2016 Functional Nanomaterials: Emerging Nanomaterials and Techniques for 3D Architectures — 2D Materials-based 3D Architectures

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 AMRoom: 211February 15, 2016Location: 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*¹; ¹Northeastern University

9:00 AM Invited

3-D Graphene Structures Synthesized by Catalyst-free Chemical Vapor Deposition: *Zhengwei Pan*¹; 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 Yun²; Hoseok Nam²; Jiyoung Kim¹; 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 Azcatl²; Christopher Smyth²; Rafik Addou²; Christopher Hinkle²; Robert Wallace²; ¹University of Virginia; ²University of Texas at Dallas

11:00 AM Invited

Plasmonic Hot Electron Induced Photocurrent Response at MoS2-Metal Junctions: *Yaqiong Xu*¹; Tu Hong¹; Bhim Chamlagain²; 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 Chamlagain²; 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 AMRoom: 105BFebruary 15, 2016Location: 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 Mohassab¹; 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 Yongbin¹; 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 Xu¹; Hongwei Cheng¹; Shuhua Geng¹; Zhongfu Zhou²; ¹State Key Laboratory of Advanced Special 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 Morales²; ¹Envicom 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 Elzohiery¹; *Yousef Mohassab*²; Jagannath Pal¹; Shengqin Zhang¹; Hong Yong Sohn¹; ¹University of Utah; ²University of Utah

10:50 AM

Solar-driven Carbothermal Zinc Recycling: Nikolaos Tzouganatos¹; Christian Wieckert¹; Aldo Steinfeld²; 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

TECHNICAL PROGRAM

Additive Forming of Components - Tailoring Specific Material Properties in Low Volume Production — Overviews

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 February 15, 2016 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 Palmer*¹; 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 Levine¹; 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 Harrysson*¹; Harvey West¹; ¹North Caroline State University

10:50 AM Invited

Multimodal Correlated Datasets to Understand Location Specific Processing State for Additive Manufacturing: Edwin Schwalbach¹; Michael Groeber; Ryan Dehoff; Vincent Paquit²; Norman Schehl³; William Porter³; Dennis Buchanan³; Reji John; 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 Pistorius*¹; Ming Tang¹; ¹Carnegie Mellon University

11:50 AM Invited

Simulation and Modeling of the Metal Laser Powder Bed Fusion Process to Accelerate Certification: *Wayne King*¹; ¹Lawrence Livermore National Laboratory

Additive Manufacturing: Building the Pathway towards Process and Material Qualification — Connections between Processing and Microstructures I

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 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
ebruary 15, 2016	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 Fabricated through Laser-based Directed Energy Deposition: *Allison Beese*¹; Zhuqing 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: *Haize Galarraga*¹; Diana Lados²; Ryan Dehoff³; Michael Kirka³; ¹Worcester Polytechnic Institute ; ²Worcester Polytechnic Institute; ³Oak Ridge National Laboratory

9:40 AM

XRM: Tomography and 3D Grain Mapping for Additive Manufacturing Qualification: *Leah Lavery*¹; 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 McKeown*¹; 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 Rodriguez*¹; Paul Allison¹; Wilburn Whittington²; David Francis²; Oscar Rivera¹; Kevin Chou¹; Xibing Gong¹; Todd Butler¹; Jedediah Burroughs³; 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 Cunningham*¹; Sneha Narra¹; Jack Beuth¹; Anthony Rollett¹; ¹Carnegie Mellon University

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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 Knezevic, University of New Hampshire; Wolfgang Pantleon, Technical University of Denmark; Thomas Bieler, Michigan State University; Khalid 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 Mills*¹; Tim Smith¹; Yunzhi Wang¹; Stephen Niezgoda¹; ¹The Ohio State University

9:00 AM

Application of a Spectral Method Framework to Interrogate the Influences of Experimental Uncertainty on Crystal Plasticity: *Philip Eisenlohr*¹; Pratheek Shanthraj²; Martin Diehl²; Chen Zhang¹; Thomas Bieler¹; Franz Roters²; Ruqing Xu³; ¹Michigan State University; ²Max-Planck-Institut für Eisenforschung GmbH; ³Argonne National Laboratory

9:20 AM

Investigation of Microstructural Stability of CuNb Composites under High-pressure Torsion (HPT): Samikshya Subedi¹; Irene Beyerlein²; Elvan Ekiz³; Pascal Bellon³; Anthony Rollett¹; ¹Carnegie Mellon University; ²Los Alamos National Laboratory; ³University 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; ¹IMDEA Materials Institute

10:00 AM Break

10:20 AM Invited

Quantifying Grain-Scale Deformation for Direct Comparison to Crystal Plasticity Predictions: *Brad Boyce*¹; Hojun Lim¹; Jay Carroll¹; Thomas Buchheit¹; Corbett Battaile¹; ¹Sandia National Labs

10:50 AM Invited

Using Synchrotron Radiation to Characterize Deformation: Anthony Rollett¹; Robert Suter¹; ¹Carnegie Mellon University

11:20 AM

Probing Grain Boundary Mechanics in alpha-titanium Using Nanoindentation and Boundary-sensitive Crystal Plasticity Modeling: *Yang Su*¹; Claudio Zambaldi²; David Mercier²; Philip Eisenlohr¹; Thomas Bieler¹; Martin Crimp¹; ¹Michigan State University; ²Max-Planck-Institut für Eisenforschung

11:40 AM

Strength Distribution in a Spalled Material and Its Dependence on Local Microstructure: *Shraddha Vachhani*¹; Carl Trujillo¹; Ellen Cerreta¹; George Thompson III¹; ¹Los Alamos National Laboratory

12:00 PM

TECHNICAL PROGRAM

Automated Correlative Tomography of an Aluminum 7075 Alloy Spanning Length Scales and Modalities: *Arno Merkle*¹; Nikhilesh Chawla²; Sudhanshu Singh²; ¹Carl Zeiss X-ray Microscopy; ²Arizona 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 Kuhr¹; John Sosa¹; Hamish Fraser¹; ¹The Ohio State University

Advanced Magnetic Materials: An FMD Symposium in Honor of Michael E. McHenry — Soft Magnetic Materials I

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 AMRoom: 209CFebruary 15, 2016Location: 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; ¹Carnegie 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 Chen²; Narendra Dahotre¹; Raju Ramanujan²; *Rajarshi Banerjee*¹; ¹University of North Texas; ²Nanyang Technological University

9:40 AM

Advanced Magnetic Materials for High Power Density, High Efficiency Electrical Systems: *Francis Johnson*¹; ¹GE Global Research

10:00 AM Break

10:20 AM

Application of Soft Magnetic Nanocomposites in Power Electronics: Alex Leary¹; Michael McHenry¹; ¹Carnegie Mellon University

10:40 AM

Design of Nano-crystalline Soft Magnetic Alloys: Electronic Structure: *Jihoon Park*¹; Yang-Ki Hong¹; Woncheol Lee¹; Seok Bae²; Seong-Gon Kim³; Chul-Jin Choi⁴; ¹The University of Alabama; ²LG Innotek; ³Mississippi State University; ⁴Korea Institute of Materials Science

11:00 AM

Cation Disorder in Nanoparticle and Thin Film Ferrite Systems: Vincent Harris¹; ¹Northeastern University

MONDAY AM

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 AMRoom: 206AFebruary 15, 2016Location: Music City Center

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

8:30 AM Keynote

The Growing Orthopedic Infection Problem: Can Anything Stop It ?: Thomas Webster¹; ¹Northeastern University

9:05 AM Invited

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

9:30 AM

Room Temperature Aging of Ti-Nb based Beta Alloys: Song Cai¹; J Schaffer¹; Y Ren²; ¹Fort Wayne Metals Research Products Corp.; ²Argonne National Laboratory

9:50 AM

Examining the Effects of Three Biologically Compatible Solvents on the Behavior of Chitosan Bonded to Titanium: *Holly Martin*¹; Kathryn Shields¹; Snjezana Balaz²; ¹Department of Chemical Engineering, Youngstown State University; ²Department of Physics and Astronomy, Youngstown State University

10:10 AM Break

10:25 AM

Mechanically Strong TiO2 Nanotubes for Hip Implants: Sweetu Patel¹; Giovanni Solitro²; Cortino Sukotjo²; Christos Takoudis²; Mathew Mathew³; Farid Amirouche²; Tolou Shokuhfar²; ¹Michigan Technological University; ²University of Illinois at Chicago; ³Rush University Medical Center

10:45 AM Invited

In-Vivo Performance and Characterization of Nanostructured Orthopedic Surfaces: Craig Friedrich¹; Erin Baker²; Sachin Bhosle¹; ¹Michigan Technological University; ²Beaumont Health System

11:10 AM

Beta-type Titanium Alloys for Use as Rods in Spinal Fixation Devices: *Mitsuo Niinomi*¹; Masaaki Nakai¹; Huihong Liu¹; Kengo Narita¹; ¹Tohoku University

11:30 AM

Processing, Microstructure Characterization and Biological Response of Cold Sprayed Biocomposite Coatings: *Eden Bhatta*¹; Grant Crawford¹; Joana Villanueva²; ¹South Dakota School of Mines and Technology; ²Humboldt State University

11:50 AM

Surface Amorphization of NiTi Alloy Induced by Ultrasonic Nanocrystal Surface Modification for Biomedical Applications: Xiaoning Hou¹; Ruixia Zhang¹; Yalin Dong¹; *Chang Ye*¹; ¹University of Akron

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

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 AMRoom: 103CFebruary 15, 2016Location: Mu

Room: 103C Location: Music City Center

Session Chairs: Sinn-wen Chen, National Tsing Hua University; Stéphane Gorsse, Bordeaux INP

8:30 AM Introductory Comments

8:35 AM Invited

Thermoelectric Properties of Higher Copper Chalcogenides: Holger Kleinke¹; ¹University of Waterloo

8:55 AM Invited

Recent Adavnces in Complex Sulphide Materials: *Emmanuel Guilmeau*¹; Cédric Bourgès¹; Tristan Barbier¹; Pierric Lemoine¹; Oleg Lebedev¹; Ramzy Daou¹; Vincent Hardy¹; ¹CRISMAT Lab.

9:15 AM Invited

Thermoelectric Properties of Cu2-dX-based (X=S, Se, and Te) Materials: *Xun Shi*¹; ¹Shanghai Institute of Ceramics

9:35 AM Invited

Nanointerface Engineering of Electronic Transport in Bulk Nanostructured in Half-Heulser Alloys: *Pierre Ferdinand Poudeu*¹; ¹University of Michigan

9:55 AM Break

10:15 AM Invited

Towards High Figure of Merit zT>1 for p-type FeNbSb Half-Heusler Thermoelectric Materials: *Tiejun Zhu*¹; Xinbing Zhao¹; ¹Zhejiang University

10:35 AM

Half-Heusler Microstructure Investigations and Ring-shaped Thermoelements Elaboration: *Christelle Navone*¹; Gilles Gaillard¹; Guillaume Bernard-Granger¹; Alizee Visconti¹; ¹Commissariat à l'Energie Atomique et aux Energies Alternatives

10:55 AM

Phase Diagrams of Chalcogenide Sn-Sb-Se Ternary System: Jui-shen Chang¹; Sinn-wen Chen¹; ¹National TsingHua University

Biological Materials Science Symposium – Biological Materials and Bioinspiration I

Sponsored by:TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee Program Organizers: Francois Barthelat, McGill University; Kalpana Katti, North Dakota State University; Paul Allison, University of Alabama; Rajendra Kasinath, DePuy Synthes Products, LLC

Monday AMRoom: 207AFebruary 15, 2016Location: 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 Meyers*¹; Steve Naleway¹; Joanna McKittrick¹; Michael Porter²; ¹University of California, San Diego; ²Clemson University

9:15 AM

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

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

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

10:15 AM Break

10:35 AM

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

10:55 AM

Why the Seahorse Tail is Square: *Michael Porter*¹; Dominique Adriaens²; Ross Hatton³; Marc Meyers⁴; Joanna McKittrick⁴; ¹Clemson University; ²Ghent University; ³Oregon State University; ⁴University of California, San Diego

11:35 AM

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 Riveros²; ¹Mississippi State University; ²US Army Engineer Research & Development Center; ³University of Alabama

11:15 AM

Lightweight Biological Composites: The Relationship between the Structure and Function of the Feather Vane and Inspired Designs: *Tarah Sullivan*¹; Steven Herrera²; David Kisailus²; Vlado Lubarda¹; Marc Meyers¹; ¹University of California, San Diego; ²University of California, Riverside

Bulk Metallic Glasses XIII — Alloy Development and Application I

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

Program Organizers: Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Jianzhong Jiang, Zhejiang University; Gongyao Wang, Alcoa Technical Center

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

Session Chairs: William Johnson, Caltech; Peter Liaw, The University of Tennessee

8:30 AM Keynote

Towards a Commercial Metallic Glass Technology: *William Johnson*¹; Marios Demetriou¹; 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 Baró¹; H. Y. Zhang¹; Y.P. Feng¹; D. Nieto²; G.M. O'Connor³; E. García-Lecina⁴; C. McDaniel³; J. Díaz-Marcos⁵; M. T. Flores-Arias²; E. Pellicer¹; J. Sort¹; 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 Bonnefont¹; 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 Hofmann*¹; 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; Cham Il Kim¹; Won Tae Kim²; *Do Hyang Kim*¹; ¹Yonsei University; ²Cheongju University

11:05 AM

Synthesis of Bulk Amorphous Co-C Alloys: Hesham Elmkharram¹; A. Aning¹; ¹Virginia Tech

11:25 AM Invited

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

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 Mashl, 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*¹; ¹MIT

9:15 AM Invited

Bulk Processing of Nanostructured Powders for Functional Materials with Hierarchical Structure Inspired by Natural Species: *Di Zhang*¹; Wang Zhang¹; Jiajun Gu¹; Shenmin Zhu¹; Huilan Su¹; Qinglei Liu¹; ¹Shanghai Jiao Tong University

9:45 AM Invited

Fracturing Mechanism of Carbon Nanotubes Reinforced Aluminum Matrix Composites: Katsuyoshi Kondoh¹; Biao Chen¹; Lei Jia¹; Junko Imai¹; Hisashi Imai¹; ¹Osaka 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*¹; Dengshan Zhou¹; Jiamiao Liang¹; Xun Yao¹; Yifeng Zheng¹; ¹Shanghai Jiao Tong University

11:05 AM Invited

Modified Strain Rate Regime in Consolidated Ultrafine Copper Powders with Silver Micro-alloying: *Yannick Champion*¹; Julie Bourgon¹; Xavier Sauvage¹; ¹CNRS

11:35 AM

Microstructures and Mechanical Properties of Ultrafine Grained Al-7Si-0.3Mg Alloy Produced by Thermomechanical Consolidation of a Milled Powder: *Jiamiao Liang*¹; C. Kong²; Md Zakaria Quadir²; Yifeng Zheng¹; X. Yao¹; Paul Munroe²; Deliang Zhang¹; ¹Shanghai Jiao Tong University; ²University of New South Wales

11:55 AM

Spark Plasma Sintering of Nanostructured AA5083 Powder with Varying Cryomilling Duration: *Frank Kellogg*¹; Benjamin Boesl²; Clara Hofmeister³; Anit Giri⁴; Yongho Sohn³; Kyu Cho⁵; Brandon McWilliams⁵; ¹Bowhead Science and Technology; ²Florida International University; ³University of Central Florida; ⁴TKC Global ; ⁵US 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:* Laurentiu Nastac, The University of Alabama; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, University of Illinois at Urbana-Champaign; Miaoyong Zhu, Northeastern University; Andreas Ludwig, Montanuniversitaet Leoben, Dep. Metallurgy; Adrian Sabau, Oak Ridge National Laboratory; Koulis 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 Ingots: *Andreas Ludwig*¹; Menghuai Wu¹; Abdellah Kharicha¹; ¹University of Leoben, Dep. Metallurgy

8:55 AM

Computational Fluid Dynamic Simulations of a Laboratory Flash Reactor Relevant to a Novel Flash Ironmaking Process: Yousef Mohassab¹; Deqiu Fan²; *Hong Yong Sohn*²; ¹University of Utah ; ²University of Utah

9:15 AM

Fluid Flow and Inclusion Motion in A Five-strand Continous Casting Tundish: Abulikemu Yasen¹; Dongteng Pan¹; *Lifeng Zhang*¹; ¹University 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*¹; Peter Glaws¹; Dongbu Cao¹; ¹TimkenSteel 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-zhen Cai*¹; Miao-yong Zhu¹; ¹Northeastern University

10:35 AM

Computational Investigation of Splashing Behaviors in Steelmaking Converter: *Qiang Li*¹; Mingming Li¹; Zongshu Zou¹; ¹Northeastern University

10:55 AM

Simulation of Air Entrainment in High Pressure Die Casting Applications: *Juergen Jakumeit*¹; Julian Gänz²; Herfried Behnken¹; ¹Access e.V.; ²CD-adapco

11:15 AM

Numerical Simulation of the Multiphase Flow in the Single-Tundish System: *Shupei Liu*¹; Bo Wang¹; Zhiliang Yang¹; Shuai Feng¹; Kongfang Feng¹; Jinyin Xie¹; Jieyu Zhang¹; ¹Shanghai University

11:35 AM

CFD Analysis of Blast Furnace Operating Condition Impacts on Operational Efficiency: Tyamo Okosun¹; Armin Silaen¹; Guangwu Tang¹; *Bin Wu*¹; Chenn Zhou¹; ¹Purdue University Calumet

11:55 AM

Numerical and Experimental Investigation of Vertical Twin Roll Strip Casting Process: Yuvaraj Patil¹; Sudipto Ghosh¹; Ajayakumar Shukla¹; ¹Indian Institute of Technology

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

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 Elfattah*¹; Hossam El-Din Sallam¹; ¹Jazan University

8:50 AM

On the Use of Higher Order Moment Invariants in the Classification of Microstructural Shapes: *Ryan Harrison*¹; Marc De Graef¹; ¹Carnegie Mellon University

9:10 AM

The Spacing Transform: Application and Validation: *William Monroe*¹; Charles Monroe¹; Robin Foley¹; ¹UAB

9:30 AM

DigiM Porosimetry: A Web Based Image to Simulation Portal for Material Characterization: Shawn Zhang¹; Cheney Zhang²; ¹DigiM Solution LLC; ²McCall Middle School

9:50 AM

Measuring Fracture Toughness Using Digital Image Correlation: *Carl Cady*¹; Cheng Liu¹; Manuel Lovato¹; ¹Los 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 Lavery¹; Erik Lauridsen²; Peter Resichig²; Michael Feser¹; ¹Carl Zeiss X-ray Microscopy, Inc.; ²Xnovo Technology ApS

10:45 AM

Speckle Measurements in Deformation Experiments and Dilatometry: *Alexander Makitka*¹; ¹Linseis

11:05 AM

A Unified Dictionary Approach for the Indexing of Electron Diffraction Modalities: Saransh Singh¹; Marc De Graef¹; ¹Carnegie Mellon University

11:25 AM

Facile Measurements of Single-crystal Elastic Constant Tensor Properties from Polycrystalline Samples: Xinpeng Du¹; Ji-Cheng Zhao¹; ¹Ohio State University

11:45 AM

Methodology for Determining Spall Damage Mode Preference in Shocked FCC Polycrystalline Metals from 3-D X-Ray Tomography Data: Andrew Brown¹; Quan Pham²; Pedro Peralta²; Brian Patterson³; Juan P. Escobedo-Diaz¹; Sheng-Nian Luo⁴; Darcie Dennis-Koller³; Ellen Cerreta³; Darrin Byler³; Aaron Koskelo³; Xianghui Xiao⁵; ¹UNSW Australia; ²Arizona State University; ³Los Alamos National Laboratory; ⁴The Peac Institute of Multiscale Sciences; ⁵Argonne National Laboratory

Characterization of Minerals, Metals, and Materials — Non-Ferrous

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

Program Organizers: Shadia Ikhmayies, AI 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 Firrao, Politecnico di Torino - DISAT; Mingming Zhang, ArcelorMittal Global R&D; Zhiwei Peng, Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Chenguang Bai, Chongging University

Monday AM	Room: 102B
Eebruary 15, 2016	Location: Music City Center

Session Chairs: Arnab Baksi, Lamar University; Evgeniya Skripnyak, National Research Tomsk State University

8:30 AM

Verification of the Predicted Martensitic Transformation in a Au-Cu-Zn Alloy: *Michael Chapman*¹; Marc DeGraef¹; ¹Carnegie Mellon University

8:50 AM

Low Cyclic Fatigue of Light Alloys with a Bimodal Grain Size Distribution: Evgeniya Skripnyak¹; Nataliya Skripnyak¹; Vladimir Skripnyak¹; Vladimir Skripnyak¹; ¹National Research Tomsk State University

9:10 AM

High Accuracy Technique to Measure the Electrical Conductivity of Highly Conductive Molten Salts: *Thomas Villalon*¹; Shizhao Su¹; Uday Pal¹; ¹Boston University

9:30 AM

Effect of Microstructural Anisotropy on the Dynamic Mechanical Behaviour of Rolled Ti-6Al-4V: Andrea Lock¹; Andrew Brown¹; Gareth Appleby-Thomas²; Md. Z. Quadir¹; Paul Hazell¹; *Juan P. Escobedo-Diaz*¹; ¹UNSW Australia; ²Cranfield University

9:50 AM

Microstructure Evolution during Thermal Aging of Inconel 718: Rajakumar Devarapalli¹; Jonathan Cormier¹; *Mustapha Jouiad*¹; ¹Masdar Institute

10:10 AM Break

10:25 AM

Microstructure Characterization of Nickel Alloy 718 with Automated Optical Image Processing: *Thomas Ivanoff*¹; Trevor Watt¹; Eric Taleff¹; ¹University of Texas at Austin

10:45 AM

An Empirical Equation to Predict the Porosity of Titanium Foams: *Xiao Jian*¹; Cui Hao¹; Qiu Guibao¹; Yang Yang¹; ¹Chongqing University

11:05 AM

Microstructure of Metal Injection Molded MIM418 Using Master Alloy Technique: Lin Zhang¹; Xiaowei Chen¹; Chi Chen¹; *Xuanhui Qu*¹; ¹University of Science and Technology Beijing

Computational Materials Engineering for Nuclear Reactor Applications — Understanding Nuclear Fuel 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 AM	Room: 101D
February 15, 2016	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*¹; Daniel Schwen²; ¹Pennsylvania State University; ²Idaho National Laboratory

9:30 AM

Cluster Dynamics Modeling of Extended Defects in Irradiated UO₂ with Off-stoichiometry Considerations: Sarah Khalil¹; Todd Allen²; *Anter El-Azab*³; ¹UW - Madison; ²Idaho National Lab; ³Purdue University

9:50 AM Break

10:10 AM

3D Phase Field Simulation of Grain Growth in Porous UO2: *Karim Ahmed*¹; Yongfeng Zhang¹; Todd Allen¹; Michael Tonks¹; Anter El-Azab²; ¹Idaho National Laboratory; ²Purdue 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 Shin¹; Stewart Voit²; Robbie Brese¹; Ben Slone¹; Suengmin Lee³; Theodore Besmann⁴; ¹Oak Ridge National Laboratory; ²Los Alamos National Laboratory; ³Pacific Northwest National Laboratory; ⁴University 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 Burkes¹; Curt Lavender¹; David Senor¹; Zhijie Xu¹; ¹Pacific Northwest National Laboratory

11:50 AM

PCI Analysis of a Commercial PWR using Bison-CASL Fuel Performance Code: *Nathan Capps*¹; Wenfeng Lui²; Joe Rashid²; Brian Wirth¹; ¹University of Tennessee; ²Anatech

Computational Methods for Spatio-temporal Scalebridging: 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 February 15, 2016 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 Chakraborty¹; Jiaxi Zhang¹; Somanth Ghosh¹; ¹Johns Hopkins University

8:50 AM

Accelerating Ring-Polymer Molecular Dynamics Simulation: A Parallel-Replica Dynamics Approach: *Chun-Yaung Lu¹*; Danny Perez²; Arthur Voter²; ¹Stanford University; ²Los Alamos National Laboratory

9:10 AM

Development of Accelerated Reactive Molecular Dynamics Framework for Chemically Reactive Systems: *Srujan Rokkam*¹; Tapan Desai¹; John Lawson²; Peter Cross³; Richard Burnes⁴; ¹Advanced Cooling Technologies, Inc.; ²NASA Ames Research Center; ³Naval Air Warfare Center ; ⁴Naval 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 Mousseau¹; ¹Université de Montréal

10:00 AM Break

10:20 AM

Further Development of the Local Hyperdynamics Method for Accelerated Molecular Dynamics: *Dipanjan Ray*¹; Danny Perez¹; Arthur Voter¹; 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 Osetsky¹; German D. Samolyuk¹; Roger E Stoller¹; ¹Oak Ridge National Laboratory

11:30 AM

Using Speculative Parallelization to Enhance Temperature Accelerated Dynamics Simulations: *Richard Zamora*¹; Danny Perez¹; Arthur Voter¹; ¹Los Alamos National Laboratory

11:50 AM

Multiscale Diffusion Method for Simulations of Long-Time Defect Evolution with Application to Dislocation Climb: Kristopher Baker¹; William Curtin¹; ¹EPFL

12:10 PM

Sublattice Parallel Replica Dynamics: *Enrique Martinez Saez*¹; Blas Uberuaga¹; Arthur Voter¹; ¹LANL

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

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 Wang¹; 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 Lejaeghere*¹; Veronique Van Speybroeck1; Ward Poelmans1; 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; 2University of Wisconsin

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: Dane Morgan, University of Wisconsin -Madison; Shawn Coleman, U.S. Army Research Laboratory; Xiang-Yang Liu, Los Alamos National Lab; Chris Wolverton, Northwestern University

Nonday AM	Room: 208B
ebruary 15, 2016	Location: Music City Center

Session Chairs: Wei Chen, Lawrence Berkelely National Laboratory; Bilge Yildiz, Massachusetts Institute of Technology

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

TECHNICAL PROGRAM

Investigation of the Ionic Conductivity of c-ZrO2 by Applying the CALPHAD Approach: Mohammad Asadikiya1; 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 Todorova1; Joerg Neugebauer1; ¹Max-Planck-Institut fuer Eisenforschung GmbH

9:40 AM

Impact of Varying Oxygen Stoichiometry on Electrochromic Behavior in WO,: Wennie Wang¹; Anderson Janotti¹; Chris Van de Walle¹; ¹University of California. Santa Barbara

10:00 AM Break

10:20 AM Invited

Intrinsic Point Defect in Intermetallics: From Computation to Data Mining: Wei Chen¹; Hong Ding¹; Bharat Medasani¹; Maciej Haranczyk¹; Kristin Persson¹; Mark Asta²; ¹Lawrence Berkeley National Laboratory; ²University of California, Berkeley

10.50 AM

First Principles Calculations of Lattice Parameters and Elastic Constants of Fe Phases Containing Solutes: Michael Fellinger¹: Louis Hector Jr.²: Dallas Trinkle¹; ¹University of Illinois at Urbana-Champaign; ²General Motors R&D Center

11·10 AM

Exploration into the Kinetics of Ultra-light Magnesium Alloys: Philipp Alieninov¹; Ian Parker¹; 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; Emine Gulsoy, Northwestern University; Yang Jiao, Arizona State University

Monday AM	Room: 102A
February 15, 2016	Location: Music City Center

Session Chair: Emine Gulsoy, Northwestern University

8:30 AM Keynote

Integrated Imaging: The Sum is Greater than the Parts: Amanda Petford-Long¹; ¹Argonne National Laboratory

9.00 AM

Digital Representation of Materials Grain Structure from

Four-Dimensional X-ray Microtomography Data: Ashwin Shahani¹; Xianghui Xiao²; Peter Voorhees¹; ¹Northwestern University; ²Argonne 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 Courtois¹; Shyamprasad Karagadde³; Fenglin Yi¹; Rahman Khandaker⁴; David Dye⁴; Robert Atwood⁵; ¹Manchester University; ²Oxford University; ³IIT Bombay; ⁴Imperial College, London; ⁵Diamond Light Source

9:40 AM

3D and 4D Characterization of Failure Mechanisms in Commercial Li-Ion Batteries: Jeff Gelb1; Paul Shearing2; Donal Finnegan2; Dan Brett2; 1San Jose State University; ²University College London

MONDAY AM

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 Xiao³; Yang Jiao¹; *Nikhilesh Chawla*¹; ¹Arizona State University; ²Carl Zeiss; ³Advanced Photon Source, Argonne National Laboratory

10:50 AM

Integrated Multimodal Imaging of Cathodes for Lithium Ion Battery: *Charudatta Phatak*¹; 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 Devaraj*¹; Robert Colby¹; Craig Szymanski¹; Jie Bao¹; Zhijie Xu¹; Vijay Murugesan¹; Tolek Tyliszczak²; Suntharampillai Thevuthasan³; ¹Pacific Northwest National Lab; ²Lawrence Berkeley National Laboratory; ³Qatar Environment and Energy Research Institute

11:40 AM Invited

Multi-Modality Imaging at the Hard X-ray Nanoprobe Beamline at the NSLS-II: *Yong Chu*¹; Hanfei Yan¹; Xiaojing Huang¹; Li Li¹; Ken Lauer¹; Sebastian Kalbfleisch¹; Wen Hu¹; Mingyuan Ge¹; Evgeny Nazaretski¹; ¹Brookhaven National Laboratory

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 Chason*¹; Fei Pei¹; ¹Brown University

8:55 AM

Mitigation of Sn Whisker Growth by Dopant Addition: *Indranath Dutta*¹; Babak Talebanpour¹; Sherin Bhassyvasantha²; Lutz Meinshausen¹; Soumik Banerjee¹; Bhaskar Majumdar²; ¹Washington State University; ²New Mexico Tech

9:15 AM

Synchrotron Radiation X-ray Measurement on Residual Stress in Sn Films and Kinetic Analysis of Sn Whiskers Growth: *Hao Chen*¹; Hsin Yi Lee²; 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 Vallabhaneni*¹; Ehsan Izadi¹; Carl Mayer¹; Sudhanshu Singh¹; C. Shashank Kaira¹; Jagannathan Rajagopalan¹; Nikhilesh Chawla¹; ¹Arizona State University

10:00 AM Break

10:20 AM

Effect of Crystal Orientation and Microstructure on the Nucleation and Growth of Tin (Sn) hillocks by In Situ Nanoindentation and Electron Backscattered Diffraction (EBSD): *Irene Lujan-Regalado*¹; Antony Kirubanandham¹; Carl Mayer¹; Sudhanshu Singh¹; Jason Williams¹; Nikhilesh Chawla¹; ¹Arizona State University

10:40 AM

Nucleation Rates of \946-Sn, Cu₆Sn₅, and Cu₂Al_y in Aluminum-Modified Lead-Free Solder Alloys: *Kathlene Reeve*¹; Carol Handwerker¹; Iver Anderson²; ¹Purdue University; ²Ames Laboratory

11:00 AM

Influence of Surface Finish on the Formation of Intermetallic Compounds during Reflow Soldering: In-situ Real-time Observations: *M. A. A. Mohd Salleh*¹; C. M. Gourlay²; H. Yasuda³; A. Sugiyama⁴; T. Nagira⁵; S. D. McDonald¹; K. Nogita¹; ¹School of Mechanical and Mining Engineering, University of Queensland; ²Imperial College; ³Kyoto University; ⁴Osaka Sangyo University; ⁵Osaka University

11:20 AM

Influence of the Substrate on the Nucleation of Tin in Solder Reactions: *Christopher Gourlay*¹; Sergey Belyakov¹; Zhaolong Ma¹; Jingwei Xian¹; ¹Imperial College London

Energy Technologies and Carbon Dioxide Management — Session I

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 AM R February 15, 2016 L

Room: 104D Location: Music City Center

Session Chairs: Neale Neelameggham, Ind LLC; Nawshad Haque, CSIRO; Jingxi Zhu, Carnegie Mellon University

8:30 AM

CO2 Reduction in Metallurgical and Gasification Industries Using Slag Byproduct: *Jinichiro Nakano*¹; James Bennett¹; Anna Nakano¹; ¹US Department of Energy National Energy Technology Laboratory

8:50 AM

CO2 Reduction in the Cement Industry by Chemical Synthesis Processes: *Juan Restrepo*¹; Oscar Restrepo¹; Jorge Tobón¹; ¹Universidad Nacional de Colombia

9:10 AM Invited

Study on Molten Salt CO2 Capture and Electrochemical Transformation (MSCC-ET): Dihua Wang¹; ¹Wuhan University

9:50 AM

Research on Greenhouse Gas Emission of Solid Dust Recovery Using Rotary Hearth Furnace Process in China: *Hong-Qiang Liu*¹; Jian-Xun Fu¹; Si-Yu Liu¹; ¹State 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 Williamson*¹; Winnie Wong-Ng²; Lan Li¹; ¹Boise State University; ²National Institute of Standards and Technology

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11:10 AM

Thermodynamic Analysis of Hydrogen Production from Cog-Steam Reforming Process Using Blast Furnace Slag as Heat Carrier: *Wenjun Duan*¹; Qingbo Yu¹; Junxiang Liu¹; Qin Qin¹; 'Northeastern University

11:30 AM

MONDAY AM

CO2 Gasification of Catalysts-loaded Petroleum Coke at Different Grinding Medium: *Zhengjie Chen*¹; Wenhui Ma¹; Kuixian Wei¹; Jijun Wu¹; ¹Kunming University of Science and Technology

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 AMRoom: 213February 15, 2016Location: Music City Center

Session Chair: Antonios Kontsos, Drexel University

8:30 AM Keynote

Advances in Modeling of Fatigue Thresholds: *Huseyin Sehitoglu*¹; Piyas Chowdhury¹; Sertan Alkan¹; ¹University of Illinois

9:10 AM Invited

Quantifying Dislocation Microstructure and Point Defect Evolutions during Cyclic Loading: Ahmed Hussein¹; *Jaafar El-Awady*¹; ¹Johns Hopkins University

9:30 AM

In-situ Laue Micro-Diffraction during Cyclic Plastic Deformation of Copper under Shear: Ainara Irastorza-Landa¹; Steven Van Petegem¹; Antoine Guitton¹; Alex Bollhalder¹; Daniel Grolimund¹; *Helena Van* Swygenhoven¹; ¹Paul Scherrer Institut

9:50 AM

Statistical Analysis of Elastic Stress Field at Surface of Ti6Al4V Polycrystals Predicted by Finite Elements Simulations: *Loic Signor*¹; Van Truong Dang¹; Patrick Villechaise¹; Samuel Hemery¹; ¹Pprime Institute (CNRS - ISAE/ENSMA - Poitiers University)

10:10 AM Break

10:30 AM Invited

Multidisciplinary Approach for Capturing Fatigue Damage Precursor Effects in Metallic Structures under Dynamic Loading: Ed Habtour¹; Daniel Cole¹; Brian Wisner²; Antonios Kontsos²; 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

11:10 AM

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

11:30 AM

Investigation of Nonmetallic Inclusion-driven Failures: *Diwakar Naragani*¹; Michael Sangid¹; Paul Shade²; Jay Schuren²; Hemant Sharma³; Jun-Sang Park³; Peter Kenesei³; Joel Bernier⁴; Todd Turner²; 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 Illnois; Alain Karma, Northeastern University; Jeffrey Hoyt, McMaster University

Monday AM	Room: 105A
ebruary 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 Sekerka*¹; ¹Carnegie Mellon University

9:55 AM Break

10:15 AM Invited

A Criterion for Wavelength Selection in Pattern Forming Systems: Jeffrey Hoyt¹; *Ken Elder*²; 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 Asta*²; Jeffrey Hoyt³; ¹Lawrence Berkeley National Laboratory; ²University of California, Berkeley; ³McMaster University

11:05 AM Invited

Solute 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: *Zhongyun Fan*¹; ¹Brunel 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 Sampath¹; ¹Stony Brook University

9:10 AM

Composition and Temperature Dependence of Fracture Behavior of Diffusion Aluminide Bond Coats: *Nagamani Jaya Balila*¹; Md Zafir Alam²; Sanjit Bhowmick³; Dipak K Das⁴; Samir Kamat⁴; S. A. Syed Asit⁵; Vikram Jayaram⁵; ¹MPIE GmbH; ²Johns Hopkins University; ³Hysitron Inc.; ⁴DMRL; ⁵IISc

9:30 AM Invited

Synchrotron-Based X-ray Imaging of Energy Conversion and Storage Materials: Wilson Chiu¹; ¹University 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*¹; ¹Utah State University

10:35 AM Invited

Hidden Information in Standard Characterization of Ceramics: James Zimmermann¹; ¹Corning

11:00 AM

Thermomechanical Properties of Bilayer La2Zr2O7 Thermal Barrier Coatings: Xingye Guo¹; Zhe Lu²; Yeon-Gil Jung²; Li Li³; James Knapp³; *Jing Zhang*¹; ¹Indiana University - Purdue University Indianapolis; ²Changwon National University; ³Praxair Surface Technologies Inc.

11:20 AM

Evaluation of Delamination Life for Thermal Barrier Coating with Various Bond Coats: *Taehyung Kim*¹; Jongkee Ahn¹; Dongick Shin¹; Kitae Kim¹; Yeon-Gil Jung²; Donghoon Kim³; ¹Hanwha Techwin; ²Changwon National University; ³Agency for Defense Development

Hume-Rothery Award Symposium: Thermodynamics of Materials — Phonon and Mechanisms I

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

Session Chairs: Ursula Kattner, National Institute of Standards and Technology; Mark Asta, University of California, Berkeley

8:30 AM Introductory Comments Michael E. Manley

8:40 AM Keynote

The Origin of Entropy in Materials: *Brent Fultz*¹; ¹California Institute of Technology

9:20 AM Invited

Vibrational Entropy and Chemical Configurations: Experimental Quantification and Their Correlation: *Matthew Lucas*¹; '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*¹; Jiawang Hong¹; Olivier Delaire¹; Michael Manley¹; Chen Li¹; Jonathan Tischler²; Ayman Said²; Bogdan Leu²; Douglas Abernathy¹; Eliot Specht¹; Lynn Boatner¹; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory

10:10 AM Break

10:30 AM Invited

Harnessing Materials Properties and Data for Accelerated Design: *Kristin Persson*¹; ¹UC Berkeley

11:00 AM Invited

Thermodynamics and Thermal Transport Near Lattice Instabilities: *Olivier Delaire*¹; ¹Oak 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*¹; Marcus Ekholm¹; Qingguo Feng¹; Leonid Pourovskii²; Mikhail Katsnelson³; John Wills⁴; Alexey Tal⁵; Natalia Dubrovinskaia⁶; Leonid Dubrovinsky⁶; ¹Linköping University; ²Ecole Polytechnique; ³Radboud University; ⁴Los Alamos National Laboratory; ⁵NUST 'MISIS'; ⁶University 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 Forsmark*¹; Mei Li¹; Raj Mishra²; Plumeri John³; Richard Michie³; Ahmad Chamanfar³; Wojciech Misiolek³; Zachary McClelland⁴; Andrew Oppedal⁴; Mark Horstemeyer⁴; Stephen Horstemeyer⁴; Xianfeng Ma⁵; John Allison⁵; Scott Sutton⁶; Alan Luo⁶; Eric Nyberg⁷; Nes Abdulrahman⁸; ¹Ford Motor Company; ²General Motors; ³Lehigh University; ⁴Mississippi State University; ⁵University of Michigan; ⁶Ohio State University; ⁷Pacific Northwest National Labs; ⁸Mag 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 Rui*¹; 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 Lee*¹; ¹KIST

11:20 AM

3D Digital Representations of Knitted Textile Architectures

: Daniel Christe¹; Dani Liu¹; Krzysztof Mazur¹; Shane Esola¹; Genevieve Dion²; David Breen³; Antonios Kontsos¹; 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 February 15, 2016

Location: Music City Center

Room: 202A

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 Delalande*¹; 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 AMRoom: 204February 15, 2016Location: 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 Kainer*¹; 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 Singh*²; ¹University of Tokyo; ²National Institute for Materials Science

11:25 AM Keynote

Developments in High Magnesium-content Bulk Metallic Glasses and Future Possibilities: *Kevin Laws*¹; Karl Shamlaye¹; Jörg Löffler²; Michael Ferry¹; 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 AMRoom: 208AFebruary 15, 2016Location: 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 Dimiduk*¹; Sean Donegan¹; Michael Groeber²; Adam Pilchak²; Shesh Srivatsa³; ¹BlueQuartz Software, LLC; ²Air Force Research Laboratory; ³Srivatsa Consulting, LLC

9:00 AM Invited

Decision Support Strategies in Design of Hierarchical Alloy Systems: *David McDowell*¹; ¹Georgia Institute of Technology

9:30 AM

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

9:50 AM Break

10:10 AM Invited

High Temperature Statistical Mechanics to Enable Alloy Design: *Anton Van der Ven*¹; John Thomas¹; Brian Puchala²; Anirudh Raju Natarajan¹; John Goiri¹; ¹University of California Santa Barbara; ²University of Michigan

10:40 AM Invited

Further Developments of CALPHAD Based Tools for Alloy Design: *Paul Mason*¹; Kaisheng Wu¹; Chao Jiang¹; Qing Chen²; Johan Bratberg²; Anders Engstrom²; 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

8:30 AM

Recent Results of Microstructural Characterization of U-10Mo Monolithic Fuel Plates Irradiated in the Advanced Test Reactor: Dennis Keiser¹; Jan-Fong Jue¹; Jian Gan¹; Brandon Miller¹; Adam Robinson¹; ¹Idaho National Laboratory

8:50 AM

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

9:10 AM

Chemical Dependence of the Amorphization Behavior of the UMo-Al Interaction Layer in Dispersion Fuels: *Laura Jamison*¹; Bei Ye¹; Sumit Bhattacharya²; Abdellatif Yacout¹; 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 Joshi*¹; Curt Lavender¹; Zhijie Xu¹; Dean Paxton¹; Douglas Burkes¹; ¹Pacific Northwest National Laboratory

9:50 AM

Swift Heavy Ion Irradiation Induced Interactions in the UMo/X/Al Trilayer System: Hsin-Yin Chiang¹; *Winfried Petry*¹; S.-H. Park²; M. Mayer³; K. Schmid³; M. Balden³; U. Boesenberg⁴; R. Jungwirth¹; G. Falkenberg⁴; Tobias Zweifel¹; 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 Soulami*¹; Zhijie Xu¹; Vineet Joshi¹; Colleen McInnis¹; Curt Lavender¹; 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 Liu¹; 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 Lavender¹; Ayoub Soulami¹; 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 Petry*¹; Tanja Huber¹; Harald Breitkreutz¹; Christian Reiter¹; Stefan Elgeti²; Douglas Burkes³; Amanda Casella³; Andrew Casella³; Frances Smith³; Daniel Wachs⁴; 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 Prabhakaran*¹; Levi Gardner²; Vineet Joshi¹; Curt Lavender¹; 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 Edmondson*¹; Chad Parish¹; Tyler Gerczak¹; Keith Leonard¹; Arthur Motta²; 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 Elbakhshwan*¹; Raul Rebak²; Lynne Ecker¹; ¹Brookhaven National Laboratory; ²GE Global Research, Schenectady

9:10 AM

Transitions in Creep Mechanisms of HANA 4 – Applications to Dimensional Change Predictions during Dry Storage: Boopathy Kombaiah¹; *Korukonda Linga Murty*¹; ¹North Carolina State University

9:30 AM

Atom Probe Examinations of Zircaloy Irradiated at Nominally 358C: Brian Cockeram¹; Phil Edmondson²; Keith Leonard²; Jim Hollenbeck¹; ¹Bechtel-Bettis; ²Oak Ridge National Laboratory

9:50 AM

Al-Ti-Cr Coating on Zr Alloys for Enhancing Accident Tolerance of Fuel Claddings: *Jeong-Yong Park*¹; Il-Hyun Kim¹; Hyun-Gil Kim¹; Yang-Il Jung¹; Dong-Jun Park¹; Jung-Hwan Park¹; Yang-Hyun Koo¹; ¹Korea Atomic Energy Research Institute

10:10 AM Break

10:30 AM

Irradiation Memory Effects in Zirconium Alloy Corrosion: Jason Gruber¹; ¹Bechtel Marine Propulsion Corporation

10:50 AM

Synthesis and Characterization of Magnetron Sputtered Cr2AlC Coatings to Improve Oxidation Resistance of Zirconium Alloys: *Maulik Patel*¹; Yueying Wu¹; Devin Roberts¹; Philip Rack¹; Jonna Partezana¹; Robert Comstock¹; Kurt Sickafus¹; ¹University 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; ¹Drexel University

11:30 AM

Study of Microstructural Evaluation and Thermal Creep Behavior of Heat-Treated Zr-Excel Pressure Tube Materials: *Kazi Ahmmed*¹; Levente Balogh¹; Yasir Idrees¹; David Kerr¹; Mark Daymond¹; ¹Queens University

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; Garritt 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 Laboatories

8:30 AM Invited

In Situ TEM Characterization on Deformation of FeCoNiMnCr High Entropy Alloy: *Qian Yu*¹; ZiJiao Zhang²; Jiangwei Wang³; 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 Kapp*¹; Anton Hohenwarter²; Stefan Wurster²; Bo Yang¹; Reinhard Pippan¹; ¹Erich Schmid Institute of Materials Science; ²Montanuniversität Leoben

9:30 AM

In Situ Study of Oxygen's Influence on Deformation Twinning in Alpha-Titanium: *Rachel Traylor*; Josh Kacher²; Max Poschmann²; Mark Asta²; Daryl Chrzan²; Andrew Minor²; ¹University 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; *Jian Wang*²; Xiang-Yang Liu¹; Amit Misra³; ¹Los Alamos National Laboratory; ²University of Nebraska-Lincoln; ³University of Michigan

10:10 AM Break

10:30 AM

In Situ Nanomechanics: Ting Zhu1; 1Georgia Institute of Technology

10:50 AM

Correlating In and Ex Situ Nanomechanical Measurements: *Douglas Stauffer*¹; Eric Hintsala²; William Gerberich²; S.A. Syed Asif¹; ¹Hysitron, Inc.; ²Chemical Engineering & Materials Science, University of Minnesota

11:10 AM

Enhancing Ductility of Metal-Metal (BCC-HCP) and Metal-Ceramic Multilayered Nanocomposites: *Siddhartha Pathak*¹; William Mook²; Youxing Chen¹; Nan Li¹; Jon Baldwin¹; Irene Beyerlein¹; Nathan Mara¹; ¹Los Alamos National Laboratory; ²Sandia National Laboratory

11:30 AM

In Situ Atomic-scale Observation of Twinning Dominated Deformation in Nanoscale BCC Bi-crystals: *Scott Mao*¹; Jiangwei Wang¹; Zhi Zeng²; Christopher Weinberger³; Ze Zhang⁴, Ting Zhu²; ¹University of Pittsburgh; ²Georgia Institute of Technology; ³Sandia National Laboratories; ⁴Zhejiang University

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MONDAY AM

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
February 15, 2016	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 Singh¹; James Mertens¹; C. Shashank Kaira¹; Hechao Li¹; Sudhanshu Singh¹; Yang Jiao¹; Nikhilesh Chawla¹; ¹Arizona State University

8:50 AM Invited

Multifunctional Polymer Matrix Nanocomposites toward Microwave Absorption: Qingliang He¹; Jiang Guo¹; Xingru Yan¹; *Zhanhu Guo*¹; ¹University of Tennessee

9:10 AM

Development of a Composite Material Filament for Lightweight 3D Printed Components: Steven Zeltmann¹; Nikhil Gupta¹; Mrityunjay Doddamani²; ¹New York University; ²National Institute of Technology, Karnataka

9:30 AM

Degradation Study of High Melt Strength Polypropylene/Clay Nanocomposites in Environmental and Accelerated Conditions: Luiz Komatsu¹; Washington Oliani¹; Ademar Lugao¹; Duclerc Parra¹; *Vijaya Rangari*¹; ¹Nuclear and Energy Research Institute

9:50 AM

The Role of Titania Surface on the Degradation Behavior of LLDPE Composites: *Hamilton Viana*¹; Patrícia Poveda²; Leonardo Silva²; ¹College of Engineering - University Center of Santo Andre; ²IPEN - 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*¹; ¹Kansas State University

10:50 AM

Laser Pulse Heating of Carbon Nanotube Composites: Stephen Bartolucci¹; Michael Miller¹; Karen Supan²; Jeffrey Warrender¹; ¹ARDEC-Benet Laboratories; ²Norwich University

11:10 AM

Nanotube Sheet - Graphite Hybrid Nanocomposite for Damage Detection: Jiukun Li¹; *Sirish Namilae*¹; ¹ERAU

11:30 AM

Progressive Damage and Failure Analysis of Composite Structures for Wind Turbine Blades and Airplane Fuselase Using Multiscale Synergistic Damage Mechanics Approach: *Chandra Veer Singh*¹; John Montesano¹; ¹University of Toronto

Nanostructured Materials for Nuclear Applications — Session I

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 AMRoom: 101CFebruary 15, 2016Location: Music City Center

Session Chairs: Cheng Sun, Los Alamos National Laboratoary; Khalid Hattar, Sandia National Laboratory

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 Odette¹; ¹University of California Santa Barbara

9:05 AM Invited

Point Defect-fluxes to Interfaces during Irradiation: *Shen Dillon*¹; Shimin Mao¹; ¹University of Illinois at Urbana-Champaign

9:35 AM

Microstructural Investigation of Irradiation Effects in Nanoscale Stable Precipitation-Strengthened Steels: *Clarissa Yablinsky*¹; Osman Anderoglu¹; Semyon Vaynman²; Yip-Wah Chung²; Morris Fine²; Kristin Tippey³; John Speer³; Kip Findley³; Omer Dogan⁴; Paul Jablonski⁴; Stuart Maloy¹; Amy Clarke¹; Kester Clarke¹; ¹Los Alamos National Laboratory; ²Northwestern University; ³Colorado School of Mines; ⁴National 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 Gordillo*¹; Jörg Wiezorek¹; ¹University 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 Hosemann¹; Nathan Bailey¹; Manuel Abad¹; David Frazer¹; Rachel Connick¹; Joanna Szornel¹; Scott Parker¹; Daniel Kiener²; Mychailo Toloczko³; ¹University of California Berkeley; ²Montanuniversität Leoben; ³Pacific Northwest National Laboratory

11:05 AM

Probing Nanoscale Damage Gradients in Irradiated Materials with Spherical Nanoindentation: *Nathan Mara*¹; Siddhartha Pathak¹; Yongqiang Wang¹; Russ Doerner²; Surya Kalidindi³; ¹Los Alamos National Laboratory; ²University of California, San Diego; ³Georgia Institute of Technology

11:25 AM

On the Nano-Oxide Phase in MA957 and FCDR NFA-1: *Yuan Wu*¹; Stephan Kraemer¹; soupitak Pal¹; George Odette¹; Nathan Bailey²; Peter Hosemann²; James Ciston³; ¹UCSB; ²UCB; ³LBL

11:45 AM

First Principles Study on Helium Bubble Formation at the Y-Ti-N/C Enriched Nano-precipitates in 14YWT: *Yingye Gan*¹; Huijuan Zhao¹; Di Yun²; David Hoelzer³; ¹Clemson University; ²Argonne National Laboratory; ³Oak Ridge National Laboratory

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; 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 & Tech; Shien Ping Feng, The University of Hong Kong; Clemens Schmetterer, Fraunhofer Institute

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

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

8:30 AM Invited

Development of High Strength and High Electrical Conductivity of Cu-Ni-Al Alloys: Kivohito Ishida1; Takashi Miyamoto1; Ikuo Ohnuma1; Toshihiro Omori¹; Ryousuke Kainuma¹; 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; Jhou-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 Chiu2; Yen-Ting Liu2; Hsin-Yi Lee2; 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 Yen²; Chih-Ming Chen¹; ¹National Chung Hsing University; ²National Taiwan University of Science and Technology

11:30 AM

Failure Mechanism of Cu₂Sn₅ Microbumps under Current Stressing: Yi Cheng Chu1; Chih Chen1; Chau-Jie Zhan2; Yu-wei Huang2; 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: Sudarsanam Babu, The University of Tennessee, Knoxville; Dhriti 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

Nonday AM	Room: 107B
ebruary 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 Zhang*¹; 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 Suman¹; Amit Bhattacharjee²; Sujoy Kar¹; 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 Djemai1; 1University Hadj-lakhdar Batna

10:00 AM Break

10:20 AM

Supersaturation and Decay: The Life of Vacancies during Precipitation: Alexis Deschamps1; De Geuser Frederic1; 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 Shetty¹; Jessica Krogstad¹; 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

TECHNICAL PROGRAM

Phase Transformations and Microstructural Evolution — Phase Transformations in Fe-Alloys -Session I

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

Program Organizers: Sudarsanam Babu, The University of Tennessee, Knoxville; Dhriti 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 AM	Room: 108
February 15, 2016	Location: Music City Center

Session Chair: Sudarsanam Babu, University of Tennessee, Knoxville

8:30 AM

Combined Atom Probe Tomography and Electron Microscopy Investigation of Intermediate Carbides Precipitation from Supersaturated Virgin Fe-Ni-C Martensites: *Frederic Danoix*¹; Sophie Cazottes²; Mohamed Goune³; Helena ZAPOLSKY¹; Sebastien Allain⁴; Philippe Maugis⁵; ¹CNRS - Université de Rouen; ²MATEIS INSA Lyon; ³ICMCB Bordeaux; ⁴IJL Université de Lorraine; ⁵Aix-Marseille Université IM2NP

9:00 AM

Ballistic Martensite: *Nicholas Wengrenovich*¹; Greg Olson¹; ¹Northwestern University

9:20 AM

Boron Segregation and its Effects in Boron Containing Steels: *Kara Luitjohan*¹; David Johnson¹; Volkan Ortalan¹; ¹Purdue University

9:40 AM

Carbide Evolution during Quenching and Partitioning of Steel Studied by Mössbauer Spectroscopy: *Dean Pierce*¹; Dan Coughlin²; Amy Clarke²; Don Williamson³; Jonathan Poplawsky⁴; Kester Clarke²; John Speer¹; David Matlock¹; Emmanuel De Moor¹; 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 Guziewski¹; Christopher Weinberger¹; 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 Shassere*¹; Yukinori Yamamoto²; Sudarsanam Babu¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

11:00 AM

High Temperature Spheroidization of Cementite in a 2C-4Cr Ultrahigh Carbon Steel.: *Matthew Hecht*¹; Yoosuf Picard¹; Bryan Webler¹; 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

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

Session Chairs: Matthias Militzer, University of British Columbia; Annika Borgenstam, KTH, Royal Institute of Technology

8:30 AM Invited

Towards a Unified Analysis of Migrating Austenite/Ferrite Interfaces in Steels: *John Agren*¹; ¹Royal Institute of Technology

9:00 AM Invited

New Insights into Alloying Elements Interaction with Migrating α-ferrite/γ-austenite Interface in Fe-C-Mn System: Goune Mohamed¹; Fréderic Danoix²; Xavier Sauvage²; Didier Huin³; ¹ICMCB-Bordeaux1; ²Université of Rouen; ³ArcelorMittal

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 Hibbard*¹; 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 Zwaag*¹; Hussein Farahani; Hatem Zurob; ¹Technical University Delft

11:00 AM

Grain Boundary Segregation in Phase Separating Nanocrystalline Alloys: The Role of Competing Processes on Microstructure Evolution: *Fadi Abdeljawad*¹; Stephen Foiles¹; Blythe Clark¹; ¹Sandia National Laboratories

11:20 AM

Solute Interactions at the Ferrite-Austenite Interphase Boundary: Brian Langelier¹; Hugo Van Landeghem¹; *Hatem Zurob*¹; ¹McMaster University

11:40 AM Panel Discussion

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

Sponsored by:TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Shafiq Alam, University of Saskatchewan; Hojong Kim, Penn State University; Neale Neelameggham, Ind LLC; Takanari Ouchi, MIT; Harald Oosterhof, Umicore

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

Session Chairs: Harald Oosterhof, Umicore; Takanari Ouchi, Massachusetts Institute of Technology

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

9:05 AM

Hydrometallurgical Extraction of Rare Earth Elements and Phosphorous from Low Grade Mine Tailings: Sebastiaan Peelman¹; ¹Delft University of Technology

9:30 AM

Fluorination Behavior of Uranium and Zirconium Mixture for Fuel Debris Treatment: Nobuaki Sato¹; Akira Kirishima¹; Tetsuo Fukasawa²; ¹IMRAM; ²Hitachi-GE Nuclear Energy

9:55 AM Invited

Hydrometallurgical Recovery of Rare Earth Metals from Spent FCC Catalysts: *Marco Wenzel*¹; K. Schnaars¹; N. Kelly¹; K. Gloe¹; Jan Weigand¹; S. Robles M²; K. Kretschmer²; Phuc Nguyen Le³; Dang Thanh Tung³; Nguyen Huu Luong³; Tran Vinh Loc³; Dang Van Sy⁴; 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*¹; Guiqing Zhang¹; Liansheng Xiao¹; Zuoying Cao¹; ¹Central South University

11:05 AM

Preparation and Analysis of Nd2O3 Doped Apatite Concentrate for Pyrometallurgical Recovery of Rare Earth Element: *Tianming Sun*¹; Mark William Kennedy²; Kai Tang³; Gabriella Tranell⁴; Ragnhild E. Aune⁴; 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	Room: 205C
February 15, 2016	Location: Music City Center

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: *Dishit Parekh*¹; Collin Ladd¹; Michael Dickey¹; ¹North Carolina State University

8:50 AM Invited

Inkjet Printed Metal Oxide Thin Film Transistors: *Chih-hung Chang*¹; ¹Oregon State University

9:15 AM Invited

Laser Writing and Photonic Reduction of High Performance Supercapacitors on Flexible Substrates: Anning Hu¹; ¹University of Tennessee

9:40 AM Invited

Low-Cost Inkjet Process for Printing Embedded Electronics: Christopher Schmitt¹; *Wenchao Zhou*¹; 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) Sierros¹; ¹West Virginia University

10:50 AM Invited

Ultrasonic Spray Printing for High-performance Flexible Organic Fieldeffect Transistors and Hybrid Perovskite Solar Cells: *Kai Xiao*¹; Sanjib Das²; Ming Shao¹; Bin Yang¹; Jong Keum¹; Ilia Ivanov¹; Gong Gu²; Tolga Aytug¹; Pooran Joshi¹; Christopher Rouleau¹; David Geohegan¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

11:15 AM Invited

Wireless Gas Sensing with NFC-enabled Mobile Device: Tuo Ji¹; Yichuan Zhao¹; Forrest Sheng Bao¹; *Jiahua Zhu*¹; ¹The University of Akron

11:40 AM

Mechanical Stability of Printed Metallizations on Polymer Substrates: Oleksandr Glushko¹; Megan Cordill²; Andreas Klug³; Emil List-Kratochvil⁴; 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 Carradò, IPCMS; Heinz Palkowski, TU Clausthal; Nuggehalli Ravindra, New Jersey Institute of Technology; Chintalapalle Ramana, University of Texas at El Paso

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

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 Gendelberg¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

8:50 AM

Thin Films and Coatings for Absorptive Removal of Antimicrobials, Antibiotics, and Other Pharmaceuticals: *David Cocke*¹; Andrew Gomes¹; Saiful Islam¹; Gary Beall²; ¹Lamar University; ²Texas State University

9:10 AM

Surface Functionalization of Titanium Surfaces to Design Innovative Hybrid and Biocompatible Materials: *Melania Reggente*¹; Irene Bonafede²; Geneviève Pourroy¹; Patrick Masson¹; Marco Rossi²; Heinz Palkowski³; Adele Carradò¹; ¹Université de Strasbourg; ²Sapienza University of Rome; ³Clausthal University of Technology

9:30 AM

Surface Functionalization of Titanium Substrates for Improving Osteointegration: Quang Van Le¹; Mathilde Giraudel²; Geneviève Pourroy¹; Caroline Fischer³; Koenig Géraldine³; Leandro Jacomine⁴; Jacques Faerber⁵; Fabienne Perrin-Schmitt³; *Adele Carradò*¹; 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*¹; Deniz Polat¹; Ozgul Keles¹; ¹ITU

10:30 AM

Improving Electrochemical Performance of LiNi0.5Mn1.5O4 by MnO2 Top Coat: Ceren Yagsi¹; Deniz Polat¹; Ozgul Keles¹; ¹ITU

10:50 AM

Role of Membrane Properties on Charge Transport across Conjugated Oligoelectrolyte Modified Phospholipid Bilayers: Justin Jahnke¹; Guillermo Bazan²; James Sumner¹; ¹US Army Research Laboratory; ²UC Santa Barbara

11:10 AM

Magnetic Field Assisted Assembly: *B. S. Mani*¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

11:30 AM

Magnetic Field Assisted Assembly Machine: Yan Liu¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

11:50 AM

Modelling Optical Properties of Black Silicon: *Sita Rajyalaxmi Marthi*¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

Refractory Metals 2016 — Processing & Characterization of Refractory Metals: Bulk & Coatings

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

Program Organizers: Gary Rozak, HC Starck; 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

8:30 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*¹; Eric Taleff¹; ¹University of Texas at Austin, Dept of Mechanical Engrg

9:10 AM

Introduction of Precisely Controlled Microstructural Defects into SRF Cavity Nb Sheet and Their Impact on Local Superconducting Properties: *Mingmin Wang*¹; Di Kang¹; Zuhawn Sung²; Peter Lee²; Anatolii Polyanskii²; Christopher Compton¹; Thomas Bieler¹; ¹Michigan State University; ²Florida State University

9:30 AM

Effect of Silicon on Texture of Niobium: Abhishek Bhattacharyya¹; *Marc Abouaf*¹; ¹H.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*¹; Z. Zak Fang¹; Huan Zhang¹; Dean Buchenauer²; Robert Kolasinski²; ¹University of Utah; ²Sandia National Laboratory

10:10 AM Break

10:25 AM

Micro-Mechanical Characterization of Micro-Architectured Refractory Metal Coatings: Quan Jiao¹; Jaafar El-Awady¹; ¹Johns Hopkins University

10:45 AM

Micromechanical Testing of Multi Compositional Tungsten Thin Film Alloys: *Vladica Nikolic*¹; Stefan Wurster²; Alan Savan³; Alfred Ludwig³; Reinhard Pippan¹; ¹Erich Schmid Institute for Materials Science, Austrian Academy of Sciences; ²Department of Materials Physics, Montanuniversität Leoben; ³Institute for Materials, Ruhr-Universität Bochum

11:05 AM

Thermo-mechanical Behavior of FG Tungsten/EUROFER Coating System under In-service Conditions: D. Qu¹; M. Wirtz²; J. Linke²; R. Vaßen²; *Jarir Aktaa*¹; ¹Karlsruhe Institute of Technology; ²Forschungszentrum Jülich GmbH

11:25 AM

Etched Surface of CVTD Single Crystal Tungsten Coating after Serving under High Temperature: *Hongtao Huang*¹; Yongfeng Wei¹; Jianpin Zheng¹; Chengwen Tan²; ¹China Institute of Atomic Energy; ²Beijing Institute of Technology

11:45 AM

Influences of Rare Earth on Microstructures and Mechanical Properties of Functionally Graded Cemented Carbides: *Xiaofeng Li*¹; Yong Liu¹; ¹Central South University

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 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 Neelameggham, Ind LLC

Monday AM	Room: 104B
ebruary 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 Antrekowitsch*¹; ¹University of Leoben

8:55 AM

Bauxite Residue for Phosphorus Removal from Waste Water: *Gamini Mendis*¹; Amanda Brock¹; Kai Gao¹; Indrajeet Chaubey¹; Ron Turco¹; John Howarter¹; ¹Purdue University

9:20 AM

Modeling the Electromagnetic Processing of Recycled Silicon Dust: *Georgi Djambazov*¹; Koulis Pericleous¹; Valdis Bojarevics¹; Michele Forzan²; Fabrizio Dughiero²; ¹University of Greenwich; ²University 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*¹; ¹University of Leoben

10:10 AM Break

10:30 AM

Thermodynamic Analysis of Zinc Status in the Upstream EAF Offgas Cleaning Systems Associated with In-process Separation of Zinc from EAF Dust: *Naiyang Ma*¹; ¹ArcelorMittal

10:55 AM

Evaluation of Reactor REOV-01 with Ti Electrode for Electrochemical Recovery of Ag from Industrial Wastes: *Pedro Ramirez Ortega*¹; Victor Reyes Cruz¹; Maria Veloz Rodríguez¹; Diana Arenas Islas¹; laura García Hernández¹; Mizraim Flores Guerrero¹; Luis García Lechuga¹; ¹Universidad Tecnológica de Tulancingo

11:20 AM Invited

Zero Waste Valorization Schemes for Non-ferrous and Ferrous Slags: Some Industrial Case Studies: Bart Blanpain¹; ¹KU Leuven

11:45 AM

Mini Mill Solutions in the Recycling of Electric Arc Furnace Dust – the 2sDR Process: Gernot Rösler¹; Christoph Pichler¹; Stefan Steinlechner¹; Juergen Antrekowitsch¹; ¹Montanuniversitaet 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, 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: 104C
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*¹; ¹RSR Anode Group and RSR Technologies

8:55 AM

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

9:20 AM

Automotive Lithium-ion Battery Recycling:A Thermodynamic Evaluation

: Reza Beheshti1; Ragnhild Aune2; 1KTH; 2NTNU

9:45 AM

Life Cycle Analysis Summary for Automotive Lithium-ion Battery Production and Recycling: Jennifer Dunn¹; Linda Gaines¹; Jarod Kelly¹; Kevin Gallagher¹; ¹Argonne 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	Room: 106C
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 Pretorius¹; ¹Nucor Steel

9:10 AM

Thermodynamic and Experimental Investigations of High Temperature Refractory Corrosion by Molten Slags: *Christoph Wagner*¹; Christine Wenzl¹; Dean Gregurek¹; Daniel Kreuzer¹; Stefan Luidold²; Holger Schnideritsch²; ¹RHIAG; ²University of Leoben

9:30 AM

Design Principles for Fluorine-free Mold Fluxes Based on Thermodynamic Calculations: *Jungwook Cho*¹; ¹Pohang University of Science and Technology

9:50 AM

Perspectives of FactSage® for Application in Continuous Casting Mold Flux Developments: *Il Sohn*¹; ¹Yonsei University

10:10 AM Break

10:30 AM

A Kinetic Ladle Furnace Process Simulation Model: Marie-Aline Van Ende¹; *In-Ho Jung*¹; ¹McGill University

10:50 AM

Applications of Computational Thermodynamics to Predict the Refractory-slag-metal Reaction Equilibria at High Temperatures: *Joohyun Park*¹; ¹Hanyang University

11:10 AM

Rapid Dissolution of Quicklime into Molten Slag by Internally Formed Gas: Nobuhiro Maruoka¹; Hiroshi Nogami¹; ¹Tohoku University

11:30 AM

A Dynamic Flux Dissolution Model for Oxygen Steelmaking: Ameya Kadrolkar¹; Nils Andersson¹; Neslihan Dogan¹; ¹McMaster 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 Room: 104A 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*¹; ¹Carnegie Mellon University

9:10 AM Invited

Diversity Leads to Innovation: Cammy Abernathy1; 1University of Florida

9:30 AM Invited

Understanding and Addressing the Patterns of Bias in STEM Environments: Kristen Constant¹; ¹Iowa 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 Murphy¹; ¹University of Michigan

10:50 AM

The Impact of Coaching, Mentoring, and Sponsorship on Diversity: *Kathleen Chou*¹; ¹The Boeing Company

R. C.

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 Wilde*¹; ¹University of Muenster

9:00 AM Invited

In-situ Observations of Mechanical Instability and Deformation Mechanisms in Nanocrystalline Thin Films: Kevin Hemker¹; Paul Rottmann¹; Suman Dasgupta¹; ¹Johns Hopkins University

9:30 AM

Nanocrystalline Grain Boundary Network Evolution: *Ying Chen*¹; 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 Borodin*¹; 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 Trelewicz*¹; 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 Solanki*¹; ¹Arizona State University; ²ARL

11:30 AM

Mechanisms of Grain Boundary Diffusion in Severely Deformed Materials: Sergii Divinsky¹; Gerhard Wilde¹; ¹University of Münster

11:50 AM

Grain Boundary Motion, Solute Drag and Precipitation in Al Alloys Processed by SPD: Xavier Sauvage¹; Yana Nasedkina¹; Elena Bobruk²; Maxim Murashkin²; Nariman Enikeev²; Ruslan Valiev²; 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 Cente

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 Yu*¹; ¹Georgia Institute of Technology

3:00 PM

3D Pick and Place Sintering Nanoprinter: *Max Carlson*¹; Ka-Yen Yau¹; Robert Simpson²; Michael Short¹; ¹Massachusetts Institute of Technology; ²Singapore University of Technology and Design

3:20 PM

Nano-manufacturingProcessUsingElectro-fountainPenNanolithography:BenLuce¹;IndranathDutta¹;¹WashingtonStateUniversity

3:40 PM Break

4:00 PM Invited

High Throughput Reactive Printing Compatible Approaches for In-situ Manufacturing of Nanomaterials: *Ghassan Jabbour*¹; 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 Nam*¹; ¹Brookhaven National Laboratory

4:50 PM

3-Dimensional Nanostructures in Bulk Monolithic Solids by Enhanced High Pressure Sintering: *James Wollmershauser*¹; Boris Feigelson¹; Kedar Manandhar²; ¹Naval Research Laboratory; ²ASEE Postdoctoral Fellowship Program

5:10 PM

Electron Beam Induced Deposition: A Direct Write Method for Nanoscale 3-Dimensional Architectures: *Brett Lewis*¹; Robert Winkler²; Jason Fowlkes³; 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 Marvel*¹; Thomas Campbell²; Richard Haglund¹; ¹Vanderbilt Univerity; ²Murray State University

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

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

2:00 PM Introductory Comments

2:05 PM

Active Oxidation and Fume Formation from Liquid SiMn: *Ida Kero*¹; Gabriella Tranell²; Dmitry Slizovskiy²; 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 Li*¹; Jintao Gao¹; Zhancheng Guo¹; ¹University of science and technology Beijing

2:45 PM

Volatilization of Rhenium from Molybdenite Concentrate by Oxidative Roasting: *Guanghui Li*¹; Rong 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 Jiang*¹; Xudong Liu¹; ¹Central South University

3:45 PM Break

4:00 PM

An Investigation on Antimony Production by Using Niederschlag Process: *Sedef Basag*¹; Ahmet Turan²; Onuralp Yucel¹; ¹Istanbul Technical University; ²Yalova University

4:20 PM

Oxygen-rich Side Blow Bath Smelting Technology – History and New Developments in China: *Lin Chen*¹; 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 Duncanson*²; ¹Outotec Pty Ltd.; ²GrafTech International

5:00 PM

TECHNICAL PROGRAM

Enrichment of Gold in Low Grade Copper Matte from Arsenical Refractory Gold Concentrate via Matte Smelting Method: Zhang Duchao¹; Xiao Qingkai¹; Yang Tianzu¹; 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.

/londay PM	Room: 205B
ebruary 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 Gong*¹; David Snyder¹; Greg Olson¹; Jason Sebastian¹; ¹QuesTek Innovations

2:30 PM Invited

Powder-bed Fabrication of the High-temperature Ni-base Superalloy LSHR: *Chantal Sudbrack*¹; Michael Kirka²; Ryan Dehoff²; Robert Carter¹; S. Lee Semiatin³; 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: *Yaakov Idell*¹; Lyle Levine¹; Sudah Cheruvadhur¹; Eric Lass¹; Mark Stoudt¹; Carelyn 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 Sheridan*¹; Nathan Klingbeil¹; Colt Montgomery²; Jack Beuth²; ¹Wright State University; ²Carnegie Mellon University

3:30 PM Break

3:50 PM Invited

Rationalization of Advanced Site-specific Microstructure Control within Additive Manufactured Components: *Michael Kirka*¹; Ryan Dehoff¹; Michael Goin¹; Michael Pearce¹; Hassina Bilheux¹; Louis Santodonato¹; Suresh Babu²; ¹Oak Ridge National Laboratory; ²University of Tennessee-Knoxville

4:20 PM

Residual Stress Determination of Additively Manufactured Inconel 718 Specimens: *Thomas Watkins*¹; Ryan DeHoff¹; Philip Maziasz¹; James Neumann²; Vinod Nangia²; ¹ORNL; ²Honeywell Aerospace

4:40 PM

Direct Writing of Nickel Super Alloy(N5) Single Crystal: Yichen Wang¹; Jeongyong Choi¹; *Jyoti Mazumder*¹; ¹University of Michigan

5:00 PM

Controlling Microstructure of IN738LC Superalloy during Selective Laser Melting (SLM) Process: *Hossein Meidani*¹; Thomas Etter¹; Fabian Geiger¹; Roman Engeli¹; 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: *Rocio Munoz Moreno*¹; Divya Vadegadde Duggappa¹; Sarah Driver¹; Trevor Illston²; Scarlett Baker³; Howard J. Stone¹; ¹University of Cambridge; ²Materials Solutions; ³Materials Solutions

Additive Manufacturing: Building the Pathway towards Process and Material Qualification — Connections between Processing 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 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 PM	Room: 205A
February 15, 2016	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. Young*¹; Garrett Marshall¹; Scott Thompson¹; Nima Shamsaei¹; Steven Daniewicz¹; 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 Dagel²; David Keicher²; Kyle Allen¹; Thomas Reynolds¹; Dorian Balch¹; Chris San Marchi¹; ¹Sandia National Labs, Livermore, CA; ²Sandia National Labs, Albuquerque, NM

2:50 PM

Qualification Methodology for AlSi10Mg Spaceflight: *Bryan McEnerney*¹; 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 Beuth¹; 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 Dehoff*¹; Vincent Paquit¹; Michael Kirka¹; Edwin Schwalbach²; Michael Groeber²; Michael Goin¹; Michael Pearce¹; ¹Oak Ridge National Laboratory; ²Wright-Patterson AFRL

4:20 PM

Microstructural Characterization of Additively Manufactured Metals: *Terry Holesinger*¹; Pallas Papin¹; Thomas Lienert¹; 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 Mulay*¹; Jeffrey Florando¹; Mukul Kumar¹; ¹Lawrence Livermore National Laboratory

5:20 PM

Oxide, Porosity and Fatigue Performance of AlSi10Mg Parts Produced by Selective Laser Melting: *Ming Tang*¹; Petrus Pistorius¹; ¹Carnegie Mellon University

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session

Sponsored by:TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Materials Characterization Committee, 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 Pantleon, Technical University of Denmark; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Irene Beyerlein, 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 Petrov*¹; Jun Wu²; Loic Malet³; Stephan Godeth³; Jilt Sietsma²; ¹Ghent University; ²Delft University of Technology; ³Universite Libre de Bruxelles

2:30 PM Invited

Physical Analysis of High Resolution Single Grain and Subgrain Diffraction Profiles: *Ulrich Lienert*¹; Wolfgang Pantleon²; Gábor Ribárik³; Tamás Ungár³; ¹Deutsches Elektronen-Synchrotron; ²Technical University of Denmark; ³Eötvös University Budapest

3:00 PM

Multiaxial Strain Path Changes in Grain Boundary Dominated Materials: In-situ Observations during XRD and SEM: Antoine Guitton¹; 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 Hoagland¹; Nathan Mara¹; Amit Misra²; 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 Lienert²; *Wolfgang Pantleon*¹; ¹Technical University of Denmark; ²DESY Photon Science

4:30 PM

Post Processing Effects on EBSD based Dislocation Density Measurements: *Stuart Wright*¹; David Field²; Matthew Nowell¹; ¹EDAX; ²Washington State University

4:50 PM

Dark Field X-Ray Microscopy for Studies of Very Low Angle Boundaries: *Sonja Ahl*¹; Hugh Simons¹; Anders Jakobsen¹; Frederik Stöhr¹; Yubin Zhang¹; Wolfgang Pantleon¹; 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: Vahid Khademi¹; Thomas Bieler¹; Carl Boehlert¹; ¹Michigan State University

5:30 PM

Plasticity Mechanisms in Hafnium Nitride at Room and Elevated Temperature: *Katherine Vinson*¹; Xiao-Xiang Yu¹; Christopher Weinberger²; 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 PMRoom: 209CFebruary 15, 2016Location: 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. Phan*¹; ¹University of South Florida

3:00 PM Invited

Magnetic Field Mapping at the Nanoscale in the Transmission Electron Microscope: *Rafal Dunin-Borkowski*¹; Jan Caron¹; Jörn Ungermann¹; ¹Forschungszentrum Jülich

3:30 PM Break

3:50 PM Invited

Magnetic Materials and Minerals in Planetary Exploration: Marina Diaz Michelena¹; ¹INTA

4:20 PM Invited

Artificial Magnetic Lattices and Their Applications: *Mitsuteru Inoue*¹; ¹Toyohashi University of Technology

4:50 PM

Processing and Characterization of Magnetic Materials for Magnetic Refrigeration, High Frequency Power Conversion, and High Temperature Electrical Machine Applications: *Matthew Lucas*¹; ¹Air Force Research Laboratory

5:10 PM

TECHNICAL PROGRAM

Preparation and Characterization Fe-Pt and Fe-Pt-M (M=B, SI) Microwires: Valentina Zhukova¹; Ahmed Talaat¹; Juan del Val¹; Mihail Ipatov¹; Arcady Zhukov²; ¹Basque Country University, UPV/EHU, San Sebastian, Spain; ²Basque 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 PMRoom: 206AFebruary 15, 2016Location: 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 Orthopaedic Implants with Surface TiO2 Nanotubes for Enhanced Osseo-Integration: *Sungho Jin*¹; Dan Justin¹; Garrett Smith²; Gary Johnston²; ¹Nanovation Partners; ²Nasseo, Inc.

2:25 PM Invited

Vanadium Interactions in Biological Systems: *Paulo Lisboa-Filho*¹; Bruna Costa¹; ¹UNESP - Sao Paulo State University

2:50 PM Invited

Overview of Degradation Phenomena in Dentistry and Orthopedics: *Luis Rocha*¹; Fernando Oliveira²; Sofia Oliveira²; Maria Runa²; Mathew Mathew³; Tolou Shokhufar⁴; Ana Ribeiro⁵; ¹UNESP, Univ. Estadual Paulista, Faculdade de Ciências; ²MEMS-Uminho, Center MicroElectroMechanical Systems, Universidade do Minho; ³Rush University Medical Center; ⁴University of Illinois at Chicago; ⁵National 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

Polymeric Coating for Optimization of Drug Release from Drug-Loaded Surfaces: *Azhang Hamlekhan*¹; Sweetu Patel¹; Tolou Shokuhfar²; ¹Michigan Tech; ²University of Illinois at Chicago

4:15 PM Invited

Titanium Oxide Nano-bio Interactions: Repercussions in Health Effects: Ana Ribeiro¹; Sara Gemini-Piperni¹; Wanderson Souza¹; Renata Travassos¹; Leandro Lemgruber²; Renata Carvalho¹; André Rossi³; Tolou Shokhufar⁴; Luis Rocha⁵; Jacques Werckmann¹; José Granjeiro¹; ¹INMETRO; ²Welcome Trust Centre for Molecular Parasitology, University of Glasgow; ³Centro Brasileiro de Pesquisas Física; 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 Grandini*¹; ¹UNESP - Univ. Estadual Paulista

5:05 PM

One-step Anodic Deposition of HA with Ag Nanoparticles on Titanium for Anti-bacterial and Bioactive Implant: *Gye-Won Kim*¹; Ki-Ryong Shin¹; Yeon-Sung Kim¹; Young-Gun Ko²; Dong-Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

5:25 PM

Diagnostics and Dental Materials for Crack Mitigation in Natural Teeth: Cherilyn Sheets¹; *James Earthman*²; 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 February 15, 2016

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 Kyratsi1; 1University of Cyprus

2:20 PM Invited

Synthesis of Higher Manganese Silicide via Low Energy Ball Milling and Reactive Sintering: Franck Gascoin1; 1CRISMAT Laboratory

2:40 PM Invited

Exploring the Role of Disorder in Discovering New Materials: Entropy Stabilized Oxides: Stefano Curtarolo1; Jon-Paul Maria2; 1Duke University; ²North Carolina State University

3:00 PM Invited

Perspectives for High Temperature Thermoelectrics: Takao Mori¹; ¹National Institute for Materials Science (NIMS)

3:20 PM Invited

Microstructure, Texture and Incommensurability of Higher Manganese Silicide: Stephane Gorsse1; Solange Vivès1; 1ICMCB-CNRS

3:40 PM Break

4:00 PM Invited

First-Principles Investigation on Improving Thermoelectric Materials: Lan Li1; Izaak Williamson1; 1Boise State University

4:20 PM Invited

Modeling the Properties of Thermoelectric Materials via First Principles Simulations: Philippe Jund1; Kinga Niedziolka1; Patrick Hermet1; Jean-Claude Tédenac1; 1Montpellier University

4:40 PM

Nanostructuring Silicon Base Materials and Its Impacts on the Thermoelectric Properties: Teruyuki Ikeda1; 1Ibaraki 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-Ng¹; William Laws¹; Guangyao Liu²; Qing Huang¹; Yonggao Yan³; Joshua Martin¹; James Kaduk4; 1NIST; 2China University of Geosciences; 3Wuhan University of Technology; ⁴Illinois Institute of Technology

5:20 PM

The Ga and In Coupling Effects in the Doping of the CoSb3 Compound: Po-Han Lin1; Sinn-wen Chen1; Ssu-ming Tseng1; Yinglu Tang2; G. Jeffrey Snyder3; 1National Tsing Hua University; 2Materials Science, California Institute of Technology; 3Department 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 February 15, 2016 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 Pan¹; Haiyan Yu¹; Yuejiao Han1; Ganfeng Tu1; Shiwen Bi1; 1Northeastern University

2:30 PM

Investigation of Flotation Behaviors of Refractory High Silica Bauxite: *Guihong Han*¹; Lulu Liu¹; Yanfang Huang¹; Shuzhen Yang¹; Dianyuan Dang¹; ¹Zhengzhou 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'an*¹; Lv Guozhi¹; Zhang Xuhua¹; Zhu Xiaofeng¹; Wang Yanxiu¹; Wang Long¹; ¹Northeastern University

3:40 PM

Ways to Improve of Aluminium Content Raw Material Treatment by Sintering Method: Vadim Lipin1; Vladimir Kazakov1; 1Saint 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
February 15, 2016	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 Rios1; 1Oak Ridge National Laboratory

2.30 PM

On the Effects of Alloying Element Range on the Mechanical Properties of Recycled Aluminium Alloy EN AB-46000: Izudin Dugic1; Felix Henriksson¹; Conrad Strebel¹; Ozkan Kosmaz¹; Salem Seifeddine¹; ¹Linnaeus 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 Field¹; Krish Krishnamurthy²; Michael Kaufman¹; ¹Colorado School of Mines; ²Honeywell

3:20 PM Break

3:35 PM

Microstructure and Phase Evolution in A201 Alloys with Additions of Si: Suzan Abd El Majid¹; Menachem Bamberger¹; Alexander Katsman¹; ¹Technion

4:00 PM

High Temperature Creep Evolution in Al-Si Alloys Developed for Automotive Powertrain Applications - A Neutron In-situ Study on hklplane Creep Response: *Dimitry Sediako*¹; Wojciech Kasprzak²; Frank Czerwinski²; Ahmed Nabawy¹; Amir R. Farkoosh³; ¹Canadian Nuclear Laboratories; ²CanmetMATERIALS; ³McGill 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
February 15, 2016	Location: Music City Center

Session Chair: Martin Segatz, Hydro Aluminium

2:00 PM Introductory Comments

2:05 PM

Conception of a "Dream Cell" in Aluminium Electrolysis: *Peter Polyakov*¹; Andrey Kluchantsev²; Andrey Yasinsky¹; Yury Popov³; ¹Siberian Federal University; ²LLC ETC RUSAL; ³Light Metals Ltd

2:30 PM

The Impact of the Cavity on the Top Heat Losses in Aluminum Electrolysis Cells: *Francois Allard*¹; Martin Désilets¹; Marc LeBreux¹; Alexandre Blais²; ¹Université de Sherbrooke; ²Rio Tinto Aluminium

2:55 PM

Rio Tinto AP44 Cell Technology Development at Alma Smelter: *Pascal Thibeault*¹; Louis Guimond¹; Herve Mezin¹; ¹RioTinto Alcan

3:20 PM Break

3:35 PM

Hydro's Cell Technology Path towards Specific Energy Consumption below 12 kWh/kg: *Martin Segatz*¹; Jorund Hop¹; Pierre Reny¹; Håvard Gikling¹; ¹Hydro Aluminium

4:00 PM

The Successful Implementation of DUBAL DX+ Technology at EMAL: Michel Reverdy¹; Sajid Hussain¹; Qassim Galadari¹; Jean-Luc Faudou¹; Abdalla Al Zarouni¹; Nadia Ahli¹; Ibrahim Al Ali¹; Shaikha Al Shehhi¹; Bijan Malladeb¹; 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; Kalpana Katti, North Dakota State University; Paul Allison, University of Alabama; Rajendra Kasinath, DePuy Synthes Products, LLC

Monday PM	Room: 207A
February 15, 2016	Location: Music City Center

Session Chairs: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes

2:00 PM Invited

Biomimetic Hard-to-Soft Interfaces: Guiding Osteogenesis to Infection Free Implants: Candan Tamerler¹; ¹University of Kansas

2:40 PM

TECHNICAL PROGRAM

Biomimetic Remineralization Strategies towards Novel Dental Health Care: *Mehmet Sarikaya*¹; Hanson Fong¹; Candan Tamerler²; Sami Dogan¹; 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 Fossum*¹; Charlotta Tegnestedt²; Kristina Dahlberg³; Emma Strömberg⁴, Javier Sanchez⁵; Håkan Wallén⁵; Annelie Liljegren⁵; Claes Frostell⁵; Gunilla Björling²; Ragnhild E. Aune¹; 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 Zhang*¹; Jiayang Liu¹; Zhe Lu²; Yeon-Gil Jung²; 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 Okeniyi*¹; Olubanke Ogunlana¹; Elizabeth Okeniyi¹; Taiwo Owoeye¹; Oluseyi Ogunlana²; 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; Yanfei Gao, University of Tennessee; Jianzhong Jiang, Zhejiang University; Gongyao Wang, Alcoa Technical Center

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

Session Chairs: Frans Spaepen, Harvard University; Eun Soo Park, Seoul National University

2:00 PM Keynote

Production of Amorphous Materials by Supersonic Spray Drying: Esther Amstad¹; David Weitz¹; *Frans Spaepen*¹; ¹Harvard School of Engrg & Appl Sciences

2:30 PM

Dissolution of Low Solubility Elements during Arc Melting: Scott Roberts¹; Douglas Hofmann¹; ¹JPL

2:50 PM Invited

Consolidation of Blended Powders by Severe Plastic Deformation to Form Amorphous Metal Matrix Composites: *Suveen Mathaudhu*¹; K. Theodore Hartwig²; Ibrahim Karaman²; ¹University of California Riverside; ²Texas A&M University

3:15 PM Invited

Variations in Glass Transition during Vitrification: Chae Woo Ryu¹; *Eun* Soo Park¹; Geun Woo Lee²; 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 Meagher*¹; 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 Kraemer*¹; Verena Maier¹; Karoline Kormout¹; Daria Setman²; Yannick Champion³; Reinhard Pippan¹; ¹Erich Schmid-Institute of Materials Sciences, Austrian Academy of Sciences; ²Physics of Nanostructured Materials, Faculty of Physics, University of Vienna; ³Institut 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 Xie*¹; Fengxiang Qin¹; Ichiro Seki¹; Wei Wang²; ¹Tohoku University; ²Tokyo 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; ¹Northeastern University

5:10 PM

High Density Ni-based Metallic Glasses Formed by Spark Plasma Sintering: *Henry Neilson*¹; Alex Petersen²; Joseph Poon²; Gary Shiflet²; John Lewandowski¹; ¹Case Western Reserve University; ²University 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
February 15, 2016	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. Eckert*¹; R.N. Shahid¹; P. Wang¹; K. G. Prashanth¹; M. Stoica¹; S. Scudino¹; Deliang Zhang²; ¹IFW Dresden; ²Shanghai Jiao Tong University

2:40 PM Invited

Bulk Nanostructured Al Synthesized by Consolidation of Al Nanopowders: *Yaojun Lin*¹; Xuejian Liu²; Bocong Xu²; ¹Wuhan University of Technology; ²Yanshan University

3:10 PM Invited

Bulk Nano Materials with Exceptional Properties Developed by High Energy Ball Milling and Spark Plasma Sintering: Srinivasa Murty Budaraju¹; ¹IIT 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 Bouaziz²; ¹University of Rouen, CNRS; ²LEM3 - University of Loraine

4:20 PM

Dynamic Cu Grain Growth of Mechanically Milled Nanostructured Cu-5vol.%Al₂O₃ Powder Particles during Hot Extrusion: *Dengshan Zhou*¹; Deliang Zhang¹; Paul Munroe²; Charlie Kong²; Wei Zeng¹; ¹Shanghai Jiao Tong University; ²University 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 Ahn*¹; Wooyeol Kim¹; Lee Ju Park²; Hyoung Seop Kim¹; ¹POSTECH; ²Agency 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 Gruen*¹; ¹Hydro 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; ¹Purdue University

2:50 PM

Aluminum Billets D.C. Casting: Level-pour vs. Fall-pour: A Technohistorical Approach: *Plácido García Pérez*

3:15 PM

Hot Tearing in DC Casting Ingot of 7XXX Aluminum Alloys: Nobuhito Sakaguchi¹; ¹UACJ 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-Bealy*¹; ¹Clausthal University of Technology

4:20 PM

Successful Implementation of a New Rolling Slab Casting Technology, AFM, within Hydro: *Arild Hakonsen*¹; Terje Iveland²; Magne Boge²; Stian Rørvik²; ¹Hycast AS; ²Hydro Aluminium

4:45 PM

Uncertainty Propagation in Numerical Modeling of Direct Chill Casting: *Kyle Fezi*¹; Matthew Krane¹; ¹Purdue 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 Beroš*¹; Zdenka Brodarac²; ¹Faculty of Metallurgy and Materials Science; ²University 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: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, University of Science and Technology Beijing; Brian Thomas, University of Illinois at Urbana-Champaign; Miaoyong Zhu, Northeastern University; Andreas Ludwig, Montanuniversitaet Leoben, Dep. Metallurgy; Adrian Sabau, Oak Ridge National Laboratory; Koulis Pericleous, University of Greenwich; Hervé Combeau, Université de Lorraine Nancy

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

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

2:00 PM Invited

Microporosity Prediction in Aluminium DC Casting: Laurent Heyvaert¹; Hervé Combeau¹; Miha Založnik¹; Philippe Jarry²; Emmanuel Waz²; ¹Institut Jean Lamour; ²C-TEC, Constellium Technology Center

2:25 PM

Simulation of Structure Evolution of 2-D Liquid Metal Using a Lattice Boltzmann Front Tracking Method: Zhuokun Cao1; Yang Yu1; Hongjie Luo1; Cong Wang1; 1Northeastern University, China

2:45 PM

Modeling the Multicomponent Columnar-to-Equiaxed Transition of Alloy 625: Kyle Fezi¹; Matthew Krane¹; ¹Purdue University

3.05 PM

Validation of a Model for the Columnar to Equiaxed Transition with Melt Convection: Mahdi Torabi Rad¹; 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 Wang¹; 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 Nastac1; Pilvi Oksman²; Mikko Kärkkäinen²; Seppo Louhenkilpi²; 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 Derby1; 1University of Minnesota

4:45 PM

Prediction of Microstructure Evolution of Hot Forged AISI 4140 Steel by Numerical Simulation: Tiago Colombo¹; Alberto Brito¹; Lirio Schaeffer¹; ¹Universidade Federal of 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

TECHNICAL PROGRAM

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 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 Firrao, Politecnico di Torino -DISAT: Mingming Zhang, ArcelorMittal Global R&D; Zhiwei Peng Central South University; Juan P. Escobedo-Diaz, UNSW Australia; Chenguang Bai, Chongging University

Monday PM February 15, 2016 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: Qiu Shuxing¹; Zhang Shengfu¹; Zhang Pengqi¹; Qiu Guibao¹; Zhang Qingyun1; 1Chongqing University

3:00 PM

Electrical Effect and Influence Factors of Tourmaline: Qi Lu¹; Bowen Li²; 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 Nickelcopper Ore: *Liu Chenhui*¹; Jinhui Peng²; TianCheng Liu²; Junming Guo²; Yunnan Minzu University; ²Yunnan Minzu University

4:15 PM

Evaluation of White Bentonite Modified by Acid Attack: Christiano Gianesi Bastos Andrade1; Danilo Marin Fermino1; Marcos Fernandes Gonzales1; Francisco Rolando Valenzuela Diaz1; 1University of Sao Paulo

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 Firrao, 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
February 15, 2016	Location: Music City Center

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

2:00 PM

Characterization of Iron Oxide Scale Formed in Naphthenic Acid Corrosion: *Peng Jin*¹; Winston Robbins¹; Gheorghe Bota¹; Srdjan Nesic¹; ¹Institute for Corrosion and Multiphase Technology (ICMT), Ohio University

2:20 PM

Transport of Chloride Ions through Modulated Concrete Microstructures: *Batric Pesic*¹; ¹University of Idaho

2:40 PM

Effect of Cold Work on the Corrosion Resistance of an Austenitic Stainless Steel: Jian Li¹; Pei Liu¹; 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 Song*¹; Yanfei Gao¹; Zhiqian Sun¹; Jonathan Poplawsky²; 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 Li*¹; Fionn Dunne¹; Barbara Shollock¹; ¹Imperial College London

3:40 PM Break

3:55 PM

Ferronickel Preparation from Nickeliferous Laterite by Rotary Kilnelectric Furnace Process: *Guanghui Li*¹; 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 Oxyhydroxide and Oxide Catalysts for Redox Reactions: Arnab Baksi¹; David Cocke¹; 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: *Guihong Han*¹; Duo Zhang¹; Yanfang Huang¹; Longjie Xing¹; Lulu Liu¹; Wencui Chai¹; Tao Jiang²; 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 Gordillo*¹; 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 Jayaraman*¹; 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
February 15, 2016	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 Stanek*¹; ¹Los Alamos National Laboratory

2:40 PM

Computer Modeling of Hydrogen and Oxygen Transport during Zirconium Corrosion: *Xian-Ming Bai*¹; Yongfeng Zhang¹; Michael Tonks¹; ¹Idaho National Laboratory

3:00 PM

Molecular Dynamics Simulations on Homogeneous Hydride Nucleation in Alpha-Zr: *Yongfeng Zhang*¹; 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 Howland*¹; 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 Short*¹; Derek Gaston¹; Daniel Wells²; ¹MIT; ²Electric Power Research Institute (EPRI)

4:40 PM

Coupled PWR Oxidation Modeling with the HOGNOSE Code: *Andrew Dykhuis*¹; 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 Thuinet*¹; Rémy Besson¹; Alexandre Legris¹; ¹Université de Lille

5:20 PM

Validation of BISON Calculation of Hydrogen Distribution by Comparison to Experiment: *Evrard Lacroix*¹; Arthur Motta¹; ¹Pennsylvania State University

Computational Methods for Spatio-temporal Scalebridging: 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 PMRoom: 209AFebruary 15, 2016Location: Music City Center

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

2:00 PM

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

2:20 PM

A Systematic Framework for Predicting Twinning in Hexagonal Closepacked Materials: *Dingyi Sun*¹; Mauricio Ponga¹; Kaushik Bhattacharya¹; Michael Ortiz¹; ¹California Institute of Technology

2:40 PM Invited

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

3:10 PM

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

3:30 PM Break

3:50 PM

Decohesion Relationships for Hydrogen Induced Grain Boundary Embrittlement in Nickel extracted from Molecular Dynamics Simulations: Wesley Barrows¹; Remi Dingreville²; *Douglas Spearot*²; ¹University of Arkansas; ²Sandia National Laboratories; ³University of Florida

4:10 PM Invited

Improved Twinning Simulation by Linking Meso-scale Full-field FFT Approach with Macro-scale Effective Medium VPSC Model: Carlos Tome¹; M. Arul Kumar¹; Irene Beyerlein¹; Rodney McCabe¹; ¹Los Alamos National Laboratory

4:40 PM

Peierls Potential and Kink Pair Mechanism in High Pressure MgSiO3 Perovskite: *Philippe Carrez*¹; Antoine Kraych¹; Pierre Hirel¹; Patrick Cordier¹; ¹Lab. UMET CNRS-UMR8207

5:00 PM

The Strength and Deformation Behavior of Nickel Based Superalloy Microcrystals through Discrete Dislocation Dynamics Simulations: *Ahmed Hussein*¹; Satish Rao²; Triplicane Parthasarathy³; Jaafar Elawady¹; Michael Uchic⁴; ¹Johns Hopkins University; ²EPFL; ³UES Inc.; ⁴WPAFB

5:20 PM

Evaluation of Strain Localizations on AA-7050 Using CP-FFT and EBSD: *Andrea Nicolas*¹; Alberto Mello¹; Michael Sangid¹; ¹Purdue University

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

Atomistic Study of Carbon Nanotubes: Effect of Cut-off Distance: S. Thamaraikannan¹; S.C. Pradhan¹; ¹Department of Aerospace Engineering, Indian Institute of Technology Kharagpur

2:50 PM Invited

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

3:20 PM

Elasticity Size Effects in ZnO Nanowires and Subjective Definitions of Cross-sectional Area: An Overlooked Source of Uncertainty: Zachary Trautt¹; Lawrence Friedman¹; Chandler Becker¹; Robert Cook¹; ¹National Institute of Standards and Technology

3:40 PM Break

4:00 PM Invited

Development of the ReaxFF Force Field for Complex Materials and Interfaces: *Adri van Duin*¹; Weiwei Zhang¹; Yun-Kyung Shin¹; Sungwook Hong¹; Jejoon Yeon¹; Metin Aktulga²; ¹Penn State; ²Michigan State University

4:30 PM

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

4:50 PM Invited

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

5:20 PM

MEAM Potential for Boron Suboxide (B6O): *Mehul Bhatia*¹; Kiran Solanki¹; Mark Tschopp²; ¹Arizona State University; ²U.S. Army Research Laboratory,

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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

2:00 PM Invited

Engineering High and Constant Cation Diffusivity in Oxides through Percolation Theory: *Gerbrand Ceder*¹; Jinhyk Lee²; Alex Urban²; ¹University of California, Berkeley; ²MIT

2:30 PM

Cation Diffusion Path in Ionic Structures -- A Pathfinder Algorithm to Precondition NEB Calculations and a Fast Approximate Barrier Calculation Method: Ziqin Rong¹; Daniil Kitchaev¹; Pieremanuele Canepa¹; Gerbrand Ceder¹; ¹MIT

2:50 PM

Fast Li-ion Transport Kinetics in LiBH4-based Solid-state Electrolytes: *Zhenpeng Yao*¹; Kyle Michel¹; Yongsheng Zhang¹; Christopher Wolverton¹; ¹Northwestern University

3:10 PM

The Role of Grain Boundaries for Lithium Diffusion in Graphite: *Christopher Shumeyko*¹; Edmund Webb¹; Garritt Tucker²; ¹Lehigh University; ²Drexel University

3:30 PM Break

3:50 PM Invited

Enhancement of Ionic Transport in Complex Oxides through Soft Lattice Modes and Epitaxial Strain: *Nicole Benedek*¹; ¹Cornell University

4:20 PM

High-Throughput ab-initio Solute Diffusion Database with the MAterials Simulation Toolkit (MAST): *Henry Wu*¹; Tam Mayeshiba¹; Haotian Wu¹; Liam Witteman¹; Ben Anderson¹; Dane Morgan¹; ¹University of Wisconsin-Madison

4:40 PM

Kinetics Investigation of Titanium-Based Multicomponent Systems Using

Liquid-Solid Diffusion Couples: *Zhi Liang*¹; Changdong Wei¹; Alan Luo¹; Ji-Cheng Zhao¹; James Williams¹; Anil Sachdev²; ¹The Ohio State University; ²General Motors

5:00 PM

Molecular Dynamics Study of Unexpected, Anisotropic Diffusion through Nickel-based Alloys and Oxides: *Penghui Cao*¹; Michael Short¹; Daniel Wells²; ¹Massachusetts Institute of Technology; ²Electric Power Research Institute

5:20 PM

Effect of Solute Atoms on Dislocation Motion in Mg: An Electronic Structure Perspective: Tomohito Tsuru¹; *Daryl Chrzan*²; ¹Japan Atomic Energy Agency; ²University of California Berkeley

5:40 PM

Numerical Analysis Evaluation of Solutions to the Diffusion Equation for Binary Interdiffusion Situations: *Irina Belova*¹; Tanvir Ahmed¹; ¹University of Newcastle

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 February 15, 2016

Room: 102A Location: Music City Center

Session Chair: Charudatta Phatak, Argonne National Laboratory

2:00 PM Invited

Neutrons, Materials and Data Challenges: *Thomas Proffen*¹; ¹Oak Ridge National Laboratory

2:30 PM

Methodology for Reconstruction of Samples Analyzed with Simultaneous Neutron and X-Ray Imaging: Jacob LaManna¹; Daniel Hussey¹; Eli Baltic¹; *David Jacobson*¹; ¹National Institute of Standards and Technology

2:50 PM Invited

Real Time Analysis, Interpretation and Experimental Steering for Electron Microscopy: *Kerstin Kleese van Dam*¹; ¹Pacific Northwest National Laboratory

3:20 PM Break

3:40 PM Invited

Bingham Mixture Model for Efficient Microtexture Estimation from Discrete Orientation Data: Stephen Niezgoda¹; Eric Magnuson¹; ¹The Ohio State University

4:10 PM

Modeling Multi-modal Images of Photocatalysis on Cu₂O: Liang Li¹; Yimin Wu¹; Yuzi Liu¹; Jeffrey Guest¹; Tijana Rajh¹; Ian McNulty¹; Zhonghou Cai¹; *Maria Chan*¹; ¹Argonne National Laboratory

4:30 PM Invited

Recognizing Patterns from Experimental Data: *Daniela Ushizima*¹; ¹Lawrence Berkeley National Laboratory

5:00 PM

Structure Quantification, Property Prediction and 4D Reconstruction Using Limited X-ray Tomography Data: *Hechao Li*¹; Somya Singh¹; C. Kaira¹; James Mertens¹; Nikhilesh Chawla¹; Yang Jiao¹; ¹Arizona State University

5:20 PM

Error Analysis of Near-field High Energy Diffraction Microscopy : *David Menasche*¹; Paul Shade; Robert Suter¹; ¹Carnegie Mellon University

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

2:00 PM Introductory Comments

2:10 PM

Characterization of Carbon Anode Materials by Image Analysis: Xianai Huang¹; Duygu Kocaefe¹; Dipankar Bhattacharyay¹; Yasar Kocaefe¹; Brigitte Morais²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc.

2:35 PM

Electrochemical Reactivity and Wetting Properties of Anodes Made from Anisotropic and Isotropic Cokes: Camilla Sommerseth¹; Rebecca Thorne²; Arne Ratvik³; Espen Sandnes¹; Stein Rørvik³; Lorentz Lossius⁴; Hogne Linga4; Ann Svensson1; 1Norwegian University of Science and Technology, NTNU; ²Norsk Institutt for Luftforskning; 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 Huang¹; Brigitte Morais²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc

3:25 PM

Quantification of Sodium Present in Dry Aggregates and Anodes: Julie Bureau1; 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 Ratvik²; Stein Rørvik²; Espen Sandnes¹; Lorentz Petter Lossius³; Hogne Linga3; Ann Mari Svensson1; 1NTNU - Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry; ³Hydro 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 Morais²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc.

Emerging Interconnect and Pb-free Materials for Advanced Packaging Technology — New Bonding Approaches

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 PM	Room: 201A
February 15, 2016	Location: Music City Cente

Session Chairs: Yan Li, Intel; John Elmer, Lawrence Livermore National Laboratory

2:00 PM Invited

WBG Die-attach Ceramic Substrate for Severe Thermal Cycling: Katsuaki Suganuma1; Hao Zhang1; Shijo Nagao1; Tohru Sugahara1; Minoru Ueshima2; Yoichi Furukawa3; Kazuhiko Minami3; Hans Albrecht4; Klaus Wilke4; Yoshinori Shirakawa4; Seigo Kurosaka5; Masanobu Tsujimoto5; Masayuki Kiso5; 1Osaka University; 2Senju Metal; 3Showa Denko; 4Siemens; ⁵C. Uyemura

2:25 PM

Die-attach Structure Using SiC Particle Added Ag Paste for Ultra High Thermal Stability Usage: Hao Zhang1; Shijo Nagao1; Tohru Sugahara1; Emi Yokoi¹; Katsuaki Suganuma¹; ¹The Institute of Scientific and Industrial Research (ISIR) Osaka University

2:45 PM

Reliability of Die Attach Using Ag Nanoporous Sheet for High Temperature Electronics: Min-Su Kim¹; Hiroshi Nishikawa¹; ¹Osaka University

3:05 PM

On the Evolution of the Nanoporous Microstructure of Sintered Ag during Ageing: Wei Mao¹; James Carr²; Loic Signor¹; Carole Nadot-Martin¹; Azdine Nait-Ali¹; Pascal Gadaud¹; Marc Legros³; Xavier Milhet¹; ¹Pprime Institute UPR CNRS 3346; ²The Manchester University; ³CEMES - CNRS

3:25 PM Break

3:45 PM

Electrical Conductivity of Porous Silver Made by Annealing Silver Nanoparticles for Short Periods: Zuruzi Abu Samah¹; Kim Siow²; ¹Institut Teknologi Brunei; ²Universiti Kebangsaan Malaysia

4.05 PM

Development of Interconnection Technology for Double Side Power IC Module: Zixuan Zhu¹: C.C. Li¹: L. L. Liao²: M. J. Dai²: C. K. Liu²: C. Robert Kao1; 1Department of Materials Science and Engineering, National Taiwan University; ²Electronic and Optoelectronics Research Laboratories, Industrial Technology Research Institute

4.25 PM

Identifying Alternative Formulations for Transient Liquid Phase Bonding: John Holadav¹; Carol Handwerker¹; ¹Purdue University

4.45 PM

Wafer Level Au-Sn TLP Bonding from Eutectic Composition: Serkan Yilmaz¹; Eyup Can Demir¹; Oguzhan Temel¹; Tayfun Akin¹; Eren 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; Wanlin Wang¹; ¹Central South University

3.00 PM

Corrosion Fatigue of X46Cr13 in CCS Environment: Anja Pfennig¹; Marcus Wolf²; Thomas Böllinghaus²; 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 Bai¹; Ning Li¹; Xin Zhang²; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²China International Engineering Consulting Corporation

3:40 PM Break

4:00 PM

Preparation of TI-AL-V Alloys by Aluminothermic Reaction: Zhijiang Gao¹; Huimin Lu¹; ¹Beihang University

MONDAY PM

4:20 PM Invited

Utilization of Copper Smelter Slags by Direct Reduction: Baojing Zhang¹; Dapeng Zhao¹; Xiaodong Zou¹; *Cong Wang*¹; ¹Northeastern University

4:50 PM

Long Term Prediction of Linz-Donawitz Converter Gas (LDG) in Steel Making Process: Xiancong Zhao¹; *Hao Bai*¹; Qi Shi¹; Yang Wang¹; Zhancheng Guo¹; ¹State Key Laboratory of Advanced Metallurgy,University of Science and Technology Beijing

5:10 PM

Coke Modification Using Hydrothermal Oxidation Treatment: *Quanqiang Ma*¹; Huiqing Tang¹; Huanyu Zhang¹; ¹University of Science and Technology Beijing,

5:30 PM

Optimization and Management of Byproduct Gas Distribution in Steel Mills under Time-of-use (TOU) Electricity Price: Xiancong Zhao¹; *Hao Bai*¹; Qi Shi¹; Zhancheng Guo¹; ¹State Key Laboratory of Advanced Metallurgy,University of Science and Technology Beijing

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 Proudhon*¹; Jia Li¹; Erembert Nizery¹; Jean-Yves Buffiere²; Wolfgang Ludwig²; Samuel Forest¹; ¹MINES ParisTech; ²INSA 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 Sun¹; Donovan Leonard²; Fuqian Yang¹; Yang-Tse Cheng¹; *Tongguang Zhai*¹; ¹University of Kentucky; ²Oak 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 Marx*¹; Florian Schaefer¹; Alain Knorr¹; Christian Motz¹; ¹Saarland University

3:00 PM

3D Characterization of the Propagation of Physically Small Fatigue Cracks in Forged High Strength Steels: Pablo Lorenzino¹; Catherine Verdu¹; Jean-Wes Buffiere¹; ¹Universite 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 Cai*¹; Tongguang Zhai¹; Yan Jin¹; Wei Wen²; ¹University of Kentucky; ²Novelis 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 Jiang*¹; Jie Yang²; Tiantian Zhang³; Yu Wang⁴; Fionn Dunne³; Ben Britton³; ¹Imperial College London ; ²Beijing Institute of Aeronautical Materials ; ³Imperial College London;

4:20 PM Invited

TEM Studies of the Evolution of Dislocation Configurations under Cyclic Loading in Al Alloys: *Ramasis Goswami*¹; Chandra Pande¹; ¹Naval Research Laboratory

4:40 PM

Fatigue in Titanium: Dislocation Mechanisms, Initiation, Hydrogen and Alpha2: *David Dye*¹; Trevor Lindley¹; Tamara Chapman¹; Anna Radecka¹; Edward Saunders²; Paul Bagot³; Adrian Walker²; Thomas Martin³; David Rugg²; ¹Imperial College; ²Rolls-Royce; ³Oxford University

5:00 PM

Dislocation Patterns under Cyclic Loading in Multiple Slip: *Shengxu Xia*¹; Anter El-Azab¹; ¹Purdue 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 Illnois; Alain Karma, Northeastern University; Jeffrey Hoyt, McMaster University

Monday PM February 15, 2016 Room: 105A 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 Granasy¹; Frigyes Podmaniczky¹; Gyula Tóth¹; ¹Wigner Research Centre for Physics

2:25 PM Invited

Multiscale Modeling of Columnar to Equiaxed Transition: *Alain Karma*¹; Pierre-Antoine Geslin¹; ¹Northeastern University

2:50 PM Invited

Dendrite Orientation Transitions in Al-Zn Alloys: *Jon Dantzig*¹; Alexandre Durussel²; Michel Rappaz³; ¹University of Illinois; ²Novelis Inc.; ³EPFL

3:15 PM Invited

Phase-field Simulations of Dendritic Sidebranching in Three Dimensions: *Mathis Plapp*¹; Alain Karma²; ¹CNRS/Ecole Polytechnique; ²Northeastern University

3:40 PM Break

4:00 PM Invited

Evolution of the Specific Solid-liquid Interface Area in Directional Solidification: *Christoph Beckermann*¹; Hieram Neumann-Heyme²; Kerstin Eckert²; ¹University of Iowa; ²Technical University Dresden

4:25 PM Invited

Study of Solidification Phenomena Using Phase Field Crystal Models: Bernadine Jugdutt¹; Nana Ofori-Opoku¹; Harith Humadi²; Jeffrey Hoyt²; *Nikolas Provatas*¹; ¹McGill University; ²McMaster University

4:50 PM

Multi-scale Experiments and Modeling of Metal Alloy Solidification Dynamics: *Amy Clarke*¹; Damien Tourret¹; Seth Imhoff¹; John Gibbs¹; Younggil Song²; Alain Karma²; Kamel Fezzaa³; Paul Gibbs¹; Daniel Coughlin¹; John Roehling⁴; Joseph McKeown⁴; Jon Kevin Baldwin¹; ¹Los Alamos National Laboratory; ²Northeastern University; ³Argonne National Laboratory; ⁴Lawrence Livermore National Laboratory

5:10 PM

Atomistic, Experimental and Simulation Investigation on the Modification of Al-Si Alloys: Jiehua Li¹; *Peter Schumacher*¹; 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 Das*¹; 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 Lu*¹; 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 Ohodnicki*¹; 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 Brinkman*¹; 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 Chen²; Tom Angsten¹; Anthony Gamst³; Randy Notestine³; Gerbrand Ceder²; Kristin Persson²; *Mark Asta*¹; ¹University of California, Berkeley; ²Lawrence Berkeley National Laboratory; ³University of California, San Diego

2:30 PM Invited

Elasticity of Metallic Glasses, Crystals, and Glass Forming Liquids: *William Johnson*¹; 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 Cuenya*¹; 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 Chen*¹; 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 Trinkle*¹; 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 Schiavone*¹; 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:* 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 PM	Room: 207B
February 15, 2016	Location: Music City Center

Session Chairs: Sheng Yen Li, NIST; Mark Tschopp, U.S. Army Research Laboratory

2:00 PM Keynote

PRISMS: An Integrated Predictive Multi-Scale Capability for the Materials Community: John Allison¹; Larry Aagesen¹; Samantha Daly¹; Krishna Garikipati¹; Vikram Gavini¹; Margaret Hedstrom¹; H. Jagadish¹; J. Wayne Jones¹; Emmanuelle Marquis¹; Amit Misra¹; Brian Puchala¹; Shiva Rudraraju¹; Veera Sundararaghavan¹; Sravya Tamma¹; Glenn Tarcea¹; Katsuyo Thornton¹; Anton Van der Ven²; ¹University of Michigan; ²University of California-Santa Barbara

2:40 PM

MIDAS: A Workflow Tool for Improving Materials Strength Modeling: *Jeffrey Florando*¹; Nathan Barton¹; Kevin Durrenberger¹; Peter Norquist¹; ¹Lawrence Livermore National Laboratory

3:00 PM Invited

Towards an ICME Methodology: Current Activities in Europe: *Georg Schmitz*¹; ¹Access e.V. at the RWTH Aachen

3:30 PM Break

3:50 PM Invited

The Materials Data Facility - Data Services to Advance Materials Science Research: I. Foster¹; R. Ananthakrishnan²; *Ben Blaiszik*²; K. Chard²; J. Pruyne²; J. Towns³; S. Tuecke¹; ¹University of Chicago; Argonne National Laboratory; ²University of Chicago; ³University 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*¹; Alain Jacot²; ¹ESI US R&D; ²Calcom ESI SA

4:50 PM

Automated Convergence Checks with the Python Based Workbench PyIron: Jan Janssen¹; Tilmann Hickel¹; Joerg Neugebauer¹; ¹Max-Planck-Institut fuer Eisenforschung GmbH

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 Bhowmick, 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 PMRoom: 212February 15, 2016Location: Music City Center

Session Chairs: Sanjit Bhowmick, Hysitron, Inc.; Vikram Jayaram, Indian Institute of Science

2:00 PM Keynote

Indentation: Evolution and Application: Brian Lawn¹; ¹National Institute of Standards and Technology

2:40 PM

Hardness Anisotropy of Single Crystal Calcite Indented with Threesided Indenters: *Shefford Baker*¹; Joseph Carloni¹; Mathias Werner¹; Miki Kunitake¹; Lara Estroff¹; Sanjit Bhowmick²; Ryan Major³; Ryan Stromberg³; Syed Asif³; Thomas Wyrobek³; ¹Cornell University; ²Hysitron Inc.; ³Hysitron, Inc.

3:00 PM

The Exponent 3/2 Instead of 2 on h for Conical/Pyramidal Indentation: Physical Foundation and Unprecedented Applications: *Gerd Kaupp*¹; ¹University of Oldenburg

3:20 PM

New Methodology to Accurately Measure the Onset of Yield Point:: Amit Pandey¹; Robert Wheeler²; Amit Shyam¹; Thomas Stoughton³; ¹Oak Ridge National Laboratory; ²MicroTesting Solutions LLC; ³General Motors

3:40 PM Break

4:00 PM Invited

Layer Thickness Effects on the Strength and Deformation Mechanisms of Al/SiC Nanolaminates: *Jon Molina-Aldareguia*¹; Lingwei Yang¹; Carl Mayer²; Javier Llorca¹; Nikhilesh Chawla²; ¹IMDEA Materials Institute; ²Arizona State University

4:30 PM

Micro-scale Fracture Behavior of Co Based Metallic Glass Thin Films: Nagamani Jaya Balila¹; Mathias Koehler¹; Volker Schnabel²; Dierk Raabe¹; Jochen Schneider²; Christoph Kirchlechner¹; Gerhard Dehm¹; ¹MPIE GmbH; ²RWTH 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 Alam¹; David Eastman¹; Thomas Straub²; Jessica Krogstad³; Chris Eberl²; Kevin Hemker¹; ¹Johns Hopkins University; ²Fraunhofer Institute for Mechanics of Materials, Freiburg, Germany; ³University 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 Croom¹; Wei-Ming Wang²; Jingjing Li²; *Xiaodong Li*¹; ¹University of Virginia; ²University 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

Monday PM	Room: 204
February 15, 2016	Location: Music City Center

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 Alderman¹; ¹Magnesium Elektron

2:40 PM

Study on Mechanism of Magnesia Production by Reversion Reaction Process in Vacuum: Yang Tian¹; ¹Kunming University of Science and Technology

3:00 PM

Thermodynamic Description of Reactions between Mg and CaO: Rainer Schmid-Fetzer¹; Artem Kozlov¹; Björn Wiese²; Chamini Mendis²; Domonkos Tolnai²; Karl Kainer²; Norbert Hort²; ¹Clausthal University of Technology; ²Helmholtz-Zentrum Geesthacht

3:20 PM Break

3:40 PM

Atomic-level Mechanisms of Magnesium Oxidation: Sandra Gardonio¹; Mattia Fanetti¹; *Dmytro Orlov*²; ¹University of Nova Gorica; ²Lund 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

Monday PMRoom: 208AFebruary 15, 2016Location: Music City Center

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 Tin¹; ¹Illinois Institute of Technology

2:30 PM Invited

Progress in Polycrystalline Co/Ni Superalloys: *David Dye*¹; Matthias Knop¹; T. Lindley¹; Vassili Vorontsov¹; Farah Ismail¹; B. Shollock¹; Mark Hardy²; ¹Imperial College London; ²Rolls-Royce plc

3:00 PM

TECHNICAL PROGRAM

Stability of Carbides in Advanced Polycrystalline Ni-base Superalloys: *Stoichko Antonov*¹; Sammy Tin¹; ¹Illinois Institute of Technology

3:20 PM Break

3:40 PM Invited

Development of γ ' Strengthened Co-Base Superalloys - Phase Stability and Applications: *Kiyohito Ishida*¹; ¹Tohoku University

4:10 PM

Alloying Effects on Oxidation Mechanisms in Polycrystalline Co-Ni-Al-W-Ta Base Superalloys: *Farah Ismail*¹; Barbara Shollock²; Trevor Lindley¹; David Dye¹; Mark Hardy³; ¹Imperial College London; ²WMG, University of Warwick; ³Rolls-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

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

Session Chair: Jon Carmack, Idaho National Laboratory

2:00 PM

Characterization of High Burnup Structure in LWR Irradiated Urania: *Kurt Terrani*¹; Philip Edmondsson¹; Chad Parish¹; Tyler Gerczak¹; Charles Baldwin¹; Keith Leonard¹; ¹Oak Ridge National Laboratory

2:20 PM

Migration of Lanthanides in U-Zr Alloy Fuel under a Thermal Gradient: *Yeon Soo Kim*¹; T. Wiencek¹; E. O'Hare¹; J. Fortner¹; J.S. Cheon²; B.O. Lee²; ¹Argonne National Laboratory; ²KAERI

2:40 PM

TEM Investigation of Phases Formed in Ternary U-Pu-Zr Systems: Assel Aitkaliyeva¹; James Madden¹; Cynthia Papesch¹; ¹Idaho National Laboratory

3:00 PM

3D Microstructural Characterization of UO2+x Using High-energy X-rays: *Reeju Pokharel*¹; Donald Brown¹; ¹Los Alamos National Laboratory

3:20 PM

Modeling Solute Segregation during Solidification of U-Mo Alloys: *Matthew Steiner*¹; Elena Garlea²; Sean Agnew¹; ¹University of Virginia; ²Y-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*¹; Terry Holesinger²; Haiming Wen¹; ¹Idaho National Laboratory; ²Los Alamos National Laboratory

4:20 PM

Correlation of Fission Product Transport to Grain Boundary Character in Neutron Irradiated Tristructural Isotropic Coated Nuclear Fuel Particles: *Haiming Wen*¹; Isabella van Rooyen¹; ¹Idaho National Laboratory

4:40 PM

Microstructure Characterization of TRISO Fuels by Atom Probe Tomography: Y. Wu¹; I van Rooyen²; H Wen²; J Burns¹; J Madden²; ¹Boise State University; ²Idaho National Laboratory

5:00 PM

Comprehensive EBSD Analysis of the SiC Layer from AGR-1 and AGR-2 Constituent TRISO Fuel Batches: *Tyler Gerczak*¹; John Hunn¹; ¹Oak Ridge National Laboratory

5:20 PM

Advanced Fuels by Field Assisted Sintering Technology – Fuel Properties Characterization and Accident Tolerance: *Jie Lian*¹; Tiankai Yao¹; ¹Rensselaer 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 Gussev*¹; Kevin Field¹; Jeremy Busby¹; Kale Stephenson²; Gary Was²; ¹Oak Ridge National Laboratory; ²University of Michigan

2:20 PM

Effect of Irradiation on Primary Water Stress Corrosion Cracking Behavior of Alloy 718 Subjected to Different Heat Treatments: *Mi Wang*¹; Silva Chinthaka²; Miao Song¹; Gary Was¹; ¹University of Michigan; ²Oak Ridge National Laboratory

2:40 PM

Irradiation-induced Microstructure of Precipitate Hardened Nickel Based Alloy: *Miao Song*¹; Mi Wang¹; David Woodley¹; Zhijie Jiao¹; Gary Was¹; ¹University of Michigan

3:00 PM

In-pile Creep of High Purity SiC and Selected FeCrAl Alloys: *Yutai Katoh*¹; Kurt Terrani¹; Yukinori Yamamoto¹; Lance Snead¹; Torill Karlsen²; ¹Oak Ridge National Laboratory; ²Halden Reactor Project

3:20 PM

A TEM Study of the Effect of Neutron Irradiation on the Microstructure of Fe-Cr Alloys: *Dhriti Bhattacharyya*¹; Yuan Wu²; Joel Davis¹; Robert Harrison¹; Emmanuelle Marquis³; Takuya Yamamoto²; Peter Wells²; Mukesh Bachhav³; G. Robert Odette²; ¹ANSTO; ²University of California, Santa Barbara; ³University 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; ¹Drexel Unviersity; ²Idaho National Laboratory

4:20 PM

Precipitation in 316 Stainless Steels under Irradiation in Light Water Reactors Condition: *Mahmood Mamivand*¹; Ying Yang²; Dane Morgan¹; ¹University of Wisconsin-Madison; ²Oak Ridge National Laboratory

4:40 PM

Phase-Specific Nanoindentation of Wear-Resistant Alloys for Nuclear Power Plant Applications: *Peter Anderson*¹; Marc Doran¹; Ryan Smith¹; David Gandy²; Suresh Babu³; ¹The Ohio State University; ²Electric Power Research Institute; ³University of Tennessee

5:00 PM

Design of Radiation Tolerant Materials via Interface Engineering: *Weizhong Han*¹; ¹CAMP-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 Ma¹; ¹Johns Hopkins University

2:40 PM

Deformation Mechanisms and Instabilities in Metallic Multilayer on the Nanoscale: *Stefan Sandfeld*¹; Danial Pourjafar¹; Ruth Schwaiger²; ¹University of Erlangen (FAU); ²Karlsruhe Institute of Technology (KIT)

3:00 PM

The Origins of High Hardening and Low Ductility in Magnesium: Zhaoxuan Wu¹; *William Curtin*²; ¹Institute of High Performance Computing, A*STAR; ²Ecole Polytechnique Federale de Lausanne

3:20 PM

Transition of Deformation Modes in Hollow Cu-Zr Metallic Glass Nanolattices: *Seok-Woo Lee*¹; Mehdi Zadeh²; David Chen³; Yong-Wei Zhang²; Julia Greet³; ¹University of Connecticut; ²Institute of High Performance Computing, A*STAR; ³California Institute of Technology

3:40 PM Break

4:00 PM Invited

Microstructural Stability under Wear of Binary Nanocrystalline Alloys with Improved Thermal Stability: *Blythe Clark*¹; Nicolas Argibay¹; Brad Boyce¹; Timothy Furnish¹; Michael Dugger¹; Michael Chandross¹; Christopher Schuh²; ¹Sandia National Laboratories; ²Massachusetts Institute of Technology

4:40 PM

Investigation of Creep in Nanocrystalline CuTa: *B. Hornbuckle*¹; Mansa Rajagopalan²; Scott Turnage²; Anthony Roberts¹; Kiran Solanki²; Laszlo Kecskes¹; Kris Darling¹; ¹U.S. Army Research Laboratory; ²Arizona State University

5:00 PM

Mechanical Scaling Behavior of Nanopopous Gold Based on 3D Structural Analysis and Indentation-based Testing: Kaixiong Hu¹; Markus Ziehmer¹; Ke Wang²; *Erica Lilleodden*¹; ¹Helmholtz-Zentrum Geesthacht; ²Hamburg 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 February 15, 2016 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: *Nikhil Koratkar*¹; ¹Rensselaer Polytechnic Institute

2:40 PM Invited

Super-strong Light Metals by Populous Dispersed Nano-elements: *Xiaochun Li*¹; ¹University of California

3:00 PM Invited

Toughening of Aluminum Matrix Nanocomposites via Spatial Arrays of B₄C Spherical Nanoparticles: *Lin Jiang*¹; Hanry Yang¹; Joshua Yee¹; Xuan Mo¹; Dalong Zhang¹; Troy Topping²; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California, Davis; ²California State University, Sacramento

3:20 PM Invited

Progresses in Light Metal Multiscale Composites by Cryogenic Nanostructuring: *Kyu Cho*¹; 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: *Meysam Tabandeh-Khorshid*¹; Emad Omrani¹; Pradeep Menezes²; Pradeep Rohatgi¹; ¹University of Wisconsin Milwaukee; ²University of Nevada Reno

4:40 PM Invited

Mechanical Properties of Amorphous Metallic Alloys at High Strain Rate: *Dung Luong*¹; ¹New York University

5:00 PM

Nanoparticle Assisted Processing for Immiscible Alloys: Chezheng Cao¹; Lianyi Chen¹; Jiaquan Xu¹; Weiqing Liu²; Xiaochun Li¹; ¹University of California, Los Angeles; ²Harbin Institute of Technology

5:20 PM

TECHNICAL PROGRAM

Effect of Nano-particle Addition on Grain Structure Evolution of Friction Stir Processed Al 6061 during Post-weld Annealing: *Junfeng Guo*¹; 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 PMRoom: 101CFebruary 15, 2016Location: 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 Hoelzer*¹; Kevin Field¹; Kinga Unocic¹; Thak Sang Byun²; Jeoung Han Kim³; 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-Mayoral*¹; Elvira Oñorbe¹; Marta Serrano¹; ¹CIEMAT

2:50 PM

Microstructure and Strengthening Mechanism of Austenitic ODS Steels for High-Temperature Nuclear Applications: *Yinbin Miao*¹; Kun Mo²; Zhangjian Zhou³; Xiang Liu¹; Kuan-Che Lan¹; Guangming Zhang³; Jun-Sang Park²; 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 Byun*¹; David Hoelzer²; Hee Joon Jung¹; Jeoung Han Kim³; Stuart Maloy⁴; ¹Pacific Northwest National Laboratory; ²Oak Ridge National Laboratory; ³Hanbat National University; 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 Hangen*¹; Asta Richter²; Chun-Liang Cheng³; 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 Gigax¹; Eda Aydogan¹; Di Chen¹; Xuemei Wang¹; Shigeharu Ukai²; Frank garner³; 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. Odette²; Yuan Wu²; Takuya Yamamoto²; Zhangjian Zhou³; Zheng Lu⁴; ¹Central South University; ²University of California, Santa Barbara; ³University of Science and Technology, Beijing; ⁴Northeastern University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XV — Thermoelectric, Solar-cell, Fuel-cell & Battery Materials

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 University Yee Ware Yee Divisional Cheng Cheng, National Chung

Hsing University; Yee-Wen Yen, National Taiwan Univ of Science & Tech; Shien Ping Feng, The University of Hong Kong; Clemens Schmetterer, Fraunhofer Institute

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

Session Chairs: Shih-kang Lin, National Cheng Kung University; Chih-Ming Chen, National Chung Hsing University

2:00 PM Invited

Interfacial Reactions in the Ni/Ag-Sb and Ni/Ag-Ge Couples: Sinn-wen Chen¹; Ling-chieh Chen¹; Jen-chieh Wang¹; Po-han Lin¹; ¹National Tsing Hua University

2:20 PM

Thermal Stabilities and Properties of AgBiS₂ and AgBi₃S₅: a Review and Experimental Study: *Fiseha Tesfaye*¹; Daniel Lindberg¹; ¹Åbo Akademi University

2:40 PM

Interfacial Reactions between Tin and Ni-coated Bi₂Te₃: Yu-Chen Tseng¹; Chih-Ming Chen¹; ¹National Chung Hsing University

3:00 PM

Liquidus projection and thermoelectric property of (Cu,Ag)–Ga–Te Thermoelectric Materials: *Yen-Te Cho*¹; Tzung-Jin Dung¹; Hsin-jay Wu¹; ¹Department of materials and Optoelectronic Science, National Sun Yat-Sen University

3:20 PM

Phase Equilibria of Thermoelectric Ag-Bi-Se System: *Cheng Hao-Yen*¹; Hsin-Jay Wu¹; ¹National Sun Yat-Sen University

3:40 PM Break

4:00 PM

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 Porphyrinsensitized Solar Cells: Zhai Peng¹; Feng Shien-Ping¹; ¹The University of Hong Kong

4:20 PM

Formula Optimization of Titanium Dioxide Paste for Dye-sensitized Solar Cells: *Chih Chung Wu*¹; Ting Chien Liu¹; Chih Ming Chen¹; ¹National Chung Hsing University

4:40 PM

Ab Initio Mechanistic Study on the Charging/Discharging Behaviors of the Layered-layered Lithium-rich Composite Cathode for Lithium-ion Batteries: *Yu-cheng Chuang*¹; Ping-chun Tsai¹; Shih-kang Lin¹; ¹Department of Materials Science and Engineering, National Cheng Kung University, Taiwan

5:00 PM

Investigation on the Phase Stability of Perovskite in La-Sr-Cr-Fe-O System and Its Long-term Operation: *Hooman Sabarou*¹; Shadi Darvish¹; Yu Zhong¹; ¹Florida International University

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

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

Program Organizers: Sudarsanam Babu, The University of Tennessee, Knoxville; Dhriti 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: 107B
February 15, 2016	Location: Music City Center

Session Chair: Yunzhi Wang, The Ohio State University

2:00 PM

Homogenization Behavior in the Au-Zn-Al and Al-Ag Systems: *Seth Imhoff*¹; Amy Clarke¹; Adam Farrow¹; John Gibbs¹; Joel Montalvo¹; Damien Tourret¹; George Havrilla¹; Velma Lopez¹; ¹Los Alamos National Laboratory

2:30 PM

Epsilon to Tau Phase Transformation in MnAl Alloy Systems: Ayse Genc¹; Ozgun Acar¹; *Eren Kalay*¹; ¹METU

2:50 PM

Phase Field Modelling of Emulsion Formation: *Gyula Toth*¹; Bjorn Kvamme¹; ¹University of Bergen

3:10 PM

The Large Scale Synthesis of Aligned Plate Nanostructures: *Yang Zhou*¹; Philip Nash¹; ¹Illinois Institute of Technology

3:30 PM Break

3:50 PM

Powder Processing of Ultra Ultra High Carbon Steels: *Ibrahim Khalfallah*¹; Alex Aning¹; ¹Virginia Tech

4:10 PM

Production of Corrosion Resistance Steel: Arnab Chatterjee¹; ¹NIT DURGAPUR

4:30 PM

Insights Into the Microstructure and Nucleation of the Zeta Phase in Transition Metal Carbides and Nitrides: *Hang Yu*¹; Thompson Gregory²; Christopher Weinberger¹; ¹Drexel University; ²The University of Alabama

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; Dhriti 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 Jablonski⁴; Kathy Powers³; Virginia Judge¹; John Speer²; Emmanuel De Moor²; 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-Luengas*¹; Juan A. Pozo-Morejón²; 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 Mburu*¹; R. Kolli¹; Samuel Schwarm¹; Daniel Perea²; Jia Liu²; Arielle Eaton²; Sreeramamurthy Ankem¹; ¹University of Maryland; ²Pacific Northwest National Laboratory

3:10 PM

Role of Alloying Elements on Thermal Stability of Duplex Stainless Steel: David Garfinkel¹; Jonathan Poplawsky²; Wei Guo²; George Young³; Julie Tucker¹; ¹Oregon State University; ²Oak Ridge National Laboratory; ³Knolls Atomic Power Laboratory

3:30 PM Break

3:50 PM

The Study of Lead Segregation Behavior of the Heterogeneous Nucleation in Steel: *Lu Xiong*¹; Hongpo Wang¹; ¹Chongqing University

4:10 PM

The Microstructure of As-Quenched 12Mn Steel: John Morris¹; Christopher Kinney¹; Liang Qi²; Ken Pytlewski¹; Armen Khachaturyan¹; Nack Kim³; ¹University of California Berkeley; ²University of Michigan; ³POSTECH

Phase Transformations in Multi-component Systems: An MPMD Symposium Honoring Gary R. Purdy — Bainite Transformation

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

londay PM	Room: 110B
ebruary 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 Miyamoto*¹; Tadashi Furuhara¹; ¹Tohoku University

2:30 PM

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Incomplete Bainite Transformation in Fe-0.4C-3Si Alloy: *Huidong Wu*¹; Goro Miyamoto¹; Zhigang Yang²; Chi Zhang²; Tadashi Furuhara¹; ¹Tohoku University; ²Tsinghua University

2:50 PM

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

3:10 PM

On the Feathery Structure of Bainite: *Jiaqing Yin*¹; 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: Jianing Zhu¹; Zhigang Yang¹; Chi Zhang¹; Congyu Zhang¹; *Hao Chen*¹; ¹Tsinghua University

4:20 PM

Modelling the Condition of Upper and Lower Bainite Formation: *Ze nan Yang*¹; Wei Xu²; Zhi gang Yang¹; Chi Zhang¹; Hao Chen¹; Sybrand van der Zwaag², 'School 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 Huang*¹; 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 Alam, 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 Alam, University of Saskatchewan; Hojong Kim, The Pennsylvania State University

2:00 PM Keynote

Recovery of Yttrium and Neodymium from Copper Pregnant Leach Solutions by Solvent Extraction: Rebecca Copp¹; Brent Hiskey¹; ¹University of Arizona

2:35 PM

Calcined Nanocrystaline Layered Double Hydroxides for the Removal of Arsenate and Arsenite: Eman Wahbah'; *Yousef Mohassab*²; Manoranjan Misra¹; Monalisa Panda¹; ¹University of Utah; ²University of Utah

3:00 PM

Experimental Study on Valuable Metals Dissolution from Copper Slag: *Ying Sun*¹; Jing Zhang¹; Yanze Wang¹; Qiuju Li¹; ¹Shanghai University

3:25 PM

Adsorption of Platinum and Palladium from Hydrochloric Acid Media by Hydrothermally Treated Garlic Waste Gel: Bo Liang¹; Kai Huang¹; Hongmin Zhu¹; *Shafiq Alam¹*; ¹University of Science and Technology Beijing

3:50 PM Break

4:10 PM

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

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

2:00 PM Keynote

A New Architecture for Flexible Large-area Electronic Systems: Sigurd Wagner¹; Warren Rieutort-Louis¹; Josue Sanz-Robinson¹; Tiffany Moy¹; Liechao Huang¹; Yingzhe Hu¹; Yasmin Afsar¹; James Sturm¹; Naveen Verma¹; ¹Princeton University

2:30 PM Invited

Materials Integration for Flexible Electronics: Cu-interconnects, Supercapacitors: *Tolga Aytug*¹; Pooran Joshi¹; Matthew Rager¹; ¹Oak Ridge National Laboratory

2:55 PM Invited

Post Processing and In Situ Processing for Low Thermal Budget Integration of Electronic Materials on Flexible Substrates: Joo Hyon Noh¹; Pushpa Pudasaini¹; Pooran Joshi²; Philip Rack¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

3:20 PM Invited

RF Devices based on 2D Materials for Flexible and Wearable Electronics: Matthew Chin¹; Alex Mazzoni¹; Pankaj Shah¹; Robert Burke¹; *Madan Dubey*¹; Barbara Nichols¹; ¹U.S. Army Research Laboratory

3:45 PM Break

4:10 PM Invited

Self-sensing Ionic Polymer-metal Composite Soft Robotic Actuator Integrated with Gallium-indium Alloy: Sarah Trabia¹; Viljar Palmre²; *Kwang Kim*¹; ¹University of Nevada, Las Vegas; ²University of Nevada, Las Vegas; University of Texas, Houston Medical School

4:30 PM

DFT Approach to Electronic and Optical Properties of Foldable and Stretchable Graphene: Yan Chu¹; Yan Liu¹; *Nuggehalli Ravindra*¹; ¹New Jersey Institute of Technology

4:50 PM

Flexible Copper Clad Laminate prepared by Roll-to-Roll Additive Manufacturing: *Bing An*¹; Xinlin Xie²; Mingzhi Gao²; ¹Huazhong U. of Sci. & Tech.; ²Zhuhai Richview Electronics Ltd.

5:10 PM

Silver Nanowire Networks for Flexible Electromagnetic Interface Shields: Ece Alpugan¹; Sahin Coskun¹; Arcan Dericioglu¹; *Husnu Unalan*¹; ¹Middle East Technical University

5:30 PM

Wearable Energy Storage Devices from Cotton T-shirts: Zan Gao¹; Ningning Song¹; Yunya Zhang¹; *Xiaodong Li*¹; ¹University of Virginia

Recent Developments in Biological, Structural and 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 Carradò, 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

2:00 PM

Grain Boundary Segregation Effects on Post-Coalescence Thin Film Growth: *Tyler Kaub*¹; Gregory Thompson¹; ¹University of Alabama

2:20 PM

Influence of Interfacial Structure on the Phase Stability and Growth Stress in Cu/Nb Multilayered Films: *Qianying Guo*¹; Li Wan¹; Richard Martens¹; Gregory Thompson¹; ¹The University of Alabama

2:40 PM

Optimizing Coating Growth by Gas Jet Assisted Physical Vapor Deposition Using Through-process Simulations: *Theron Rodgers*¹; Hengbei Zhao²; Haydn Wadley²; ¹Sandia National Laboratories; ²University of Virginia

3:00 PM

3:20 PM Break

3:40 PM

On the Boronizing Response of NiCrMo Alloys in Use for Wear and Corrosive Service: *Manuel Marya*¹; Virendra Singh¹; ¹Schlumberger Technology Corporation

4:00 PM

The Investigation on the Intermetallic Layer of Hot-dipping Al-10Si Alloy with 22MnB5 and DC51 Substrate: *Weidong Hu*¹; Wende Dan¹; Wangjun Peng¹; Guangxin Wu¹; Qing Du¹; Jieyu Zhang¹; ¹Shanghai University

4:20 PM

The Wetting Behavior of Fe-Si and Fe-Mn Alloy with Al-10%Si Coating: Wende Dan¹; Guangxin Wu¹; Bo Zhang²; Qing Du¹; Weidong Hu¹; Jieyu Zhang¹; Wangjun Peng¹; ¹Shanghai University; ²Guiyang Institute of Industry Technology

4:40 PM

Thermally-Assisted Interfacial Diffusion in High Phosphorous Nickel Plating on a 4140 Low-alloy Steel: *Virendra Singh*¹; Manuel Marya¹; Tatiana Ayers¹; ¹Schlumberger

5:00 PM Invited

Harvesting Light from Crystalline-Silicon via Processing Of Stressed Interface with Sol-Gel Based Silica: *Sufian Abedrabbo*¹; Anthony Fiory²; Nuggehalli Ravindra²; ¹The Petroleum Institute; University of Jordan; ²New 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; Ivi Smid, Penn State

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

Session Chairs: Ivi Smid, Pennsylvania State University; Kevin Jaansalu, Royal Military College of Canads

2:00 PM

On Plasticity of Polycrystalline Rhenium at Room Temperature: *Peter Panfilov*¹; Yuri Gornostyrev²; Vitalii Pilyugin³; Alexander Yermakov¹; ¹Ural Federal University; ²Institute of Quantum Materials Science; ³Institute of Metalphysics 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 Maier¹; Anton Hohenwarter²; Reinhard Pippan¹; Daniel Kiener²; ¹Austrian Academy of Science; ²Montanuniversität Leoben

2:40 PM

Mechanical Properties of Cold-rolled Tungsten at Different Strain Rates: *Qiuming Wei*¹; Laszlo Kecskes²; ¹University of North Carolina at Charlotte; ²US-ARL

3:00 PM

TECHNICAL PROGRAM

Fracture of Severely Plastically Deformed Niobium and Tantalum: *Anton Hohenwarter*¹; ¹Department of Materials Physics, Montanuniversität Leoben, Austria

3:20 PM

Stress Accommodation in Plastic Zone Ahead Crack Tip in Iridium: *Peter Panfilov*¹; Mikhail Gutkin²; Elijah Borodin¹; Elena Lyapunova¹; ¹Ural Federal University; ²Institute 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*¹; Martin Heilmaier¹; ¹Karlsruhe Institute of Technology

4:15 PM

Improving the Performance of Nb-Silicide Based Refractory Alloys through a Novel Cold Crucible Directional Solidification: *Hongsheng Ding*¹; Kun He¹; Shiqiu Liu¹; Yongwang Kang¹; Jingjie Guo¹; ¹Harbin Institute of Technology

4:35 PM

Microstructure and Properties of a Ternary Eutectic Mo-Si-B Alloy: *Georg Hasemann*¹; Florian Gang²; Martin Palm³; Iurii Bogomol⁴; Manja Krüger¹; ¹Otto-von-Guericke University Magdeburg; ²Karlsruhe Institute of Technology; ³Max-Planck-Institut für Eisenforschung GmbH; ⁴National Technical University of Ukraine "KPI"

4:55 PM

Size Effect of Intermetallic Compounds on Fracture Toughness of Mo-Si-B Alloys: *Jong Min Byun*¹; Su-Ryong Bang¹; Myung-Jin Suk²; Sung-Tag Oh³; Young Do Kim¹; ¹Hanyang University; ²Kangwon National University; ³Seoul National University of Science and Technology

5:15 PM

Reactive Spark Plasma Sintering of Tungsten Borides Using Elemental Tungsten and Boron Powders: Govind Choudhary¹; Ravi Kumar¹; ¹Indian 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 Neelameggham, 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*¹; Silviana Onisei¹; Remus Ion Iacobescu¹; Lubica Kriskova¹; Bart Blanpain¹; ¹KU Leuven

2:25 PM

Valorization of Bauxite Residue in a Technologically Realistic, Financially Viable Process: Are We Getting There?: *Yiannis Pontikes*¹; Efthymios Balomenos²; Peter Tom Jones¹; Koen Binnemans¹; ¹KU Leuven; ²NTUA

2:50 PM

Energy Generation from Waste Slags: Beyond Heat Recovery: Jinichiro Nakano¹; James Bennett¹; Anna Nakano¹; ¹US Department of Energy National Energy Technology Laboratory

MONDAY PM

3:15 PM

Production of Lightweight Aggregate and Ceramic Balls by Utilizing Gold Tailing, Red Mud and Limestone: *Hyunsik Park*¹; Soo-kyung Kim¹; Doyun Shin¹; Jeong-soo Sohn¹; ¹Korea Institute of Geoscience and Mineral Resources

3:40 PM Break

4:00 PM

Accounting for Variation in Life Cycle Inventories: The Case of US Portland Cement Production in the U.S.: Xin Xu¹; Jeremy Gregory¹; *Randolph Kirchain*¹; ¹Massachusetts Institute of Technology

4:25 PM

Kinetics of Dephosphorization from the Steelmaking Slag by Leaching with C6H8O7-NaOH-HCl Solution: *Yong Qiao*¹; Jiang Diao¹; Xuan Liu¹; Xiaosa Li¹; Tao Zhang¹; Bing Xie¹; ¹Chongqing University

4:50 PM

Treatment of Molten Steel Slag for Cement Application: Joao Ferreira Neto¹; Catia Fredericci¹; Joao Oswaldo Garcia Faria¹; Fabiano Chotoli¹; Tiago Ramos Ribeiro¹; Antonio Malynowskyj¹; Andre Luiz Nunis da Silva¹; Valdecir Angelo Quarcioni¹; Andre Alexandrino Lotto¹; ¹Institute for Technological Research - IPT

5:15 PM

Incorporation of Sewage Sludge into Heavy Clay Ceramic Body: Carlos Maurício Vieira¹; Isabela Areias¹; ¹State University of the North Fluminense

REWAS 2016 — Enabling & Understanding Sustainability - Rare Earth Element Applications

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 Neelameggham, Ind LLC

Monday PM	Room: 104B
February 15, 2016	Location: Music City Center

Session Chairs: John Howarter, Purdue University; Randolph Kirchain, Massachusetts Institute of Technology

2:00 PM

Life Cycle Assessment of Rare Earth Production from Monazite: Nawshad Haque¹; Callum Browning¹; Stephen Northey²; Warren Bruckard¹; Mark Cooksey¹; ¹CSIRO; ²Monash University

2:25 PM

Rare Earth Metals Recycling from Spent CFLs and Permanent Magnets: *Brajendra Mishra*¹; Patrick Eduafo²; Caleb Stanton²; ¹Worcester Polytechnic Institute; ²Colorado School of Mines

2:50 PM

Recovery of Rare Earth Elements from the Ferrous Fraction of Electronic Waste: Lars Klemet Jakobsson¹; Mark Kennedy¹; Gabriella Tranell¹; Ragnhild Aune¹; ¹Norwegian University of Science and Technology

3:15 PM

Fundamental Study of the Rare Earths Recycling Through the Pyrotetallurgical Route - Phase Relations and Crystallization Behavior of the CaO-SiO2-Nd2O3 System: *Thu Hoai Le*¹; Annelies Malfliet¹; Bart Blanpain¹; Muxing Guo¹; ¹KU Leuven

3:40 PM Break

4:00 PM

Mitigating Supply Risk of Critical and Strategic Materials: The Role of Trade Policies: *Vasken Xhaxhollari*¹; Michele Bustamante¹; Gabrielle Gaustad¹; ¹Rochester Institute of Technology

4:25 PM

Sustainable Processing of Phosphogypsum Waste Stream for the Recovery of Valuable Rare Earth Elements: Mugdha Walawalkar¹; *Gisele Azimi*¹; Connie Nichol²; ¹University of Toronto; ²Agrium Inc.

4:50 PM

Life Cycle Analysis for Solvent Extraction of Rare Earth Elements from Aqueous Solutions: *Ehsan Vahidi*¹; Fu Zhao²; ¹Division of Environmental and Ecological Engineering, Purdue University; ²School of Mechanical Engineering, Purdue University

5:15 PM Invited

Characteristics of Light Rare Earths from Korean Coal Power Plants Ash: *Ahn Ji Whan*¹; Thenepalli Thriveni¹; ¹Korea 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/Programing

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 PM	
February 15, 2016	

Room: 106C Location: Music City Center

Session Chairs: David Robertson, Missouri Univ. S&T; Gunnar Eriksson, GTT Technologies

2:00 PM Keynote

FactSage – Past, Present and Future: Christopher Bale¹; ¹Ecole Polytechnoque

2:40 PM

Combining Thermodynamics, Education, and Software—A Neglected but Productive Combination: Art Morris¹; ¹Thermart Software

3:00 PM

CALPHAD, Materials Design, and Materials Genome®: Zi-Kui Liu¹; ¹The Pennsylvania State University

3:20 PM

Simulation of the Precipitation Kinetics of Aluminum Alloys and Magnesium Alloys: Fan Zhang¹; Weisheng Cao¹; Chuan Zhang¹; Shuanglin Chen¹; Jun Zhu¹; Rainer Schmid-Fetzer²; ¹CompuTherm; ²Clausthal University of Technology, Institute of Metallurgy

3:40 PM Break

4:00 PM

Paraequilibrium Phase Diagrams: *Arthur Pelton*¹; Pertti Koukkari²; Risto Pajarre²; Gunnar Eriksson³; ¹Ecole Polytechnique; ²VTT Technical Research Centre of Finland; ³GTT-Technologies

4:20 PM

PolySection Projection Phase Diagrams with Applications to Heat Treating: John Morral¹; ¹The Ohio State University

4:40 PM

Calculation of Property Contour Diagrams: *Shuanglin Chen*¹; Weisheng Cao¹; Fan Zhang¹; Chuan Zhang¹; Jun Zhu¹; ¹CompuTherm, LLC

5:00 PM

Identifying Optimal Conditions for Alloys and Process Design Using the Mesh Adaptive Direct Search Algorithm: Aimen Gheribi¹; Jean-Phillipe 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; Wennie 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; Wennie Wang, University of California, Santa Barbara; David Hwang, University of California, Santa Barbara

2:00 PM

TUESDAY AM

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 Hudson*¹; Loretta Moore¹; Janice Lassiter-Mangana¹; 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 Pollock*⁴; Diran Apelian⁵; ¹National Institute of Standards and Technology; ²Colorado School of Mines; ³University of Michigan; ⁴University of California, Santa Barbara; 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 Meyers*¹; Eric Hahn¹; Eduardo Bringa¹; Yzhe Tang¹; ¹University of California, San Diego

3:00 PM

Deformation Mechanism of a Strong and Ductile Nanotwinned Steel: *Mingxin Huang*¹; Peng Zhou¹; ¹The University of Hong Kong

3:20 PM

Phase-field Simulations of Microstructure Evolution under Elasticplastic Deformation in Nanostructured Materials: Shenyang Hu¹; Yulan Li¹; 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 Zhou*¹; 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 Wang*¹; 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 Chorpa, 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: Jinwoo Hwang¹; ¹The Ohio State University

9:00 AM Invited

Invited: Contact Thermal Resistance between Individual Nanostructures: *Deyu Li*¹; ¹Vanderbilt University

9:30 AM

Size-Dependence in Thermo-Mechanical Characterization of Multifunctional Nanocomposite Materials: V. U. Unnikrishnan¹; ¹The University of Alabama