

5:00 PM

The Formation of Growth Twins in Polycrystalline Al with High Stacking Fault Energy: *Sichuang Xue*¹; Fan Zhe¹; Youxing Chen²; Jin Li¹; Haiyan Wang¹; Xinghang Zhang¹; ¹Texas A&M University; ²Argonne National Laboratory

5:20 PM

Modeling Effects of Grain Boundary Sliding on Crystallographic Texture and Grain Shape Evolution Using Explicit Grain Structure Models: *Milan Ardeljan*¹; Irene Beyerlein²; Marko Knezevic¹; ¹University of New Hampshire; ²Los Alamos National Laboratory

2016 Functional Nanomaterials: Emerging Nanomaterials and Techniques for 3D Architectures — Nanomaterials General 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

Wednesday AM
February 17, 2016

Room: 211
Location: Music City Center

Session Chairs: Terry Xu, UNC Charlotte; Vinu Unnikrishnan, The University of Alabama

8:30 AM

Gas-phase Condensation of Core-Shell Nanoparticles: *Mark Koten*¹; Pinaki Mukherjee²; Jeff Shield¹; ¹University of Nebraska; ²Rutgers University

8:50 AM

Morphological, Structural and Optical Characterization of Bottom up Growth of Ag-WO₃ Core Shell Nano-cube Heterostructures: *Muhammad Imam*¹; William Benton¹; Nitin Chopra¹; ¹The University of Alabama

9:10 AM

Titanium Dioxide Architects Made by Amorphous Building Blocks: *Mengkun Tian*¹; Masoud Mahjouri-Samani²; Gyula Eres²; Davide B. Geoghegan²; Gerd Duscher¹; ¹University of Tennessee; ²Oak Ridge National Lab

9:30 AM

Structural Study of Kinked B4C Nanowires: *Zhiguang Cui*¹; SiangYee Chang¹; Terry Xu¹; ¹The University of North Carolina at Charlotte

9:50 AM

Characterization of Free-Standing NiTi Shape Memory Alloy Nanowires Fabricated by Nanoskiving: *Huilong Hou*¹; Reginald Hamilton¹; ¹The Pennsylvania State University

10:10 AM Break

10:30 AM

Shape Shifting Fullerene Self-Assemblies for Supercapacitor Applications: *Deepak Sridhar*¹; *Selene Sandoval*¹; Tony Gnanaprakasam¹; Srin Raghavan¹; Krishna Muralidharan¹; ¹University of Arizona

10:50 AM

Ferroplasmons: Strong Plasmonic Resonances in Magnetic Nanoparticles: *Abhinav Malasi*¹; Jingxuan Ge¹; Annette Farah¹; Hernando Garcia²; Gerd Duscher³; Ramki Kalyanaraman¹; ¹University of Tennessee, Knoxville; ²Southern Illinois University Edwardsville; ³University of Tennessee Knoxville, Oakridge National Laboratory

11:10 AM

The Influence of Shape and Surface Chemistry on Solvated Nanodiamonds as Lubricant Additives: *Farshad Saberi-Movahed*¹; Donald Brenner¹; Olga Shenderova²; ¹North Carolina State University; ²International Technology Center

11:30 AM

DFT Study of Au-Ti Bimetallic Nanoparticle on TiO₂ Support as Highly Active CO Oxidation Catalysts: *Kihoon Bang*¹; Kihyun Shin¹; Myung Shin Ryu¹; Soon Ho Kwon¹; Hyuck Mo Lee¹; ¹KAIST

7th International Symposium on High Temperature Metallurgical Processing — Direct Reduction and Smelting Reduction

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

Wednesday AM
February 17, 2016

Room: 105B
Location: Music City Center

Session Chairs: Onuralp Yücel, ITU; Chenguang Bai, Chongqing University

8:30 AM Introductory Comments

8:35 AM

Experiment Research on Direct Reduction of Celestine by Rotary Hearth Furnace Process: *Dongping Duan*¹; *Hongliang Han*¹; Siming Chen¹; E Zhou¹; Li Zhong¹; ¹Key Laboratory of Green Process and Engineering, Institute of Process Engineering, Chinese Academy of Sciences

8:55 AM

Influence of Slag Basicity on the Silicon within the Stainless Steel Master Alloy Prepared by Smelting Reduction of Fe-Ni-Cr Sinters: *Yanhui Liu*¹; Xuewei Lv¹; Pingsheng Lai¹; Chenguang Bai¹; ¹School of Materials Science and Engineering, Chongqing University

9:15 AM

Reduction Behavior of Chromic Oxide in Ti-bearing BF Slag: *Baohua Li*¹; Lv Xuewei¹; Chen Yun¹; Liu Yanhui¹; Li Shengping¹; ¹Chongqing University

9:35 AM

Reinforcement of Self-reducing Pellets Elaborated with Cement with Cellulose Waste: *Alberto Eloy Nogueira*¹; Cyro Takano¹; Marcelo Mourão¹; Adolfo Zambrano¹; Litzzy Catorceno¹; ¹Universidade de São Paulo

9:55 AM

Smelting Reduction of Bottom Ash in Presence of Liquid Iron Bath for Recovery of Aluminium: *Arup Kumar Mandal*¹; Om Prakash Sinha¹; ¹Indian Institute of Technology, (BHU)

10:15 AM Break

10:30 AM

Effects of Mineral Oxides on the Precipitation Micro-morphology of Metallic Iron in the Reduction of Iron Oxides under CO Atmosphere: *Zhancheng Guo*¹; Zhilong Zhao¹; Huiqing Tang¹; Jintao Gao¹; Lin Lin¹; ¹University of Science and Technology Beijing

10:50 AM

Influence of Operation Parameters on Mass Fraction of Sulfur in the Hot Metal in COREX Process: *Laixin Wang*¹; Shengli Wu¹; Minyin Kou¹; Xinliang Liu¹; Yujue Wang¹; Weidong Zhuang²; ¹University of Science and Technology Beijing; ²National Engineering Research Center for Rare Earth Materials, General Research Institute for Nonferrous Metals, Girem Advanced Materials Co. Ltd

11:10 AM

Influence of Operation Parameters on Sticking Behavior of Pellet in COREX Shaft Furnace: *Xinliang Liu*¹; Shengli Wu¹; Zhe Wang¹; Laixin Wang¹; Minyin Kou¹; ¹University of Science and Technology Beijing

10:50 AM

Change of Slip Anisotropy in Zr Alloys Due to Irradiation: *Yang Liu¹*; Allan Harte¹; Zhenbo Zhang¹; Michael Preuss¹; ¹University of Manchester

11:10 AM

Evaluation of Radiation Effects in FeMnNiCr High Entropy Alloy: *Congyi Li¹*; Anantha Phani Kiran Kumar Nimishakavi²; Hongbin Bei²; Brian Wirth³; G. Malcolm Stocks²; Steve Zinkle³; ¹Bredesen Center; ²Oak Ridge National Laboratory; ³University of Tennessee

11:30 AM

Atomic Scale Characterisation of Radiation Damage in Superconducting Perovskites for Nuclear Applications: Stella Pedrazzini¹; Mohsen Danaie¹; Gregory Brittles¹; Susannah Speller¹; Neil Young¹; Chris Grovenor¹; *Philip Edmondson²*; Paul Bagot¹; ¹University of Oxford; ²Oak Ridge National Laboratory

Additive Manufacturing: Building the Pathway towards Process and Material Qualification — Non-Metals and Feedstock Design

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

Wednesday AM
February 17, 2016

Room: 205A
Location: Music City Center

Session Chairs: Sudarsanam Babu, University of Tennessee - Knoxville; Kenny Dalgarno, Newcastle University

8:30 AM Invited

Fatigue and QA Testing of Polymer SLS and FFF Parts: Stephen Akande¹; Javier Munguia¹; *Kenneth Dalgarno¹*; ¹Newcastle University

9:00 AM

Electromagnetic Thermal Management and Structure Control in High Throughput Large Area Additive Manufacturing: *William Carter¹*; Orlando Rios¹; Vlastimil Kunc¹; Brian Post¹; Randall Lind¹; Lonnie Love¹; ¹Oak Ridge National Laboratory

9:20 AM

Non-Invasive Evaluation of Big Area Additive Manufacturing (BAAM) Parts using Thermoplastic (ABS) Chopped Carbon Fiber Composites for Microstructure-Mechanical Property Relationship: *Stephen Young¹*; Dayakar Penumadu¹; Chad Duty²; Vlastimil Kunc³; ¹University of Tennessee, Knoxville; ²Oak Ridge National Laboratory; ³Oak Ridge National Laboratory

9:40 AM Invited

Innovative Process Controls and Qualification of Additively Manufactured Metallic Components with Tailored Microstructure and Properties: *Sudarsanam Babu¹*; Ryan Dehoff²; Lonnie Love²; William Peter²; ¹The University of Tennessee, Knoxville; ²Oak Ridge National Laboratory

10:10 AM Break

10:30 AM

Using Powder Cored Tubular Wire Technology to Enhance Electron Beam Freeform Fabricated Structures: *Devon Gonzales¹*; Marcia Domack²; Robert Hafley²; Stephen Liu¹; ¹Colorado School of Mines; ²NASA Langley Research Center- Advanced Materials and Processing Branch

10:50 AM

Manufacturing Process Development to Produce Depleted Uranium Wire for EBAM Feedstock: *David Alexander¹*; Kester Clarke¹; Daniel Coughlin¹; Jeffrey Scott¹; ¹Los Alamos National Laboratory

11:10 AM

A Novel Low Cost Process for Making Spherical Ti Alloy Powders for Additive Manufacturing and Other Applications: *Zhigang Fang¹*; Pei Sun¹; Yang Xia¹; Ying Zhang¹; ¹University of Utah

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session V

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

Wednesday AM
February 17, 2016

Room: 103B
Location: Music City Center

Session Chairs: Joel Bernier, Lawrence Livermore National Laboratory; Samantha Daly, University of Michigan

8:30 AM Invited

High-temperature In-SEM Mapping of Early Damage Accumulation across Length Scales in CMCs: Jared Tracy¹; Kathy Sevensen¹; *Samantha Daly¹*; ¹University of Michigan

9:00 AM

In-situ 3-D Characterization and Direct Micromechanical Modelling for Identification of Microstructural Effects on Ductile Damage in 2-phase Polycrystals: *Ricardo Lebensohn¹*; Reju Pokharell¹; Bjorn Clausen¹; Chris Chen¹; Timothy Ickes¹; James Hunter¹; Darren Dale¹; ¹Los Alamos National Laboratory

9:20 AM

Experimental Micromechanics – Getting the Most out of High Resolution EBSD and DIC: Jun Jiang¹; Fionn Dunne¹; *T Ben Britton¹*; ¹Department of Materials, Imperial College

9:40 AM

Hydrogen-Enhanced ‘Free-Volume’ Effects during Deformation of Ni Alloys: *Samantha Lawrence¹*; Yuriy Yagodzinsky²; Hannu Hänninen²; Esa Korhonen²; Filip Tuomisto³; Zachary Harris³; Brian Somerday¹; ¹Sandia National Laboratories; ²Aalto University; ³University of Virginia

10:00 AM Break

10:20 AM Invited

Quantifying the Response of Polycrystalline Materials at the Mesoscale: Measurements, Modeling and Data Mining: *Joel Bernier¹*; Paul Shade²; Todd Turner²; ¹Lawrence Livermore National Laboratory; ²Air Force Research Laboratory

10:50 AM

Computational and Experimental Comparison of Mechanical Deformation and Microstructure Evolution of Additively Manufactured Materials: *Tugce Ozturk¹*; Ross Cunningham¹; Robert Suter¹; Anthony Rollett¹; ¹Carnegie Mellon University

11:10 AM

Which Aggregate Complexity is Required in Full-field Polycrystalline Computations Depending on the Scale of Interest?: *Maxime Sauzay¹*; J. Liu¹; Loic Signor²; Th. Ghidossi²; Patrick Villechaise²; F. Rachdi²; ¹CEA; ²Prime Institut

11:30 AM

A Study of Grain-level Deformation and Residual Stresses in Ti-7Al under Combined Bending and Tension: *Kamalika Chatterjee*¹; Armand Beaudoin¹; Ajey Venkataraman²; Michael Sangid²; Tim Garbacia¹; John Rotella²; Peter Kenesei³; Jun-Sang Park³; ¹University of Illinois at Urbana-Champaign; ²Purdue University; ³Argonne National Laboratory

11:50 AM

Effects of Stretch Forming on Microstructure and Corrosion of Al-Cu-Li Alloys: *Ellen Wright*¹; Michael Kaufman¹; Gary Weber²; ¹Colorado School of Mines; ²Boeing

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

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

Wednesday AM Room: 209C
February 17, 2016 Location: Music City Center

Session Chairs: Robert Shull, National Institute of Standards and Technology; Rafal Dunin-Borkowski, Forschungszentrum Jülich

8:30 AM Invited

Magnetocaloric Effects in Ni-Mn-Al Type Alloys: *Robert Shull*¹; Daniel Lepkowski²; Cindi Dennis¹; Adam Creuziger¹; Anit Giri³; ¹National Institute of Standards and Technology; ²Louisiana State University; ³TKC Global

9:00 AM Invited

Observation of 'Re-entrant Inverse-magnetocaloric Phenomenon' and Asymmetric Magnetoresistance Behavior in RFe₅Al₇ (R = Gd and Dy): Venkatesh Chandragiri¹; Kartik Iyer Iyer¹; *E.V. Sampathkumaran*¹; ¹Tata Institute of Fundamental Research

9:30 AM Invited

Transition Metal Based Magnetocaloric Materials: *Ekkas Brück*¹; ¹Delft University of Technology

10:00 AM Break

10:20 AM

Amorphous, Nanostructured and Composite Magnetocaloric Materials: Optimization of Properties via Materials Processing: *Victorino Franco*¹; Luis Moreno-Ramírez¹; Jhon Ipus¹; Javier Blázquez¹; Alejandro Conde¹; ¹Sevilla University

10:40 AM

Caloric Effects in Ni-Mn-Sn Ribbons: Christian Omar Aguilar Ortiz¹; Juan Pablo Camarillo¹; Daniel Soto-Parra¹; Pablo Álvarez-Alonso²; Elena Villa³; Daniel Salazar⁴; Horacio Flores-Zúñiga¹; *José Manuel Barandiarán*⁴; Volodymyr Chernenko⁵; ¹División de Materiales Avanzados, IPICYT; ²Departamento de Electricidad y Electrónica, Universidad del País Vasco (UPV/EHU); ³CNR IENI; ⁴BCMaterials; ⁵Ikerbasque, Basque Foundation for Science

11:00 AM

Magnetocaloric Materials: From Advanced Characterization to Industrial Application: *Konstantin Skokov*¹; Tino Gottschall¹; Oliver Gutfleisch¹; ¹Technische Universität Darmstadt

11:20 AM

A Study of Magnetocaloric Effect and Increased Working Temperature Range in a Heusler Mn₂₀Ni₃₇In₁₀Co₃ Unidirectional Crystal: *Jian Ren*¹; Hongxing Zheng¹; ¹Shanghai University

11:40 AM

Magnetic Field Induced Large Strain by Reversible Phase Transformation on Metamagnetic Shape Alloys: *Ali Turabi*¹; Haluk Karaca¹; Merivan Sasmaz²; Volodymyr Chernenko²; Yury Chumlyakov³; ¹University of Kentucky; ²University of Basque Country (UPV/EHU); ³Tomsk State University

Aluminum Alloys, Processing and Characterization — Solidification

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Steven Long, Kaiser Aluminum Corporation

Wednesday AM Room: 201B
February 17, 2016 Location: Music City Center

Session Chair: Hiromi Nagaumi, Suzhou Research Institute for Nonferrous Metals

8:30 AM Introductory Comments

8:35 AM Invited

Grain Refinement Mechanism of Aluminum by Al-Ti-B Master Alloys: *Xiaoming Wang*¹; Qingyou Han¹; ¹Purdue University

9:00 AM

Optimization of Electrical Conductivity and Strength by Grain Refinement in Al-Mg-Si Alloys: *Xavier Sauvage*¹; Yana Nasedkina¹; Nariman Enikeev²; Elena Bobruk²; Maxim Murashkin²; Ruslan Valiev²; ¹University of Rouen, CNRS; ²IPAM-USATU

9:25 AM

Power Law Scaled Hardness of Mn Strengthened Al-Mn Solid Solutions: An Integrated Density Functional Theory and Electron Work Function Study: *William Yi Wang*¹; Kristopher Darling²; Yi Wang¹; Shunli Shang¹; Laszlo Keeskes²; Xidong Hui³; Zi-Kui Liu¹; ¹The Pennsylvania State University; ²U.S. Army Research Laboratory; ³University of Science and Technology Beijing

9:50 AM

Universal Modifiers for Al-Si Casting Alloys: *Yang Lu*¹; Andre Lee¹; ¹Michigan State University

10:15 AM Break

10:30 AM

Effect of the Shape of Solid Particles on the Distribution of Particles in JIS AC4CH (A356) Aluminum Alloy Semi-solid High Pressure Die Casting: *Yuichiro Murakami*¹; Kenji Miwa²; Masayuki Kito³; Takashi Honda³; Shuji Tada¹; ¹Advanced Industrial Science and Technology; ²Aichi Science and Technology Foundation; ³Aisan Industry Co., Ltd.

10:55 AM

A High Strength Aluminium Alloy for High Pressure Die Casting: *Shouxun Ji*¹; Zhongyun Fan¹; ¹Brunel University

Aluminum Reduction Technology — Fundamentals in Chemistry I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Stephan Broek, Hatch Ltd

Wednesday AM Room: 202C
February 17, 2016 Location: Music City Center

Session Chair: Arne Ratvik, SINTEF

8:30 AM Introductory Comments

8:30AM

Characterization of Bubble Behavior in Aluminum Reduction Cells: Xiaojun Lv¹; Yajing Shuang¹; Jie Li¹; Lingyun Hu¹; Jianhua Liu¹; Zhenming Xu¹; Hongliang Zhang¹; ¹Central South University

9:00 AM

Elimination of Lithium from Aluminium Electrolyte by Acid Leaching Method: Hou Jianfeng¹; Wang Zhaowen¹; Li Tuofu¹; SHI Zhongning¹; Hu Xianwei¹; ¹Northeastern University

9:25 AM

Impact of the Heat Flux on the Solidification of a Cryolite Based Bath: Sandor Poncsak¹; László Kiss¹; Csilla Kaszás¹; Véronique Dassylyva Raymond¹; Sébastien Guérard²; Jean François Bilodeau²; ¹Univeristy of Quebec at Chicoutimi; ²CRDA Rio Tinto Aluminium

9:50 AM

Investigation of Sodium Sulfate Additions into Cryolite-Alumina Melts: Raanan Meirbekova¹; Geir Haarberg²; Thor Aarhaug³; Gudrun Saevardsdottir¹; ¹Reykjavik University; ²Norwegian University of Science and Technology; ³SINTEF

10:15 AM Break

10:30 AM

Polyvalent Impurities and Current Efficiency in Aluminium Cells: A Model Concerning Electrochemical Short Circuiting: Asbjorn Solheim¹; ¹SINTEF

10:55 AM

Sodium in Aluminum Metal of Operating Prebake Cells: Confirmation and New Findings: Alton Tabereaux¹; Mike Barber¹; ¹Consultant

11:20 AM

The Performance of Aluminium Electrolysis in a Low Temperature Electrolyte System: Peng Cui¹; Asbjorn Solheim²; Geir Martin Haarberg¹; ¹Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry

11:45 AM

The Role of Key Impurity Elements on the Performance of Aluminium Electrolysis - Current Efficiency and Metal Quality: Jassim Al-Mejali¹; Geir Martin Haarberg²; ¹Qatar Aluminium Company (Qatalum); ²NTNU

Bio Nano Interfaces and Engineering Applications — Bio-Nano Interfaces: Applications & Devices

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Candan Tamerler, University of Kansas; Po-Yu Chen, National University of Tsing Hua University; Terry Lowe, Colorado School of Mines; John Nychka, University of Alberta; Wen Yang, Swiss Federal Institute of Technology in Zurich (ETHZ)

Wednesday AM Room: 206B
February 17, 2016 Location: Music City Center

Session Chair: Hendrik Heinz, University of Colorado-Boulder

8:30 AM Invited

Biological Fabrication of Nanodevices by Protein Supramolecules: Ichiro Yamashita¹; ¹Nara Institute of Science and Technology

9:10 AM Invited

Stimuli Responsive and Reconfigurable Nanoparticle Biointerfaces: Marc Knecht¹; ¹University of Miami

9:40 AM Invited

Computational Strategies for Amyloidogenic Proteins Interacting with Gold NPs: Giorgia Brancolini¹; Stefano Corni²; ¹CNR-Nano S3; ²CNR Istituto Nanoscienze

10:10 AM Break

10:30 AM

Engineered Interfaces for Dehydrogenase Based Self-Integrated Electrode System: Brandon Tomas¹; Banu Taktak-Karaca¹; Dwight Deay III¹; Deniz Yucesoy²; Mark Richter¹; Candan Tamerler¹; ¹University of Kansas; ²University of Washington

10:50 AM Invited

Engineering of Bio-Nano Interfaces on 2D Nanomaterials by Self-Assembled Peptides: Yuhei Hayamizu¹; ¹Tokyo Institute of Technology

11:20 AM

An Electrochemical Approach to Control Surface Behavior of Peptides Self-assembling on Graphite: Takakazu Seki¹; Christopher So²; Tamon Page²; Yuhei Hayamizu¹; Mehmet Sarikaya²; ¹Tokyo Institute of Technology; ²University of Washington

Biological Materials Science Symposium — Mechanics of Hard Biological Materials

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

Wednesday AM
February 17, 2016

Room: 207A
Location: Music City Center

Session Chairs: Francois Barthelat, McGill University; Kalpana Katti, North Dakota State University

8:30 AM

A Comparison of Tooth Enamel from Disparate Mammals: Yuta Ohtsuka¹; Shaoyu Zhu¹; Dwayne Arola¹; ¹University of Washington

8:50 AM

Competition of Elastic-plastic Deformation and Fracture in Plastic Zone Ahead Crack Tip in Dentin and Tooth Enamel: Peter Panfilov¹; Elijah Borodin¹; Elena Lyapunova¹; Anna Kabanova¹; Dmitry Zaytsev¹; Mikhail Gutkin²; ¹Ural Federal University; ²Institute of Problems of Mechanical Engineering of the RAS

9:10 AM

On the Reduction in Crack Growth Resistance of Human Enamel with Age: Dongsheng Zhang¹; Mobin Yahyazadehfard²; Dwayne Arola²; ¹Shanghai University; ²University of Washington

9:30 AM

Analysis of Naturally-occurring and Biomimetic Rod Like Microstructures: Enrique Escobar de Obaldia¹; Chanhue Jeong¹; Steven Herrera²; Lessa Grunenfelder²; David Kisailus²; Pablo Zavattieri¹; ¹Purdue University; ²University of California, Riverside

9:50 AM

Functional Design of Keratinous Materials: Pangolin Scales and the Feather Shaft: Bin Wang¹; Marc Meyers¹; ¹University of California, San Diego

10:10 AM Break

10:30 AM

Mechanical Investigation of Naturally-Occurring and Biomimetic Bouligand Materials: Nobphadon Suksangpanya¹; Nicolas Guarin-Zapata¹; David Restrepo¹; Nicholas Yaraghi²; Steven Herrera²; David Kisailus²; Pablo Zavattieri¹; ¹Purdue University; ²University of California, Riverside

10:50 AM

The Twisted Fibrous Structure and Mechanical Behavior of Coelacanth: Haocheng Quan¹; Wen Yang²; Marc Meyers¹; ¹UCSD; ²ETH-Zurich

11:10 AM

Nanoindentation-based Mechanical Spectroscopy of Wood Cell Walls:*Joseph Jakes¹; ¹USDA Forest Products Laboratory***Bulk Metallic Glasses XIII — Mechanical and Other Properties I***Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee; Jianzhong Jiang, Zhejiang University; Gongyao Wang, Alcoa Technical CenterWednesday AM
February 17, 2016Room: 102B
Location: Music City Center*Session Chairs:* Marios Demetriou, Caltech; Katharine Flores, Washington University in St. Louis

8:30 AM Invited

FeCoSiBNbCu Bulk Metallic Glass with Compressive Deformability:*Mihai Stoica¹; Sergio Scudino¹; Jozef Bednarcik²; Ivan Kaban¹; Jürgen Eckert¹; ¹IFW Dresden; ²DESY Hamburg*

8:50 AM Invited

Fracture and Fatigue of a Ni-based Glass: Bernd Gludovatz¹; Edwin Chang²; J. Na³; Max Launey³; Marios Demetriou⁴; William Johnson⁴; *Robert Ritchie²; ¹Lawrence Berkeley National Laboratory; ²University of California Berkeley; ³Glassimetal Technology Inc.; ⁴California Institute of Technology*

9:10 AM

On the Structural Origin of Strength and Plasticity of Metallic Glasses:*Yuan Wu¹; Xiongjun Liu¹; Hui Wang¹; Zhaoping Lu¹; Hongbin Bei²; Yanfei Gao²; Yanli Wang²; Easo. P. George²; ¹State Key Lab for Advanced Metals and Materials, USTB; ²Oak Ridge National Lab.*

9:30 AM Invited

Plastic Deformation Mechanisms in Bulk Metallic Glass Composites:*Kelly Kranjc¹; Michael Gibbons²; Allen Hunter³; Stephen Niezgoda²; Emmanuelle Marquis³; Wolfgang Windl²; Katharine Flores¹; ¹Washington University; ²The Ohio State University; ³University of Michigan*

9:50 AM Break

10:05 AM Invited

Thermodynamic Origin of Fracture Resistance in Metallic Glasses:*Marios Demetriou¹; Glenn Garrett¹; Maximilien Launey¹; William Johnson¹; ¹Glassimetal Technology*

10:25 AM Invited

Mechanical, Thermal and Kinetic Characterization of a Series of Zr-based Bulk Metallic Glasses as a Function of Co-concentration: Rainer Wunderlich¹; *Yue Dong¹; Hans-Jörg Fecht¹; ¹Universität Ulm*

10:45 AM

Tailoring the Magnetic Properties and Mechanical Behavior of Cobalt-Iron Metallic Glasses:*Santanu Das¹; Sundeeep Mukherjee¹; ¹University of North Texas*

11:05 AM

Microstructure and Mechanical Properties of Ti-6Al-4V Alloy Joints**Brazed with Zr-Ti-Cu-Ni Metallic Glass as Filler Metal:** *Yun Ji So¹; Jin Kyu Lee¹; ¹Kongju National University*

11:25 AM

On the Chemistry-topology-stiffness Relationship of Co-based Metallic**Glass Thin Films: A Combinatorial Approach:** *Volker Schnabel¹; Mathias Köhler²; Simon Evertz¹; Jana Michalikova³; Jozef Bednarcik³; Denis Music¹; Dierk Raabe²; Jochen Schneider¹; ¹RWTH Aachen; ²MPIE; ³DESY***Bulk Metallic Glasses XIII — Structures and Modeling***Sponsored by:* TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee*Program Organizers:* Peter Liaw, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, Univ of Tennessee; Jianzhong Jiang, Zhejiang University; Gongyao Wang, Alcoa Technical CenterWednesday AM
February 17, 2016Room: 101E
Location: Music City Center*Session Chairs:* Yunfeng Shi, Rensselaer Polytechnic Institute; Robert Ritchie, Lawrence Berkeley National Laboratory

8:30 AM Invited

Intrinsic and Extrinsic Ductility of Amorphous Solids: *Yunfeng Shi¹;**¹Rensselaer Polytechnic Institute*

8:50 AM

Determining Key Mechanical and Thermophysical Properties of**Bulk Metallic Glasses from First Principles:** *Nicholas Hamilton¹; Reza Mahjoub¹; Kevin Laws¹; Mike Ferry¹; ¹School of Materials, UNSW Australia*

9:10 AM

Mechanical and Structural Properties of Metallic Glasses in Simulation**and Experiment:** *Mathias Koehler¹; Volker Schnabel²; Nagamani Jaya Balila¹; Christoph Kirchlechner¹; Gerhard Dehm¹; Dierk Raabe¹; Jochen M. Schneider²; ¹Max Planck Institute for Iron Research; ²RWTH Aachen University*

9:30 AM

Mesoscopic Models for Amorphous and Crystalline Solids: *Francisco**Perez-Reche¹; ¹University of Aberdeen*

9:50 AM

Thermally Activated Plastic Events and Their Underlying Structural**Signature in Metallic Glasses:** *Jun Ding¹; Evan Ma²; Mark Asta³; Robert Ritchie¹; ¹Lawrence Berkeley National Laboratory; ²Johns Hopkins University; ³University of California Berkeley*

10:10 AM Break

10:25 AM

Structural Evolution of Liquid Eutectic GaIn Alloy using In Situ**Synchrotron X-ray Diffraction and Ab Initio Molecular Dynamics Simulation:** *Jianzhong Jiang¹; Qing Yu¹; X.D. Wang¹; Q.P. Cao¹; D.X. Zhang¹; ¹Zhejiang University*

10:45 AM

Atomic Size Effect on Elastic Softening in Multicomponent Glasses**Investigated by MD Simulation:** *Zengquan Wang¹; Takuya Iwashita¹; Wojciech Dmowski¹; Takeshi Egami²; ¹University of Tennessee, Knoxville; ²Oak Ridge National Laboratory*

11:05 AM Invited

Investigation of Simulated Local Atomic Structure above and below the**Melting Temperature of a Metallic Glass:** *Cang Fan¹; C.T. Liu²; Jingfeng Zhao¹; P.K. Liaw³; ¹Nanjing University of Science and Technology; ²City University of Hong Kong; ³University of Tennessee*

11:25 AM

Kumar: Metallic Glass Janus Microstructures: *Golden Kumar¹; ¹Texas**Tech University*

11:45 AM

Five-fold Symmetry as Indicator of Dynamic Arrest in Metallic Glass-**forming Liquids:** *Maozhi Li¹; ¹Renmin University of China*

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

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

Wednesday AM
February 17, 2016

Room: 210
Location: Music City Center

Session Chairs: Mathieu Brochu, McGill University; Jiamiao Liang, Shanghai Jiao Tong University

8:30 AM Invited

The Effect of Er on Grain Growth in Cryomilled Al-Mg-Er Powders: *Mathieu Brochu*¹; Bamidele Akinrinlola¹; Raynald Gauvin¹; Carl Blais²; ¹McGill University; ²Laval University

9:00 AM

Surface Energetics Studies of Nanomaterials: *Kristina Lilova*¹; Link Brown¹; ¹Setaram Inc.

9:20 AM

Controllable Preparation of Nickel Nanoparticles by Arc Discharge Method: *Feng Liang*¹; Yaochun Yao¹; WenHui Ma¹; Bin Yang¹; Yongnian Dai¹; Manabu Tanaka²; Takayuki Watanabe²; ¹Kunming University of Science and Technology; ²Kyushu University

9:40 AM

Synthesis and Consolidation of Nanocrystalline Fe-10Cr-3Al Alloy Powder: *Rajiv Kumar*¹; Srinivasa Bakshi²; V. S. Raja¹; Smrutiranjana Parida¹; R. K. Singh Raman³; ¹Indian Institute of Technology Bombay; ²Indian Institute of Technology Madras; ³Monash University

10:00 AM

Synthesis of Porous Boron Nitride Nanosheets with High Pore Volume: *Huazhang Zhai*¹; ¹Beijing Institute of Technology

10:20 AM Break

10:40 AM

Synthesis and Morphology Characterization of Nanocrystalline ZnO Powder Fabricated by a Green Low Temperature Route: *Katja Engelke*¹; Olexandr Grydin¹; Mirko Schaper¹; ¹Universität Paderborn

11:00 AM

Two-Stage Sintering of Nano-sized Yttria Stabilized Zirconia with Polymer Sphere Generated Porosity: *Edward Gorzkowski*¹; Scooter Johnson¹; James Wollmershauser¹; Stephanie Wimmer¹; ¹Naval Research Laboratory

11:20 AM

Synthesis of Quasi-Nano-sized Ni-Zn-X-Ferrites (Gd, Cu, Mg) by Using Combustion Synthesis and Improvement of Purity by Wet Process: *Man Kim*¹; *Yong Choi*²; Moon Sun Gu²; Youl Baik²; Bo Kyeong Kang²; Sang Sun Han²; Sun I. Hong³; Chung T. Kim³; ¹KIMS; ²Dankook University; ³Jungwha Nano Engineering LTD

11:40 AM

TiO₂-CeO₂ Nano Crystalline Powders and Thin Films by an Aqueous Sol-Gel Process: Effect of Ce:Ti Molar Ratio on Microstructure and Physical Properties: *Mohsen Manjili*¹; Morteza Shaker²; Mahan Hosseinzadeh²; ¹UWM; ²Sharif University of Technology

Cast Shop Technology: An LMD Symposium in Honor of Wolfgang Schneider — Degassing and Solidification Defects

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

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

Wednesday AM
February 17, 2016

Room: 202A
Location: Music City Center

Session Chair: Dave Gildemeister, Alcoa

8:30 AM Introductory Comments

8:35 AM

Design of Square Induction Coils for the Electromagnetic Priming of Ceramic Foam Filters: *Robert Fritzsche*¹; Ragnhild Aune¹; Mark Kennedy¹; ¹Norwegian University of Science and Technology

9:00 AM

Assessment of Active Filters for High Quality Aluminium Cast Products: *Pierre Le Brun*¹; Fabio Taina¹; Claudia Voigt²; Eva Jackel²; Christos Aneziris²; ¹Constellium Technology Center; ²Technische Universität Bergakademie Freiberg

9:25 AM

Numerical Simulation of Degassing Phenomena in Continuous Casting Process under External Static Magnetic Field on Flow Pattern in Slab Mold: *Mouhamadou Diop*¹; Mohamed Hassan¹; ¹Masdar Institute of Science and Technology

9:50 AM

The Problem of Cavities in Open Mold Conveyor Remelt Ingots: *John Grandfield*¹; ¹Grandfield Technology Pty Ltd

10:15 AM Break

10:30 AM

Theory and Practical Application of Ultrasonic Degassing: *Dawid Smith*¹; Kent Britt¹; ¹JWAluminum

10:55 AM

TiB₂ Particle Detection in Liquid Aluminum Via Laser-Induced Breakdown Spectroscopy: *Shaymus Hudson*¹; Diran Apelian¹; Joe Craparo²; Robert De Saro²; ¹Worcester Polytechnic Institute; ²Energy Research Company

11:20 AM

Modification of Macrosegregation Patterns in Rolling Slab Ingots by Bulk Grain Migration: *Samuel Wagstaff*¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

Characterization of Minerals, Metals, and Materials — Composites

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

Wednesday AM
February 17, 2016

Room: 103A
Location: Music City Center

Session Chairs: Juan Escobedo-Diaz, UNSW Australia; Jeongguk Kim, Korea Railroad Research Institute

8:30 AM

Tensile Strength Tests in Epoxy Composites with High Incorporation of Malva Fibers: Carolina Ribeiro¹; Ygor de Moraes¹; Jean Igor Margem²; Frederico Mulyaert¹; Sergio Monteiro³; Fernanda de Paula¹; ¹State University of the Northern Rio de Janeiro; ²ISECENSA; ³IME

8:50 AM

Refractory's Cements and Composites Materials Based on Them in System BaO-AL₂O₃-SiO₂ N.Iliukha, W.Timofeeva: Ilyoukha Nikolai¹; Timofeeva Valentina¹; ¹Academic Ceramic Center

9:10 AM

Photocatalytic H₂ Production on Novel Heterostructure Composite CuCO₃/TiO₂ Photocatalyst: Likun Li¹; Jim Hwang¹; ¹Advanced Materials R&D Center of WISCO

9:30 AM

Highly Electrically Conductive Polyolefin Nanocomposites Reinforced with a Low Concentration of Carbon Nanotubes: Xingru Yan¹; Zhanhu Guo¹; Qingliang He¹; Jiang Guo¹; Xi Zhang¹; ¹University of Tennessee

9:50 AM

Mechanical Characterization of Polymer Matrix Composites with Nondestructive Evaluation Techniques: Jeongguk Kim¹; ¹Korea Railroad Research Institute

10:10 AM Break

10:25 AM

Characterization of Glassy and Partially Crystalline Cu-Zr-Al-Sm Metallic Glasses: Fatih Sikan¹; Ilkay Kalay²; Eren Kalay¹; ¹METU; ²Cankaya University

10:45 AM

Microstructural Characteristics of Reaction-bonded B₄C/SiC Composite: Tianshi Wang¹; Prashant Karandikar²; Chaoying Ni¹; ¹University of Delaware; ²M Cubed Technologies, Inc.

11:05 AM

Analysis of Methanol Sensitivity on SnO₂-ZnO Nanocomposite: Enobong Bassey¹; Philip Sallis²; Krishnamachar Prasad²; ¹Coventry University; ²Auckland University of Technology

11:25 AM

Meltspun Lignin Carbon Fibers for Reinforced Polymeric Composite Applications: Stephen Young¹; Nathan Meek¹; Dayakar Penumadu¹; ¹University of Tennessee, Knoxville

Computational Materials Discovery and Optimization: From 2D to Bulk Materials — 2D Materials Discovery and Design

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

Program Organizers: Richard Hennig, University of Florida; Houlong Zhuang, Oak Ridge National Laboratory; Dallas Trinkle, University of Illinois, Urbana-Champaign; Eric Homer, Brigham Young University

Wednesday AM
February 17, 2016

Room: 207D
Location: Music City Center

Session Chair: Houlong Zhuang, Princeton University

8:30 AM Invited

High-Throughput Screening of Substrates for Synthesis and Functionalization of Two-Dimensional Materials: Arunima Singh¹; Kiran Mathew²; Richard Hennig³; Albert Davydov¹; Francesca Tavazza¹; ¹National Institute of Standards and Technology; ²Cornell University; ³University of Florida

9:00 AM

Prediction of Entropy Stabilized Incommensurate Phases in the System MoS₂-MoTe₂: Benjamin Burton¹; Arunima Singh¹; ¹NIST

9:20 AM

ReaxFF Force Field Development and Simulations of Two Classes of 2-Dimensional Structures: MoS₂ and MXenes: Alireza Ostadhossein¹; Adri C.T. van Duin¹; ¹Pennsylvania State University

9:40 AM Invited

Turbostratically Disordered Compounds as a Template for Computational Materials Discovery: Sven Rudin¹; ¹Los Alamos National Laboratory

10:10 AM Break

10:25 AM

Stability of Combined Depositions of Graphene and Gallium Nitride on Silicon Carbide: Interfacial Energies and Phonons: Yi Wang¹; Rafael Vila¹; Yu-Chuan Lin¹; Joshua Robinson¹; Zakaria Al Balushi¹; Joan Redwing¹; Zi-Kui Liu¹; Long-Qing Chen¹; ¹The Pennsylvania State University

10:45 AM

Structure-mechanical Property Relationships for a Wide Range of 2D Materials: Chandra Veer Singh¹; ¹University of Toronto

11:05 AM Invited

Computational Discovery of New 2D and 3D Topological Materials: Arun Bansil¹; ¹Northeastern University

11:35 AM

Computational Discovery of Novel Single-Layer Group-IV Oxides with an Evolutionary Algorithm: Rohit Ramanathan¹; Benjamin Revard¹; Arunima Singh²; Richard Hennig³; ¹Cornell University; ²National Institute of Standards and Technology; ³University of Florida

11:55 AM

Computational Discovery of Novel Magnetic 2D Materials: Richard Hennig¹; Ziyu Zhou²; Ran Duan²; Houlong Zhuang³; Arunima Singh⁴; Benjamin Revard²; ¹University of Florida; ²Cornell University; ³Princeton University; ⁴NIST

Computational Methods for Spatio-temporal Scale-bridging: from Atomistics to Mesoscale — Novel Coupling Strategies

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.

Wednesday AM
February 17, 2016

Room: 209A
Location: Music City Center

Session Chairs: Richard Hennig, University of Florida; Srujan Rokkam, Advanced Cooling Technologies, Inc.

8:30 AM

Computation of the Lattice Green Function of a Dislocation: *Anne Marie Tan¹*; Dallas Trinkle¹; ¹University of Illinois, Urbana-Champaign

8:50 AM

Concurrent Atomistic-continuum Simulations of Sequential Slip Transfer of Curved Dislocations across Grain Boundaries: *Shuozhi Xu¹*; Liming Xiong²; Youping Chen³; David McDowell¹; ¹Georgia Tech; ²Iowa State University; ³University of Florida

9:10 AM Invited

Coupling of Density-Functional Theory with Continuum Methods for Solid/Liquid Interfaces and Electrochemistry: *Richard Hennig¹*; Kiran Mathew²; ¹University of Florida; ²Cornell University

9:40 AM

Comprehensive Kinetic Characterization of Clusters from the Atomic Scale: *Thomas Schuler¹*; Maylise Nastar¹; ¹CEA/SRMP

10:00 AM Break

10:20 AM

Continuum Modeling of Coherent Reference States in Semicoherent Interfaces: *Niaz Abdolrahim¹*; Michael Demkowicz²; ¹Department of Mechanical Engineering, University of Rochester, Rochester NY, 14604; ²MIT Department of Materials Science and Engineering, Cambridge MA, 02139

10:40 AM

Scale-Bridging Modeling of Helium Segregation to Surfaces of Plasma-Exposed Tungsten: *Sophie Blondel¹*; Dimitrios Maroudas²; Lin Hu²; Karl Hammond³; Brian Wirth⁴; ¹Oak Ridge National Laboratory; ²University of Massachusetts; ³University of Missouri; ⁴University of Tennessee

11:00 AM

Multiscale Model for Interlayer Dislocations in Bilayer Material: *Shuyang Dai¹*; Yang Xiang²; David Srolovitz¹; ¹University of Pennsylvania; ²Hong Kong University of Science and Technology

11:20 AM

Anharmonic Flexural Modes in Free-Standing Graphene: *Hengjia Wang¹*; Murray Daw¹; ¹Clemson University

Computational Thermodynamics and Kinetics — Phase Diagrams and Phase Stability

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

Wednesday AM
February 17, 2016

Room: 208B
Location: Music City Center

Session Chairs: Blas Pedro Uberuaga, Los Alamos National Laboratory; Adri van Duin, Penn State University

8:30 AM Invited

Applications of the ReaxFF Force Field for Identifying Reactive Properties for Complex Materials and Interfaces: *Adri van Duin¹*; Chowdhury Ashraf²; Abhishek Jain¹; Alireza Ostadhossein¹; Mahbub Islam¹; Yuan Xuan¹; Oleg Borodin²; ¹Penn State; ²US Army Research Laboratory

9:00 AM

Understanding Thermodynamics and Kinetics at the Electrolyte-Electrode Interfaces in All-Solid-State Li-ion Batteries: Insight from First-Principles Computation: *Yifei Mo¹*; ¹University of Maryland, College Park

9:20 AM

Computational Investigation of Enhanced Activity and Stability in Modified Pt-Ni Octahedral Nanoparticles Using a Cluster Expansion: *Liang Cao¹*; Tim Mueller¹; ¹Johns Hopkins University

9:40 AM

Phase Stability of Nano-sized Yttria Stabilized Zirconia System: *Mohammad Asadikiya¹*; Yu Zhong¹; ¹MME Department of Florida International University

10:00 AM Break

10:20 AM Invited

A Generalized View of Amorphization Resistance in Complex Oxides: *Blas Uberuaga¹*; ¹Los Alamos National Laboratory

10:50 AM

Phase Stability and Kinetics in Ni-superalloys from First Principles: *John Goiri¹*; Anton Van der Ven¹; ¹UCSB

11:10 AM

Defect Formation in Aqueous Environment: Theoretical Assessment of Boron Incorporation in Nickel Ferrite under Conditions of an Operating Pressurized-water Nuclear Reactor (PWR): *Zsolt Rak¹*; Donald Brenner¹; ¹North Carolina State University

11:30 AM

Thermal Decomposition Kinetics of Manganese Carbonate in the Process of MnZn Ferrite Preparation: *Lin Wang¹*; ¹University of Science and Technology Liaoning

11:50 AM

Solid-liquid Phase Transitions of FCC-Al and HCP-Mg Nanoparticles: *Yewei Jiang¹*; Linlin Lv¹; Yongquan Wu¹; ¹Shanghai University

12:10 PM Invited

Predicting Novel Pressure-Stabilized Materials Using Evolutionary Algorithms: *Eva Zurek¹*; ¹University at Buffalo, SUNY

Electrode Technology — Electrode Operations and Control

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Angélique Adams, Alcoa Inc

Wednesday AM Room: 202B
 February 17, 2016 Location: Music City Center

Session Chair: Duygu Kocaefe, University of Quebec at Chicoutimi

8:30 AM Introductory Comments

8:40 AM

MIREA: An On-line Quality Control Equipment Integration in an Operational Context: *Marc Gagnon*¹; ¹Aluminerie Alouette

9:05 AM

Journey towards World-Class Operational Effectiveness at DUBAL (EGA Jebel Ali Operations) Paste Plant: *Bienvenu Ndjom*¹; *Muhammad Shafiq Malik*¹; *Amer Abdul Rahman Al Marzouqi*¹; *Mohamed Fazal Ismail*¹; *Tapan Kumar Sahu*¹; *Saleh Ahmed Rabbaa*¹; ¹Emirates Global Aluminium

9:30 AM

The Start up & the Operation Performance of the Twin Green Anode Plant at Ma'aden Aluminium Smelter in Saudi Arabia: *Christophe Bouche*¹; *Pasquale Calo*¹; *Abdulrahman H. Al Shammari*²; *Nitin Yadav*²; *Michel Gendron*²; *Subah Al Shammari*²; *Fabienne Virieux*¹; ¹Fives Solios; ²Maaden Aluminium

9:55 AM

Simulation-Based Decision Support in Cathode Relining Facility Scaling: *Laszlo Tikasz*¹; *Wesam Alghamdi*²; *Jacques Caissy*¹; *Robert McCulloch*¹; ¹Bechtel Canada Co.; ²MA'ADEN Aluminium Co.

Emerging Interconnect and Pb-free Materials for Advanced Packaging Technology — Electrochemical Behavior; Intermetallic Compound II

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

Wednesday AM Room: 201A
 February 17, 2016 Location: Music City Center

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

8:30 AM Invited

Influence of Corrosive Electrolyte on the Electrochemical Behavior of Cu(Pd)-Al IMCs: *Yuelin Wu*¹; *Andre Lee*¹; ¹Michigan State University

8:55 AM

Electrochemical Migration of Fine Pitch Ag Interconnects: *Chia-Hung Tsou*¹; *Heng-Tien Lin*²; *Fan-Yi Ouyang*¹; ¹Dept. of Engineering and System Science, National Tsing Hua University; ²Industrial Technology Research Institute

9:15 AM

The Intermetallic Compound Formation for the Wire Bond between Al pad and Ag-xPd Alloy Wire: *Wei-hsiang Huang*¹; *Kwang-Lung Lin*¹; *Yu-Wei Lin*²; *Yun-Kai Cheng*²; ¹Department of Materials Science and Engineering, National Cheng Kung University; ²Precision Packaging Materials Corp

9:35 AM

Fracture Reliability Concern of (Au,Ni)Sn₄ Phase in 3D IC Microbumps Using ENIG Surface Finishing: *Yingxia Liu*¹; *Yi-Ting Chen*¹; *Sam Gu*²; *Dong Wook Kim*²; *King-Ning Tu*¹; ¹UCLA; ²Qualcomm

9:55 AM

Interfacial Sliding due to Stress, Electromigration and Thermal Gradient and Effect on Through-Silicon Via Structures: *Harry Yang*¹; *Lutz Meinshausen*¹; *Indranath Dutta*¹; *Tae-Kyu Lee*²; ¹Washington State University; ²Cisco Systems

10:15 AM Break

10:35 AM

New Concept Solders/Interconnects for 3D Packaging: *Kazuhiro Nogita*¹; *Christopher Gourlay*²; *Mohd Arif Mohd Salleh*¹; *Guang Zeng*¹; *Yueqin Wu*¹; *Stuart McDonald*¹; ¹The University of Queensland; ²Imperial College London

10:55 AM

Effect of Kirkendall Void Formation in Cu₃Sn on Mechanical Properties of IMCs-based Microbumps: *Yaodong Wang*¹; *King-Ning Tu*¹; ¹University of California at Los Angeles

11:15 AM

Mechanical Properties of Ni₃Sn₄ by Micropillar Compression and Nanoindentation: *Li-Jen Yu*¹; *J. J. Yu*¹; *J. Y. Wu*¹; *C. R. Kao*¹; ¹National Taiwan University

11:35 AM

Growth Kinetic of Ni₃Sn₄ Intermetallic Compounds in Pb-free Interconnect under a Temperature Gradient: *Yu - Fang Lin*¹; *Yi - Shan Yang*¹; *Fan - Yi Ouyang*¹; ¹National Tsing Hua University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Microstructure-sensitive and Multiscale Modeling of Fatigue

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

Wednesday AM Room: 213
 February 17, 2016 Location: Music City Center

Session Chair: Ashley Spear, The University of Utah

8:30 AM Keynote

Modeling 3D Microstructurally Small Crack Growth in 7075-T6 Al: *Conor Hennessey*¹; *Paul Kern*¹; *David McDowell*¹; ¹Georgia Institute of Technology

9:10 AM Invited

Probability of Life-Limiting Fatigue Failures in the Titanium Alloy Ti-6Al-2Sn-4Zr-2Mo: *Sushant Jha*¹; *Robert Brockman*²; *Vikas Sinha*³; *Adam Pilchak*⁴; *Reji John*⁴; *James Larsen*⁴; ¹US Air Force Research Laboratory/Universal Technology Corporation; ²University of Dayton Research Institute; ³UES, Inc.; ⁴US Air Force Research Laboratory

9:30 AM

Microstructural Small Flaw Fracture Mechanics for Improved Design Analysis: *Robert Tryon*¹; *Robert McDaniels*¹; *Animesh Dey*¹; ¹VEXTEC

9:50 AM

Investigating Microstructural Features in Ti-6Al-4V Using CPFEM (Note: This presentation will also appear in the poster session.): *Kartik Kapoor*¹; *Michael Sangid*¹; ¹Purdue University

10:10 AM Break

10:30 AM Invited

Intergranular Strain Evolution near Fatigue Crack Tips in Polycrystalline Materials: *Yanfei Gao*¹; *Rozaliya Barabash*²; *Peter Liaw*¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

10:50 AM

Effect of Pore Voxel Size on Driving Forces for Fatigue Crack Initiation in a Single Crystal Ni-Base Superalloy: *William Musinski¹*; Michael Groeber¹; Michael Uchic¹; ¹US Air Force Research Laboratory

11:10 AM

Simulation of Grain Boundary/Slip Band Interaction in Polycrystalline Metallic Materials: *Julien Genee¹*; Patrick VILLECHAISE¹; Loïc Signor¹; ¹PPRIME Institute CNRS ENSMA

11:30 AM

A 3-D Model for Quantification of Fatigue Weaklink Strength in an A713 Cast Aluminum Alloy (Note: This presentation will also appear in the poster session.): *Lin Yang¹*; Zhiqiang Xu²; Yan Jin¹; Tongguang Zhai¹; ¹University of Kentucky; ²Yanshan University

Frontiers in Solidification: An MPMD Symposium in Honor of Michel Rappaz — Processing/Interfaces

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Wilfried Kurz, EPFL; Jon Dantzig, EPFL and University of Illinois; Alain Karma, Northeastern University; Jeffrey Hoyt, McMaster University

Wednesday AM
February 17, 2016

Room: 105A
Location: Music City Center

Session Chairs: Zhongyun Fan, Brunel University; Dieter Herlach, Deutsches Zentrum für Luft- und Raumfahrt

8:30 AM Invited

Multiphysics and Multiscale Modeling and Simulation of Solidification Processes: *Hervé Combeau¹*; Miha Založnik¹; ¹Institut Jean Lamour

8:55 AM Invited

Simulation of Crystal Sedimentation and Viscoplastic Behavior of Sedimented Equiaxed Mushy Zones: *Andreas Ludwig¹*; Alexander Vakhurshev¹; Menghuai Wu¹; Tobias Holzmann¹; Abdellah Kharicha¹; ¹Montanuniversität Leoben

9:20 AM Invited

Thermal-Fluid Model of Meniscus Behavior during Mold Oscillation in Steel Continuous Casting: *Xiaolu Yan¹*; ASM Jonayat¹; *Brian Thomas¹*; ¹University of Illinois at Urbana-Champaign

9:45 AM Invited

Inverse Methods and Temperature Gradients – An Expedient Combination for the Determination of Thermophysical Properties: *Qingyu Zhang¹*; Aaron Grasemann²; Stephanie Lippmann²; Mingfang Zhu³; *Markus Rettenmayr²*; ¹Friedrich Schiller University Jena; ²Southeast University Nanjing; ³Friedrich Schiller University Jena; ³Southeast University Nanjing

10:10 AM Break

10:30 AM

Microstructure Evolution in Containerless Solidification: *Jonas Vallotton¹*; Abdoul-Aziz Bogno¹; Dieter Herlach²; Hani Henein¹; ¹University of Alberta; ²Deutsches Zentrum für Luft- und Raumfahrt

10:50 AM

Single-Phase Filamentary Cellular Breakdown via Laser-Induced Solute Segregation: *Austin Akey¹*; Daniel Recht²; James Williams³; *Michael Aziz²*; Tonio Buonassisi¹; ¹Massachusetts Institute of Technology; ²Harvard John A. Paulson School of Engineering and Applied Sciences; ³The Australian National University

11:10 AM

Autogenous Interface Modulations: *Martin Glicksman¹*; ¹Florida Institute of Technology

11:30 AM Invited

Spreading of Liquid Pb Droplets on an Al Surface Exhibiting Solid-liquid Interfacial Premelting: *Brian Laird¹*; Yang Yang²; ¹University of Kansas; ²East China Normal University

High-Temperature Systems for Energy Conversion and Storage — Systems for Energy Conversion and Storage 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

Wednesday AM
February 17, 2016

Room: 104E
Location: Music City Center

Session Chairs: Ritesh Sachan, ORNL; Swathi Manivannan, University of Hyderabad

8:30 AM

Carbon Deposition Behavior on Chromium Oxides Heated Directly in Low S/C Environments: *Takuya Ito¹*; Shinji Amaha¹; Mitsutoshi Ueda²; ¹TOKYO GAS CO.,LTD.; ²Tokyo Institute of Technology

8:50 AM

CH₄ Reforming by CO₂ and O₂ Using Ni-M (M= Cu, Fe, Co, Mn, Zn, Cr) Bimetallic Aerogel Catalysts: *Tianzu Yang¹*; Wei Chen¹; *Lin Chen¹*; Weifeng Liu¹; Duchao Zhang¹; ¹Central South University

9:10 AM

Effect of Additives on Densification and Thermal Conductivity of Barium Zinc Tantalate Ceramics: *Swathi Manivannan¹*; P.Kumar Sharma²; Tanjore V. Jayaraman³; *Dibakar Das¹*; ¹University of Hyderabad; ²Institute for Plasma Research; ³University of Michigan - Dearborn

9:30 AM

Electro-spraying and Combustion of Ethanol in a Micro-scale Combustor under Combined Electric Field: *Yunhua Gan¹*; Yang Tong¹; Xiaowen Chen¹; ¹South China University of Technology

9:50 AM Invited

Strain Assisted Fast Ionic Conduction in Ion Irradiation Induced Nanofibers in Pyrochlore Structure Complex Oxide Matrix: *Ritesh Sachan¹*; D. Aidhy¹; Yanwen Zhang¹; Matthew Chisholm¹; William Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee

High Entropy Alloys IV — Structures and Mechanical Properties I

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside; Gongyao Wang, Alcoa Technical Center

Wednesday AM
February 17, 2016

Room: 102A
Location: Music City Center

Session Chairs: Takeshi Egami, The University of Tennessee; Yong Zhang, University of Science and Technology Beijing

8:30 AM Invited

Electronic Effects in High-Entropy Alloys: *Takeshi Egami¹*; Odbadrakh Khorgolkhuu¹; George Stocks²; ¹University of Tennessee; ²Oak Ridge National Laboratory

8:55 AM

Stress-strain Response and Microstructure of High Entropy Alloy ($\text{Fe}_{20}\text{Mn}_{20}\text{Ni}_{20}\text{Co}_{20}\text{Cr}_{20}$) Deformed Micro-pillars: *Daniel Janda*¹; Hyokyung Sung¹; Alexander Kauffmann²; Martin Heilmaier²; Sharvan Kumar¹; ¹Brown University; ²Karlsruhe Institute of Technology

9:15 AM

Structure and Mechanical Properties of Fe₄₀Mn₂₈Ni₃₂-xCr_x Alloys with Different Cr Content: *Nikita Stepanov*¹; Dmitry Shaysultanov¹; Mikhail Tikhonovsky²; Gennady Salishchev¹; ¹Belgorod State University; ²National Science Center "Kharkov Institute of Physics and Technology" NAS of Ukraine

9:35 AM Invited

High Entropy Alloy Materials for Naval Applications: *Thanh Tran*¹; ¹NSWC Carderock

9:55 AM Break

10:10 AM Invited

Tensile Properties of Refractory High-entropy HfNbTaTiZr Alloy: *Che-Wei Tsai*¹; Chien-Chang Juan¹; Jien-Wei Yeh¹; ¹National Tsing Hua University

10:30 AM

Structure and Mechanical Properties of the AlNbTiVCr_x (x = 0, 0.5, 1, 1.5) High Entropy Alloys: *Nikita Yurchenko*¹; Nikita Stepanov¹; Gennady Salishchev¹; Mikhail Tikhonovsky²; ¹Belgorod National Research University, Laboratory of Bulk Nanostructured Materials; ²National Science Center, Kharkov Institute of Physics and Technology

10:50 AM Invited

Influence of Cryogenic Prestraining on Tensile Properties of a High-entropy Alloy: G. Laplanche¹; O. Horst¹; A. Kostka¹; G. Eggeler¹; E. P. George¹; ¹Ruhr University Bochum

11:15 AM Invited

Serration Behaviors and Structural Flow Units in High Entropy Alloys: *Yong Zhang*¹; ¹University of Science and Technology Beijing

Hume-Rothery Award Symposium: Thermodynamics of Materials — Temperature Effects

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

Wednesday AM
February 17, 2016

Room: 107A
Location: Music City Center

Session Chairs: Winfried Petry, Technische Universität München; Dane Morgan, University of Wisconsin-Madison

8:30 AM Invited

Mixed-space Approach to Phonons Involving Vibration-Induced Dipole-Dipole Interactions: Yi Wang¹; Zikui Liu¹; *Long Qing Chen*¹; ¹Penn State University

9:00 AM Invited

Non-harmonic Modelling of Materials: *Olle Hellman*¹; ¹California Institute of Technology

9:30 AM

Ab Initio Molecular Dynamics Study of Speciation in AlCl₃-ZnCl₂-based Network Forming Liquids: *Venkateswara Rao Manga*¹; Krishna Muralidharan¹; Pierre Lucas¹; Pierre Deymier¹; ¹University of Arizona

9:50 AM

Reduced Elastic Anisotropy of Cementite at Moderate Temperatures from Nonharmonic Effects: *Jane Herriman*¹; Lisa Mauger¹; Olle Hellman¹; Sally Tracy¹; Matt Lucas²; Jorge Munoz²; John Horwath²; Jackie Li³; Brent Fultz¹; ¹Caltech; ²AFRL; ³University of Michigan

10:10 AM Break

10:40 AM Invited

Inclusion of Phonon-Phonon and Magnon-Phonon Couplings in the Thermodynamic Description of Materials: An Ab Initio Approach: *Jörg Neugebauer*¹; Albert Glensk¹; Fritz Kormann²; Blazej Grabowski¹; Tilmann Hickel¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Delft University of Technology

11:10 AM Invited

Temperature Dependent Phonon Anharmonicity in Elementary and Martensite Systems: *Winfried Petry*¹; Michael Leitner¹; Pascal Neibecker¹; Jürgen Neuhaus¹; ¹Heinz Maier-Leibnitz Zentrum (MLZ) - Technische Universität München

11:40 AM

Phonon-Induced Charge Transfer and Electron-Phonon Interaction in FeTi: *Fred (Chae-Reem) Yang*¹; Jorge Muñoz²; Lisa Mauger¹; Olle Hellman¹; Matthew Lucas³; Brent Fultz¹; ¹California Institute of Technology; ²The Datum Institute; ³Air Force Research Laboratory

In Operando Nano- and Micro-mechanical Characterization of Materials with Special Emphasis on In Situ Techniques — Nano- and Micro-mechanical Characterization of Materials at Elevated Temperatures

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

Wednesday AM
February 17, 2016

Room: 212
Location: Music City Center

Session Chairs: Vikram Jayaram, Indian Institute of Science; Vikas Tomar, Purdue University

8:30 AM Invited

Shape Memory Properties and Martensitic Transformation in Shape Memory Ceramics at the Micro- and Nanoscale: *Christopher Schuh*¹; Zehui Du²; Chee-Lip Gan²; ¹MIT; ²NTU Singapore

9:00 AM

Temperature and Dislocation Density Effects on Size Dependent Plasticity Mechanisms: *David Bahr*¹; Michael Maughan¹; ¹Purdue University

9:20 AM

In Situ Nanomechanical Properties of Diffusion Aluminide Bond Coating at Elevated Temperature: Sanjit Bhowmick¹; *Douglas Stauffer*¹; S.A. Syed Asif¹; ¹Hysitron, Inc.

9:40 AM

Measurement of Localized Deformation in Superalloys with Heterogeneous Microstructures: *Connor Slone*¹; Michael Mills¹; ¹The Ohio State University

10:00 AM Break

10:20 AM Invited

In-situ Testing in the Electron Microscope at High and Low Temperatures: *Jeffrey Wheeler*¹; ¹ETH Zurich

10:50 AM

In-situ Fracture Testing of Microscale Silicon at Elevated Temperatures: *Eric Hintsala*¹; Sanjit Bhowmick²; William Gerberich¹; Douglas Stauffer²; ¹University of Minnesota; ²Hysitron, Inc.

11:30 AM

Suppression of Plastic Instability in Submicron FCC Crystals with Ultrahigh Strength: *Tao Hu*¹; Lin Jiang¹; Hanry Yang¹; Kaka Ma¹; Troy Topping²; Amiya Mukherjee¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California Davis; ²California State University, Sacramento

11:10 AM

Benchmarking Multi-scale Models through Micro-mechanical Testing and Characterization of Ni-base Superalloys: *David Eastman*¹; Zafir Alam¹; Paul Shade²; Michael Uchic²; Will Lenthe³; Tresa Pollock³; Kevin Hemker¹; ¹Johns Hopkins University; ²Air Force Research Laboratory; ³University of California, Santa Barbara

Interface-driven Phenomena in Solids: Thermodynamics, Kinetics and Chemistry — Microstructural Evolution I

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Nanomaterials Committee, TMS: Thin Films and Interfaces Committee
Program Organizers: Fadi Abdeljawad, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Timofey Frolov, UC Berkeley; Emine Gulsoy, Northwestern University; Heather Murdoch, Army Research Lab; Mitra Taheri, Drexel University

Wednesday AM
February 17, 2016

Room: 108
Location: Music City Center

Session Chair: Begum Gulsoy, Northwestern University

8:30 AM Invited

Exploring the Causes and Effects of Fast Grain Boundary Motion: *Elizabeth Holm*¹; Brian DeCost¹; Jonathan Humberson¹; Taichong Ma¹; Philip Goins¹; ¹Carnegie Mellon University

9:10 AM

Migration Mechanisms of Flat S3 Grain Boundaries: Jonathan Priedeman¹; Eric Homer¹; David Olmsted²; ¹Brigham Young University; ²University of California, Berkeley

9:30 AM

Twin Boundary Energy as a Driving Force for Microstructural Instability in Thin Films: *Shefford Baker*¹; Elizabeth Ellis¹; ¹Cornell University

9:50 AM

Abnormal Grain Growth-The Role of Curvature in Pinned Microstructures
*: Catherine Sahi*¹; Steven Chiu¹; David Graniero¹; Robert DeHoff¹; Burton Patterson¹; ¹University of Florida

10:10 AM Break

10:30 AM Invited

Thermodynamic High-temperature Stability in Nano Metallic Multilayers: *Andrea Hodge*¹; ¹University of Southern California

11:10 AM

Grain Growth and Segregation in Hf-Ti Nanometallic Multilayers: *Juan Riaño Zambrano*¹; Mikhail Polyakov¹; Andrea Hodge¹; ¹University of Southern California

11:30 AM

Coarsening of a Two-Phase System with Asymmetric Bulk Mobilities: *William Andrews*¹; Chal-Lan Park¹; Peter Voorhees²; Katsuyo Thornton¹; ¹University of Michigan; ²Northwestern University

11:50 AM

Molecular Dynamics Simulation of B2-B33 Transformation in Ni-Zr Alloy: *Seth Wilson*¹; Mikhail Mendelev¹; Ames Laboratory

Magnesium-based Biodegradable Implants — Materials and Processing / Surface Modification and Corrosion

Sponsored by: TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Biomaterials Committee, TMS: Magnesium Committee
Program Organizers: Wim Sillekens, European Space Agency; Martyn Alderman, Magnesium Elektron; Patrick Bowen, Michigan Technological University; Jaroslav Drelich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund

Wednesday AM
February 17, 2016

Room: 206A
Location: Music City Center

Session Chairs: Petra Maier, Fachhochschule Stralsund ; Jaroslav Drelich, Michigan Technological University

8:30 AM Introductory Comments Wim Sillekens

8:40 AM Invited

Fabrication, Testing and Performance of Rare Earth-containing Magnesium Biodegradable Metals: *Yufeng Zheng*¹; ¹Peking University

9:10 AM

Manufacturing of Osteosynthesis Systems Made of Magnesium Alloy AZ91: Britta Hering¹; Andi Wippermann¹; Tobias Mörke¹; Thilo Grove¹; Berend Denkena¹; ¹Leibniz University of Hannover

9:30 AM

Magnesium Powder Injection Molding (MIM) of Orthopedic Implants for Biomedical Applications: *Martin Wolff*¹; Johannes Schaper¹; Marc Suckert¹; Michael Dahms¹; Thomas Ebel¹; Regine Willumeit-Römer¹; Thomas Klassen¹; ¹Helmholtz-Zentrum Geesthacht

9:50 AM Invited

Absorbable Filament Technologies: Wire-drawing to Enable Next-generation Medical Devices: *Adam Griebel*¹; Jeremy Schaffer¹; ¹Fort Wayne Metals

10:20 AM Break

10:40 AM Invited

Plasma Surface Modification of Magnesium-Based and Related Biomaterials: *Paul Chu*¹; ¹City University of Hong Kong

11:10 AM

Degradation of MgF₂-coated and Uncoated MgNd₂ Specimens in Contact with Nasal Mucosa: *Rainer Eifler*¹; Martin Durisin²; Christian Klose¹; Thomas Lenarz²; Hans Jürgen Maier¹; ¹Leibniz Universität Hannover; ²Medical School of Hanover

11:30 AM

Influence of Precipitation Hardening in Mg-Y-Nd on Mechanical and Corrosion Properties: *Petra Maier*¹; Raimund Peters¹; Chamini Mendis²; Sören Müller³; Norbert Hort²; ¹University of Applied Sciences Stralsund; ²Helmholtz-Zentrum Geesthacht; ³Extrusion Research and Development Center TU Berlin

Magnesium Technology 2016 — LPSO Alloys and Composites

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

Wednesday AM
February 17, 2016

Room: 204
Location: Music City Center

Session Chairs: Manoj Gupta, National University of Singapore; Hyunkyu Lim, Korea Institute of Technology KITECH

8:30 AM

Solid Solution Hardening in Mg-Gd-TM (TM=Ag, Zn and Zr) Alloys: An Integrated Density Functional Theory and Electron Work Function Study: *William Yi Wang*¹; Shunli Shang¹; Yi Wang¹; Hongyeun Kim¹; Kristopher Darling²; Laszlo Kecskes²; Suveen Mathaudhu³; Xidong Hui⁴; Zi-Kui Liu¹; ¹The Pennsylvania State University; ²U.S. Army Research Laboratory; ³University of California; ⁴University of Science and Technology Beijing

8:50 AM

Microstructure and Mechanical Properties New Magnesium-Zinc-Gadolinium Alloys: Sankaranarayanan Seetharaman¹; Sravya Tekumalla¹; Bhavesh Lalwani²; Hardik Patel²; Quy Bau Nguyen¹; *Manoj Gupta*¹; ¹National University of Singapore, Singapore; ²National Institute of Technology, Karnataka

9:10 AM

Effects of Alloying Elements on Microstructures and Mechanical Properties of Mg-Gd-Zn-Ca Alloys: *Hyunkyu Lim*¹; Youngkyun Kim¹; Bonghwan Kim¹; Daeguen Kim²; Young-Ok Yoon¹; Shae K. Kim¹; ¹KITECH; ²GI Tech

9:30 AM

Creep of a Mg-Zn-Y Alloy at Elevated Temperatures: Weiwei Hu¹; *Zhiqing Yang*¹; Jianfang Liu¹; Hengqiang Ye¹; ¹Institute of Metal Research

9:50 AM Break

10:10 AM Invited

An Insight into Use of Hollow Fly Ash Particles on the Properties of Magnesium: Vyasraj Manakari¹; Gururaj Parande¹; *Manoj Gupta*¹; ¹National University of Singapore

10:30 AM

Role of SiC in Grain Refinement of Aluminum-free Mg-Zn Alloys: *Jian Gu*¹; Yuanding Huang¹; Karl Ulrich Kainer¹; Norbert Hort¹; ¹Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht, Max-Planck-Str. 1, D-21502 Geesthacht, Germany

10:50 AM

Hot Deformation and Processing Map in an Mg-Zn-Mn-Y Alloy: *Nabila Tahreen*¹; Dingfei Zhang²; Fusheng Pan²; Xianquan Jiang³; Dongyang Li⁴; Daolun Chen¹; ¹Ryerson University; ²Chongqing University; ³Southwest University; ⁴University of Alberta

Magnesium Technology 2016 — Solidification and Casting

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

Wednesday AM
February 17, 2016

Room: 205B
Location: Music City Center

Session Chairs: Norbert Hort, Helmholtz-Zentrum Geesthacht; Tracy Berman, University of Michigan

8:30 AM

In Situ Synchrotron Radiation Diffraction of the Solidification of Mg-Dy(-Zr) Alloys: *Domonkos Tolnai*¹; Peter Staron¹; Andreas Staeck¹; Helmut Eckerlebe¹; Norbert Schell¹; Martin Müller¹; Joachim Gröbner²; Norbert Hort¹; ¹Helmholtz-Zentrum Geesthacht; ²Institute of Metallurgy, Clausthal University of Technology

8:50 AM

As Solidified Microstructure Investigation of Mg₁₅Y and Mg_xY_yGd (x+y=15 wt.%) Ternary Alloys: *Gabor Szakacs*¹; Chamini Mendis¹; Norbert Hort¹; Karl Kainer¹; Norbert Schell¹; Domonkos Tolnai¹; Ivana Stuliková²; Marian Vlcek²; Frantisek Lukác²; Bohus Smola²; Rainer Fetzner³; ¹Helmholtz-Zentrum Geesthacht; ²Charles University in Prague; ³Clausthal University of Technology

9:10 AM

Development of the New High Shear Technology for Continuous Processing of Mg-alloys for Ingot Casting: *Jayesh Patel*¹; Peter Lloyd¹; Guosheng Peng¹; Zhongyun Fan¹; ¹BCAST

9:30 AM

Dendritic Morphology and Growth Orientation of Magnesium Alloys: 3-D Characterization by Synchrotron X-ray Tomography and Simulation by Phase-field: *Manhong Yang*¹; Shou-Mei Xiong¹; Zhi-Peng Guo¹; ¹Tsinghua University

9:50 AM Break

10:10 AM

Influence of Hot Isostatic Processing on the Microstructure and Tensile Behavior of HPDC AM50: *Erin Deda*¹; John Allison¹; ¹University of Michigan

10:30 AM

Microsegregation in High Pressure Die Cast AM70: *Tracy Berman*¹; Erin Deda¹; Jiashi Miao¹; Mei Li²; John Allison¹; ¹University of Michigan; ²Ford Motor Company

10:50 AM

Predicting Solidification Properties of Magnesium by Molecular Dynamics Simulations: *Ebrahim Asadi*¹; Mohsen Asle Zaeem¹; ¹Missouri University of Science and Technology

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

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

Program Organizers: John Carsley, General Motors Research & Development; Daniel Coughlin, Los Alamos National Laboratory; Myoung-Gyu Lee, Korea University; Youngung Jeong, National Institute of Standards and Technology; Piyush Upadhyay, Pacific Northwest National Laboratory

Wednesday AM Room: 104A
February 17, 2016 Location: Music City Center

Session Chairs: John Carsley, General Motors Co.; Daniel Coughlin, Los Alamos National Laboratory

8:30 AM Invited

A Novel In-situ Planar Biaxial Experiment: *Aaron Stebner*¹; ¹Colorado School of Mines

9:00 AM Invited

Advanced Cruciform Testing at the NIST Center for Automotive Lightweighting: *Adam Creuziger*¹; Mark Iadicola¹; Tim Foecke¹; Dilip Banerjee¹; ¹National Institute of Standards and Technology

9:30 AM Invited

Biaxial Loading of Anisotropic Al-6022-T4 Sheets Using Cruciform Specimens: Nengxiu Deng¹; Ian Gagnon¹; Vojtech Kubec¹; Brad Kinsey¹; Yannis Korkolis¹; ¹University of New Hampshire

10:00 AM Break

10:30 AM

Optimization of Biaxial Tensile Test Specimen Design: *Dilip Banerjee*¹; Mark Iadicola¹; Adam Creuziger¹; Timothy Foecke¹; ¹NIST

11:00 AM

Hardening Behavior of 316L SS Subject to Biaxial Strain Path Change: Multiscale Modeling for Guiding Experiments: *Manas Upadhyay*¹; Tobias Panzner¹; Steven Van Petegem¹; Helena Van Swygenhoven²; ¹Paul Scherrer Institut; ²Paul Scherrer Institute and École polytechnique fédérale de Lausanne

Material Design Approaches and Experiences IV — TiAl, Ti Alloys and Functional Materials

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 Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Wednesday AM Room: 208A
February 17, 2016 Location: Music City Center

Session Chairs: Akane Suzuki, GE Global Research; Dongsheng Xu, Institute of Metal Research

8:30 AM Invited

TiAl Alloy Design : Principles, Processing, Properties, and Applications: *B. P. Bewlay*¹; ¹GE Global Research

9:00 AM Invited

Application-specific R&D Pathway to Higher-Temperature Gamma (TiAl) Alloy Materials and Processes: *Young-Won Kim*¹; Sang-Lan Kim²; ¹Gamteck, Inc.; ²UES, Inc.

9:30 AM Invited

Alloy Design Concept for High Nb-TiAl Alloy for High Temperature Application: *Junpin Lin*¹; Xiangjun Xu²; Yongfeng Liang¹; Laiqi Zhang¹; Guojian Hao¹; ¹University of Science and Technology Beijing; ²Zhongyuan University of Technology

10:00 AM Break

10:20 AM Invited

Multi-scale Simulation towards the Understanding of the Microstructure Evolution and Fracture Behavior in Titanium Alloys: *Dongsheng Xu*¹; Jinhu Zhang¹; Chunyu Teng¹; Hao Wang¹; Jianke Qiu¹; Jiafeng Lei¹; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

10:50 AM

Interface Materials Design of Nanoscale Multi-layered Composite Materials and Its Mechanical Properties: *Hashina Parveen Anwar Ali*¹; Ihor Radchenko¹; Arief Budiman¹; Nan Li²; Nathan Mara²; Irene Beyerlein²; ¹Singapore University of Technology and Design; ²Los Alamos National Laboratory

11:10 AM

Experimental Investigation of the Sm-rich Side in Sm-Zr System: *Tian Yin*¹; Shuqiang Zhang¹; Zhihong Zhang²; Jieyu Zhang¹; ¹State Key Laboratory of Advanced Special Steel; ²Baotou Research Institute of Rare Earths

Materials and Fuels for the Current and Advanced Nuclear Reactors V — Structural Materials III

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

Wednesday AM Room: 101A
February 17, 2016 Location: Music City Center

Session Chairs: Brian Cockeram, Bechtel-Bettis; Brad Baker, United States Naval Academy

8:30 AM

Oxidation Behavior of Accident-Tolerant FeCrAl Cladding Alloys: *Bruce Pint*¹; Yukinori Yamamoto¹; Kinga Unocic¹; Kurt Terrani¹; Oak Ridge National Laboratory

8:50 AM

Ferritic Steels Cladding for Accident Tolerant Fuel in Light Water Power Reactors: *Raul Rebak*¹; Yang-Pi Lin²; Russell E. Stachowski²; Kurt A. Terrani³; ¹GE Global Research; ²Global Nuclear Fuels; ³Oak Ridge National Laboratory

9:10 AM

Nanostructured Vanadium Carbide Coating on the F/M Stainless Steel for Mitigating Fuel Cladding Chemical Interaction: *Kookhyun Jeong*¹; *Yong Yang*¹; ¹University of Florida

9:30 AM

Deposition of Compatibility Films on SiC for Environmental Barrier Coatings: *Caen Ang*¹; Jim Kiggans¹; Craig Kemery²; Jeffery Thomson¹; Yutai Katoh¹; Kurt Terrani¹; ¹ORL; ²NEO Industries

9:50 AM

Processability Assessment of Accident-Tolerant FeCrAl Cladding Alloys: *Yukinori Yamamoto*¹; Kevin Field¹; Bruce Pint¹; Kurt Terrani¹; ¹Oak Ridge National Laboratory

10:10 AM Break**10:30 AM**

Down Selection of Clad Material for LEU Fuel Elements for the TREAT Reactor: *Isabella van Rooyen*¹; Darryl Butt²; Randy Lloyd¹; Jordan Vandegrift²; Patrick Price²; ¹Idaho National Laboratory; ²Boise State University

10:50 AM

Effect of Cold Rolling on the Integrity and SCC Susceptibility of Twin Boundaries of Alloy 690: *Wenjun Kuang*¹; Cody Miller²; Mike Kaufman²; Talukdar Aman³; Bharat Gwalani³; Rajarshi Banerjee³; Gary Was¹; ¹University of Michigan; ²Colorado Schools of Mines; ³University of North Texas

11:10 AM

Effect of Heat Treatment and Chemical Composition on the Precipitation Behavior in Commercialized Age Hardening Nickel Based Alloys: *Miao Song*¹; Zhijie Jiao¹; Mi Wang¹; David Woodley¹; Gary Was¹; ¹University of Michigan

11:30 AM

Elevated Temperature Deformation Behaviour of an Alloy 693: *Jung Singh*¹; Shabana Khan¹; Amit Verma¹; Jayanta Chakravarty¹; ¹Bhabha Atomic Research Centre

Materials in Clean Power Systems IX: Durability of Materials — Materials for Supercritical CO₂ Applications

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Energy Committee, TMS: High Temperature Alloys Committee
Program Organizers: Sebastien Dryepondt, Oak Ridge National Laboratory; Peter Hosemann, University of California Berkeley; Kinga Unocic, ORNL; Paul Jablonski, US Department of Energy; Joseph Licavoli, Department of Energy; Donna Guillen, Idaho National Laboratory

Wednesday AM
February 17, 2016

Room: 104D
Location: Music City Center

Session Chairs: Sebastien Dryepondt, ORNL; Donna Guillen, Idaho National Laboratory

8:30 AM Introductory Comments**8:35 AM Invited**

Corrosion of Supercritical CO₂ Turbomachinery Components: *Voramon Dheeradhada*¹; Azam Thattai¹; ¹GE Global Research

9:05 AM

Corrosion of Energy System Materials in Supercritical Carbon Dioxide (sCO₂): Lucas Teeter¹; *Benjamin Adam*¹; Marco Teeter¹; Bjorn Westman¹; Shannon Bragg-Sitton²; Julie Tucker¹; ¹Oregon State University; ²INL

9:25 AM

Effect of Temperature and Pressure on Supercritical CO₂ Compatibility of Structural Alloys: *Robert Brese*¹; ¹Oak Ridge National Laboratory/University of Tennessee

9:45 AM Invited

Corrosion Behaviour of 9-12Cr Ferritic Steels and 18-25Cr Austenitic Steels in Supercritical CO₂: *F. Rouillard*¹; T. Furukawa²; B. Duprey¹; ¹Universite Paris Saclay; ²Japan Atomic Energy Agency

10:15 AM Break**10:35 AM Invited**

Materials Issues for Supercritical CO₂ above 700°C: *Bruce Pint*¹; ¹Oak Ridge National Laboratory

11:05 AM Invited

Corrosion of Nickel-base Alloys by Supercritical CO₂: Rene Olivares¹; Wes Stein¹; Thuan Nguyen²; *David Young*²; ¹CSIRO; ²University of New South Wales

11:35 AM

High-Temperature Corrosion of Diffusion Bonded Haynes 230 in Supercritical CO₂ Cycle Conditions: *Omer Dogan*¹; Casey Carney²; Gordon Holcomb¹; Lucas Teeter³; Julie Tucker³; ¹DOE National Energy Technology Laboratory; ²AECOM; ³Oregon State University

Materials Innovation — Keynote Session: Multidisciplinary Materials Design Optimization Under Uncertainty

Sponsored by: TMS: Materials Innovation Committee
Program Organizers: Charles Ward, Air Force Research Laboratory; David McDowell, Georgia Institute of Technology; James Warren, NIST; Katsuyo Thornton, University of Michigan

Wednesday AM
February 17, 2016

Room: 207B
Location: Music City Center

Session Chair: Charles Ward, Air Force Research Laboratory

8:30 AM Introductory Comments**8:35 AM Keynote**

Morphing the Design Box: New Design Paradigms Enabled by Additive Manufacturing: *Rick Barto*¹; ¹Lockheed Martin

9:05 AM Keynote

Model-Based Materials Definitions for Design and Structural Analysis: *David Furrer*¹; ¹Pratt & Whitney

9:35 AM Keynote

Statistical Rigor Versus Statistical Confidence in the Optimal Design of Materials: *Michael McKerns*¹; ¹California Institute of Technology

10:05 AM Keynote

A Set-Based Approach for Hierarchical Materials Design: *Carolyn Seepersad*¹; ¹University of Texas at Austin

10:35 AM Concluding Comments

Materials Processing Fundamentals — Iron and Steelmaking - Thermodynamic, Reduction and Physical Metallurgy

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee
Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Lifeng Zhang, University of Science and Technology Beijing; Laura Bartlett, Texas State University; Jonghyun Lee, University of Massachusetts; Cong Wang, Northeastern University

Wednesday AM
February 17, 2016

Room: 106B
Location: Music City Center

Session Chairs: Laura Bartlett, Texas State University; Lifeng Zhang, University of Science and Technology Beijing

8:30 AM

Reduction Kinetics of Magnetite Concentrate Particles with Hydrogen at 1150 – 1600 °C Relevant to a Novel Flash Ironmaking Process: Mohamed Elzohiery¹; *Yousef Mohassab*²; Amr Abdelghany¹; Shengqin Zhang¹; Feng Chen¹; Hong Yong Sohn¹; ¹University of Utah; ²University of Utah

8:50 AM

Hydrogen Reduction Kinetics of Mechanically Activated Magnetite Concentrate: Juan Ruiz-Ornelas¹; Noemi Ortiz-Lara¹; *Yousef Mohassab*²; Ricardo Morales-Estrella¹; Hong Yong Sohn²; ¹Universidad Michoacana de San Nicolás de Hidalgo; ²University of Utah

9:10 AM

Thermodynamics of Rare Earth Elements in Nodular Cast Iron: *Kok Long Ng*¹; Hideaki Sasaki¹; Hisao Kimura¹; Masafumi Maeda¹; ¹University of Tokyo

9:30 AM

Influences of Thermomechanical Processing on the Microstructure and Mechanical Properties of a HSLA Steel: *Yu Zhao*¹; Songsong Xu¹; Hao Guo¹; Yun Zou¹; Jinhui Li¹; Junpeng Li¹; Zhongwu Zhang¹; ¹Harbin Engineering University

9:50 AM

Behaviors and Evolutions of MgO·Al₂O₃ in Non-oriented Silicon Steel during Calcium Treatment: *Yong Zhao*¹; Yan-hui Sun¹; ¹University of Science and Technology Beijing

Materials Research in Reduced Gravity — Material Science Research Rack (MSRR)

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

Program Organizers: Douglas Matson, Tufts University; Hani Henein, University of Alberta; Robert Hyers, Boston Electrometallurgical Corp.; Ivan Egry, DLR

Wednesday AM
February 17, 2016

Room: 104C
Location: Music City Center

Session Chairs: Robert Hyers, Boston Electrometallurgical Corp.; Louise Strutzenberg, NASA

8:30 AM

Analysis of Particle Engulfment Dynamics during Solidification: Yutao Tao¹; *Jeffrey Derby*¹; ¹University of Minnesota

9:00 AM

Analysis of a Rotating Magnetic Field on the THM growth of CZT in Microgravity: Zaoyang Li¹; Jeff Peterson¹; *Jeffrey Derby*¹; ¹University of Minnesota

9:20 AM

Modeling of Gravitational Effects on Particle Settling and Shape Distortion During Liquid-Phase Sintering of Tungsten Heavy Alloys: *Eugene Olevsky*¹; Jose Alvarado-Contreras¹; Randall German¹; ¹San Diego State University

9:40 AM

Directional Solidification of Metals and Alloys under Low Gravity - Cartridge Design and Processing Conditions of the Solidification and Quenching Furnace: Petra Neuhaus¹; *Harald Lenski*¹; ¹Airbus DS

10:00 AM Break

10:20 AM

Evaluation of the MICAST#2-12 Al-7wt%Si Sample Directionally Solidified Aboard the International Space Station: Surendra Tewari¹; Masoud Ghods¹; Samuel Angart²; Mark Lauer²; *Richard Grugel*³; David Poirier²; ¹Cleveland State University; ²The University of Arizona; ³Marshall Space Flight Center

10:50 AM

Coarsening of Dendrites in Solid-Liquid Mixtures: The Low Volume Fraction Limit: *Thomas Cool*¹; Peter Voorhees¹; ¹Northwestern University

11:10 AM

Dynamics of Eutectic Solidification Patterns in Diffusive Conditions: *Silvere Akamatsu*¹; Sabine Bottin-Rousseau¹; ¹CNRS - UPMC

11:30 AM

Phase-field Modeling of Cellular and Dendritic Microstructure Formation during Directional Solidification of Binary Alloys under Diffusive Growth Conditions: Dynamical Selection of the Primary Spacing: *Younggil Song*¹; Jean-Marc Debierre²; Damien Tourret³; Fatima Lisboa Mota²; Nathalie Bergeon²; Rohit Trivedi⁴; Rahma Guérin²; Bernard Billia²; Alain Karma¹; ¹Northeastern University; ²Aix-Marseille University and CNRS; ³Los Alamos National Laboratory; ⁴Iowa State University

11:50 AM

Dynamics of Microstructure Formation in 3D Directional Solidification of Transparent Model Alloys under Microgravity: Analysis of the Primary Spacing Evolution: *Jorge Pereda*¹; Fatima Mota¹; Nathalie Bergeon¹; Younggil Song²; Damien Tourret²; Jean-Marc Debierre¹; Rahma Guérin¹; Alain Karma²; Rohit Trivedi³; Bernard Billia¹; ¹IM2NP Aix Marseille Université, CNRS UMR 7334; ²Northeastern University Boston; ³Ames Laboratory, Iowa State University

12:10 PM

Effect of Thermal Drift on the Initial Transient Behavior in Directional Solidification of a Bulk Transparent Model Alloy: *Fatima Mota*¹; Nathalie Bergeon¹; Damien Tourret²; Alain Karma²; Rohit Trivedi³; Bernard Billia¹; ¹IM2NP Aix Marseille Université, CNRS UMR 7334; ²Northeastern University Boston; ³Ames laboratory, Iowa State University

Mechanical Behavior at the Nanoscale III — Mechanical Behavior of Materials with Twins, Grains and Other Interfaces

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

Wednesday AM
February 17, 2016

Room: 214
Location: Music City Center

Session Chair: Garritt Tucker, Drexel University

8:30 AM Invited

Nucleation and Evolution of Dynamic Damage at Bimetal Interfaces Using Molecular Dynamics: *Saryu Fensin*¹; Ellen Cerreta¹; George Gray¹; ¹Los Alamos National Laboratory

9:10 AM

Dynamic Behavior of a Nanocrystalline Cu-Ta Alloy: *Scott Turnage*¹; Kristopher Darling²; Mansa Rajagopalan¹; Mark Tschopp²; Kiran Solanki¹; ¹Arizona State University; ²Army Research Laboratory

9:30 AM

A Fast Fourier Transform Based-approach for the Modeling and Simulation of Grain Boundary Defects: *Stephane Berbenni*¹; Vincent Taupin¹; Claude Fressengeas¹; ¹CNRS, University of Lorraine

9:50 AM

Microstructural Evolution of Nanocrystalline Copper-tantalum Alloy: *Mansa Rajagopalan*¹; Scott Turnage¹; Kristopher Darling²; Mark Tschopp²; Kiran Solanki¹; ¹Arizona State University; ²Army Research Laboratory

10:10 AM Break

10:30 AM

Effect of Annealing on Grain Boundary Character and Attendant Tensile Behavior of Nanocrystalline Nickel Thin Films: *Suman Dasgupta*¹; Nora Hassan¹; Daniel Gianola²; Kevin Hemker¹; ¹Johns Hopkins University; ²University of Pennsylvania

10:50 AM

A High Temperature In-situ Nanoindentation Study of Nanotwinned Silver Films: *Hakan Yavas*¹; Matthew Besser¹; Ryan Ott¹; Huan Zhang¹; Matthew Kramer¹; Krishna Rajan²; Richard LeSar²; ¹The Ames Laboratory; ²Iowa State University

11:10 AM

Spall of Tantalum Bicrystals and Nanocrystals: *Eric Hahn*¹; Tim Germann²; Eduardo Bringa³; Marc Meyers¹; Saryu Fensin²; ¹University of California San Diego; ²Los Alamos National Laboratory; ³Universidad Nacional de Cuyo

11:30 AM

Atomic-scale Investigation on the Nucleation of Twinning-like Lattice Reorientation in Hexagonal Close-packed Metals: *Hao Wang*¹; ¹Institute of Metal Research, Chinese Academy of Sciences

Metal and Polymer Matrix Composites II — Iron Based Composites and Porous Composites

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

Program Organizer: Nikhil Gupta, New York University

Wednesday AM
February 17, 2016

Room: 110A
Location: Music City Center

Session Chair: To Be Announced

8:30 AM Invited

A Novel Manufacturing Approach to Fabricate Near-Net Shape Femoral Head ZrO₂-toughened-Al₂O₃: *Bikramjit Basu*¹; Srimanta Barui¹; ¹Indian Institute of Science

8:50 AM

The Corrosion of 30% Mo-ZrO₂ Cerment about Molten Slag of CaO-MgO-Al₂O₃: *Xiaopeng Li*¹; Ziming Wang¹; Yang Yang¹; Yanling Guo¹; Wende Dan¹; Jieyu Zhang¹; ¹Shanghai University

9:10 AM

Matrix Tailoring by Mn Addition in In-situ Liquid Metallurgy Synthesized Fe-TiB₂ High Modulus Steels: *Christian Baron*¹; Hauke Springer¹; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH

9:30 AM

Physical and Mechanical Properties of LoVAR: A New Lightweight Particle-reinforced Fe-36Ni Alloy: *David Tricker*¹; Andrew Tarrant¹; Timothy Stephenson²; ¹Materion; ²NASA

9:50 AM

Reinforcing 440B Stainless Steels by In Situ Synthesized Niobium Carbides: *Wen Hao Kan*¹; Jack Zi Jie Ye¹; Yue Zhu¹; Vijay Bhatia¹; Kevin Dolman²; Xin Hu Tang²; Tim Lucey²; Gwénaëlle Proust¹; Julie Cairney¹; ¹The University of Sydney; ²Weir Minerals Australia Ltd.

10:10 AM Break

10:30 AM Invited

Hollow Fly Ash Composite Foams – Thermal and Mechanical Properties: *Dinesh Pinisetty*¹; Vasanth Shunmugasamy²; ¹California Maritime Academy, CSU; ²Texas A&M University

10:50 AM Invited

Forming of Open Cell Aluminum Foams at High Temperatures: *Vasanth Chakravarthy Shunmugasamy*¹; Bilal Mansoor¹; ¹Texas A&M University at Qatar

11:10 AM

Influence of Gas Component on Foaming Behavior and Cell Structure of Aluminum Foams Produced under Reduced Pressure Foaming: *Zhuokun Cao*¹; Yang Yu¹; Hongjie Luo¹; Cong Wang¹; ¹Northeastern University, China

Nanostructured Materials for Nuclear Applications — Session V

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

Wednesday AM
February 17, 2016

Room: 101C
Location: Music City Center

Session Chairs: Michael Demkowicz, Massachusetts Institute of Technology; Kaiyuan Yu, China University of Petroleum

8:30 AM Invited

Multiscale Modeling of Radiation Induced Segregation in Nanostructured Materials: *Blas Uberuaga*¹; Samrat Choudhury¹; Richard Zamora¹; Enrique Martinez¹; David Andersson¹; Alfredo Caro¹; Arthur Voter¹; ¹Los Alamos National Laboratory

9:00 AM Invited

Mechanisms of Defect Interactions on Grain Boundaries of Pure Fe: *Lin Shao*¹; Di Chen¹; Tianyi Chen¹; Jonathan Gigax¹; ¹Texas A&M University

9:30 AM

Nanoprecipitation in Immiscible Alloy Systems: *John Beach*¹; Xuan Zhang²; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois at Urbana-Champaign; ²Argonne National Laboratory

9:50 AM

Investigation of He Implanted Fe-Y₂Ti₂O₇ Bilayers: Surrogate Interfaces to Further NFA Understanding: *Tiberiu Stan*¹; Yuan Wu¹; Stephan Kraemer¹; George Odette¹; ¹University of California Santa Barbara

10:10 AM Break

10:30 AM Invited

Spatial Scales for Designing Radiation-resistant Materials: *Steven Zinkle*¹; Chad Parish²; Daniel Clark¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

11:00 AM Invited

Stabilization Mechanisms of Nanocrystalline Iron-Chromium Alloys with Hafnium Addition: *Weizong Xu*¹; Lulu Li¹; Mostafa Saber¹; Carl Koch¹; Ronald Scattergood¹; *Yuntian Zhu*¹; ¹North Carolina State University

11:30 AM

Radiation Response of Nanostructured Apatite as a Nuclear Waste Form: *Fengyuan Lu*¹; ¹Louisiana State University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XV — Electrochemistry & UBM

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

Wednesday AM
February 17, 2016

Room: 109
Location: Music City Center

Session Chairs: Jae-Ho Lee, Hongik University; Shien Ping Tony Feng, The University of Hong Kong

8:30 AM Invited

Tunable Surface Wettability and Adhesivity of Nitrogen-doped Graphene Foam: *Shien Ping Feng*¹; Peng Zhai¹; ¹The University of Hong Kong

9:00 AM

Effects of Electroplating Formula on the Void Formation at the Sn/Electroplated Cu Interface: *Tai-Yi Yu*¹; Chih-Ming Chen¹; ¹National Chung Hsing University

9:20 AM

The Development of Alumina Nanofluid-based Electrolyte for Thermogalvanic Cells: *Chang Liu*¹; Shien Feng¹; ¹The University of Hong Kong

9:40 AM

Comparison of Electroless and Electroplating of Nickel Iron Alloy for the Diffusion Barrier of UBM: *Ja-Kyung Koo*¹; Sung Kang²; *Jae-Ho Lee*¹; ¹Hongik University; ²IBM Watson Research Center

10:00 AM Break

10:20 AM

Effects of Electroless Copper Bath Compositions on the Adhesion of Cu/Substrates in PCB: *Ju-Seok Kang*¹; Jinuk Lee²; *Jae-Ho Lee*¹; ¹Hongik University; ²Samsung Electro-Mechanics

10:40 AM

Electrochemical Evaluation of Copper Etchant to Reduce the Galvanic Etching in Cu/Au Coupled Pads: *Jong-Chan Choi*¹; Young-Hwan Bae¹; Jinuk Lee²; *Jae-Ho Lee*¹; ¹Hongik University; ²Samsung Electro-Mechanics

11:00 AM

Kinetic Study of Silver Electrocrystallization on Silane-grafted Flexible Indium-oxide Substrate: *Hau Nga Yu*¹; Ya-Huei Chang¹; Shien Ping Feng¹; ¹The University of Hong Kong

11:20 AM

Effect of Cu Surface Microstructure on Surface Oxidation and Soldering Wettability: *Yi Chun Hsu*¹; Cheng-Yi Liu¹; ¹National Central University

Phase Transformations and Microstructural Evolution — Phase Transformations during Non-Equilibrium Processing - 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

Wednesday AM
February 17, 2016

Room: 107B
Location: Music City Center

Session Chair: Antonio Ramirez, The Ohio State University

8:30 AM

Coupling CALPHAD to Phase-field Modeling: A Pathway to the Prediction of Microstructures in Additive Manufacturing?: *Aurelien Perron*¹; John Roehling¹; Patrice Turchi¹; Jean-Luc Fattebert¹; Joseph McKeown¹; ¹Lawrence Livermore National Laboratory

9:00 AM

Role of Cyclic Solid-Solid Phase Transformations in Microstructure Evolution during Thermal Gyration during Additive Manufacturing: *Ryan Dehoff*¹; *Niyanth Sridharan*²; Avinash Prabhu²; Naren Raghavan²; Michael Kirka¹; Anil Chaudhary³; Sudarsanam Babu²; ¹ORNL; ²The University of Tennessee, Knoxville; ³Applied Optimization

9:20 AM

Solid-liquid Transformations during Powder-bed Additive Manufacturing: *Rainer Hebert*¹; ¹University of Connecticut

9:40 AM

In-situ SEM Observation of Surface Diffusion and Intermetallic Compound Growth in Lead-free Solder Joints: *Yang Li*¹; Choong Un Kim¹; Minyoung Kim¹; ¹University of Texas at Arlington

10:00 AM

Microstructure Evolution of Uranium-6wt.% Niobium During Deformation Processing: *Kester Clarke*¹; Daniel Coughlin¹; Jeffrey Scott¹; David Alexander¹; Rodney McCabe¹; Robert Hackenberg¹; Amy Clarke¹; ¹Los Alamos National Laboratory

10:30 AM Break

10:50 AM

Effect of Friction Welding Parameters on Microstructural Development and Mechanical Properties in Dissimilar 304L to 1018 Steel: *Nathan Switzer*¹; Zhenzhen Yu¹; Michael Eff²; Thomas Lienert³; Stephen Liu¹; ¹Colorado School of Mines; ²Edison Welding Institute; ³Los Alamos National Laboratory

11:10 AM

Effect of Time and Temperature on Microstructural Evolution for Improved Braze Joint Strength in Oil and Gas Drill Bits: *Gagan Saini*¹; William Atkins¹; ¹Halliburton Energy Services

11:30 AM

Microstructure evolution of undercooled Co-Sn alloy melts solidified in Strong Magnetic Field: *Jun Wang*¹; Jinshan Li¹; Eric Beaugnon²; ¹Northwestern Polytechnical University; ²University Grenoble Alpes, CNRS-LNCMI

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

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 Furuha, Tohoku University; Wenzheng Zhang, Tsinghua University; Christopher Hutchinson, Monash University; Robert Hackenberg, Los Alamos National Laboratory

Wednesday AM
February 17, 2016

Room: 110B
Location: Music City Center

Session Chairs: Tadashi Furuha, Tohoku University; Wenzheng Zhang, Tsinghua University

8:30 AM Invited

Atomistic Simulations of the Interaction of Alloying Elements with Interfaces: *Matthias Militzer*¹; ¹The University of British Columbia

9:00 AM Invited

An Integrated Model for Microstructure Development in the Heat Affected Zone of Linepipe Steels: *Warren Poole*¹; *Matthias Militzer*¹; *Thomas Garcin*¹; ¹The University of British Columbia

9:30 AM

Atomistic Modeling and Experiments of Spinodal Decomposition in Fe-Ni-C Martensite: *Helena Zapolsky*¹; *Mykola Lavrskyi*¹; *Frederic Danoix*²; *Sophie Cazotte*³; *Sergui Curelea*³; *Renaud Pate*¹; *Armen Khachaturyan*²; ¹University of Rouen; ²Department Material Science & Engineering Rutgers University; ³INSA de Lyon Laboratoire Mateis et Département SGM

9:50 AM

Molecular Dynamics Simulation of fcc/bcc Interface Migration in Pure Iron: *Zhipeng Sun*¹; *Fu-Zhi Dai*²; *Ben Xu*¹; *Wen-Zheng Zhang*¹; ¹Tsinghua University; ²Aerospace Research Institute of Materials and Processing Technology

10:10 AM Break

10:30 AM Invited

Formation of Widmanstätten Ferrite by the Dynamic Transformation of Austenite at Temperatures Well above the Ae3: *John Jonas*¹; *Clodualdo Aranas*¹; ¹McGill University

11:00 AM Invited

Who Cares About Phase Transformations? A Tribute to Gary Purdy: *Yves Brechet*¹; *Christopher Hutchinson*²; *Hatem Zurob*³; ¹INP Grenoble; ²Monash University; ³McMaster University

11:30 AM

Hidden Pathway and Defects Generation during Structural Phase Transformations: *Yipeng Gao*¹; *Yunzhi Wang*¹; ¹The Ohio State University

11:50 AM

Kinetics and Mechanism of Austenite Isothermal Transformation in Carbonitrided Low-alloy Steel: *Hugo Van Landeghem*¹; *Simon Catteau*¹; *Julien Teixeira*¹; *Jacky Dulcy*¹; *Abdelkrim Redjaïmia*¹; *Sabine Denis*¹; ¹Institut Jean Lamour

Powder Metallurgy of Light Metals — Powder Metallurgy Aluminum and Other Light Metals

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

Program Organizers: Zhigang Fang, University of Utah; Qian Ma, RMIT University

Wednesday AM
February 17, 2016

Room: 205C
Location: Music City Center

Session Chairs: Qian Ma, Royal Melbourne Institute of Technology; James Paramore, University of Utah

8:30 AM Invited

Light Weight Automotive Trends Impact on Powder Metallurgy: *Ian Donaldson*¹; ¹GKN Sinter Metals

9:00 AM

Enhanced Sintering Kinetics in AA5083 Powder Processed Using DC Electric Fields: *Brandon McWilliams*¹; *Jian Yu*¹; *Steven Kilczewski*²; ¹US Army Research Laboratory; ²TKC Global

9:20 AM

Field Effects during Spark Plasma Sintering of AA5083 Powder: *Frank Kellogg*¹; *Brandon McWilliams*²; *Kyu Cho*²; ¹Bowhead Science and Technology; ²US Army Research Laboratory

9:40 AM

Microstructure Evolution and Mechanical Properties Investigation of Friction Stir Welded AlMg5-Al2O3 Nanocomposites: *N. Kishore Babu*¹; *Kaspar Kallip*¹; *Marc Leparoux*¹; *Khaled A. AlOgab*¹; *G.M. Reddy*¹; *Mahesh Kumar Talari*¹; ¹Empa (Swiss Federal Laboratories for Materials Science and Technology)

10:00 AM

Processing-Microstructure Relationships during Cold Spray Deposition of Aluminum-Copper Alloys: *Tian Liu*¹; *Luke Brewer*¹; *Jeremy Leazer*²; *E.S.K. Menon*²; *B.D. Bouffard*³; *J.A. Christophersen*⁴; *F.A. Lancaster*⁴; *J.N. Wolk*³; ¹University of Alabama; ²Naval Postgraduate School; ³Naval Surface Warfare Center; ⁴Naval Air Systems Command

10:20 AM Break

10:40 AM

Titanium Foam for Cancellous Bone Implant Prepared by Space Holder Technique: *Xiao Jian*¹; *Cui Hao*¹; *Qiu Guibao*¹; *Yang Yang*¹; ¹Chongqing University

11:00 AM

Microstructural Evolution and Mechanical Responses of Solid Solution Strengthened Titanium Materials with Ubiquitous Light Elements: *Takanori Mimoto*¹; *Junko Umeda*²; *Katsuyoshi Kondoh*²; ¹Osaka University; ²JWRI, Osaka University

11:20 AM

Room Temperature Viability of NiMnCoSn as Magnetic Shape Memory Sensory Particle in an SPS Consolidated Al7075 Composite: *Nick Barta*¹; *Ibrahim Karaman*¹; *Jacob Hochhalter*²; *John Newman*²; ¹Texas A&M University; ²NASA Langley Research Center

REWAS 2016 — Understanding & Enabling Sustainability - Education Research Innovation + Electronic Equipment

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. Spangenberg, Argonne National Laboratory; Diran Apelian, Worcester Polytechnic Institute; Brajendra Mishra, Colorado School of Mines; Neale Neelameggham, Ind LLC

Wednesday AM
February 17, 2016
Room: 104B
Location: Music City Center

Session Chairs: Jeffrey S. Spangenberg, Argonne National Laboratory; Randolph Kirchain, Massachusetts Institute of Technology

8:30 AM

3d Printed ABS and Carbon Fiber Reinforced Polymer Specimens for Engineering Education: *Michael Golub*¹; Jing Zhang¹; ¹Indiana University Purdue University Indianapolis

8:55 AM

Improvement in Resource Productivity by Life Extension through Corrosion Control: An Educational Perspective: *Brajendra Mishra*¹; ¹Worcester Polytechnic Institute

9:20 AM

Towards a Resource Resilient Society via the Triple Helix Concept: A Story of Transition, Collaboration and Innovation: Tom Hennebel¹; Diran Apelian²; Christina Meskers³; Karolien Vasseur¹; Marleen Esprit¹; *Maurits Van Camp*¹; ¹Umicore Group Research & Development; ²Worcester Polytechnic Institute; ³Umicore Precious Metals Refining

9:45 AM Break

10:05 AM

Waste Management of Printed Wiring Boards: A Life Cycle Assessment of the Metals Recycling Chain from Liberation through Refining: *Julie Schoenung*¹; Mianqiang Xue²; Alissa Kendall³; Zhenming Xu²; ¹University of California, Irvine; ²Shanghai Jiao Tong University; ³University of California, Davis

10:30 AM

Utilizing Economic Value, Resource Availability, and Environmental Impact Metrics to Improve the WEEE and Battery Directives and Promote Alignment with the European Commission Circular Economy Strategy: *Patrick Ford*¹; Eduardo Santos²; Paulo Ferrão³; Fernanda Margarido³; Krystyn Van Vliet¹; Elsa Olivetti¹; ¹MIT; ²3 Drivers – Engenharia, Inovação e Ambiente, Lda; ³Instituto Superior Técnico

10:55 AM

High Temperature Characterization and Techno-economics of E-waste Processing: Michael Somerville¹; Paul Koltun¹; *Kathie McGregor*¹; ¹CSIRO

11:20 AM

Enabling Energy Efficient Electronics through Thermally Conductive Plastic Composites: Novel Surface Modification Techniques for Boron Nitride in Epoxy: *Alex Bruce*¹; Holly Avins¹; Inez Hua¹; John Howarter¹; ¹Purdue University

11:45 AM

Environmental and Economic Evaluation of Cathode Ray Tube (CRT) Funnel Glass Waste Management Options in the United States: *Julie Schoenung*¹; Qingbo Xu²; Mengjing Yu³; Alissa Kendall³; Wenzhi He²; Guangming Li²; ¹University of California, Irvine; ²Tongji University; ³University of California, Davis

Shape Casting: 6th International Symposium — Engineering High Quality Castings II

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

Program Organizers: Murat Tiryakioglu, University of North Florida; Glenn Byczynski, Nemak Canada; Mark Jolly, Cranfield University

Wednesday AM
February 17, 2016
Room: 203B
Location: Music City Center

Session Chair: Mark Jolly, Cranfield University

8:30 AM

Grain Refinement of Al-Si Hypoeutectic Alloys by Al₃Ti₁B Master Alloy and Ultrasonic Treatment: Gui Wang¹; Eric Qiang Wang¹; Arvind Prasad¹; Matthew Dargusch¹; *David StJohn*¹; ¹University of Queensland

8:55 AM

Influence of Process Parameters on the Microstructure and Casting Defects of a LPDC Engine Block: *Giulio Timelli*¹; Daniele Calari¹; ¹University of Padua

9:20 AM

Preliminary Investigation of the Grain Refinement Mechanism in Cu Alloys: *Andreas Czigler*¹; Peter Schumacher¹; ¹Montanuniversitaet Leoben

9:45 AM

Solidification Analysis of Magnesium Alloys Using In-situ Neutron Diffraction: *Abdallah Elsayed*¹; Dimitry Sediako²; Ravi Ravindran³; ¹Nemak Canada; ²Canadian Neutron Beam Centre; ³Ryerson University

10:10 AM Break

10:30 AM

Change in Si Morphology with Time and Temperature in Sr Modified A356: *Sadik Ipek*¹; Caglar Yuksel²; Eray Erzi¹; Derya Dispinar¹; ¹Istanbul University; ²Yildiz Technical University

10:50 AM

Effects of Casting Conditions on End Product Defects in Direct Chill Casted Hot Rolling Ingots: *Arda Yorulmaz*¹; Caglar Yuksel²; Eray Erzi¹; Derya Dispinar¹; ¹Istanbul University; ²Yildiz Technical University

11:10 AM

A Coupled Thermal-stress Model of A319 Alloy Chilled Sand Casting: *Farzaneh Farhang Mehr*¹; Steve Cockcroft¹; ¹UBC

11:30 AM

Effect of Duration on Ti Grain Refinement of A356 and Melt Quality: *Ozen Gursoy*¹; Caglar Yuksel²; Eray Erzi¹; Derya Dispinar¹; ¹Istanbul University; ²Yildiz Technical University

Strip Casting of Light Metals — Strip Casting Process

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee
Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Dietmar Letzig, MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht; Jan Bohlen, Helmholtz-Zentrum Geesthacht; Murat Dundar, Assan Aluminium

Wednesday AM Room: 203A
 February 17, 2016 Location: Music City Center

Session Chairs: Kai Karhausen, Hydro Aluminium Rolled Products; Jan Bohlen, Helmholtz-Zentrum Geesthacht

8:30 AM Introductory Comments

8:35 AM Keynote

Liquid Metal Feeding Technology for Twin-roll Casting of Magnesium and Aluminium: *Frederic Basson*¹; ¹Novelis PAE

8:55 AM

Twin-roll Casting of Carbon Fiber-reinforced and Glass Fiber-reinforced Aluminium Strips: *Olexandr Grydin*¹; Mykhailo Stolbchenko¹; Mirko Schaper¹; ¹Universität Paderborn

9:15 AM

Productivity Improvements in Industrial TRC by Heat Loss Analysis along the Process Chain: *Christian Schmidt*¹; Kai Karhausen¹; ¹Hydro Aluminium Rolled Products GmbH

9:35 AM

Development and Numerical Simulation of a Compound Belt Casting Process: *Stefan Heugenhauser*¹; Erhard Kaschnitz¹; Tim Mittler²; Manuel Pintore²; Peter Schumacher³; ¹Österreichisches Gießerei-Institut; ²Technische Universität München; ³Montanuniversität Leoben

9:55 AM Break

10:25 AM

Microstructure Investigations of Inverse Segregations in Twin-roll Cast AZ31 Strips: *Christina Krbetschek*¹; Franz Berge¹; Matthias Oswald¹; Madlen Ullmann¹; Rudolf Kawalla¹; ¹Tu Bergakademie Freiberg

10:45 AM

Effect of Twin-Roll Casting Parameters on Mechanical and Microstructural Properties of AA5083-H321 Sheet: *Mehdi Soltan Ali Nezhad*¹; Ali Hoseinifar²; Sina Salari²; ¹Ferdowsi University of Mashhad, Mashhad, Iran; ²Ferdowsi University of Mashhad, Mashhad, Iran

11:05 AM Poster Previews

Thermodynamic Applications, Optimizations and Simulations in High-Temperature Processes: An EPD Symposium in Honor of Christopher W. Bale's 70th Birthday — Energy, Nuclear and Other 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

Wednesday AM Room: 106C
 February 17, 2016 Location: Music City Center

Session Chairs: Evgueni Jak, The University of Queensland; John Gisby, NPL

8:30 AM Keynote

Application of Thermochemical Modeling to Assessment/Evaluation of Nuclear Fuel Behavior: *Theodore Besmann*¹; ¹University of South Carolina

9:10 AM

An Overview of Thermochemical Modelling of CANDU Fuel and Applications in the Nuclear Industry: *Emily Corcoran*¹; *Matthew Kaye*²; Markus Piro³; ¹The Royal Military College of Canada; ²University of Ontario Institute of Technology; ³Canadian Nuclear Laboratories

9:30 AM

Development of Thermodynamic Databases in the System U-Zr-Ce-Cs-Fe-B-C-I-O-H for Application to Simulating Phase Equilibria in Severe Nuclear Accidents: *Masanori Suzuki*¹; *Ken Kurosaki*¹; *Shinsuke Yamanaka*¹; *Toshihiro Tanaka*¹; *Masayoshi Uno*²; *Yukihiro Murakami*²; *Tatjana Jantzen*³; *Stephan Petersen*³; *Klaus Hack*³; ¹Osaka University; ²Univeristy of Fukui; ³GTT-Technologies

9:50 AM

Application of Computational Thermodynamics to Understand the Venusian Atmosphere: *Nathan Jacobson*¹; *Gustavo Costa*¹; *Michael Kulis*¹; *Brandon Radoman-Shaw*²; *Ralph Harvey*²; *Dwight Myers*³; ¹NASA Glenn Research Center; ²Case Western Reserve University; ³East Central University

10:10 AM Break

10:30 AM

Thermodynamic Models for Chemical Reactions Involving Cokes: *Patrice Chartrand*¹; *Philippe Ouzilleau*¹; *Daniel Lindberg*²; ¹Ecole Polytechnique; ²Abo Akademi

10:50 AM

Thermodynamics of Portland Cement Clinker Formation: *Alexander Pisch*¹; ¹Lafarge LCR

11:10 AM

Calculation of Portland Cement Clinker Phase Diagrams: *Daniel Jiménez*¹; *Oscar Restrepo Baena*¹; *María Antonia Sainz Trigo*²; *Sara Serena Palomares*²; ¹Universidad Nacional de Colombia; ²Instituto de Cerámica y Vidrio (CSIC)

11:30 AM

Effect of Gas-slag Interactions during Plasma Gasification of Refuse Derived Fuel from Enhanced Landfill Mining: *Lieven Pandelaers*¹; *Pengcheng Yan*¹; *Sander Arnout*²; *Lieven Machiels*¹; *Bart Blanpain*¹; ¹KU Leuven; ²InsPyro

11:50 AM

CALPHAD Modeling of Thermochemical Interactions of Thermal Barrier Coatings (TBCs) with Molten Calcium-Magnesium-Aluminum-Silicon Oxides (CMAS): *Lina Kjellqvist*¹; *Huahai Mao*¹; *Qing Chen*¹; *Johan Bratberg*¹; *Anders Engström*¹; *Nicholas Hatcher*²; *Weiwei Zhang*²; *Jason Sebastian*²; ¹Thermo-Calc Software AB; ²QuesTek Innovations LLC

Ultrafine Grained Materials IX — Equal Channel Angular Pressing/Extrusion Studies

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

Program Organizers: Suveen Mathaudhu, University of California Riverside; Irene Beyerlein, 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

Wednesday AM
February 17, 2016

Room: 207C
Location: Music City Center

Session Chairs: Roberto Figueiredo, Federal University of Minas Gerais; Edgar Garcia-Sanchez, Universidad Autonoma de Nuevo Leon - Facultad de Ingeniería Mecánica y Eléctrica

8:30 AM Invited

Synchrotron X-Ray Microbeam Diffraction Measurements of Full Elastic Strain and Stress Tensors in Commercial-Purity Aluminum Processed by Multiple Passes of Equal-Channel Angular Pressing: *Michael Kassner¹*; Thien Phan¹; Lyle Levine²; Terence Langdon¹; ¹University of Southern California; ²NIST

9:00 AM

Creating Bulk Ultrafine-grained Laminated Structures by Equal-Channel Angular Pressing: *Philipp Frinl¹*; Martin F.-X. Wagner¹; ¹Technische Universität Chemnitz

9:20 AM

Introducing Superplastic Properties in a ZK10 Magnesium Alloy by ECAP: *Roberto Figueiredo¹*; Terence Langdon²; ¹Federal University of Minas Gerais; ²University of Southampton

9:40 AM

Microstructural Refinement, Rate Sensitivity and Structural Stability of Cu-X Solid Solutions after Severe Plastic Deformation: *Karsten Dürst¹*; Enrico Bruder¹; ¹Technical University Darmstadt

10:00 AM Break

10:20 AM Invited

Examining the Paradox of Strength and Ductility in Ultrafine-grained Materials: Praveen Kumar¹; Megumi Kawasaki²; *Terence Langdon³*; Indian Institute of Science; ²Hanyang University; ³University of Southern California

10:50 AM

Microstructure and Mechanical Behavior of Ultrafine-grained Al-Mg-Si-(Cu) Alloys Fabricated by Severe Plastic Deformation: *Hans Roven¹*; Manping Liu²; Yingda Yu¹; Pål Skaret¹; ¹Norwegian University of Science and Technology; ²Jiangsu University

11:10 AM

Comparative Study of the Wear Properties in Ultrafine-grained 5083 and 2024 Aluminum Alloys: M. G. Orozco-Sandoval¹; M. A. L. Hernandez-Rodriguez¹; R. Deaquino-Lara²; *E. Garcia-Sanchez¹*; ¹Universidad Autónoma de Nuevo León -Facultad de Ingeniería Mecánica y Eléctrica; ²Centro de Investigación y de Estudios Avanzados del IPN

11:30 AM

Relationship between Microstructural Parameters Measured by X-Ray, TEM and EBSD: *Alexander Zhilyaev¹*; ¹Institute for Metals Superplasticity Problems, Russian Academy of Science

11:50 AM

Thermal Stability of Ultra-fine Grained Microstructure of Biomedical Ti-6Al-7Nb Alloy: Josef Stráský¹; Kristina Vaclavova¹; *Petr Hrcuba¹*; Pavel Zhanal¹; Jakub Cizek¹; Veronika Polyakova¹; Irina Semenova¹; Milos Janecek¹; ¹Charles University

Ultrafine Grained Materials IX — Roll Processing Studies

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

Program Organizers: Suveen Mathaudhu, University of California Riverside; Irene Beyerlein, 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

Wednesday AM
February 17, 2016

Room: 209B
Location: Music City Center

Session Chairs: Sergey Dobatkin, A.A. Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences; Werner Skrotzki, Dresden University of Technology

8:30 AM Invited

Bulk Texture Evolution of Nanolamellar Zr-Nb Composites Processed via Accumulative Roll Bonding: *John Carpenter¹*; Thomas Nizolek²; Rodney McCabe¹; Marko Knezevic³; Shijian Zheng⁴; Benjamin Eftink⁵; Jeffrey Scott¹; Sven Vogel¹; Tresa Pollock²; Nathan Mara¹; Irene Beyerlein¹; ¹Los Alamos National Laboratory; ²University of California Santa Barbara; ³University of New Hampshire; ⁴Institute of Metal Research; ⁵University of Illinois at Urbana-Champaign

9:00 AM

Effect of Shear Strain on the Evolution of Microstructure and Microtexture in Cu/Ta multilayer during Accumulative Roll-Bonding at High Temperature: *Tarang Mungole¹*; Bilal Mansoor²; Georges Ayoub³; David Field¹; ¹Washington State University; ²Texas A & M University; ³American University of Beirut

9:20 AM

Microstructure, Texture and Mechanical Properties of ARB Processed Aluminium Laminates: Viswanadh Gowtham Arigela¹; Juliane Scharnweber²; Laura Lienschoeff²; Paul Chekhonin²; Rolf Schaarschuch²; Satish Kumar Kolli¹; Nageswara Rao Palukuri¹; Jayaganthan Rengaswamy¹; *Werner Skrotzki²*; ¹Indian Institute of Technology Roorkee; ²Dresden University of Technology

9:40 AM Invited

Mechanical Anisotropy and Kink Banding in Bulk Accumulative Roll Bonded Cu-Nb Nanolaminates: *Thomas Nizolek¹*; Nathan Mara²; Irene Beyerlein³; Jaclyn Avallone¹; Tresa Pollock¹; ¹Materials Department, University of California Santa Barbara; ²Institute for Materials Science and the Center for Integrated Nanotechnologies, Los Alamos National Laboratory; ³Theoretical Division, Los Alamos National Laboratory

10:10 AM Break

10:30 AM

Mechanical Properties of Duplex Stainless Steels with Laminated Structure: Lin Xie¹; Tianlin Huang¹; *Guilin Wu¹*; Xiaoxu Huang¹; ¹Chongqing University

10:50 AM

Hall-Petch Relation in Ultrafine Grained Al-0.3Cu Alloy: *Tianlin Huang¹*; Aneela Wakeel¹; Zongqiang Feng¹; Guilin Wu¹; ¹Chongqing University

11:10 AM

Structure, Texture and Mechanical Properties of Ultrafine Grained Mg-Al-Zn-Mn Alloy after Radial-shift Rolling: *Sergey Dobatkin*¹; Yuri Estrin²; Sergey Galkin³; Vladimir Serebryany⁴; Mathilde Diez⁵; Natalia Martynenko⁶; ¹A.A. Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences; National University of Science and Technology "MISIS"; Laboratory of Hybrid Nanostructured Materials; ²Monash University, Centre for Advanced Hybrid Materials, Department of Materials Engineering; National University of Science and Technology "MISIS"; Laboratory of Hybrid Nanostructured Materials; ³National University of Science and Technology "MISIS"; ⁴A.A. Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences; ⁵Seoul National University, Department of Materials Science and Engineering; ⁶National University of Science and Technology "MISIS", Laboratory of Hybrid Nanostructured Materials

11:30 AM

Effect of Cryorolling on the Precipitation Evolution and Properties of Al Alloys: *Nageswararao Palukuri*¹; Jayaganthan R¹; ¹IIT Roorkee

2016 Functional Nanomaterials: Emerging Nanomaterials and Techniques for 3D Architectures — Nanomaterials General 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

Wednesday PM
February 17, 2016

Room: 211
Location: Music City Center

Session Chair: Terry Xu, UNC Charlotte

2:00 PM

Effect of SPD Surface Treatments on Corrosion and Environmental Cracking Susceptibility of Oilfield Alloys: *Ting Chen*¹; ¹SET Labs

2:20 PM

Preparation of MWCNT-supported Mo₂C Nanocomposite Materials by Microwave Method for Applying in Direct Methanol Fuel Cells: *Jinlin Lu*¹; Zhe Ning¹; Zhuo Li¹; Hua Song¹; Lu Han¹; ¹University of Science and Technology Liaoning

2:40 PM

Controlled Synthesis of TiC Nanoparticles Using Solid Oxide Membrane Technology in Molten CaCl₂: *Kai Zheng*¹; Xingli Zou¹; Xionggang Lu¹; Qian Xu¹; Hongwei Cheng¹; ¹Shanghai University

3:00 PM

Hydrothermal Growth of ZnO Nanorod Arrays via Microsphere Self-assembled Monolayer for Nanocapacitor Application: *Bo-Cheng Lin*¹; Ching-Shun Ku²; Hsin-Yi Lee²; Albert T. Wu¹; ¹National Central University Taiwan; ²National Synchrotron Radiation Research Center

3:20 PM

A Facile Fabrication of Fe₂O₃/C Composite as Anode for Lithium Ion Batteries: *Mingru Su*¹; Aichun Dou¹; Yunjian Liu¹; Fagen Peng¹; ¹Jiangsu University

3:40 PM Break

4:00 PM

An Aluminum Based Amorphous/Nanocrystal Foil Composites Preparation: *Jitai Niu*¹; Dongfeng Cheng¹; ¹Henan Polytechnic University

4:20 PM

Synthesis and Hydrothermal Method with Enhanced Photocatalytic Performance Optimization of Bi₂S₃ Nanorods: *Tarek Abdelhamid*¹; Ahmed Helal¹; Adel Ismail¹; Ibrahim Ibrahim¹; Ahmed Harraza¹; ¹Tabbin Institute for Metallurgical Studies

4:40 PM

Simple Green Synthesis of Amino Acid Functionalised CdTe/CdSe/ZnSe Core-multi Shell with Improved Cell Viability for Cellular Imaging : *Vuyelwa Ncapayi*¹; *Oluwafemi Oluwatobi*¹; Sandile Songca²; Tetsuya Kodama³; ¹University of Johannesburg; ²Walter Sisulu University; ³Tohoku University

5:00 PM

Size Tunable Synthesis of HDA and TOPO Capped ZnSe Nanoparticles via a Facile Non-organometallic Method: *Oluwafemi Oluwatobi*¹; Vuyelwa Ncapayi¹; Sandile Songca²; ¹University of Johannesburg; ²Walter Sisulu University

7th International Symposium on High Temperature Metallurgical Processing — Sintering and Pelletizing of Iron Ores

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

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Tao Jiang, Central South University; 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

Wednesday PM
February 17, 2016

Room: 105B
Location: Music City Center

Session Chairs: Liyuan Cai, Central South University; Deqing Zhu, Central South University

2:00 PM Introductory Comments

2:05 PM

Enhancing the Removal of Sodium and Potassium of Sinter by CO-Containing Flue Gas Circulation Sintering Process: *Guanghui Li*¹; Chen Liu¹; Ruijun Wang¹; Zhengwei Yu¹; Qian Li¹; Zhao Jing¹; Yuanbo Zhang¹; ¹School of Minerals Processing and Bioengineering, Central South University

2:25 PM

Chemical, Physical and Morphological Changes of Sintering Dust by Mechanical Activation: *Feng Chang*¹; Shengli Wu¹; Jianliang Zhang¹; Mingyin Kou¹; Hua Lu¹; Laixin Wang¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

2:45 PM

Cohering Behavior of Scrap Powder in Kiln by a Novel Natural Stacking Method: *Yong-bin Yang*¹; Yan Zhang¹; Jiang Tao¹; Qian Li¹; Bin Xu¹; ¹Central South University

3:05 PM

The Preheating and Roasting Properties of Fluorine-bearing Iron Concentrate Pellets and Main Influence Factors: *Lu Yang*¹; Shuai Wang¹; Ganghua Fu¹; Yufeng Guo¹; *Tao Jiang*¹; ¹Central South University

3:25 PM

Thermogravimetric Analysis of Coal Used in Rotary Kiln of Iron Ore Oxide Pellet: *Qiang Zhong*¹; Yongbin Yang¹; Qian Li¹; Tao Jiang¹; ¹Central South University

3:45 PM Break

4:05 PM

Ringling Mechanism and Prevention of Ringling in Kiln: *Yong-bin Yang*¹; Yan Zhang¹; Qian Li¹; Bin Xu¹; Xiaoliang Liu¹; ¹Central South University

4:25 PM

Performance Monitoring of Grate-kiln-cooler Process Based on Quality Prediction and Statistical Analysis: *Gui Yang*¹; Xiao Fan¹; Xiao Huang¹; Xu Chen¹; ¹School of Minerals Processing and Bioengineering, Central South University

4:45 PM

Mechanisms of Strengthening the Reduction of Fine Hematite in High Silicon Coal-containing Mini-pellets by Sodium Additives: *Zhucheng Huang¹; Liangming Wen¹; Ronghai Zhong¹; Tao Jiang¹; ¹Central South University*

5:05 PM

Sintering Test Research of High Proportion Limonite: *Zhao Qiang¹; ¹Changsha Research Institute of Mining and Metallurgy*

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Integrated Modeling — Neutron Irradiation and Mechanical Properties

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: James Cole, Idaho National Laboratory; Peter Hosemann, University of California Berkeley; Todd Allen, Idaho National Laboratory; Elaine West, Knolls Atomic Power Laboratory

Wednesday PM
February 17, 2016

Room: 101B
Location: Music City Center

Session Chair: Peter Hosemann, University of California, Berkeley

2:00 PM Invited

Microstructural Characterization of ATR Irradiated Cu/Nb Nanolayered Composites: *Osman Anderoglu¹; Jon Baldwin¹; Amit Misra²; Michael Nastasi³; Stuart Maloy¹; James Cole⁴; George Odette⁵; ¹Los Alamos National Laboratory; ²University of Michigan; ³University of Nebraska; ⁴Idaho National Laboratory; ⁵University of California*

2:30 PM

Energy Dissipation and Defect Evolution in Concentrated Solid-solution Alloys: *Yanwen Zhang¹; G. Malcolm Stocks¹; Ke Jin¹; Hongbin Bei¹; Chenyang Lu¹; Lumin Wang¹; Brian Sales¹; Laurent Beland¹; Roger Stoller¹; William Weber¹; ¹Oak Ridge National Laboratory*

2:50 PM

Solute Redistribution Processes in Neutron-irradiated Model FeCrAl Alloys: *Samuel Briggs¹; Philip Edmondson²; Ken Littrell²; Yukinori Yamamoto²; Kumar Sridharan¹; Kevin Field²; ¹University of Wisconsin-Madison; ²Oak Ridge National Laboratory*

3:10 PM

TEM Characterization of Neutron-irradiated Cast Austenitic Stainless Steel at 320°C to 0.08 dpa: *Wei-Ying Chen¹; Yiren Chen¹; Xuan Zhang¹; Chi Xu²; Mark Kirk¹; Meimei Li¹; ¹Argonne National Laboratory; ²University of Florida*

3:30 PM Break

3:50 PM

Thermal Aging and Low Dose Neutron Irradiation Effect on the Microstructural Stability of Delta Ferrite in a 308L Weld: *Zhangbo Li¹; Yong Yang¹; Yiren Chen²; ¹University of Florida; ²Argonne National Laboratory*

4:10 PM

Structural Characterization of Nanoscale Intermetallic Precipitates in Highly Neutron Irradiated Reactor Pressure Vessel Steels: *David Sprouster¹; E Dooryhee¹; S Ghose¹; P Wells²; T Stan²; N Almirall²; G. Odette²; L Ecker¹; ¹Brookhaven National Laboratory; ²University of California, Santa Barbara*

4:30 PM

Production of Microstructure to Mimic Key Effects of Neutron Irradiation Damage in Core Materials: *Ram Bajaj¹; Justin Cook¹; Gene Lucadamo¹; Jesse Carter¹; Clinique Brundidge¹; Richard Smith¹; ¹Bettis Atomic Power Laboratory*

4:50 PM

A Comparison of Methods for Measurement of Ion Irradiation Induced Hardening in Metallic Materials: *Dhriti Bhattacharyya¹; Mihail Ionescu¹; Zain Zaidi²; Christopher Hurt²; Ashley Reichardt³; Peter Hosemann³; Robert Harrison¹; John Daniels²; Lyndon Edwards¹; ¹ANSTO; ²UNSW; ³University of California, Berkeley*

5:10 PM

Nanoindentation and In Situ Microcompression Testing in Various Dose Regimes of Proton-beam Irradiated 304 SS: *Ashley Reichardt¹; David Frazer¹; Cameron Howard¹; Amanda Lupinacci¹; Peter Chou¹; Peter Hosemann¹; ¹University of California, Berkeley*

Acta Materialia Symposium — Award Session

Funding Support Provided by: Elsevier

Program Organizer: Carolyn Hansson, University of Waterloo

Wednesday PM
February 17, 2016

Room: 103C
Location: Music City Center

Session Chair: Carolyn Hansson, University of Waterloo

3:30 PM Introductory Comments

3:35 PM Invited

2016 Acta Materialia Gold Medal Award: Structural Control for Enhanced Functional Materials: *Sungho Jin¹; ¹University of California San Diego*

4:05 PM Question and Answer Period

4:15 PM Invited

Acta Materialia Inc. Hollomon Award for Materials and Society: Even “Green” Technologies Create Environmental Impact: A Case Study Perspective: *Julie Schoenung¹; ¹University of California, Irvine*

4:45 PM Question and Answer Period

4:55 PM Reception

Additive Forming of Components - Tailoring Specific Material Properties in Low Volume Production — Emerging Additive Manufacturing Technologies and Applications

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.

Wednesday PM
February 17, 2016

Room: 205B
Location: Music City Center

Session Chairs: Judy Schneider, University of Alabama in Huntsville; Tom Stockman, University of Alabama in Huntsville

2:00 PM Invited

Developing 3D Printed Heat Exchangers: *Vinod Narayanan¹; Samikshya Subedi²; Erfan Rasouli³; Eric Truong³; Colt Montgomery²; Anthony Rollett²; ¹UC Davis; ²Carnegie Mellon University; ³Oregon State University*

2:30 PM

Microstructure and Mechanical Characterization of Hybrid Materials Fabricated Using Ultrasonic Additive Manufacturing: *Niyanth Sridharan*¹; Maxim Gussev²; Kurt Terrani³; Mark Norfolk⁴; Sudarsanam Babu¹; ¹University of Tennessee Knoxville; ²Fusion Materials and Nuclear Structures Group, Oak Ridge National Lab; ³Nuclear Fuels Materials Group, Oak Ridge National Laboratory; ⁴Fabrisonic

2:50 PM

Additive Friction Stir Deposition of Functionally Gradient Al-Fe Composite: Nanci Hardwick¹; *Kumar Kandasamy*¹; Jianqing Su¹; James Donnelly¹; Dietrich Linde¹; ¹Aeropro Corporation

3:10 PM

Lightweight, Strong and Ductile Hierarchical Architected Materials Fabricated from Additive Manufacturing: *Xiaoyu "Rayne" Zheng*¹; ¹Virginia Tech/Lawrence Livermore National Lab

3:30 PM Break**3:50 PM Invited**

Constitutive Modeling and Experimental Verification of Aqueous-based Freeform Extrusion Fabrication Processes: *Ming Leu*¹; Mingyang Li¹; Robert Landers¹; ¹Missouri University of Science and Technology

4:20 PM

Flexible Heat Treatment of AM Material in a HIP: Anders Eklund¹; *Magnus Ahlfors*²; ¹Quintus Technologies, LLC.; ²Avure Technologies AB

4:40 PM

Additive Manufacturing from the Gaseous State: *Vicki Barbur*¹; Michael Tims¹; Juan Valencia¹; Melissa Klingenberg¹; ¹CTC

Additive Manufacturing: Building the Pathway towards Process and Material Qualification — Emerging Technologies

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

Wednesday PM
February 17, 2016

Room: 205A
Location: Music City Center

Session Chairs: Lyle Levine, NIST; Michael Maguire, Sandia National Laboratory

2:00 PM Invited

Microstructure and Mechanical Property Relationships in Additively Manufactured 304L: *Michael Maguire*¹; Jeffrey Rodelas¹; Jay Carroll¹; Dave Adams¹; Benjamin Reedlunn¹; Joseph Bishop¹; Bo Song¹; Jack Wise¹; ¹Sandia National Laboratories

2:30 PM

Linkage between FEA Thermal Modeling of Laser Powder Bed Fusion and Microstructure Evolution Simulations: *Li Ma*¹; Jeffrey Fong¹; Brandon Lane¹; Shawn Moylan¹; Lyle Levine¹; ¹NIST

2:50 PM

Powder Bed Layer Characteristics – The Overseen First Order Process Input: *Mustafa Megahed*¹; Hans-Wilfried Mindt¹; Nicholas Lavery²; Mark Holmes²; Stephen Brown²; ¹ESI Group; ²Swansea University

3:10 PM Invited

Additive Manufacturing of Metals: Building Unreliable Microstructures 20 Microns at a Time: *Lyle Levine*¹; ¹National Institute of Standards and Technology

3:40 PM Break**4:00 PM**

Power Bed Fusion-based Additive Manufacturing in Turbine Engine Hot-section Alloys Through Scanning Laser Epitaxy: Amrita Basak¹; Andriy Dotsenko¹; Yunpei Yang¹; Arpit Patel¹; *Suman Das*¹; ¹Georgia Institute of Technology

4:20 PM

In-Space Manufacturing Baseline Property Development: *Tom Stockman*¹; Judith Schneider¹; Quincy Bean²; Tracie Prater²; Nicki Werkheiser²; ¹Mississippi State University; ²NASA

4:40 PM

Kinetic Monte-Carlo: A Tool for Examining Microstructural Evolution in Materials Processing: *Jonathan Madison*¹; Theron Rodgers¹; Veena Tikare¹; ¹Sandia National Laboratories

Advanced Characterization Techniques for Quantifying and Modeling Deformation — Session VI

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

Wednesday PM
February 17, 2016

Room: 103B
Location: Music City Center

Session Chairs: Fionn Dunne, Imperial College; Grethe Winther, Technical University of Denmark

2:00 PM Invited

Crystal Plasticity and HR-DIC Studies of Slip and Strain Localisation in Single and Polycrystal Ni Alloys under Cyclic Bending: Yongjun Guan¹; Ben Britton¹; Jun Jiang¹; *Fionn Dunne*¹; ¹Imperial College

2:30 PM Invited

Intragranular Orientation Spread Induced by Grain Interaction: *Grethe Winther*¹; Jette Oddershede¹; ¹Technical University of Denmark

3:00 PM

Quantitative Analysis of Dislocation Densities from Electron Backscatter Diffraction and Precession Electron Diffraction Data: *Asher Leff*¹; Austin Nye¹; Evan Kahl¹; Greg Vetterick¹; Mitra Taheri¹; ¹Drexel University

3:20 PM

Using Conventional EBSD for Dislocation Structure Quantification: *David Field*¹; ¹Washington State University

3:40 PM Break**4:00 PM Invited**

Slip Localisation in Ti Alloys Studied by High-resolution Digital Image Correlation: *Michael Preuss*¹; David Lunt¹; Joao Quinta da Fonseca¹; ¹University of Manchester

4:30 PM

Continuous Yielding Investigated by Concurrent Mapping of Microstructure, Micro-strain and Micro-stress Evolution: *Cem Tasan*¹; Dingshun Yan¹; Dierk Raabe¹; ¹Max-Planck Institute for Iron Research

4:50 PM

Slip Band Development in Aluminium: Measurements and CPFEM Predictions: *Joao Fonseca*¹; ¹The University of Manchester

5:10 PM

3D Analysis of Dislocations near Grain Boundary Using Nonlocal Plasticity Model: *Chen Zhang*¹; Philip Eisenlohr¹; Thomas Bieler¹; Martin Crimp¹; Carl Boehlert¹; ¹Michigan State University

5:30 PM

Three Dimensional Orientation Characterization of Metals Tested in Tension: *Jonathan Ligda*¹; Nick Lorenzo¹; Emily Huskins²; Tomoko Sano¹; Brian Schuster¹; ¹Army Research Laboratory; ²United States Naval Academy

Advanced Magnetic Materials: An FMD Symposium in Honor of Michael E. McHenry — Permanent Magnets 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

Wednesday PM
February 17, 2016

Room: 209C
Location: Music City Center

Session Chairs: George Hadjipanayis, University of Delaware; Rajarshi Banerjee, University of North Texas

2:00 PM Invited

Dy-free High Coercivity Nd-Fe-B Permanent Magnets: *Kazuhiro Hono*¹; Taisuke Sasaki¹; Hossein Sepehri-Amin¹; Tadakatsu Ohkubo¹; ¹NIMS

2:30 PM Invited

Synthesis of Submicron R-Co and R-Fe-B Particles by the Mechanochemical Process: *George Hadjipanayis*¹; Alexander Gabay¹; Ozlem Koylu-Alkan¹; Manu Barandiaran¹; Daniel Salazar¹; ¹University of Delaware

3:00 PM

Co-based Rare Earth Free Permanent Magnet Materials: *Meiyu Wang*¹; Michael Lucis¹; *Jeff Shield*¹; ¹University of Nebraska

3:20 PM Break

3:40 PM

Developing Permanent Magnet Alloys via Rapid Assessment Methodologies: *Ryan Ott*¹; Jie Geng¹; Ikenna Nlebedim¹; Emrah Simsek¹; Matthew Besser¹; Valentin Taufour¹; Matthew Kramer¹; ¹Ames Laboratory (USDOE)

4:00 PM

Enhanced Powder-processed Alnico Magnets by Thermal Gradient Control: *Emma White*¹; Aaron Kassen²; Kevin Dennis¹; Wei Tang¹; Andriy Palasyuk¹; Lin Zhou¹; R. William McCallum¹; Iver Anderson¹; ¹Ames Laboratory; ²Iowa State University

4:20 PM

Heavy Rare Earths at Grain Boundaries to Achieve Maximum Coercivity in Industrial Magnetic Materials: *Spomenka Kobe*¹; Jožef Stefan Institute

4:40 PM

A Solid-State Approach to Alnico-based Permanent Magnets: *Aaron Kassen*¹; Emma White²; Wei Tang²; Andriy Palasyuk²; Lin Zhou²; Iver Anderson²; ¹Iowa State University; ²Ames Laboratory

5:00 PM

Microstructural Effects of Thermomagnetic Treatments in Sintered Nd-Fe-B Magnets: *Catherine Smith*¹; Michael Kaufman¹; John Speer¹; Michael McGuire²; ¹Colorado School of Mines; ²Oak Ridge National Laboratory

Aluminum Alloys, Processing and Characterization — Thermal Mechanical Processing

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Steven Long, Kaiser Aluminum Corporation

Wednesday PM
February 17, 2016

Room: 201B
Location: Music City Center

Session Chair: Tongguang Zhai, University of Kentucky

2:00 PM Introductory Comments

2:05 PM

A Study of the Formation Mechanism of Mn Containing Precipitates during Homogenization in a 6xxx Series Aluminum Alloy: *Gongwang Zhang*¹; *Tongguang Zhai*¹; Yi Han²; Yi Xu²; Hiromi Nagaumi²; Gang Sha³; Chad Parish⁴; Donovan Leonard⁴; ¹University of Kentucky; ²Suzhou Research Institute for Nonferrous Metals; ³Nanjing University of Science and Technology; ⁴Oak Ridge National Laboratory

2:30 PM

Precipitation of Al₃Zr Dispersoids during Homogenization of Al-Zn-Cu-Mg-Zr Alloys: *Pikee Priya*¹; Matthew Krane¹; David Johnson¹; ¹Purdue University

2:55 PM

Characterization and Simulation of Microstructure Evolution of 7075 Aluminium Alloy during Homogenization: *Siamak Rafiezadeh*¹; Ahmad Falahati¹; Ernst Kozeschnik¹; ¹Vienna University of Technology

3:20 PM

Application of Secondary Shear Effects in the Extrusion-Machining Process to Explore Recrystallization Mechanics during Conventional Extrusion of 7050 Aluminium: *Daniel Klenosky*¹; David Johnson¹; Kevin Trumble¹; ¹Purdue University

3:45 PM Break

4:00 PM

Fatigue Crack Growth in Structural Cast Aluminum Alloys: Microstructural Mechanisms, Modeling Strategies, and Integrated Design: *Anthony Spangenberg*¹; Diana Lados¹; ¹Worcester Polytechnic Institute, Integrative Materials Design Center

4:25 PM

Large Strain Extrusion Machining on 6013 Aluminum Alloy: *Xiaolong Bai*¹; Andrew Kustas¹; Srinivasan Chandrasekar¹; Kevin Trumble¹; ¹Purdue University

Aluminum Reduction Technology — Environment II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Stephan Broek, Hatch Ltd

Wednesday PM
February 17, 2016

Room: 202B
Location: Music City Center

Session Chair: Michael Gershenzon, Alcoa

2:00 PM Introductory Comments

2:05 PM

Assessing the Role of Smelter Grade Alumina Porosity in the HF Scrubbing Mechanism: *Gordon Agbenyegah*¹; Grant McIntosh²; Margaret Hyland³; Jim Metson⁴; ¹Chemical and Material Engineering Dept., University of Auckland/ Light Metals Research Center; ²School of Chemical Sciences, University of Auckland/Light Metal Research Center; ³Faculty of Engineering, University of Auckland / Light Metals Research Center; ⁴Faculty of Science, University of Auckland / Light Metals Research Center

2:30 PM

The Competitive Adsorption of HF and SO₂ on Smelter Grade Alumina: Neal Dando¹; *Stephen Lindsay*¹; ¹Alcoa

2:55 PM

Evaluation of Gas Composition from Laboratory Scale Electrolysis Experiments with Anodes of Different Sulphur Content: *Thor Anders Aarhaug*¹; Ole Sigmund Kjos¹; Henrik Gudbrandsen¹; Alain Ferber¹; Arne Petter Ratvik¹; ¹SINTEF

3:20 PM

Sustainable Reduction of Anode Effect and Low Voltage PFC Emissions: *Eliezer Batista*¹; Dando Neal¹; Nicola Menegazzo¹; Luis Espinoza-Nava¹; ¹Alcoa

3:45 PM Break

4:00 PM

QCL-based Perfluorocarbon Emission Monitoring: *Luis Espinoza-Nava*¹; Nicola Menegazzo¹; Neal Dando¹; Peter Geiser²; ¹Alcoa Technical Center; ²NEO

4:25 PM

Using Artificial Neural Network to Predict Low Voltage Anode Effect PFCs at the Duct End of an Electrolysis Cell: *Lukas Dion*¹; Charles-Luc Lagacé²; László Kiss¹; Sándor Poncsák¹; ¹Université du Québec à Chicoutimi; ²Aluminerie Alouette inc.

4:50 PM

Anode Effect Initiation during Aluminium Electrolysis in a Two-compartment Laboratory Cell: *Henrik Åsheim*¹; Ole Kjos²; Espen Sandnes¹; Thor Aarhaug²; Asbjørn Solheim²; Steinar Kolås³; Geir Haarberg¹; ¹NTNU; ²SINTEF; ³Hydro

Aluminum Reduction Technology — Materials & Equipment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Stephan Broek, Hatch Ltd

Wednesday PM
February 17, 2016

Room: 202C
Location: Music City Center

Session Chair: Olivier Martin, Rio Tinto Alcan

2:00 PM Introductory Comments

2:05 PM

Alumina Handling in the Smelter- from Port to Pot: *Anders Sorhuus*¹; Sivert Ose¹; Morten Karlsen²; Are Dyrhaug²; ¹Alstom; ²Hydro Aluminium AS

2:30 PM

Recent Developments in Hyper-Dense Phase Alumina Handling Systems: *Guillaume Girault*¹; Philippe Godde¹; Jean-Philippe Laine¹; Mehrdji Hemati²; ¹Rio Tinto Alcan; ²Université de Toulouse

2:55 PM

The Challenge to Supply Consistent Alumina Quality to All Pots on the Increasing Longer and Higher Capacity Potlines: *Shane Polle*¹; Shaikha Al Shehhi¹; Sunny Mathew¹; Bharat Gadilkar¹; Deepu Ramchandran¹; ¹Emirates Global Aluminium, Al Taweela

3:20 PM

Design and Demonstration of an Improved Automated Pot Tapping Method and Equipment: *Jean-Francois Desmeules*¹; Martin Tremblay²; Jean-Benoit Neron¹; ¹Dynamic Concept; ²Aluminerie Alouette

3:45 PM Break

4:00 PM

Evolution of Crust Breaker Control for DX+ and DX+ Ultra Technologies: *Konstantin Nikandrov*¹; Abdalla Zarouni¹; Sergey Akhmetov¹; Nadia Ahli¹; Michel Reverdy¹; ¹Emirates Global Aluminium (EGA)

4:25 PM

SiC in Electrolysis Pots: An Update: *Rudolf Pawlek*¹; ¹TS+C

Bio Nano Interfaces and Engineering Applications — Bio-Nano Interfaces: Medical Applications

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

Program Organizers: Candan Tamerler, University of Kansas; Po-Yu Chen, National University of Tsing Hua University; Terry Lowe, Colorado School of Mines; John Nychka, University of Alberta; Wen Yang, Swiss Federal Institute of Technology in Zurich (ETHZ)

Wednesday PM
February 17, 2016

Room: 206B
Location: Music City Center

Session Chair: Mohan Edirisinghe, University College London

2:00 PM Invited

Green Nanotechnology Approach Towards Water-soluble Iron Oxide MRI Contrast Agents: *Sanjay Mathur*¹; ¹University of Cologne

2:40 PM Invited

Gene Expression Profiling of Preosteoblasts on Conventional and Nanostructured Bulk Titanium: *Rebecca Reiss*¹; Terry Lowe²; ¹New Mexico Tech; ²Colorado School of Mines

3:10 PM Invited

Implantable Magnetic Nanocomposites for Cancer Treatment: *Nima Rahbar*¹; ¹Worcester Polytechnic Institute

3:40 PM Break

4:00 PM Invited

Modeling the Organic-Inorganic Nano Interface in Nanocomposites in Bone Tissue Engineering: *Kalpna Katti*¹; Dinesh Katti¹; Anurag Sharma¹; ¹North Dakota State University

4:40 PM Invited

How Do Nano and Microscale Surface Topographies Affect Bacterial Attachment? Designing a New Generation of Antimicrobial Surfaces: *Benjamin Hatton*¹; Nicolas Lavielle¹; Dalal Asker¹; ¹University of Toronto

5:10 PM

Rules of Induction Towards Chimeric Antimicrobial Peptide Design as Implant Biocoatings: *Kyle Boone*¹; Sarah VanOosten¹; Marcos Simoes¹; Candan Tamerler¹; ¹University of Kansas

5:30 PM

Self-reinforced Fibro-porous 3D Tubes for Vascular Graft Applications: *Vinoy Thomas*¹; Paloma Coelho¹; Siddhartha Patel²; Andrew Wood¹; ¹University of Alabama at Birmingham; ²University of North Georgia

Biological Materials Science Symposium — Biomaterials III

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

Wednesday PM
February 17, 2016

Room: 207A
Location: Music City Center

Session Chairs: Paul Allison, University of Alabama; Rajendra Kasinath, DePuy Synthes

2:00 PM Invited

Towards Computer-aided, Rational Design of Ceramic Biomaterials: Combining Micro-Computed Tomography, Nanoindentation, Ultrasonic, and Micromechanical Theory: *Christian Hellmich*¹; ¹Vienna University of Technology

2:40 PM

Microstructure and Tribological Behaviors of Laser Clad Ti-based Metallic Glass Composite Coatings: *Hong Wu*¹; Xiaodong Lan¹; Xiongfei Zai¹; Yong Liu¹; ¹Central South University

3:00 PM

The Effects of Closed-Cell Metallic and Polymeric Foams on the Dynamic Mechanical Response of Bone and Brain Simulants via Impact Testing: *Andrew Brown*¹; Paul Hazell¹; Juan P. Escobedo-Diaz¹; ¹UNSW Australia

3:20 PM Break

3:40 PM

Monotonic and Cyclic Response of Austenitic and Martensitic NiTi wires for Medical Device Applications: *Elizabeth Gurin*¹; Yiyi Yang¹; Hyunmin Kim¹; Sharvan Kumar¹; ¹Brown University

4:00 PM

Micropillar Cyclic Compression Study of a Nitinol Tube Intended for Medical Devices: *Hyunmin Kim*¹; Hyokyung Sung¹; Sharvan Kumar¹; ¹Brown University

4:20 PM

Transient Simulation of Low Volume Gravity Driven Flow in a Human Organ Mimicking Microfluidic Platform: *Kazi Tasneem*¹; Christopher Long¹; James Hickman¹; ¹University of Central Florida

Bulk Metallic Glasses XIII — Hidden Orders in Structures and Deformation

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

Wednesday PM
February 17, 2016

Room: 101E
Location: Music City Center

Session Chairs: Karin Dahmen, University of Illinois at Urbana Champaign; Xie Xie, The University of Tennessee

2:00 PM Invited

Temperature Dependent slip Avalanche Statistics in Bulk Metallic Glasses – Experiments and Model: *Corey Fyock*¹; Peter Thurnheer²; Robert Maass¹; Michael LeBlanc¹; Peter Liaw³; Jonathan Uhl; Joerg Loeffler²; *Karin Dahmen*¹; ¹University of Illinois at Urbana Champaign; ²ETH Zuerich; ³University of Tennessee Knoxville

2:20 PM Invited

Universal Scaling of the Viscosity of Metallic Liquids: *Ken Kelton*¹; ¹Washington University

2:40 PM

Local Structure Orders in Metallic Liquids and Glasses and Their Influence on the Phase Selection: *Cai-Zhuang Wang*¹; Yue Zhang¹; Feng Zhang¹; Yang Sun¹; Zhou Ye¹; Kai-Ming Ho¹; M. I. Memdelev¹; M. J. Kramer¹; ¹Ames Laboratory

3:00 PM Invited

Jerky Flow Dynamics in Bulk Metallic Glasses: *Junwei Qiao*¹; Zhong Wang¹; Huijun Yang¹; ¹Taiyuan University of Technology

3:20 PM Break

3:35 PM Invited

Insights into β -Relaxation-Mediated Performance of Metallic Glasses: An Integrated Density-Functional-Theory and Electron-Work-Function Study: *William Yi Wang*¹; Shunli Shang¹; Yi Wang¹; Kristopher Darling²; Laszlo Kecskes²; Peter Liaw³; Xidong Hui⁴; Zi-Kui Liu¹; ¹The Pennsylvania State University; ²U.S. Army Research Laboratory; ³University of Tennessee; ⁴University of Science and Technology Beijing

3:55 PM

The 2.5 Power Law: A General Rule of Metallic Glasses: *Qiaoshi Zeng*¹; ¹Carnegie Institution of Washington

4:15 PM Invited

Toughen and Harden Metallic Glass through Designing Statistical Heterogeneity: *Yongwei Wang*¹; *Mo Li*²; ¹University of Science and Technology Beijing; ²Georgia Institute of Tech

4:35 PM Invited

Time-dependent Mechanical Properties of Metallic Glass via Molecular Dynamics Simulations: *Yunche Wang*¹; Nai-Hua Yeh¹; Peter Liaw²; ¹National Cheng Kung University; ²University of Tennessee

4:55 PM

Constraint Effects on the Serrated Behavior in the Compression and Nanoindentation for Bulk Metallic Glasses: *Xie Xie*¹; Guangfeng Zhao²; Peizhen Li²; Shuying Chen¹; Fuqian Yang²; Karin Dahmen³; Peter Liaw¹; ¹The University of Tennessee; ²University of Kentucky; ³University of Illinois at Urbana Champaign

5:15 PM

Local Ordering in Molten State and Its Legacy on Abnormal Primary Crystallization in Al-RE Metallic Glasses: *Mustafacan Kutsal*¹; *Eren Kalay*¹; ¹METU

Cast Shop Technology: An LMD Symposium in Honor of Wolfgang Schneider — Metal Treatment and Metal Quality

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Mohamed Hassan, Masdar Institute of Science and Technology

Wednesday PM
February 17, 2016

Room: 202A
Location: Music City Center

Session Chair: Mark Badowski, Hydro Aluminium Rolled Products GmbH

2:00 PM Introductory Comments

2:05 PM

Inline Melt Treatment for Low to Medium Metal Flow Rates: *Arild Hakonsen*¹; Terje Haugen¹; John Fagerlie¹; ¹Hycast AS

2:30 PM

Effect of Soaking Treatment on the Microstructure and Wear Behavior of the Ultrasonic Melt-treated B390 Hypereutectic Al-Si Alloy: Mona Fadl¹; *Waleed Khalifa*¹; Shima El-Hadad²; ¹Cairo University; ²Central Metallurgical Research and Development Institute

2:55 PM

Influence of Oxidation on Contact Angle between Liquid Aluminum and Al₂O₃: Ping Shen¹; *Lifeng Zhang*¹; Yi Wang¹; ¹University of Science and Technology Beijing

3:20 PM

Optimization of the Ultrasonic Processing in a Melt Flow: *Iakovos Tzanakis*¹; Gerard Lebon²; Dmitry Eskin¹; Koulis Pericleous²; ¹Brunel University; ²Greenwich University

3:45 PM Break

4:25 PM

Assessment of Settling Behavior of Particles with Different Shape Factors by LiMCA Data Analysis: *Mertol Gökelma*¹; Pierre Le Brun²; Thien Dang³; Mark Badowski⁴; Johannes Morscheiser⁵; Bernd Friedrich¹; Sebastian Tewes⁶; ¹RWTH Aachen University; ²Constellium Technology Center; ³TRIMET Aluminium SE; ⁴Hydro Aluminium Rolled Products GmbH; ⁵Aleris Rolled Products Germany GmbH; ⁶NEMAK Europe GmbH

4:50 PM

Modeling of Inclusion Behaviour in an Aluminium Induction Furnace: *Emmanuel Waz*¹; Akshay Bansal²; Pierre Chapelle²; Yves Delannoy³; Jean-Pierre Bellot²; Pierre Le Brun¹; ¹Constellium Technology Center; ²Université de Lorraine; ³Grenoble-INP

4:00 PM

A Comparison of Cold and Hot PoDFA Procedure for Particle Monitoring in Liquid Aluminium: *Mark Badowski*¹; Roland Schmoll¹; ¹Hydro Aluminium

5:15 PM

Inclusion Measurement with PoDFA/ Prefil — On-site and Off-site: *Volker Ohm*¹; Anand Santhanam²; Arun Kumar Ghosala²; ¹HOESCH Metallurgie GmbH; ²Aluminium Bahrain

Characterization of Minerals, Metals, and Materials — Extraction

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

Wednesday PM
February 17, 2016

Room: 103A
Location: Music City Center

Session Chairs: Li Qian, Central South University; Mingming Zhang, ArcelorMittal Global R&D

2:00 PM Invited

Experimental Study on Quality Evaluation of Calcium-based Agents for Desulfurization of Sinter Gas on SDA: *Lu Lj*¹; Huang Jianyang¹; ¹Wisco

2:20 PM

Recovery of Palladium from Spent Pd/Al₂O₃ Catalyst by Hydrochloric Acid Leaching: Yang Yong-bin¹; Hu Long¹; *Li Qian*¹; Xu Bin¹; Rao Xue-fei¹; Jiang Tao¹; ¹Central South University

2:40 PM

Prevention of Airborne Dust from Petroleum Coke Stockpiles: *Robert Kozicki*¹; George Wrightson¹; ¹Andrew S. McCreath & Son, Inc.

3:00 PM

Experimental Analysis of Interlocking Pavement of Concrete with Addition of Waste Glass Applied in Construction: *Victor Souza*¹; Niander Cerqueira²; Andre Jardim³; ¹Universidade Federal Fluminense; ²Universidade Estadual do Norte Fluminense; ³Sociedade Universitária Redentor

3:20 PM Break

3:35 PM

Ligand Selection Model for Leaching of Low Grade Zinc Oxide Ores: Yang Tianzu¹; Rao Shuai¹; *Zhang Duchao*¹; Chen Lin¹; Liu Weifeng¹; ¹Central South University

3:55 PM

Using of Combined Electrochemical Reactions for the Extraction of Metals from Different Raw Materials: *Bagdaulet Kenzhaliyev*¹; ¹Kazakh-British Technical University

4:15 PM

Effect of Ferric Ions on Bioleaching of Pentlandite Concentrate: *Li Qian*¹; Lai Hui-min¹; Yang Yong-bin¹; Xu Bin¹; Jiang Tao¹; Zhang Ya-ping²; ¹Central South University; ²Jimei University

4:35 PM

Characterization and Stoichiometry of the Cyanidation Reaction in NaOH, of Argentinian Waste Tailings of Hidalgo, México: *Mizraim Flores*¹; Francisco Patiño²; Iván Reyes³; Martín Reyes²; Julio Juárez²; Ister Mireles²; Juan Hernández²; ¹Universidad Tecnológica de Tulancingo; ²Universidad Autónoma del Estado de Hidalgo; ³Universidad Autónoma de San Luis Potosi

Computational Materials Discovery and Optimization: From 2D to Bulk Materials — Bulk Materials Discovery and Design

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee
Program Organizers: Richard Hennig, University of Florida; Houlong Zhuang, Oak Ridge National Laboratory; Dallas Trinkle, University of Illinois, Urbana-Champaign; Eric Homer, Brigham Young University

Wednesday PM
February 17, 2016

Room: 207D
Location: Music City Center

Session Chair: Richard Hennig, University of Florida

2:00 PM Invited

Machine Learning in Chemical Space: *Anatole von Lilienfeld*¹; ¹University of Basel

2:30 PM

A General-Purpose Toolkit for Predicting the Properties of Materials using Machine Learning: *Logan Ward*¹; Amar Krishna¹; Rosanne Liu¹; Vinay Hegde¹; Ankit Agrawal¹; Alok Choudhary¹; Chris Wolverton¹; ¹Northwestern University

2:50 PM

Exploring the Structure-composition Design Space in Multi-component Alloy Systems Using Nature Inspired Optimization Algorithms: *Aayush Sharma*¹; Rahul Singh¹; Peter Liaw²; Ganesh Balasubramanian¹; ¹Iowa State University; ²The University of Tennessee, Knoxville

3:10 PM

Proving the Exact Ground State of a Generalized Ising Model by Convex Optimization and MAX-SAT: *Wenxuan Huang*¹; Daniil Kitchaev¹; Stephen Dacek¹; Ziqin Rong¹; Alexander Urban¹; Alexander Toumar¹; Shan Cao¹; Chuan Luo²; Gerbrand Ceder¹; ¹MIT; ²Key Laboratory of High Confidence Software Technologies of Ministry of Education, Peking University

3:30 PM Break

3:45 PM

Effect of Charge on Point Defect Size Misfits from Ab Initio: Aliovalently Doped SrTiO₃: *Hyojung Kim*¹; Dallas Trinkle¹; ¹University of Illinois at Urbana-Champaign

4:05 PM

Electronic Structures of Ferromagnetic $\text{Fe}_{1-x}\text{TM}_x\text{Pt}$ Alloys (TM = Mn, Fe, Co, Ni, Cu): *Jihoon Park*¹; Yang-Ki Hong¹; Woncheol Lee¹; Seong-Gon Kim²; Chul-Jin Choi³; ¹The University of Alabama; ²Mississippi State University; ³Korea Institute of Materials Science

4:25 PM

First Principles Investigation On TiAl_3 Alloys Substitutively Doped With Si: *Qing Du*¹; Weidong Hu¹; WangJun Peng¹; GuangXin Wu¹; Wende Dan¹; JieYu Zhang¹; ¹Shanghai University

4:45 PM

A Fast Algorithm for the Discovery of Optimal Nickel-based Superalloys: *Edern Menou*¹; Gérard Ramstein²; Emmanuel Bertrand¹; Franck Tancrét¹; ¹Institut des matériaux Jean Rouxel; ²Laboratoire d'informatique de Nantes Atlantique

5:05 PM

Computational Exploration of Rare-earth Zirconate Pyrochlores for Thermal Barrier Coatings: Accurate Prediction of Thermal Conductivities and Thermal Expansion Coefficients from First-principles Calculations: *Guoqiang Lan*¹; Jun Song¹; ¹McGill University

Computational Methods for Uncertainty Quantification, Model Validation, and Stochastic Predictions — Uncertainty Quantification and Effects in Coarse Grain, Finite Element and Crystal Plasticity Modeling

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

Wednesday PM
February 17, 2016

Room: 207C
Location: Music City Center

Session Chair: To Be Announced

2:00 PM Invited

Accuracy of Kinetics in Coarse-Grained Molecular Dynamics: Andrew Binder¹; Mitchell Luskin²; Arthur Voter³; *Danny Perez*³; ¹University of Minnesota; ²University of Minnesota; ³Los Alamos National Laboratory

2:40 PM

How Important are the Smallest Grains on Grain Aggregate Mechanics?: *Tias Maiti*¹; Philip Eisenlohr¹; ¹Michigan State University

3:00 PM

Grain Deformation in a Cast Ni Superalloy: Comparing Experimental and Modelling Results: *Mohammed Fazal*¹; Wei Li²; Michael Preuss¹; João Quinta Da Fonseca¹; ¹University of Manchester; ²Rolls-Royce plc.

3:20 PM Break

3:40 PM Invited

Probabilistic Homogenization of Crystal Plasticity Modeling for Ti Alloys: Somnath Ghosh¹; *Shravan Kumar Kotha*¹; Deniz Ozturk¹; ¹Johns Hopkins University

4:20 PM

Microstructure-Uncertainty Propagation in Sheet Metal Forming FE-Simulations: *Stephen Niezgoda*¹; Ayman Salem²; Joshua Shaffer²; Daniel Satko²; ¹The Ohio State University; ²Materials Resources LLC

4:40 PM

Functional Uncertainty Quantification for Multi-fidelity and Multi-scale Simulations: *Sam Reeve*¹; Alejandro Strachan¹; ¹Purdue University

5:00 PM

Computational Simulation and Physical Validation of Welded Aluminum Structures: *Charles Fisher*¹; Matthew Sinfield¹; Gary Margelowsky¹; Yared Amanuel¹; Jazalyn Dukes¹; Ken Nahshon¹; ¹Naval Surface Warfare Center

Computational Thermodynamics and Kinetics — CALPHAD, Multiscale Modeling, and ICME

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

Wednesday PM
February 17, 2016

Room: 208B
Location: Music City Center

Session Chairs: David McDowell, Georgia Institute of Technology; Nicholas Hatcher, QuesTek Innovations LLC

2:00 PM Invited

Density Functional Theory (DFT) Methods for Integrated Computational Materials Engineering (ICME): *Jeff Doak*¹; James Saal¹; Jason Sebastian¹; Greg Olson¹; Nicholas Hatcher¹; ¹QuesTek Innovations LLC

2:30 PM

Revisiting Thermodynamic Models for TCP Phases Utilizing DFT Calculations: *Ursula Kattner*¹; Mauro Palumbo²; Jörg Koßmann²; Suzana Fries²; Thomas Hammerchmidt²; Ralf Drautz²; ¹National Institute of Standards and Technology; ²ICAMS, Ruhr-University Bochum

2:50 PM

Revisiting Thermodynamics of The Co-Al-W System: Peisheng Wang¹; *Wei Xiong*¹; Oleg Kontsevoi¹; Ursula Kattner²; Carelyn Campbell²; Gregory Olson¹; ¹Northwestern University; ²National Institute of Standards and Technology

3:10 PM

First-principles Thermodynamic Modeling of μ Phase in the Co-W Alloy System: *Oleg Kontsevoi*¹; Wei Xiong¹; Gregory Olson¹; ¹Northwestern University

3:30 PM Break

3:50 PM

Thermodynamics of Li_2 -containing Co-Al-W Alloys from First-Principles: *Robert Rhein*¹; Tresa Pollock¹; Anton Van der Van¹; ¹University of California Santa Barbara

4:10 PM

Experimental Investigation and Thermodynamic Assessment of Phase Equilibria in the Al-rich Portion of the Al-Mn-Ce Ternary System: *Francisco Coury*¹; Andre Luiz Costa e Silva²; Walter Botta¹; Claudio Kiminami¹; Michael Kaufman³; ¹Universidade Federal de São Carlos; ²Universidade Federal Fluminense; ³Colorado School of Mines

4:30 PM

The Application Software Interface to the Open Calphad Software and Some Examples: *Bo Sundman*¹; Matthias Stratmann²; Mauro Palumbo²; Suzana Fries²; Ursula Kattner³; ¹CEA Saclay; ²Ruhr University Bochum; ³NIST

4:50 PM Invited

Considering the Role of Kinetics in Computational Materials Discovery and Development: *David McDowell*¹; Laurent Capolungo¹; Ting Zhu¹; ¹Georgia Institute of Technology

5:20 PM

A Discrete Dislocation Model of Creep in Single Crystals: *M. Rajaguru*¹; Shyam Keralavarma¹; ¹Indian Institute of Technology Madras

Emerging Interconnect and Pb-free Materials for Advanced Packaging Technology — Wetting Behavior; Solders for New Applications

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

Wednesday PM Room: 201A
 February 17, 2016 Location: Music City Center

Session Chairs: Tae-kyu Lee, Cisco Systems; Kwang-Lung Lin, National Cheng Kung University

2:00 PM

Solder Wetting Behavior of Plasma Organic Surface Finish with Multiple Heat-Treatment: *Kyoung-Ho Kim*¹; Sehoon Yoo¹; Junichi Koike²; ¹Korea Institute of Industrial Technology; ²Tohoku University

2:20 PM

The Early Stage Wetting Behaviors between Solder and Cu: *Wei-Chih Huang*¹; Kwang-Lung Lin¹; ¹National Cheng Kung University

2:40 PM

Grain-structure Engineering in Copper TSVs: Q. Zhu¹; H. Ma¹; J. Guo¹; J. Shang²; ¹Shenyang National Laboratory for Materials Science; ²University of Illinois

3:00 PM

Effect of Bump Height on Grain Size and Orientation of Solder Microbumps Bonded by Thermal Compression: *Yu-An Shen*¹; Chih Chen¹; ¹National Chiao Tung University

3:20 PM Break

3:40 PM

In Situ Mechanical Testing of Micro-Scale Solder Joints: Leila Ladani¹; Soud Choudhury²; ¹University of Connecticut; ²University of Connecticut

4:00 PM

Estimation of Constitutive Parameters in beta-Sn by Instrumented Nanoindentation and Crystal Plasticity Simulation: *Aritra Chakraborty*¹; Zhuowen Zhao¹; Philip Eisenlohr¹; Thomas Bieler¹; ¹Michigan State University

4:20 PM

Study of Low Melting Solder Alloys: Chih-Hao Chen¹; Boon-Ho Lee²; Hsiang-Chuan Chen²; Chang-Meng Wang²; *Albert T. Wu*¹; ¹National Central University; ²SHENMAO Technology Inc.

4:40 PM

Using Sn-Bi-Zn Solder as the LED Die-attach Material by Controlling the Sn-Bi-Zn Composition and the Roughness of the Substrate: *Yue Kai Tang*¹; Chengyi Liu¹; ¹National Central University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Fatigue Properties of Engineering Alloys

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

Wednesday PM Room: 213
 February 17, 2016 Location: Music City Center

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

2:00 PM Invited

What Causes the Formation of Crack Initiation Characteristic Region for Very-High-Cycle Fatigue of Metallic Materials?: *Youshi Hong*¹; Xiaolong Liu¹; Zhengqiang Lei¹; Chengqi Sun¹; ¹LNM, Institute of Mechanics, Chinese Academy of Sciences

2:20 PM Invited

Statistical Characterization of Multimodal Behavior in Material Properties: *D Gary Harlow*¹; ¹Lehigh University

2:40 PM Invited

Creep-fatigue of Steels with Cyclic Softening: *Jarir Aktaa*¹; Ulrich Führer¹; ¹Karlsruhe Institute of Technology

3:00 PM Invited

Ultra Small Scale High Cycle Fatigue Testing by Micro-cantilevers: *Jicheng Gong*¹; Angus Wilkinson¹; ¹University of Oxford

3:20 PM

Thermal Fatigue as the Origin of Rock Break-up on Asteroids (Note: This presentation will also appear in the poster session.): *Kavan Hazel*¹; Stefanos Papanikolaou¹; Charles El Mir¹; Marco Delbo²; K. T. Ramesh¹; ¹Johns Hopkins University; ²UNS-CNRS-Observatoire de la Cote d'Azur

3:40 PM Break

4:00 PM

Fatigue Monitoring of Metals Based on Physical Data Like Electrical Resistance, Temperature and Electromagnetic Ultrasound: *Dietmar Eifler*¹; ¹University of Kaiserslautern

4:20 PM

Microstructure-Sensitive Probabilistic Prediction of Small Fatigue Crack Growth Behavior in a Ni-Base Superalloy: *Patrick Golden*¹; ¹Air Force Research Laboratory

4:40 PM

Hydrogen Influences on Notched Fatigue Life of Stainless Steels: *Paul Gibbs*¹; Jonathan Zimmerman¹; Kyle Karlson¹; Xiaoli Tang²; Samuel Kernion³; Kevin Nibur⁴; Christopher San Marchi¹; ¹Sandia National Laboratories; ²Swagelok Company; ³Carpenter Technology Corporation; ⁴Hy-Performance Materials

5:00 PM

Short Crack Growth and Very High Cycle Fatigue Behavior of Magnesium Alloy WE43: *Jacob Adams*¹; J. Wayne Jones¹; John Allison¹; ¹University of Michigan

5:20 PM

Microstructural Effects on Small-Fatigue Crack Growth in Resistance Spot Welded Sheet 5754 and 6111 Aluminum and Durability Modeling of Eyebrow Cracking in Resistance Spot Welds (Note: This presentation will also appear in the poster session.): *Vir Nirankari*¹; ¹University of Michigan

Frontiers in Solidification: An MPMD Symposium in Honor of Michel Rappaz — Defects/Conclusions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Wilfried Kurz, EPFL; Jon Dantzig, EPFL and University of Illinois; Alain Karma, Northeastern University; Jeffrey Hoyt, McMaster University

Wednesday PM Room: 105A
February 17, 2016 Location: Music City Center

Session Chairs: Hervé Combeau, Université de Lorraine Nancy; Jon Dantzig, Univ of Illinois

2:00 PM Invited

Atomistic Modeling of Grain Boundary Melting and Pre-melting in Alloys: J. Hickman¹; Y. Mishin¹; ¹George Mason University

2:25 PM Invited

Hot Tearing: After the Rappaz-Drezet-Gremaud Criterion, Where Are We?: Jean-Marie Drezet¹; Nicolas Chobaut¹; Michael Drakopoulos²; Thilo Pirling³; ¹Ecole Polytechnique Federale Lausanne; ²I12 (JEEP) Diamond Light Source Ltd; ³Salsa, Institut Laue Langevin

2:50 PM Invited

Grain Structures and Segregations: Charles-Andre Gandin¹; ¹MINES Paris Tech

3:15 PM Invited

Granular Modelling of Solidification and Semi-solid Defect Formation: Andre Phillion¹; Fariba Sheykhi-Jaberi¹; Hamid Reza Zareie Rajani¹; Steve Cockcroft¹; Daan Maijer¹; ¹University of British Columbia

3:40 PM Break

4:00 PM Invited

Hot Tear Criterion Accounting for the Last Stage Precipitation Phenomena in the Solidification Path: A Refinement of the Rappaz Drezet Gremaud Approach: Philippe Jarry¹; ¹Constellium

4:25 PM Invited

Dendrite Arm and Grain Boundary Coalescence: William Boettinger¹; ¹NIST

4:50 PM Invited

Future Challenges in Solidification: Michel Rappaz¹; ¹EPFL

High-Temperature Systems for Energy Conversion and Storage — Systems for Energy Conversion and Storage II

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

Wednesday PM Room: 104E
February 17, 2016 Location: Music City Center

Session Chairs: Jung Pyung Choi, PNNL; William Chueh, Stanford University

2:00 PM Invited

Molecular View of High Temperature Oxygen Reduction & Evolution Reactions: William Chueh¹; ¹Stanford University

2:25 PM Invited

Solid Acid Electrolytes Applied to Electricity Generation and Gas Separation: Alexander Papadrew¹; Ramez Elgammal¹; Ondrej Dyck¹;

David Wilson¹; Wesley Tennyson²; Gabriel Veith²; Thomas Zawodzinski²; ¹University of Tennessee; ²Oak Ridge National Laboratory

2:50 PM

The Role of Fe-O Complex in Determining Oxygen Nonstoichiometry in the Lanthanum Strontium Ferrite (LSF) System: Tridip Das¹; Jason Nicholas¹; Yue Qi¹; ¹Michigan State University

3:10 PM Invited

Two-Dimensional Transition Metal Carbides and Carbonitrides Derived from MAX Phases for Electrochemical Energy Storage Systems: Michael Naguib¹; ¹Oak Ridge National Laboratory

3:35 PM Break

3:55 PM Invited

Understanding the Mechanisms of Electrode Degradation in Solid Oxide Fuel Cells by Phase-field Modeling: Jiamian Hu¹; Liang Hong¹; Linyun Liang¹; Kirk Gerdes²; Long-Qing Chen¹; ¹Pennsylvania State University; ²National Energy Technology Laboratory

4:15 PM Invited

In-Operando XRD Tests of LSCF and LSM/YSZ SOFC Cathodes: John Hardy¹; Christopher Coyle¹; Jared Templeton²; Nathan Canfield¹; Jeffry Stevenson¹; ¹Pacific Northwest National Laboratory; ²WRPS

High Entropy Alloys IV — Mechanical and Other Properties I

Sponsored by: TMS Functional Materials Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside; Gongyao Wang, Alcoa Technical Center

Wednesday PM Room: 102B
February 17, 2016 Location: Music City Center

Session Chairs: Rajiv Mishra, University of North Texas; Niles Kumar, University of North Texas

2:00 PM Invited

Lattice Strain Framework for Plastic Deformation in Complex Concentrated Alloys Including High Entropy Alloys: Rajiv Mishra¹; Niles Kumar¹; Mageshwari Komarasamy¹; ¹University of North Texas

2:20 PM

From Pure Element to High-entropy Alloy : Limits of the Concept: Lola Liliensten¹; Jean-Philippe Couzinié¹; Ivan Guillot¹; Loïc Perrière¹; Guy Dirras²; ¹CNRS - ICMPE; ²CNRS - LSPM

2:40 PM

Microstructures of Annealed and Oxidized Al₈(NiCoCrFe)₉₂, Al₁₅(NiCoCrFe)₈₅, and Al₃₀(NiCoCrFe)₇₀ High-Entropy Alloys: Todd Butler¹; Mark Weaver¹; ¹University of Alabama

3:00 PM

Precipitation Kinetics in High Entropy Alloy Al_{0.5}CrFeCoNiCu: Nicholas Jones¹; Kathy Christofidou¹; Edward Pickering¹; Roberto Izzo¹; Howard Stone¹; ¹University of Cambridge

3:20 PM Break

3:35 PM Invited

Atomic and Electronic Basis for Viscous Flow Mediated Avalanches of Ultrastrong Refractory High Entropy Alloys: William Yi Wang¹; Shunli

Shang¹; Yi Wang¹; Yidong Wu²; Kristopher Darling³; Xie Xie⁴; Oleg Senkov⁵; Laszlo Kecskes³; Karin Dahman⁶; Xidong Hui²; Peter Liaw⁴; Zi-Kui Liu¹; ¹The Pennsylvania State University; ²University of Science and Technology Beijing; ³U.S. Army Research Laboratory; ⁴University of Tennessee; ⁵Air Force Research Laboratory; ⁶University of Illinois at Urbana Champaign

3:55 PM

Trace Elements and Processing of High Entropy Alloys: *Paul Jablonski¹; Joseph Licavoli¹; John Sears¹; Jeffrey Hawk¹; ¹US Department of Energy*

4:15 PM

Tailoring the Microstructure and Mechanical Properties of a CoCrFeNi High Entropy Alloy by Supercooling Method: *Jinshan Li¹; Wenjuan Jia¹; Jun Wang¹; Hongchao Kou¹; ¹Northwestern Polytechnical University*

4:35 PM

Vacancy Formation and Migration Energy of High Entropy Alloy: *Congyi Li¹; Artur Tamm²; G. Malcolm Stocks³; Brian Wirth⁴; Steve Zinkle⁴; Alfredo Caro²; Alvo Aabloo⁵; Mattias Klintonberg⁶; ¹Bredesen Center; ²Los Alamos National Lab; ³Oak Ridge National Lab; ⁴University of Tennessee; ⁵University of Tartu; ⁶Uppsala University*

4:55 PM

Thin Film Approach to Optimize Structure and Composition of High Entropy Alloys: *Azin Akbari¹; Artashes Ter-Isahakyan²; Julia Lehmann²; Thomas Balk²; ¹University of Kentucky; ²University of Kentucky*

High Entropy Alloys IV — Structures and Mechanical Properties II

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

Program Organizers: Peter Liaw, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside; Gongyao Wang, Alcoa Technical Center

Wednesday PM Room: 102A
February 17, 2016 Location: Music City Center

Session Chairs: Oleg Senkov, Air Force Research Laboratory; Gong Li, The University of Tennessee

2:00 PM

A Thermodynamic Parameter to Predict Formation of Solid Solution or Intermetallic Phases in High Entropy Alloys: *Oleg Senkov¹; Dan Miracle¹; ¹Air Force Research Laboratory*

2:20 PM Invited

Mechanical Study of a Refractory bcc High Entropy Solid Solution: Deformation Mechanisms and Strain Rate Effect: *Jean-Philippe Couzine¹; Lola Lilensten¹; Guy DIRRAS²; David Tingaud²; Loïc Perrière¹; Jeno Gubicza³; Ivan GUILLOT¹; Hervé Couque⁴; ¹CNRS/UPEC; ²Université Paris 13 - Sorbonne Paris Cité; ³Eötvös Loránd University; ⁴Nexter Munitions*

2:40 PM

A Non-equiatomic, Dual-phase, TRIP-assisted HEA: *Cem Tasan¹; Zhiming Li¹; Dierk Raabe¹; ¹Max-Planck Institute for Iron Research*

3:00 PM

Mechanical Properties of Refractory High Entropy Alloys Fabricated by the Powder Metallurgy Process: *Seoungwoo Kuk¹; Woojin Lim¹; Hojin Ryu¹; Soon Hyung Hong¹; ¹Korea Advanced Institute of Science and Technology*

3:20 PM Invited

Solute Effects in High-Entropy FeNiMnAlCr Alloys: *I. Baker¹; Zhangwei Wang¹; ¹Dartmouth College*

3:40 PM Break

3:55 PM Invited

Microstructure and Mechanical Properties of YxCoCrFeNi High Entropy Alloys: *Gong Li¹; Huan Zhang²; Lijun Zhang²; Pengfei Yu²; Hu*

Cheng²; Qin Jing²; Mingzhen Ma²; P. K. Liaw²; Riping Liu²; ¹University of Tennessee; ²State Key Laboratory of Metastable Materials Science and Technology, Yanshan University

4:15 PM

Nanomechanical Behavior and Dislocation Nucleation in FCC High Entropy Alloys: *Sanghita Mridha¹; Sundeep Mukherjee¹; ¹University of North Texas*

4:35 PM

Microstructure and Mechanical Behavior of Equiatomic CoCuFeMnNi High-entropy Alloy: *Anna Fraczekiewicz¹; Michal Mroz¹; ¹MINES St-Etienne*

4:55 PM

Precious Metal High Entropy Alloys - Microstructure, Phase Evolution and Properties: *Caitlin Healy¹; Allison Lim²; Lucia Kaye²; Lorri Bassman²; Jörg Löffler³; Michael Ferry¹; Kevin Laws¹; ¹University of New South Wales; ²Harvey Mudd College; ³ETH Zürich*

Hume-Rothery Award Symposium: Thermodynamics of Materials — High Throughput Methods

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

Wednesday PM Room: 107A
February 17, 2016 Location: Music City Center

Session Chairs: Jörg Neugebauer, Max-Planck-Institut für Eisenforschung GmbH; Olle Hellman, California Institute of Technology

2:00 PM Invited

Lattice Excitations in Magnetic Alloys: Recent Advances in Ab Initio Modeling of Coupled Spin and Atomic Fluctuations: *Fritz Körmann¹; Blazej Grabowski¹; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung GmbH*

2:30 PM Invited

Thermodynamics of Multicomponent Alloys: Beyond the Binary Approximation: *Marcel Sluiter¹; ¹TU Delft*

3:00 PM

Information is Not Knowledge: *Suzana Fries¹; ¹ICAMS, Ruhr University Bochum*

3:20 PM Break

3:40 PM

Comments on Thermodynamic Instability: *John Morris¹; ¹University of California Berkeley*

4:00 PM Invited

Genetic Algorithm Structure Optimization Applied to Defect Clusters and Nanoparticles with Integrated Experimental Data: *Dane Morgan¹; Min Yu¹; Amy Kaczmarowski¹; Hyunseok Ko¹; Paul Voyles¹; ¹University of Wisconsin - Madison*

4:30 PM Invited

First-principles Studies of Strongly Anharmonic Crystalline Solids: *Fei Zhou¹; Weston Nielson²; Yi Xia²; Vidvuds Ozolins²; ¹Lawrence Livermore National Laboratory; ²University of California, Los Angeles*

5:00 PM Concluding Comments

In Operando Nano- and Micro-mechanical Characterization of Materials with Special Emphasis on In Situ Techniques — In-Situ Characterization of Mechanical Properties of Materials III

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

Wednesday PM
February 17, 2016

Room: 212
Location: Music City Center

Session Chairs: Arief Budiman, Singapore University of Technology and Design; Weizhong Han, Xi'an Jiaotong University

2:00 PM Invited

In-situ Micromechanical Testing Using Correlated 3-D X-ray and 2-D Electron Microscopy Analyses: *Robert Wheeler*¹; ¹MicroTesting Solutions LLC

2:30 PM

Cyclic Electro-mechanical Behaviour of Ductile Films Examined with In-situ Methods: *Megan Cordill*¹; Oleksandr Glushko¹; ¹Erich Schmid Institute of Materials Science

2:50 PM

In Situ Corrosion-Fatigue of 7075 Aluminum in 3.5 wt% NaCl: Tyler Stannard¹; Jason Williams¹; Sudhanshu Singh¹; Xianghui Xiao²; *Nikhilesh Chawla*¹; ¹Arizona State University; ²Advanced Photon Source, Argonne National Laboratory

3:10 PM

Investigation of Deformation Twinning under Complex Stress States in a Rolled Magnesium Alloy: *Wei Wu*¹; Chih-Pin Chuang²; Yang Ren²; Ke An¹; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory

3:30 PM Break

3:50 PM Invited

Direct Imaging of Mechanically or Thermally Induced Grain Structure Changes in Nanocrystalline Metals: *Christian Kuebel*¹; Aaron Kobler¹; Krishna Kanth¹; Horst Hahn¹; ¹KIT

4:20 PM

In-situ High-energy X-ray Investigation of Plastic Deformation and Damage Evolution in Polycrystalline Cu-5%W Composite: *Reeju Pokharell*¹; Timothy Ickes¹; Bjorn Clausen¹; Ching-Fong Chen¹; Darren Dale²; Ricardo Lebensohn¹; ¹Los Alamos National Laboratory; ²Cornell High Energy Synchrotron Source

4:40 PM

An In Situ Load Stage to Combine 3D X-ray Tomography with Nanomechanical Testing: *William Harris*¹; Benjamin Hornberger¹; Arno Merkle¹; Hrishikesh Bale¹; Leah Lavery¹; Roberty Bradley²; Xuekun Lu²; Philip Withers²; Nikolaus Cordes³; Brian Patterson³; ¹Carl Zeiss X-ray Microscopy, Inc.; ²University of Manchester; ³Los Alamos National Laboratory

5:00 PM

Understanding the Ultra High Strength of Ni Micro-wires from In-situ Deformation Study under X-rays: Soham Mukherjee¹; Ludovic Thilly¹; *Celine Gerard*¹; Atul Chokshi²; Satyam Suwas²; ¹Institut Pprime, CNRS - ENSMA - Université de Poitiers; ²Indian Institute of Science

5:20 PM

Novel In-situ Mechanical Test within an X-ray Microscope: *Jürgen Gluch*¹; Kristina Kutukova²; Ehrenfried Zschech¹; ¹Fraunhofer IKTS; ²Dresden International University

Interface-driven Phenomena in Solids: Thermodynamics, Kinetics and Chemistry — Microstructural Evolution II

Sponsored by: TMS Functional Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Nanomaterials Committee, TMS: Thin Films and Interfaces Committee

Program Organizers: Fadi Abdeljawad, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Timofey Frolov, UC Berkeley; Emine Gulsoy, Northwestern University; Heather Murdoch, Army Research Lab; Mitra Taheri, Drexel University

Wednesday PM
February 17, 2016

Room: 108
Location: Music City Center

Session Chair: Timofey Frolov, University of California at Berkeley

2:00 PM

Microstructure Evolution and Consolidation Kinetics Prediction in Powder Materials during Field Assisted Sintering Technique: *Sudipta Biswas*¹; Vikas Tomar¹; ¹Purdue University

2:20 PM

Interface Mediated Formation of Monatomic Metallic Glasses: *Scott Mao*¹; Li Zhong¹; Jiangwei Wang¹; Ze Zhang²; Hongwei Sheng³; ¹University of Pittsburgh; ²Zhejiang University; ³George Mason University

2:40 PM

Grain Network Connectivity in 3D Copper Microstructures Resulting from Disparate Processing Routes: *J. Lind*¹; S. F. Li¹; M. Kumar¹; ¹Lawrence Livermore National Laboratory

3:00 PM

Nanostructures Formation from Pulsed-laser Induced Rayleigh-Taylor Instabilities at Metal/fluid Interfaces: *Venkatanarayana Prasad Sandireddy*¹; Sagar Yadavali¹; Ramki Kalyanaraman¹; ¹University of Tennessee Knoxville

3:20 PM Break

3:40 PM Invited

Zener Pinning of Grain Boundary Migration in Immiscible Nanocrystalline Alloys: Raj K. Koju¹; K. A. Darling²; L. J. Kecskes²; *Y. Mishin*¹; ¹George Mason University; ²U.S. Army Research Laboratory

4:20 PM

The Development of Large Twin Related Domains in Grain Boundary Engineered Cu: *David Bober*¹; Rupalee Mulay¹; Mukul Kumar¹; ¹Lawrence Livermore National Laboratory

4:40 PM

The Influence of Temperature in the Formation of Highly Nanotwinned Cu Alloys: Varying the Twin Thickness: *Leonardo Velasco*¹; Andrea Hodge¹; ¹University of Southern California

5:00 PM

Watching the Growth of Si Particles in a Liquid: The Role of Twin Defects on Microstructural Evolution: *Ashwin Shahani*¹; E. Gulsoy¹; Michael Chapman²; Xianghui Xiao³; Marc De Graef²; Peter Voorhees¹; ¹Northwestern University; ²Carnegie Mellon University; ³Argonne National Laboratory

Magnesium-based Biodegradable Implants — Corrosion / Market and Clinic

Sponsored by: TMS Functional Materials Division, TMS Light Metals Division, TMS Structural Materials Division, TMS: Biomaterials Committee, TMS: Magnesium Committee

Program Organizers: Wim Sillekens, European Space Agency; Martyn Alderman, Magnesium Elektron; Patrick Bowen, Michigan Technological University; Jaroslaw Drellich, Michigan Technological University; Petra Maier, University of Applied Sciences Stralsund

Wednesday PM
February 17, 2016

Room: 206A
Location: Music City Center

Session Chairs: Pat Bowen, Michigan Technological University; Martyn Alderman, Magnesium Elektron

2:00 PM Invited

Understanding Corrosion-assisted Cracking of Magnesium Alloys for Bioimplant Applications: RK Singh Raman¹; *Shervin Eslami Harandi*¹; ¹Monash University

2:30 PM

In Vitro Corrosion and Cytocompatibility Properties of Mg-2Gd-X(Ag, Ca) Alloys: *Yiyi Lu*¹; Yuanding Huang¹; Frank Feyerabend¹; Regine Willumeit-Römer¹; Karl-Ulrich Kainer¹; Norbert Hort¹; ¹Helmholtz-Zentrum Geesthacht

2:50 PM

Appropriate Corrosion-Fatigue Testing of Magnesium Alloys for Temporary Bio-implant Applications: *Shervin Eslami Harandi*¹; RK Singh Raman¹; ¹Monash University

3:10 PM Invited

Computer Simulation of the Mechanical Behaviour of Implanted Biodegradable Stents in a Remodelling Artery: *Peter McHugh*¹; Enda Boland¹; ¹NUI Galway

3:40 PM Break

4:00 PM Invited

Standardized Guidance for the Preclinical Evaluation of Absorbable Metal Implants: *Byron Hayes*¹; ¹W.L. Gore and Associates, Inc

4:30 PM Invited

The Industrial Challenges of Manufacturing Bioabsorbable Magnesium: *Robert Thornton*¹; Paul Lyon¹; ¹Magnesium Elektron

5:00 PM Invited

Monitoring Biodegradation of Magnesium Implants with Sensors: Daoli Zhao¹; Tingting Wang¹; Xuefei Guo¹; Julia Kuhlmann¹; Amos Doepeke¹; Zhongyun Dong¹; Vesselin Shanov¹; *William Heineman*¹; ¹University of Cincinnati

5:30 PM Invited

Magnesium-based Compression Screws: *Jan Seitz*¹; ¹Syntellix AG

Magnesium Technology 2016 — Corrosion

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

Wednesday PM
February 17, 2016

Room: 203B
Location: Music City Center

Session Chair: Michele Manuel, University of Florida

2:00 PM

Numerical Investigation of the AE44-mild Steel Galvanic Structural Joint: *Nitin Muthegowda*¹; Kiran Solanki¹; Benyamin Bazehhour¹; ¹Arizona State University

2:20 PM

Fabrication of a Superhydrophobic Films with Self-cleaning Property on Magnesium Alloy and its Corrosion Resistance Properties: *Meng Zhou*¹; Xiaolu Pang¹; Kewei Gao¹; ¹University of Science and Technology Beijing

2:40 PM

The Surface Films and their Possible Roles in Mg Corrosion: *Guang-Ling Song*¹; ¹Oak Ridge National Laboratory

3:00 PM

Micro-arc Oxide Film of Aluminum Coating Pre-sprayed on a Magnesium Alloy: *Suyuan Yang*¹; Lin Zhou¹; Xingwang Cheng¹; ¹Beijing Institute of Technology

Magnesium Technology 2016 — Twinning and Plasticity

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

Wednesday PM
February 17, 2016

Room: 204
Location: Music City Center

Session Chairs: Tyrone Jones, US Army Research Laboratory; Peifeng Li, Nanyang Technological University

2:00 PM

What is a Strain Hardening “Plateau”?: *Sean Agnew*¹; Chris Calhoun¹; Jishnu Bhattacharyya¹; ¹University of Virginia

2:20 PM

Asymmetric Growth of Tensile Twins in Magnesium: *Zhe Li*¹; Ben Xu¹; ¹Tsinghua University

2:40 PM

Non-dislocation Based Room Temperature Plastic Deformation Mechanism in Magnesium: *Bo-Yu Liu*¹; Zhi-Wei Shan¹; Evan Ma²; ¹Xi'an Jiaotong University; ²Johns Hopkins University

3:00 PM

Investigation of the Plastic Flow Field in Magnesium Alloy AZ31B in Three Orientations for Empirical Penetration Models: *Tyrone Jones*¹; John Riegel²; Christopher Meredith¹; Kris Darling¹; Jim Catalano¹; Anthony Roberts¹; ¹US Army Research Laboratory; ²R3 Technology, Inc

3:20 PM Break

3:40 PM

Deformation Behavior of Mg Single Crystals Compressed Along c-axis: *Kelvin Xie*¹; Zafir Alam¹; Alex Caffee¹; Kevin Hemker¹; ¹Johns Hopkins University

4:00 PM

The Use of Acoustic Emission and Neutron Diffraction to Reveal the Active Deformation Mechanisms in Polycrystalline Magnesium and Comparison to Theoretical Modeling: *Jan Capek*¹; Kristian Mathis¹; Tomáš Krajnák¹; ¹Charles University in Prague

4:20 PM

Strain Rate Dependent Deformation and Failure Process of Magnesium Foams: *Peifeng Li*¹; ¹Nanyang Technological University

4:40 PM

Exploration of Thin-walled Magnesium Alloy Tube Extrusion for Improved Crash Performance: Bruce Williams¹; *Robert Klein*²; Jonathan McKinley¹; Sean Agnew²; ¹CanmetMATERIALS, Natural Resources Canada; ²University of Virginia

5:00 PM

High Temperature Tensile Behaviors and Deformation Mechanisms of Mg-x%Al Alloys: Jiaxing Ji¹; Fubo Bian¹; Tiangang Niu¹; Min He¹; *Jun Qiao*¹; ¹The University of Science and Technology Liaoning

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

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

Program Organizers: John Carsley, General Motors Research & Development; Daniel Coughlin, Los Alamos National Laboratory; Myoung-Gyu Lee, Korea University; Youngung Jeong, National Institute of Standards and Technology; Piyush Upadhyay, Pacific Northwest National Laboratory

Wednesday PM
February 17, 2016

Room: 104A
Location: Music City Center

Session Chairs: Myoung-Gyu Lee, Korea University; Youngung Jeong, NIST

2:00 PM Invited

An Experimentally Validated, Microstructure Based Model for Forming of Low-symmetry Alpha-uranium: *Rodney McCabe*¹; Miroslav Zecevic²; Daniel Coughlin¹; Andrew Richards¹; Kester Clarke¹; Irene Beyerlein¹; Marko Knezevic²; ¹Los Alamos National Laboratory; ²University of New Hampshire

2:30 PM

Dilational Response of Voided Polycrystals: *Daniel Savage*¹; Marko Knezevic¹; Oana Cazacu²; ¹University of New Hampshire; ²University of Florida, REEF

3:00 PM

Effect of Complex Strain Paths on Microstructure Evolution Studied by In-situ Neutron Diffraction: *Steven Van Petegem*¹; Tobias Panzner¹; Manas Upadhyay¹; Helena Van Swygenhoven¹; ¹Paul Scherrer Institut

3:30 PM Break

4:00 PM

Predicting Cyclic Deformation of AA6022-T4 and DP590 Using Polycrystal Plasticity: *Milovan Zecevic*¹; Marko Knezevic¹; ¹University of New Hampshire

4:30 PM

The Influence of Deformation Mechanisms on Forming of Commercially Pure Titanium Sheets: *Feng Li*¹; ¹The University of Manchester

5:00 PM

Inflation of Stainless Steel 304L Microtubes under Axial Tension and Internal Pressure to Assess the Plastic Anisotropy: Peter Ripley¹; Yannis Korkolis¹; ¹University of New Hampshire

Material Design Approaches and Experiences IV — Steels II

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 Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Wednesday PM
February 17, 2016

Room: 208A
Location: Music City Center

Session Chairs: Qiang Feng, University of Science & Technology Beijing; Kip Findley, Colorado School of Mines

2:00 PM Invited

Hydrogen Embrittlement Susceptibility in Tension and Fatigue of Austenitic Stainless Steels: *Kip Findley*¹; Alex Ly¹; Brian Somerday²; ¹Colorado School of Mines; ²Sandia National Laboratory

2:30 PM Invited

Flash Processing of Steels: Alternative Pathway to Develop Advanced High Strength Steels for Automotive Applications: Gary Cola¹; T. Lolla²; B. Hanhold²; D. Tung³; *Sudarsanam Babu*⁴; ¹SFP Works, LLC; ²Formerly at The Ohio State University; ³The Ohio State University; ⁴The University of Tennessee, Knoxville

3:00 PM

Design and Development of Cast Alumina-forming Austenitic Stainless Steels: *Govindarajan Muralidharan*¹; Yukinori Yamamoto¹; Michael Brady¹; Donovan Leonard¹; ¹Oak Ridge National Laboratory

3:20 PM Break

3:40 PM Invited

Design Approaches Using TCP Sigma Phase as a Promising Strengthener in Austenitic Heat Resistant Steels: *Masao Takeyama*¹; Yoshiki Kumagai¹; ¹Tokyo Institute of Technology

4:10 PM Invited

Development of a New Alloy Family - High Performance Ferrite: *Bernd Kuhn*¹; M. Talik¹; L. Singheiser¹; ¹Forschungszentrum Juelich GmbH

4:40 PM

Alloy Design for Promoting Creep Resistance of Austenitic Cast Steels for Exhaust Component Applications: Yinhui Zhang¹; Mei Li²; Larry Godlewski²; Jacob Zindel²; *Qiang Feng*¹; ¹University of Science and Technology Beijing; ²Ford Motor Company

Materials and Fuels for the Current and Advanced Nuclear Reactors V — Structural Materials IV

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

Program Organizers: Ramprasad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday PM
February 17, 2016

Room: 101A
Location: Music City Center

Session Chairs: Thak Sang Byun, Pacific Northwest National Laboratory; Walter Luscher, Pacific Northwest National Laboratory

2:00 PM

Microstructure and Phase Stability of Oxide Dispersion Strengthened Steels: *Brad Baker*¹; Keith Knippling²; ¹U.S. Naval Academy; ²U.S. Naval Research Laboratory

2:20 PM

Development of Fe-12Cr-5.6Al ODS Alloys for Nuclear Applications: *Caleb Massey*¹; David Hoelzer²; Kinga Unocic²; Sebastien Dryepondt²; Chad Parish²; Bruce Pint²; ¹Virginia Commonwealth University; ²Oak Ridge National Laboratory

2:40 PM

Development of ODS FeCrAl Alloys for Accident-tolerant Fuel Cladding: *Sebastien Dryepondt*¹; Caleb Massey²; Kinga Unocic¹; Dave Hoelzer¹; Chad Parish¹; Bruce Pint¹; Kurt Terrani¹; ¹Oak Ridge National Laboratory; ²Virginia Commonwealth University

3:00 PM

Laser Shock Peening of Oxide-Dispersion-Strengthened Austenitic Stainless Steels: *Bai Cui*¹; Qiaofeng Lu¹; Chenfei Zhang¹; Dawei Li¹; Yongfeng Lu¹; Qing Su¹; Michael Nastasi¹; ¹University of Nebraska-Lincoln

3:20 PM Break

3:40 PM

Bulk Extraction and XAS Characterization of Oxides in Nanostructured Ferritic Alloy MA957: *Tiberiu Stan*¹; David Sprouster²; Avishai Ofra²; Lynne Ecker²; George Odette¹; ¹University of California Santa Barbara; ²Brookhaven National Laboratory

4:00 PM

Temperature Effect of Microstructural Evolution in Advanced Nanostructured Alloys by in-situ Synchrotron X-ray Diffraction: *Yingye Gan*¹; Huijuan Zhao¹; Di Yun²; Kun Mo²; David Hoelzer³; Xiang Liu⁴; Kuan-Che Lan⁴; Yinbin Miao⁴; ¹Clemson University; ²Argonne National Lab; ³Oak Ridge National Laboratory; ⁴UIUC

4:20 PM

Texturing, Microcracking and Delamination in 14YWT Nanostructured Ferritic Alloys: *Soupitak Pal*¹; Md Ershadul Alam¹; David Gragg¹; G. Odette¹; Stuart Maloy²; David Hoelzer³; John Lewandowski⁴; ¹University of California Santa Barbara; ²Los Alamos National Laboratory; ³Oak Ridge National Laboratory; ⁴Case Western Reserve University

4:40 PM

Thermal Stability of Nanoscale Hardening Features in Irradiated Reactor Pressure Vessel Steels: *Peter Wells*¹; Nathan Almirall¹; Yuan Wu¹; David Gragg¹; G. Odette¹; Takuya Yamamoto¹; ¹UC Santa Barbara

Materials in Clean Power Systems IX: Durability of Materials — Materials Development for Clean Power Systems

Sponsored by: TMS Extraction and Processing Division, TMS Structural Materials Division, TMS Light Metals Division, TMS: Energy Committee, TMS: High Temperature Alloys Committee
Program Organizers: Sebastien Dryepondt, Oak Ridge National Laboratory; Peter Hosemann, University of California Berkeley; Kinga Unocic, ORNL; Paul Jablonski, US Department of Energy; Joseph Licavoli, Department of Energy; Donna Guillen, Idaho National Laboratory

Wednesday PM Room: 104D
February 17, 2016 Location: Music City Center

Session Chairs: Paul Jablonski, NETL; Peter Tortorelli, ORNL

2:00 PM Invited

Precipitation Dynamics and the Role of Microstructural Changes in the Development of Alumina-Forming Austenitic Stainless Steels: *Geneva Trotter*¹; Ian Baker¹; ¹Thayer School of Engineering, Dartmouth College

2:30 PM Invited

Development of Creep Resistant High Cr containing FeCrAl Ferritic Alloys for Fossil Energy Applications: *Yukinori Yamamoto*¹; Bruce Pint¹; Benjamin Shassere²; Sudarsanam Babu²; ¹Oak Ridge National Laboratory; ²The University of Tennessee

3:00 PM

High Temperature Oxidation and Mechanical Properties of Novel Al-containing Fe-based ODS Alloys: *Tyler Slinger*¹; Iver Anderson¹; ¹Ames Lab/Iowa State University

3:20 PM Invited

Heat Resistant Alloy Development for Fossil Energy Power Generation: *Jeffrey Hawk*¹; Paul Jablonski¹; Gordon Holcomb¹; ¹U.S. Department of Energy, National Energy Technology Laboratory

3:50 PM Break**4:10 PM**

Electrodeposition of MCrAlY and Pt-Modified MCrAlY Coatings for Gas-Turbine Engine Applications: Jason Witman¹; Brian Bates¹; *Ying Zhang*¹; Sebastien Dryepondt²; Bruce Pint²; ¹Tennessee Technological University; ²Oak Ridge National Laboratory

4:30 PM

Characterization of Titanium Thin-Film Liquid/Gas Diffusion Layer in Clean and Renewable Power Systems: *Zhenye Kang*¹; Jingke Mo¹; Bo Han¹; Feng-Yuan Zhang¹; ¹UT Space Institute, The University of Tennessee, Knoxville

4:50 PM

Mechanical Characterization of Solid Acid Materials for Intermediate Temperature Fuel Cells: *Ryan Ginder*¹; George Pharr²; ¹University of Tennessee at Knoxville; ²University of Tennessee at Knoxville & Oak Ridge National Laboratory

5:10 PM

Development of HfB₂-ZrB₂ Based Ceramics as High Temperature Electrode Materials for MHD Direct Power Extraction System: Cody Hill¹; Steven Sittler¹; Krishnan Raja¹; *Indrajit Charit*¹; ¹University of Idaho

Materials Processing Fundamentals — Forming, Joining, Sensing: Devices and Applications

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

Program Organizers: Antoine Allanore, Massachusetts Institute of Technology; Lifeng Zhang, University of Science and Technology Beijing; Laura Bartlett, Texas State University; Jonghyun Lee, University of Massachusetts; Cong Wang, Northeastern University

Wednesday PM Room: 106B
February 17, 2016 Location: Music City Center

Session Chairs: Cong Wang, Northeastern University; Jonghyun Lee, University of Massachusetts

2:00 PM

Multiscale Modelling of Hydrogen Transport in Martensitic Steels: *Andrej Turk*¹; David Bombac¹; Enrique Galindo-Nava¹; Pedro Rivera-Diaz-del-Castillo¹; ¹University of Cambridge

2:20 PM

Contactless Inductive Flow Tomography for Industrially Relevant Applications: *Thomas Wondrak*¹; Matthias Ratajczak¹; Frank Stefani¹; Josef Pal¹; Klaus Timmel¹; Sven Eckert¹; ¹Helmholtz-Zentrum Dresden-Rossendorf

2:40 PM

Ultrasonic Vibration-assisted Laser Surface Drilling: Experimental and Finite Element Analysis: *Seyyed Habib Alavi*¹; Sandip Harimkar¹; ¹Oklahoma State University

3:00 PM

Evaluation of Joint Performance on High Nitrogen Stainless Steel which is Expected to Have Higher Allergy Resistance: *Kouichi Nakano*¹; ¹Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology

3:20 PM Break**3:40 PM**

Mechanical Characterization and Microstructure Formation when Joining Stainless Steels with Amorphous Brazing Foils: *David Kemmenoe*¹; Eric Theisen²; Shefford Baker³; ¹Cornell University Mechanical Engineering; ²Metglas Incorporated; ³Cornell University Department of Material Science

4:00 PM

Co-spray Forming Process of Supermartensitic Stainless Steel Based Bimetallic Pipes: *Guilherme Zepón*¹; Nils Ellendt²; Volker Uhlenwinkel²; Claudemiro Bolfarini³; ¹Post-Graduation Program of Materials Science and Engineering (PPG-CEM/UFSCar); ²Foundation Institute of Materials Science (IWT- Bremen University); ³Department of Materials Engineering (DEMa/UFSCar)

4:20 PM

Graphite Enhanced Workability of Aluminum 6061: Lourdes Salamance-Riba¹; Xiaoxiao Ge¹; Iftekhar Jaim¹; Marc Zupan¹; Rick Everett¹; Mitch Zavala¹; *Manfred Wuttig*¹; ¹University of Maryland

Materials Research in Reduced Gravity — Ground-based/Parabolic Aircraft/Sounding Rocket Testing

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

Program Organizers: Douglas Matson, Tufts University; Hani Henein, University of Alberta; Robert Hyers, Boston Electrometallurgical Corp.; Ivan Egly, DLR

Wednesday PM
February 17, 2016

Room: 104C
Location: Music City Center

Session Chairs: Douglas Matson, Tufts University; Jonghyun Lee, University of Massachusetts

2:00 PM Invited

Crystal Nucleation and Growth from Levitated Aqueous Solutions Using Electrostatic Levitation: *Geun Woo Lee*¹; Soohyeong Lee¹; Haeng Sub Wi¹; Wonhyuk Jo¹; Yong Chan Cho¹; Hyun Hwi Lee²; Se-Young Jeong³; Yong-Il Kim¹; ¹Korea Research Institute of Standards and Science; ²Pohang Accelerator Laboratory; ³Pusan National University

2:30 PM

Rapid Quench in an Electrostatic Levitator: *Michael SanSoucie*¹; Jan Rogers¹; Douglas Matson²; ¹NASA MSFC; ²Tufts University

2:50 PM

Metastable Phase Formation from Undercooled Melt in Peritectic Systems under Terrestrial and Microgravity Conditions: Fe-Co vs. Ti-Al: *Olga Shuleshova*¹; Wolfgang Löser¹; Thomas Volkmann²; Christian Karrasch²; Douglas Matson³; Mikhail Krivilyov⁴; Stepan Lomaev⁵; Jan Fransaer⁵; ¹IFW Dresden; ²German Aerospace Center; ³Tufts University; ⁴Udmurt State University; ⁵KU Leuven

3:20 PM

Numerical Simulation of the Oscillation and Damping of Core-Shell-Structured Iron-Slag Droplets for the Measurements of Surface Tension and Viscosity in Reduced Gravity: *Jonghyun Lee*¹; Eli Baldwin¹; Kyle Mooney¹; Robert Hyers¹; ¹University of Massachusetts

3:40 PM Break

4:00 PM

Simulation of Shrinkage-induced Segregation in Multicomponent Multiphase Alloys during Reduced-gravity Solidification: *Ali Saad*¹; *Charles-André Gandin*¹; Michel Bellet¹; Thomas Volkmann²; Dieter Herlach³; ¹ARMINES CEMEF; ²German Aerospace Center (DLR)

4:20 PM

In Situ Investigation of the Effects of Gravity Level Variations on the Directional Solidification Microstructures during Parabolic Flights: *Lara Abou-Khalil*¹; Georges Salloum-Abou-Jaoude²; Guillaume Reinhart¹; Christoph Pickmann³; Ylva Houlitz⁴; Jianning Li⁴; Olle Janson⁴; Henri Nguyen-Thi¹; Gerhard Zimmermann³; ¹IM2NP & Aix Marseille university; ²BCAST; ³ACCESS e.V.; ⁴Swedish Space Corporation

4:40 PM

Microstructure Evolution in Undercooled Al-Fe Melts: *Jonas Vallotton*¹; Abdoul-Aziz Bogno¹; Dieter Herlach²; Hani Henein¹; ¹University of Alberta; ²Deutsches Zentrum für Luft- und Raumfahrt

5:00 PM

Reduced-gravity Measurements of the Effect of Oxygen on Properties of Zirconium: *Jie Zhao*¹; Jonghyun Lee¹; Rainer Wunderlich²; Hans Fecht²; Stephan Schneider³; Michael SanSoucie⁴; Jan Rogers⁴; Robert Hyers⁵; ¹University of Massachusetts; ²Universität Ulm; ³DLR / Institut für Materialphysik im Weltraum; ⁴NASA MSFC; ⁵University of Massachusetts - Amherst

Mechanical Behavior at the Nanoscale III — Dislocation Plasticity and Dislocation-Defects Interactions

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

Wednesday PM
February 17, 2016

Room: 214
Location: Music City Center

Session Chairs: Joshua Crone, US Army Research Laboratory; Lucas Hale, National Institute of Standards and Technology

2:00 PM Invited

Ab Initio Modeling of Dislocation Core Properties in BCC and HCP Metals: *David Rodney*¹; Lucile Dezerald²; Emmanuel Clouet³; Nermine Chaari³; Lisa Ventelon³; François Willaime³; ¹Université de Lyon; ²Massachusetts Institute of Technology; ³Commissariat à l'Energie Atomique

2:40 PM

Is the Anomalous Slip in BCC Transition Metals a Consequence of the Transformations of the Core of Screw Dislocations by Applied Stresses?: *Vaclav Vitek*¹; Yi-Shen Lin¹; ¹University of Pennsylvania

3:00 PM

Effect of Solutes on Dislocation Nucleation from Grain Boundaries in fcc Metals: *Valery Borovikov*¹; Mikhail Mendelev¹; Alexander King¹; ¹The Ames Laboratory

3:20 PM

Stress Statistics and Universal Scaling Exponent Determining Strength-size Scaling at Small Scales: *Robert Maass*¹; Peter Derlet²; ¹University of Illinois at Urbana-Champaign; ²Paul Scherrer Institute

3:40 PM Break

4:00 PM

On the Relationship among Lattice Misorientation Field, Strain Gradient Effects, and Indentation Size Effects: *Yanfei Gao*¹; Lucia Nicola²; Bennett Larson³; George Pharr¹; ¹Univ of Tennessee; ²Delft University of Technology; ³Oak Ridge National Laboratory

4:20 PM

Capturing the Collaborative Strengthening Effects of Dislocations and Nanoscale Obstacles: *Joshua Crone*¹; ¹US Army Research Laboratory

4:40 PM

Simulations of Orientation Dependence of Strain-Hardening Characteristics and Dislocation Microstructure Evolution in 20, 6 Micron Size Ni Microcrystals: *Satish Rao*¹; Dennis Dimiduk²; Michael Uchic²; Triplicane Parthasarathy³; Jaafar El-Awady⁴; Ahmed Hussein⁴; William Curtin¹; ¹EPFL; ²AFRL; ³UES Inc.; ⁴Johns Hopkins University

5:00 PM

Dynamic Investigations of Dislocation-Self Point Defect Interactions in BCC Metals: *Lucas Hale*¹; Yuri Mishin²; Zachary Trautt Trautt¹; Chandler Becker¹; ¹National Institute of Standards and Technology; ²George Mason University

Metal and Polymer Matrix Composites II — Processing of Composites

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

Program Organizer: Nikhil Gupta, New York University

Wednesday PM
February 17, 2016

Room: 110A
Location: Music City Center

Session Chair: To Be Announced

2:00 PM Invited

Laser Processing of Hybrid Materials for Biomedical Applications: *Roger Narayan*¹; ¹UNC/NCSU Joint Department of Biomedical Engineering

2:20 PM

Polytetrafluoroethylene-based Composites Containing Graphene Nanoplatelets Fabricated via Solid-state Mixing and Hot-pressing: *Jiyeon Suh*¹; Seungwon Kang¹; Donghyun Bae¹; ¹Yonsei University

2:40 PM

Surface Characterization of Carbon Fiber Polymer Composites and Aluminum Alloys after Laser Interference Structuring: *Adrian Sabau*¹; Clayton Greer²; Jian Chen¹; Charles Warren¹; Claus Daniel¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

3:00 PM

Simulation of Ultrasonic Processing to Fabricate Carbon Nanotube-reinforced Magnesium Composite: *Yuansheng Yang*¹; Fuze Zhao¹; ¹Institute of Metal Research, Chinese Academy of Sciences

Nanostructured Materials for Nuclear Applications — Session VI

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

Wednesday PM
February 17, 2016

Room: 101C
Location: Music City Center

Session Chairs: Khalid Hattar, Sandia National Laboratory; Osman Anderoglu, Los Alamos National Laboratory

2:00 PM Invited

Phase Stability and Solute Redistribution at Metal-oxide Interface under Ion Irradiation: *Nan Li*¹; Yun Xu¹; Satyesh Yadav¹; Jeffery Aguiar¹; Osman Anderoglu¹; Yongqiang Wang¹; Amit Misra²; Hongmei Luo³; Blas Uberuaga¹; ¹Los Alamos National Laboratory; ²University of Michigan, Ann Arbor; ³New Mexico State University, Las Cruces

2:30 PM

Surface and Interface Effects on Zinc Oxide Nanowires due to Ionizing Radiation: *Daniel Mayo*¹; Ryan Nolen²; Richard Haglund¹; ¹Vanderbilt University; ²David Lipscomb University

2:50 PM

Behavior of Twin Boundaries in Nanotwinned Metals under In Situ Heavy Ion Radiation: *Kaiyuan Yu*¹; Jin Li²; Daniel Bufford³; Youxing Chen⁴; Mark Kirk⁵; Meimei Li⁵; Haiyang Wang²; Xinghang Zhang²; ¹China University of Petroleum-Beijing; ²Texas A&M University; ³Sandia National Laboratories; ⁴Los Alamos National Laboratory; ⁵Argonne National Laboratory

3:10 PM

Evolution of Helium Bubbles in Nano-engineered SiC under Irradiation: *Chien-Hung Chen*¹; Yongqiang Wang²; Miguel Crespo¹; Cristiano Fontana³; Joseph Graham¹; Steven Shannon⁴; Yanwen Zhang³; William Weber¹; ¹University of Tennessee; ²Los Alamos National Laboratory; ³Oak Ridge National Laboratory; ⁴North Carolina State University

3:30 PM Break

3:50 PM Invited

Synergistic Effects in Multi-Ion Irradiated Nano-Oxide Dispersed Ferritic Alloys: *Luke Hsiung*¹; Michael Fluss¹; ¹Lawrence Livermore National Laboratory

4:20 PM

TEM Characterization of Irradiated and Unirradiated Fe-Cr Steels, Ni-based and ODS Fe-12Cr-5Al Alloys: *Kinga Unocic*¹; David Hoelzer¹; Chad Parish¹; Mark Bannister¹; Kevin Field¹; ¹Oak Ridge National Laboratory

4:40 PM

Nanoprecipitates with High Coarsening Resistance in Irradiated Cu-Mo-Si Thin Films: *Jae Yel Lee*¹; John Beach¹; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois at Urbana-Champaign

Phase Transformations and Microstructural Evolution — Phase Transformations - Titanium Alloys

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

Wednesday PM
February 17, 2016

Room: 109
Location: Music City Center

Session Chair: Raj Banerjee, University of North Texas

2:00 PM

Integrated Experimental and Computational Investigation of Omega Phase and Omega Phase Assisted Super-refined Alpha Precipitation: *Yufeng Zheng*¹; Robert Williams¹; Talukder Alam²; Deep Choudhuri²; Rongpei Shi¹; Niraj Gupta²; Srinivasan Srivilliputhur²; Yunzhi Wang¹; Rajarshi Banerjee²; Hamish Fraser¹; ¹The Ohio State University; ²University of North Texas

2:30 PM

Efficient Experimental Determination of Diffusion Coefficients and Elastic Modulus for the Ti-Mo-Nb-Ta-Zr System: *Zhangqi Chen*¹; Ji-Cheng Zhao¹; ¹The Ohio State University

2:50 PM

Alpha Phase Precipitation in Metastable Beta Ti-Nb-Fe Alloys: Fernando Costa¹; Eder Lopes¹; *Rubens Caram*¹; ¹University of Campinas

3:10 PM

There and Back Again: Microstructural Investigations of Forward and Reverse α - ω Phase Transformations in HCP Metals: *Benjamin Morrow*¹; Carl Trujillo¹; Francis Addessio¹; Curt Bronkhorst¹; Turab Lookman¹; George Gray¹; Ellen Cerreta¹; ¹Los Alamos National Laboratory

3:30 PM Break

3:50 PM

Study of Phase Transitions Occurring in 1946-Titanium Alloy Ti-15Mo: *Pavel Zháňal*¹; Petr Harcuba¹; Michal Hájek¹; Jana Šmilauerová¹; Josef Veselý¹; ¹Charles University in Prague

4:10 PM

The Influence of Aluminum Content on Recrystallization and Grain Growth in α -titanium Alloys: *Anna Trump¹*; John Allison¹; ¹University of Michigan

4:30 PM

In-situ Small-angle Scattering Study of ω Particles Growth in Metastable β Titanium Alloys: *Jana Šmilauerová¹*; Petr Hrcuba¹; Dominik Kriegner¹; Miloš Janeček¹; Václav Holý¹; ¹Charles University

4:50 PM

Thermal Stability of ω -phase in Pure Ti Formed by High-pressure Torsion Process: *Nozomu Adachi¹*; Yoshikazu Todaka¹; Minoru Umemoto¹; ¹Toyohashi University of Technology

5:10 PM

Observation of All 12 Alpha Variants and Strip Microstructure in Multi-component Titanium Alloys: *Hongchao Kou¹*; Yi Chen¹; Jiangkun Fan¹; Yudong Zhang²; Bin Tang¹; Jinshan Li¹; ¹Northwestern Polytechnical University; ²Laboratoire d'Étude des Microstructures et de Mécanique des Matériaux (LEM3), CNRS UMR 7239, Université de Lorraine

5:30 PM

Assessment of Tribological Properties of Cast and Forged Ti-6Al-7Nb and Ti-6Al-4V Implants for Dental Application: *Ahmed Zaki¹*; *Shimaa El-Hadad¹*; Waleed Khalifa²; ¹Central Metallurgical Research and Development Institute; ²Cairo University

Phase Transformations and Microstructural Evolution — Phase Transformations during Non-Equilibrium Processing - 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

Wednesday PM
February 17, 2016

Room: 107B
Location: Music City Center

Session Chair: Monica Kapoor, U. Alabama Tuscaloosa

2:00 PM

Effect of Velocity Change on Ternary Eutectic Morphology: *Amber Genau¹*; Subhojit Chakraborty¹; ¹University of Alabama at Birmingham

2:20 PM

Mechanical Properties of 5000 Series Aluminum Alloys Following Fire Exposure: *Jillian Free¹*; Patrick Summers¹; Brian Lattimer¹; Scott Case¹; ¹Virginia Polytechnic Institute and State University

2:40 PM

Effect of Concurrent Microstructure Evolution and Hydrogen Level on Flow Behavior of Near Alpha Ti-alloy: *Jagadeesh Babu S M¹*; B. P. Kashyap¹; N. Prabhu¹; R. Kapoor²; R. N. Singh²; Bhupendra K Kumawat²; J. K Chakravarty²; ¹Indian Institute of Technology Bombay; ²Bhabha Atomic Research Centre

3:00 PM

Isothermal Annealing of Shocked Zirconium: Stability of the γ 45- γ 69 2-phase Microstructure: *Thaddeus Song En Low¹*; Donald Brown²; Brian Welk¹; Ellen Cerrera²; John Okasinski³; Stephen Niezgoda¹; ¹The Ohio State University; ²Los Alamos National Laboratory; ³Argonne National Laboratory

3:20 PM

Microstructure Evolution and Stability of Nanostructured Electrodeposited Al-Mn Alloys upon Heating: *Ting-Yun Huang¹*; Christopher Schuh¹; ¹MIT

3:40 PM Break

4:00 PM

Phase Field Modelling of Microstructural Evolution in Titanium Alloy Welds: *David Wu¹*; Nathaniel Ng¹; Adele Lim¹; Mark Wong¹; Siu Sin Quek¹; Rajeev Ahluwalia¹; ¹Institute of High Performance Computing, A*STAR

4:20 PM

The Effect of Cooling Rate on the Microstructure and Mechanical Properties of Thin Wall Ductile Iron Castings: *Alexander Reinl¹*; ¹Michigan Technological University

4:40 PM

Using Temporary Hydride Formation in Metastable Beta Titanium Alloys to Improve the Microstructure: *Hans-Juergen Christ¹*; Vitali Macin¹; ¹University of Siegen

5:00 PM

Numerical Simulation of Solidification Microstructure with Active Fiber Cooling for Making Fiber-Reinforced Aluminum Matrix Composites: *Zhiliang Yang¹*; Bo Wang¹; Shupe Liu¹; Jie Ma¹; Wanping Pan¹; Shuai Feng¹; Liang Bai¹; Jieyu Zhang¹; ¹Shanghai University

5:20 PM

Interplay of Substrate Interaction, Electric Field and Confinement on Microphase Separation of Diblock Copolymers: *Arnab Mukherjee¹*; Rajdip Mukherjee²; Kumar Ankit³; Avisor Bhattacharya¹; Britta Nestler³; ¹Karlsruhe University of Applied Sciences; ²Indian Institute of Technology Kanpur; ³Karlsruhe Institute of Technology

Phase Transformations in Multi-component Systems: An MPMD Symposium Honoring Gary R. Purdy — Use of Advanced Tools to Understand Phase Transformations

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 Furuha, Tohoku University; Wenzheng Zhang, Tsinghua University; Christopher Hutchinson, Monash University; Robert Hackenberg, Los Alamos National Laboratory

Wednesday PM
February 17, 2016

Room: 110B
Location: Music City Center

Session Chairs: Robert Hackenberg, Los Alamos National Laboratory; Hatem Zurob, McMaster University

2:00 PM

An In-situ TEM Investigation of a Reverse Martensite Transformation in an Fe-20Ni-5.4Mn Alloy: *Frédéric Mompou¹*; Jing Wu²; *Wenzheng Zhang²*; ¹CEMES-CNRS; ²Tsinghua University

2:20 PM

Analyzing Internal Interfaces Chemistry down to the Atomic Scale: *Frederic Danoix¹*; Xavier Sauvage¹; Mohamed Goune²; Claire Debreux¹; Fabien Cuvilly¹; Thomas Sourmail³; ¹CNRS - Université de Rouen; ²ICMCB Bordeaux; ³CREAS - AscoIndustries

2:40 PM

Evolution of Mn/Cr Composition Gradients in Cementite during Annealing of DP Steels: *Marc Moreno¹*; Hugo Van Landeghem¹; Jaafar Ghanbaja¹; Julien Teixeira¹; Frédéric Bonnet²; Sébastien Allain¹; ¹Institut Jean Lamour; ²Arcelormittal

3:00 PM Break

3:20 PM Invited

Kinetics of Decomposition in Fe-Cr Alloys and Refractory Carbides: *Joakim Odqvist¹*; ¹KTH Royal Institute of Technology

3:50 PM

Segregation and Nanoscale Precipitation in Multi-component Fe-Cu Based Steel: *Zhongwu Zhang*¹; ¹Harbin Engineering University

4:10 PM

Effects of Internal Oxidation on Microstructure in Ni Alloy 600: *Brian Langelier*¹; Suraj Persaud²; Roger Newman²; Gianluigi Botton¹; ¹McMaster University; ²University of Toronto

4:30 PM

High Throughput Screening of Phase Transformation in Multi-component Ti Alloys: Kinetic Diffusion Multiple: *Bin Tang*¹; ¹Northwestern Polytechnical University

4:50 PM Concluding Comments

Powder Metallurgy of Light Metals — Additive Manufacturing of Ti and Mg and Ti Powder Metallurgy -- Microstructure and Mechanical Properties

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

Program Organizers: Zhigang Fang, University of Utah; Qian Ma, RMIT University

Wednesday PM
February 17, 2016

Room: 205C
Location: Music City Center

Session Chairs: Rajiv Tandon, Magnesium Elektron Powders; Ian Donaldson, GKN Sinter Metals LLC

2:00 PM Invited

Microstructure and Mechanical Properties of Ti-6Al-4V Additively Manufactured by Selective Electron Beam Melting: *Huiping Tang*¹; Shenglu Lu¹; Jian Wang¹; ¹Northwest Institute for Non-ferrous Metal Research

2:30 PM Invited

Advances in Additive Manufacturing of Magnesium: *Rajiv Tandon*¹; ¹Magnesium Elektron Powders

3:00 PM

Processing-structure-property Relations in Powder Metallurgy Mg₉₇Zn₁Y₂ Alloys: *R Sadangi*¹; D Kapoor²; T Zahrah³; R Tandon⁴; D Madan⁴; ¹Armament Research Development Engineering Center; ²Armament Research Development Engineering Center; ³MATSYS, Inc.; ⁴Magnesium Electron Powder Products

3:20 PM Break

3:40 PM Invited

Implementation of Titanium Powder Metallurgy for Airframe Applications: *Kathleen Chou*¹; James Cotton¹; Kevin Slattery¹; ¹The Boeing Company

4:10 PM

High Performance Titanium Alloys with Wrought-like Microstructures and Mechanical Properties Produced by Hydrogen Sintering and Phase Transformation (HSPT): *James Paramore*¹; Brady Butler²; Matt Dunstan¹; Z. Zak Fang¹; Pei Sun¹; Mark Koopman¹; ¹University of Utah; ²United States Army Research Laboratory

4:30 PM

Mechanism of Microstructural Refinement of Ti-6Al-4V during Hydrogen Sintering and Phase Transformation (HSPT): *Pei Sun*¹; Zhigang Fang¹; Mark Koopman¹; James Paramore¹; K.S. Ravi Chandran¹; ¹University of Utah, Dept. of Metallurgical Engineering

4:50 PM

Dehydrogenation Kinetics of Hydrogen Sintered Titanium: *Matt Dunstan*¹; James Paramore¹; Z. Zak Fang¹; Mark Koopman¹; Pei Sun¹; ¹University of Utah

REWAS 2016 — Understanding & Enabling Sustainability - Education Research Innovation

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. Spangenberg, Argonne National Laboratory; Diran Apelian, Worcester Polytechnic Institute; Brajendra Mishra, Colorado School of Mines; Neale Neelameggham, Ind LLC

Wednesday PM
February 17, 2016

Room: 104B
Location: Music City Center

Session Chairs: Christina Meskers, Umicore Precious Metals Refining; Bart Blanpain, KU Leuven

2:00 PM

Sustainability: Opportunities for Teaching Old Concepts via New Problems: *Gabrielle Gaustad*¹; ¹Rochester Institute of Technology

2:25 PM

The Material Life Cycle: A Steering Wheel for Europe's Raw Materials Academy: *Eric Pirard*¹; Jenny Greberg²; ¹Universite de Liege; ²Lulea University of Technology

2:50 PM

Teaching Sustainable Development and Recycling to First-Year Students -- The Ignition Point in the Academic Journey: *Diran Apelian*¹; ¹Worcester Polytechnic Institute

3:15 PM Break

3:35 PM

The Educational Aspects of Sustainability Related on Japan: *Toyohisa Fujita*¹; ¹The University of Tokyo

4:00 PM

Current State of Sustainability Education and Research for Materials Science and Engineering in Korea: *Il Sohn*¹; ¹Yonsei University

Strip Casting of Light Metals — Strip Casting: Properties

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

Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Dietmar Letzig, MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht; Jan Bohlen, Helmholtz-Zentrum Geesthacht; Murat Dundar, Assan Aluminium

Wednesday PM
February 17, 2016

Room: 203A
Location: Music City Center

Session Chairs: Murat Dundar, Assan Aluminium; Dietmar Letzig, MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht

2:00 PM Introductory Comments

2:05 PM

Substitution of Rare Earth Elements in Magnesium Alloys for the Sheet Production via Twin Roll Casting: *Gerrit Kurz*¹; Tom Petersen¹; Ibai Portugal Gonzales¹; Roland Hoppe¹; Dietmar Letzig¹; ¹Helmholtz-Zentrum Geesthacht

2:25 PM

Crystallographic Texture Development of As-cast 3105 Alloy Produced by St/Cu Shell Pair: *Hatice Mollaoglu Altuner*¹; Cemil Isiksan¹; Onur Birbasar¹; Mert Günyüz¹; Onur Meydanoglu¹; ¹Assan Alüminyum San. Tic. AS

2:45 PM

Annealing Curve of 3105 Alloy Produced by Twin Roll and Belt Casting
Method: *Dionisios Spathis*¹; John Tsiros¹; Andreas Mavroudis¹; ¹Hellenic Aluminium Industry (ELVAL SA)

3:05 PM

Effect of Heat Treatment on Tensile and Fatigue Properties of Al 3527K Alloy Manufactured by Twin Roll Strip Casting: *Min-Seok Baek*¹; Gi-Su Ham¹; Kwang-Jun Euh²; Young-Mok Rhyim²; Kee-Ahn Lee¹; ¹Andong National University; ²Korea Institute of Materials Science

3:25 PM Break

3:55 PM

Effect of As-cast Strip Thickness and Reduction Prior to Soft Annealing on the Formability of Twin-roll Cast 5754 Sheets: *Onur Meydanoglu*¹; Cemil Isiksaçan¹; Mert Günyüz¹; Onur Birbasar¹; Hatice Mollaoglu Altuner¹; ¹Assan Alüminyum San. Tic. AS

4:15 PM

Microstructure and Mechanical Properties of Ca Containing AZX310 Alloy Sheets Produced via Twin Roll Casting Technology: *Sangbong Yi*¹; Junho Park²; Dietmar Letzig¹; Oh Duck Kwon²; Karl Ulrich Kainer¹; Jae Joong Kim²; ¹Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung; ²POSCO

4:35 PM Poster Previews

Thermodynamic Applications, Optimizations and Simulations in High-Temperature Processes: An EPD Symposium in Honor of Christopher W. Bale's 70th Birthday — Database Development and Experimental Measurements

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

Wednesday PM
February 17, 2016

Room: 106A
Location: Music City Center

Session Chairs: Pekka Taskinen, Aalto University; Stephan Petersen, GTT-Technologies

2:00 PM

Thermodynamic Assessments of the Nd-Fe-B-C and Nd₂O₃-SiO₂-CaO-Al₂O₃ Systems: *Kai Tang*¹; Yuyang Bian¹; Thu Hoai Le¹; ¹SINTEF Materials and Chemistry

2:20 PM

Measurement of the Thermodynamic Properties of Rare Earth Oxide Melts: *Bradley Nakanishi*¹; Guillaume Lambotte²; Antoine Allanore¹; ¹Massachusetts Institute of Technology; ²University of Massachusetts Amherst

2:40 PM

An Experimental and Thermodynamic Investigation of the Iron Saturated FeO-B₂O₃-Nd₂O₃ System: *Lars Klemet Jakobsson*¹; Gabriella Tranell¹; In-Ho Jung²; ¹Norwegian University of Science and Technology; ²McGill University

3:00 PM

Thermodynamics of Gaseous Metal Hydroxides: A Review: *Elizabeth Opila*¹; ¹University of Virginia

3:20 PM

Searching L12 phase in Ternary and Quaternary Super Alloy Compositions (Ni-Al-Co-Ti): *Surendra Saxena*¹; Selva Vennila Raju¹; Krishna Rajan²; Rupa Dumpala³; Scott Broderick³; ¹Florida Int University; ²University at Buffalo-State University of New York; ³Iowa State University

3:40 PM Break

4:00 PM Keynote

MTDATA and the Prediction of Phase Equilibria in Oxide Systems: Thirty Years of Industrial Collaboration: *John Gisby*¹; Pekka Taskinen²; Hugh Davies¹; Zushu Li³; Jonathan Pearce¹; Jouni Pihlasalo⁴; Jim Robinson¹; Mark Tyrer⁵; ¹National Physical Laboratory; ²Aalto University; ³Tata Steel R&D; ⁴Outotec Research Center, Pori; ⁵Mineral Industry Research Organisation

4:40 PM

A New FactSage Optimization Tool and Its Application in the Assessment of Multicomponent Alkali-containing Oxide Systems: *Evgenii Nekhoroshev*¹; Sergei Decterov¹; ¹CRCT

5:00 PM

Prediction of the Thermal Conductivity of Oxide Microstructures by a New Self Consistent Thermodynamics Method Supported by First Principle Calculations: *Aimen Gheribi*¹; Chartrand Patrice¹; ¹Ecole Polytechnique de Montreal

Thermodynamic Applications, Optimizations and Simulations in High-Temperature Processes: An EPD Symposium in Honor of Christopher W. Bale's 70th Birthday — Non-Ferrous Applications II

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

Wednesday PM
February 17, 2016

Room: 106C
Location: Music City Center

Session Chairs: John Morral, The Ohio State University; Alexander Pisch, Lafarge LCR

2:00 PM Keynote

Thermochemical Modeling in Industry – A 30-Year Perspective: *R. Diemer*¹; ¹University of Delaware

2:40 PM

Use of Thermodynamic Modelling for Selection of Electrolyte for Electrowinning of Mg from Al Alloy Melts: Adam Gesing¹; *Subodh Das*¹; Raouf Loutfy²; ¹Phinix, LLC; ²MER Corporation

3:00 PM

Application of Thermodynamic Calculations on the Pyro-refining Process of High Purity Bismuth: *Mohammad-Mezbahul Islam*¹; Patrice Chartrand²; Frederic Belanger¹; In-Ho Jung³; Pascal Coursol¹; ¹5N Plus Inc.; ²Ecole Polytechnique de Montréal; ³McGill University

Ultrafine Grained Materials IX — High Pressure Torsion Studies I

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

Wednesday PM
February 17, 2016

Room: 209B
Location: Music City Center

Session Chairs: Zenji Horita, Kyushu University; Julian Rosalie, Erich Schmid Institute for Materials Science

2:00 PM Invited

High-Pressure Torsion from 1935 to 1988: *Kaveh Edalati*¹; Zenji Horita¹; ¹Kyushu University

2:30 PM Invited

Microstructure Evolution, Phase Stability and Mechanical Behavior of Ultra-fine Grained AlFeNiCuCoCr High Entropy Alloy Processed by Severe Plastic Deformation: Baolong Zheng¹; Zhiqiang Fu¹; Lilia Kurmanaeva²; Yaojun Lin³; Julia Ivanisenko⁴; Yizhang Zhou¹; Fei Chen³; Horst Hahn⁴; Lianmeng Zhang³; *Enrique Lavernia*¹; ¹University of California, Irvine; ²University of California, Davis; ³Wuhan University of Technology; ⁴Karlsruhe Institute of Technology (KIT)

3:00 PM

New Advances in High Pressure Torsion Processing: *Anton Hohenwarter*¹; Reinhard Pippan²; ¹Department of Materials Physics, Montanuniversität Leoben, Austria; ²Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

3:20 PM

Mechanical Alloying of Magnesium-manganese Alloys via High-pressure Torsion: *Julian Rosalie*¹; Zaoli Zhang¹; ¹Erich Schmid Institute for Materials Science

3:40 PM Break

4:00 PM Invited

Work-Hardening Induced Tensile Ductility of Bulk Metallic Glasses via High-Pressure Torsion: *Hyoung Seop Kim*¹; Soo Hyun Joo¹; ¹POSTECH

4:30 PM

Peculiar Mechanical Properties and Microstructures of CoCrFeNiMn High Entropy Alloy after High Pressure Torsion at 300 K and 77 K: Aleksey Podolskiy¹; Elena Tabachnikova¹; *Erhard Schafner*²; Christian Rentenberger²; Bertalan Joni³; Stefan Maier²; M. Tikhonovsky⁴; A. Tortika⁴; Tamas Ungar³; Michael Zehetbauer²; ¹B. Verkin Institute for Low Temperature Physics & Engineering; ²University of Vienna; ³Eötvös Lorand University Budapest; ⁴Kharkov Institute of Physics and Technology

4:50 PM

Substantially Reduced Elastic Modulus in Nanocrystalline Tantalum Processed by High Pressure Torsion: Jonnathan Ligda¹; Brian Schuster¹; Laszlo Kecskes¹; *Qiuming Wei*²; ¹US-ARL; ²University of North Carolina at Charlotte

Ultrafine Grained Materials IX — Powder Processing Studies

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

Program Organizers: Suveen Mathaudhu, University of California Riverside; Irene Beyerlein, 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

Wednesday PM
February 17, 2016

Room: 209A
Location: Music City Center

Session Chairs: Raj Sadangi, U.S. Armament Research Development Engineering Center; Deliang Jiang, Shanghai Jiao Tong University

2:00 PM Invited

Recrystallization during Thermomechanical Consolidation of Nanostructured Metallic and Metal Matrix Nanocomposite Powders: *Deliang Zhang*¹; Dengshan Zhou¹; Jiamiao Liang¹; Xun Yao¹; Yifeng Zheng¹; ¹Shanghai Jiao Tong University

2:30 PM

Deformation Behavior of Ultrafine Grained Tungsten from Powder Metallurgy Processes: *Brady Butler*¹; Tomoko Sano¹; Jonathan Ligda¹; ¹U.S. Army Research Laboratory

2:50 PM

Microstructure and Mechanical Properties of AA5083 Produced through Cryogenic Attrition and HIP: *Clara Hofmeister*¹; Le Zhou¹; Frank Kellogg²; Anit Giri³; Tony Zahrah⁴; Kyu Cho⁵; Yongho Sohn¹; ¹University of Central Florida; ²Bowhead Science and Technology; ³TKC Global; ⁴Matsys Inc; ⁵U.S. Army Research Laboratory

3:10 PM

Consolidation of Copper/Copper Oxide Nanoparticles by Spark Plasma Sintering: *Takahiro Kunimine*¹; Hisashi Sato²; Motoko Yamada²; Yoshimi Watanabe²; Nobuhiro Tsuji¹; ¹Kyoto University; ²Nagoya Institute of Technology

3:30 PM Break

3:50 PM Invited

Elevated Temperature Mechanical Behavior of Cryomilled UFG Al-Cu-Mg-Ag Alloys: *Troy Topping*¹; Lilia Kurmanaeva²; Hanry Yang³; Julie Schoenung⁴; Enrique Lavernia⁴; ¹California State University, Sacramento; ²University of California, Davis; ³Washington State University; ⁴University of California, Irvine

4:20 PM

Study of Sm-Fe Alloy Powders Prepared by Cryomilling in Liquid Nitrogen: *Bin Yang*¹; ¹University of Science and Technology Beijing

4:40 PM

Solid Hydrocarbon Assisted Reduction: A Novel Approach to Generation of Sub-micron and Nano-metal Particles: *Jonathan Phillips*¹; ¹Naval Postgraduate School

5:00 PM

Mechanical Behavior of UFG-Al/B4C Composites Tubes Produced by Severe Plastic Deformation Consolidation of Powders: *Hamid Alihosseini*¹; Kamran Dehghani¹; ¹Amirkabir University of Technology

5:20 PM

Effect of Process Control Agents on Composition, Structure, and Properties of Mechanically Alloyed Powders: *R. Sadangi*¹; D Kapoor²; T Zahrah³; ¹Armament Research Development Engineering Center; ²Armament Research Development Engineering Center; ³MATSYS Inc

7th International Symposium on High Temperature Metallurgical Processing — Characterization and Simulation of High Temperature Process

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

Thursday AM
February 18, 2016

Room: 105B
Location: Music City Center

Session Chairs: Baojun Zhao, The University of Queensland; Tarasankar DebRoy, The Pennsylvania State University

8:30 AM Introductory Comments

8:35 AM

Heat and Fluid Flow Modeling to Examine 3D-Printability of Alloys: Tuhin Mukherjee¹; James Zuback¹; Amitava De¹; *Tarasankar DebRoy*¹; ¹The Pennsylvania State University

8:55 AM

Characterization of Iron-bearing Dust Pellet in Composite Agglomeration Process (CAP): Zhuyin Chen¹; Bingbing Liu¹; Chen Liu¹; Xiao Kang¹; Yuanbo Zhang¹; ¹Central South University

9:15 AM

Evaluation of Heat Flow and Thermal Stratification in a Steelmaking Ladle through Mathematical Modelling: *Varadarajan Seshadri*¹; Izabela Duarte²; Itavahn Alves da Silva²; Carlos Antonio da Silva²; ¹Universidade Federal de Minas Gerais; ²Universidade Federal de Ouro Preto

9:35 AM

Viscous and Crystallization Characteristics of CaO-SiO₂-MgO-Al₂O₃-FeO-P₂O₅-(CaF₂) Steelmaking Slags: *Zhanjun Wang*¹; Zuotai Zhang²; Yongqi Sun²; Min Guo¹; Mei Zhang¹; ¹University of Science and Technology Beijing; ²Peking University

9:55 AM

Microstructure and Texture Evolution of Different High Manganese Cast Steels during Hot Deformation and Subsequent Treatment: Mohammad Masoumi¹; *Waydson Ferreira*¹; Hamilton de Abreu¹; ¹Universidade Federal do Ceara

10:15 AM Break

10:30 AM

Online Temperature Measurement System for Process Control and Endpoint Detection: Goran Vukovic¹; *Klaus Gamweger*¹; Bojan Zivanovic¹; Bob Drew¹; ¹RHI AG

10:50 AM

Dynamic Thermal Simulation Study of Copper Slag Dilution under Direct Current Field: *Zhang Jing*¹; Sun Ying¹; Li Qiuju¹; ¹Shanghai University

11:10 AM

Analysis of Turbulence at the Metal / Slag Interface in the Meniscus Region of a Continuous Casting Mold through Physical and Mathematical Modelling: *Varadarajan Seshadri*¹; Jose de Arruda²; Amanda Arruda²; Samuel de Souza²; Carlos Antonio da Silva²; Itavahn Alves da Silva²; ¹Universidade Federal de Minas Gerais; ²Universidade Federal de Ouro Preto

11:30 AM

Computer Simulation of Copper Smelting with FCS Slags: *Chen Wang*¹; ¹Central South University

11:50 AM

Study on the Properties and Damage Analysis on the Lining Used in Cooling Section of Coke Dry Quench Furnaces: *Guotao Xu*¹; ¹Wuhan Iron and Steel Group Company

7th International Symposium on High Temperature Metallurgical Processing — Utilization of Complex Ores

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

Thursday AM

February 18, 2016

Room: 105A

Location: Music City Center

Session Chairs: Varadarajan Seshadri, Universidade Federal de Minas Gerais; Guanghui Li, Central South University

8:30 AM Introductory Comments

8:35 AM

Characterization of Sulfidation Roasting of an Iron-rich Manganese Oxide Ore with Elemental Sulfur: Tao Jiang¹; Li Qin¹; Zhixiong You¹; Yuanbo Zhang¹; *Guanghui Li*¹; ¹School of Minerals Processing and Bioengineering, Central South University

8:55 AM

Research on Recovering Iron Oxide from the Iron, Tin-bearing Tailings: Jun Chen¹; Zijian Su¹; *Yuanbo Zhang*¹; Yingming Chen¹; Bingbing Liu¹; ¹Central South University

9:15 AM

A Study on the Characterization of Nickel Laterites of Central Anatolia: *Ender Keskinilic*¹; Saeid Pournaderi²; Ahmet Geveci³; Yavuz A. Topkaya³; ¹Atilim University; ²Karadeniz Technical University; ³Middle East Technical University

9:35 AM

Recovery of Powdered Metallic Iron from Ludwigite Ore via Reductive Roasting with Sodium Salts-Magnetic Separation: *Guanghui Li*¹; Huanpeng Mi¹; Binjun Liang¹; Zhiwei Peng¹; Yuanbo Zhang¹; Tao Jiang¹; ¹School of Minerals Processing and Bioengineering, Central South University

9:55 AM

Selective Reduction of TiO₂-SiO₂ in the Preparation of Titanium Oxycarbide through Carbothermal Reduction of Titanium Raw Materials: *Jiusan Xiao*¹; Bo Jiang¹; Kai Huang¹; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

10:15 AM Break

10:30 AM

Kinetic Study on the Pyrolysis of Low Grade Coals: *Ruiling Du*¹; ¹University of Science and Technology Beijing

10:50 AM

Salt Roasting of Nickel Sulfide Concentrate Using KCl: *Changyuan Lu*¹; xingli zou¹; Xionggang Lu¹; ¹Shanghai University

11:10 AM

Research on Leaching of Zinc Sulfide Ores through Synergistic Coordination: *Kun Yang*¹; Shiwei Li¹; Jinhui Peng¹; Libo Zhang¹; Aiyuan Ma¹; Weiheng Chen¹; Feng Xie¹; ¹Kunming University of Science and Technology