS: Education Committee
Program Organizers: Natalie Larson, University of California, Santa Barbara; Winnie Wang, University of California, Santa Barbara; David Hwang, University of California, Santa Barbara
Monday PM  Room: 104A
February 15, 2016  Location: Music City Center
Session Chairs: Natalie Larson, University of California, Santa Barbara; Winnie Wang, University of California, Santa Barbara; David Hwang, University of California, Santa Barbara

Tuesday AM

2:00 PM
PEERs: Educating and Empowering Student Change Agents in the University of Washington’s College of Engineering: Alexis Nelson1; 1University of Washington

2:20 PM
JSU ADVANCE: Bias Awareness Strategies to Affect University Policies: Thomas Hudson1; Loretta Moore1; Janice Lassiter-Mangama1; 1Jackson State University

2:40 PM  Invited
How to do Diversity at the PhD Level in STEM: Lessons and Tools from the Fisk-Vanderbilt Bridge Program: Keivan Stassun1; 1Vanderbilt University

3:20 PM  Break

3:40 PM
Panel of Past TMS Presidents: Transforming the Diversity Landscape: Dan Thoma; Robert Shull1; Brajendra Mishra2; J. Wayne Jones3; Tresa Pollock4; Diran Apelian5; 1National Institute of Standards and Technology; 2Los Alamos National Laboratory; 3University of Alabama; 4University of Michigan; 5Worcester Polytechnic Institute

Ultrafine Grained Materials IX — Dislocation and Twinning Mechanisms
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, Los Alamos National Laboratory; Roberto Figueiredo, Federal University of Minas Gerais; Zenji Horita, Kyushu University; Megumi Kawasaki, Hanyang University; Qizhen Li, Washington State University; Hans Roven, Norwegian University of Science and Technology (NTNU); Timothy Rupert, University of California, Irvine
Monday PM  Room: 209B
February 15, 2016  Location: Music City Center
Session Chairs: Hans Roven, Norwegian University of Science and Technology (NTNU); Qizhen Li, Washington State University

2:00 PM  Invited
Synthesis of UFG Nanotwinned Alloys: Andrea Hodge1; 1University of Southern California

2:30 PM  Invited
Grain-Size Dependent Mechanical Behavior of Nanocrystalline Metals: Marc Meyers1; Eric Hahn1; Eduardo Bringa1; Yzhe Tang1; 1University of California, San Diego

3:00 PM
Deformation Mechanism of a Strong and Ductile Nanotwinned Steel: Mingxin Huang1; Peng Zhou1; 1The University of Hong Kong

3:20 PM
Phase-field Simulations of Microstructure Evolution under Elastic-plastic Deformation in Nanostructured Materials: Shenyang Hu1; Yulan Li2; Suveen Mathaudhu2; 1Pacific Northwest National Laboratory; 2University of California, Riverside

3:40 PM  Break

4:00 PM  Invited
Understanding Effects of Dislocation Emissions and Crystallographic Textures on Grain-size Dependent Behavior of Nanocrystalline Metals: Caizhi Zhou1; Rui Yuan1; Irene Beyerlein2; 1Missouri University of Science and Technology; 2Los Alamos National Laboratory

4:30 PM
Effects of Stacking Fault Energy on Dislocation Nucleation and Plastic Deformation Mechanisms in fcc Metals: Valery Borovikov1; Mikhail Mendelev1; Alexander King1; 1The Ames Laboratory

4:50 PM
Developing Atomistically-Informed Interface Dislocation Dynamics (AIDD) Simulator: Jian Wang1; Shuai Shao2; Irene Beyerlein2; Amit Misra3; 1University of Nebraska-Lincoln; 2Los Alamos National Laboratory; 3University of Michigan

5:10 PM
Nanodomains in Nickel Enable Simultaneous High Strength and Ductility: Evan Ma1; X.L. Wu2; 1Johns Hopkins University; 2Inst of Mechanics

2016 Functional Nanomaterials: Emerging Nanomaterials and Techniques for 3D Architectures — Fundamental and Unique Techniques to Create 3D Architectures II
Sponsored by:TMS Functional Materials Division, TMS: Nanomaterials Committee
Program Organizers: Terry Xu, UNC Charlotte; Nitin Chopra, The University of Alabama; Jung-Kun Lee, University of Pittsburgh; Jiyoung Kim, University of Texas; V. U. Unnikrishnan, The University of Alabama
Tuesday AM  Room: 211
February 16, 2016  Location: Music City Center
Session Chairs: Nitin Chopra, The University of Alabama; Jinwoo Hwang, The Ohio State University

8:30 AM  Invited
Three-Dimensional Imaging of Point Defects in Functional Materials Using Quantitative STEM: Jinyoung Kim1; 1University of Alabama

9:00 AM  Invited
Invited: Contact Thermal Resistance between Individual Nanostructures: Deyu Li1; 1Vanderbilt University

9:30 AM
Size-Dependence in Thermo-Mechanical Characterization of Multifunctional Nanocomposite Materials: V. U. Unnikrishnan1; 1The University of Alabama