

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Carbon Nanomaterials II & Computational Studies on Nanomaterials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Wednesday AM
February 19, 2014

Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Yuanbing Mao, University of Texas - Pan American; Ramki Kalyanaraman, University of Tennessee; Nitin Chopra, The University of Alabama

8:30 AM Invited

Microwave Irradiation Enables Rapid and Direct Dispersion of Highly Conductive Carbon Nanomaterials: *Huixin He*¹; ¹Rutgers University

9:00 AM

Controlling Oxidative Cutting for Graphene Nanosheets or Graphene QDs: *Huixin He*¹; ¹Rutgers University

9:20 AM

Interaction of Graphite with Molten Salts to Form Novel Structures: Ali Kamali¹; *Derek Fray*¹; ¹University of Cambridge

9:40 AM Invited

Effective Thermal Transport Properties of Multifunctional Nanocomposite Materials: *V. U. Unnikrishnan*¹; ¹The University of Alabama

10:10 AM Break

10:30 AM

High Strength, High Conductivity of Wire-drawn Cu-Ag Nanometric Filamentary Composites: *Artur Kawecki*¹; *Tadeusz Knych*¹; *Eliza Sieja-Smaga*¹; *Andrzej Mamala*¹; *Pawel Kwasniewski*¹; *Grzegorz Kiesiewicz*¹; ¹AGH University of Science and Technology

10:50 AM Invited

Extending Bulk CALPHAD Methods to Interfaces and Nanomaterials to Help Decipher the “Materials Genome”: *Jian Luo*¹; *Naixie Zhou*¹; ¹UC San Diego

11:20 AM

Computational Study of the Directed Self-assembly of Porous Thin-film Membranes with Colloidal Particle Coated Channels: *Paul Millett*¹; ¹University of Arkansas

11:40 AM

Reactive Molecular Dynamics Simulations of Switching in Conductive Bridge Random Access Memory: *Nicolas Onofrio*¹; *David Guzman*¹; *Alejandro Strachan*¹; ¹Purdue University

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanometals II-Processing and Strengthening Mechanisms

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nugehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Wednesday AM
February 19, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Evan Ma, Johns Hopkins University; Suveen Mathaudhu

8:30 AM Invited

Superior Strength in Bulk Nanostructured Metallic Materials Produced by SPD Processing: *Ruslan Valiev*¹; *Nariman Enikeev*¹; *Sergei Firstov*²; ¹Ufa State Aviation Technical University; ²Frantsevich Institute for Problems of Materials Science

8:50 AM

Dynamic Strain Aging in Ultrafine Grained Titanium: *Felipe Lopes*¹; *Sergio Monteiro*¹; *Daniel Fernandes*¹; *Carlos Elias*¹; *Chia-Hui Lu*²; *Ruslan Valiev*³; *Marc Meyers*²; ¹IME; ²UC San Diego; ³Ufa State Aviation Technical University

9:10 AM Invited

Generation of Bulk Nanocomposites and Supersaturated Solid Solutions by Severe Plastic Deformation: *Andrea Bachmaier*¹; *Anton Hohenwarter*²; *Reinhard Pippan*³; ¹Saarland University; ²University of Leoben; ³Austrian Academy of Sciences

9:30 AM Invited

Crystallization of Metallic Glasses to Produce Nanostructured Materials: *Ken Kelton*¹; ¹Washington University

9:50 AM Break

10:10 AM Invited

Industrially Useful Nanostructured Molybdenum Alloys with Unprecedented Tensile Ductility: *Evan Ma*¹; ¹Johns Hopkins University

10:30 AM Invited

High-strength Low-alloyed Zinc Processed by High-pressure Torsion: *Javier Gil Sevillano*¹; *Tobias Zühlke*¹; *Jon Iglesias Erasquin*¹; *Jon Alkorta*¹; *Heinz Werner Höppel*²; *Mathias Göken*²; ¹CEIT and TECNUN, University of Navarra; ²University of Erlangen-Nuremberg

10:50 AM Invited

Finding Strength in Our Faults: Extreme Strengthening of Mg-alloys via Nano-spaced Stacking Faults: *Weiwei Jian*¹; *Weizhong Xu*¹; *Hao Yuan*¹; *Ming-Hung Tsai*¹; *Carl Koch*¹; *Yuntian Zhu*¹; *Suveen Mathaudhu*²; ¹North Carolina State University; ²U.S. Army Research Office

11:10 AM Invited

Microstructural and Geometrical Size Scale Effects in Shape Memory Alloys: *Raj Vaidyanathan*¹; ¹UCF

11:30 AM

Grain Size Effect on Deformation Physics of Nanostructured Materials: *Yuntian Zhu*¹; *Guangming Cheng*¹; *Xiaozhou Liao*²; *Xiaolei Wu*³; ¹North Carolina State University; ²University of Sydney; ³Chinese Academy of Sciences



5th International Symposium on High Temperature Metallurgical Processing — Sintering of Ores and Powder

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

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Wednesday AM Room: 18
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Guanghui Li, Central South University; Xuewei Lv, Chongqing University

8:30 AM Introductory Comments

8:35 AM Invited

Microwave Sintering of Pressurized Ceramics: *M. Ashraf Imam*¹; Arne Fliflet¹; Benjamin Rock¹; ¹Naval Research Laboratory

8:50 AM

Microscopic Mechanisms of Spark Plasma Sintering in a TiAl Alloy: *Zofia Trzaska*¹; Alain Couret¹; Jean-Philippe Monchoux¹; ¹CEMES/CNRS

9:05 AM

Effects of Fuel's Distribution on NOx Emissions in Iron Ore Sintering: Xiaohui Fan¹; Wei Lv¹; Min Gan¹; Xuling Chen¹; Zhiyuan Yu¹; Jian Wang¹; Yang Zhou¹; Qiang Chen¹; ¹Central South University

9:20 AM

Study on the Metallurgical Performances of Typical Manganese Ores: *Yuanbo Zhang*¹; Yongjian Zhang¹; Zhixiong You¹; Yi Zhao¹; Guanghui Li¹; Tao Jiang¹; ¹Central South University

9:35 AM

Comprehensive Emission Reduction of Sintering Exhaust Gas Pollutant with Addition of Urea: *Hongming Long*¹; ¹Anhui University of Technology

9:50 AM

Fabrication of Al-Si Alloys by Microwave Sintering: *Lei Xu*¹; Mi Yan¹; Yi Xia¹; Jinhui Peng¹; Wei Li¹; Libo Zhang¹; Chenhui Liu¹; Yun Li¹; ¹Kunming University of Science and Technology

10:05 AM Break

10:15 AM

Influence of Limestone Types on Iron Ore Sintering: Xuling Chen¹; *Qiang Chen*¹; Min Gan¹; Xiaohui Fan¹; Zhiyuan Yu¹; Zhiyun Ji¹; Jian Wang¹; Yang Zhou¹; ¹Central South University

10:30 AM

Effect of Aluminum Oxide on Compressive Strength of Pellets and its Mechanism Analysis: Zhang Jianliang¹; *Wang zhenyang*¹; Xing xiangdong¹; Liu zhengjian¹; ¹University of Science and Technology Beijing

10:45 AM

Process Optimization of Removing Chlorine of Zinc Dross Using Microwave Roasting: *Lu Shuaidan*¹; ¹School of Materials and Metallurgy, Northeastern University

11:00 AM

Physico-chemical Properties and Sintering Performance of Canadian Iron Concentrate: Jian Pan¹; Benjing Shi¹; *Deqing Zhu*¹; Xiaobo Li¹; ¹Central South University

11:15 AM

Study of Pre-granulation for High Proportion Iron Ore Concentrate Sintering: Xuling Chen¹; Jian Wang¹; Xiaohui Fan¹; Min Gan¹; Yang Zhou¹; Wei Lv¹; Qiang Chen¹; Zhiyuan Yu¹; ¹Central South University

11:30 AM

The Influence of Al₂O₃ Content on Sinter Softening and Melting Properties: *Fanyi Meng*¹; Zhe Wang¹; Jianliang Zhang¹; ¹University of Science and Technology of Beijing

11:45 AM

Influence of B₂O₃ on Phases and Metallurgical Properties of High Ti-bearing Vanadium-titanomagnetite Sinter: *Shan Ren*¹; Jianliang Zhang¹; Xiangdong Xing¹; Zhe Wang¹; Bingji Yan¹; Kexin Jiao¹; ¹University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Boyer Honorary Session I: Environmental Effects

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Wednesday AM Room: 1A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: James Cotton, Boeing; Jaimie Tiley, Air Force Research Laboratory

8:30 AM Invited

The Effect of Hydrogen on the Fracture Toughness of Ti-5Mo-5V-5Al-3Cr: *James Cotton*¹; David Bryan²; Thomas Bayha²; Peter Hellenbrand¹; Michael Leder³; Igor Levin³; ¹Boeing; ²ATI Allvac; ³VSMPO-AVISMA

9:00 AM

Stress Corrosion Cracking Threshold of Ti 6-4 Extrusions: *Robert Briggs*¹; ¹Boeing

9:20 AM

An Atom per Square Mile: On the Mechanisms of Stress Corrosion Cracking in Titanium: *Adam Pilchak*¹; James Williams²; ¹Air Force Research Laboratory; ²The Ohio State University

9:40 AM

Protection of Ti-alloys against High Temperature Environmental Attack by a Two Step Process, Aluminization + Fluorination: *Alexander Donchev*¹; Michael Schütze¹; Mathias Galetz¹; Rossen Yankov²; Andreas Kolitsch²; ¹DFI; ²HZDR

10:00 AM Break

10:15 AM Invited

Microstructural and Environmental Effects on Very High Cycle Fatigue Crack Formation in Ti-6242: *Jason Geathers*¹; Chris Torbet²; J. Wayne Jones¹; Samantha Daly¹; ¹University of Michigan; ²University of California-Santa Barbara

10:35 AM

Environmentally Assisted Crack Nucleation in Ti-6246: *Tamara Chapman*¹; Richard Chater¹; Adrian Walker²; Trevor Lindley¹; David Dye¹; ¹Imperial College London; ²Rolls-Royce plc

10:55 AM

Welding of Ti-6Al-4V in Air: Carsten Schwandt¹; Chris Allen²; *Derek Fray*¹; ¹University of Cambridge; ²TWI Ltd

11:15 AM

Joining Characteristics of ATI 425 Alloy- Microstructural and Mechanical Property Developments: *Luis Ruiz-Aparicio*¹; ¹ATI Aerospace

11:35 AM

Understanding the Effect of Impurities (O, C, Fe, Cl and P) on the Microstructural Development of Powder Metallurgy Titanium and Titanium Alloys: *Ma Qian*¹; Ming Yan; ¹The University of Queensland

11:55 AM

Vacuum and Color Etching for Titanium Alloys: *Olga Sergienko*¹; ¹Zaporozhye National Technical University

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Irradiation Studies in Reactors

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Wednesday AM
February 19, 2014

Room: 32B
Location: San Diego Convention Center

Session Chair: Peter Hosemann, University of California Berkeley

8:30 AM

Irradiation Effects in Aged Cast Duplex Stainless Steels: *Yong Yang*¹; Yiren Chen²; Janne Pakarinen³; ¹University of Florida; ²Argonne National Laboratory; ³University of Wisconsin-Madison

9:10 AM

Microstructural Characterization of Test Reactor Irradiated RPV Steels by Post-irradiation Annealing and State-of-the-art Characterization Tools: *Takuya Yamamoto*¹; Takeshi Toyama²; Peter Wells¹; Yasuyoshi Nagai²; G. Robert Odette¹; ¹University of California Santa Barbara; ²Tohoku University

9:30 AM

Grain Boundary Structure Effects on Radiation Induced Segregation in Neutron Irradiated Type 304 Stainless Steels Variants: *Kevin Field*¹; Lizhen Tan¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

9:50 AM

Grain Orientation Dependence of Deformation Twinning in Irradiated and Nonirradiated Austenitic Stainless Steels: *Thak Sang Byun*¹; Maxim Gussev¹; Kevin Field¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

10:10 AM Break

10:30 AM

On the Opportunities and Challenges for Using Test Reactor and Charged Particle Irradiations to Help Predict Inaccessible In-service Neutron Irradiations Effects: *G. Robert Odette*¹; Takuya Yamamoto¹; Peter Wells¹; Peter Hosemann²; ¹University of California Santa Barbara; ²University of California Berkeley

11:10 AM

Microstructure and Mechanical Property Studies on Neutron-irradiated Ferritic FeCr Model Alloys: *Wei-Ying Chen*¹; Yinbin Miao¹; Carolyn Tomchik¹; Kun Mo¹; Jian Gan²; Maria Okuniewski²; Y.Q. Wu³; Stuart Maloy⁴; James Stubbins¹; ¹U of Illinois at Champaign-Urbana; ²Idaho National Laboratory; ³Boise State University; ⁴Los Alamos National Laboratory

11:30 AM

Helium Behaviour in Ferritic/Martensitic Steels Irradiated in a Spallation Target and Implanted with Helium: *Vladimir Krsjak*¹; Veronika Sabelova²; Christiane Vieh¹; Yong Dai¹; ¹Paul Scherrer Institut; ²Slovak University of Technology

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Strain and Plasticity II

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

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

Wednesday AM
February 19, 2014

Room: 8
Location: San Diego Convention Center

Session Chairs: Tom Bieler, Michigan State; Khalid Hattar, Sandia National Laboratory

8:30 AM Invited

Local Elastic Strain and Strain Tensor Measurements of Deformed Metals Using Focused, Sub-micrometer X rays: *Lyle Levine*¹; I-Fang Lee²; Thien Phan²; Chukwudi Okoro¹; Ruqing Xu³; Jon Tischler³; Wenjun Liu³; Michael Kassner²; ¹National Institute of Standards and Technology; ²University of Southern California; ³Argonne National Laboratory

9:00 AM Invited

Strain Mapping at Multiple Length Scales: Experimentally Validated Predictive Modelling: *Brian Abbey*¹; ¹Worcester Polytechnic Institute

9:30 AM Invited

Using High Energy X-ray Diffraction and a Crystal-based Finite Element Model to Understand Fatigue Crack Initiation: *Matthew Miller*¹; Paul Dawson¹; Mark Obstalecki¹; Su Leen Wong¹; ¹Cornell University

10:00 AM Break

10:20 AM

Use of High Energy Diffraction Microscopy to Study the Elasto-plastic Transition and Stress Relaxation: *Armand Beaudoin*¹; Wenli Tang¹; Margaret Koker²; Ulrich Lienert³; Peter Kenesei⁴; ¹University of Illinois at Urbana-Champaign; ²Cornell University; ³Deutsch Elektronen Synchrotron DESY; ⁴Argonne National Laboratory

10:40 AM

Coupling of Electron Channelling Contrast Imaging with EBSD: New Perspectives into the Characterization of Deformation Structures in the SEM: *Ivan Gutierrez-Urrutia*¹; Dierk Raabe¹; ¹Max-Planck-Institut for Iron Research

11:00 AM

Characterization of the Deformation Mechanisms in Fe-Mn Austenitic Steels Using Aberration-corrected Transmission Electron Microscopy: *James Wittig*¹; Dean Pierce¹; Linda Mosecker²; Maryam Beigmohamadi³; Joachim Mayer⁴; ¹Vanderbilt University; ²Institute for Eisenhüttenkunde, RWTH University; ³Gemeinschaftslabor für Elektronenmikroskopie, RWTH University; ⁴Ernst Ruska Center

11:20 AM

Slip and Orientation Change during In Situ Testing of Micro-tensile Samples of BCC Fe: *Dhriti Bhattacharyya*¹; Robert Wheeler²; Robert Harrison¹; Lyndon Edwards¹; ¹ANSTO; ²Micro Testing Solutions LLC



Advances in Surface Engineering: Alloyed and Composite Coatings III — Joint Session I: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings

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

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carradó, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Wednesday AM Room: 1B
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Roger Narayan, University of North Carolina and North Carolina State University; Sandip Harimkar, Oklahoma State University

8:30 AM Invited

Development of Titanium/Polymer Systems for Biomedical Applications: Heinz Palkowski¹; Mohamed Harharsh²; Genevieve Pourroy³; Patrick Masson³; Pierre Lutz⁴; Adele Carradó³; ¹Clausthal University of Technology; ²Clausthal University of Technology; ³IPCMS, UMR 7504 UDS-CNRS; ⁴ICS UPR22-CNRS

8:55 AM

Mechanical and Microstructural Evaluation of Laser Assisted Cold Sprayed Coatings for Potential Use in Biomedical Applications: Monnamme Tlotleng¹; Mukul Shuklar²; Esther Akinlabi³; Sisa Pityana⁴; ¹Council for Scientific and Industrial Research; ²Motilal Nehru National Institute of Technology Allahabad; ³University of Johannesburg

9:10 AM

Blood-compatibility Characteristics for Biocompatible Artificial Lungs: Narayana Garimella¹; ¹University of Maryland Baltimore

9:25 AM

Study of the Extent of Denaturation in Electrospun Collagen: Amir Hossein Rajabi Zamani¹; Eric Winters¹; George Collins¹; Treena Livingston Arinze¹; Michael Jaffe¹; ¹New Jersey Institute of Technology

9:40 AM

Stiffness Graded Titanium Obtained by Laser Surface Alloying: Lisiane Carvalho¹; Adilson Rodrigues¹; Milton Lima²; João Fogagnolo¹; ¹University of Campinas; ²Instituto de Estudos Avançados

9:55 AM

Mechanical Characterization of Anodic Zirconium Oxide Nanotubular Arrays on Zirconium: Luning Wang¹; Ming Jin¹; Zhou Yang¹; Jingli Luo²; ¹University of Science and Technology Beijing; ²University of Alberta

10:10 AM Break

10:20 AM Invited

Enhancing the Toughness of Ceramic-based Multilayer Coatings by Introducing Polymer Interface: Xi-Ming Yang¹; Tsung-Hao Hsu¹; Yu-Chen Chan¹; Chang-Yu Sun¹; Jenq-Gong Duh¹; Po-Yu Chen¹; ¹National Tsing Hua University

10:45 AM

Double Layer Multifunctional Zn-Ni-P Coatings for Anticorrosive Applications: Ionut Constantin¹; Vasile Soare¹; Marian Burada¹; Dumitru Mitrica¹; Daniela Dumitrescu¹; Petru Moldovan²; Ana-Maria Popescu³; ¹National R&D Institute for Nonferrous and Rare Metals; ²Polytechnic University of Bucharest; ³Institute of Physical Chemistry

11:00 AM

Characterization of Graphite Coatings Produced by CoBlast™ Technology: Atinuke Oladoye¹; James Carton²; Abdul Olabi³; ¹Dublin City University; ²EnBio Ltd.; ³University of the West of Scotland

11:15 AM

Analysis of Corrosion Resistant Laser Assisted Cold Sprayed Titanium Coatings: Effects of Process Parameters: Eytayo Olakanmi¹; Monnamme Tlotleng²; Tebogo Mathebula²; Khoro Malabi²; Herman Burger²; Mulalo Doyoyo¹; ¹University of Johannesburg; ²Council for Scientific and Industrial Research

11:30 AM

Research on Modification of Anti-oxidation Coating for Steel Billet: Chen Sheng¹; ¹Wuhan Iron and Steel Co.

11:45 AM

Nanotubes Growth on Titanium Based Alloys for Biomedical Applications: Ana Paula Rosifini Alves Claro¹; Ana Lúcia Escada¹; Patricia Capellato¹; Andre Luis Seixas Rangel¹; ¹UNESP

Algorithm Development in Computational Materials Science and Engineering — Algorithms for General Materials Modeling and Integrating Experiments: Part I

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

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Wednesday AM Room: 31B
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Mohsen Asle Zaeem, Missouri University of Science and Technology; Terry Delph, Lehigh University

8:30 AM Invited

Calculating Wear Coefficients from Microscale Simulations: Michael Demkowicz¹; Areg Hayrapetian¹; ¹Massachusetts Institute of Technology

9:10 AM

GPU Simulations of Fracture in Bioinspired Brick and Mortar Composites: John Pro¹; Matt Begley¹; Linda Petzold¹; Marcel Utz²; Rone Lim¹; ¹University of California, Santa Barbara; ²University of Southampton

9:30 AM

Defect Nucleation in Crystals: Terry Delph¹; Jonathan Zimmerman²; Harold Park³; ¹Lehigh University; ²Sandia National Laboratory; ³Boston University

9:50 AM

Diffuse Interface Field Approach to Modeling and Simulation of Packing of Arbitrarily Shaped Particles with Friction: Fengde Ma¹; Yu Wang¹; ¹Michigan Technological University

10:10 AM Break

10:30 AM

Automatic Differentiation for Numerically Exact Computation of Tangent Operators in Small- and Large-deformation Computational Inelasticity: Qiushi Chen¹; Jakob Ostien²; Glen Hansen²; ¹Clemson University; ²Sandia National Laboratories

10:50 AM

Microstructure-sensitive Modelling of Void Nucleation in Single-phase Polycrystalline Materials: Evan Lieberman¹; Anthony Rollett¹; Edward Kober²; Ricardo Lebensohn²; ¹Carnegie Mellon University; ²Los Alamos National Laboratory

11:10 AM

Frictional Effects of Granular Material under Shock Loading: Efrem Vitali¹; Eric Herbold¹; ¹LLNL

11:30 AM

Topological Characterization of 3D Microstructures with Diffuse Interfaces: Trevor Keller¹; Daniel Lewis¹; ¹Rensselaer Polytechnic Institute

Alloys and Compounds for Thermoelectric and Solar Cell Applications II — Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Chih-Huang Lai, National Tsing Hua University; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hubert Scherrer, Ecole des Mines; Hsin-jay Wu, National Tsing Hua University

Wednesday AM Room: Cardiff
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Takao Mori, National Institute for Materials Science (NIMS); G. Snyder, California Institute of Technology

8:30 AM Invited

Functional Metallurgy: A Powerful Approach to Design Thermoelectric Materials: *Stephane Gorsse*¹; Philippe Bellanger¹; Solange Vivès¹; Yves Bréchet²; ¹ICMCB-CNRS; ²SIMAP

8:55 AM Invited

Development of Novel Refractory Compounds as Thermoelectric Materials: *Takao Mori*¹; ¹National Institute for Materials Science (NIMS)

9:20 AM

Potential of High Thermoelectric Efficiency of Silver Selenide: *Tristan Day*¹; Fivos Drymiotis¹; Tiansong Zhang²; Daniel Rhodes³; Xun Shi²; Lidong Chen²; G. Snyder¹; ¹California Institute of Technology; ²Shanghai Institute of Ceramics; ³Florida State University

9:40 AM

Three-dimensional Nanoscale Characterization of PbTe Based Thermoelectric Materials Using Ultraviolet Laser-assisted Atom-probe Tomography: *Yoon-Jun Kim*¹; David Seidman¹; Shih-Han Lo¹; Changqiang Chen¹; Lidong Zhao¹; Rachel Korkosz¹; Vinayak Dravid¹; Mercouri Kanatzidis¹; ¹Northwestern University

10:00 AM

Evaluation of Shear Strength on Pb-free Solder/Diffusion Barrier/Bi₂Te₃ Thermoelectric System: *Neng-I Lin*¹; Ting-Chung Chen¹; Chien-Hsuan Yeh²; Albert T. Wu¹; ¹National Central University; ²Green Energy and Environment Research Laboratories, Industrial Technology Research Institute

10:20 AM Break

10:30 AM Invited

Enhanced Thermoelectric Properties by Nanominiaturization and Elemental Doping: Gang Li¹; Hongliang Liu¹; Feipeng Zhang¹; Ran Zhao¹; Yanqin Liu¹; Qingmei Lu¹; Xin Zhang¹; Jiuxing Zhang¹; Yutian Shu¹; *Fu Guo*¹; ¹Beijing University of Technology

10:55 AM Invited

Chalcogenides as Thermoelectric: New Materials and New Processes: *Franck Gascoin*¹; ¹CRISMAT Laboratory

11:20 AM

Effect of Non-stoichiometry on the Microstructures, Phases and Thermoelectric Properties of Pseudo-binary AgSbSe₂-AgSbTe₂ System: *Hsin-Jay Wu*¹; Sinn-wen Chen¹; ¹National Tsing Hua University

11:40 AM

Interfacial Evolution between Pure Ni Foil Diffusion Barrier and PbTe Based Thermoelectric Materials for Thermoelectric Module Applications: *Haiyang Xia*¹; Fivos Drymiotis²; G Jeffrey Snyder²; Cheng-Lung Chen³; Aiping Wu¹; ¹Tsinghua University; ²California Institute of Technology; ³Academia Sinica

Alumina and Bauxite — Non-bayer Process

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

Wednesday AM Room: 15B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Hugues Tremblay, Hatch

8:30 AM Introductory Comments

8:35 AM

Tests on Comprehensive Recovery of Iron Minerals and Bauxite from High Iron Diasporic Bauxite by Medium Temperature Metal-based Roasting: *Sichun Hu*¹; Henqing Zhao¹; Min Guo¹; ¹Zhengzhou Institute of Multipurpose Utilization of Mineral Resources, Chinese Academy of Geological Sciences

8:55 AM

The Influence of Mineral Composition of Low-grade Aluminum Ores on Alumina Extraction by Acid Leaching: *Andrey Panov*¹; Alexander Suss¹; Alexander Damaskin¹; Alexander Senyuta¹; ¹RUSAL Engineering & Technology Centre

9:20 AM

Dry Sintering of Nepheline - A New More Energy Efficient Technology: *Sine Bogh Skaarup*¹; Victor M. Sizyakov²; Victor V. Volkov³; Yuriy A. Gordeyev³; ¹FLSmidth; ²St. Petersburg National Mineral Resources University; ³Closed Corporation "Pikalevo Soda"

9:45 AM

A Study on Sintering Process Optimization of Alumina Attraction from Fly Ash: Yongfeng Xiao¹; *Qi Sun*¹; Baodong Wang¹; Xiaoting Liu¹; Xiaohuan Wang¹; Lijun Zhao¹; Gengzhi Yu¹; ¹National Institute of Clean-and-Low-Carbon Energy (NICE)

10:10 AM Break

10:25 AM Introductory Comments

10:30 AM

Effect of Pressure on Alumina Extraction from Low-grade Bauxite by Acid-leaching Method: *Yusheng Wu*¹; laishi li²; ¹Shenyang University of Technology; ²Shenyang Alumina and Magnesium Engineering and Research Institute

10:55 AM

Extraction of Alumina from Coal-derived Pyrite Flotation Tailing by Pre-desilication-bayer Process: Jun Luo¹; Mingjun Rao¹; Mingxia Liu¹; *Guanghui Li*¹; Tao Jiang¹; ¹School of Minerals Processing and Bioengineering, Central South University

11:20 AM

Extracting Alumina from Low Grade Bauxite with Ammonium Bisulfate Leaching: *Laishi Li*¹; Yusheng Wu²; Yingying Liu¹; ¹Shenyang Aluminum & Magnesium Engineering & Research Institute Co., Ltd.; ²Shenyang University of Technology

11:45 AM

Hydrochemical Method of Low-quality Raw Materials Processing to Alumina: Vladimir Kazakov¹; *Vadim Lipin*²; ¹St. Petersburg State Technologic University of Plant Polymers; ²Saint Petersburg State Polytechnical University



Aluminum Alloys: Development, Characterization and Applications — Corrosion and Fatigue

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
 Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Wednesday AM Room: 12
 February 19, 2014 Location: San Diego Convention Center

Session Chair: Tongguang Zhai, University of Kentucky

8:30 AM

A New Approach for Evaluation of Fatigue Life of Al Wire Bonds in Power Electronics: *Golta Khatibi*¹; Martin Lederer¹; Bernhard Czerny¹; Agnieszka Betzwar Kotas¹; Brigitte Weiss¹; ¹University of Vienna

8:50 AM

Aluminum Sensitization and the Navy: *William Golumbfskie*¹; ¹Naval Surface Warfare Center, Carderock Division

9:10 AM

Microstructural and Stress influence on Sensitization of 5xxx Alloys: *William Golumbfskie*¹; Jennifer Gaies¹; Nicholas Jones¹; Mitra Taheri²; ¹Naval Surface Warfare Center, Carderock Division; ²Drexel University

9:30 AM

Long and Small Fatigue Crack Growth in Aluminum Alloys: *Anthony Spangenberg*¹; Anastasios Gavras¹; Diana Lados¹; ¹Worcester Polytechnic Institute, Integrative Materials Design Center

9:50 AM

Welded Aluminum 6061: The Effect of Corrosion on Yield Strength: *Holly Martin*¹; Chris Horstemeyer²; Weiwei Song²; Wilburn Whittington²; Scott Turnage²; Radu Florea²; Jenna Grantham²; Ayesha Hicks²; Hongjoo Rhee²; Roger King²; ¹Chemical Engineering, Youngstown State University; ²Center for Advanced Vehicular Systems, Mississippi State University

10:10 AM Break

10:25 AM

Alumina Silica Brick Corrosion by Different Aluminium Alloys: *Guillermo Monsberger*¹; Christian Majcenovic¹; Gerald Praseta¹; ¹RHI-AG

10:45 AM

Effect of Salt Solution Corrosion on Tensile Properties of Vacuum High Pressure Die Cast A₃₅₆ Alloys Subjected to Heat Treatment: *Yanda Zou*¹; Henry Hu¹; Xuezhi Zhang¹; ¹University of Windsor

11:05 AM

High Cycle Fatigue and Fatigue Crack Propagation Behavior of Modified A7075-T73 Alloy: *Kee-Ahn Lee*¹; Gwan-Yeoung Kim¹; Kyu-Sik Kim¹; Joong-Cheol Park²; Shae-Kwang Kim³; Young-Ok Yoon³; ¹Aandong National University; ²Research Institute of Industrial Science & Technology; ³Korea Institute of Industrial Technology

11:25 AM

Effect of the Thermo-mechanical Treatment on IGC Susceptibility of AA 5083 Alloy: *Tamara Radetic*¹; Akram Halap¹; Miljana Popovic¹; Endre Romhanji¹; ¹University of Belgrade

11:45 AM

Characterization of Corrosion Scales on Aluminum Alloy AlFeNi Used for Fuel Cladding in Nuclear Research Reactors: *Diana Nabhan*¹; Bénédicte Kapusta¹; Lionel Séjourné¹; Kimberly Colas¹; Sophie Bosonnet¹; Françoise Barcelo¹; Sandrine Miro¹; Michel Tabarant¹; Didier Hamon¹; Nicolas Dacheux¹; ¹CEA

Aluminum Reduction Technology — Environment II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
 Program Organizer: Margaret Hyland, University of Auckland

Wednesday AM Room: 13
 February 19, 2014 Location: San Diego Convention Center

Session Chair: David Wong, Light Metals Research Centre

8:30 AM Introductory Comments

8:35 AM

Abart CDS - A New Compact Multi-pollutant Pot Gas and Alumina Handling System: Anders Sorhuus¹; Sivert Ose¹; Geir Wedde²; ¹Alstom; ²Consult

9:00 AM

Development on Electrolytic Cell Gas Cooling: *Antoine de Gromard*¹; Chin Lim¹; El Hani Bouhabila¹; Bernard Cloutier²; Mathieu Frainais²; ¹Solios Environnement; ²Solios Environnement Inc.

9:25 AM

15 Years of GTC Operations at Aldel: Long-Term Assessment of GTC Performance: Anita Folkers¹; Jan de Weerd²; *Peter Klut*²; Edo Engel²; Erik Dupon²; ¹Aluminium Delfzijl; ²Danieli Corus

9:50 AM

Pot Gas Cooling Technologies: Travis Turco¹; *Peter Verbraak*¹; Peter Klut¹; Erik Dupon¹; Edo Engel¹; ¹Danieli Corus

10:15 AM Break

10:30 AM

Modelling HF Generation: The Role of Ambient Humidity: *Youjian Yang*¹; Margaret Hyland²; Chris Seal²; Zhaowen Wang¹; ¹Northeastern University; ²University of Auckland

10:55 AM

Online Monitoring of Aluminium Primary Production Gas Composition by Use of Fourier-transform Infrared Spectrometry: *Thor Anders Aarhaug*¹; Alain Ferber¹; Heiko Gaertner²; Ole Kjos¹; ¹SINTEF; ²NTNU

11:20 AM Introductory Comments

11:25 AM

Reducing Greenhouse Gas Emissions during Aluminium Smelting through Development and Implementation of Improved Control Strategies and Operational Practices: *Abdalla Zarouni*¹; ¹DUBAL

Aluminum Reduction Technology — Fundamentals - Modelling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
 Program Organizer: Margaret Hyland, University of Auckland

Wednesday AM Room: 14A
 February 19, 2014 Location: San Diego Convention Center

Session Chair: Martin Desilets, Sherbrooke University

8:30 AM Introductory Comments

8:35 AM

On the Prediction of the Crust Evolution inside Aluminum Electrolysis Cells: *Marc LeBreux*¹; Martin Desilets¹; Alexandre Blais²; Marcel Lacroix¹; ¹Université de Sherbrooke; ²CRDA Électrolyse, RioTinto Alcan

9:00 AM

An Improved Finite Element Model for Thermal Balance Analysis of Aluminum Electrolysis Cells: Cui Xifeng¹; Zhou Yiwen¹; *Yang Jianhong*¹; ¹Zhengzhou Research Institute of CHALCO

9:25 AM

A Modelling of Heat Losses in Aluminium Reduction Cell with Slotted Anodes: Shuai Yang¹; Jie Li¹; Hongliang Zhang¹; Yujie Xu¹; Xiaojun Lv¹;

Ming Jia¹; ¹Central South University

9:50 AM

AP60 Cell Start-up: Thermal Electrical Mechanical Quarter Cell Model: *Lyès Hacini¹; Jean-François Bilodeau¹; Yves Caratini²; ¹ARDC/Rio Tinto Alcan; ²LRF/Rio Tinto Alcan*

10:15 AM Break

10:30 AM

A Numerical Approach for the Design of Anode Beam Mechanical Systems: *Andre Felipe Schneider¹; Olivier Charette¹; Daniel Richard¹; ¹HATCH Ltd.*

10:55 AM

MHD Stability for Irregular and Disturbed Aluminium Reduction Cells: *Valdis Bojarevics¹; ¹University of Greenwich*

11:20 AM

Revised Benchmark Problem for Modeling of Metal Flow and Metal Heaving in Reduction Cells: *Jinsong Hua¹; Christian Droste²; Kristian Einarsrud; Magne Rudshaug¹; Robert Jorgensen²; Nils-Haavard Giskeodegard²; ¹Institute for Energy Technology; ²Hydro Aluminium*

11:45 AM

Dynamic Simulation of Cell Voltage Resonance Effect in Aluminum Electrolysis Cell: *Yongliang Wang¹; Jun Tie²; Ganfeng Tu¹; Shuchen Sun¹; Rentao Zhao²; Zhifang Zhang²; ¹Northeastern University; ²North China University of Technology*

12:10 PM

Analysis of the MHD Instabilities in Reduction Cells with Lyapunov Method: *Yang Yi¹; Yao Shihuan¹; Yi Xiaobing¹; ¹CHALIECO*

Biological Materials Science Symposium — Biomimetic and Bio-inspired Materials Synthesis

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Wednesday AM

Room: 33A

February 19, 2014

Location: San Diego Convention Center

Session Chairs: Rajendra Kasinath, Johnson and Johnson Company; Ekaterina Novitskaya, University of California, San Diego

8:30 AM

Natural Fiber Biocomposites: Biodegradability and Mechanical Response after Water Immersion: *Nicole-Lee Robertson¹; John Nychka¹; John Wolodko²; ¹University of Alberta; ²Alberta Innovates Technology Futures*

8:50 AM Invited

Using a Polymer-induced Liquid-precursor (PILP) Process to Make Hard Tissues: *Laurie Gower¹; ¹University of Florida*

9:20 AM

Bio-inspired Mechanical Strengthening of Single Crystals of Calcite: *Joseph Carloni¹; Miki Kunitake¹; Lara Estroff¹; Shefford Baker¹; ¹Cornell University*

9:40 AM

Synthesis of Bio-inspired Scaffolds by Freeze Casting and Vapor Deposition: *Pei Chun Chou¹; Pang-Hsuan Li¹; Ying-Tsun Su²; Po-Yu Chen¹; ¹National Tsing Hua University; ²Industrial Technology Research Institute of Taiwan*

10:00 AM Break

10:10 AM Keynote

Biomimetic Micropatterned Surfaces with Switchable Functionality: *Eduard Arz¹; ¹Saarland University*

10:50 AM

Modeling, optimization, fabrication and Testing of a Bio-inspired Segmented Armor System: *Ravi Chintapalli¹; Francois Barthelat¹; ¹McGill*

University

11:10 AM

Analysis of the Effect of a Compliant Layer on Indentation of an Elastic Material: *Fuqian Yang¹; ¹University of Kentucky*

11:30 AM Invited

Structural Integration Design For Enhanced Photoluminescence in Butterfly Wing: *Tongxiang Fan¹; ¹Shanghai Jiaotong University*

Bulk Metallic Glasses XI — Alloy Development and Applications II

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Wednesday AM

Room: 2

February 19, 2014

Location: San Diego Convention Center

Session Chairs: Matthew Kramer, Iowa State University; Norbert Mattern, IFW Dresden

8:30 AM Invited

Effect of Thermal History and Plastic Deformation on Diffusion in a Cu-Zr Metallic Glass: Experiments and Simulations: *M. Kramer¹; R. Ott¹; M. Mendeleev¹; ¹Iowa State University*

8:50 AM

Property Evaluation of Rare Earth Element Based Bulk Metallic Glass with High Configurational Entropy: *Jinyeon Kim¹; Hyunseok Oh¹; Hye Jung Chang²; Eunsoo Park¹; ¹Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University; ²Advanced Analysis Center, Korea Institute of Science and Technology*

9:00 AM Invited

Ti₂₀Zr₂₀Cu₂₀Ni₂₀Be₂₀ and Ti₂₀Hf₂₀Cu₂₀Ni₂₀Be₂₀ High-entropy Bulk Metallic Glasses: *Ke-Fu Yao¹; Hong-Yu Ding¹; ¹Tsinghua University*

9:20 AM

Toward RE-free Aluminium Bulk Metallic Glasses: *Yi Cao¹; Kevin Laws¹; Michael Ferry¹; ¹University of New South Wales*

9:30 AM Invited

Metallic Glass: A New Approach of Printed Silver Electrodes: *Lee Eun Sung¹; Jee Sang-Soo¹; Kim Suk-Jun¹; KIM Se-yun¹; KIM Do-hyang²; KIM Won-Tae³; ¹Samsung Advanced Institute of Technology; ²Yonsei University; ³Cheongju University*

9:50 AM

The Research of a Novel Corneal Suturing Device Based on Bulk Metallic Glass: *Min Zhang¹; Shujie Pang¹; Tao Zhang¹; ¹Beihang University*

10:00 AM Break

10:20 AM Invited

Phase Separation in Liquid and Glassy Gd-based Metallic Alloys: *Norbert Mattern¹; Jun Hee Han¹; Do Hyang Kim²; Juergen Eckert¹; ¹IFW Dresden; ²Yonsei University Seoul*

10:40 AM

Synthesis and Mechanical Properties of Fe-Nb-B Metallic Glasses: Bulk Form and Thin Film: *Jiahao Yao¹; ¹Institute of Metal Research, Chinese Academy of Sciences*

10:50 AM Invited

Mg-Zn-Ca Bulk Metallic Glasses with High Glass Forming Ability, Enhanced Compressive Strength and Corrosion Resistance: *Xidong Hui¹; Y. F. Zhao¹; X. H. Chen¹; X. J. Liu¹; ¹University of Science and Technology Beijing*



11:10 AM Invited

Effect of Structural Relaxation on Deformation Characteristics in Rejuvenated Zr-Cu-Al Bulk Metallic Glass: *Koichi Tsuchiya*¹; Fanqiang Meng¹; Seiichiro Ii¹; Yoshihiko Yokoyama²; Osami Haruyama³; ¹NIMS; ²Tohoku University; ³Tokyo University of Science

11:30 AM Invited

Glass Formation and Properties of New Ternary Bulk Metallic Glasses: *Ran Li*¹; Tao Zhang¹; ¹Beihang University

11:50 AM

Joining of Active Bulk Metallic Glasses in Air: *Wen Chen*¹; Ze Liu²; Jan Schroers¹; ¹Department of Mechanical Engineering & Materials Science, Yale University; ²Center for Research on Interface Structures and Phenomena (CRISP), Yale University

12:10 PM

Nanocrystallization Pathways in Amorphous Melt-spun and Sputtered Al₉₀Tb₁₀ Alloys: Can Yildirim¹; Mert Ogun¹; Mustafacan Kutsal¹; Ryan Ott²; Matthew Kramer²; *Eren Kalay*¹; ¹METU; ²Ames Laboratory US DOE

Cast Shop for Aluminum Production — Metal Treatment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Wednesday AM Room: 15A
February 19, 2014 Location: San Diego Convention Center

Session Chair: Stephen Instone, Hydro Aluminium Rolled Products GmbH

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

20 Years of LiMCA Utilization in the Aluminum Industry: A Review of the Technology Development and Applications: *Thomas Buijs*¹; Daniel Gagnon¹; Claude Dupuis²; ¹ABB; ²Rio Tinto Alcan

9:00 AM

Clean Aluminum Processing: New Avenues for Measurement and Analysis: *Shaymus Hudson*¹; Diran Apelian¹; ¹Worcester Polytechnic Institute

9:25 AM

Metallurgical Performance of Salt and Chlorine Fluxing Technologies in Casting Furnaces: *Mark Badowski*¹; Stephen Instone¹; Markus Hagen¹; ¹Hydro Aluminium Rolled Products GmbH

9:50 AM

Metal Cleanliness Evaluation of Reusable Ceramic Foam Filters: *D. Corleen Chesonis*¹; Edward Williams¹; Louis Gendreau²; Louis-Pierre Clément²; ¹Alcoa Technical Center; ²Aluminerie de Bécancour

10:15 AM Break**10:30 AM**

Parallel Laboratory, and Industrial Scale Aluminium Filtration Tests with Al₂O₃ and SiC Based CFF Filters: *Martin Syvertsen*¹; Anne Kvithyld¹; Sarina Bao¹; Arne Nordmark¹; Anders Johansson²; ¹SINTEF Materials and Chemistry; ²SAPA Heat Transfer AB

10:55 AM

New Developments of the I-60 SIR Melt Refining Unit: Terje Haugen¹; *Arild Hakonsen*¹; John Olav Fagerlie¹; Mats Ole Jönsson¹; ¹Hycast AS

11:20 AM

A New Vacuum Degassing Process for Molten Aluminum: *Jianmin Zeng*¹; ¹Guangxi University

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Process Modeling and Simulation

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Wednesday AM
February 19, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Geoffrey Brooks, Swinburne University; Mark Kennedy, ProVal Partners SA

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

Computational Modelling of Metallurgical Processes: Achievements and Challenges: *Mark Cross*¹; Nick Croft¹; Diane McBride¹; ¹Swansea University

8:55 AM

Metallurgical Plant Optimization through the Use of Flowsheet Simulation Modelling: *Mark Kennedy*¹; ¹Proval Partners SA

9:15 AM

ChemSheet as a Simulation Platform for Pyrometallurgical Processes: Karri Penttilä¹; Nagendra Tripathi²; Justin Salminen¹; *Pertti Koukkari*¹; ¹VTT; ²Glencore-Xstrata

9:35 AM

A Computational Fluid Dynamics Model for a Novel Flash Ironmaking Process: *Miguel Olivas-Martinez*¹; Silvia Perez-Fontes¹; Hong Yong Sohn¹; ¹University of Utah

9:55 AM Break**10:15 AM**

Application of the Combined Reactors Method for Analysis of Steelmaking Process: *Simon Lekakh*¹; David Robertson¹; ¹MST

10:35 AM Invited

Modelling of Slag Foaming Coupled with Decarburisation: *Md Sattar*¹; Jamal Naser¹; Geoffrey Brooks¹; ¹Swinburne University of Technology

10:55 AM Invited

A Methodology for Modeling Electromagnetic Confinement Systems: Application to Levitation Melting: *Nagy El-Kaddah*¹; Thinius Natarajan²; ¹University of Alabama; ²United States Steel Corporation

11:15 AM Invited

Electrochemical Characterization and Modeling of a Solid Oxide Membrane-based Electrolyzer for Production of Magnesium and Oxygen: Xiaofei Guan¹; *Uday Pal*¹; Srikanth Gopalan¹; Adam Powell²; ¹Boston University; ²Infinium

11:35 AM Invited

Phenomenological Models and Animations of Welding and their Impact: *Tarasankar DebRoy*¹; ¹Penn State University

Characterization of Minerals, Metals and Materials 2014 — Characterization of Ferrous Metals

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Wednesday AM
February 19, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Donato Firrao, Politecnico de Torino; Jim Hwang, Michigan Technological University

8:30 AM

In Situ X-ray Diffraction Study of Recovery and Recrystallisation in ODS Ferritic Steel Powder: *Nicolas Sallez*¹; Xavier Boulnat²; Andras Borbely³; Cristian Mocuta⁴; Louis Hennez⁵; Dominique Thiaudière⁴; Jean-Luc Béchéde⁶; Yann de Carlan⁶; Pauline Moeyaert⁶; Patricia Donnadieu¹; Damien Fabregue²; Michel Perez²; Yves Bréchet¹; ¹CNRS; ²MATEIS - INSA de Lyon; ³Ecole Nationale Supérieure des Mines de Saint-Etienne; ⁴SOLEIL; ⁵CEMHTI; ⁶CEA

8:50 AM

Influence of Grain Boundary Engineering on the 2D and 3D Grain Boundary Network Connectivity in Austenitic Stainless Steel: *Amanda Levinson*¹; David Rowenhorst²; Alexis Lewis²; ¹National Research Council Fellow, Naval Research Laboratory; ²Naval Research Laboratory

9:10 AM

Fatigue Characterization of New Automotive High-strength Steels after Prestraining and Welding: Paolo Matteis¹; Giorgio Scavino¹; Raffaella Sesana¹; Fabio D' Aiuto¹; *Donato Firrao*¹; ¹Politecnico di Torino

9:30 AM

Experimental Investigation of Austenitic Stainless Steel on the Mechanical Properties and Oxidation Resistance: *LI Jie*¹; Shen Peng²; Yan Mi¹; ¹Department of Materials Science and Engineering, Zhejiang University; ²Zhenshi Group Eastern Special Steel Co., Ltd

9:50 AM

Effects of Heat Treatment on Transverse and Longitudinal Mechanical Properties of Engineering Machinery Steel WQ960: *su fen Tao*¹; *Fuming WANG*¹; ¹University of Science and Technology Beijing

10:10 AM Break

10:20 AM

Size and Orientation Dependent Deformation Behavior of a Dual Phase Steel: *Moritz Wenk*¹; Reiner Mönig¹; Oliver Kraft¹; ¹Karlsruhe Institute of Technology

10:40 AM

In-Situ EBSD Investigation of Carbides during Annealing of AISI M42 Steel: *Matjaz Godec*¹; Barbara Šetina Batic¹; Tatjana Vecko Pirtovšek²; ¹Institute of Metals and Technology; ²Metal Ravne d.o.o.

11:00 AM

Investigation on Corrosion Behavior, Micro-structure Evolution, and Chemical Compositions of the Product Layers of API X65 Steel in Corrosive Environment: *Yakun Zhu*¹; Michael Free¹; ¹University of Utah

11:20 AM

Ultrasonic Non-destructive Characterization of Power Plant Steel: *Magdy El Rayes*¹; Ehab El-Danaf¹; Abdulhakim Almajid¹; ¹King Saud University

11:40 AM

Study on Modification of Anti-Oxidation Coating for Steel Billet: *Chen Sheng*¹; ¹Wuhan Iron and Steel Co.

Computational Thermodynamics and Kinetics — Phase-field Simulations

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Wednesday AM
February 19, 2014

Room: 30D
Location: San Diego Convention Center

Session Chairs: Long-Qing Chen, The Pennsylvania State University; Yunzhi Wang, Ohio State University

8:30 AM Invited

Phase-field Simulation at the Mesoscopic Scale and Its Applications Using Open Phase: *Ingo Steinbach*¹; Oleg Scchyglo¹; ¹Ruhr-University

8:55 AM Invited

Unique Properties of Nano Domains of Martensite: Dong Wang¹; Liangxiang Zhang¹; Xiaobing Ren²; *Yunzhi Wang*³; ¹Xi'an Jiaotong University; ²National Institute for Materials Science; ³Ohio State University

9:20 AM Invited

Linking Atomistic and Phase-field Simulations using Numerically Coarse-grained Free Energy Functionals: *Jeffrey Rickman*¹; ¹Lehigh University

9:45 AM

Phase-field Modeling of Continuously Cooling in Ti-6Al-4V Alloy: *Yanzhou Ji*¹; Tae Wook Heo¹; Patrick Hricko¹; Todd Palmer¹; Long-Qing Chen¹; ¹The Pennsylvania State University, University Park

10:05 AM Break

10:20 AM Invited

Phase Field Crystal Modeling of Microstructure in Multi-component Alloys: *Nikolas Provatas*¹; Nana Ofori-Opoku¹; Bernadine Jugdutt¹; Matthew Seymour¹; Harith Humadi²; Wahid Fallah³; Jeffrey Hoyt²; ¹McGill University; ²McMaster University; ³Waterloo University

10:45 AM

Coupling Phase-field Model and Dislocation Density Based Crystal Plasticity Model: *Pierre-Louis Valdenaire*¹; Alphonse Finel¹; Yann Le Bouar¹; Benoît Appolaire¹; ¹Onera-CNRS, Laboratoire d'Etude des Microstructures

11:05 AM

Adaptive Phase-field Modeling of Grain Growth in Sintered Uranium Dioxide under High Temperature Gradients: *Benjamin Winchester*¹; Veena Tikare¹; ¹Sandia National Laboratories

11:25 AM

Phase Field Modeling and Simulation of Particulate Magnetolectric Composites: *Fengde Ma*¹; Yongmei Jin¹; Yu Wang¹; Stephen Kampe¹; ¹Michigan Technological University

11:45 AM

Phase Field Simulation of the Stabilization of Nanocrystalline Alloys via Solute Segregation: *Philip Goins*¹; Elizabeth Holm¹; ¹Carnegie Mellon University



Deformation, Damage, and Fracture of Light Metals and Alloys III — Modelings

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Wednesday AM Room: 19
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Yanfei Gao, University of Tennessee, Knoxville; Sooyeol Lee, Chungnam National University

8:30 AM Invited

Physics and Modeling of Strengthening of Metals by Parallel Stacking Faults: Weiwei Jian¹; Guangming Cheng¹; Carl Koch¹; Qudong Wang²; Yuntian Zhu¹; *Suveen Mathaudhu*³; ¹North Carolina State University; ²Shanghai Jiaotong University

9:00 AM

Combined Effects of Lode Angle and Sign of Pressure on Yielding and Void Evolution: *Oana Cazacu*¹; Benoit Revil-Baudard¹; Ricardo Lebensohn²; ¹University of Florida; ²Los Alamos National Laboratory

9:20 AM

Effects of Twinning on Damage Evolution in Porous Materials: *Benoit Revil-Baudard*¹; *Oana Cazacu*¹; ¹University of Florida

9:40 AM

An Atomistically-informed Energy Based Theory of Environmentally Assisted Failure: *Sriram Ganesan*¹; Veera Sundararaghavan¹; ¹Department of Aerospace Engineering, University of Michigan-Ann Arbor

10:00 AM Break

10:15 AM

Role of the Plastic Flow of the Matrix on Yielding and Void Evolution of Porous Solids: *Oana Cazacu*¹; Benoit Revil-Baudard¹; Nitin Chandola¹; ¹University of Florida

10:35 AM

Banding and Texture Formation in f.c.c. Polycrystals during Rolling Deformation: *M. Arul Kumar*¹; Sivasambu Mahesh²; ¹Los Alamos National Lab; ²Indian Institute of Technology Kanpur

10:55 AM

Molecular Statics and Molecular Dynamics Simulations of the Critical Stress for Motion of a/3<11-20> Screw Dislocations in a-Ti at Low Temperatures Using a Modified Embedded Atom Method Potential: *Satish Rao*¹; A. Venkateswaran²; M.D. Letherwood³; ¹UES Inc.; ²Wilberforce University; ³TARDEC

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Shock-Induced Deformation and Failure

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Wednesday AM Room: 3
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Vitali Nesterenko, University of California at San Diego; Jerry La Salvia, U.S. Army Research Laboratory

8:30 AM Keynote

Deformation and Failure of Metals Subjected to Laser Shock Loading: *Marc Meyers*¹; Chia-Hui Lu¹; Bruce Remington²; Eduardo Bringa³; H.-S. Park²; Tane Remington¹; Brian Maddox²; Carlos Ruestes¹; ¹UCSD; ²LLNL; ³Conicet/U. Nacional de Cuyo

9:00 AM Invited

Texture Dependence and Conversion of Plastic Work to Heat in Magnesium Alloys during High Strain Rate Deformation: Dipankar Ghosh¹; *Guruswami Ravichandran*²; ¹California Institute of Technology; ²California Institute of Technology

9:20 AM Invited

Effect of Pre-strain on the Dynamic Behavior in Tantalum: *Jeffrey Florando*¹; Nathan Barton¹; Baseem El-Dasher¹; Damian Swift¹; Mukul Kumar¹; Changqiang Chen²; Kalias Ramesh³; Kevin Hemker³; ¹Lawrence Livermore National Laboratory; ²Northwestern University; ³Johns Hopkins University

9:40 AM

High Strain-rate Tensile Response of a Tungsten Heavy Alloy: *Juan P. Escobedo*¹; Eric Brown¹; Carl Trujillo¹; Ellen Cerreta¹; George Gray III¹; ¹Los Alamos National Laboratory

10:00 AM Introductory Comments A Tribute to Paul DeCarli

10:10 AM Break

10:30 AM Invited

Martensitic Transformations Induced by Impact-generated Tensile Stress Waves: *Naresh Thadhani*¹; Marc Meyers²; ¹Georgia Institute of Technology; ²University of California at San Diego

10:50 AM

Age Hardening and Its Effects on the Shock Response of Materials: *Jeremy Millet*¹; ¹AWE

11:10 AM

Capturing Microstructural Features Related to Dynamic Damage Nucleation: *Veronica Livescu*¹; John Bingert¹; Curt Bronkhorst¹; ¹Los Alamos National Laboratory

11:30 AM

Microstructural Modeling of Dynamic Intergranular and Transgranular Fracture Modes in Crystalline Alloys: S. Ziaei¹; *Mohammed Zikry*¹; ¹North Carolina State University

11:50 AM

Deformation and Failure of Shocked Bulk Cu-Nb Nanolaminates: Weizhong Han¹; *Ellen Cerreta*¹; Nathan Mara¹; Amit Misra¹; Irene Beyerlein¹; John Carpenter¹; Shijian Zheng¹; Carl Trujillo¹; Patricia Dickerson¹; ¹Los Alamos National Lab

Electrode Technology for Aluminium Production — Anode Quality and Performance

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Andre Proulx, Rio Tinto Alcan

Wednesday AM Room: 14B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Marc Gagnon, Aluminerie Alouette Inc

8:30 AM Introductory Comments

8:35 AM

An Approach to Help Control Air Permeability of Pre-baked Anodes: Shoujun Zhang¹; Wenxiang Li¹; *Euel Cutshall*¹; Jinlong Jiang¹; Joe Woo¹; ¹Sunstone Development Co., Ltd

9:00 AM

Optimizing Anode Performance in DUBAL Reduction Cells: *Edouard Mofor*¹; Sergey Akhmetov¹; T.K. Sahu¹; Jose Blasques¹; Daniel Whitfield¹; Rajwinder Kaur¹; Gregory Meintjes¹; Ali Jassim¹; Saleh Rabba¹; H.R. Devadiga¹; Kamel Alaswad¹; ¹Dubai Aluminium

9:25 AM

Paste Production and Its Performance in Soederberg Smelters: *Markus Meier*¹; Raymond Perruchoud¹; ¹R&D Carbon Ltd.

9:50 AM Break

10:00 AM

Study of Manufacturing Technology for High Quality Anodes: *Qingcai Zhao*¹; Jingli Zhao¹; Qingbo Zhao¹; ¹Jinan Aohai Carbon Products Corporation Ltd.

10:25 AM

Understanding Anode Overpotential: *Rebecca Thorne*¹; Camilla Sommerseth¹; Ann Mari Svensson¹; Espen Sandnes²; Lorentz Petter Lossius²; Hogne Linga²; Arne Petter Ratvik¹; ¹Norwegian University of Science and Technology (NTNU); ²Hydro Aluminium a.s. Årdal

Energy Technologies and Carbon Dioxide Management — Energy Efficiency and Furnace Technologies

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Wednesday AM
February 19, 2014

Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Li Li, Cornell University; Tao Wang, University Of Alabama

8:30 AM

An Experimental Investigation of a Flue Gas Recirculation System for Aluminum Melting Furnaces: *James Wiswall*¹; Mark Kruzynski¹; Srinivas Garimella¹; ¹ALCOA

8:55 AM

Research on Common Biomass Pyrolysis Production of Biomass Carbon, Pyrolysis Gas, and Biomass Tar: Li Yang¹; *Yonggang Wei*¹; Hua Wang¹; Jianhang Hu¹; Kongzhai Li¹; ¹Kunming University of Science and Technology

9:15 AM

Optimization the Preparation of Activated Carbon Form Walnut Shell with Microwave Heating Using Response Surface Methodology: Zheng Zhaoqiang¹; *Xia Hongying*¹; Peng Jinhui¹; Zhang Libo¹; ¹Kunming University of Science and Technology

9:35 AM

Research on Using Carbide Slag to Mineralize the Carbon Dioxide in Electrolytic Aluminum Waste Gas: Liu Yan¹; Fang Yu¹; Liu Guanting¹; Dou Zhihe¹; *Zhang Ting'an*¹; Jiang Xiaoli¹; ¹Northeastern University

10:00 AM Break

10:20 AM

Study on the Combustion Characteristics and Kinetics of Blending Coal: *Xing Xiangdong*¹; Jianliang ZHANG¹; Shan Ren¹; Xingle Liu¹; Zhenyang Wang¹; Hongen Xie¹; ¹University of Science and Technology of Beijing

10:40 AM

Effect of Batch Initial Velocity on the Glass Furnace Efficiency: Nasim Soleimani¹; *Mark Jolly*²; Karl Dearn³; Oliver Brinkman⁴; William Brinkman⁴; ¹Cranfield University; ²Cranfield University; ³University of Birmingham; ⁴Glassworks Hounsell Ltd

11:05 AM

Kinetic Modeling Study of Oxy-methane Combustion at Ordinary Pressure: *Xianzhong Hu*¹; Qingbo Yu¹; Qin Qin¹; Nan Sun¹; ¹Northeastern University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Fatigue Investigations of Novel Materials

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

Program Organizers: Antonios Kotsos, Drexel University; Tongguang Zhai, University of Kentucky

Wednesday AM
February 19, 2014

Room: 7B
Location: San Diego Convention Center

Session Chairs: Olivier Pierron, Georgia Institute of Technology; Antonios Kotsos, Drexel University

8:30 AM Introductory Comments

8:35 AM Keynote

Fatigue of Bulk-metallic Glass: *Robert Ritchie*¹; Bernd Gludovatz²; Marios Demetriou³; William Johnson³; ¹University of California Berkeley; ²Lawrence Berkeley National Laboratory; ³California Institute of Technology

9:15 AM Invited

Fatigue Deformation and Failure of Carbon Nanotube-loaded Polyacrylonitrile Fibers: James Collins¹; Vincent Wu¹; Sarthak Vaish¹; *Christopher Muhlstein*¹; ¹Georgia Institute of Technology

9:35 AM Invited

Fatigue Damage in Carbon Fibre Epoxy Composite Under Variable Loading Conditions: *Alan Plumtree*¹; ¹University of Waterloo

9:55 AM Invited

Fatigue Behavior of Surface Nanocrystallized Zirconium: *Conghui Zhang*¹; Yaomian Wang¹; ¹'Xi'an University of Architecture and Technology

10:15 AM Break

10:35 AM Invited

Processing and Fatigue Crack Growth Behavior of Cold-spray 6061 Aluminum Alloys: *Anastasios Gavras*¹; Diana Lados¹; Victor Champagne²; ¹Worcester Polytechnic Institute; ²US Army Research Labs

10:55 AM

Comparative Investigation of Fatigue-induced Grain Boundary Instability in Nanoscale Metal Films: *Bin Zhang*¹; Tingyu Xiao¹; Xuemei Luo²; Xiaofei Zhu²; Guang-Ping Zhang²; ¹Key Laboratory for Anisotropy and Texture of Materials (Ministry of Education), Northeastern University, China; ²Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

11:15 AM

Acoustic Emission Monitoring of Fatigue Crack Growth in a NiTi/AA7050 Composite: *William Leser*¹; John Newman¹; Jacob Hochhalter¹; Fred Parker¹; Fuh-Gwo Yuan²; ¹NASA Langley Research Center; ²North Carolina State University

11:35 AM

Role of Intermetallics on Mechanical Properties of Al-Cu Interfaces: *Alice Lassnig*¹; Christopher Torbet²; Golta Khatibi¹; Michael Zehetbauer¹; Tresa Pollock²; ¹University of Vienna; ²UC Santa Barbara

11:55 AM Concluding Comments



Gamma TiAl Alloys 2014 — Session V

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

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Wednesday AM
February 19, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Christoph Leyens, Fraunhofer IWS; Deliang Zhang, Shanghai Jiao Tong University

8:30 AM Invited

Design of Surface Protection for TiAl Alloys: *Michael Schuetze*¹; ¹DECHEMA-Forschungsinstitut

8:55 AM

Development of New Coatings to Prevent Environmental Embrittlement of Titanium Aluminides: *Patrick Masset*¹; Friedrich Bleicher²; Laurent Bortolotto³; Georg Geiger²; Andreas Kolitsch⁴; Cecile Langlade⁵; Jonathan Paul⁶; Bernadeta Pelic⁴; Florian Pyczak⁶; David Rafaja⁷; Peter Schumacher⁸; Michael Schütze³; Gerhard Wolf¹; Rossen Yankov⁴; ¹Fraunhofer UMSICHT; ²TU Wien; ³Dechema Forschungsinstitut; ⁴HZDR; ⁵UTBM; ⁶HZG; ⁷TU Freiberg; ⁸ÖGI

9:15 AM Invited

Wear Protection for Turbine Blades Made of Titanium Aluminum: *André Werner*¹; ¹MTU Aero Engines AG

9:40 AM Invited

Electron Beam Joining of γ -Titanium Aluminide: Uwe Reissen¹; Simon Olshok¹; *Alexander Backhaus*¹; ¹RWTH Aachen University

10:05 AM Break**10:25 AM**

Influence of the Slag Composition on the Fluorine Absorption in Gamma-TiAl during IESR: *Peter Spiess*¹; Bernd Friedrich¹; ¹RWTH Aachen University

10:45 AM

Microstructure and Mechanical Properties of a Fine Structured Gamma TiAl Alloy Synthesized by a Powder Metallurgy Route: *Deliang Zhang*¹; Xun Yao¹; ¹Shanghai Jiao Tong University

11:05 AM

Formation of a Protective Alumina Scale during Initial Oxidation of F-doped TiAl: *Hans-Eberhard Zschau*¹; Michael Schütze¹; ¹DECHEMA - Forschungsinstitut

11:25 AM

Enhancement of the High Temperature Oxidation Resistance of TiAl-alloys by Fluorine: *Alexander Donchev*¹; Simone Friedle¹; Mathias Galetz¹; Michael Schütze¹; Rossen Yankov²; Andreas Kolitsch²; ¹DFI; ²HZDR

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Materials Systems for Energy

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Wednesday AM
February 19, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Hyuck Lee, Korea Advanced Institute of Science and Technology (KAIST); Jungshen Wang, Ford Motor Company

8:30 AM Invited

Interfacial Reactions of Sn with the n-Type Bi₂(Te,Se)₃ and p-Type (Bi,Sb)₂Te₃ Thermoelectric Materials: *Sinn-wen Chen*¹; Hsin-jay Wu¹; Chih-yu Wu¹; Chun-fei Chang¹; ¹National Tsing Hua University

8:50 AM

Calorimetric Studies of Lithium Ion Cells and Their Constructing Materials: *Hans Juergen Seifert*¹; Carlos Ziebert¹; Elke Schuster¹; ¹Karlsruhe Institute of Technology (KIT)

9:10 AM

Determination of Thermodynamic Properties by Experimental and Computational Methods for New Lithium-ion Batteries: *David Henriques*¹; Marco Prill¹; Siaufung Dang¹; Torsten Markus¹; ¹Forschungszentrum Jülich

9:30 AM Invited

Thermodynamic Assessment of the Sn Based Anode Material Systems for Li-ion Batteries: *Dajian Li*¹; Hans Flandorfer²; Torsten Markus³; Damian Cupid¹; ¹Karlsruhe Institute of Technology; ²University of Vienna; ³Forschungszentrum Jülich GmbH

9:50 AM

Thermodynamic Investigations and Modeling of Copper and Iron Oxides Used as Conversion Electrodes in Lithium Ion Batteries: *Maren Lepple*¹; Peter Franke¹; Damian Cupid¹; Hans Seifert¹; ¹Karlsruhe Institute of Technology

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

The Cadmium – praseodymium System: Phase Equilibria, Thermodynamic Investigations and CALPHAD Optimization: *Thomas Reichmann*¹; Klaus Richter¹; Herbert Ipsen¹; ¹University of Vienna

10:50 AM

Thermodynamic Assessment of Pu-based Alloys: *Aurelien Perron*¹; Patrice Turchi²; Alexander Landa²; P. Söderling²; Brice Ravat³; Benoit Oudot³; Francois Delaunay³; ¹LLNL/CEA; ²LLNL; ³CEA

11:10 AM

Thermodynamic Investigations in the Ternary Al-Ti-Cr System: *Mario Krieger*¹; Olga Fabrichnaya¹; Dmytro Pavlyuchkov¹; David Rafaja¹; Hans Seifert²; ¹TU Bergakademie Freiberg; ²Karlsruhe Institute of Technology

11:30 AM

Alloy Compatibility Study for Dual Alloy Disc Development: *Caroline Goddard*¹; Mark Hardy²; Cathie Rae¹; ¹University of Cambridge; ²Rolls-Royce plc.

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements- V

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Wednesday AM Room: 31A
February 19, 2014 Location: San Diego Convention Center

Session Chair: Peter Collins, University of North Texas

8:30 AM Invited

Changing the Paradigm for Engineering Design by Merging High Energy X-ray Data with Materials Modeling: *Jay Schuren*¹; Paul Shade¹; Todd Turner¹; Robert Suter²; Jonathan Lind²; Joel Bernier³; Frankie Li³; Jonathan Almer⁴; Peter Kenesei⁴; Ulrich Liener⁵; ¹AFRL/RXCM; ²Carnegie Mellon University; ³Lawrence Livermore National Laboratory; ⁴Argonne National Laboratory; ⁵DESY

9:10 AM Invited

Imperfection Modeling to Determine Probabilistic Materials Behavior for Zr Nuclear Fuel Clad Tubes: Curt Lavender¹; Elizabeth Stephens²; *Richard Davies*²; ¹Pacific Northwest National Laboratory; ²PNNL

9:50 AM

Material Interface Effects on the Topology Optimization of Multi-phase Structures Using a Level Set Method: *Natasha Vermaak*¹; Georgios Michailidis²; Guillaume Parry³; Rafael Estevez³; Gregoire Allaire²; Yves Brechet³; ¹Lehigh University; ²Ecole Polytechnique; ³Institut National Polytechnique de Grenoble

10:10 AM Break

10:30 AM

Explicit Incorporation of Cementite in Pearlite Steel Modeling: *Benjamin Anglin*¹; Tomoko Sano¹; Charles Randow¹; Chian-Fong Yen¹; ¹US Army Research Laboratory

10:50 AM

Design of Multifunctional Material Architectures Using Topology Optimization: *James Guest*¹; Seunghyun Ha¹; Johns Hopkins University

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification — Eutectics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Robert Hackenberg, Los Alamos National Lab; Carlos Capdevila-Montes, CENIM-CSIC; Amy Clarke, Los Alamos National Laboratory; John Perepezko, University of Wisconsin-Madison

Wednesday AM Room: 32A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Ralph Napolitano, Iowa State University; Amber Genau, University of Alabama at Birmingham

8:30 AM Invited

Template-directed Directionally Solidified Eutectic Metamaterials: *Paul Braun*¹; ¹University of Illinois at Urbana-Champaign

9:00 AM

Versatile Aligned Eutectics: From High Temperature Structural Materials to Functional Nanodevices: *Srdjan Milenkovic*¹; IMDEA Materials Institute

9:25 AM Invited

Multiple Solidification Structures and Mechanisms in Ternary Alloys: *Ralph Napolitano*¹; Irmak Sargin¹; ¹Iowa State University

9:55 AM Break

10:15 AM Invited

Quantifying Length Scale Evolution in Higher Order Eutectics: *Amber Genau*¹; ¹University of Alabama at Birmingham

10:45 AM

Real-time Study of Dynamical Instabilities of Rodlike Eutectic Solidification Patterns: *Silvere Akamatsu*¹; Mikael Perrut²; Sabine Bottin-Rousseau¹; Gabriel Faivre¹; Mathis Plapp³; ¹CNRS - UPMC; ²ONERA; ³LPMC - Ecole Polytechnique

11:10 AM

Cooperative Growth but Uncooperative Melting?: *Seth Imhoff*¹; Paul Gibbs¹; Martha Katz¹; Jason Cooley¹; Wah-Keat Lee²; Kamel Fezzaa³; Alex Deriy³; Amy Clarke¹; ¹Los Alamos National Laboratory; ²Brookhaven National Laboratory; ³Argonne National Laboratory

Magnesium Technology 2014 — Melting, Modelling, and Solidification

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Wednesday AM Room: 17A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Dallas Trinkle, University of Illinois; James Saal, North Western University

8:30 AM

Finite-element Analysis of Melt Flow in Horizontal Twin-roll Casting of Magnesium Alloy AZ31: *Jong Jin Park*¹; ¹Hongik University

8:50 AM

Nucleation and Growth of Metastable Phases in Mg-Nd, Mg-Gd and Mg-Gd-Nd Based Alloys: Suzan Abd El Majid¹; Galit Atiya¹; Menachem Bamberger¹; *Alexander Katsman*¹; ¹Technion - Israel Institute of Technology

9:10 AM

A Numerical and Experimental Study of Flow Behaviour in High Pressure Die Casting: *Mahdi Saeedipour*¹; Simon Schneiderbauer¹; Stefan Pirker¹; Salar Bozorgi²; ¹Johannes Kepler University; ²LKR Leichtmetallkompetenzzentrum Ranshofen GmbH

9:30 AM

In Situ Synchrotron Radiation Diffraction during Melting and Solidification of Mg-Al Alloys Containing CaO: *Björn Wiese*¹; Chamini Mendis¹; Domonkos Tolnai¹; Gábor Szakács¹; Norbert Hort¹; Karl Kainer¹; Andreas Stark¹; Norbert Schell Norbert Schell¹; Heinz-Peter Reichel²; R Brückner²; ¹Helmholtz-Zentrum Geesthacht; ²LMpv Leichtmetall - Produktion & Verarbeitung GmbH

9:50 AM

Solidification Characteristics of Wrought Magnesium Alloys Containing Rare Earth Metals: *Amjad Javaid*¹; Frank Czerwinski¹; Renata Zavadil¹; Marta Aniolek¹; Amir Hadadzadeh²; ¹CANMET Materials; ²University of Waterloo

10:10 AM Break

10:30 AM

Strengthening Due to the Percolating Eutectic Microstructure in Squeeze Cast MRI230D: *Bao Zhang*¹; Anumalasetty Nagasekhar¹; Carlos Caceres¹; ¹The University of Queensland

10:50 AM

Effect of Al Addition on Microstructure of AZ91D: *Utsavi Joshi*¹; Hari Babu Nadendla¹; ¹Brunel University



11:10 AM

In Situ Synchrotron Radiation Diffraction during Solidification of Mg₄Y and Mg₄YxGd Alloys (x = 1, 4 wt.-%): *Gabor Szakacs*¹; Karl Kainer¹; Norbert Schell¹; Andreas Stark¹; Björn Wiese¹; Chamini Mendis¹; Domonkos Tolnai¹; Norbert Hort¹; ¹Helmholtz-Zentrum Geesthacht

11:30 AM

A New Method for Melting Mg-Li Alloys: *Liu Gong*¹; Jieyu Zhang¹; Tian Yin¹; Jia Wei¹; Guangxin Wu¹; ¹Shanghai University

Magnetic Materials for Energy Applications IV — Magnetocaloric Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Wednesday AM
February 19, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Vitalij Pecharsky, Ames Laboratory; Kelly Morrison, Loughborough University

8:30 AM Invited

Fe and Mn Based Materials for Magnetic Refrigeration: *Ekkes Brückel*¹; Francois Guillot¹; ¹Delft University of Technology

9:00 AM

Novel Synthetic Approach to Metal-pnictide/Metalloid Based Magnetocaloric Compounds for Material Exploration and Practical Application: *Soon-Jae Kwon*¹; In-Gyu Kim¹; Seung-Ho Lee¹; Eun-Sung Lee¹; Sang-Mock Lee¹; In-Taek Han¹; ¹Samsung Advanced Institute of Technology

9:20 AM Invited

The Magnetocaloric Effect in Nanostructured Materials: *Victorino Franco*¹; Alejandro Conde¹; ¹Sevilla University

9:50 AM

Affordable High Performance Magnetocaloric Fluids: *Raju Ramanujan*¹; Chen Xi¹; V Chaudhary¹; P Kumar¹; ¹Nanyang Technological University

10:10 AM Break

10:25 AM

The Magnetocaloric Effect in a Composite Based on the Series Er_{1-x}Tb_xAl₂: *Paula Ribeiro*¹; Alexandre Carvalho²; Bruno Alho¹; Eduardo Nóbrega¹; Thiago Alvarenga¹; Airton Caldas¹; Vinicius de Sousa¹; Nilson de Oliveira¹; Pedro von Ranke¹; ¹UERJ; ²Universidade Federal de São Paulo

10:45 AM

Enhanced Magnetocaloric Effect (MCE) in Polycrystalline Ni₂MnGa Alloys through Isobaric Thermal Cycling and Correlation with Texture Changes: *Michael McLeod*¹; Anit Giri²; Le Zhou³; Sven Vogel⁴; Yongho Sohn³; Kyu Cho²; Bhaskar Majumdar¹; ¹New Mexico Tech; ²US Army Research Laboratories; ³University of Central Florida; ⁴Los Alamos National Laboratory

11:05 AM

Martensitic Transformations Study from Composition Gradients Generated by Diffusion Couples for in NiMnGa System: *Le Zhou*¹; Anit Giri²; Kyu Cho²; Yongho Sohn¹; ¹University of Central Florida; ²U.S. Army Research Laboratory

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

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Wednesday AM
February 19, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Yong Yang, University of Florida

8:30 AM Invited

High Temperature Fracture Toughness Testing for Advanced Reactor Applications: *Randy Nanstad*¹; Xiang Chen¹; Mikhail Sokolov¹; ¹Oak Ridge National Laboratory

8:55 AM

Material Selection for Accident Tolerant Fuel Cladding: *Bruce Pint*¹; Kurt Terrani¹; Yukinori Yamamoto¹; Lance Snead¹; ¹Oak Ridge National Laboratory

9:10 AM

Grain Boundary Engineering of Alloy 617 through Cold Deformation and Annealing: *Behrang Poorganji*¹; Deepthi Tammana¹; Xingshou Wen¹; Richard Wright²; T-L. Sam Sham³; vijay vasudevan¹; ¹University of Cincinnati; ²Idaho National Lab; ³Oak Ridge National Laboratory

9:25 AM

Effect of Nanocrystalline Grain Size on Mechanical Property Variation during Irradiation of Electrodeposited Nickel Coatings: Satish Gautam¹; Christopher David²; Karthiselva N.S.¹; B.K. Panigrahi²; Nitin Wasekar³; *Srinivasa Bakshi*¹; ¹Indian Institute of Technology Madras; ²Indira Gandhi Centre for Atomic Research; ³ARCI

9:40 AM Break

10:00 AM

Corrosion Behavior of Alumina-forming Austenitic Steels in Supercritical Carbon Dioxide: *Lingfeng He*¹; Paul Roman¹; Bin Leng¹; Kumar Sridharan¹; Mark Anderson¹; Todd Allen¹; ¹University of Wisconsin-Madison

10:15 AM

Thermal Aging Effect on Fracture Toughness of Modified 9Cr-1Mo Steel for Advanced Reactor Applications: *Xiang Chen*¹; *Randy Nanstad*¹; Mikhail Sokolov¹; ¹Oak Ridge National Laboratory

10:30 AM

Impacts of Hydrogen in Unirradiated Zircaloy Nuclear Cladding under Dry Storage Conditions: *Rick Shimskey*¹; ¹Pacific Northwest National Laboratory

10:45 AM

Effect of Ni on Formation of Intermetallic Phases in Highly Irradiated Reactor Pressure Vessel Steels: *Peter Wells*¹; G. Odette¹; Nicholas Cunningham¹; Tim Milot¹; Yuan Wu¹; Takuya Yamamoto¹; Jim Cole²; Brandon Miller²; ¹UC Santa Barbara; ²Idaho National Laboratory

11:00 AM

Effects from Cr Concentration on Stability against Inter-diffusion between Lanthanides and Fe-Cr Alloys: *Wei-Yang Lo*¹; Yuedong Wu¹; Nicolas Silva¹; Yong Yang¹; ¹University of Florida

11:15 AM

Thermal Stability of Ultrafine Grained Austenitic ODS Steel: *Xiaodong Mao*¹; Chang Hee Han¹; Tae Kyu Kim¹; Kyu Hwan Oh²; Jinsung Jang¹; ¹Korea Atomic Energy Research Institute; ²Seoul National University

11:30 AM

Mechanical Properties and Microstructure of Ultrafine-grained Zircaloy-4 processed through Multiaxial Forging: Devasri Fuloria¹; *Jayaganthan R*¹; Dinesh Srivastava¹; Dey G.K.¹; Saibaba N¹; ¹IIT Roorkee

Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration — Session I

Sponsored by: TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee
Program Organizer: David Mitlin, University of Alberta and NINT NRC

Wednesday AM
February 19, 2014
Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: To Be Announced

8:30 AM Invited

Engineering Nanostructured Materials for Extreme Applications: *Troy Topping*¹; Kaka Ma¹; William Golumbfskie²; Julie Schoenung¹; Enrique Lavernia¹; ¹University of California, Davis; ²Naval Surface Warfare Center, Carderock

8:50 AM Invited

Materials Solutions for Fouling Mitigation in Oil and Gas: *Seth Taylor*¹; Les Jackowski¹; ¹Chevron Energy Technology Company

9:10 AM Invited

Mechanism of Corrosion-enhanced Erosion of Steels in Oil and Gas Production: Baotong Luo¹; Dahai Xia²; *Jingli Luo*²; ¹Southwest Research Institute; ²University of Alberta

9:30 AM Invited

Microstructure Engineering of the Heat Affected Zone in Linepipe Steels: *Matthias Militzer*¹; Jennifer Reichert¹; Faysal Eliyan¹; Akram Alfantazi¹; ¹The University of British Columbia

9:50 AM Break

10:00 AM Invited

Microstructure of Low Alloy Steels for Casing Application in Sour Environments: Weishan Huang¹; *Jingli Luo*¹; Barry Wiskel¹; Hani Henein¹; Josiah Jordan¹; ¹University of Alberta

10:20 AM Invited

Advance Alloys for Sour HPHT: Thermo-mechanically Processed Ultra-fine Grain UNS N07718: *Indranil Roy*¹; Manuel Marya¹; Paul Maxwell²; Xinghang Zhang³; ¹Schlumberger; ²Carpenter Technology; ³Texas A&M University

10:40 AM Invited

Comparison of Scales Formed on Laboratory Coupons and Field Components Using X-ray Microdiffraction: Implications for Corrosion Rate Prediction and Reliability: *Monica Barney*¹; Andrew Nissan¹; ¹Chevron Energy Technology Company

11:00 AM Invited

Wear Resistance of the Ti/TiC Coatings Deposited by Means of Supersonic Cold Gas Spray Technique: *Jan Kusinski*¹; Slawomir Kac¹; Sergi Dosta²; Jorge Garcia-Forgas³; ¹University of Mining and Metallurgy; ²Universitat de Barcelona Martí i ; ³ALHENIA AG

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Mo- and Ni-Based Alloys

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee
Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Wednesday AM
February 19, 2014
Room: 6D
Location: San Diego Convention Center

Session Chairs: Junpin Lin, University Science and Technology Beijing; Todd Leonhardt, Rhenium Alloys, Inc.

8:30 AM Invited

Effect of Ti-macroalloying on Phase Formation and Properties of Mo-borosilicide Alloys: *Martin Heilmaier*¹; Daniel Schliephake¹; Maria Azim²; Bronislava Gorr²; Hans-Jürgen Christ²; ¹Karlsruhe Institute of Technology; ²University of Siegen

9:00 AM Invited

Environmental Resistance of Mo-Si-B Alloys and Coatings: *John Perepezko*¹; Travis Sossaman¹; ¹University of Wisconsin-Madison

9:30 AM

Microstructure and Creep Properties of Mo-Si-B Base Alloys at High Temperatures: *Christian Hochmuth*¹; Daniel Schliephake²; Rainer Völk¹; Martin Heilmaier²; Uwe Glatzel¹; ¹University Bayreuth; ²Karlsruhe Institute of Technology

9:50 AM

Destablizing Mo₃Si Phase in Mo-Si-B Alloys by Tungsten Additions and Its Oxidative Resistance: *Pratik Ray*¹; Matthew Kramer¹; Muft Akinc²; ¹Ames Laboratory, US-DOE; ²Iowa State University

10:10 AM Break

10:25 AM

Oxidation Performance of Mo-Mo₃Si-Mo₅SiB₂ Alloys and Coated Mo-Si-B Materials: *Manja Krüger*¹; Georg Hasemann¹; Torben Baumann¹; Sebastian Dieck¹; Stefan Rannabauer¹; Michael Scheffler¹; ¹Otto-von-Guericke University Magdeburg

10:45 AM Invited

Welding Behavior of Molybdenum: *Todd Leonhardt*¹; ¹Rhenium Alloys Inc

11:15 AM

Atomistic Modeling of Zr, Si Segregation at Twist and Tilt Grain Boundaries in Molybdenum: *Olena Lenchuk*¹; Karsten Albe¹; ¹TU Darmstadt

11:35 AM

Mechanical Properties and Fracture Behavior of NiAl-V In Situ Composites: *Srdjan Milenkovic*¹; Rubens Caram²; ¹IMDEA Materials Institute; ²State University of Campinas

11:55 AM

Transformation and Deformation Mechanisms in High Temperature Shape Memory Alloys with Nanoprecipitates: Yunzhi Wang¹; Pete Anderson¹; Michael Mills¹; Fan Yang¹; Matthew Bowers¹; *Lee Casalena*¹; Yipeng Gao¹; Xiang Chen¹; ¹The Ohio State University



Mechanical Behavior at the Nanoscale II — Nanostructured Composites and Glasses

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Wednesday AM
February 19, 2014

Room: 9
Location: San Diego Convention Center

Session Chairs: Timothy Rupert, University of California, Irvine; Nathan Mara, Los Alamos National Laboratory

8:30 AM Invited

Influence of Biphasic Interfacial Character on the Mechanical Response of Nanolamellar Composites: *Nathan Mara*¹; John Carpenter¹; Thomas Nizolek²; Shijian Zheng¹; Weizhong Han¹; William Mook¹; Tresa Pollock²; Irene Beyerlein¹; ¹Los Alamos National Laboratory; ²University of California, Santa Barbara

9:00 AM Invited

Strengthening Effect of Single-atomic-layer Graphene in Metal-graphene Nanolayered Composites: *Seung Min Han*¹; ¹Korea Advanced Institute of Science and Technology

9:30 AM

Micro-mechanical Characterization of Ultra-high Strength Dendritic Tungsten Thermal Barrier Coatings: *Yaofang Zhang*¹; *Jaafar El-Awady*¹; ¹Johns Hopkins University

9:50 AM

Comparison of Nano-indentation Results Obtained with Berkovich, Cube-corner and Cono-spherical Indenter Tips in Al-Cu Alloys: *Vipul Gupta*¹; Jacob Hochhalter²; Stephen Smith²; ¹National Institute of Aerospace; ²NASA Langley Research Center

10:10 AM Break

10:25 AM

Enhanced Strength and Damage Tolerance in 3D Nano-architected Metamaterials: *Lucas Meza*¹; Dongchan Jang¹; Harold Greer¹; Julia Greer¹; ¹California Institute of Technology

10:45 AM Invited

Simulation of Complex Materials Structures with Charge Optimized Many-body (COMB) Potentials: *Simon Phillpot*¹; Yangzhong Li¹; Mark Noordhoek¹; Tzu-Ray Shan²; Tao Liang¹; Susan Sinnott¹; ¹University of Florida; ²Sandia National Laboratories

11:15 AM

Understanding the Failure of Sodium Borosilicate Glasses: From the Macroscale to the Microscale: *Cindy Rountree*¹; Marina Barlet¹; Jean-Marc Delay¹; Daniel Bonamy¹; ¹CEA

11:35 AM

High Temperature Nanomechanical Testing: Softening and Melting of Soda Lime Glass: *Jeremiah Vieregge*¹; Ude Hangen¹; Katie Fisher¹; ¹Hysitron

11:55 AM

Ultra-low Density Nanotubular Metal Oxides with Super-high Modulus and Strength by Atomic Layer Deposition: *Jianchao Ye*¹; Andreas Baumgaertel¹; Yinmin Wang¹; Juergen Biener¹; Monika Biener¹; ¹Lawrence Livermore National Laboratory

Mechanical Behavior Related to Interface Physics II — Twinning Effects on Mechanical Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Wednesday AM
February 19, 2014

Room: 11A
Location: San Diego Convention Center

Session Chairs: Garritt Tucker, Sandia National Laboratories; Giacomo Po, UCLA

8:30 AM Invited

Mechanical behavior of Nanotwinned Metals: *Xinghang Zhang*¹; D. Bufford¹; Y. Liu¹; H. Wang¹; ¹Texas A&M University

9:00 AM

A 2D Dislocations Dynamics Model for Nanotwinned Materials: *Hakan Yavas*¹; Richard LeSar²; ¹The Ames Laboratory; ²Iowa State University

9:20 AM

Angstrom Scaled Twin Boundary Role on Ductile to Brittle Transition in Soft Gold Wires: *Scott Mao*¹; Jiangwei Wang¹; Frederic Sansoz²; Jianyu Huang³; ¹University of Pittsburgh; ²The University of Vermont; ³None

9:40 AM Invited

Mechanisms of Dipolar Loop Formation and Interactions in FCC metals: *Giacomo Po*¹; Tamer Crosby¹; Nasr Ghoniem¹; ¹UCLA

10:10 AM Break

10:30 AM Invited

The Influence of Twin Boundaries on the Stability and Deformation of Nanocrystalline Copper with Atomistic Simulations: *Garritt Tucker*¹; Stephen Foiles²; ¹Drexel University; ²Sandia National Laboratories

11:00 AM

Extraordinary Stability of Nano-twinned Structure and Its Mechanical Behavior in Electrodeposited Co-Ni Alloys: *Xuejun Jin*¹; Jiayao Li¹; Wei Li¹; ¹Shanghai Jiao Tong University

11:20 AM

Twin-twin Interactions in Magnesium Single Crystal: *Qin Yu*¹; Jian Wang²; Yanyao Jiang¹; Rodney McCabe²; Carlos Tomé²; ¹Department of Mechanical Engineering, University of Nevada, Reno; ²Los Alamos National Laboratory

11:40 AM

In Situ and Ex Situ TEM Experiments to Elucidate Defect Interface Interactions in Ag-Cu Composites: *Ben Eftink*¹; Owen Kingstedt¹; John Lambros¹; Nathan Mara²; Ian Robertson¹; ¹University of Illinois; ²Los Alamos National Laboratory

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Atomistic Modelling of H-microstructure Interactions

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

Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Wednesday AM
February 19, 2014
Room: 11B
Location: San Diego Convention Center

Session Chairs: Matous Mrovec, Fraunhofer IWM; Tilmann Hickel, Max-Planck-Institut für Eisenforschung

8:30 AM Invited

Ab Initio Based Understanding of the Segregation and Diffusion Mechanisms of Hydrogen in Steels: *Tilmann Hickel*¹; Roman Nazarov¹; Aurab Chakrabarty¹; Poulumi Dey¹; Gerard Leyson¹; Robert Spatschek¹; Blazej Grabowski¹; Jörg Neugebauer¹; ¹Max-Planck-Institut fuer Eisenforschung GmbH

9:10 AM

First-principles Models for Radiation Damage in D-T Fusion Power Plants: *Duc Nguyen-Manh*¹; S.L. Dudarev¹; ¹Culham Centre for Fusion Energy

9:30 AM

Coupled Atomistic-analytical Approach to Study Hydrogen Embrittlement by Nano-hydride Formation: *Blazej Grabowski*¹; Gerard Leyson¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

9:50 AM Break

10:10 AM Invited

Magnetic Tight Binding Models for Interstitial Elements and Extended Defects in Iron Phases: *Christian Elsaesser*¹; Matous Mrovec¹; Davide Di Stefano¹; Anthony Paxton²; Bernd Meyer³; ¹Fraunhofer IWM, Freiburg, Germany; ²King's College London, United Kingdom; ³University Erlangen-Nuremberg, Germany

10:50 AM

The Effect of Alloying on the Properties of Metal-Hydrogen Systems: Modeling and Simulation of Diffusion, Dislocation Loops, and Phase Changes.: *Clive Freeman*¹; Mikael Christensen¹; Walter Wolf¹; Paul Saxe¹; Erich Wimmer¹; ¹Materials Design, Inc.

11:10 AM

Effects of Hydrogen Concentration, Dislocation Density and Crystal Size in Deformation of Iron Nano-crystals: A Molecular Dynamics Study: Malik Wagih¹; Yizhe Tang²; Tarek Hatem¹; *Jaafar El-Awady*²; ¹British University in Egypt; ²Johns Hopkins University

11:30 AM

An Atomistic Study of Helium-3 Bubble Growth in Aging Palladium Tritides: *Jonathan Zimmerman*¹; Lucas Hale¹; ¹Sandia National Laboratories

Nanoparticulate Materials: Production, Consolidation and Characterization — Consolidation II: Field Assisted Sintering

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Wednesday AM
February 19, 2014
Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chair: Javier Garay, UC Riverside

8:30 AM Invited

The Role of the Pressure Parameter in the Current Activated Pressure Assisted Densification (CAPAD) of Nanocrystalline Materials: A Dupuy¹; Y Kodera¹; *J. Garay*¹; ¹UC Riverside

9:00 AM Invited

Synthesis and Processing of Nanoscale B4C Powders: *K Mills*¹; D Martin¹; R Sadangi¹; D Kapoor¹; ¹US Army ARDEC

9:30 AM

Assessment of Electrical Contact Resistance in Spark-plasma Sintering Graphite Tooling: *Diletta Giuntini*¹; Xialu Wei¹; Eugene Olevsky¹; ¹San Diego State University

9:50 AM

Temperature Uniformization in Spark-plasma Sintering by Novel Tooling Design: *Diletta Giuntini*¹; Jan Raethel²; Mathias Herrmann²; Eugene Olevsky¹; ¹San Diego State University; ²Fraunhofer-Institut für Keramische Technologien und Systeme, IKTS Dresden

10:10 AM Break

10:30 AM

On the Role of Electric Current in Spark Plasma Sintering of Conductive Materials: *Eugene Olevsky*¹; Aleksandra Ilyina²; Elena Aleksandrova²; Maria Yurlova²; Igor Bogachev²; Evgeny Grigoryev²; ¹San Diego State University; ²Moscow Engineering Physics University

10:50 AM

Influence of Processing Parameters on Mechanical Properties of Ferritic ODS: Nerea Garcia-Rodriguez¹; Monica Campos¹; *Jose Torralba*²; ¹Universidad Carlos III Madrid; ²IMDEA Materials Institute

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session V

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Wednesday AM
February 19, 2014
Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Reza Shahbazian-Yassar, Michigan Technological University; Scott Mao, University of Pittsburgh

8:30 AM Invited

Interfaces in Advanced LI Batteries: *Jun Liu*¹; ¹Pacific Northwest National Laboratory

8:45 AM Invited

A Systematic Approach to Extend the Cycle Life of Li/S Cells: *Yuegang Zhang*¹; ¹Lawrence Berkeley National Laboratory

9:00 AM

Facile Synthesis of α -Fe₂O₃ Nanorods Derived from α -FeOOH Nanorods and Its Application as Anode Materials for Rechargeable Sodium-ion Batteries: Shubo Wang¹; *Wei Wang*¹; Liwen Hu¹; Zongqian Hu²; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science & Technology Beijing; ²Beijing Institute of Radiation Medicine

9:15 AM Invited

Graphene Hybridized with Transition Metal Oxides for High-performance Supercapacitors: *Jun Jiao*¹; Wen Qian¹; ¹Portland State University

9:30 AM Invited

Microwave Assisted Sulfur Infusion Technique and the Corresponding Reactor Design for Li-S Battery Applications: *Jayaprakash Navaneethakrishnan*¹; ¹NOHMs Technologies

9:45 AM Invited

In Situ TEM Observation on Multiple-stripe Lithiation Process in Individual SnO₂ Nanowires: *Scott Mao*¹; Li Zhong¹; Jianyu Huang¹; ¹University of Pittsburgh

10:00 AM Break

10:15 AM Invited

Nanomaterials and Electrochemical Energy Storage: The Pros and the Cons: *Claude Delmas*¹; ¹ICMCB- CNRS

10:30 AM Invited

Nanoscale Materials for Energy Storage Systems: *Nader Hagh*¹; ¹400 Apgar drive

10:45 AM Invited

Phase Transformations Determine the Electrochemical Properties of Nanomaterials: *Jordi Cabana*¹; ¹University of Illinois at Chicago

11:00 AM Invited

Improved Electrochemical Energy Storage Devices Based on Layer-by-layer Spray Deposition: *Patrick Grant*¹; Chaopeng Fu¹; Laura O'Neill¹; Meng Jiang¹; Ann Huang¹; Beatriz Mendoza-Sanchez²; ¹Oxford University; ²CRANN, Trinity College Dublin

11:15 AM Invited

On the Evaluation Methods of Supercapacitors: *Ning Pan*¹; Sanliang Zhang¹; ¹University of California at Davis

11:30 AM Invited

Rational Design of Si-based Anodes for High Performance Lithium-ion Batteries: *Junhong Chen*¹; ¹University of Wisconsin-Milwaukee

11:45 AM Invited

Thin Films as a Platform for Understanding the Basic Mechanisms of FeF₂ Electrodes for Li-ion Batteries: *Nigel Shepherd*¹; Reinaldo Santos¹; Vyacheslav Volkov²; Yimei Zhu²; ¹University of North Texas; ²Brookhaven National Laboratory

12:00 PM

The Mechanism Interpretation by Energetic Band Diagram of Super P Carbon Black and Silicon Carbide in Si-based Lithium Ion Batteries: *Bing-Hong Chen*¹; Chun-Kai Lan¹; ¹Department of Materials Science and Engineering, National Tsing Hua University

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Multi-Modal Monitoring of Structure Evolution*Sponsored by:* TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee*Program Organizers:* Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kosterz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of TennesseeWednesday AM
February 19, 2014Room: 10
Location: San Diego Convention Center*Session Chairs:* E-Wen Huang, Central University; Ross Harder, Advanced Photon Source

8:30 AM Keynote

Metals under Complex Conditions: In-situ and real-time Information Revealt by Neutron and Synchrotron X-Ray Diffraction: *Klaus-Dieter Liss*¹; ¹Japan Atomic Energy Agency; Australian Nuclear Science and Technology Organisation

9:10 AM Invited

Multi-modal Tracking of Microstructure Responses: Combining Near-field Orientation Mapping, Far-field Strain Sensitivity, and Tomography in HEDM Measurements: *Robert Suter*¹; Frankie Li²; Joel Bernier²; Jay Schuren³; Paul Shade³; Peter Kenesei⁴; Jon Almer⁴; Ulrich Lienert³; Jon Lind¹; Reeju Pokharell¹; Anthony Rollett¹; ¹Carnegie Mellon University; ²Lawrence Livermore National Laboratory; ³Wright Patterson Air Force Base; ⁴Argonne National Laboratory; ⁵DESY Photon Source

9:35 AM Invited

Recent Neutron and Synchrotron Studies in Magnetic Shape Memory Alloys: *Jose Manuel Barandiaran*¹; Volodymyr Chernenko²; Maria Luisa Fdez-Gubieda¹; Patricia Lazpita¹; Akio Kimura³; ¹BCMATERIALS and University of the Basque Country (UPV/EHU); ²BCMATERIALS and Ikerbasque; ³Hiroshima University

10:00 AM Break

10:15 AM Invited

In Situ Neutron Diffraction Study of Shape Memory Alloys under Isothermal, Isobaric and Isostrain Loads: *Raj Vaidyanathan*¹; ¹UCF

10:40 AM Invited

New Intrinsic Mechanism on Gum-like Superelasticity of Multifunctional Alloys: *Yandong Wang*¹; Jiapeng Liu²; Yulin Hao³; Yunzhi Wang⁴; Zhihua Nie²; Dong Wang⁵; Yang Ren⁶; Rui Yang³; ¹University of Science and Technology; ²Beijing Institute of Technology; ³Shenyang National Laboratory for Materials Science; ⁴The Ohio State University; ⁵State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ⁶X-ray Science Division, Argonne National Laboratory

11:05 AM Invited

A General Formalism to Model the Diffraction Pattern of Layered and Faulted Materials: *Matteo Leoni*¹; Robert Koch¹; ¹University of Trento

11:30 AM

3-D Diffuse-scattering Characteristics of the Diffraction Spots of NiMnGa Ferromagnetic Shape-memory Alloys: *Gang Wang*¹; ¹Northeastern University

11:45 AM

State of Hydrogen and Deuterium in Electrochemically and Chemically Charged High Purity Aluminum: *Paul Rozenak*¹; ¹Hydrogen Energy Batteries, LTD

Pb-free Solders and Emerging Interconnect and Packaging Materials — Characterization and Assessment*Sponsored by:* TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee*Program Organizers:* Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch AutomovtiveWednesday AM
February 19, 2014Room: 5B
Location: San Diego Convention Center*Session Chairs:* Robert Kao, National Taiwan University; Cheng-En Ho, Yuan-Ze University

8:30 AM

Characterization of Sn Crystal Orientation and Microstructure Evolution during Thermal Cycling in a Wafer Level Chip Scale Package Using EBSD and In Situ x-ray Diffraction: *Jason Zhou*¹; Bite Zhou¹; Thomas Bieler¹; Tae-kyu Lee²; ¹Michigan State University; ²Cisco Systems, Inc.

8:50 AM

Characterization of Sn Crystallographic Orientation and Cu₆Sn₅ Precipitates in Solder Joints at Small Volumes Using 3D Electron Backscatter Diffraction (EBSD): *Antony Kirubanandham*¹; Yang Jiao¹; Nikhilesh Chawla¹; ¹Arizona State University

9:10 AM

Void Migration in Cu Vias under Current Flow Detected by 3D X-ray Computed Tomography: Yan Li¹; Luhua Xu¹; Pilin Liu¹; Balu Pathangey¹; Mario Pacheco¹; Rajen Dias¹; Deepak Goyal¹; ¹Intel

9:30 AM

Synchrotron Radiation Micro Tomography Study of 3D Microelectronic Packages: John Elmer¹; Yan Li²; Holly Barth¹; Dula Parkinson³; Mario Pacheco²; Deepak Goyal²; ¹Lawrence Livermore National Laboratory; ²Intel Corporation; ³Lawrence Berkeley National Laboratory, ALS

9:50 AM

Effect of Grain Orientation on the Behavior of Thermomigration in Sn3.5Ag Solders: Wei-Neng Hsu¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University

10:10 AM Break

10:30 AM

Mechanism of Mechanical Twinning in High Sn Alloys Induced by Thermal Strain: Huili Xu¹; Choong-un Kim; Tae-Kyu Lee²; Zhou Quan³; Thomas Bieler; ¹National Dong Hwa University; ²Cisco System Inc.; ³Michigan State University

10:50 AM

Coincident Site Lattice Boundaries Formed in Solidification and Deformation Twinning in Low-silver Solder Interconnects: Hongtao Chen¹; ¹Shenzhen Graduate School, Harbin Institute of Technology

11:10 AM

Vibrational Based Damage Analysis of Microelectronic Packages: Peyman Raffee¹; Golta Khatibi¹; Michael Nelhiebel²; Rainer Pelzer²; ¹University of Vienna; ²Infineon Technologies AG

11:30 AM

Evolution of Microstructure Characteristics across Sn-based Solder Joints under Simultaneous Thermal Cycling and Current Stressing: Yong Zuo¹; Limin Ma¹; Yutian Shu¹; Fu Guo¹; Andre Lee²; K. N. Subramanian²; ¹Beijing University of Technology; ²Michigan State University

Phase Transformation and Microstructural Evolution — Alloying, Grain Refinement, and Microstructural Evolution in Steels

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

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Wednesday AM
February 19, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: Emmanuel DeMoor, Colorado School of Mines; Ning Ma, ExxonMobile Research & Engineering Company

8:30 AM Invited

Tensile Behavior of Intercritically Annealed 10%Mn Multi-phase Steel: Bruno De Cooman¹; ¹Pohang University of Science and Technology

9:00 AM

Obtaining Ultrafine-grained Austenite in a Cold-rolled Metastable Stainless Steel: Carola Celada¹; Jer-Ren Yang²; David San Martin¹; ¹CENIM-CSIC; ²National Taiwan University

9:20 AM Invited

Work Hardening and Austenite Stability in Ultra Fine Grained Medium-Mn TRIP Steels: Paul Gibbs¹; Bruno De Cooman²; Donald Brown¹; Bjørn Clausen¹; Matthew Merwin³; David Matlock⁴; ¹Los Alamos National Laboratory; ²Graduate Institute of Ferrous Technology, POSTECH; ³United States Steel Corporation; ⁴Advanced Steel Processing and Products Research

Center, Colorado School of Mines

9:50 AM

Microstructural Evolution of Ferrite Grains during Dynamic Transformation in 10Ni-0.1C Steel: Lijia Zhao¹; Nokeun Park¹; Akinobu Shibata¹; Nobuhiro Tsuji¹; ¹Kyoto University

10:10 AM Break

10:25 AM Invited

Nanoscale Martensite-to-austenite reversion at Grain Boundaries: A Pathway to Tough and Ductile Martensite: Dirk Ponge¹; Stefanie Sandlöbes¹; Julio Millán¹; Hamid Assadi¹; Michael Herbig¹; Pyuck-Pa Choi¹; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH

10:55 AM

Hot Deformation Behavior of an Fe-Al Steel in the Two Phase Region: Kenta Maeda¹; Tihe Zhou¹; Hatem Zurob¹; ¹McMaster University

11:15 AM Invited

Microalloyed High Carbon Wire Steels: Emmanuel De Moor¹; Stephanie Miller¹; ¹ASPPRC Colorado School of Mines

11:45 AM

Effect of Microstructural Evolution on the Mechanical Behavior of High Strength 560 MPa Linepipe Steels: Pavan Challa Venkata Surya¹; Devesh Misra¹; Murali Manohar²; Michael Mulholland²; Jack Hartmann²; ¹University of Louisiana at Lafayette; ²ArcelorMittal

12:05 PM

Role of Microalloying Precipitates in Grain Refinement and Dynamic Recrystallization in HSLA Steels: Deepak Kundalkar¹; Rajkumar Singh²; Asim Tewari¹; ¹IIT Bombay; ²KCTI, Bharat Forge

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Advances in Atomistic Simulations - III

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

Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

Wednesday AM
February 19, 2014

Room: 30E
Location: San Diego Convention Center

Session Chairs: Mark Horstemeyer, Mississippi State University; Byeong-Joo Lee, Pohang University of Science and Technology; Mark Tschopp, Army Research Laboratory

8:30 AM Invited

Mesoscale Phase-field Modeling of Cr Segregation on Grain Boundaries in Fe-Cr Alloys under Irradiation: Shenyang Hu¹; Yulan Li¹; Fei Gao¹; Xin Sun¹; Chuck H. Henager Jr.¹; ¹Pacific Northwest National Laboratory

8:50 AM

Analytic Bond-order Potentials for Fe and Fe-C: Sebastian Schreiber¹; Miroslav Cak¹; Thomas Hammerschmidt¹; Ralf Drautz¹; ¹ICAMS, Ruhr-University Bochum

9:10 AM Invited

Using the (Modified) Embedded Atom Method for Studying Shock Processes in Materials Approaching Continuum Levels: Case Study of a Richtmyer-Meshkov Instability: Frank Cherne¹; ¹Los Alamos National Laboratory

9:30 AM

Molecular Dynamics Study of Voids and Bubbles in BCC Uranium: Benjamin Beeler¹; Chaitanya Deo²; Michael Baskes³; Maria Okuniewski⁴; ¹University of California, Davis; ²Georgia Institute of Technology; ³University of California, San Diego; ⁴Idaho National Laboratory



9:50 AM Break**10:10 AM**

Atomistic Modeling of Thermodynamic Properties of Pu-Ga Alloys Based on the Invar Mechanism: *Tongsik Lee*¹; Michael Baskes¹; A.C. Lawson¹; Steven Conradson¹; Shaoping Chen¹; Alfredo Caro¹; Steven Valone¹; Christopher Taylor¹; ¹Los Alamos National Laboratory

10:30 AM Invited

From First Principles Calculations to Low Fluence Irradiation Experiments in Uranium Alloys: *Maria Okuniewski*¹; ¹Idaho National Laboratory

10:50 AM

Role of Dislocation Junctions in Spall Initiation in Shocked Single Crystals: *Niraj Gupta*¹; Mike Baskes²; Srinivasan Srivilliputhur¹; ¹University of North Texas; ²Los Alamos National Laboratory

Radiation Effects in Oxide Ceramics and Novel LWR Fuels — Experimental Characterization of Radiation Effects in Oxide Ceramics

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Xian-Ming Bai, Idaho National Laboratory; Todd Allen, Idaho National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Jianliang Lin, Colorado School of Mines; Michele Manuel, University of Florida; Dragos STAIU, European Commission, Joint Research Centre, Institute for Transuranium Elements; Yong Yang, University of Florida

Wednesday AM
February 19, 2014

Room: 33B
Location: San Diego Convention Center

Funding support provided by: The Center for Materials Science of Nuclear Fuel (CMSNF), an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Todd Allen, Idaho National Laboratory; William Weber, University of Tennessee

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

Irradiation Response of Fluorite-structured Oxides to Extreme Irradiation Conditions: *Yanwen Zhang*¹; Haiyan Xiao²; Ke Jin²; Caitlin Taylor²; Haizhou Xue²; Tamas Varga³; Fereydoon Namavar⁴; William Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³Pacific Northwest National Laboratory; ⁴University of Nebraska Medical Center

9:05 AM

Damage Structure Evolution in Ion Irradiated UO₂: *Mahima Gupta*¹; Janne Pakarinen¹; Steven Conradson²; Jeff Terry³; Lingfeng He¹; Jian Gan⁴; Andrew Nelson²; Todd Allen⁴; ¹University of Wisconsin - Madison; ²Los Alamos National Lab; ³Illinois Institute of Technology; ⁴Idaho National Lab

9:25 AM

Ion-implantation Induced Nano-channels for Optical Waveguide in LiNbO₃: *Ritesh Sachan*¹; L. Peng²; G. Duscher²; Y. Zhang²; M. Chisholm¹; W. Weber¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

9:45 AM

Ion Irradiation-induced Structural Transitions in Orthorhombic Ln₂TiO₅: *Jiaming Zhang*¹; Fuxiang Zhang²; Maik Lang²; Fengyuan Lu³; Jie Lian³; Rodney Ewing¹; ¹Stanford University; ²University of Michigan; ³Rensselaer Polytechnic Institute

10:05 AM Break**10:30 AM Invited**

Structural Defects in Uranium Dioxide: From Oxidation to Irradiation: *lionel Desgranges*¹; ¹CEA

11:00 AM

The Role of Non-stoichiometry in the Radiation Damage Evolution of SrTiO₃: *Blas Uberuaga*¹; ¹Los Alamos National Laboratory

11:20 AM

Kr and Xe Bubble Characterization in CeO₂: Lingfeng He¹; *Janne Pakarinen*¹; Mahima Gupta¹; Jian Gan²; Yongqiang Wang³; Marquis Kirk⁴; Todd Allen¹; ¹University of Wisconsin-Madison; ²Idaho National Laboratory; ³Los Alamos National Laboratory; ⁴Argonne National Laboratory

11:40 AM

Nano-scale Irradiation Induced Chemistry Changes in Oxide Fuel Materials: *Billy Valderrama*¹; Hunter Henderson¹; Lingfeng He²; Janne Pakarinen²; Jian Gan³; Todd Allen²; Michele Manuel¹; ¹University of Florida; ²University of Wisconsin-Madison; ³Idaho National Laboratory

Rare Metal Extraction & Processing Symposium — Rhenium, Tin, Vanadium and SX Processing

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

Wednesday AM
February 19, 2014

Room: 16B
Location: San Diego Convention Center

Session Chairs: Harald Oosterhof, Umicore; Brent Hiskey, University of Arizona

8:30 AM Introductory Comments**8:40 AM Invited**

Electrochemical Dissolution of Rhenium Bearing Super Alloy: Brent Hiskey¹; *John Snowberger*¹; ¹University of Arizona

9:00 AM

Sodium Stannate Preparation from Cassiterite Concentrate and Sodium Carbonate by Roasting under a CO/CO₂ Atmosphere: *Yuanbo Zhang*¹; Zijian Su¹; Zhixiong You¹; Bingbing Liu¹; Guang Yang¹; Guanghui Li¹; Tao Jiang¹; ¹Central South University

9:20 AM Invited

Dynamic Adsorption Behavior of Aqueous Vanadium onto Anion Exchange Resin: Cui Li¹; *Hong-Yi Li*¹; Liang Wang¹; Sheng-Kai An¹; Bing Xie¹; ¹Chongqing University

9:45 AM Invited

Ultrasonic-assisted Alkaline Leaching of Vanadium from Stone Coal: *Xuheng Liu*¹; Xingyu Chen¹; Jiangtao Li¹; Zhongwei Zhao¹; ¹Central South University

10:05 AM Break**10:25 AM**

Sodium Roasting Thermodynamics of Chromium-containing Vanadium Slag and Its Application: Hai-Xing Fang¹; *Hong-Yi Li*¹; Xin Li¹; Bing Xie¹; ¹Chongqing University

10:45 AM

Definition of the Process to Separate Light Rare Earths by Working with (2-Ethylhexyl)-Mono (2-Ethylhexyl) Ester Phosphonic Acid (P507) in a Mixler Settler Battery: *Alessandro Blasi*¹; Corradino Sposato¹; Giuseppe Devincenzi¹; Pietro Garzone¹; Massimo Morgana¹; ¹ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development

11:05 AM

Comparison Among Different Extractants, as (2-Ethylhexyl)-Mono (2-Ethylhexyl) Ester Phosphonic Acid (P507), Secondary-octyl Phenoxyl Acetic Acid (CA-12) and Bis(2,4,4-Trimethylpentyl)Phosphinic Acid (CYANEX272), in Heavy Rare Earths Separation via Hydrometallurgical Processes: *Corradino Sposato*¹; Alessandro Blasi¹; Giuseppe Devincenzi¹; Pietro Garzone¹; Massimo Morgana¹; ¹ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development

Shape Casting: 5th International Symposium — Process Design and Innovation

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee
Program Organizers: Murat Tiryakioglu, University of North Florida; John Campbell, University of Birmingham; Glenn Byczynski, Nemak Canada

Wednesday AM Room: 17B
February 19, 2014 Location: San Diego Convention Center

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM

A Draft Melting Procedure for Al alloys: *John Campbell*¹; ¹University of Birmingham

8:55 AM

Effect of Casting Condition in Semi-solid Aluminum Alloy Injection Process on Distribution of Defects and Density: *Yuichiro Murakami*¹; Kenji Miwa²; Masayuki Kito³; Takashi Honda³; Naoyuki Kanetake⁴; Shuji Tada¹; ¹Advanced Industrial Science and Technology; ²Aichi Science and Technology Foundation; ³Aisan Industry Co., Ltd; ⁴Nagoya University

9:15 AM

Reliability-based Casting Process Design Optimization: Richard Hardin¹; K.K. Choi¹; *Christoph Beckermann*¹; ¹University of Iowa

9:35 AM

Influence of Process Parameters on Blistering during T6 Heat Treatment of Semi-solid Castings: *Youfeng He*¹; Xiaojing Xu¹; Fan Zhang¹; Daquan Li¹; Stephen Midson¹; Qiang Zhu¹; ¹General Research Institute for Nonferrous Metals

9:55 AM

Integrated Casting-heat Treatment Technology for Near Net Shape ADI Casting Production: *Mohamed El Mansori*¹; Anil Meena¹; ¹MSMP Laboratory

10:15 AM Break

10:30 AM

Swage Casting of A356 (AlSi7Mg0.3) Alloy: *Huseyin Lus*¹; ¹Yildiz Technical University

10:50 AM

Additive Manufacturing Supports the Production of Complex Castings: *Alan Druschitz*¹; Mary Seals¹; Dean Snelling¹; ¹Virginia Tech

11:10 AM

Evolution of Filling System Design for an A356 Aluminum Housing Casting: *Joseph Chvala*¹; Murat Tiryakioglu¹; ¹University of North Florida

11:30 AM

Recent Advances on the Solidification Processing of Cast Energetic Materials: Ruslan Mudryy¹; Shian Jia²; *Laurentiu Nastac*²; ¹U.S. Army, RDECOM-ARDEC; ²The University of Alabama

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Oxides and Nanostructures II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Wednesday AM Room: 4
February 19, 2014 Location: San Diego Convention Center

Session Chair: Rampi Ramprasad, University of Connecticut

8:30 AM Invited

Structural Distortions at Interfaces - The Interplay between Surface and Volume Free Energy: *David Johnson*¹; ¹University of Oregon

9:10 AM

Developing Nanoalloy Stability Diagrams to Guide the Sintering of Binary Nanocrystalline Alloys: Yuanyao Zhang¹; *Naixie Zhou*¹; Jian Luo¹; ¹University of California, San Diego

9:30 AM Invited

A Nanomolecular Approach for Tailoring Multiple Properties of Inorganic Heterointerfaces: *Ganpati Ramanath*¹; ¹Rensselaer Polytechnic Institute

10:10 AM Break

10:20 AM

Vacancy Structure and Mobility at Low-angle Twist Grain Boundaries in MgO: *Blas Uberuaga*¹; Kedarnath Kolluri¹; ¹Los Alamos National Laboratory

10:40 AM

Surface and Grain Boundary Segregation in Oxides: Implications for Stability of Nanocrystalline Oxides: *Pratik Dholabhai*¹; Blas Uberuaga¹; Longjia Wu²; Sanchita Dey²; Ricardo Castro²; ¹Los Alamos National Laboratory; ²University of California Davis

11:00 AM

Intra-variant Substructure in Ni₂MnGa Martensite: Conjugation Boundaries: *Brittany Muntifering*¹; Libor Kovarik²; R.C. Pond³; Nigel Browning²; Peter Müllner¹; ¹Boise State University; ²Pacific Northwest National Laboratory; ³University of Exeter

11:20 AM

Self-trapping at Surfaces and Interfaces of Functional Oxides: *Paul Erhart*¹; Andreas Klein²; Nina Balke³; ¹Chalmers University of Technology, Department of Applied Physics; ²Technische Universität Darmstadt, Institut für Materialwissenschaft; ³Oakridge National Laboratory

11:40 AM

Surface Chemical Defects on Sapphire Contributing Paramagnetic Noise to Superconducting Circuits: *Vincenzo Lordi*¹; Donghwa Lee¹; Jonathan DuBois¹; ¹Lawrence Livermore National Laboratory

WEDNESDAY AM



Symposium on High Entropy Alloys II — Alloy Development and Applications

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Alloy Phases Committee

Program Organizers: Peter Liaw, The University of Tennessee; Gongyao Wang, University of Tennessee; M. C. Gao, National Energy Technology Laboratory; S. N. Mathaudhu

Wednesday AM
February 19, 2014

Room: 5A
Location: San Diego Convention Center

Session Chairs: Peter Liaw, The University of Tennessee; Suveen Mathaudhu

8:30 AM Invited

Potential Applications of High-entropy Materials: *Jien-Wei Yeh*¹; ¹National Tsing Hua University

8:50 AM

AlMnCrCuFeNi Multicomponent Alloy with Superior Hardness and Corrosion Resistance: Vasile Soare¹; Dumitru Mitrica¹; Ionut Constantin¹; Gabriela Popescu²; Ioana Csaki²; Mihai Tarcolea²; Ioan Carcea³; ¹National R&D Institute for Nonferrous and Rare Metals; ²Polytechnic University of Bucharest; ³Gheorghe Asachi Technical University of Iasi

9:00 AM Invited

High Entropy Multicomponent Alloys: *Brian Cantor*¹; ¹University of York

9:20 AM Invited

Development of BMG-forming High Entropy Alloy: Jin Yeon Kim¹; Hye Jung Chang²; Eun Soo Park¹; ¹Seoul National University; ²Korea Institute of Science and Technology

9:40 AM

High Entropy Alloy Coatings by Laser Processing: *Shravana Katakam*¹; Sanghita Mridha¹; Harpreet Arora¹; Sundeep Mukherjee¹; Narendra Dahotre¹; ¹University of North Texas

9:50 AM Break

10:10 AM Invited

The Search for Lower Density High Entropy Alloys: *James Cotton*¹; Ryan Glamm¹; Vanessa Venturella¹; Eric Pripstein¹; Michael Kaufman²; Abraham Munitz²; Ryan Oliver²; Rodinei Gomes³; Gerald Bourne²; Joseph Jankowski²; ¹Boeing; ²Colorado School of Mines; ³Universidade Federal da Paraiba

10:30 AM

Characterization of Laser-deposited CoCrFeNi High Entropy Alloy Coatings: Siva priya Jaccani¹; Vamsi krishna Balla²; Ravi Sankar Kottada¹; Janaki ram Gabbita¹; ¹Indian Institute of Technology Madras (IIT Madras); ²Central Glass and Ceramics Research Institute (CGCRI)

10:40 AM Invited

Micro-segregation and Metastable Phase Stability of Cast Ti-Zr-Hf-Ni-Pd-Pt High Entropy Alloys: *Y. Yokoyama*¹; S. Itoh¹; Y. Murakami¹; I. Narita¹; G. Wang²; Peter Liaw²; ¹Institute for Materials Research; ²The University of Tennessee

11:00 AM

Phase Selection in Al-Cu-Ni-Ti-Zr Alloys: *Pratik Ray*¹; Tanner Thom²; Mufit Akinc²; Matthew Kramer¹; ¹Ames Laboratory, US-DOE; ²Iowa State University

11:10 AM Invited

Manufacturing High Entropy Alloys Using Traditional Melt Casting Techniques: *Paul Jablonski*¹; Jeffrey Hawk¹; ¹US Department of Energy

11:30 AM Invited

Development of High Entropy Superalloys: *An-Chou Yeh*¹; Te-Kang Tsao¹; Yao-Jen Chang¹; Jien-Wei Yeh¹; ¹National Tsing Hua University

Ultrafine Grained Materials VIII — Fundamental Deformation Phenomena

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Wednesday AM
February 19, 2014

Room: 6E
Location: San Diego Convention Center

Session Chairs: Christopher Saldana, the Pennsylvania State University; M. Ravi Shankar, University of Pittsburgh

8:30 AM Invited

The Fine Line between Brittleness and Toughness in Severely Plastically Deformed Metals: *Anton Hohenwarter*¹; Reinhard Pippan²; ¹Department of Materials Physics, Montanuniversität Leoben, Austria; ²Erich Schmid Institute of Materials Science

8:50 AM Invited

Improved Tensile and Fatigue Properties of Nanocrystalline Cu and Cu-Al Alloys: *Zhefeng Zhang*¹; Xianghai An¹; Zhenjun Zhang¹; Peng Zhang¹; Shen Qu¹; Shiding Wu¹; ¹Institute of Metal Research

9:10 AM Invited

Strain and Stress Partitioning in Ultrafine Grained Ferrite/Martensite Steel: *Cem Tasan*¹; Dirk Ponge¹; Johan Hoefnagels²; Dingshun Yan¹; Martin Diehl¹; Franz Roters¹; Marion Calcagnotto³; Dierk Raabe¹; ¹Max-Planck Institute for Iron Research; ²Eindhoven University of Technology; ³Salzgitter Mannesmann Forschung GmbH

9:30 AM

Stress-driven Grain Growth during Stress-relaxation in Nanocrystalline Ni: *Yong Zhang*¹; Jessica Krogstad¹; Kevin Hemker¹; ¹Johns Hopkins University

9:45 AM

Maps of Microstructures Resulting from Severe Shear: *M. Ravi Shankar*¹; Sepideh Abolghasem¹; Saurabh Basu¹; ¹University of Pittsburgh

10:00 AM Break

10:15 AM Invited

Transient Plastic Phenomena in Large Strain Deformation: Fei Du¹; Cesar Moreno¹; *Christopher Saldana*¹; ¹The Pennsylvania State University

10:35 AM Invited

The Role of Copper Twin Boundaries in Cryogenic Indentation-induced Grain Growth: Justin Brons¹; Henry Padilla II²; Khalid Hatter²; Brad Boyce²; *Gregory Thompson*¹; ¹University of Alabama; ²Sandia National Laboratories

10:55 AM

Quantifying the Role of Grain Boundary Energetics and Texture on the Strength of Ultrafine Grained Materials: *Lei Cao*¹; Marisol Koslowski¹; ¹Purdue University

11:10 AM

Interface Controlled Plasticity in Nanocrystalline Alloys: *Karsten Albe*¹; Jonathan Schäfer¹; Alexander Stukowski¹; ¹TU Darmstadt

11:25 AM Invited

Study of SPD Induced Lattice Defects and Their Effects to Strength before and during Annealing: *Michael Zehetbauer*¹; Peter Cengeri¹; Ismar Mulalic¹; Daria Setman¹; Florian Spieckermann¹; Erhard Schafner¹; Bartosz Sulkowski²; Borys Mikulowski²; ¹University of Vienna; ²AGH University of Science and Technology

11:45 AM

Hollow Cone High-pressure Torsion: *Hyoung Seop Kim*¹; Ho Yong Um¹; ¹POSTECH

Ultrafine Grained Materials VIII — Stability of Nanomaterials

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Wednesday AM Room: 6F
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Ying Chen, Rensselaer Polytechnic Institute; Heather Murdoch, U.S. Army Research Laboratory

8:30 AM Invited

Tailoring Mechanical Behavior and Stress-driven Grain Growth of Nanocrystalline Thin Films via Alloying: Mo-rigen He¹; Peter Felfer²; Saritha Samudrala²; Joel Lefever¹; Suman Dasgupta³; Kevin Hemker³; Julie Cairney²; Daniel Gianola¹; ¹University of Pennsylvania; ²University of Sydney; ³Johns Hopkins University

8:50 AM Invited

Cu/Nb Nanocomposite Metallic Wires Processed by Severe Plastic Deformation: Effects of the Nanostructure on the Resistance to Extreme Environment (High Strain, High Stress, High Temperature): Ludovic Thilly¹; Jean-Baptiste Dubois¹; Pierre-Olivier Renault¹; Florence Lecouturier²; ¹University of Poitiers; ²LNCMI

9:10 AM Invited

Stability of Nanostructured Metals at High Temperature and Against Radiation: Xinghang Zhang¹; Y. Chen¹; D. Bufford¹; K.Y. Yu¹; C. Sun²; H. Wang¹; ¹Texas A&M University; ²Los Alamos National Laboratory

9:30 AM

Nanoscale Precipitation, Recovery and Grain Growth in ODS Steel Particles: Nicolas Sallez¹; Laurent Couturier¹; Frédéric de Geuser¹; Alexis Deschamps¹; Frédéric Delabrouille²; Martine Blat-Yrieix²; Patricia Donnadieu¹; Yves Bréchet¹; ¹CNRS; ²EDF

9:45 AM

Mesoscale Modeling of Nanocrystalline Structural Evolutions under Thermal-mechanical Influences: Ying Chen¹; ¹Rensselaer Polytechnic Institute

10:00 AM Break

10:15 AM Invited

Bulk Consolidation of Nanostructured Cu-Ta Alloys: Kris Darling¹; Laszlo Keeskes²; A. Roberts²; Deepak Kapoor; Suveen Mathaudhu; T. Zahrah³; ¹ARL; ²US Army Research Laboratory; ³MATSYS Corporation

10:35 AM Invited

High Strain Rate Properties of Nanostructured Cu-Ta Alloys: Laszlo Keeskes¹; Kris Darling; ¹US Army Research Laboratory

10:55 AM

Quasi-static and Dynamic Mechanical Properties of Nanostructured Copper Doped with Tantalum: Weihua Yin¹; Kristal Darling²; Laszlo Keeskes²; Qiuming Wei¹; ¹University of North Carolina at Charlotte; ²US ARL

11:10 AM

Microstructures and Mechanical Properties of Ultrafine Grained and Nanostructured Cu after Annealing: Nairong Tao¹; Y. Zhang¹; Y.S. Li¹; K. Lu¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

11:25 AM

Effect of Diamantane Nanoparticles on the Thermal Stability of Cryomilled 5083 Aluminum: Walid Hanna¹; Khinlay Maung¹; Mohammed Enayati¹; James Earthman¹; Farghalli Mohamed¹; ¹University of California, Irvine

11:40 AM Invited

Processing Routes for Ultrafine Grained Magnesium MgZn₁Y₂ Alloy: D Kapoor¹; R. Sadangi¹; T. Zahrah²; R. Tandon³; D. Madan³; ¹US Army ARDEC;

²Matsys Inc; ³Magnesium Elektron Powder Products

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Magnetic Nanomaterials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Wednesday PM Room: Ballroom D
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Nitin Chopra, The University of Alabama; Yuanbing Mao, University of Texas - Pan American; Stephan Turano, Georgia Tech Research Institute

2:00 PM Invited

Spintronics for Integrated Circuits: Scalable Magnetic Nanostructures for Energy-efficient System-on-Chip: Seung Kang¹; ¹Qualcomm Technologies Inc.

2:30 PM

Bit Patterned Media Using Block Copolymer Templating on FePt: Allen Owen¹; Hao Su¹; Robert Douglas¹; Angeliq Montgomey¹; Subhadra Gupta¹; ¹The University of Alabama

2:50 PM

Antiferromagnetic Thickness Dependence of Blocking Temperature in Exchange Coupled SFMO/SFWO Multilayers: Deepak Kumar¹; Davinder Kaur²; ¹Graphic Era University Dehradun; ²IIT Roorkee

3:05 PM

Domain Wall Motion during Mechanical Depoling in the Ferroelectric Ceramic (1-x)(Na_{0.5}Bi_{0.5})TiO₃-xBaTiO₃ (NBT-BT): Lyndsey Denis¹; Julia Glaum²; Mark Hoffman²; John Daniels²; Jennifer Forrester¹; Ryan Hooper¹; Michele Manuel¹; Jacob Jones¹; ¹University of Florida; ²University of New South Wales

3:25 PM

High Magnetic Coercivity Associated with Nanoscale Phase Transformations in Near-eutectoid Co-Pt Alloys: Priya Ghatwal¹; Mark Hrdy¹; Thanakorn Iamsasri¹; Eric Vetter¹; William Soffa¹; Jerrold Floro¹; ¹University of Virginia

3:45 PM Break

4:05 PM

Structure and Magnetocaloric Effect of Pr₂Fe₁₇-xAlx: Lotfi Bessais¹; Rym Guetari¹; Riadh Bez¹; Karim Zehani¹; Najeh Mliki²; Corneliu Cizmas³; ¹CNRS; ²LMOP; ³Department of Electrical Engineering and Applied Physics,

4:20 PM

Galvanic Coupling of Ferromagnetic and Silver Nanoparticles for Stable Plasmons: Abhinav Malasi¹; Jingxuan Ge¹; Ritesh Sachan¹; Hernando Garcia²; Anup Gangopadhyay³; Gerd Duscher¹; Ramki Kalyanaraman¹; ¹University of Tennessee, Knoxville; ²Southern Illinois University Edwardsville; ³Washington University, St. Louis

4:40 PM

High Magnetic Moment CoFe Nanoparticles: Lotfi Bessais¹; Karim Zehani¹; Riadh Bez¹; Jacques Moscovici¹; Hassan Lassri²; El Kebir Hli³; Najeh Mliki⁴; ¹CNRS; ²University Hassan 2; ³Institut Neel CNRS; ⁴LMOP

5:00 PM

On the Study of Nanocrystalline Pr-Co Systems: Najeh Mliki¹; Riadh Fersi¹; Lotfi Bessais²; ¹LMOP, Faculty of Science of Tunis, University of Tunis El Manar; ²CMTR, ICMPE, UMR7182, CNRS, Université Paris Est

5:20 PM

Structural and Magnetic Properties of Nanocrystalline Pr₂Co₇Cx and Pr₂Co₇Hy Alloys: Lotfi Bessais¹; Riadh Fersi²; Najeh Mliki²; ¹CNRS; ²LMOP



2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanomaterials for Device Applications and Nanometal III-Deformation Mechanisms

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nugehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Wednesday PM
February 19, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: R. Katiyar, University of Puerto Rico; Somuri Prasad, Sandia National Laboratories

2:00 PM Invited

Nanoengineered Binary and Ternary Heavy Metal Selenides for MWIR Detectors: *Narsingh Singh*¹; ¹University of Maryland, Baltimore County

2:20 PM Invited

Electronically-active Silicon Nanophotonic Structures for Nonlinear Optics on a CMOS-compatible Chip: *Shayan Mookherjee*¹; ¹UC San Diego

2:40 PM Invited

Fabrication, Characterization, and Mechanism of Vertically Aligned Titanium Nitride Nanowires: Seyram Gbordzoe¹; Mainul Faruque¹; Kwadwo M-Darkwa¹; Zhigang Xu; *Dhananjay Kumar*²; ¹North Carolina Agricultural and Technical State University; ²North Carolina A & T State University

3:00 PM Invited

Novel Bimetallic Plasmonic Nanomaterials: *Ritesh Sachan*¹; R. Kalyanaraman²; G. Duscher²; ¹Oak Ridge National Laboratory; ²University of Tennessee

3:20 PM

Hollow Fiber Solar Cells: Processing, Morphology, and Property Correlations: Tyler Smith¹; *Abhinav Malasi*¹; Hernando Garcia²; Gerd Duscher¹; Ramki Kalyanaraman¹; ¹University of Tennessee, Knoxville; ²Southern Illinois University Edwardsville

3:40 PM Break

4:00 PM Invited

The Hall-petch Based Dislocation Mechanics of Nanopolycrystal Plasticity: *Ronald Armstrong*¹; ¹University of Maryland

4:20 PM Invited

Modeling of Grain Boundaries in Nanostructured Alloys: Structure, Stability and Dynamics: Shijing Lu¹; *Donald Brenner*¹; ¹North Carolina State University

4:40 PM Invited

The Role of Interfaces on the Deformation Behavior of Nanocrystalline Thin Films and Bulk Materials: *Mathias Göken*¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

5:00 PM Invited

Friction Behavior of Nanocrystalline Metals: The Role of Subsurface Grain Structures: *Somuri Prasad*¹; Corbett Battaile¹; Henry Padilla¹; Brad Boyce¹; Paul Kotula¹; ¹Sandia National Laboratories

5:20 PM Invited

3D TEM Characterization of Nanocrystalline Metal Thin Films: *Xiaoxu Huang*¹; S. Schmidt¹; P. Larsen¹; H. H. Liu²; A. Godfrey³; Z. Q. Liu⁴; ¹Technical University of Denmark; ²California Institute of Technology; ³Tsinghua University; ⁴Institute of Metal Research

5th International Symposium on High Temperature Metallurgical Processing — Simulation and Modeling

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

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Wednesday PM
February 19, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Phillip Mackey, P.J.Mackey Technology Inc; Mingjun Rao, Central South University

2:00 PM Introductory Comments

2:05 PM

Thermochemical Simulation of Cu-Ni Smelting Operations: Karri Penttilä¹; *Justin Salminen*¹; Nagendra Tripathi²; Pertti Koukkari¹; ¹VTT; ²Glencore-Xstrata Koniambo Nickel

2:20 PM

Impact of Concentrate Feed Temporal Fluctuations on a Copper Flash Smelting Process: *Alexandre Lamoureux*¹; Adam Blackmore¹; Maciej Jastrzebski¹; ¹Hatch Ltd.

2:35 PM

Influence of Microwave Radiation on Phosphorus-removal Process of Oolitic High-phosphorus Iron Ore Fines: *Huiqing Tang*¹; ¹University of Science and Technology Beijing

2:50 PM

Mathematical Modeling for Developing Iron Bath Reactor with H₂-C Mixture Reduction: *Bo Zhang*¹; Huai-wei Zhang¹; Jie-nan Liu¹; Li-sheng Liang²; Dong-yan Wang²; Yan-feng Yang³; Hua-ling Guo³; Xin Hong¹; ¹Shanghai University; ²Baosteel Co.,Ltd; ³Guiyang Vocational and Technical College

3:05 PM

Optimization System of Iron Ores Proportion for Sintering Process: *Xiaohui Fan*¹; Xiaoxian Huang¹; Xuling Chen¹; Min Gan¹; ¹Central South University

3:20 PM

Numerical Simulation Study on Immersed Side-blowing in C-H₂ Smelting Reduction Furnace: *Kongfang Feng*¹; Jieyu Zhang¹; Bo Wang¹; Jun Xu¹; Jinyin Xie¹; Weiling Cheng¹; Deyou Yin¹; Shaobo Zheng¹; ¹Shanghai University

3:35 PM Break

3:45 PM

Study of Mixing Phenomena during RH Refining Using Water Modeling: *Lifeng Zhang*¹; ¹University of Science and Technology Beijing

4:00 PM

Modeling and CFD Simulation of Multiphase Melt Flows in Steelmaking Oxygen Converters during Top Blow: *Varadarajan Seshadri*¹; Carlos Antônio da Silva²; Itavahn Alves da Silva²; Bruno Sandburg de Castro Lima²; Camila Goes Mattioli²; Marco Tulio Carmozine Prado²; Eliana Ferreira Rodrigues²; ¹Universidade Federal de Minas Gerais; ²Department of Metallurgical Engineering, Federal University of Ouro Preto Campus do Morro do Cruzeiro S/N

4:15 PM

Modeling and CFD Simulations of Multiphase Melt Flows in Steelmaking Converters under Combined Blow Conditions: *Varadarajan Seshadri*¹; Carlos Antônio da Silva²; Itavahn Alves da Silva²; Bruno Sandburg de Castro Lima²; Camila Goes Mattioli²; Marco Tulio Carmozine Prado²; Eliana Ferreira Rodrigues²; ¹Department of Metallurgical Engineering and Materials Universidade Federal de Minas Gerais; ²Department of Metallurgical Engineering, Federal University of Ouro Preto

4:30 PM

Factors Affecting the Mixing Characteristics of Molten Steel in the RH Refining Process: *Minren Xu*¹; Qingcai Liu¹; Jian Yang¹; Dongran Ma¹; Bing Hu¹; Yuanpei Lan¹; Deliang Niu¹; ¹Chongqing University

4:45 PM

Numerical simulation on temperature distribution and microstructure growth of Horizontal Unidirectional Solidification Equipment: Bai Liang¹; Zhong Honggang¹; Wang Bo¹; Zhai Qijie¹; Zhang Jieyu¹; ¹Shanghai University

4:55 PM

Large Eddy Simulation for Turbulent Flow in a Dissipative Ladle Shroud: *Jiangshan Zhang*¹; Jingshe Li¹; ¹University of Science and Technology Beijing

5:05 PM

Study on the Shape of the Cohesive Zone in PanZhiHua Steel Based on the Cluster Analysis: *Hongwei Guo*¹; ¹University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Boyer Honorary Session II: Structure/Property Correlations

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Wednesday PM
February 19, 2014

Room: 1A
Location: San Diego Convention Center

Session Chairs: Sushant Jha, Universal Technology Corporation; Robert Briggs, Boeing

2:00 PM

Microstructure - Its Effect on Fracture Toughness and Tensile Properties of Ti-5Al-5Mo-5V-3Cr (Ti5553) Alloy: *Sujoy Kar*¹; Swati Suman¹; Atasi Ghosh¹; Amit Bhattacharjee²; Dipankar Banerjee³; ¹Indian Institute of Technology, Kharagpur; ²Defence Metallurgical Research Laboratory; ³Indian Institute of Science, Bangalore

2:20 PM **Invited**

Advances in Structure-property Relationships in Titanium Alloys: Iman Ghamarian¹; Vikas Dixit¹; Hamish Fraser¹; Rajarshi Banerjee¹; *Peter Collins*¹; ¹University of North Texas

2:50 PM

Fatigue Behavior of Laser Shock Peened Ti-6Al-4V ELI and Ti6242 Alloys: Sagar Bhamare¹; Sethu Subramanian²; Gokul Ramakrishnan³; Zhong Zhou⁴; David Kirschman⁵; Kristina Langer⁶; Seetha Mannava⁷; Dong Qian⁴; *Vijay Vasudevan*⁷; ¹Innova Engineering, Inc.; ²Cummins, Inc.; ³Applied Thermal Technologies; ⁴University of Texas at Dallas; ⁵X-spine Systems, Inc.; ⁶Air Force Research Laboratory; ⁷University of Cincinnati

3:10 PM

Studying Fatigue Using Diffracted X-ray intensity Profiles and a Crystal-based Finite Element Model: *Mark Obstalecki*¹; Su Leen Wong¹; Matthew Miller¹; Paul Dawson¹; ¹Cornell University

3:30 PM **Break**

3:50 PM

Effect of Microstructure on the Life-limiting Fatigue Mechanisms in Titanium Alloys: *Sushant Jha*¹; Christopher Szczepanski²; Patrick Golden²; Alisha Hutson³; Reji John²; James Larsen²; ¹Air Force Research Laboratory/Universal Technology Corporation; ²Air Force Research Laboratory; ³University of Dayton Research Institute

4:10 PM

Effect of Heat Treatment on Microstructure and Abrasive Wear of Ti-6Al-4V Alloy: *Shreyash Hadke*¹; Shreyans Jain¹; Rajesh Khatirkar¹; S Sapate¹; ¹Visesvaraya National Institute of Technology

4:30 PM

Grain Refinement in Ti-6Al-4V Alloy During Thermomechanical processing and Investigation of Flow Properties: *Digvijay Sheed*¹; Bhagawati Kashyap²; Rajkumar Singh¹; ¹Bharat Forge Ltd. Pune; ²Indian Institute of Technology, Bombay

4:50 PM

A Study on Microstructures and Hardening Behaviors of Ti-12.1Mo-1Fe Alloy: *Chenglin Li*¹; Dong-Geun Lee²; Xujun Mi¹; Wenjun Ye¹; Yongtai Lee²; ¹General Research Institute for Nonferrous Metals; ²Korea Institute of Materials Science

5:10 PM

Structure-property Correlation in an Aircraft Sheet Metal Alloy Ti-15V-3Cr-3Al-3Sn: *Santhosh Rajaraman*¹; Geetha Manivasagam¹; Vikas Kumar²; Nageswara Rao M¹; ¹VIT University Vellore, India; ²Defence Metallurgical Research Laboratory, Hyderabad

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Fuels

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Wednesday PM
February 19, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: James Cole, Idaho National Laboratory

2:00 PM

Advanced Nuclear Fuel Concepts for Minor Actinide Burning: *Manuel Pouchon*¹; ¹Paul Scherrer Institute

2:40 PM

Phase Stability and Evolution of Ion-irradiated Uranium-rich Alloys for Advanced Nuclear Fuels: *Joseph McKeown*¹; Sangjoon Ahn²; Sandeep Irukuvarghula²; Mark Wall¹; Thomas Brown¹; Scott Tumey¹; Luke Hsiung¹; Michael Fluss¹; Sean McDevitt²; Patrice Turchi¹; ¹Lawrence Livermore National Laboratory; ²Texas A&M University

3:00 PM

Mechanism of Irradiation-induced Creep in Ultra-fine Grain Graphite: *Anne Campbell*¹; Gary Was¹; ¹University of Michigan

3:20 PM

Examination of Radiation Damage in ZrC Using EXAFS: *Jeff Terry*¹; Daniel Olive²; Hasitha Ganegoda¹; Todd Allen³; Yong Yang⁴; Clayton Dickerson⁵; ¹Illinois Institute of Technology; ²University of California, Berkeley; ³University of Wisconsin, Madison; ⁴University of Florida; ⁵Argonne National Laboratory

3:40 PM **Break**

4:00 PM

Viability of SiC/SiC Composites as LWR Cladding: Bridging Experiments and Fuel Performance Modeling: *Kurt Terrani*¹; Yutai Katoh¹; Lance Snead¹; ¹Oak Ridge National Laboratory

4:40 PM

Radiation Response of Silicon Carbide under In-situ Electron Irradiation: *Laura Jamison*¹; Ming-Jie Zheng¹; Kumar Sridharan¹; Todd Allen¹; Dane Morgan¹; Izabela Szlufarska¹; ¹University of Wisconsin-Madison

5:00 PM

Ion Beam Experiment to Simulate Simultaneous Molten Salt Corrosion and Fast Neutron Damage for Advanced Fuel Cycles: *Elizabeth Sooby*¹; Magda De Caro²; Robert Houlton²; Feng Lu¹; Peter McIntyre¹; Nathaniel Pogue¹; Akhdiyov Sattarov¹; Joseph Tesmer²; Yongqiang Wang²; ¹Texas A&M University; ²Los Alamos National Laboratory



Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — High Performance Soft Magnets I (This is a joint session with Magnetic Materials for Energy Applications IV)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
 Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Wednesday PM
 February 19, 2014

Room: Ballroom G
 Location: San Diego Marriott Marquis & Marina

Session Chairs: Matthew Willard, Case Western Reserve University; Michael McHenry, Carnegie Mellon University

2:00 PM Joint Session with Magnetic Materials for Energy Applications. A joint session with the Magnetic Materials for Energy Applications symposium is planned. This session will be held in Ballroom G of the Marriott. For complete session details, turn to the Magnetic Materials for Energy Applications entry in the program book or online.

2:00 PM Invited: Magneto-optical Analysis of Magnetic Microstructures; presented by Rudolf Schaefer, Leibniz Institute for Solid State and Materials Research (IFW) Dresden

2:30 PM Invited

Processing of Soft Magnetic Alloys in High Magnetic Field; presented by Sophie Rivoirard, CNRS/CRETA

3:00 PM Invited

Recent Advancements in Modeling of Hysteretic Phenomena; presented by Yevgen Melikhov, Cardiff University

3:30 PM Break

3:45 PM

Nano-magnetism of bcc Fe-based Solid Solutions; presented by Manfred Wuttig, University of Maryland

4:05 PM Invited

Tailoring of Magnetic Properties and GMI Effect in Thin Amorphous Wires; presented by Arcady Zhukov, Basque Country University and IKERBASQU

4:35 PM

Soft Magnetic Rapidly Solidified Bilayer Ribbons for Energy Applications; presented by Ivan Skorvanek, Institute of Experimental Physics; ²Institute of Physics

4:55 PM

Student: Atomic Scale Analysis of Rapid Annealing Induced Fe-Si Nanocrystals with Strong Creep Induced Anisotropy; presented by Pradeep Konda Gokuldoss, Max Planck Institute for Iron Research GmbH

5:15 PM

Effects of Elastic Interactions on Domain Structures in Terfenol-D; presented by Ben Wang, Michigan Technological University

Advanced Materials in Dental and Orthopedic Applications — Corrosion and Tribocorrosion Behavior of Orthopedic/Dental Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Wednesday PM
 February 19, 2014

Room: 32B
 Location: San Diego Convention Center

Session Chairs: Mathew Mathew, Rush University Medical Center at Chicago; Tolou Shokuhfar, Michigan Technological University

2:00 PM Invited

On the Relevance of Bio-tribocorrosion Phenomena in Dental and Orthopedic Applications: An Overview: *Luis Rocha*¹; Fernando Oliveira²; Helena Cruz²; Maria Joao Runa²; Sofia Alves²; Ana Rosa Ribeiro³; José Mauro Granjeiro³; ¹UNESP, Univ. Estadual Paulista, Faculdade de Ciências; ²CT2M - Centre for Mechanical and Materials Technologies; ³INMETRO - Instituto Nacional de Metrologia, Normalização e Qualidade Industrial

2:30 PM

Damage Analysis of a Used Co-Cr-based Metal-on-metal Hip Joint Bearing: Comparisons with a Newly Developed Co-Cr-Mo-N Alloy: *Yuichiro Koizumi*¹; Chen Yan¹; Takuya Mitsunobu¹; Akihiko Chiba¹; Shu-Ichiro Tanaka¹; Yoshihiro Hagiwara¹; ¹Tohoku University

2:45 PM

Mechanical and Corrosion Property Study of Zn modified Mg-Ca Alloys as Biodegradable Orthopedic Materials: *Zhigang Xu*¹; Christopher Smith¹; Lisa Ferrara²; Yongjun Chen¹; Jag Sankar¹; ¹NC A&T State University; ²OrthoKinetic Technologies, LLC

3:00 PM

Influence of Albumin on the Corrosion Behaviour of Zr in Phosphate Buffered Saline Solutions: *Luning Wang*¹; ¹University of Science and Technology Beijing

3:15 PM Invited

Adverse Tissue Response to Corrosion and Products of Corrosion in CoCr Dual-modular Neck Hip Prostheses: *Deborah Hall*¹; Robert Urban¹; Joshua Jacobs¹; ¹Rush University Medical Center

3:45 PM Break

4:05 PM Invited

Influence of Cold Rolling on Microstructure and the Passive Film of the NBR ISO 5832-1 Austenitic Stainless Steel: *Alexander Ramirez*¹; Cristiaann Hincapie Ramirez¹; Isolda Costa¹; ¹Instituto de Pesquisas Energéticas e Nucleares

4:35 PM

Corrosion and In Vitro Biocompatibility Properties of Cryomilled-spark Plasma Sintered Commercially Pure Titanium: *Shehreen Dheda*¹; Yoon Kim¹; Christopher Melnyk²; Wendy Liu¹; Farghalli Mohamed¹; ¹University of California, Irvine; ²California Nanotechnologies, Inc.

4:50 PM

Surface Amorphization of NiTi Shape Memory Alloy by Advanced Surface Treatment for Improved Corrosion Resistance and Biocompatibility: *Chang Ye*¹; Abhiehek Telang²; Amrinder Gill²; Zhong Zhou³; Seetha Mannava²; Dong Qian³; Vijay Vasudevan²; ¹University of Akron; ²University of Cincinnati; ³University of Texas at Dallas

5:05 PM

In Vitro Corrosion Resistance, Mechanical Behavior and Biocompatibility of Ti-Mo-Zr-Fe and Ti-Mo-Nb-Fe Alloys for Orthopedic Implants: A Comparative Assessment: *Vishal Musaramthota*¹; *Sushma Amruthaluri*¹; *Amit Datye*²; *Chandan Pulletikurthi*¹; *Dwayne McDaniel*³; *Norman Munroe*¹; ¹Florida International University; ²The University of Tennessee; ³Applied Research Centre

Advances in Surface Engineering: Alloyed and Composite Coatings III — Joint Session II: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings

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

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efsthathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carradó, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Wednesday PM
February 19, 2014

Room: 1B
Location: San Diego Convention Center

Session Chair: Roger Narayan, University of North Carolina and North Carolina State University

2:00 PM Invited

Nanoscale Building Blocks for Electronics and Photonics: *Federico Rosei*¹; ¹INRS

2:25 PM

High Temperature Characterization of Silicon Dioxide Films: *Megan Cordill*¹; *Stephan Bigl*²; *Walter Heinz*²; *Markus Kahn*³; *Helmut Schoenherr*³; *Reinhard Pippan*¹; ¹Erich Schmid Institute of Materials Science; ²Kompetenzzentrum Automobil- und Industrie-Elektronik GmbH; ³Infineon Technologies Austria AG

2:40 PM

Resistance Switching of Electrodeposited Cuprous Oxide Thin Films: *Sanaz Yazdanparast*¹; *Jakub Koza*¹; *Jay Switzer*¹; ¹Missouri University of Science and Technology

2:55 PM

Characterization of Coatings for Electroformed Cold Shields Developed for Optoelectronic Applications: *Burcu Arslan*¹; *Gökhan Demirci*²; *Ishak Karakaya*¹; *Metehan Erdogan*¹; ¹Middle East Technical University; ²Aselsan Inc. MGEO Division

3:10 PM Invited

Processing of Highly Emissive CZ-Silicon by Depositing Stressed Sol-gel Films: *Sufian Abedrabbo*¹; *Bashar Lahlouh*; *Anthony Fiory*; *Nuggehalli Ravindra*; ¹University of Jordan

3:35 PM Break

3:50 PM Invited

Correlation of Structural Morphology Evolution to Restoration of Plasma-induced Damage in Porous Low-k Dielectrics: *Yoonki Sa*¹; *Todd Ryan*²; *Sean King*³; *Choong-Un Kim*¹; ¹UTA; ²Globalfoundries; ³Intel Co.

4:15 PM

Process Optimization of Reactively Sputtered Aluminum Nitride Piezoelectric Thin Films for Elevated Temperature Applications: *Masood Hasheminasari*¹; *Jianliang Lin*¹; *John Scales*¹; *John Moore*¹; ¹Colorado School of Mines

4:30 PM

Transparent Composite Electrode (TCE) for ITO-free, PEDOT:PSS-free Bulk-heterojunction Organic Solar Cells: *Hyung Choi*¹; *N. Theodore*²; *Terry Alford*¹; ¹Arizona State University; ²Freescale Semiconductor Inc.

4:45 PM

Confirmation of Role of Hydrogen as a Compensating Donor to Enhance the Stability and Performance of Mixed Oxide Thin Film Transistors: *Terry Alford*¹; *Muhammad Hasin*¹; *Rajitha Vemuri*¹; ¹Arizona State University

5:00 PM

Simulation of a Distribution of Polarization Currents to Fit Experimental TSPC in Amorphous Pharmaceuticals: *Amir Hossein Rajabi Zamani*¹; *George Collins*¹; ¹New Jersey Institute of Technology

5:15 PM

Preparing of High Silicon Coating by Composite Electrodeposition in Magnetic Field: *Long Qiong*¹; *Zhong Yunbo*¹; *Fan Lijun*¹; ¹Shanghai University

Algorithm Development in Computational Materials Science and Engineering — Algorithms for General Materials Modeling and Integrating Experiments: Part II

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

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Wednesday PM

February 19, 2014

Room: 31B

Location: San Diego Convention Center

Session Chair: Jonathan Zimmerman, Sandia National Laboratories

2:00 PM

Reliability Calculations for Ductile Laser Welds with Stochastic Reduced-order Models: *John Emery*¹; *Richard Field*¹; *Mircea Grigoriu*²; *James Foulk*¹; ¹Sandia National Laboratories; ²Cornell University

2:20 PM

Simulation of Grain Growth in Hot-rolled 7xxx Aluminum Alloys: *Khaled Adam*¹; *David Field*¹; ¹WSU

2:40 PM

Tarjan's Algorithm for Scheduling the Solution Sequence of Systems of Federated Models: *Perry Antonelli*¹; *Gabe McNunn*¹; *Kenneth Bryden*¹; *Richard LeSar*¹; ¹Ames Laboratory

3:00 PM

Study of the Heterogeneous Deformation Process of Polycrystalline Ti-5Al-2.5Sn Alloy with Crystal Plasticity Finite Element Analysis Using Realistic 3D Microstructure: *Chen Zhang*¹; *Hongmei Li*¹; *Philip Eisenlohr*¹; *Thomas Bieler*¹; *Martin Crimp*¹; *Carl Boehlert*¹; ¹Michigan State University

3:20 PM

Numerical Modeling of Damage in Al-SiC Composites by Extended Finite Element Method (XFEM): *Salar Safarkhani*¹; *Rui Yuan*¹; *Sudhanshu Singh*¹; *Jay Oswald*¹; *Nikhilesh Chawla*¹; ¹Arizona State University

3:40 PM Break

4:00 PM

Integrating Advanced Materials Simulation Techniques into an Automated Data Analysis Workflow at the Spallation Neutron Source: *Jose Borreguero*¹; *Vickie E. Lynch*¹; *Shelly Ren*¹; *Mathieu Doucet*¹; *Andrei Savici*¹; *Jiawang Hong*¹; *Monojoy Goswami*¹; *Olivier Delaire*¹; *Bobby G. Sumpter*¹; *Mark Hagen*¹; *Thomas Proffen*¹; ¹Oak Ridge National Laboratory



4:20 PM

Modified Constitutive Equations for Crystal Plasticity Finite Element Modeling of Low Cycle Fatigue in Single Crystal fcc Metals: *Nicolò Grilli*¹; Koenraad Janssens²; Helena Van Swygenhoven³; ¹Laboratory for Nuclear Materials, Nuclear Energy and Safety Research Department, Paul Scherrer Institut, CH-5232 Villigen PSI & NXMM Laboratory, IMX, École Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland; ²Laboratory for Nuclear Materials, Nuclear Energy and Safety Research Department, Paul Scherrer Institut, CH-5232 Villigen PSI; ³Material Science and Simulations, NUM/ASQ, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland & NXMM Laboratory, IMX, École Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland

4:40 PM

A New Framework to Re-construct 3D Microstructures from the Generalized 2-Point Correlation Function: *Yauheni Staraselski*¹; Abhijit Brahma¹; Kaan Inal¹; Raja Mishra²; ¹University of Waterloo; ²General Motors Research and Development Center

5:00 PM

Systematic Optimization of Pig Iron Production during Sustainable Red Mud Smelting: *Dimitrios Gerogiorgis*¹; ¹University of Edinburgh

Alloys and Compounds for Thermoelectric and Solar Cell Applications II — Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Chih-Huang Lai, National Tsing Hua University; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hubert Scherrer, Ecole des Mines; Hsin-jay Wu, National Tsing Hua University

Wednesday PM
February 19, 2014

Room: Cardiff
Location: San Diego Marriott Marquis & Marina

Session Chairs: Teruyuki IkEDA, Ibaraki University; Hsin-jay Wu, National Tsing Hua University

2:00 PM Invited

Thermoelectric Properties of a Nanocomposite Composed of Au/AuTe₂ Nanoparticles and Sb_{1.6}Bi_{0.4}Te₃ Synthesized by a γ -Ray Irradiation Method: *Ken Kurosaki*¹; Doyoung Jung¹; Satoshi Seino¹; Manabu Ishimaru²; Kazuhisa Sato³; Yuji Ohishi¹; Hiroaki Muta¹; Shinsuke Yamanaka¹; ¹Osaka University; ²Kyushu Institute of Technology; ³Tohoku University

2:25 PM Invited

Structural Features and High Thermoelectric Performance on Mg₂(Si,Sn)-based Thermoelectric Materials: *Theodora Kyratsi*¹; ¹University of Cyprus

2:50 PM

Processing and Characterization of Thermoelectric Thin Film Devices Consisting of n-Type Bi₂Te₃ and p-Type Sb₂Te₃ Thin Film Legs: *Jae-Whan Kim*¹; Min-Young Kim¹; Jung-Yeol Choi¹; Tae-Sung Oh¹; ¹Hongik University

3:10 PM

Thermally Stable Nanocrystalline Bismuth Telluride: *Samuel Humphry-Baker*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

3:30 PM

Microstructure and Thermoelectric Properties of Bi₂Te₃ Materials by Powder Metallurgy Process: *Hyo-Seob Kim*¹; Soon-Jik Hong¹; ¹Kongji National University

3:50 PM Break

4:00 PM Invited

Hierarchically Architected High Performance Bulk Thermoelectrics: *David Seidman*¹; Mercouri Kanatzidis Kanatzidis¹; Kanishka Biswas¹; Jiaqing He¹; Ivan Blum¹; Chun-I Wu²; Timothy Hogan²; Vinayak Dravid¹; ¹Northwestern University; ²Michigan State University

4:25 PM Invited

Narrow Bandgap Intermetallic Compound RuGa₂: Chemical Bonding Nature, Thermoelectric Properties, and their Calculations: *Yoshiki Takagiwa*¹; Naoki Sato¹; Koichi Kitahara¹; Ken-ichi Kato²; Masaki Takata²; Kaoru Kimura¹; ¹The University of Tokyo; ²RIKEN SPring-8 Center/JASRI

4:50 PM

High-temperature Thermoelectric Properties of Ag₂Se₅Te₅: *Fivos Drymiotis*¹; Tristan Day¹; David Brown¹; Nicholas Heinz¹; G Jeffrey Snyder¹; ¹California Institute of Technology

5:10 PM

Influence of Milling Time on Microstructure and Thermoelectric Properties of p-Type Bi₂Te₃ Alloys: Madavali Babu¹; Hyo Seob Kim¹; *Soon-Jik Hong*¹; ¹Kongju National University

Alumina and Bauxite — Waste Recovery

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

Wednesday PM
February 19, 2014

Room: 15B
Location: San Diego Convention Center

Session Chair: Andrey Panov, Rusal

2:00 PM Introductory Comments

2:05 PM

The Enxal Bauxite Residue Treatment Process: Industrial Scale Pilot Plant Results: *Efthymios Balomenos*¹; Dimitris Kastritis²; Dimitrios Panias¹; Ioannis Paspaliaris¹; Dimitrios Boufounos²; ¹National Technical University of Athens; ²Alouminion S.A.

2:30 PM

Sustainability and Bauxite Deposits: *Peter-Hans ter Weer*¹; ¹TWS Services and Advice

2:55 PM

Valorization of Alumina Red Mud for Production of Geopolymeric Bricks and Tiles: *Dimitrios Panias*¹; Ioanna Giannopoulou¹; Dimitrios Boufounos²; ¹National Technical University of Athens; ²Alouminion S.A.

3:20 PM Break

3:35 PM

Study of Alternative Technologies for Residue Disposal (Red Mud): Kellen Nery¹; Joaquim Ávila¹; Milton Scarmínio¹; Luciana Bittar¹; *Rodrigo Moreno*²; Roberto Seno²; ¹Pimenta de Ávila Consultoria; ²Companhia Brasileira de Alumínio

4:00 PM

Economic Analysis of Producing Alumina with Low-grade Bauxite(Red Mud) by Calcification-carbonization Method: Zhao Qiuyue¹; Zhang Zimu¹; Zhu Xiaofeng¹; Liu Yan¹; Lv Guozhi¹; *Zhang Ting'an*¹; Wang Shuchan¹; ¹Northeastern University

4:20 PM

Recovery of Titanium Oxide from Undigested Sand of an Indian Alumina Refinery and Preparation of Value Added Titanium Carbide: *Birendra Mohapatra*¹; Saroj Singh¹; Chittaranjan Mishra¹; Barada Kanta Mishra¹; ¹Institute of Minerals & Materials Technology(IMMT)

Aluminum Alloys: Development, Characterization and Applications — Material Characterization and Modeling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Wednesday PM
February 19, 2014
Room: 12
Location: San Diego Convention Center

Session Chair: William Golumbfskie, Naval Surface Warfare Center, Carderock Division

2:00 PM

Correlation between Different Metallurgical Parameters and Hardness of Aluminum-Silicon Alloys Using Minitab Software: *Mahmoud Tash¹*; Saleh AlKhatani¹; ¹Salman bin Abdulaziz University

2:20 PM

Update of the Al-Fe-Mn-Si Thermodynamic Description within the TCAL Database and Predictions for the Phase Formation in a Wide Range of Commercial Aluminum Alloys: Hailin Chen¹; *Qing Chen¹*; Johan Bratberg¹; Paul Mason¹; Anders Engström¹; ¹Thermo-Calc Software AB

2:40 PM

An Observation of β -phase Precipitation Cycling in Al-Mg Alloys during In Situ TEM Heating Experiments: *Daniel Scotto D'Antuono¹*; Daniel Foley²; Jennifer Gaies³; William Golumbfskie³; Mitra Taheri¹; ¹Drexel University; ²University of Maryland; ³Naval Surface Warfare Center

3:00 PM

Effect of Heat Treatment on Microstructure and Mechanical Properties of Al₂Ca Added A383 Alloy: *Young-Ok Yoon¹*; Gil-Yong Yeom¹; Hyun Kyu Lim¹; Shae K. Kim¹; ¹Korea Institute of Industrial Technology

3:20 PM

Stress-strain Curves of Pure Aluminum and Al-4.5mass%Cu Alloy in Semi-solid State: *Nobuhito Sakaguchi¹*; ¹Sumitomo Light Metal Industries, LTD.

3:40 PM Break

3:55 PM

Thermo-mechanical Behavior of a 5xxx Series Aluminum Alloy; Experiment and Constitutive Modeling: *Farhoud Kabirian¹*; Akhtar Khan¹; ¹University of Maryland, Baltimore County

4:15 PM

Modeling Texture Evolution of Pure FCC Alloy during Annealing: Shiyao Huang¹; Ruijie Zhang²; *Mei Li¹*; ¹Ford Motor Company; ²University of Science and Technology Beijing

4:35 PM

Microstructure and Mechanical Properties of 3003 Aluminum Alloy with Mg and Ni Addition: Zhijiao Tang¹; *Ye Pan¹*; Tao Lu¹; Yabiao Lin²; ¹Southeast University; ²Yinbang Aluminum Industry Co. Ltd.

4:55 PM

Lightweight Construction for Electric Mobility Using Aluminium: *Andreas Kleine¹*; Marcel Rosefort¹; Hubert Koch¹; ¹TRIMET Aluminium SE

5:15 PM

3D Microstructural Characterization and Mechanical Properties of Constituents Particles in Al7075 Alloys Using X-ray Synchrotron Tomography and Nanoindentation: *Sudhanshu Shekhar Singh¹*; Cary Schwartzstein¹; Jason Williams¹; Xianghui Xiao²; Francesco De Carlo²; Nikhilesh Chawla¹; ¹Arizona State University; ²Argonne National Laboratory

Aluminum Reduction Technology — Fundamentals - Electrochemistry and New Processes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Wednesday PM
February 19, 2014
Room: 13
Location: San Diego Convention Center

Session Chair: Geoff Brooks, Swinburne University of Technology

2:00 PM Introductory Comments

2:05 PM

Mass Transfer Reactions Near the Cathode during Aluminium Electrolysis: *Geir Martin Haarberg¹*; Peng Cui¹; ¹Norwegian University of Science and Technology

2:30 PM

Current Efficiency in Aluminium Reduction Cells: Theories, Models, Concepts, and Speculation: *Asbjorn Solheim¹*; ¹SINTEF

2:55 PM

Effect of Current Density and Phosphorus Species on Current Efficiency in Aluminum Electrolysis at High Current Densities: *Rauan Meirbekova¹*; Jomar Thonstad²; Geir Haarberg²; Gudrun Saevarsdottir¹; ¹Reykjavik University; ²NTNU

3:20 PM

A Concept for Electrowinning of Aluminium Using Depolarized Gas Anodes: *Tommy Mokkelbost¹*; Ole Kjos¹; Ove Paulsen¹; Bjarte Øye¹; Henrik Gudbrandsen¹; Arne Petter Ratvik¹; Geir Haarberg²; Egil Skybakmoen¹; ¹SINTEF Materials and Chemistry; ²Norwegian University of Science and Technology

3:45 PM Break

4:00 PM

Investigations into Innovative and Sustainable Processes for the Carbothermic Production of Gaseous Aluminum: *Efthymios Balomenos¹*; Panagiotis Diamantopoulos¹; Dimitrios Gerogiorgis¹; Dimitrios Panias¹; Ioannis Paspaliaris¹; Christoph Kemper²; Lars Peters²; Bernd Friedrich²; Irina Vishnevetsky³; Michael Epstein³; Martin Halmann³; Andreas Haselbacher⁴; Zoran Jovanovic⁴; Aldo Steinfeld⁴; ¹National Technical University of Athens; ²IME Process Metallurgy and Metal Recycling, RWTH Aachen University; ³Weizmann Institute of Science; ⁴ETH Zurich

4:25 PM

A CFD-PBM Coupled Model Predicting Anodic Bubble Size Distribution in Aluminum Reduction Cells: Shuiqing Zhan¹; *Mao Li²*; Jiemin Zhou³; Jianhong Yang⁴; Yiwen Zhou⁴; Chenn Q Zhou⁵; ¹Central South University; ²Central South University; ³Purdue University Calumet; ⁴Zhengzhou Research Institute, Chalco Ltd; ⁵Purdue University Calumet

4:50 PM

Simulation of Anode Bubble: Volume of Fluid Method: *Yiwen Zhou¹*; Jiemin Zhou¹; Jianhong Yang²; Wangxing Li²; Shouhui Chen²; ¹School of Energy Science and Engineering, Central South University; ²Zhengzhou Research Institute of Chalco

5:15 PM

EAF Carbothermic Co-reduction of Alumina and Silica, for the Direct Production of Al-Si Master Alloy: *Christoph Kemper¹*; Efthymios Balomenos²; Dimitrios Panias²; Ioannis Paspaliaris²; Bernd Friedrich¹; ¹IME Process Metallurgy and Metal Recycling, RWTH Aachen University; ²National Technical University of Athens



Aluminum Reduction Technology — Potline Operations- Equipment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Wednesday PM Room: 14A
February 19, 2014 Location: San Diego Convention Center

Session Chair: B.K. Kakkar

2:00 PM Introductory Comments

2:05 PM

A Novel Heat Recovery Technology from an Aluminum reduction Cell Side Walls: Experimental and Theoretical Investigations: *Yaser Mollaei Barzi*¹; Mohsen Assadi¹; Håvard Møllerhagen Arvesen²; ¹University of Stavanger; ²Goodtech Recovery Technology AS

2:30 PM

Non-linear Behavior of a Metallic Foam for the Reduction of Energy Losses at Electrical Contacts in the Aluminum Industry: *René von Kaenel*¹; Jacques Antille¹; Michel Pillet²; Matthieu Lindeboom²; ¹KAN-NAK Ltd.; ²AMC ETEC Ltd.

2:55 PM

Influence of Heat Source Cooling Limitation on ORC System Layout and Working Fluid Selection: The Case of Aluminum Industry: *Yves Ladam*¹; ¹SintefEenergy

3:20 PM

Concept and Design of Dubal Pot Start-up Fuses: Michel Reverdy¹; *Abdulla Zarouni*¹; Lalit Mishra¹; Marwan Bastaki¹; Amal Al Jasmi¹; Vinko Potocnik¹; ¹DUBAL

3:45 PM Break

4:00 PM

A Novel Design Criterion for Alumina Feeders in Aluminium Electrolysis Cells: *Asbjorn Solheim*¹; ¹SINTEF

4:25 PM

On-line Monitoring of Anode Currents; Experience at Trimet: Andreas Luetzerath¹; *James Evans*²; Ron Victor²; ¹TRIMET Aluminium SE; ²Wireless Industrial Technologies (WIT)

4:50 PM

Start and Tuning of Material Distribution System at Aluminum Smelter in Qatar: Julian Sowah¹; *Jan Paepcke*²; Arne Hilck²; Vivek Shroff¹; Santosh Kumar¹; Rahul Jain¹; ¹Qatalum; ²Claudius Peters Projects

Biological Materials Science Symposium — Multi-functional Surfaces and Interfaces (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Wednesday PM Room: 33A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Bowen Li, Michigan Technological University; Nima Rahbar, Worcester Polytechnic Institute

2:00 PM Invited

Bacteria on Surfaces: Engineering Surface Microstructures to Control Bacterial Adhesion and Biofilm Growth: *Benjamin Hatton*¹; ¹University of Toronto

2:30 PM

Antibacterial Effect of Plastics Containing Copper-based Mineral Additive: *Bowen Li*¹; ¹Michigan Technological University

2:50 PM

On the Determining Role of Network Structure Titania in Silicone against Bacterial Colonization: Mechanism and Disruption of Biofilm: *Dilip Depan*¹; R.D.K. Misra¹; ¹University of Louisiana at Lafayette

3:10 PM

Interplay between Protein Adsorption at Biointerfaces and Osteoblast Functions: *Krishna Chaitanya Nune*¹; Devesh Misra¹; Pentti Karjalainen²; Mahesh Somani²; ¹University of Louisiana at Lafayette; ²University of Oulu

3:30 PM Break

3:50 PM Invited

Improving the Resistance to Contact and Flexural Damage of Ceramics Using Elastic Gradients: *Yu Zhang*¹; ¹NYU College of Dentistry

4:20 PM

Interfacial Adhesion between Polymer and Osteoconductive Minerals: *Sina Youssefian*¹; Pingsheng Liu²; Nima Rahbar¹; Jie Song²; ¹Worcester Polytechnic Institute; ²University of Massachusetts Medical School

4:40 PM

Structural Design and Attachment Mechanisms of Aquatic Insects: *Guan-Lin Liu*¹; Yin Chang¹; Yung-Chieh Chuang¹; Hao-Jen Fang¹; Po-Yu Chen¹; ¹Department of Materials Science and Engineering, National Tsing Hua University

5:00 PM

Characteristics and Influence of TiO₂ Layer on the Corrosion Resistance of Ultrafine Grained, Commercially Pure, and Surface Treated Titanium for Biomedical Applications: *Daniel Fernandes*¹; Carlos Elias²; Felipe Lopes²; Sergio Monteiro²; Ruslan Valiev³; Marc Meyers¹; ¹University of California, San Diego; ²Military Institute of Engineering; ³Ufa State Aviation Technical University

Bulk Metallic Glasses XI — Simulation and Modeling

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Wednesday PM Room: 2
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Dan Miracle, AF Research Laboratory; Karin Dahmen, University of Illinois at Urbana Champaign

2:00 PM Invited

Modeling Plastic Deformation and the Statistics of Serrations in the Stress Versus Strain Curves of Bulk Metallic Glasses: *Karin Dahmen*¹; James Antonaglia¹; Xie Xie²; Junwei Qiao³; Y Zhang⁴; Jonathan Uhl; Peter Liaw²; ¹University of Illinois at Urbana Champaign; ²The University of Tennessee; ³Taiyuan University of Technology; ⁴University of Science and Technology Beijing

2:20 PM

Calculation of the Dynamic Loss Modulus for Bulk Metallic Glasses: *Peter Derler*¹; Robert Maass²; ¹Paul Scherrer Institut; ²University of Göttingen

2:30 PM Invited

A Predictive Model for Binary Metallic Glasses: *Dan Miracle*¹; Kevin Laws²; Oleg Senkov³; Michael Ferry²; ¹AF Research Laboratory; ²Australian Research Council Centre of Excellence for Design in Light Metals, School of Materials Science and Engineering; ³UES, Inc

2:50 PM

Search for Universal Characteristics of Metallic Glass Formation by Rapid Molecular Dynamics Simulation: *David Riegner*¹; Logan Ward²; Kathy Flores³; Wolfgang Windl¹; ¹The Ohio State University; ²Northwestern University; ³Washington University in St. Louis

3:00 PM Invited

Fracture and Cavitation Behaviors in Brittle and Ductile Metallic Glasses: *Huajian Gao*¹; ¹Brown University

3:20 PM Invited

A Predictive Model for Ternary Bulk Metallic Glasses and its Application: *Kevin Laws*¹; *Daniel Miracle*²; *Oleg Senkov*²; *Michael Ferry*¹; ¹University of New South Wales; ²Air Force Research Laboratories

3:40 PM Break

3:50 PM Invited

Theoretical Strength of Metallic Glasses: *Mo Li*¹; ¹Georgia Institute of Tech

4:10 PM Invited

Glass Transition by Gelation: *Michael Demkowicz*¹; *Richard Baumer*¹; ¹Massachusetts Institute of Technology

4:30 PM

Characterization of Inhomogeneous Deformation and Serrated Flows in Bulk Metallic Glasses: *Xie Xie*¹; *James Antonaglia*²; *Junwei Qiao*³; *Gongyao Wang*¹; *Yong Zhang*⁴; *Yoshihiko Yokoyama*²; *Karin Dahmen*²; *Peter Liaw*¹; ¹University of Tennessee; ²University of Illinois at Urbana Champaign; ³Taiyuan University of Technology; ⁴University of Science and Technology Beijing; ⁵Tohoku University

4:40 PM Invited

Modeling of Metallic Glass by Energy Minimization: *Martin Ostojic*; *Starzewski*¹; *Dansong Zhang*¹; *Jun Zhang*¹; ¹University of Illinois

5:00 PM Invited

Uniaxial and Bending Deformation of Metallic-glass and Titanium Laminate by Molecular Dynamics Simulation: *Yunche Wang*¹; *Chun-Yi Wu*¹; *Peter Liaw*²; ¹National Cheng Kung University; ²University of Tennessee

5:20 PM Invited

Atomic Simulation of Size Dependent Tensile Ductility of Metallic Glasses: *Jian Luo*¹; *Yunfeng Shi*¹; ¹RPI

5:40 PM Invited

Metallic Glass Model: Interconnecting Zones and Free Volumes: *Cang Fan*¹; *C. T. Liu*²; *P. K. Liaw*³; ¹Nanjing University of Science and Technology; ²City University of Hong Kong; ³University of Tennessee

Cast Shop for Aluminum Production — Furnaces and Energy

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Wednesday PM
February 19, 2014

Room: 15A
Location: San Diego Convention Center

Session Chairs: Cynthia Belt, Energy Management Consultant; Mark Jolly, Cranfield University

2:00 PM Introductory Comments

2:05 PM

Regenerative Burners Assessment in Holding Reverberatory Furnace: *Mohamed Hassan*¹; *Panagiotis Forakis*¹; *Hassan Al Moosawi*¹; *Mohamed Ibrahim*¹; ¹Masdar Institute of Science and Technology

2:30 PM

Computational Analysis of Thermal Process of a Regenerative Aluminum Melting Furnace: *Jimin Wang*¹; *Yuanyuan Zhou*¹; *Hongjie Yan*²; *Jiemin Zhou*²; ¹Anhui University of Technology; ²Central South University

2:55 PM

Electromagnetic Stirring in Melting Furnaces - A Critical Evaluation: *Andreas Buchholz*¹; *Georg Rombach*¹; *Gerd-Ulrich Grün*¹; ¹Hydro Aluminium Rolled Products GmbH

3:20 PM

Sampling Tool for In-depth Study of Furnace Processes: *Stephen Instone*¹; *Mark Badowski*¹; *Daniel Krings*¹; ¹Hydro Aluminium Rolled Products GmbH

3:45 PM Break

4:00 PM

Transient Properties of Refractory Castable with Hydraulic Binders: *Mohamed-Ali Maaroufi*¹; *Cécile Diliberto*¹; *André Leconte*¹; *Olivier Francy*²; *Pierre Le Brun*³; ¹Institut Jean Lamour; ²Saint-Gobain CREE; ³Constellium

4:25 PM

A Novel Method of Online Measurement to Develop Specific Heating-up Procedures for Refractories in Industrial Furnaces: *Thomas Schemmel*¹; *Guenter Thieser*¹; *Uwe Kremer*²; *Norbert Pfitzner*³; ¹Refratechnik Steel GmbH; ²TRIMET Aluminium SE; ³Franken Industrieofen-Service GmbH

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Metallurgical Education

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Wednesday PM
February 19, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Peter Hayes, University of Queensland; Merete Tangstad, Norwegian University of Science & Technology (NTNU)

2:00 PM Introductory Comments

2:05 PM Invited

Current and Suggested Focus on Sustainability in Pyrometallurgy: *John See*¹; *D.G.C. Robertson*²; *Phillip Mackey*³; ¹Consultant; ²Missouri University of Science and Technology; ³P.J.Mackey Technology Inc

2:25 PM Invited

Teaching Process Simulation in Eleven Easy Lessons Using Excel: *Art Morris*¹; ¹Thermart Software

2:45 PM Invited

Enhancement of Pyrometallurgical Teaching Using Excel Simulation Models: *Eric Grimsey*¹; ¹Curtin University, W A School of Mines

3:05 PM Invited

The Engineering Design Sequence and Materials Development: 990 Gold-Titanium as a Case Study: *Mark Schlesinger*¹; ¹Missouri University of Science and Technology

3:25 PM Break

3:45 PM Invited

The Challenges for Professional Metallurgical Education: *Bob Hannah*¹; *Peter Hayes*¹; ¹University of Queensland

4:05 PM Invited

Sustainability Education for Minerals and Materials Industry Professionals: *William Rankin*¹; ¹CSIRO

4:25 PM Invited

Delivering a National Process Design Unit with Industry Support: *Don Ibana*¹; ¹Curtin University

4:45 PM Invited

The MetSkill Program – Rapidly Developing Effective Young Engineers in the Workplace: *Diana Drinkwater*¹; ¹JKTech



Characterization of Minerals, Metals and Materials 2014 — Characterization of Material Processing

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Wednesday PM
February 19, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Tonya Stone, Mississippi State; Pasquale Russo Spena, Free University of Bozen-Bolzano

2:00 PM

The Structure-property Relationship of Cold-drawn 1010 Steel Tubing: *Tonya Stone*¹; Ken Sullivan¹; Mark Horstemeyer¹; Robert Zelinka²; ¹Mississippi State University; ²Plymouth Tube

2:20 PM

Characterization of Particle Damage and Surface Exposure of a Copper Ore Processed by Jaw Crusher, HPGR and Electro-dynamic Fragmentation: *Otávio Gomes*¹; Debora de Oliveira¹; Luis Sobral¹; Eric Pirard²; ¹CETEM; ²University of Liege

2:40 PM

Effect of Friction Stir Welding Speed and Post Weld Heat Treatment on the Microstructure and Hardness of AA7020: *Mohamed Ahmed*¹; Essam Ahmed¹; Abdalla Mahdy¹; ¹Suez University

3:00 PM

Study on Reactivity between Mould Fluxes and High-Al Molten Steel: *Ting Wu*¹; Shengping He¹; Qian Wang¹; ¹Chongqing University

3:20 PM

Grinding Kinetics of Vanadium-titanium Magnetite Concentrate in a Ball Mill: *Zhang Rende*¹; lv xuewei¹; ji changyang¹; zheng xiangwei¹; ¹College of Materials Science and Engineering, Chongqing University, China

3:40 PM Break

3:50 PM

Arc Welding of Advanced High Strength Steels for Car-body Components: *Pasquale Russo Spena*¹; Fabio D'Aiuto²; Paolo Matteis³; Giorgio Scavino³; ¹Free University of Bozen-Bolzano; ²Centro Ricerche Fiat S.C.p.A.; ³Politecnico di Torino

4:10 PM

Load Carrying Capacity and Microstructure of Resistance Spot Welded Dual-phase (DP600) Steel: *Sabbah Ataya*¹; ¹Suez University

4:30 PM

Influence of Different Cooling Structure on Surface Crack of HSLA Steel Plate by DHCR: *Banglun Wang*¹; ¹Chongqing University

4:50 PM

Optimization on Refining Slag and Tapping Deoxidation System for Carbon Structure Steel without Calcium Treatment: *Shuo Zhao*¹; Wang Qian¹; Chen Gujun¹; He Shengping¹; Peng Mingming¹; ¹Chongqing University

Computational Discovery of Novel Materials — Methodologies and Application for Materials Discovery

Sponsored by: TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Francesca Tavazza, National Institute of Standards and Technology; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign

Wednesday PM
February 19, 2014

Room: 31A
Location: San Diego Convention Center

Session Chair: Richard Hennig, Cornell University

2:00 PM Invited

Structure Prediction from First Principles: *Eva Zurek*¹; ¹University at Buffalo, SUNY

2:30 PM

Solid-liquid Coexistence in Small Systems: A Statistical Method to Calculate Melting Temperatures: *Qijun Hong*¹; Axel van de Walle²; ¹Caltech; ²Brown University

2:50 PM

Bayesian Model Selection in Cluster Expansions: *Jesper Kristensen*¹; Nicholas Zabaras¹; ¹Cornell University

3:10 PM Invited

Assessing the Reliability of the “Base” of Multiscale Modeling: First-Principles Description of Van Der Waals Interactions in Materials: *Alexandre Tkatchenko*¹; Fritz-Haber-Institut der Max-Planck-Gesellschaft

3:40 PM Break

3:55 PM

Validation of Density Functional Theory for Bulk Solids: *Richard Taylor*¹; Francesca Tavazza¹; Eric Cockayne¹; Tom Allison¹; Mark Stiles¹; ¹NIST

4:15 PM

Computational Design of Nanosegregated Pt Alloy Catalysts: *Guofeng Wang*¹; Zhiyao Duan¹; Shyam Kattel¹; ¹University of Pittsburgh

4:35 PM

Novel Approach to Find Chemical Composition of Heat-resistant Nickel Superalloy, Designed for Naval Power Plants: Yuriy Shmotin¹; Alexander Logunov¹; Denis Danilov¹; *Igor Leshchenko*¹; JSC “NPO “SATURN”

Computational Thermodynamics and Kinetics — Phase-field Simulations/Molecular Dynamics

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Wednesday PM
February 19, 2014

Room: 30D
Location: San Diego Convention Center

Session Chairs: Yu Wang, Michigan Technological University; Katsuyo Thornton, University of Michigan

2:00 PM Invited

Modeling the Solidification, Growth and Properties of Multiferroic Polycrystalline Materials: *Ken Elder*¹; ¹Oakland University

2:25 PM

Molecular Dynamics Simulation of Solidification in Cu50Zr50 Alloy: Seth Wilson¹; *Mikhail Mendelev*¹; ¹Ames Laboratory

2:45 PM

Molecular Dynamics Simulations of Wetting in Nanowire Geometries: *Timofey Frolov*¹; W. Craig Carter²; Mark Asta¹; ¹University of California Berkeley; ²Massachusetts Institute of Technology

3:05 PM

Three-dimensional Phase Field Model for Vapor-liquid-solid Growth of Nanowires: *Yanning Wang*¹; Seunghwa Ryu²; Paul McIntyre¹; Wei Cai¹; ¹Stanford University; ²Korea Advanced Institute of Science and Technology

3:25 PM

Phase Field Models and Plastic Flow: *Alphonse Finel*¹; Pierre-Antoine Geslin¹; Pierre-Louis Valdenaire¹; Benoît Appolaire¹; Yann Le Bouar¹; ¹ONERA-CNRS

3:45 PM Break

4:05 PM Invited

Framework for Parameterizing the Phase-field Crystal Model: V.W.L. Chan¹; Susanta Ghosh¹; Nirand Pisutha-Arnon²; *Katsuyo Thornton*¹; ¹University of Michigan; ²King Mongkut's Institute of Technology Ladkrabang

4:30 PM

Configurational Entropy and Structure of the Molten NaCl-KCl-ZnCl₂ Salt Mixtures: *Venkateswara Rao Manga*¹; Stefan Bringuier¹; Saivenkataraman Jayaraman²; Pierre Lucas¹; Pierre Deymier¹; Krishna Muralidharan¹; ¹University of Arizona; ²MIT

4:50 PM

Multiscale Modeling of Precipitate Morphology and Evolution in Mg-Nd Alloys: *Yanzhou Ji*¹; Ahmed Issa²; Tae Wook Heo¹; James Saal²; Chris Wolverton²; Long-Qing Chen¹; ¹The Pennsylvania State University, University Park; ²Northwestern University

5:10 PM

Atomistically-informed Phase Field Simulations of Germanium Crystallization in Laser Driven Systems: Celia Reina¹; Luis Sandoval²; *Jaime Marian*³; ¹University of Pennsylvania; ²LANL; ³LLNL

Data Analytics for Materials Science and Manufacturing — Inverse Methods II: Reduced Order Modeling

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

Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Wednesday PM
February 19, 2014

Room: 30E
Location: San Diego Convention Center

Session Chairs: Surya Kalidindi, Georgia Institute of Technology; Jeff Simmons, Air Force Research Laboratory

2:00 PM

Physics of Regularized Image Processing: *Jeff Simmons*¹; Craig Przybyla¹; Stephen Bricker¹; Charles Bouman²; Michael Jackson³; Marc De Graeff¹; ¹Air Force Research Laboratory; ²Purdue University; ³Blue Quartz Software; ⁴Carnegie Mellon University

2:20 PM Invited

A New Probabilistic Graph Model and Its Application to Materials Microstructures: *Mary Comer*¹; Huixi Zhao¹; ¹Purdue University

2:45 PM

Stochastic-integral Models for Propagation-of-uncertainty Problems in Nondestructive Evaluation: *Elias Sabbagh*¹; R. Murphy¹; Harold Sabbagh; John Aldrin²; Jeremy Knopp; Mark Blodgett; ¹Victor Technologies, LLC; ²Computational Tools

3:05 PM

A Response Surface Method (RSM) for Model-based Optimization of Expanded Perlite Production: *Dimitrios Gerogiorgis*¹; Panagiotis Angelopoulos²; Ioannis Paspaliaris²; ¹University of Edinburgh; ²National

Technical University of Athens (NTUA)

3:25 PM

Growth Path Envelope Analysis of Grain Growth in Tungsten: *Burton Patterson*¹; Tyler Kaub¹; Amy Adams¹; George Strickland¹; Steven Chiu¹; Robert DeHoff¹; Veena Tikare²; Zak Fang³; ¹University of Florida; ²Sandia National Laboratories, New Mexico; ³University of Utah

3:45 PM Break

4:00 PM Invited

Predictive Modeling in Characterizing Localization Relationships: *Ruoqian Liu*¹; Zhengzhang Chen¹; Tony Fast²; Surya Kalidindi²; Ankit Agrawal¹; Alok Choudhary¹; ¹Northwestern University; ²Georgia Institute of Technology

4:25 PM

New Data Mining Techniques in Materials Science : Bayesian Networks to Predict the Yield Stress of Ni-Base Superalloys: Ederm Menou¹; *Franck Tancret*¹; Philippe Leray¹; ¹Université de Nantes

4:45 PM

Applications of Wavelets in the Representation and Prediction of Transformation in Shape-memory Polycrystals: *Gal Shmuel*¹; Adam Thorgeirsson²; Kaushik Bhattacharya¹; ¹CalTech; ²University of Iceland

5:05 PM

Leveraging Data Science to Enable Multiscale Materials Modeling and Design: *Surya Kalidindi*¹; ¹Georgia Institute of Technology

Deformation, Damage, and Fracture of Light Metals and Alloys III — Ti Alloys

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Wednesday PM
February 19, 2014

Room: 19
Location: San Diego Convention Center

Session Chair: Hongbin Bei, Oak Ridge National Laboratory

2:00 PM Invited

Effect of Extrusion Speed on the Microstructures and Mechanical Properties of Ti-6Al-4V Alloy Prepared by Combining of Powder Compact Hot Pressing and Extrusion under Air: *Fei Yang*¹; Brian Gabbitas¹; Huiyang Lu¹; Ajit Singh¹; ¹The University of Waikato

2:20 PM

Characterization of Ti/Al Multilayered Composites Subjected to Perforation Testing: *Derrick Stokes*¹; Jennifer Conway¹; Stanley Jones¹; Viola Acoff¹; ¹The University of Alabama

2:40 PM

Mechanical Properties of Ti-6Al-4V Rods Produced by Powder Compact Extrusion: *Ajit Singh*¹; Brian Gabbitas¹; Rob Torrens¹; Fei Yang¹; Amir Mukhtar²; ¹Waikato Centre for Advance Materials, School of Engineering, University of Waikato, Hamilton, New Zealand; ²Titanium Industry Development Association Inc. (TiDA), Tauranga, New Zealand

3:00 PM

Development of Low-cost Powder Metallurgy Titanium Alloys by Addition of Commercial 430 Stainless Steel Powder: *Leandro Bolzoni*¹; Enrique Herraiz²; Elisa Maria Ruiz-Navas²; Elena Gordo²; ¹Brunel University; ²Universidad Carlos III de Madrid



Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — High-Strain-Rate Deformation Mechanisms

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Wednesday PM
February 19, 2014

Room: 3
Location: San Diego Convention Center

Session Chairs: Herve Couque, Nexter Munitions; Alain Molinari, University of Lorraine

2:00 PM Keynote

Dislocation Mechanics of High Rate Deformations: *Ronald Armstrong*¹; ¹University of Maryland

2:30 PM Invited

A Physically Based Constitutive Model for the Viscoplastic Behavior of fcc Pure Metals and Alloys under Shock Wave Loading: Ryan Austin¹; *David McDowell*²; ¹Lawrence Livermore National Laboratory; ²Georgia Institute of Technology

2:50 PM Invited

A Dislocation Dynamics Model of the Plastic Flow of fcc Polycrystals: Dislocation Density Evolution: Dean Preston¹; *Abigail Hunter*¹; ¹Los Alamos National Laboratory

3:10 PM Invited

Signatures of Deformation Twinning – The Mechanical Threshold Stress Constitutive Model: *Paul Follansbee*¹; ¹Saint Vincent College

3:30 PM

A Dislocation Dynamics Model of the Plastic Flow of fcc Polycrystals: Dislocation Intersection Processes: *Abigail Hunter*¹; Dean Preston¹; ¹Los Alamos National Laboratory

3:50 PM Break

4:10 PM

Signatures of Dynamic Strain Aging – The Mechanical Threshold Stress Constitutive Model: *Paul Follansbee*¹; ¹Saint Vincent College

4:30 PM Invited

Multiscale Collective Behavior of Defects and Criticality of Damage-failure Transitions under Dynamic and Shock Wave Loading: *Oleg Naimark*¹; ¹ICMM UB RAS

4:50 PM Invited

Large Plastic Deformation of FCC Metals at High Strain Rates: *Hervé Couque*¹; ¹Nexter Munitions

5:10 PM

3-D Analysis of Incipient Spall Damage Geometry and its Correlation to Microstructure in Shock Loaded Copper Polycrystals: *Andrew Brown*¹; Kapil Krishnan¹; Quan Pham¹; Pedro Peralta¹; Shengnian Luo²; Brian Patterson³; Darrin Byler³; Scott Greenfield³; Kenneth McClellan³; Aaron Koskelo³; ¹Arizona State University; ²Sichuan University; ³Los Alamos National Laboratory

Electrode Technology for Aluminium Production — Cathode Materials and Wear

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

Program Organizer: Andre Proulx, Rio Tinto Alcan

Wednesday PM
February 19, 2014

Room: 14B
Location: San Diego Convention Center

Session Chair: Alan Tomsett, Pacific Aluminium

2:00 PM Introductory Comments

2:05 PM

Room Temperature Creep Behaviour of Ramming Paste Baked at Different Temperatures: *Pierre-Olivier St-Arnaud*¹; Donald Picard¹; Houshang Alamdari¹; Donald Ziegler²; Mario Fafard¹; ¹Université Laval; ²Alcoa Primary Metals

2:30 PM

Characterization of the Material Behaviour of Cathode Steel Collector Bar at High Temperatures and Low Stress Levels: *Femi Fakoya*¹; Donald Picard¹; Guillaume Gauvin¹; Houshang Alamdari¹; Richard Beeler²; Mario Fafard¹; ¹REGAL, Université Laval; ²Alcoa Primary Metals, Alcoa Technical Center

2:55 PM

Cartography and Chemical Composition of the Different Deposits in the Hall-Heroult Process: François Allard¹; Marc-André Coulombe¹; *Gervais Soucy*¹; Loig Rivoaland²; ¹Université de Sherbrooke; ²Rio Tinto Alcan

3:20 PM Break

3:30 PM

Interaction of Sodium Vapor and Graphite Studied by Thermogravimetric Analysis: *Zhaohui Wang*¹; Tor Grande¹; Egil Skybakmoen²; Arne Peter Ratvik²; ¹Norwegian University of Science and Technology (NTNU); ²SINTEF

3:55 PM

N-SiC Side Lining- Variations of Materials Structure: *Andrey Yurkov*¹; Oksana Danilova¹; Alexey Dovgal¹; ¹Voljsky Abrasive Works

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Design Against Fatigue and Fatigue Property Enhancement

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

Program Organizers: Antonios Kotsos, Drexel University; Tongguang Zhai, University of Kentucky

Wednesday PM
February 19, 2014

Room: 7B
Location: San Diego Convention Center

Session Chairs: Diana A. Lados, Worcester Polytechnic Institute; Tongguang Zhai, University of Kentucky

2:00 PM Introductory Comments

2:05 PM Keynote

Quantitative Effects of Micro-texture on Growth Behaviors of Short Fatigue Cracks in Al Alloys: *Tongguang Zhai*¹; ¹University of Kentucky

2:45 PM Invited

Design for Fatigue Crack Growth Resistance in Light Metal Alloys: Recent Developments and Steps Forward: *Diana A. Lados*¹; Anastasios Gavras; Anthony Spangenberg; ¹Worcester Polytechnic Institute

3:05 PM Invited

Enhanced Fatigue Strength of Nanocrystalline Cu and Cu-Al Alloys: *Zhefeng Zhang*¹; Xianghai An¹; Shiding Wu¹; ¹Institute of Metal Research

3:25 PM

Influence of Non Metallic Inclusions on Low Cycle Fatigue Life at Intermediate Temperature of Inconel718DA: *Damien Texier*¹; Ana Casanova

Gomez¹; Patrick Villechaise¹; Jonathan Cormier¹; Tresa Pollock²; Stéphane Pierrat²; ¹Institut Pprime - ENSMA; ²UC Santa Barbara; ³SNECMA

3:45 PM Break

4:05 PM

Fatigue Properties of Nanostructured Al6061 Plates Produced by Equal Channel Angular Extrusion: Hamid Alihosseini¹; *Mohsen Asle Zaeem*¹; ¹Missouri University of Science and Technology

4:25 PM

Effect of Laser Ablation Coating Removal (LACR) on a Steel Substrate: *Md. Shamsujjoha*¹; Sean Agnew¹; Michael Melia¹; James Fitz-Gerald¹; Terry Tyler²; James Brooks²; Matthew Stremmer³; ¹University of Virginia; ²Newport News Shipbuilding; ³Commonwealth Center for Advanced Manufacturing

4:45 PM

Investigation of Fatigue Micromechanisms in Ultrafine Grained Al-Mg-Sc Alloy: *Mageshwari Komarasamy*¹; Rajiv Mishra¹; ¹University of North Texas

5:05 PM

Methodologies for Microstructure-sensitive Fatigue Design of Ni-base Superalloys that Undergo Aging: *Michael Kirka*¹; Sean Neal¹; Richard Neu¹; ¹Georgia Institute of Technology

5:25 PM Concluding Comments

Gamma TiAl Alloys 2014 — Session VI

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

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Wednesday PM
February 19, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Rui Yang, Institute of Metal Research; Svea Mayer, Montanuniversitaet Leoben

2:00 PM Invited

Laser-based Additive Manufacturing of Titanium Aluminides: *Christoph Leyens*¹; Frank Brückner¹; Steffen Nowotny¹; ¹Fraunhofer IWS

2:25 PM

Development and Optimization of Process Parameters for TNMB1 Titanium Aluminide for Selective Laser Melting: From Single Track to Fully Dense Specimens: *Lukas Loeber*¹; Uta Kuehn¹; Juergen Eckert¹; Frank Peter Schimansky²; Florian Pyczak²; ¹IFW Dresden; ²Helmholtzzentrum Geesthacht

2:45 PM Invited

Effect of the Microstructure on the Deformation and Fatigue Damage in a Gamma-TiAl Produced by Additive Manufacturing: *Mauro Filippini*¹; Stefano Beretta¹; Luca Patriarca¹; Silvia Sabbadini²; ¹Politecnico di Milano; ²AVIO S.p.A.

3:10 PM Break

3:30 PM

Role of Interstitial Atoms on the Macrosegregation and Microsegregation in High Nb Containing TiAl Alloys: Tiebang Zhang¹; Rui Hu¹; *Zeen Wu*¹; Hongchao Kou¹; Jinshan Li¹; ¹Northwestern Polytechnical University

3:50 PM Invited

Additive Manufacturing via Electron Beam Melting of Gamma TiAl Alloys: *Sara Biamino*¹; Federica Pelissero²; Silvia Sabbadini²; Paolo Fino¹; Claudio Badini¹; ¹Politecnico di Torino; ²Avio s.p.a

4:10 PM

Additive Manufacturing of Gamma TiAl Alloys and Control and Integration of Application-specific Microstructures: Jaimie Tiley¹; Sang-Lan Kim²; *Young-Won Kim*³; ¹AFRL; ²UES, Inc.; ³Gamteck, Inc.

4:30 PM

Microstructure and Properties of Gamma-TiAl (48-2-2) Produced by Selective Electron Beam Melting: *Vera Jüchter*¹; Jan Schwerdtfeger²; Carolin Körner¹; ¹WTM, University of Erlangen-Nürnberg; ²ZMP, University of Erlangen-Nürnberg

4:50 PM

Recent Development and Optimization of Forging Process of High Nb-TiAl Alloy: *Xiangjun Xu*¹; Junpin Lin²; Laiqi Zhang²; Yongfeng Liang²; ¹Zhongyuan university of technology; ²University of Science and Technology Beijing

5:10 PM

Microscopic Mechanisms of Spark Plasma Sintering in TiAl Alloys: *Zofia Trzaska*¹; Guillaume Bonnefont²; Alain Couret¹; Jean-Philippe Monchoux¹; ¹CEMES/CNRS; ²MATEIS/CNRS

Integration of Materials Science and Nondestructive Evaluation for Materials Characterization — Quantitative Nondestructive Characterization I

Sponsored by: TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Adam Pilchak, Air Force Research Laboratory; Dennis Dimiduk, Air Force Research Lab; Eric Lindgren, Air Force Research Laboratory; Richard Lesar, Iowa State University; Leonard Bond, Iowa State University

Wednesday PM

February 19, 2014

Room: 8

Location: San Diego Convention Center

Session Chairs: Dennis Dimiduk, Air Force Research Laboratory; Richard Lesar, Iowa State University

2:00 PM Invited

An Assessment of Computational Materials Modeling and Simulation for Nondestructive Evaluation in Structural Materials: *Richard LeSar*¹; Dennis Dimiduk²; Nicola Bowler¹; ¹Iowa State University; ²AFRL/RXCM

2:30 PM Invited

Calculations on Ultrasonic Scattering in Polycrystalline Structures Aiming for Nondestructive Materials Characterization and Defect Detection: *Sigrun Hirsekorn*¹; ¹Fraunhofer Institute for Nondestructive Testing (IZFP)

3:00 PM Invited

Ultrasonic Backscattering Measurements of Grain Size in Metal Alloys: *Paul Panetta*¹; ¹Applied Research Associates, Inc.

3:30 PM Break

3:45 PM Invited

Strategies for Ultrasonic Determination of Grain Size Versus Depth in Non-uniform Metal Microstructures: *Ronald Roberts*¹; Frank Margetan¹; Dan Barnard¹; Brady Engle¹; Brittney Pavel¹; ¹Iowa State University

4:15 PM

Modeling the Interaction of Elastic Waves and Microstructure Using Finite Difference: *Adam Pilchak*¹; Thomas Smith²; Michael Groeber¹; ¹Air Force Research Laboratory; ²University of Dayton Research Institute

4:35 PM Invited

A Methodology to Characterize Lattice Elastic Strain Distributions in Processed Alloys Using Spatially-Resolved X-ray Diffraction Data: *Paul Dawson*¹; Matthew Miller¹; Eralp Demir¹; Jun-Sang Park²; ¹Cornell University; ²APS

5:00 PM

Toward an Empirical Prediction of Porosity in Laser-welds of 304L Stainless Steel: *Jonathan Madison*¹; Corbett Battaile¹; Larry Aagesen²; Victor Chan²; Katsuyo Thornton²; ¹Sandia National Laboratories; ²University of Michigan

5:20 PM

X-ray Microscopy for In Situ Characterization of 3D Microstructure Evolution in the Laboratory: *Arno Merkle*¹; Leah Lavery¹; Jeff Gelb¹; ¹Xradia



Light-metal Matrix (Nano)-composites — In-situ Synthesis and Novel Additions

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

Program Organizers: Wim Sillekens, European Space Agency; Dmitry Eskin, Brunel University

Wednesday PM Room: 16B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Dmitry Eskin, Brunel University

2:00 PM

Novel Ultrafine-grained (UFG) Aluminium (Al) Metal Matrix Composites (MMCs) Prepared from Fine Atomized Al Powders: *Martin Balog*¹; Frantisek Simancik¹; Peter Krizik¹; Walter Rajner²; Martin Walcher²; Ma Qian³; ¹The Slovak Academy of Sciences; ²New Materials Development GmbH; ³School of Aerospace, Mechanical and Manufacturing Engineering, RMIT University

2:20 PM

The Structure, Phase Composition and Mechanical Properties of Hot Pressed Metal Matrix Nanocomposites Al-A₁₄C₃: *Sergey Vorozhtsov*¹; *Alexander Vorozhtsov*¹; *Sergey Kulkov*¹; ¹Tomsk State University

2:40 PM

Ceramic Dispersions in Metal Castings Created by Direct Injection of a Liquid Organic Precursor into the Melt: *Sudarshan Fnu*¹; *Rishi Raj*¹; ¹University of Colorado at Boulder

3:00 PM

Mechanical Properties of Aluminium-based Nanocomposite Reinforced with Fullerenes: *Kwangmin Choi*¹; Se-eun Shin²; Donghyun Bae²; Hyunjoo Choi¹; ¹Kookmin University.; ²Yonsei University

3:20 PM Break

3:40 PM

The Effect of Mechanically Exfoliated Graphenes Dispersion on the Mechanical Properties of Aluminum/Graphene Composites: *Seoun Shin*¹; Jiyeon Suh¹; Donghyun Bae¹; ¹Yonsei University

4:00 PM

Development of Al/C₆₀ Composites with Nano-network Structures: *Hyunjoo Choi*¹; Donghyun Bae²; ¹Kookmin University; ²Yonsei University

4:20 PM Concluding Comments

Magnesium Technology 2014 — Texture and Wrought Processing I

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Wednesday PM Room: 17A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Julian Rosalie, NIMS; Eric Nyberg, Pacific Northwest National Laboratory

2:00 PM

Deformation Behavior of ZE₁₀ Magnesium Alloy Sheet: *Patrik Dobron*¹; Jaroslav Balík¹; František Chmelík¹; Daria Drozdenko¹; Jan Bohlen²; Dietmar Letzig²; Pavel Lukáč¹; ¹Charles University in Prague; ²Helmholtz-Zentrum-Geesthacht

2:20 PM

Simulating Microstructure Evolution and Deformation Behavior of Magnesium Alloys Using the Intermediate Phi-model: *Dongsheng Li*¹; Said Ahzi²; Curt Lavender¹; Moe Khaleel³; ¹Pacific Northwest National Laboratory; ²University of Strasbourg; ³Qatar Foundation Research and Development

2:40 PM

Texture Evolution during Grain Growth of Mg Alloy, AZ31B: *Jishnu Bhattacharyya*¹; Balasubramaniam Radhakrishnan²; Govindarajan Muralidharan²; Sean Agnew¹; ¹University of Virginia; ²Oak Ridge National Laboratory

3:00 PM

Effect of Annealing on Microstructure, Texture and Tensile Properties of Twin-roll Cast AZ31B: *Mohsen Masoumi*¹; Mihriban Pegguleryuz¹; ¹McGill University

3:20 PM

Influence of Rolling Direction and Temperature on the Texture Formation in Rolled AZ31B Magnesium Alloy: *Litzy Lina Catorcen*⁰; Nelson de Lima²; ¹USP-EP University of São Paulo; ²Instituto de Pesquisas Energéticas e Nucleares

3:40 PM Break

4:00 PM

Texture Evolution during Wire Drawing of Mg-RE Alloy: *Mark Chatterton*¹; Joseph Robson¹; Dominic Henry²; ¹The University of Manchester; ²Magnesium Elektron

4:20 PM

Effect of Composition and Extrusion Temperature on the Microstructure, Strength and Ductility of Ultra-high Strength Mg-Zn-Y Alloys: *Alok Singh*¹; Yoshiaki Osawa¹; Hidetoshi Somekawa¹; Toshiji Mukai²; ¹National Institute for Materials Science; ²Kobe University

4:40 PM Invited

Extrusion of Hollow Magnesium Profiles and Investigation of Extrusion Seams: *Felix Gensch*¹; René Nitschke¹; Sven Gall¹; Sören Müller¹; ¹Extrusion R&D Center, TU Berlin

5:00 PM

Microstructural Evolution and Its Relationship to the Mechanical Properties of Mg AZ₃₁B Friction Stir Back Extruded Tubes: *Justin Milner*¹; Fadi Abu-Farha¹; ¹Clemson University

5:20 PM Invited

Effect of Yttrium Addition on Texture Development in a Cast Mg-Al-Y Magnesium Alloy during Compression: *Nabila Tahreen*¹; *Daolun Chen*¹; Meisam Nouri²; Dongyang Li²; ¹Ryerson University; ²University of Alberta

Magnetic Materials for Energy Applications IV — High Performance Soft Magnets I (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Wednesday PM Room: Ballroom G
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Matthew A. Willard, Case Western Reserve University; Michael E. McHenry, Carnegie Mellon University

2:00 PM Invited

Magneto-optical Analysis of Magnetic Microstructures: *Rudolf Schaefer*¹; ¹Leibniz Institute for Solid State and Materials Research (IFW) Dresden

2:30 PM Invited

Processing of Soft Magnetic Alloys in High Magnetic Field: *Sophie Rivoirard*¹; ¹CNRS/CRETA

3:00 PM Invited

Recent Advancements in Modeling of Hysteretic Phenomena: *Yevgen Melikhov*¹; ¹Cardiff University

3:30 PM Break

3:45 PM

Nano-magnetism of bcc Fe-based Solid Solutions: *Manfred Wuttig*¹; Abdellah Lisfi²; ¹University of Maryland; ²Morgan State University

4:05 PM Invited

Tailoring of Magnetic Properties and GMI Effect in Thin Amorphous Wires: *Arcady Zhukov*¹; Mihail Ipatov²; Ahmed Talaat²; Juan Blanco³; Valentina Zhukova²; ¹Basque Country University and IKERBASQU; ²Dpto. de Fis. Mater., Basque Country University, UPV/EHU; ³Basque Country University, Dpto. de Fisica Aplicada

4:35 PM

Soft Magnetic Rapidly Solidified Bilayer Ribbons for Energy Applications: *Ivan Skorvanek*¹; Marek Capik¹; Jozef Marcin¹; Jozef Hoško²; Igor Matko²; Peter Svec²; ¹Institute of Experimental Physics; ²Institute of Physics

4:55 PM

Atomic Scale Analysis of Rapid Annealing Induced Fe-Si Nanocrystals with Strong Creep Induced Anisotropy: *Pradeep Konda Gokuldoss*¹; Giselher Herzer²; Pyuck-Pa Choi¹; Dierk Raabe¹; ¹Max Planck Institute for Iron Research GmbH; ²Vacuumschmelze GmbH&Co.KG

5:15 PM

Effects of Elastic Interactions on Domain Structures in Terfenol-D: *Ben Wang*¹; Yongmei Jin¹; ¹Michigan Technological University

Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration — Session II

Sponsored by: TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee

Program Organizer: David Mitlin, University of Alberta and NINT NRC

Wednesday PM
February 19, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: To Be Announced

2:00 PM Invited

Recent Developments in Oil and Gas Production: *Raul Rebak*¹; ¹GE Global Research

2:20 PM Invited

Rising Challenges for the Petroleum Refiners in Managing Corrosion Risks: *Ming Wei*¹; ¹BP Products North America, Inc

2:40 PM Invited

Nonmagnetic Materials and Their Challenges Regarding Corrosion Resistance in the Exploration of Subterranean Energy Sources: *Vladimir Jovancevic*¹; Helmuth Sarmiento-Klapper¹; Denis Kopecki¹; ¹Baker Hughes

3:00 PM Invited

Corrosion-fouling of 316 Stainless Steel and Pure Iron by Hot Oil: *David Mitlin*¹; Tyler Stephenson¹; Mike Hazelton¹; ¹University of Alberta and NINT NRC

3:20 PM Break

3:30 PM Invited

An Overview of Stress Cracking of Pipeline Steels in Near-neutral pH Environments: *Weixing Chen*¹; ¹University of Alberta

3:50 PM Invited

Protective Effect of Sulfide Scales Formed with Crude Fraction and Exposed to Naphthenic Acids Challenges: *Gheorghe Bota*¹; ¹Ohio University - Institute for Corrosion and Multiphase Technology

4:10 PM Invited

Some Aspects of Corrosion Inhibitors Strongly Acidic Environments: *Gordon Burstein*¹; ¹University of Cambridge

4:30 PM Invited

The Corrosivity of Linepipe Mild Steel in an Environment Containing Microbes Cultivated from an Oil Reservoir: *Faisal AlAbbas*¹; *Brajendra Mishra*²; David Olson²; ¹Saudi Aramco; ²Colorado School of Mines

4:50 PM Invited

Corrosion Issues of Advanced Steels in Exploration of Oil and Gas Wells: *Malgorzata Ziomek-Moroz*¹; ¹U.S. Department of Energy, National Energy Technology Laboratory

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Superalloys

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

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakirooulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Wednesday PM

February 19, 2014

Room: 6D

Location: San Diego Convention Center

Session Chairs: Joe Rigney, GE Aviation; Brian Cockeram, Bettis Atomic Power Lab

2:00 PM

Is Ruthenium Really Necessary in the Next-generation Superalloys for Single Crystal Turbine Blades?: *Pierre Caron*¹; ¹ONERA

2:20 PM

High Temperature Response of Single Crystal (SC) Nickel Superalloys: *Amit Pandey*¹; Kevin Hemker²; ¹Oak Ridge National Laboratory; ²The Johns Hopkins University

2:40 PM

Hot Deformation Characteristics of a Polycrystalline γ - γ' -d Ternary Eutectic Ni-base Superalloy: *Martin Detrois*¹; *Randolph Helmkink*²; *Sammy Tin*¹; ¹Illinois Institute of Technology; ²Rolls Royce Corporation

3:00 PM

Effects of Cooling Rates after Solution Heat Treatment on the Creep Behavior of Directionally Solidified CM-247LC Superalloy: *Mau-Sheng Chiou*¹; *An-Chou Yeh*²; *Sheng-Rui Jian*¹; *Chen-Ming Kuo*¹; ¹I-Shou University; ²National Tsing Hua University

3:20 PM

Fabrication of 3D Woven and 3D Braided Ni-based Superalloys: *Dinc Erdeniz*¹; *Keith Sharp*²; *David Dunand*¹; ¹Northwestern University; ²3TEX Incorporated

3:40 PM Break

3:55 PM

Mechanical Behavior and Microstructure Evolution of AD730 Superalloy: *Timur Khismatullin*¹; ¹Advanced Forming Research Centre, University of Strathclyde

4:15 PM

Development of a Si-bearing DS Superalloy: *Kuo-Cheng Yang*¹; *Yao-Jen Chang*¹; *An-Chou Yeh*¹; *Jien-Wei Yeh*¹; ¹National Tsing Hua University

4:35 PM

Grain Boundary Engineering in Alloy 800H/HT via Thermo-mechanical Processing: *Hamed Akhiani*¹; *Majid Nezakat*¹; *Jerzy Szpunar*¹; ¹University of Saskatchewan

4:55 PM

Heat Treatment Effects on the High Temperature Creep Behavior of Directionally Solidified Mar-M₂₄₇ Superalloy: *An-Chou Yeh*¹; *Wei-Bin He*²; *Sheng-Rui Jian*²; *Hui-Yun Bor*³; *Chao-Nan Wei*³; *Chen-Ming Kuo*²; ¹National Tsing Hua University; ²I-Shou University; ³Chung-Shan Institute of Science and Technology

5:15 PM

Microstructural and Properties Evolution of 800H Superalloy during Grain Boundary Engineering Processes: *Ya-Hsun Huang*¹; *Te-Kang Tsao*¹; *An-Chou Yeh*¹; *Shih-Chin Chang*¹; ¹National Tsing Hua University



Mechanical Behavior at the Nanoscale II — Micro/Nano-crystalline Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Wednesday PM Room: 9
 February 19, 2014 Location: San Diego Convention Center

Session Chairs: T. John Balk, University of Kentucky; Yong-Wei Zhang, Institute of High Performance Computing

2:00 PM Invited

Internal Structure, Size and Surface Effects on the Plasticity and Failure of Metallic Nanowires: *Yong-Wei Zhang*¹; Zhaoxuan Wu¹; Mark Jhon¹; Julia Greer²; David Srolovitz³; ¹Institute of High Performance Computing; ²Division of Engineering and Applied Science, California Institute of Technology; ³Departments of Materials Science and Engineering & Mechanical Engineering and Applied Mechanics

2:30 PM Invited

Tailoring Grain Boundary Structure to Control the Mechanical Behavior of Nanocrystalline Alloys: *Timothy Rupert*¹; ¹University of California, Irvine

3:00 PM

Small Activation Volume and Negative Activation Entropy of Short-circuit Diffusion in Nanocrystal: *Yunjiang Wang*¹; Guo-Jie Gao²; Shigenobu Ogata²; ¹Kyoto University; ²Osaka University

3:20 PM

Direct Measurement of the Effect of Applied Stress on Texture Transformations in Thin Ag Films: *Shefford Baker*¹; Ming-Tzer Lin²; Markus Chmielus¹; Howie Joresl¹; Kyle Visser¹; Arthur Woll¹; Elizabeth Ellis¹; Richard Vinci¹; Walter Brown¹; ¹Cornell University; ²National Chung Hsing University

3:40 PM Break

3:55 PM Invited

High Temperature Mechanical Behaviour of Al/SiC Multilayers: *Jon Molina-Aldareguia*¹; Saeid Lotfian¹; Carl Mayer²; Nikhilesh Chawla²; Javier LLorca³; Amit Misra³; ¹IMDEA Materials Institute; ²Arizona State University; ³Los Alamos National Laboratory

4:25 PM

Deformation Behavior of Nanotwinned Thin Films from In Situ Synchrotron X-ray Experiments: *Ryan Ott*¹; Matthew Besser¹; Eun Soo Park¹; Matthew Kramer¹; ¹Ames Laboratory (USDOE)

4:45 PM

Counting Dislocations in Micro-crystals with Coherent X-rays: Ex Situ and In Situ Studies of the Plastic Deformation of InSb Micro-pillars: Vincent L.R. Jacques¹; Geradina Carbone²; Rudy Ghisleni³; *Ludovic Thilly*⁴; ¹Laboratoire de Physique des Solides; ²ESRF; ³EMPA; ⁴University of Poitiers

5:05 PM

Room Temperature In Situ Transmission Electron Microscopy Plastic Deformation of 6H-SiC and Its Mechanism: *Sara Kiani*¹; Suneel Kodambaka¹; Andrew Minor²; Jenn-Ming Yang¹; ¹UCLA; ²UC Berkeley AND Lawrence Berkeley National Lab

5:25 PM

Mechanical Properties and Scaling Behavior of Bulk Nanoporous Gold and Iridium: Nicolas Briot¹; Lei Wang¹; *T. John Balk*¹; ¹University of Kentucky

Mechanical Behavior Related to Interface Physics II — Grain Boundary Effects on Mechanical Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Wednesday PM Room: 11A
 February 19, 2014 Location: San Diego Convention Center

Session Chairs: Marisol Koslowski, Purdue University; Tamer Crosby, UCLA

2:00 PM Invited

Emission of Dislocations from Grain Boundaries: *Richard Hoagland*¹; Saryu Fensin¹; Steve Valone¹; ¹LANL

2:30 PM Invited

Understanding the Role of Grain Boundaries during Deformation Using Spherical Nanoindentation and Orientation Imaging Microscopy: *Surya Kalidindi*¹; Shraddha Vachhani¹; ¹Georgia Institute of Technology

3:00 PM

Atomistic and Electron Tomography Study of 3D Dislocation-grain Boundary Interaction in BCC Metals: *Zhi Zeng*¹; Ting Zhu¹; ¹Georgia Institute of Technology

3:20 PM Break

3:40 PM Invited

Temporal and Spatial Stochasticity of Plastic Flow in Small Volumes: *Tamer Crosby*¹; Giacomo Po¹; Nasr Ghoniem¹; ¹UCLA

4:10 PM Invited

Reverse Plastic Strain in Polycrystalline Materials: *Marisol Koslowski*¹; Yuesong Xie¹; ¹Purdue University

4:40 PM

Modelling and Understanding the Strength of Grain Boundaries Based on Ab-initio Results: *Rebecca Janisch*¹; Xueyong Pang¹; Arshad Tahir¹; Alexander Hartmaier¹; ¹ICAMS

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Meso & Macro-scale Modelling of H-microstructure Interactions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Wednesday PM Room: 11B
 February 19, 2014 Location: San Diego Convention Center

Session Chairs: Petros Sofronis, University of Illinois at Urbana-Champaign; Xavier Feaugas, Université de La Rochelle

2:00 PM Invited

Hydrogen-defect Interactions in the Framework of the Defactant Concept: *Reiner Kirchheim*¹; ¹University of Goettingen

2:40 PM

Simulating Hydrogen Embrittlement and Fast Pathways for Diffusion through Localization Elements: *James Foulk*¹; WaiChing Sun¹; Jakob Ostien¹; Alejandro Mota¹; ¹Sandia National Laboratories

3:00 PM

A Re-examination of the Modeling of Solutes and Their Interactions with Other Defects: *Ryan Sills*¹; Wei Cai¹; David Barnett¹; William Nix¹; ¹Stanford

University

3:20 PM

Diffusion-coupled Hybrid Cohesive Zone Model for Hydrogen Embrittlement Analysis: Zhaoyu Jin¹; Jun Song¹; ¹McGill University

3:40 PM Break

4:00 PM Invited

Modeling of Gaseous Impurity Inhibition of Hydrogen Environment Embrittlement: Brian Somerday¹; Alex Staykov²; Petros Sofronis³; Reiner Kirchheim⁴; ¹Sandia National Laboratories; ²International Institute for Carbon Neutral Energy Research; ³University of Illinois; ⁴Georg-August-Universität Göttingen

4:40 PM

Simulating Hydride Precipitation in Zirconium by an Elastic Phase Field Model: Jacob Bair¹; Mohsen Asle Zaeem¹; ¹Missouri University of Science and Technology

5:00 PM

Random-walk Based Continuum Model of Hydrogen Diffusion and Trapping in Metals: Jesus Toribio¹; Viktor Kharin¹; ¹University of Salamanca

Multiscale Perspectives on Plasticity in HCP Metals — Mechanisms & Microstructures I

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

Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Suveen Mathaudhu; Ellen Cerreta, Los Alamos National Laboratory; Juan P. Escobedo, The University of New South Wales Canberra; Dallas Trinkle, University of Illinois, Urbana-Champaign

Wednesday PM

Room: 6C

February 19, 2014

Location: San Diego Convention Center

Session Chair: Ellen Cerreta, Los Alamos National Laboratory

2:00 PM Invited

Connection between the II Fault and c+a Slip: Sean Agnew¹; Laurent Capolungo²; Christopher Calhoun¹; ¹University of Virginia; ²Georgia Institute of Technology

2:20 PM

Cyclic Loading Experiments and Crystal Plasticity Modeling of Mg AZ31: Matthew Priddy¹; David McDowell¹; ¹Georgia Institute of Technology

2:40 PM

Microstructural Investigation of Twin Boundaries in HCP Metals and Implications Towards Mechanical Behavior: Benjamin Morrow¹; Rodney McCabe¹; Ellen Cerreta¹; Carlos Tomé¹; ¹Los Alamos National Laboratory

3:00 PM

Characterization and Modeling of High Strain-rate Tensile Deformation in Zirconium: Juan P. Escobedo¹; Ellen Cerreta¹; Carl Trujillo¹; Ricardo Lebensohn¹; Daniel Martinez²; George Gray III¹; ¹Los Alamos National Laboratory

3:20 PM

Micro-cantilever Testing of Hexagonal Close Packed Metals and Alloys: Angus Wilkinson¹; Jicheng Gong¹; ¹University of Oxford

3:40 PM Break

4:00 PM Invited

In Situ Characterization on Oxygen Impurity Effects in α -Titanium: Qian Yu¹; Rachel Traylor¹; Liang Qi¹; John Morris¹; Mark Asta¹; Daryl C Chrzan¹; Andrew Minor²; ¹UC Berkeley; ²LBNL

4:20 PM

Effect of Alloying Elements on Twin Activity in Ti and Zr: Michael Preuss¹; Leo Prakash¹; Arnas Fitzner¹; Joao Quinta da Fonseca¹; ¹University of Manchester

4:40 PM

Multiscale Effects of Twin-induced Strain Localizations in Mg Alloys: Kavan Hazeli¹; Jefferson Cuadra¹; Prashanth Vanniamparambil¹; Antonios Kontsos¹; ¹Drexel University

5:00 PM

Modelling Twin Clustering and Its Effect on Formability: Gabor Timar¹; Joao Fonseca¹; ¹The University of Manchester

Nanoparticulate Materials: Production, Consolidation and Characterization — Consolidation III: Novel Consolidation Techniques

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Wednesday PM

Room: Carlsbad

February 19, 2014

Location: San Diego Marriott Marquis & Marina

Session Chair: James Wollmershauser, Naval Research Laboratory

2:00 PM Invited

Bulk Single Phase Nanocrystalline Ceramics by Integrated High Pressure Consolidation: Boris Feigelson¹; James Wollmershauser¹; ¹US Naval Research Laboratory

2:30 PM

Al-Ni Energetic Composites Produced from Nano-thickness Flakes by Ultrasonic Powder Consolidation: Dinc Erdeniz¹; Teiichi Ando²; ¹Northwestern University; ²Northeastern University

2:50 PM

Morphology of Yttria Partially Stabilized Zirconia during Cryomilling and Thermomechanical Processing: Matthew Dussing¹; Hanry Yang¹; Troy Topping¹; Enrique Lavernia¹; Julie Schoenung¹; ¹UC Davis

3:10 PM

Yttria and Alumina Nano-scale Oxide-dispersion-strengthened (ODS) 316 Stainless Steels: Chen Dai¹; Chris Schade²; Enrique Lavernia¹; Diran Apelian²; ¹University of California, Davis; ²Hoeganaes Corporation

3:30 PM Break

3:50 PM Invited

Fully Dense Oxide-free Nanocomposite Magnets and Nanostructured Semiconductor Thermoelectrics Produced by High Pressure Consolidation: James Wollmershauser¹; Boris Feigelson¹; ¹US Naval Research Laboratory

4:20 PM

Enhanced Sintering Mechanism in Nanocrystalline Powders Undergoing Phase Separation: Mansoo Park¹; Christopher Schuh¹; ¹MIT

4:40 PM

Multi-scale Modeling of Sintering of Agglomerated Nano-powders: Jose Alvarado-Contreras¹; Diletta Giuntini¹; Andrey Maximenko¹; Eugene Olevsky¹; ¹San Diego State University

5:00 PM

Synthesis of Copper Nanoparticles for Inkjet Printing Technology: Giuseppe Granata¹; Taisi Yamaoka¹; Akio Fuwa¹; ¹Waseda University



Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session VI

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Wednesday PM Room: Ballroom F
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Shirley Meng, UC San Diego; Reza Shahbazian-Yassar, Michigan Technological University

2:00 PM Invited

The Development of Two Dimensional Materials for Energy Storage: *Guillaume Muller*¹; Bruce Dunn¹; ¹UCLA - Department of Materials Science and Engineering

2:15 PM Invited

3-Dimensional Nanostructured Silicon Electrodes for Use in Li Ion Batteries: *Julia Greer*¹; X Gu¹; Sarah Mitchell¹; Satyajit Das¹; Michael Ortiz¹; ¹California Institute of Technology

2:30 PM Invited

Coupled Electrochemical Cycling and TEM Characterization of Individual Nanostructures for Energy Storage Materials: *Katherine Jungjohann*¹; Yang Liu¹; Kevin Zavadil¹; Tom Harris¹; Andrew Leenheer¹; John Sullivan¹; Nathan Hahn¹; Katharine Harrison¹; ¹Sandia National Laboratories

2:45 PM Invited

Effect of Ionic liquids on Li-sulfur Battery Performance: *Surya Moganty*¹; ¹NOHMs Technologies

3:00 PM Invited

High-throughput Search for Dual-functioning Electrocatalyst/Electrode Li-O₂ Cells from First-principles Thermochemical Database: *Scott Kirklin*¹; Maria Chan²; Lynn Trahey²; Michael Thackeray²; Chris Wolverton¹; ¹Northwestern University; ²Argonne National Laboratory

3:15 PM Invited

Understanding Capacitance Variation with the Pore Size in Electric Double-layer Capacitors: *De-en Jiang*¹; ¹Oak Ridge National Laboratory

3:30 PM Break

3:45 PM Invited

Lithiation Induced Stresses and Interfacial Phenomena in Li Ion Battery Electrodes: *Brian Sheldon*¹; Anton Tokranov¹; Ravi Kumar¹; Xingcheng Xiao²; Peng Lu²; Yue Qi²; ¹Brown University; ²General Motors

4:00 PM Invited

Mesoscale Electrode Physics in Lithium-ion Batteries: *Partha Mukherjee*¹; Pallab Barai¹; Zhixiao Liu¹; ¹Texas A&M University

4:15 PM Invited

Nanocomposite Cathodes and Barrier Layers for Long-life Lithium Sulfur Batteries: Jocelyn Hicks-Garner¹; Adam Gross¹; John Wang¹; John Vajo¹; Jason Graetz¹; ¹HRL Laboratories, LLC

4:30 PM Invited

Three-dimensional Nanofiber-based Electrode Architecture for Supercapacitors: *Vibha Kalra*¹; ¹Drexel University

4:45 PM Invited

TiO₂ Nanosheet Assemblies as Lithium Ion Battery Anodes at Elevated Temperatures: Wei Zhang¹; Dawei Liu¹; ¹Alfred University

5:00 PM Invited

Dynamic Phenomena in Complex Oxides during Electrochemical Processes in Li ion and Na Ion Batteries: *Shirley Meng*¹; ¹U.C. San Diego

5:15 PM Invited

In Situ Transmission Electron Microscopy of Lithium Storage in Nanomaterials: *John Cumings*¹; ¹University of Maryland

5:30 PM

Hierarchical MnO₂ Nanosheet-built Nanotubes for Electrochemical Capacitor Electrodes: *Yuxin Zhang*¹; Ming Huang¹; ¹Chongqing University

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Static and Dynamic Displacements

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kosterz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Wednesday PM Room: 10
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Chen Li, ORNL; Luca Gelisio, University of Trento

2:00 PM Keynote

Powder Diffraction and Lattice Dynamics of Nanocrystals: *Paolo Scardi*¹; ¹University of Trento

2:40 PM Invited

Synchrotron Laue X-ray Microdiffraction Imaging: *Nobumichi Tamura*¹; ¹Lawrence Berkeley National Lab.

3:05 PM

Optimising Time Resolved Strain Resolution with Micro-laue X-ray Diffraction: *T Ben Britton*¹; Luc Vandeperre¹; Finn Giuliani¹; ¹Department of Materials, Imperial College

3:20 PM

An Atomistic Approach to Diffraction: *Luca Gelisio*¹; Paolo Scardi¹; ¹University of Trento

3:35 PM Break

3:55 PM Invited

Neutron and X-ray Scattering Investigations of Microscopic Energy Transport: *Olivier Delaire*¹; ¹Oak Ridge National Laboratory

4:20 PM Invited

Strain Mechanisms in Polycrystalline BaTiO₃ Measured at the Single Grain Level during In Situ Electrical Poling: *Jette Oddershede*¹; Marta Majkut¹; John Daniels²; Wook Jo³; Soren Schmidt¹; ¹DTU Physics; ²University of New South Wales; ³TU Darmstadt

4:45 PM

Phonon Dynamics in SnTe: *Chen Li*¹; Olivier Delaire¹; Xin Chen¹; David Singh¹; Andrew May¹; Jie Ma¹; Zhiting Tian²; Gang Chen²; Michael McGuire¹; Georg¹; Andrew Christianson¹; Ashfia Huq¹; ¹Oak Ridge National Laboratory; ²Massachusetts Institute of Technology

5:00 PM

Small Angle X-ray Scattering Study of ω Phase in Metastable β Titanium Single Crystals: *Jana Šmilauerová*¹; Miloš Janeczek¹; Václav Holý¹; Jan Ilavský²; ¹Charles University; ²Argonne National Laboratory

5:15 PM

Synchrotron X-ray Diffraction Study of the Plasticity of Bulk Metallic Glass Composites: *Jiawei Mi*¹; ¹University of Hull

Pb-free Solders and Emerging Interconnect and Packaging Materials — Interfacial Reactions and Fatigue

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotivve

Wednesday PM
February 19, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Won Sik Hong, Korea Electronics Technology Institute; Polina Snugovsky, Celestica

2:00 PM

Interfacial Microstructures and Brittle Fracture Behavior of Solder Joints on ENIG and ENEPIG Surface Finishes: *Kyoung-Ho Kim*¹; Wonil Seo¹; Kang-Dong Kim²; Deok-Gon Han³; Tae-Hyun Sung³; Tae-Ho Lee³; Sehoon Yoo¹; ¹Korea Institute of Industrial Technology; ²Samsung Electro-Mechanics; ³MK CHEM&TECH

2:20 PM

Electrical Contact Resistance of Pb-free Solders: *Fay Hua*¹; ¹Intel Corporation

2:40 PM

Phase Transformation in the Early Stage of Soldering Reaction between Sn-Ag-Cu and a Submicron Ni(P) Film: *Shih-Ju Wang*¹; Chia-Wei Fan¹; Wei-Hsiang Wu¹; *Cheng-En Ho*¹; ¹Yuan Ze University

3:00 PM

The Evolution of Microstructure and Mechanical Strength Affected by Adding Pd in Co-based Surface Finishes: *Chun-Hao Huang*¹; Jia-Hong Hong¹; Albert T. Wu¹; ¹National Central University

3:20 PM Break

3:40 PM

Thermal Fatigue Reliability of LED Joints on Aluminium Substrate at SnAgCu+Sb and SnAgCu+Bi Alloys: *Minoru Ueshima*¹; ¹Senju Metal Industry

4:00 PM

Relation between the Fatigue Life of SnAgCu Pb-Free Solder Joints and both Composition and Thermal History: *Francis Mutuku*¹; Babak Arfaei²; Eric Cotts¹; ¹Binghamton University; ²Universal Instruments

4:20 PM

Assessing Solder Joint Fatigue Life under Realistic Service Conditions: *Sa'D Hamasha*¹; Mazin Obaidat¹; Sulman Majeed¹; Peter Borgesen¹; ¹Binghamton University

4:40 PM

Drop and High Speed Impact Response for Multi-level Assembly Packaging with Slightly Significant Pd or Ni(P) Layer Deposit under Thermal Treatment: *Hsiu-Min Lin*¹; Cheng-Ying Ho¹; Wen-Lin Chen¹; Yi-Hsin Wu¹; De-Hui Wang²; Jun-Ren Lin²; Yu-Hui Wu²; Huei-Cheng Hong²; Zhi-Wei Lin²; Jenq-Gong Duh¹; ¹Materials Science and Engineering, National Tsing Hua University; ²Kinsus Interconnect Technology Corporation

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — General Issues in Microelectronics and Energy Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Wednesday PM
February 19, 2014

Room: 32A
Location: San Diego Convention Center

Session Chairs: Chih-Ming Chen, National Chung Hsing University; Ikuo Ohnuma, Tohoku University

2:00 PM Invited

Ag Decorated Al Nanoparticles as Novel Ink Materials for Printed Electronics Applications: *Yung Jong Lee*¹; Na Rae Kim¹; Jahyun Koo¹; *Hyuck Mo Lee*¹; ¹KAIST

2:20 PM Invited

Chemical and Thermal Reductions of Carboxylate-protected Nanoparticle-based Ag Conductive Films: *Jenn-Ming Song*¹; Kun-Hung Hsieh¹; Tsung-Yun Pai¹; ¹National Chung Hsing University

2:40 PM

Synthesis, Microstructures and Properties of High Strength-high Conductivity Cu-Mg Alloys: *Stephane Gorsse*¹; Blanche Ouvrard¹; Angeline Poulon¹; Mohamed Gouné¹; Yannick Champion²; ¹ICMCB-CNRS; ²ICMPE

3:00 PM

Metallization on Indium Tin Oxide Plastic Substrate by Potential-sweeping Electroplating: *Hau Nga Yu*¹; Ya-Huei Chang¹; Yu-Ting Huang¹; Shien-Ping Feng¹; ¹The University of Hong Kong

3:20 PM Break

3:40 PM Invited

Electroplating Ni-Au Low Ohmic Contacts on Nanostructured Bi₂Te₃ Alloys: *Shien Ping Feng*¹; Ya-Huei Chang¹; ¹The University of Hong Kong

4:00 PM

Low-temperature Synthesis of Cu Interconnects on Glass Using Cu(Mg) Alloy Films: *Kazuhiro Ito*¹; Keiji Hamasaka²; *Kazuyuki Kohama*¹; Yasuharu Shirai²; Masanori Murakami³; ¹Osaka University; ²Kyoto University; ³The Ritsumeikan Trust

4:20 PM

Synthesis of Low Contact-resistance Cu(Ti)/ITO Junctions: *Kazuhiro Ito*¹; Wataru Nakagawa²; Yasuharu Shirai²; Masanori Murakami³; ¹Osaka University; ²Kyoto University; ³The Ritsumeikan Trust

4:40 PM

Effect of Layer Direction on the Interfacial Reactions between Bismuth Telluride and Tin-based Solder: *Shan Ye*¹; Chih-Ming Chen¹; ¹National Chung Hsing University

5:00 PM

Wetting Behavior of Solders on ENIG and ENEPIG Metallization without Flux: *Wen Ning Chuang*¹; C.Y. Liu¹; ¹National Central University



Phase Transformation and Microstructural Evolution — Processing and Microstructural Evolution I

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

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Wednesday PM
February 19, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: John Gibbs, Northwestern University; Amy Clarke, Los Alamos National Laboratory

2:00 PM Invited

Surface Precipitation in Engineering Alloys: *Christopher Hutchinson*¹; Yu Chen¹; Xiya Fang¹; Yves Brechet²; ¹Monash University; ²Institute National Polytechnique de Grenoble

2:30 PM

Quantitative Characterization and Modeling of Precipitation during Quench in the Heat Treatable 7449 Aluminium Alloy: *Patrick Schloth*¹; Julia Repper²; Charles-André Gandin³; Frédéric de Geuser⁴; Alexis Deschamps⁴; Helena Van Swygenhoven²; Jean-Marie Drezet¹; ¹EPFL; ²Paul Scherrer Institut; ³CEMEF UMR CNRS-ENSMP 7635; ⁴SIMAP, INP Grenoble

2:50 PM Invited

Evolution of Precipitate Nuclei during Age-hardening: *Peter Liddicoat*¹; Simon Ringer¹; ¹The University of Sydney

3:20 PM

Phase Field Crystal Modeling and Atomic-scale Characterization of Clustering in Al-Mg-Si Alloys: *Vahid Fallah*¹; Andreas Korinek²; Mark Gallerneault³; Nana Ofori-opoku²; Nikolas Provatas⁴; Shahrzad Esmaili¹; ¹University of Waterloo, Mechanical and Mechatronics Engineering Department; ²McMaster University, Department of Materials Science and Engineering; ³Novelis Inc.; ⁴McGill University, Department of Physics

3:40 PM Break

3:55 PM

Microstructure and Property Changes in Metallic Alloys Induced by Advanced Mechanical Surface Treatments: *Amrinder Gill*¹; Abhishek Telang¹; Chang Ye¹; Zhong Zhou²; Seetha Mannava¹; Dong Qian²; *Vijay Vasudevan*¹; ¹University of Cincinnati; ²University of Texas at Dallas

4:15 PM

In Situ X-ray Tomographic Microscopy Study of the Evolution of Aluminide Coatings on Ni-20Cr Wires: *Ashley Ewh*¹; Dinc Erdeniz¹; Matthew Glazer¹; Thomas Philippe¹; Julie Fife²; Peter Voorhees¹; David Dunand¹; ¹Northwestern University; ²Swiss Light Source

4:35 PM

Nanosecond-scale Multi-frame TEM of Phase Transformations: Measuring Crystal Growth Rates during Laser Annealing of Amorphous Phase Change Materials: *Melissa Santala*¹; Simone Raoux²; Teya Topuria³; Bryan Reed¹; Thomas LaGrange¹; Geoffrey Campbell¹; ¹Lawrence Livermore National Laboratory; ²IBM Watson Research Center; ³IBM Research Almaden

4:55 PM

Coarsening Dynamics in Two-phase Mixtures: Interfacial Velocity Distributions: *John Gibbs*¹; Peter Voorhees¹; ¹Northwestern University

5:15 PM

Analysis of Precipitation Reaction Kinetics: Kinetic Model vs. Experiments: *Bastian Rheingans*¹; Eric Mittemeijer²; ¹Institute for Materials Science, University of Stuttgart; ²Institute for Materials Science, University of Stuttgart / Max Planck Institute for Intelligent Systems

5:35 PM

A Phase Field Crystal Study of Nucleation and Growth during a Polymorphic Transformation: *Tao Yang*¹; Yipeng Gao¹; Rongpei Shi¹; Jiahong Ke¹; Yunzhi Wang¹; ¹Ohio State University

Radiation Effects in Oxide Ceramics and Novel LWR Fuels — Multi-scale Modeling of Radiation-induced Microstructure Evolution in Oxide Ceramics

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Xian-Ming Bai, Idaho National Laboratory; Todd Allen, Idaho National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Jianliang Lin, Colorado School of Mines; Michele Manuel, University of Florida; Dragos Staicu, European Commission, Joint Research Centre, Institute for Transuranium Elements; Yong Yang, University of Florida

Wednesday PM
February 19, 2014

Room: 33B
Location: San Diego Convention Center

Funding support provided by: The Center for Materials Science of Nuclear Fuel (CMSNF), an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Blas Uberuaga, Los Alamos National Laboratory; Michael Tonks, Idaho National Laboratory

2:00 PM Invited

UO₂ Fission Gas Release Rates from Atomistic Calculations of Intrinsic and Radiation-enhanced Diffusion Coefficients: *David Andersson*¹; Xiang-Yang Liu¹; Giovanni Pastore²; Michael Tonks²; Paul Millett³; Boris Dorado⁴; Philippe Garcia⁵; Blas Uberuaga¹; Chris Stanek¹; ¹Los Alamos National Laboratory; ²Idaho National Laboratory; ³University of Arkansas; ⁴CEA, DAM, DIF; ⁵CEA, DEN, DEC, Centre de Cadarache

2:30 PM

Irradiation-induced Grain Growth in Nanocrystalline Ceria: *William Weber*¹; Dilpuneet Aidhy²; Yanwen Zhang²; ¹University of Tennessee; ²Oak Ridge National Laboratory

2:50 PM

Modeling of Grain Growth in UO₂ under a Temperature Gradient: *Michael Tonks*¹; Yongfeng Zhang¹; Xianming Bai¹; ¹Idaho National Laboratory

3:10 PM

Molecular Dynamics Study of Grain Boundary Properties in UO₂: *Joseph Carmack*¹; Yongfeng Zhang¹; ¹Idaho National Laboratory

3:30 PM Break

3:50 PM Invited

Multiscale Computer Simulation of Fission Gas Release in Oxide Fuels: *Paul Millett*¹; Michael Tonks²; Yongfeng Zhang²; Bulent Biner²; ¹University of Arkansas; ²Idaho National Laboratory

4:20 PM

Electrochemical Effect of Void Ensembles in UO₂: *Abdel-Rahman Hassan*¹; Janne Pakarinen²; Michele Manuel³; Anter El-Azab¹; ¹Purdue University; ²University of Wisconsin-Madison; ³University of Florida

4:40 PM

Segregation of Fission Products to Dislocations in Uranium Dioxide: *Anuj Goyal*¹; Bowen Deng¹; Minki Hong¹; Aleksandr Chernatynskiy¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

Shape Casting: 5th International Symposium — Solidification and Microstructure I

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee
Program Organizers: Murat Tiryakioglu, University of North Florida; John Campbell, University of Birmingham; Glenn Byczynski, Nemak Canada

Wednesday PM Room: 17B
February 19, 2014 Location: San Diego Convention Center

Session Chair: To Be Announced

2:00 PM

Thermodynamics-based Computational Approach to AL-CU Alloys: Grain Refinement: Jiehua Li¹; Carmen Promer²; Albert Jahn²; B. Oberdorfer²; S. Wurster¹; F. Martin¹; *Peter Schumacher*³; ¹University of Leoben; ²Austrian Foundry Research Institute; ³University of Leoben, Austrian Foundry Research Institute

2:20 PM

Control Diffusion Solidification(CDS): An Overview of Mechanism and Application: *Sumanth Shankar*¹; Reza Ghiaasiaan¹; Diran Apelian²; ¹McMaster University; ²Worcester Polytechnic Institute

2:40 PM

Correlation between Melt Quality and Fluidity of A356: Baris Akkaya¹; *Emine Erturk*¹; Derya Dispinar¹; ¹Istanbul University

3:00 PM

Fluidity Characteristics of A356 Alloy with Various Thickness Sectioned New Test Mould: Murat Colak¹; Ramazan Kayikci¹; *Derya Dispinar*²; ¹Sakarya University; ²Istanbul University

3:20 PM

Effect of Feeder Configuration on the Microstructure of Ductile Cast Iron: *Nikolaj Vedel-Smith*¹; Niels Tiedje¹; ¹Technical University of Denmark

3:40 PM Break

3:50 PM

Analysis of Heterogeneous Nucleation in Ductile Iron: *Simon Lekakh*¹; ¹MST

4:10 PM

The External and Internal shrinkages in Aluminum Gravity Castings: *Fu-Yuan Hsu*¹; Shin-Wei Wang¹; Huey-Juan Lin¹; ¹National United University

4:30 PM

Effect of Si and Cu Content on the Size of Intermetallic Phase Particles in Al-Si-Cu-Mg-Fe Alloys: *Tharmalingam Sivarupan*¹; Carlos H Caceres²; John Andrew Taylor¹; ¹CAST CRC Ltd.; ²ARC-Centre of Excellence for Design in Light Metals

4:50 PM

Efficient Use of Titanium, Boron and Strontium in Grain Refining and Modification of Die-cast A356: *Sebastian Fischer*¹; Roman Boras¹; Andreas Bührig-Polaczek¹; Matthias Bünck²; ¹RWTH Aachen University; ²Access e.V.

5:10 PM

Studying on the Effects of Quenching Rate on Residual Stress in Al-5Mg and Al-Mg-Cu Alloys: *Halil Kalkan*¹; Derya Dispinar¹; ¹Istanbul University

Solar Cell Silicon — Silicon Production and Solidification

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gabriella Tranel, Norwegian University of Science & Technology; Yulia Meteleva-Fischer, Materials Innovation Institute M2i; Arjan Ciftja, SINTEF; Shadia Ikhmayies, Al Isra University

Wednesday PM Room: Balboa
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Gabriella Tranel, Norwegian University of Science & Technology; Arjan Ciftja, SINTEF

2:00 PM Introductory Comments

2:10 PM

Electrochemical Deposition of High Purity Silicon from Molten Fluoride Electrolytes: *Geir Martin Haarberg*¹; Henrik Gudbrandsen²; Karen Osen²; Sverre Rolseth²; Ana Maria Martinez²; ¹Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry

2:30 PM

Investigation on the Electrochemical Reduction Behavior of Granular SiO₂ in Molten CaCl₂: *Xiao Yang*¹; Kouji Yasuda¹; Toshiyuki Nohira¹; Rika Hagiwara¹; Koki Ichitsubo²; Kenta Masuda²; Takayuki Homma³; ¹Kyoto University; ²Taiheiyō Cement Corporation; ³Waseda University

2:50 PM

Determination of Cell Potential for Silicon Electrodeposition: *Samira Sokhanvaran*¹; Mansoor Barati¹; ¹University of Toronto

3:10 PM

Preparation of Solar Grade Silicon Precursor by Electrolysis SiO₂ in Molten Salts: Liangxing Li¹; *Zhongning Shi*¹; Aimin Liu¹; Bingliang Gao¹; Zhaowen Wang¹; Xianwei Hu¹; Jiangyu Yu¹; ¹Northeastern University

3:30 PM Break

3:50 PM

Metallurgical Silicon Refining by Transient Directional Solidification: *Moysés Lima*¹; Marcelo Martorano²; João Batista Neto¹; ¹Institute for Technological Research of the São Paulo State - IPT; ²University of São Paulo

4:10 PM

New Applications of Sheet Casting of Silicon and Silicon Composites: *Bert Kraaijveld*¹; Pierre-Yves Pichon¹; Axel Schonecker¹; Yulia Meteleva-Fischer²; ¹RGS Development; ²Materials Innovation Institute M2i

4:30 PM

Gas Phase Interactions as Sources of Contamination in Solar Silicon: *Yulia Meteleva-Fischer*¹; Amarante Böttger²; Wim Sloof²; Bert Kraaijveld³; ¹Materials innovation institute (M2i); ²Delft University of Technology; ³RGS Development B.V.

4:50 PM

Tracing Impurities in Silicon Production in the Microwave Furnace: *Jan-Philipp Mai*¹; Gabriele Raabe²; ¹JPM Silicon GmbH; ²University of Braunschweig, Institute of Technology, IfT

5:10 PM

Synthesis of SiC by Direct Reduction of SiO₂ by Using a Methane Gas-Experimental Approach: *Michal Ksiazek*¹; Halvor Dalaker²; Eli Ringdalen²; Merete Tangstad¹; ¹NTNU Norwegian University of Science and Technology; ²SINTEF



Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Interface Morphology and Stability

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
 Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Wednesday PM Room: 4
 February 19, 2014 Location: San Diego Convention Center

Session Chair: Mitra Taheri, Drexel University

2:00 PM Invited

A Continuous Method for the Calculation of the Reduction in Interfacial Gibbs Free Energy Due to Interfacial Segregation: *David Seidman*¹; Ivan Blum¹; Sung-Il Baik¹; Mercuri Kanatzidis¹; ¹Northwestern University

2:40 PM

Trans-Interface-Diffusion-Controlled Coarsening of Precipitates in Ternary Alloys: *Alan Ardell*¹; ¹University of California

3:00 PM

Interfacial Reactions and Phase Growth for Various Metal/Amorphous Si System: *Zoltán Balogh*¹; Alexander Fuhrich¹; Mohammed Ibrahim¹; Bence Parditka²; Ralf Schlesiger¹; Patrick Stender²; Zoltán Erdélyi²; Guido Schmitz¹; ¹University of Münster; ²University of Debrecen

3:20 PM

Interfacial Segregation in MoSi₂-Based Duplex Alloys: A Phase-field Study Combined with First-principles Calculation: *Toshihiro Yamazaki*¹; Yuichiro Koizumi¹; Akihiko Chiba¹; Koji Hagihara²; Takayoshi Nakano²; Koretaka Yuge³; Kyosuke Kishida³; Haruyuki Inui³; ¹Tohoku University; ²Osaka University; ³Kyoto University

3:40 PM Break

3:50 PM Invited

Periodic Segregation of Solute Atoms in Fully Coherent Twin Boundaries in Mg Alloys: *Jian-Feng Nie*¹; Yuman Zhu¹; Zhe Liu¹; Xi-Ya Fang¹; ¹Monash University

4:30 PM

The Effects of Solutes on Thermal Stability of Nanotwins: *Valery Borovikov*¹; Mikhail Mendelev¹; ¹The Ames Laboratory

4:50 PM

Effect of Vacancy Ordering and Order-disorder Transitions on Ionic Diffusivity in Iron-sulfide Passive Corrosion Films: *Aravind Krishnamoorthy*¹; Bilge Yildiz¹; ¹Massachusetts Institute of Technology

5:10 PM

Cation Diffusion and Surface Reactivity in Iron Sulfide Fe1-xS: *William Herbert*¹; Aravind Krishnamoorthy¹; Bal Mukund Dhar¹; Krystyn Van Vliet¹; Bilge Yildiz¹; ¹MIT

Symposium on High Entropy Alloys II — Modeling and Mechanical Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Alloy Phases Committee

Program Organizers: Peter Liaw, The University of Tennessee; Gongyao Wang, University of Tennessee; M. C. Gao, National Energy Technology Laboratory; S. N. Mathaudhu

Wednesday PM Room: 5A
 February 19, 2014 Location: San Diego Convention Center

Session Chairs: Michael Gao, National Energy Technology Lab; Michael Widom, Carnegie Mellon University

2:00 PM Invited

Prediction of Low Temperature Phase Transitions in the High Entropy Alloy Mo-Nb-Ta-W: *Michael Widom*¹; ¹Carnegie Mellon University

2:20 PM

Ab Initio Study of FeMnNiCoCr High Entropy Alloys: *Blazej Grabowski*¹; Duancheng Ma¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

2:30 PM Invited

Low Stacking Fault Energy High Entropy Alloys: Alexander Zaddach¹; Changning Niu¹; James LeBeau¹; Carl Koch¹; *Douglas Irving*¹; ¹North Carolina State University

2:50 PM

Equal Channel Angular Extrusion Consolidation of Lightweight High Entropy Alloys: Laszlo Kecskes¹; *Mark Atwater*²; Vincent Hammond¹; Kristopher Darling¹; ¹US Army Research Laboratory; ²Millersville University

3:00 PM Invited

An Understanding of High Entropy Alloy from Phase Diagram Calculation: *Fan Zhang*¹; Chuan Zhang¹; Shuanglin Chen¹; Weisheng Cao¹; Jun Zhu¹; Ursula Kattner²; ¹CompuTherm, LLC; ²NIST

3:20 PM

Aluminum Alloying Effects on Lattice Types, Microstructures, and Mechanical Behavior of High-entropy Alloys Systems: *Zhi Tang*¹; Michael Gao²; Haoyan Diao¹; Tengfei Yang¹; Junpeng Liu³; Tingting Zuo³; Yong Zhang³; Zhaoping Lu³; Yongqiang Cheng⁴; Yanwen Zhang¹; Karin Dahmen⁵; Peter Liaw¹; Takeshi Egami¹; ¹The University of Tennessee; ²National Energy Technology Laboratory; ³University of Science and Technology Beijing; ⁴Oak Ridge National Laboratory; ⁵University of Illinois at Urbana-Champaign

3:30 PM Break

3:50 PM

First Principles Simulation of a NiFeCrCoMn High Entropy Alloy: *Changning Niu*¹; Alexander Zaddach¹; Carl Koch¹; Douglas Irving¹; ¹North Carolina State University

4:00 PM Invited

Characterization of Multicomponent Alloys Developed by Equiatomic Substitution: *Ki Buem Kim*¹; ¹Sejong University

4:20 PM Invited

Ab Initio Modeling of High Entropy Alloys Using Special Quasirandom Structures: *Chao Jiang*¹; Michael Gao²; ¹University of Wisconsin; ²National Energy Technology Laboratory

4:40 PM Invited

Phase Evolution in High Entropy Alloys during Mechanical Alloying and Spark Plasma Sintering: S. Praveen¹; Mayur Vaidya¹; *Ravi Sankar Kottada*¹; Srinivasa Murty Budaraju¹; ¹IIT Madras