The leading forum addressing structure, properties, processing and performance across the materials community.

Technical Meeting and Exhibition

MS&T 18
MATERIALS SCIENCE & TECHNOLOGY

OCTOBER 14 – 18, 2018 | GREATER COLUMBUS CONVENTION CENTER | COLUMBUS, OHIO, USA
## PROGRAM AT-A-GLANCE

### PROGRAM HIGHLIGHTS

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### ADDITIVE MANUFACTURING

#### Additive Manufacturing of Composites and Complex Materials III

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#### Additive Manufacturing of Metals: Microstructure and Material Properties

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**International Symposium on Ceramic Matrix Composites**

- **Processing and Microstructure Evolution**
- **Testing and Damage Characterization**
- **Damage Evaluation and Modeling**

**Materials Science and Engineering of Earth Abundant Materials**

- **Materials Science and Engineering of Earth Abundant Materials**

**Modern Ceramic Manufacturing Methods and Applications**

- **Modern Ceramic Manufacturing Methods and Applications**

**New Advances and Innovations in Corrosion of Refractory Ceramics**

- **International Symposium on New Advances and Innovation in Corrosion of Refractory Ceramics I**
- **International Symposium on New Advances and Innovation in Corrosion of Refractory Ceramics II**

**Phase Transformations in Ceramics: Science and Applications**

- **Phase Transformations in Ceramics: Science and Applications - Crystallography**
- **Phase Transformations in Ceramics: Science and Applications - Processing-Microstructure-Properties I**
- **Phase Transformations in Ceramics: Science and Applications - Processing-Microstructure-Properties II/Theory**

**ELECTRONIC AND MAGNETIC MATERIALS**

**Advances in Dielectric Materials and Electronic Devices**

- **Dielectrics and Magnetoelectrics I**
- **Dielectrics and Magnetoelectrics II**
- **Advanced Dielectrics and Energy**

**Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder**

- **Session I**
- **Session II**
- **Session III**

**Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications**

- **Semiconductor Heterostructures I**
- **Semiconductor Heterostructures II**
## ENERGY

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### Covetic Nanomaterials for Energy Applications

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### Materials for Nuclear Applications and Extreme Environments

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### Materials Issues in Nuclear Waste Management

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## FAILURE ANALYSIS

### Characterization & Methods in Failure Analysis

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### Manufacturing-Related Failures

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- Transportation
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- **Alloy Design and Theoretical Modeling**
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- **Mechanical Properties and Structure-property Relation**
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- **Dislocation-Grain Boundary interactions**
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- **Fast TEM Imaging - Phase Transformation and Beyond**
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- **Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties**
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#### Advances in Zinc-coated Sheet Steel Processing and Properties

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### Materials-Environment Interactions

#### Advanced Coatings for Wear and Corrosion Protection

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#### Catalyst Support Materials and Support Effect

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#### Corrosion of Additively Manufactured Metals

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### Materials Degradation in CO2 Environments

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### Selection of Materials for Application in Corrosive Environments

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### NANOMATERIALS

#### Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials

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#### Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry Applications

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#### Responsive Functional Nanomaterials

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### PROCESSING AND PRODUCT MANUFACTURING

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**Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials**

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**Advances in Surface Engineering**

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**Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications**

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<td>2D Boron &amp; Clusters</td>
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<td>Novel Synthesis &amp; Boron Suboxide</td>
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<td>Physical Properties of Bulk Systems</td>
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**Composition-Processing-Microstructure-Property Relationships of Titanium Alloys**

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<td>Deformation and Transformations</td>
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<td>Deformation, Fatigue, &amp; Fracture</td>
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## Joining of Advanced and Specialty Materials (JASM XX)

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<td>Brazing of Advanced Materials</td>
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<td>Friction Stir and Friction Welding I</td>
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<td>Welding Processes</td>
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<td>Ultrasonic Joining</td>
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<td>Dissimilar Materials Joining</td>
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## Light Metal Technology—Applications for the Transportation Industry

<table>
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<td>Aluminium Alloys Casting I</td>
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<td>Titanium/Aluminium Alloys Development</td>
<td>MON</td>
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<tr>
<td>High Strength Aluminium Alloys</td>
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<tr>
<td>Modeling and Formability/Magnesium Alloys</td>
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<tr>
<td>Aluminium Alloys Casting II</td>
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## Light Metals—Applications and Fitness-for-Service Characterization

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<td>Light Metals – Applications and Fitness-for-Service Characterization</td>
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## Mechanochemical Synthesis and Reactions in Materials Science III

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## Multi Scale Modeling of Microstructure Deformation in Material Processing

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## SPECIAL TOPICS

### Art and Cultural Heritage: Reverse Engineering

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### Careers in Industry

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<td>Networking and Careers for Material Scientists</td>
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### Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium

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<td>The Classroom Laboratory</td>
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### From Diversity to Inclusion

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### Journal of the American Ceramic Society Awards Symposium

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### Perspectives for Emerging Materials Professionals

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### Special Session on Innovation by Entrepreneurs, Startups, and Small Businesses

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8:00 AM Invited
Challenges in High Temperature Electrochemical Systems: Manoj Mahapatra1;  
1University of Alabama at Birmingham

8:20 AM Invited
A Suspension-enclosing Projection-stereolithography Process for Complex  
Ceramic Component Fabrication without Building Support Structures: Xuan  
Song1; Li He1; 1University of Iowa

8:40 AM Invited
Hybrid Thermoplastic Composites of Natural Fiber and Recycled Carbon  
Fiber: Joseph Fehrenbach1; Niyati Shali1; Chad Ulver1; 1North Dakota State  
University

9:00 AM
Thermodynamic Model for Predicting the Embodied Energy of Titanium  
Alloys Produced by Powder Metallurgy: James Paramore1; Brady Butler1;  
Matthew Dunstan1; Z. Zak Fang2; 1United States Army Research Laboratory;  
2University of Utah

9:20 AM
Tannic Acid: A Sustainable Crosslinking Agent for High Glass Transition  
Epoxy Thermosets: Matthew Korey1; John Howarter1; 1Purdue University

9:40 AM Invited
Flash Sintering as an Energy and Cost Saving Sintering Technology: A Case  
Study of ZaO: Jian Luo1; 1University of California San Diego

10:00 AM Break

10:20 AM Invited
Flexibly-embedding Microchannels in Ceramics Using an Integrated Additive  
Manufacturing and Laser Machining Method: Fei Peng1; Yazhe Hong1; Hai  
Xiao1; Jianhua Tong1; Rajendra Bordia1; 1Clemson University

10:40 AM Invited
GPsed Reaction Bonded Silicon Nitride with High Thermal Conductivity  
for Power Module Substrate Applications: Jae-Woong Ko1; Ha-Neul Kim1; Jin-  
Myung Kim1; Young-Jo Park1; Hai-Doo Kim1; 1Korea Institute of Materials Science

11:00 AM
Materials Innovations to Support Next Generation Manufacturing: Glenn  
Daehn1; George Spanos2; 1The Ohio State University; 2The Minerals, Metals &  
Materials Society

11:20 AM
Investigating the Potential of Bismuth as Replacement for “Toxic” Lead:  
Joseph Hamayun1; Fishe Tesfaye2; Daniel Lindberg2; 1Aalto University; 2Abo  
Akademi University

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing  
and Processing — Session I  
Program Organizers: YiQuan Wu, Alfred University; Hisayuki Suematsu,  
Nagaoka University of Technology; Surajit Gupta, University of North  
Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo,  
University of Padova; Zhengyi Fu, Wuhan University of Technology;  
Rajiv Asthana, University of Wisconsin-Stout; Allen Appleb, Oklahoma  
State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki  
Ohji, National Institute of Advanced Industrial Science and Technology;  
Mritunjay Singh, Ohio Aerospace Institute

Monday AM  Room: B233  
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Junichi Tatami, Yokohama National University; Hisayuki  
Suematsu, Nagaoka University of Technology

ACerS/EPDC: Arthur L. Friedberg Ceramic Engineering  
Tutorial and Lecture

Monday AM  Room: A111/112  
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Kristen Brosnan, GE Global Research

9:00 AM Invited
Digital Assembly of Colloidal Suspensions, Gels and Foams: Jennifer Lewis1;  
1Harvard University

Additive Manufacturing of Composites and Complex  
Materials III — Metals Additive Manufacturing  
Program Organizers: Dirk Lehnhus, Fraunhofer - Ifam; Jonathan Spowart,  
Air Force Research Laboratory; Nikhil Gupta, New York University; Eric  
Jaegle, Max-Planck-Institut Fuer Eisenforschung

Monday AM  Room: A222  
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Introductory Comments

8:10 AM
Horizontal and Vertical Grading of Ti-Ta in Laser Powder Bed Fusion Additive  
Manufacturing: Joe Walker1; Matt Larson2; John Middendorf2; Joy Gockel2;  
1WSU; 2Universal Technology Corporation

8:30 AM Invited
Hybrid Additive Manufacturing of Gamma Titanium Aluminide Space  
Hardware: Andre Seidel1; Elena Lopez1; Shvra Saha1; Tim Mawald2; Juliane  
Moritz2; Stefan Polenz2; Axel Marquardt2; Joerg Kaspar2; Thomas Finaske2;  
Mirko Riede2; Frank Brueckner1; Christoph Leyens1; Technical Univ Dresden  
and Fraunhofer IWS, 1Fraunhofer IWS

8:50 AM
Improving the Manufacturability of Tungsten Produced via LPBF Through  
in Situ alloying with Tantalum: Amanda Field1; Luke Carter2; Nicholas Adkins1;  
Martin Strangwood1; Moataz Attallah1; Mike Gorley2; 1University of Birmingham;  
2UK Atomic Energy Authority

9:10 AM Invited
Manufacturing of Functionally Graded Parts Using 3D Plasma Metal  
Deposition: Peter Mayr1; Kevin Hoeffe1; 1Chemmz University of Technology

9:30 AM
Tailoring the Coefficient of Thermal Expansion in Additively Manufactured  
Functional Materials through Compositional Grading: Skyley Hilburn1; Tim  
Simpson1; Todd Palmer1; 1Penn State University

9:50 AM
The Microstructure and Mechanical Properties of Ti-12Mo and Ti-12Mo-6Zr-  
2Fe -Titanium Alloy Fabricated Using Selective Laser Melting (SLM) In-situ  
Alloying: Ranxi Duan1; Sophie Cox1; FuZeng Ren1; Moataz Attallah1; 1University  
of Birmingham; 2South China University of Science and Technology (SUSTech

10:10 AM Break

10:30 AM
Laser Powder Bed Fusion of WHA: Elias Jels1; Michael Nespos1; Matthew  
Clemente1; 1U.S. Army ARDEC-Picatinny Arsenal

Session Chair: Fei Peng1; 1Clemson University
<table>
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<tr>
<th>Time</th>
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<th>Location</th>
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<tbody>
<tr>
<td>10:00 AM</td>
<td>Additive Manufacturing of a Ti-6Al-4V and 304L Stainless Steel Functionally Graded Material: Investigating the Addition of an Intermediate V Section: Lourdes Bobbio; Brandon Bocklund; Richard Otis; John Paul Borgia; R. Peter Dillon; Andrew Shapiro; Bryan McEnery; Zi-Kui Liu; Allison Beese; Pennsylvania State Univ; Jet Propulsion Laboratory</td>
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<tr>
<td>10:10 AM</td>
<td>Reinforcement of Forming Blanks by Ultrasonic Additive Manufacturing: Youngsen Rong; Xiang Chen; Bryant Gingerich; Leon Headings; Ryan Hahnlen; Marcelo Dapino; The Ohio State University; University of Illinois at Urbana</td>
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<td>11:10 AM</td>
<td>DOE Remade Institute to Reduce Embodied Energy and Reduce Emissions: Pradeep Raghali; Alan Luo; Magdi Azer; University of Wisconsin-Milwaukee; The Ohio State University; University of Illinois at Urbana</td>
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<tr>
<td>8:00 AM</td>
<td>Invited Session</td>
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<td>Impact of the Process Gas Atmosphere in Laser Additive Manufacturing: Desired and Undesired Effects: Eric Jaggie; Anoop Kini; Michael Haines; Markus Wilms; Christian Baron; Hauke Springer; Nobuo Nakada; Dierk Raabe; Philipp Kuehrsteiner; Max-Planck-Institut Fuer Eisenforschung; University of Tennessee - Knoxville; Fraunhofer Institut fuer Lasertechnik; Tokyo Institute of Technology; Max-Planck-Institut fuer Eisenforschung GmbH</td>
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<tr>
<td>9:00 AM</td>
<td>Effect of Process Parameters on Surface and Microstructural Features of Direct Metal Laser Sintered Metals: Aditya Pathabandra; Ashley Puente; Dustin Lindley; University of Cincinnati; University of Cincinnati Research Institute</td>
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<tr>
<td>9:20 AM</td>
<td>In-Situ Tuning of Mechanical Properties in SLM Processed Materials: Prashanth Konda Gokuldoss; Norwegian University of Science and Technology Gjovik</td>
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<td>9:40 AM</td>
<td>Effect of Hardness of Recoater Blade on Density and Buildability of Cellular Lattice Structures in the Laser Powder Bed Process: Colt Montgomery; Michael Brand; Robin Pacheco; Daniel Coughlin; John Carpenter; Los Alamos National Laboratory</td>
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<td>10:00 AM</td>
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<td>10:20 AM</td>
<td>Melt-Pool Scale Analysis of Metal Layers Processed by Powder Bed Fusion (PDF) Technique: Youn Suk Choi; Seul-Bi Lee; Jae-Woong Kim; Jae-Keun Hong; Myeongseong Kim; Dae-Geun Nam; Pusan National Univ; Korea Institute of Materials Science; KAM; Korea Institute of Industrial Technology</td>
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<td>10:40 AM</td>
<td>Scan Pattern and Energy Density Effects during Additive Manufacturing: Robin Ward; Rewnizad Mogrelia; Rachel Jennings; Moaatz Attallah; University of Birmingham</td>
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<tr>
<td>11:00 AM</td>
<td>The Effect of Heating Rate, Time-temperature on the Grain Boundary Character Distribution and Densification of Water-atomized 316L Stainless Steel Metallic Components Produced via Binder Jet-powder 3-D Printing System: Yu Zhou; Gregorio Solis-Bravo; C. Isaac Garcia; University Of Pittsburgh</td>
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<tr>
<td>11:20 AM</td>
<td>The Effects of Scan Strategy on Crystallographic Texture, Microstructure and Mechanical Properties of Selectively Laser Melted AISi10Mg Alloys: Le Zhou; Hao Pan; Holden Hyer; Sharon Park; Yuanli Bai; Yongho Sohn; University of Central Florida</td>
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<tr>
<td>11:40 AM</td>
<td>Understanding Hot Cracking in Laser and Electron Beam Powder Bed Fusion of AA7075: Sneha Prabha Narra; Daming Ding; Shrivani Pandiya; Jack Beuth; Carnegie Mellon University</td>
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<tr>
<td>10:00 AM</td>
<td>Additive Manufacturing: In-situ Process Monitoring and Control — Session I</td>
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<td>Program Organizers: Ulf Ackelid; Freemelt AB; Andrzej Wojcieszynski, ATI Specialty Materials; Sudarsanam Babu, The University of Tennessee, Knoxville</td>
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<td>Monday AM</td>
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<td>Room: A215</td>
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<td>Location: Greater Columbus Convention Center</td>
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<td>Session Chair: Andrzej Wojcieszynski, ATI Specialty Materials</td>
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<tr>
<td>8:00 AM</td>
<td>Invited Session</td>
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<td>High-speed Imaging of the Powder-bed and Shield Gas during Laser PBF of Metals: P. Bidare; I. Bitharas; R.M. Ward; M.M. Attallah; A.J. Moore; Heriot-Watt University; University of Birmingham</td>
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<tr>
<td>8:40 AM</td>
<td>Advancing High-speed Optical Monitoring of Spatter Tracking during Laser Powder Bed Fusion of Nickel Alloys and Aluminum Alloys: Christopher Barrett; Carolyn Carradore-Santiago; Eric MacDonald; Brett Conner; Youngstown State University</td>
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<tr>
<td>9:00 AM</td>
<td>Characterizing Surface Defects in Additively Manufactured Components Using Smart-phone Imaging: Mustafa Rifat; Amol Kulkarni; Saurabh Basu; Penn State</td>
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<tr>
<td>9:20 AM</td>
<td>On the Formation of Large Particles during Laser Powder Bed Fusion Additive Manufacturing: Abdalla Nasser; Edward Reutzel; Paul Guerrier; Matthew Weldon; Michael Krane; Applied Research Lab at Penn State; Moog Inc.</td>
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<td>10:00 AM</td>
<td>Break</td>
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<tr>
<td>10:20 AM</td>
<td>Multi Sensor In-situ Monitoring and Physics Based Modeling of Alloy 718 Microstructure: Joe Walker; Andrew Driendling; John Middendorf; Glen Perram; Nathan Klingbeil; Joy Gockel; WSU; UTC; Air Force Institute of Technology</td>
<td></td>
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</tbody>
</table>

Program Organizers: Jing Zhang, Indiana University-Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Xinghua Yu, Oak Ridge National Laboratory; Yeongil Jung, Changwon National University

Monday AM October 15, 2018 Room: A223 Location: Greater Columbus Convention Center

Session Chairs: Jing Zhang, Indiana University-Purdue University Indianapolis; Yeon-Gil Jung, Changwon National University

8:00 AM
An Integrated Computational Materials Engineering (ICME) Approach for Inconel 718 Additive Manufacturing: Qiuxia Zhang1; Abhinav Saboo1; Jiadong Gong1; Greg Olson1; ‘QuesTek Innovations LLC

8:20 AM
Correlations of Cracking with Scan Strategy and Build Geometry in Electron Beam Powder Bed Additive Manufacturing: Yousub Lee1; Mike Kirka1; Ryan Dehoff1; ‘Oak Ridge National Lab

8:40 AM
Modelling Residual Stresses in Powder Bed Fusion Processes: Validation & Application: Mustafa Megahed1; Alonso Peralta1; ‘Esi Group; ‘Honeywell Aerospace

9:00 AM
Numerical Simulations of Crack Extensions in Additive Manufactured Fracture Specimens of Hydrogen-charged and Charged 304 Stainless Steels Using Cohesive Zone Model: Shin-Jung Sung1; Shengji Wu1; Jwo Pan1; Paul Korinko2; Michael Morgan2; Poh-Sang Lam2; Anthony McWilliams2; ‘University Of Michigan; ‘Savannah River National Laboratory

9:20 AM
Phase Field Modeling of Microstructure Evolution in Selective Laser Melting Process through a Multiscale Scheme: Yao Fu1; ‘University of Cincinnati

9:40 AM Keynote
Simulation-experiment Comparison for Strain Field around a Pore: Robert Suter1; Anthony Rollett1; Rachel Lim1; Yufeng Shen1; Vahid Tari1; Ross Cunningham1; Joel Bernier2; ‘Carnegie Mellon University; ‘Lawrence Livermore National Laboratory

10:00 AM Break

10:30 AM Keynote
The Influence of Surface Finish on the Topography of Laser Tracks: Richard Ricker1; Jarred Heigel1; Jason Fox1; ‘National Institute of Standards & Tech

11:00 AM
Thermal-material Simulation to Predict Microstructure Evolution in Additive Manufacturing: Daniel Lewis1; Antoinette Maniatty1; Scott Peters1; James Dolan1; ‘Rensselaer Polytechnic Institute

11:20 AM
Simulations of Selective Laser Melting by Smoothed Particle Hydrodynamics
Method: Deepak Shah1; Alexey Volkov1; ‘University of Alabama

Additive Manufacturing: Powder Characterization and Recycling — Powder Characterization

Program Organizers: Sudarsanam Babu, The University of Tennessee, Knoxville; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University

Monday AM October 15, 2018 Room: A224 Location: Greater Columbus Convention Center

Session Chair: Mathieu Brochu, McGill University

8:00 AM
Optimizing Thermal Parameters for Powder Pre-processing Treatments: Caitlin Walde1; Danielle Cote1; Richard Sisson1; Victor Champagne2; ‘Worcester Polytechnic Institute; ‘US Army Research Laboratory

8:20 AM
Measuring Inconel 625 Powder Thermal Conductivity in SLM by Laser Flash: Shanshan Zhang1; Brandon Lane2; Justin Whiting2; Kevin Chou3; ‘University of Louisville; ‘National Institute of Standards and Technology

8:40 AM
Characterization and Qualification of Bulk Feedstock Powders Using Machine Learning and Computer Vision: Anna Smith1; Srujana Yarasi1; Elizabeth Holm1; ‘Carnegie Mellon University

9:00 AM Invited
Understanding the Relationships between Chemistry and Flowability via GranuDrum™ in Aluminium Alloys for Powder Bed Fusion Additive Manufacture: Jose Alberto Muñiz Lerma1; Amy Nommeots-Nomm1; Mathieu Brochu1; ‘McGill University

9:40 AM
Computer Vision and Machine Learning to Associate Powder Characteristics with Flow Properties for Additive Manufacturing: Srujana Yarasi1; Anna Smith1; Anthony Rollett1; Elizabeth Holm1; ‘Carnegie Mellon University

10:00 AM Break

10:20 AM
Characterization Methods for Powder Bed Fusion Feedstocks: Zackary Snow1; Ken Meineert1; Sanjay Joshi2; Brett Conner3; Richard Martukanitz1; ‘Applied Research Lab, The Pennsylvania State University; ‘Department of Industrial and Manufacturing Engineering, The Pennsylvania State University; ‘Youngstown State University

17
11:00 AM  
Study of the Usability of Hydride-Dehydride (HDH) Ti-6Al-4V Powders in Electron Beam Powder Bed Printing: Ziheng Wu; Rahi Patel; Joe Capone; Muktesh Palival; Jack Beuth; Anthony Rollett; Sneha Narra; ’Carnegie Mellon University

Advanced Coatings for Wear and Corrosion Protection — Advanced Coatings for Wear and Corrosion Protection I

Monday AM  
Room: C160A/160B  
Location: Greater Columbus Convention Center

Session Chairs: Evelina Vogli, LMGH; Fei Tang, DNV GL; Timothy Hall, Faraday Technology Inc.

8:00 AM  
Effects of Rapid Solidification and Numerical Modelling of Laser Cladded Ti-Al-Cu Coatings on Ti-6Al-4V Alloy: Olanwale Fatoba; Rezvan Gharebaghi; Stephen Akinlabi; Esther Akinlabi; ’University of Johannesburg

8:20 AM  
Effect of Ni-Cr FLAME SPRAY Coating Parameters on Corrosion Properties: Arisha Nasik; Muhammad Ishiaq; Muhammad Shamis; Shahmin Shah; Aqil Inam; Iqra Siddique; Syed Naqvi; ’University of the Punjab

8:40 AM  
Fatigue Life of a NiCr-Coated Powder Metallurgy Disk Superalloy after Varied Pre- and Post-coat Processing and Environmental Exposures at 760°C: Tim Gabb; James Nesbitt; Derek Hass; Susan Draper; Bernadette Puleo; Jack Telesman; Robert Miller; ’NASA Glenn Research Ctr; ’Directed Vapor Technologies International, Inc.; ’Vantage Partners, LLC

9:00 AM  
Electrodeposited Inconel and Stainless Steel like Coatings for Improved Corrosion Resistance in Biomiscutitors: Timothy Hall; Santosh Vajapar; Maria Inman; EJ Taylor; Michael Brady; ’Faraday Technology Inc; ’Oak Ridge National Lab

9:20 AM  
High Performance Amorphous Thermal Sprayed Coatings for Molten Salt Environment: Evelina Vogli; Stephen Raiman; Bruce Pint; Ricardo Salas; John Kang; ’Lm Group Holdings Inc; ’ORNL

9:40 AM  
Overlays for Protection against Impact Wear in Mining Applications: Gary Fisher; Tonya Wolfe; Johanna Meier; ’InnoTech Alberta

10:00 AM Break

10:20 AM  
Automated Case-depth Analysis with a Decision Tree: Andrew Storey; ’LECO Corporation

10:40 AM  
Numerical Modelling and Influence of Silicon Addition on the Surface Analyses of Laser Deposited Al-Sn-Si Coatings on Ti-6Al-4V Alloy: Olanwale Fatoba; Esther Akinlabi; Rezvan Gharebaghi; Stephen Akinlabi; ’University of Johannesburg

Advanced Materials for Harsh Environments — Advanced Materials for Harsh Environments I
Program Organizers: Navin Manjooran, Siemens AG; Gary Pickrell, Virginia Tech

Monday AM  
Room: C161A/161B  
Location: Greater Columbus Convention Center

Session Chairs: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

8:00 AM Invited  
Additive Manufacturing of Glass Freestanding Structures Using Fiber Feedstock: John Hostetter; Jason Johnson; Jonathan Goldstein; Robert Landers; Douglas Bristow; Richard Brown; Edward Kinkel; ’Missouri University of Science and Technology; ’Air Force Research Laboratory

8:40 AM  
Durability Assessment of Alx CoCrFeNi High Entropy Alloy under Extreme Conditions: Harpreet Grewal; Rakesh Nair; Harpreet Arora; Sundeep Mukherjee; Shiv Nadar University; ’University of North Texas

9:00 AM  
Effect of Dopant and Heat Treatment on the Microstructure and Mechanical Properties of Nickel-aluminum Bronze: Amaechi Anene; Nkem Nwankwo; Victor Nwoke; ’Nnamdi Azikiwe University, Awka

9:20 AM  
Effect of Steam and Temperature on Rapid Internal Oxidation-Sulfidation Initiated by CaSO4 Deposits: Patrick Brennan; Brian Gleeson; ’University of Pittsburgh

9:40 AM  
Electrochemical Impedance Characterization of YSZ for Temperature and O2 Sensing: Travis Peters; Sheikh Akbar; Jiayi Lin; Dean Modroukas; ’Ohio State University; ’InnoViewing

10:00 AM Break

10:20 AM  
Electrodeposited MCrAlY Coatings for Gas Turbine Engine Applications: Ying Zhang; Brian Bates; Jason Witman; Sebastien Dryepondt; ’Tennessee Tech University; ’Oak Ridge National Laboratory

10:40 AM Concluding Comments

Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Session I
Program Organizers: Iver Anderson, Iowa State University / Ames Laboratory; Carol Handwerker, Purdue University; Albert T. Wu, National Central University

Monday AM  
Room: B140/141  
Location: Greater Columbus Convention Center

Session Chairs: Albert T. Wu, National Central University; Thomas R. Bieler, Michigan State University

9:00 AM Invited  
Reliability of Joint Bonded by Micro-sized Ag Particles for Die-attach in Power Devices: Hiroshi Nishikawa; ’Osaka University
9:20 AM  
Effect of Thermal History and Composition on the Microstructure and Reliability of Copper Pillar Solder Joints: Mohammed Genani; Eric Cotts; Francis Mutuku; Babak Arfaei; Faramarz Hadian; Binghamton University

9:40 AM  
Progress in Development of Pb-free High Temperature Composite Solder: Iver Anderson; Stephanie Choquette; Iowa State Univ, Ames Laboratory

10:00 AM  
Break

10:20 AM  
Transient Liquid Phase Bonding as a High Temperature Pb-Free Alloy Alternative: Fei Dong; Hamid Fallahdoost; Junghyun Cho; State University of New York

10:40 AM  
Transient Liquid Phase Reaction in Sn-Bi-Ag System: Yaohui Fan; John Blended; Carol Handwerker; Purdue University

11:00 AM  
Undercooling in Sn Droplets as a Function of Impurity Content: Sitaram Panta; Eric Cotts; Binghamton University

11:20 AM  
The Study of Corrosion Resistance for High Reliability Devices: Albert T. Wu; Tsan-Hsien Tseng; Freeze Wang; Chih Yuan Hsiao; National Central University; Taiwan Uyemura Co Ltd

Advanced Steel Metallurgy: Products and Processing  
— General Steel Session I

Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuil De Moor, Colorado School of Mines

Monday AM  
Room: A226  
Location: Greater Columbus Convention Center

Session Chair: John Andrew Roubidoux, Evraz NA; Ron Radziatowski, AK Steel Corp.

8:00 AM  
Tempering and Austempering Response of a Double Soaked Medium Manganese Steel: Alexandra Glover; John Speer; Emmanuel De Moor; Advanced Steel Processing and Products Research Center, Colorado School of Mines

8:20 AM  
Cold Stamping 1500 to 1800MPa Structural and Energy Absorbing Components to <2T Bend Radii from Coil-to-Coil Flash Processing: Garycola; SFP Works LLC & Sirius Protection LLC

8:40 AM  
Effect of the Heating Rate on Austenite Formation and Its Subsequent Transformation in a 22MnB5 Steel: Juan Pedraza; Rafael Landa-Mejia; Gregorio Solis-Bravo; Omar Garcia-Rincon; Isaac Garcia; Ternium Mexico SA de CV; University of Pittsburgh

9:00 AM  
Low Alloy High Strength Martensitic Nitrogen Steel: John Chinella; US Army Research Laboratory

9:20 AM  
Microstructure Control and Correlation to Formability of Low Alloy Steel Via Flash Processing: Benjamin Shassere; Sudarsanan Babu; Gary Cola; Thomas Muth; Thomas Watkins; Oak Ridge National Laboratory; University of Tennessee; SFP Works LLC

9:40 AM  
Development of the Plate Steels with Grain Refined Surface Layers: Il-cheol Yi; Jae-Young Cho; Sang-Ho Han; POSCO Technical Research Lab.

10:00 AM  
Break

10:20 AM  
Development of Nanostructured Bainitic Steel: Bismillah Saleem; Muhammad Ishitig; Muhammad Shamsi; Muhammad Mughal; Aqil Inam; University of the Punjab

10:40 AM  
Microstructural Modifications in a Low-alloy High-performance Steel: F. Sihah; E.I. Payton; M. Gonzales; R.A. Abrahams; B.S. Song; Air Force Research Laboratory/UES, Inc.; Air Force Research Laboratory

11:00 AM  
Structure-property Correlations of Submicron Sizd Nb–Ti Stabilized Low C Microalloyed and IF Steels Processed through Advance Rolling and SPD Techniques: Sumit Ghosh; Suhrit Mula; Indian Institute of Technology, Roorkee

11:20 AM  
Effect of Alloy Composition and Microstructure on Yield Ratio and Elongation of DP Steel: Yeon-sang Ahn; Sangho Han; John Speer; POSCO Technical Research Laboratories; Colorado School of Mines

Advances in Dielectric Materials and Electronic Devices  
— Dielectrics and Magnetoelectrics I

Program Organizers: Amar Bhalia, University of Texas; Ruyan Guo, The University of Texas at San Antonio; Rick Ubic, Boise State University; Danilo Suvorov, Jožef Stefan Institute

Monday AM  
Room: B132  
Location: Greater Columbus Convention Center

Session Chairs: Ruyan Guo, University of Texas at San Antonio; Matjaz Spreitzer, Jožef Stefan Institute

8:00 AM  
Invited  
Symmetry Breaking in Bulk Ceramics and Crystals: Dragom Damjanovic; Sina Hashemizadeh; Emad Oveis; S. De Zanet; Takuya Hoshina; Andreja Bencan; Tadej Rojavec; Goran Drazic; EPFL SCI STI DD; EPFL CIME; Ecole Polytechnique Federale De Lausanne CIME; Tokyo Institute of Technology; Jožef Stefan Institute; National Institute of Chemistry

8:20 AM  
Invited  
Influence of LNO Bottom Electrode and Target Stoichiometry on the Properties of 0.67Pb(Mg0.33 Nb0.67)O3–0.33PbTiO3 Thin Films: Matjaz Spreitzer; Urska Gabor; Damjan Vengust; Aleksander Matav; Danilo Suvorov; Jožef Stefan Institute

8:40 AM  
Invited  
Semiconductor Ceramic Properties in the Light of the Fractal Nature Corrections Frontiers: Vojislav Mitic; Goran Lazovic; Vesna Paumovic; Zoran Voskia; Sandra Veljkovic; Branimir Vlahovic; University of Nis; Institute of Technical Sciences of SASA; University of Belgrade; University of Nis; North Carolina Central University

9:00 AM  
Invited  
Effect of Atmosphere on Dielectric Properties of Calcium Copper Titanate Ceramics: Disma Samarakoon; Nirmal Govindaraju; Raj Singh; Oklahoma State University
9:20 AM Invited
Physical Properties of BFO-modified Multiferroic Ceramics: Effect of Rare-earth Cations Size: Yosdan Martinez Camejo; Ruyan Guo; Amar Bhatta; José de los Santos Guerra; 1Universidade Federal de Uberlandia; 2The University of Texas at San Antonio

9:40 AM
Experimental and Numerical Evaluation of Stacked Piezoelectrics for Mechanical Energy Harvesting: Bryan Gamboa; Ruyan Guo; Amar Bhatta; 1The University of Texas at San Antonio

10:00 AM Break

10:20 AM Invited
Structural Phase Transitions in Bi$_x$Nd$_{1-x}$Fe$_{2/3}$Co$_{1/3}$O$_4$ Compositions: Luiz Fernando Cotica; Anuar Mincache; Odair Oliveira; Gustavo Dias; Ivar Santos; Ruyan Guo; Amar Bhatta; 1State University Of Maringá; 2University of Texas at San Antonio

10:40 AM
Development of Ferro- and Magnetoelectric NANOMaterials for Drop-on-Demand Microfabrication: Brandon Young; Bryan Gamboa; Denise Alanis; Luiz Fernando Fernando Cotica; Amar Bhatta; Ruyan Guo; 1University of Texas at San Antonio; 2State University of Maringá

11:00 AM
Novel Two Phase Self-assembled Nanopillar Heterostructures with E-field Induced Magnetization Manipulation: Xiao Tang; Min Gao; Chung Ming Leung; Jiefang Li; Dwight Viehland; 1Virginia Tech

11:20 AM
Magnetoelectric Coupling Induced Multistate Magnetization: Zhigang Wang; Yanxi Li; Dwight Viehland; Xi’an Jiaotong University; 1Virginia Tech

11:40 AM
Study of Magnetoelectric Properties in Bi$_x$Nd$_{1-x}$Fe$_{2/3}$Co$_{1/3}$O$_4$ Compositions: Anuar Mincache; Odair Oliveira; Luiz Cótiça; Ivar Santos; Gustavo Sanguino; Amar Bhatta; Ruyan Guo; 1State University of Maringá; 2State University of Maringá; 3University of Texas at San Antonio

Advances in Zinc-coated Sheet Steel Processing and Properties — Advances in Zinc-coated Sheet Steel Processing and Properties I
Program Organizers: Frank Goodwin, ILZRO; Joseph McDermid, McMaster University

Monday AM Room: A225 Location: Greater Columbus Convention Center
October 15, 2018

Session Chair: Joseph McDermid, McMaster University

8:00 AM
Impact of Roughness Length Scale on Spectral Emissivity during Intercritical Annealing of Advanced High Strength Steels: Kaihsiang Lin; Simon Trivett; Kyle Duun; 1UW

8:20 AM
Influence of Processing Heat Cycles on the Mechanical Properties and Zinc Adhesion of Advanced High Strength Steels: Marina Pushkareva; Myriam Brochu; Polytechnique Montréal

8:40 AM
Effect of Liquid Metal Embrittlement Cracks on Resistance Spot Weld Fracture: Chris DiGiovanni; Andrew Macwai; Elliot Biro; Norman Zhou; 1University of Waterloo; 2ArcelorMittal Global Research

9:00 AM Interaction of Zinc Penetration and Propagation for Liquid Metal Embrittlement Cracks in Zn-coated AHSS Resistance Spot Welds: Yeongdo Park; Siva Prasad Murugan; Chun Chang Keun; 1Dong-Eui University; 2Research Institute of Industrial Science & Technology

9:20 AM
Liquid Metal Embrittlement in Laser Beam Welding of Zn-coated Advanced High Strength Steels: Mohammad Hadi Razipooosh; Elliot Biro; Norman Zhou; 1University of Waterloo

9:40 AM
Weldablity Evaluation of Zn and Al-Si Coated Hot Press Forming (HPF) Steels in Resistance Spot Welding: Changwook Ji; Joo Yong Cheon; Jae Hoon Kim; 1Korea Institute of Industrial Technology

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — 2D Boron & Clusters
Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

Monday AM Room: B244/245 Location: Greater Columbus Convention Center
October 15, 2018

Session Chair: Jens Kunstmann, TU Dresden

8:00 AM Invited
Recent Advances in Structure and Bonding of Boron Clusters: Minh Tho Nguyen; 1KU Leuven

8:40 AM Invited
Dirac Δ-Cones in 2D Borophene: Iwao Matsuda; 1the University of Tokyo

9:20 AM Invited
Hydrogen Boride Sheets Derived from MgB$_2$ by Cation Exchange: Takahiro Kondo; 1University of Tsukuba

10:00 AM Break

10:20 AM Invited
Structure and Properties of 2D Borocarbonitrides as Predicted by First-principles Calculations: Neville Gonzalez-Szwacki; 1Faculty of Physics, University of Warsaw

Catalyst Support Materials and Support Effect — Catalyst Support Materials and Support Effect
Program Organizers: Ruigang Wang, The University Of Alabama; Zhenmeng Peng, University of Akron; Bin Liu, Kansas State University

Monday AM Room: C170 Location: Greater Columbus Convention Center
October 15, 2018

Session Chairs: Ruigang Wang, The University of Alabama; Zhenmeng Peng, The University of Akron

8:00 AM
Intriguing Catalyst Supports via Additive Manufacturing: Joe Cesarano; John Stuecker; James Miller; Robert Ferrizz; 1Robocasting Enterprises; 2Sandia National Labs
Catalytic Application of Palladium Based Hierarchical Hybrid Carbon Material: Wenhu Wang; Marlikarjuna Nadagouda; Sharmila Mukhopadhyay; "Wright State University
8:40 AM
New Technique For Restoring Catalyst Activity In MIDREX DR Plants (SEALPRO-G): Gaber Hefny; "EZDK
9:00 AM
Effect of Metal-support Interaction on Catalytic Activity and Redox Property of Supported Co-M (M=Ru, Pd, Ag, Pt and Au) Bimetallic Catalysts: Zhongqi Liu; Junhao Li; Ruigang Wang; "The University of Alabama
9:20 AM
Ab Initio Modeling of Catalysis with Surface Overlayers: Maytal Caspary Toroker; "Technion - Israel Institute of Technology
9:40 AM
Surface Property Optimization for Improved Efficiency of the Environmental Control and Life Support System: Timothy Hall; Dan Wang; Santosh Vijapur; EJ Taylor; Carlos Cabrera; Armando Peña-Duarte; Melissa Vega-Cartagena; "Faraday Technology Inc; "University of Puerto Rico
10:00 AM Break
10:20 AM Invited
Nitrogen-doped Ordered Mesoporous Carbon/Graphene Framework as Dual Electrocatalyst for Oxygen Reduction and Evolution Reactions: Zhenmeng Peng; "University of Akron
10:40 AM Support Structure and Reduction Treatment Effects on CO Oxidation of SiO2 Nanospheres and CeO2 Nanorods Supported Ruthenium Catalysts: Junhao Li; Zhongqi Liu; Ruigang Wang; "The University of Alabama
11:10 AM Break
Catalyst Reduction of MIDREX Direct Reduction Plants without Using Natural Gas, New Technique: Gaber Hefny; "EZDK

Ceramic and Crystal Materials for Optics and Photonics — Session I
Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikesue, World-Program Organizers: Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)
Monday AM
October 15, 2018
Room: A113
Location: Greater Columbus Convention Center
Session Chairs: Woohong (Rick) Kim, Naval Research Laboratory; Yiquan Wu, Alfred University
8:00 AM Invited
Transparent Polycrystalline Ceramics Fabricated under High Pressure and Temperature: Norimasa Nishiyama; Fuminori Wakai; "Tokyo Institute of Technology
8:40 AM Invited
Powder Engineering for Highly Transparent Rare-earth SesquioxideCeramics: Ji-Guang Li; "National Institute for Materials Science
9:20 AM Invited
Solid-state Sintering of Zinc Sulfide Based Infrared Optical Ceramics: Yiyu Li; Yiquan Wu; "Alfred University
9:40 AM Invited
Advanced Optical Materials for IR Applications: Woohong (Rick) Kim; Guillermo Villalobos; Shyam Bayya; Brandon Shaw; Colin Baker; Michael Hunt; Lynda Busse; Darryl Boyd; Bryan Sadowski; Ishwar Aggarwal; Jashinder Sanghera; "Naval Research Laboratory; "KeyW Corp.
10:00 AM Break
10:20 AM Invited
Promising Magneto-optical Ceramics for High Power Faraday Isolators: Jiang Li; Jiawei Dai; "Shanghai Institute of Ceramics, Chinese Academy of Sciences
10:40 AM Invited
Recent Progress on the MIR Laser Applications of Te-doped and Er-doped Fluorite-type Crystals: Liangbi Su; Fengkai Ma; Xinshe Guo; Dapeng Jiang; Jie Liu; Tao Li; Jun Xu; "Shanghai Institute of Ceramics, Chinese Academy of Sciences; "Shandong Normal University; "Shandong University; "Tongji University
11:20 AM Invited
Refractive Index Patterning of Infrared Glass Ceramics through Laser-induced Vitrification: Myungkoo Kang; Laura Sisken; Justin Cook; Cesar Blanco; Martin Richardson; Ilya Mingareev; Kathleen Richardson; "University of Central Florida; "University of Central Florida; "Florida Institute of Technology

Characterization & Methods in Failure Analysis — Tools & Techniques I
Program Organizers: Andrew Havics, PH2  LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)
Monday AM
October 15, 2018
Room: A211
Location: Greater Columbus Convention Center
8:00 AM
Investigating and Trending Precursor Failures to Prevent Major Incidents: Nicholas Chorolli; Daniel Benac; "Baker Engineering and Risk Consultants, Inc.
8:20 AM
Investigative Use of Reverse Engineering Techniques: Application to Metallurgical Laboratory Analysis of an Aircraft Accident: Dale Alexander; Robert Franzese; Matthew Kenner; Alison Maratea; Gary Novak; Michael Stevenson; Jacob Wagner; "ESi
8:40 AM
Failure Analysis of Hydraulic Components: Yindong Ge; "Parker Hannifin Corporation
9:00 AM
Avoiding Mischaracterization of Metallographic and Fractographic Features of Copper Alloys Used in Potable Water Systems: Eric Weishaupt; "ESi
9:20 AM
Analysis of Gear Machining Profile Mismatch to avoid Premature Failure: Ahmed Elkholy; "Kuwait University
9:40 AM Invited
Use of Eddy Current Conductivity and Hardness Testing to Evaluate Heat Damage in Aluminum Alloys: Erik Mueller; Luis Carney; Kara Mixson; "NTSB; "NAVAIR Materials Engineering, ISSC-Jacksonville

MONDAY AM
10:00 AM Break

10:20 AM
Quasi-dynamic Approach of X-ray Computed Tomography for Characterization of Progressive Damage in Composite Materials and Structures: Ryan Deacon\(^1\); Mark Gurwich\(^1\); Neal Magdefrau\(^1\); Matthew Mordasky\(^2\); Greg Ojardi\(^3\); Kerisha Williams\(^1\); ¹United Technologies Research Center

10:40 AM Invited
Detection of Cracks in Materials Using Heterodyne Lock-in Holography and Signal Processing Techniques: Marat Khafizov\(^1\); Kevin Agarwal\(^2\); ¹The Ohio State University

11:00 AM Invited
EBSD as a Technique for Visualizing and Better Analyzing Failure/Fatigue Properties: Michael Hjelmstad\(^1\); ²Oxford Instruments

11:20 AM Invited
Endoscopy as a Tool for Failures Prevention in Machineries: Pierre Dupont\(^1\); Pierre Dupont\(^1\); Schaeffler Belgium Sprl/Bvba

11:40 AM
Integrated 3D Data Analysis for Metallurgical Failure Analysis: Matthew Kenney\(^1\); Michael Stevenson\(^1\); Robert Bailey\(^1\); Gary Rogers\(^1\); Pierce Umberger\(^1\); Dale Alexander\(^1\); ²ESi

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Heat Treatment & Processing, Powder Metallurgy

Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Carl Boehlert, Michigan State University; Kayla Calvert, TIMET - HTL; Yunzhi Zheng, The Ohio State University

Monday AM
Room: C150
Location: Greater Columbus Convention Center

Session Chairs: Yunzhi Wang, Ohio State Univ; Vikas Sinha, Air Force Research Laboratory

8:00 AM Invited
Abnormal Grain Growth in Beta-annealed Ti-6Al-4V: V. Sinha\(^1\); A.L. Pilchak\(^2\); E.J. Payton\(^3\); S.L. Semiatin\(^1\); ¹Air Force Research Laboratory/UES, Inc.; ²Air Force Research Laboratory

8:30 AM Invited
Modeling Abnormal Grain Growth in Beta-annealed Ti-6Al-4V: Adam Pilchak\(^1\); Lee Morris\(^1\); Shesh Srivatsa\(^1\); Ryan O’Hara\(^1\); V. Sinha\(^1\); Eric Payton; Lee Semiatin\(^1\); ¹Air Force Research Laboratory; ²Air Force Institute of Technology (AFIT); ³Srivatsa Consulting, LLC; ¹Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM and UES, Inc.; ⁴Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM

9:00 AM
Accelerated Sintering of Powder Metallurgy (PM) Ti-6Al-4V Alloy at the Beta Transus and Its High Fatigue Performance: Pankaj Kumar\(^1\); K.S. Ravi Chandran\(^1\); ¹University of Utah

9:20 AM
Heat Treatment of Alpha+Beta Titanium Alloys: Alireza Fadavi Boostani\(^1\); Shiraz Mujahid\(^2\); Andrew L. Oppedal\(^3\); Wilburn Whittington; Cory Krivance\(^1\); Haitham El Kadiri\(^1\); ¹Center for Advanced Vehicular Systems; ²Mississippi State University

9:40 AM Invited
Computational Design of Heterogeneous Microstructures for Alpha+Beta Ti-Alloys: Tianlong Zhang\(^1\); Dong Wang\(^1\); Yufeng Zheng\(^2\); Rongpei Shi\(^1\); Hamish Fraser\(^2\); Yunzhi Wang\(^3\); Xin’an Jiaotong University; ¹The Ohio State University

10:10 AM Break

10:30 AM
A Critical Analysis of Thermo-mechanical Simulation and Testing of Powder-metallurgy Titanium Alloys: Austin Mann\(^1\); Ali Yousefian\(^1\); James Dobbs\(^1\); Karen Thacker\(^1\); Boeing Research & Technology

11:10 AM
Effect of Rapid Heat Treatment on the Microstructure of Alpha+ Beta Titanium Alloys: Shiraz Mujahid\(^1\); Alireza Boostani\(^2\); Andrew Oppedal\(^3\); Wilburn Whittington; Cory Krivance\(^1\); Haitham El Kadiri\(^2\); Mississippi State University

Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium — ABET and Accreditation

Program Organizers: Gregg Janowski, University of Alabama at Birmingham; Devarajan Venugopalan, University of Wisconsin-Milwaukee; Thomas Bieler, Michigan State University; Jeffrey Fergus, Auburn University; Janet Callahan, Boise State University; Ronald Gibala, University of Michigan; Tonya Stone, Mississippi State University

Monday AM
Room: B232
Location: Greater Columbus Convention Center

Session Chairs: Dev Venugopal, University of Wisconsin-Milwaukee; Gregg Janowski, University of Alabama at Birmingham

8:00 AM Introductory Comments

8:10 AM Invited
Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium — ABET and Accreditation

Program Organizers: Gregg Janowski, University of Alabama at Birmingham; Devarajan Venugopalan, University of Wisconsin-Milwaukee; Thomas Bieler, Michigan State University; Jeffrey Fergus, Auburn University; Janet Callahan, Boise State University; Ronald Gibala, University of Michigan; Tonya Stone, Mississippi State University

8:50 AM
Practical Advice on Preparing for an EAC/ABET Accreditation Visit: Gregg Janowski\(^1\); ¹University of Alabama at Birmingham

9:30 AM Invited
Changes in ABET Engineering Criteria 3 and 5: Jeffrey Fergus\(^1\); ¹Auburn University

9:50 AM
Changes in ABET Engineering Criteria 3 and 5: Jeffrey Fergus\(^1\); ¹Auburn University

10:10 AM Break

10:30 AM Panel: Panel Discussion includes Joseph Sussman, Jeffrey Fergus, Gregg Janowski, and Devarajan Venugopalan
Environmental Degradation and Embrittlement of Structural Metals — Stress Corrosion Cracking I
Program Organizers: Jun Song, McGill University; Ankit Srivastava, Texas A&M University; Homero Castaneda, Texas A&M University; Salim Brahi, McGill University / IBECA Technologies; Frank Cheng, University of Calgary; Ronald Miller, Carleton University; Xin Pang, CanmetMaterials, Natural Resources Canada; Stephen Yue, McGill University

Monday AM Room: C162A/162B Location: Greater Columbus Convention Center

Session Chairs: Xin Pang, Natural Resources Canada; Ankit Srivastava, Texas A&M University

8:00 AM Break

8:30 AM Keynote
Characterizing the Local Electrochemical Effects on Environmental Assisted Cracking: Homero Castaneda; Ankit Srivastava; Texas A&M University

9:10 AM
Synergistic Effects of Corrosion and Slow Strain Rate Loading on the Mechanical Behavior of an Aluminum Alloy: Xinzhu Zheng; Homero Castaneda; Ankit Srivastava; Texas A&M University

9:30 AM
Comparison of the Effect of Sensitization on Corrosion Fatigue of AA5456-H116 for In-service Versus Laboratory Accelerated Sensitization: Allison Akna; Jenifer (Warner) Locke; Ohio State University

9:50 AM Invited
Corrosion Fatigue of AZ31B Magnesium Alloy with Hard Ceramic Surface Coating: Xin Pang; Yuna Xue; Bailing Jiang; Hamid Jahed; CanmetMaterials, Natural Resources Canada; Xian an University of Technology; University of Waterloo; Xi’an University of Technology; University of Waterloo

10:10 AM Break

10:30 AM
Desensitization of Al-Mg Alloys with Boron Addition: Rantis Goswami; Syed Qadri; Naval Research Laboratory

10:50 AM
Development of Predictive Capabilities for Stress Corrosion Cracking of Corrosion Resistant Alloys via Empirical and First Principles Methods: Brandon Free; James Saal; Pin Lu; Christopher Taylor; John Scully; Jenifer (Warner) Locke; Fontana Corrosion Center, The Ohio State University; QuesTek Innovations LLC; Department of Materials Science and Engineering, University of Virginia; The Ohio State University

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Chemical and Transport Processes in Glasses
Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Monday AM Room: A115 Location: Greater Columbus Convention Center

Session Chair: To Be Announced

8:10 AM Invited
Amorphous Transitions: The Role of Metasomatic Changes on Glass Corrosion Performance: Joseph Ryan; Pacific Northwest National Laboratory

8:40 AM Invited
A Structural Approach to Understand the Corrosion of Aluminoborate Glasses: Ashutosh Goel; Saurabh Kapoor; Randall Youngman; Nicholas Smith; Rutgers, The State University of New Jersey; Corning Incorporated

9:10 AM
Predicting the Dissolution Kinetics of Silicate Glasses Using Machine Learning: N. M. Anoop Krishnan; Mathieu Bauchy; IIT Delhi; University of California, Los Angeles

9:30 AM Invited
Understanding Silicate Glass-water Interactions and Reactions from Atomistic Based Computer Simulations: Jincheng Du; University of North Texas

10:00 AM Break

10:20 AM Invited
New Solid State Na+ Ion Conducting Glassy Solid Electrolytes: Steve W. Martin; Iowa State University

10:50 AM
Ionic Mobility and Mechanical Stiffness in Mixed-Network Former Glasses: Experiments vs. Molecular Simulations: Vazirk Keshishian; Rafat Mohammadi; John Kieffer; University of Michigan

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Metallographic Preparation Techniques of Materials
Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frajford, IMR Test Labs - Portland

Monday AM Room: A212 Location: Greater Columbus Convention Center

Session Chairs: Daniel Dennies, DMS, Inc.; George Vander Voort, Vander Voort Consulting LLC; Tony Havics, pH2, LLC; Burak Akyuz, ATS, Inc.

8:00 AM
Mechanism of Etching of AI-4.5Mg-1.0Mn Alloy: Aline D. Gabbardo; Xi Wang; Angeire Huggins; Gerald Frankel; Ohio State University

8:20 AM Invited
Polymerography: Chemical Etching of Polymers: Andrew Havics; pH2 LLC
8:40 AM  Chemical Etching of Porcelain: Max Modugno1; Hyojin Lee1; William Carty1; 1New York State College of Ceramics at Alfred University

9:00 AM  Etching of Polycrystalline Alumina: Sarah Whiskey1; Hyojin Lee1; William Carty1; 1Alfred University

9:20 AM  Invited  Metallographic Preparation of Coatings: Jessica Enos1; 1Allied High Tech Products

9:40 AM  Invited  Metallographic Preparation of Soft and Ductile Materials Using Mechanical Polishing Techniques: Michael Keeble1; 1Buchler

10:00 AM  Break

10:20 AM  Invited  Microchemical Testing as a Tool for the Materials Engineer: Andrew Havice1; 1PH2 LLC

10:40 AM  Invited  Examination of the Steel Used to Construct the USS Arizona: George Vander Voort1; 1Vander Voort Consulting L.L.C.

11:00 AM  Invited  Three Strikes Your Out: Shutting Down the Argument on Poor Fastener Quality: Michael Connelly1; 1Casey Products Inc

11:20 AM  Advanced Microstructural Classification: How Machine Learning Can Support Us in Metallographic Practice: Dominik Britz1; Jessica Gola1; Frank Muecklich1; 1Sararland University


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Innovative Processing and Synthesis of Ceramics, Glasses and Composites — Processing I

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jitendra Singh, Retired, U.S. Army Research Laboratory

Monday AM  Room: A120  Location: Greater Columbus Convention Center

Session Chair: Amjad Almansour, NASA Glenn Research Center

8:00 AM  Beta-silicon Carbide Powders from Continuous Electro-thermal Processing: Jeff Verdu1; 1Superior Graphite

8:20 AM  Fabricating Mesoporous Silicon Carbide Ceramics via Block-Copolymer Soft Templates: Lisa Rueschhoff1; Luke Baldwin1; Robert Wheeler1; John Berrigan1; Matthew Dalton1; Hilmar Koerner1; Michael Cinibulk1; Matthew Dickerson1; 1National Research Council Research Associate 1UES, Inc.; 1Air Force Research Laboratory

8:40 AM  High-entropy Metal Carbides and Borides Synthesized under Atmospheric Pressure as a New Class of Ultrahigh Temperature Ceramics: Junheng Xing1; Paniz Foroughi1; Andriy Durygin1; Zhe Cheng1; 1Florida International University

9:00 AM  Additive Manufacturing of SiC Using the Binder Jetting Method: Chuyuan Zheng1; Jung Kun Lee1; Ian Nettleship1; 1University of Pittsburgh

9:20 AM  Optimizing the Rheology of Ceramic Suspensions for Direct-write Additive Manufacturing of Advanced Armor Ceramics: Carl Moorehead1; Ryan Dunn1; Nicholas Ku1; Lionel Vargas-Gonzalez1; 1US Army Research Lab

9:40 AM  Rapid Field-assisted Sintering of UHTC Solid Solution Nanopowders: Paniz Foroughi1; Andriy Durygin1; Zhe Cheng1; 1Florida International University

10:00 AM  Break

10:20 AM  Study on the Technology about Preparation of Al2O3-based Cermet by Oxidation-Sintering Process: Yihan Liu1; 1Northeastern University

10:40 AM  Synthesis and Characterization of W-TiC Nanopowdered Powders Produced via Selective Metallothermic Reactions: Ryan Dempsey1; David Lipke1; 1Missouri S&T; 1Missouri University of Science and Technology

11:00 AM  Synthesis of a Two-component Carboxilane System for the Modular Production of Polymer-derived Ceramics: Luke Baldwin1; Lisa Rueschhoff1; Hilmar Koerner1; Matthew Dalton1; Matthew Dickerson1; 1UES Inc; 1NRC; 1Air Force Research Labs; 1Air Force Research Laboratory

11:20 AM  Low-temperature Treatment of Commercial Pre-ceramic Polymers and Its Effect on the Processing of Non-oxide Ceramic Fibers and Ceramic Matrix Composites: Zlatomir Apostolov1; Heather Chaput1; Elizabeth Heckman1; Michael Cinibulk1; 1Air Force Research Laboratory; 1UTC Corp.; 1Wright State University

11:40 AM  Laser Shock Processing of Structural Ceramics: Bai Cai1; Fei Wang1; Xueliang Yan1; Chenfei Zhang1; Leimin Deng1; Yongfeng Lu1; Michael Nastasi1; 1University of Nebraska–Lincoln

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Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Polycrystal Interfaces

Program Organizers: John Blendell, Purdue University; Ming Tang, Rice University; Shen Dillon, University of Illinois; Wayne Kaplan, Technion - Israel Institute of Technology; Dominique Chatain, CNRS, Aix-Marseille University

Monday AM  Room: A122  Location: Greater Columbus Convention Center

Session Chair: John Blendell, Purdue University

8:00 AM  In-situ Characterization of the Thermal Degradation of LiNi0.8Co0.15Al0.05O2 Cathode Materials for Lithium Ion Batteries: Eric Stach1; Sooyeon Hwang1; Khim Karki1; Stanley Whittingham1; Guangwen Zhour1; 1University of Pennsylvania; 1Brookhaven National Laboratory; 1Huntingbird Scientific; 1Binghamton University
8:40 AM
Characterization of Platinum/Gamma-alumina Interfaces Combining Transmission Electron Microscopy and Density Functional Theory: Arielle Clauzer; Kofo Owari Sarfo; Colin Opiah; Raquel Giulian; Liney Arndtöhr; Melissa Santala; 1Oregon State University; 2Lawrence Berkeley National Laboratory; 3Universidade Federal do Rio Grande do Sul

9:00 AM
Modeling Grain Boundaries with a Concurrent Multiscale Method: Shengfeng Yang; 1Indiana University Purdue University Indianapolis

9:20 AM
Extreme Thermal Stability in Ternary Nanocrystalline Cu-Zr-Hf and Cu-Zr-Al Alloys with Amorphous Complexions: Charlotte Grigorian; Timothy Rupert; 1University of California, Irvine

9:40 AM
Grain Boundary Structure Characterization with the Smooth Overlap of Atomic Positions Descriptor: Jonathan Friedmann; Conrad Rosenbrock; Oliver Johnson; Eric Homer; 1Brigham Young University

10:00 AM Break

10:20 AM Invited
Computational Study of Chemistry on Surfaces and Interfacial Structures: Peilin Liao; 1Purdue University

10:50 AM Invited
Impact of Electric Fields on Grain Boundary Core Structures in SrTiO3 Bicrystals: Laurens Hughes; Klaus Van Benthem; 1University of California, Davis

11:20 AM
A Phase-field Investigation of the Stabilization of Intermetallic Precipitates through Heterophase Interface Segregation: Sourabh Kadambi; Siri Kanth Patel; 1North Carolina State University

11:40 AM
Grain Boundary Manipulation in Directionally Solidified Bicrystals: Logan Ware; Daniel Suzuki; Andrew Catalanotto; Zachary Cordero; 1Rice University; 2University of Texas at Tyler

International Symposium on Ceramic Matrix Composites — Processing and Microstructure Evolution
Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Monday AM
Room: A114
Location: Greater Columbus Convention Center

Session Chair: Raj Singh, Oklahoma State University

8:00 AM Invited
Current Trends and Future Prospects for Ceramic Matrix Composites: Raj Singh; 1Oklahoma State University

8:40 AM
Development of Low Temperature, Dense Composite Material Using a Hybrid Deposition Technique: Sumit Bhattacharya; Abdellatif Yacoub; 1Argonne National Laboratory; 2Argonne National Laboratory

9:00 AM Invited
Pre-ceramic Polymers for Enhanced Processing and Improved Properties of Ceramic Matrix Composites: Zlatomir Apostolov; Matthew Dickerson; Thomas Key; Luke Baldwin; Lisa Rueschoff; Michael Cimulk; 1Air Force Research Laboratory; 2UES Inc.

9:40 AM
Scalable Measurements of Tow Architecture Variability in Braided Ceramic Composite Tubes: Frederick Heim; Brendan Croom; Clifton Buergardner; Xiaodong Li; 1University of Virginia

10:00 AM Break

10:20 AM Invited
Advanced Environmental Barrier Coatings for SiC CMCs: Larry Fehrenbacher; 1Technology Assessment & Transfer Inc.

10:40 AM
Microstructural Evolution of Silicate-based Environmental Barrier Coatings in Combustion Environments: Mackenzie Ridley; Elizabeth Opila; Robert Golden; 1University of Virginia; 2Rolls-Royce

11:00 AM
Study on Structure and Thermal Stability of Ferrite Cermet: Yihan Liu; 1Northeastern University

International Symposium on Defects, Transport and Related Phenomena — Defect Formation and Properties
Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

Monday AM
Room: B242/243
Location: Greater Columbus Convention Center

Session Chairs: Tatsuya Kawada, Tohoku University; Dane Morgan, University of Wisconsin-Madison

8:00 AM Invited
Oxygen Point Defect Formation and Migration in Ruddlesden-Popper Phases: Dave Morgan; Shenzhen Xu; Ryan Jacobs; Wei Xie; Dongkya Lee; Ho-Nyung Lee; 1University of Wisconsin; 2Princeton University; 3University of CA, Berkeley; 4University of South Carolina; 5Oak Ridge National Laboratory

8:40 AM Invited
Polaron Size and Shape Effects on Oxygen Vacancy Interactions in Lanthanum Strontium Ferrite: Yue Qi; Tridip Das; Jason Nicholas; 1Michigan State University

9:20 AM
Structurally Driven Magnetic Disorder in Entropy Stabilized Oxides: Peter Mesenheimer; John Heron; 1University of Michigan

9:40 AM
Thermodynamic Analysis of Oxygen Vacancy Formation in Perovskite Type Oxides for Solar Thermochromic Cycles: Ryo Hishimura; Keiji Yashiro; Tatsuya Kawada; 1Tohoku University

10:00 AM Break

10:20 AM
Phase Equilbria and Defect Chemistry of Cu2ZnSnS4: Pinwen Guan; ShunLi Shang; Greta Lindwall; Timothy Anderson; Zi-Kui Liu; 1Pennsylvania State University
10:40 AM Invited
Melting Mechanisms of Alkali Metasilicate Crystals: The Role of Point Defects: 
Alastair Cormack1; 1Alfred University

11:20 AM Invited
Solid-state NMR Study on Hydration Mechanism in Perovskite-type Protonic 
Conductors: Itaru Oikawa2; Hitoshi Takamura3; 1Tohoku University

Joining of Advanced and Specialty Materials (JASM XX) 
— Plenary: 20 Years of JASM

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barborak, WeldQc, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhilyong Gu, University of Massachusetts Lowell

Monday AM  
October 15, 2018  
Room: C171  
Location: Greater Columbus Convention Center

Session Chair: Boian Alexandrov, Ohio State University

8:00 AM Invited
The Holy Grail of Welding: The Perfect Weldability Test: John Lippold1; 1Ohio State University

8:30 AM Invited
Use of Modeling Tools for Controlling Weld Microstructure and Properties: 
John DuPont1; 1Lehigh University

9:00 AM Invited
Welding and Joining at Microscale and Nanoscale: A Perspective: Norman Zhou1; 1University of Waterloo

9:30 AM Invited
The Intercritical Heat-affected Zone of Steel Welds: Leijun Li1; 1University of Alberta

10:00 AM Break

10:20 AM Invited
Materials Quality Assurance of Welded and 3D-Printed Structures: Stephen Liu1; 1Colorado School of Mines

10:50 AM Invited
Process Based Qualification Components Made by Welding and Additive Manufacturing: Sudarsanam Babu1; 1The University of Tennessee, Knoxville

11:20 AM Invited
Laser Additive Manufacturing of Grade 91 F/M Steel: Thomas Lienert1; 1Los Alamos National Laboratory

Light Metal Technology – Applications for the Transportation Industry — Aluminium Alloys Casting I

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Mihaiela Isac, McGill Metals Processing Centre; Xiaoming Wang, Purdue University; Roderick Guthrie, McGill University; Sa Ge, Hatch Ltd.; Kaan Inal, University of Waterloo; Frederic Laroche, Rio Tinto

Monday AM  
October 15, 2018  
Room: B130  
Location: Greater Columbus Convention Center

Session Chairs: Mihaiela Isac, McGill University; Roderick Guthrie, McGill University

10:20 AM
3D Sand Printed Tooling Surface Features and Their Effect on the Fatigue Behavior of Aluminium Castings: Caitlyn Rodomsky1; Kip Woods2; Jason Walker1; Gerard Thiel1; Brett Conner1; 1Youngstown State University; 2University of Northern Iowa

10:40 AM
Modeling Precipitation of Strengthening Phases and Mechanical Properties of Cast Aluminium Alloys: Emre Cinkılıc1; Xinyan Yan2; Alan Luo2; 1Ohio State University; 2Alcoa Technical Center, LLC

11:00 AM
A Study of the Effect of Rotary Electromagnetic Stirring on the Solidification Microstructure of Aluminium Alloys: Mohammad Mahdi Aboualebeh1; Mihaiela Isac2; Roderick Guthrie1; 1McGill Metals Processing Centre (MMPC)

11:20 AM
Numerical Simulation and Pilot Scale Horizontal Single Belt Casting Experiments Used for the Production of Thin Strips of AA6111: Mianguang Xu1; Mihaiela Isac1; Roderick Guthrie1; 1McGill Metals Processing Center, McGill University

11:40 AM
Computational Study and Microstructural Analysis of AA2024 Strips Processed via the Horizontal Single Belt Casting Technique: Justin Lee1; Roderick Guthrie1; Mihaiela Isac1; 1MMPC, McGill University

Light Metals – Applications and Fitness-for-Service Characterization — Light Metals – Applications and Fitness-for-Service Characterization

Program Organizers: Dimitry Sediako, University Of British Columbia; David Weiss, Eck Industries Inc; Kevin Anderson, Brunswick Corporation; Lukas Bichler, University of British Columbia

Monday AM  
October 15, 2018  
Room: B230  
Location: Greater Columbus Convention Center

Session Chair: Dimitry Sediako, University of British Columbia

8:00 AM Keynote
Assessing the Corrosion Resistance of Aluminum Alloys for Real-world Marine Environment Exposure: Kevin Anderson1; Christopher Misorski1; 1Brunswick-Mercury Marine

8:30 AM
Ductile Tearing Fracture Mechanics for Sub-millimeter Al Sheets: Wade Lanning1; Syed Javaid1; Camilla Johnson1; Christopher Muhlstein1; 1Georgia Institute of Tech
8:50 AM  
Effect of Confined Rolling on Microstructure and Mechanical Properties of Magnesium Alloys: Pavitra Krishnan; Laszlo Keskes; Tomoko Sano; Quiming Wei; 1University of North Carolina Charlotte; 2WMRD, US ARL, APG; 3UNCC

9:10 AM  
The Effects of Pre-heating on Nugget Growth and Weldability for Resistance Spot Welding of A6014 Alloy: Joo Yong Cheon; Changwook Ji; Jae Hun Kim; Oksu Kim; Byungchul Cha; 1Korea Institute of Industrial Technology

9:30 AM  
Properties of Various Phases in Al Powerttrain Alloys: A Review: Ermia Aghaie; Dimitry Sediako; 1University of British Columbia-Okanagan

9:50 AM  
Residual Strain Characterization of an Advanced Aluminum Marine Alloy Using In-situ Neutron Diffraction: Joshua Stroh; Dimitry Sediako; 1UBC Okanagan

10:10 AM Break

10:30 AM Keynote  
Microstructure: Phases and Morphologies: Domonkos Tolnai; Serge Gavras; R. H. Buzolin; Norbert Hort; 1Magnesium Innovation Centre, Helmholtz Zentrum Geesthacht; 2Institute of Materials Science, Joining and Forming, Graz University of Technology

11:00 AM  
Investigating the Tribological Behaviour of Magnesium-Based Nanocomposites: Srivatsan Tersimalai; Subramanian. Jayalakshmi; Singh Arvind; Manoj Gupta; 1Bangalore, India; 2Kumaraguru College of Technology

11:20 AM  
Corrosion Performance of Warm-formed Automotive Heat Exchanger Components: Michael Benoit; Sooky Winkler; Mary Wells; Carolyn Hanson; 1University of Waterloo; 2Dana Canada Corporation; 3University of Guelph

11:40 AM  
The Effect of an Al-Ti Grain Refiner on Hot Tearing of AZ91D Mg Alloy: Tyler Davis; Lukas Bichler; 1University of British Columbia

Materials for Nuclear Applications and Extreme Environments — Metallic Alloys for Nuclear Systems

Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Dev Chidambaram, University of Nevada, Reno; Raoul Rebak, GE Global Research; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

Monday AM  
Room: D183  
October 15, 2018  
Location: Greater Columbus Convention Center  
Session Chair: Michael Tonks, University of Florida

8:00 AM Invited  
Application of Metallo-organic Chemistry and Nanotechnology to Issues Faced by the Nuclear Industry: Allen Apblett; 1Oklahoma State University

8:40 AM  
Porphyrine Crystal Growth Behavior in High Level Nuclear Waste Glasses: Devon McClane; Jake Amoroso; Kevin Fox; Albert Kruger; 1Savannah River National Lab; 2US Department of Energy Office of River Protection

9:00 AM Invited  
Crystallization of Rare-earth Containing Phases in Molybdenum-containing Alumino-boro-silicate Glasses: John McClay; Deepak Patil; Md Salahi; Mostafa Ahmadzadeh; Brian Riley; Jarrod Crum; Ashutosh Goel; Hrishikesh Kanat; Kristian Barnsley; John Hanna; Prashant Rajbandari; Russell Hand; Neil Hyatt; 1Washington State University; 2Washington State University; 3Pacific Northwest National Laboratory; 4Rutgers University; 5Warwick University; 6University of Sheffield

9:40 AM  
Nuclear and Environmental Technology Division – Outstanding Student Research Award (NETD-OSR Award): Bismuth Alumino-borosilicate Glass Binders for Sintered and Vitrified High-level Waste Salt Immobilization: Levi Gardner; Manish Wasnik; Michael Simpson; Krista Carlson; 1University of Utah
MONDAY AM

10:00 AM Break

10:20 AM Invited
Waste Forms: Can We Design Durable Materials and Predict Performance over Geologic Time Scales? Eric Pierce1; Jeremy Eskelsen2; Michelle Chiu3; 1Oak Ridge National Laboratory

11:00 AM
Contributions to Enhanced Waste Glasses for the Hanford Waste Treatment and Immobilization Plant: Kevin Fox1; Devon McClane2; Jake Amoroso3; Mark Fowley4; Albert Kruger5; 1Savannah River National Lab; 2US Department of Energy Office of River Protection

11:20 AM
Review of Sorbent Materials for Ocean Mining of Uranium: Allen Aplleitt1; Cory Perkins2; 1Oklahoma State University

Materials Science and Engineering of Earth Abundant Materials — Materials Science and Engineering of Earth Abundant Materials
Program Organizers: Jessica Rimsza, Sandia National Laboratories; Krishna Muralidharan, University Of Arizona

Monday AM  Room: B240/241
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated; Bryan Wheaton, Corning Incorporated

8:00 AM Invited
3D Porosity Analysis of Collagen-hydroxypatite Coatings for Hard Tissue Replacement: Tomas Silva Santisteban1; Le Yu2; Mei Wei3; 1Thermo Fisher Scientific; 2University of Connecticut

8:40 AM Invited
Connecting Structure and Properties of Amorphous Ceramics Using 4-dimensional Scanning Transmission Electron Microscopy: Menglin Zhu1; Soohyun Im2; Ridwan Sakidja2; Nathan Oyler3; Michelle Paquette4; Paul Rulis5; Jinwoo Hwang6; 1Ohio State University; 2Missouri State University; 3University of Missouri Kansas City

9:20 AM
Quantifying Spread in Crystallographic Textures Due to Stochasticity in Deformation Processes: Mustafa Rifat1; Saurabh Basu2; 1Penn State University; 2Penn State

9:40 AM Invited
Determining Sensitivities of Various Forming Limit Analyses Techniques to Changes in Experimental Parameters: Dilip Banerjee1; Mark Iadicola2; 1National Institute of Standards and Technology

10:20 AM Break

10:40 AM
Predictive Hardness Modeling of Materials: Hongyun Kim1; Shunli Shang2; Laszlo Keekses3; Zi-Kui Liu4; 1Penn State University; 2Matsys

Materials Science and Engineering of Earth Abundant Materials — Materials Science and Engineering of Earth Abundant Materials
Program Organizers: Jessica Rimsza, Sandia National Laboratories; Krishna Muralidharan, University Of Arizona

Monday AM  Room: A124
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Jessica Rimsza, Sandia National Laboratories; Krishna Muralidharan, University of Arizona

8:00 AM Invited
Bio-inspired Catalysts from Earth Abundant Materials for the Conversion of CO2 to Fuel and Chemicals: Nora De Leon1; 1Cardiff University

8:40 AM
NMR Characterization of MgO Engineered Barrier Materials: Jessica Rimsza1; Eric Sorte2; Todd Alain3; 1Geochemistry Department, Sandia National Labs; 2Organic Materials Science, Sandia National Laboratories

9:00 AM Invited
An Atomic-scale Analysis and Thermodynamic Assessment of the First Ceramics Formed in the Solar System: Thomas Zega1; Venkat Manga2; Krishna Muralidharan3; Fred Ciesla4; Keitaro Watanabe5; Hiromi Inada6; 1University of Arizona; 2University of Chicago; 3Hitachi High Technologies

9:40 AM
V-segregation at (111) Twins in MgAl2O4-spinel: A First-principles Study: Venkateswara Manga1; Thomas Zega1; Prajka Mane2; Tarunika Ramprasad3; Keith Runge1; Krishna Muralidharan2; 1University of Arizona

10:00 AM Break

10:20 AM
Microstructural Behaviour of Ti6Al4V during Room Temperature Deformation: Gajanan Kulkarni1; 1Bharat Forge LTD

10:40 AM
Selection of Aluminum Alloy for Casting Defectless Thermoforging Molds Using Green Sand Foundry Technology: An Experimental Approach: Abdullah Al Shafe1; Sabila Kader Pinky2; Cynthia K. Waters2; 1North Carolina A&T State University; 2Missouri State University

Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance — Novel Composite Materials
Program Organizers: Martin Pech-Canul, Cinvestav IPN Saltillo; Golam Newaz, Wayne State University; Xiaoming Wang, Purdue University

Monday AM  Room: A123
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Martin Pech-Canul, Cinvestav IPN Saltillo

8:00 AM Invited
A Novel Micro/Nano Multi-scaled Cermet with Simultaneously High Hardness/ Toughness: Guan-Jun Yang1; 1University of Arizona; 2North Carolina A&T State University; 3Hitachi High Technologies

8:30 AM
On the Design of Novel MAX Reinforced Ni-matrix Composites: Maharshi Dey1; Matt Fuka2; Surojit Gupta3; 1University of North Dakota
8:50 AM
Multiscale Study of Mechanical Properties of Composite Metal Nano-foams: Andres Jimenez; Hang Ke; Cetin Cetinkaya; David Bahr; Ioannis Mastorakos; ’Clarkson University; ’Purdue University

9:10 AM Invited
Rolling Behaviour of Aluminum Alloy 2014-10wt% SiCp Metal Matrix Composites: Ajay Kumar P.; Gajendra Dixit; Aruna Patel; Satyabrata Das; ’University of Wisconsin-Milwaukee; Materials Department; ’Maulana Azad National Institute of Technology; Bhopal; ’Advanced Materials and Processes Research Institute (CSIR, New Delhi), Bhopal; ’Indian Institute of Technology, Kanpur

9:30 AM
Processing and Properties of Engineered Metal Matrix Composites Produced Via Co-Extrusion: Paul Brune; Jeremy Watts; Greg Hilmas; ’Missouri University of Science and Technology

9:50 AM
Characterisation and Mechanical Properties of Stainless Steel Matrix Composites Reinforced with (Nb,0.05,0.05)C Particles: Wen Hao Kan; Vijay Bhatia; Zijian Yu; Yong Jang; Kevin Dolman; Xinhu Tang; Timothy Lucey; Li Chang; Gwenaëlle Proust; Julie Cairney; ’University Of Sydney; ’Weir Minerals Australia Ltd.

10:10 AM Break

10:30 AM
Hybrid Aluminum Matrix Composites (HAMCs) Using Powder Metallurgy Method: AHM Rahaman; Issam Abu-Mahfouz; Imran Zakir; ’Penn State Harrisburg

10:50 AM
Stochastic Modeling of the Effects of Structural Randomness on the Mechanical Behavior of Discontinuous Fiber-reinforced Composites: Revealing the Role of Network Coordination State: Mujuan Seif; Mary Martin; Dorothy Richardson; Matthew Turner; Thomas Balk; Matthew Beck; ’University of Kentucky; ’Northeastern University

11:10 AM Invited
Fabrication of High-property Graphene Reinforced Aluminum Alloy Composite by Powder Metallurgy Combined with Friction Stir Processing: Zongyi Ma; Zhanwei Zhang; Zhenyu Liu; Bolu Xiao; ’Institute Of Metal Research Chinese Academy of Sciences

11:30 AM
Comparative Assessment of Delamination control techniques in Conventional drilling of CFRP: Kamlesh Phapale; ’Bharat Forge Ltd

MONDAY AM

Neutron and Synchrotron Techniques for Advanced Materials Characterization — Advanced Neutron & Synchrotron Techniques
Program Organizers: Helen Playford, ISIS Facility; Lewis Owen, University of Cambridge

Monday AM
Room: B246
October 15, 2018
Location: Greater Columbus Convention Center

Session Chairs: Helen Playford, ISIS Facility; Lewis Owen, University of Cambridge

8:00 AM
Comparing Laboratory X-ray and Neutron Methods of Diffraction-based Stress Measurements: Adam Creuziger; Thomas Gnaepel-Herold; Chris Calhoun; ’National Institute of Standards & Technology; ’National Institute of Standards & Tech

8:20 AM
Identification of Orientation Relationships in Metallic Polycrystals with Neutron Diffraction: Joe Kelleher; ’Engin-X, ISIS, STFC

8:40 AM
Examining Deformation Mechanisms in Al-Cu Alloys with In-situ Neutron Diffraction: Brian Milligan; Dong Ma; Amit Shyam; Amy Clarke; Lawrence Allard; Francisco Coury; ’Oak Ridge National Laboratory; ’Oak Ridge National Lab; ’Colorado School of Mines

9:00 AM
In-situ Characterisation of the Thermomechanical Deformation Behaviour of Ni-based Superalloys: Katerina Christofidou; Nick Jones; Mark Hardy; Howard Stone; ’University of Cambridge; ’Rolls-Royce plc.

9:40 AM

10:00 AM Break

10:20 AM
Recent Upgrades to the Residual Stress Diffractometer HB2B at the High Flux Isotope Reactor: Jeffrey Bunn; Chris Fancher; Andrew Payzant; Barton Bailey; ’Oak Ridge National Laboratory

10:40 AM
Near-surface Elemental Analysis of Solids by Neutron Depth Profiling: Jamie Weaver; Gregory Downing; ’National Institute of Standards and Technology

11:00 AM
In-situ Quasi-elastic Neutron Scattering Study on the Water Dynamics during Formation of Sustainable Cements: Kai Gong; Yongqiang Cheng; Luke Daemen; Claire E. White; ’Princeton University; ’Oak Ridge National Laboratory

11:20 AM
Pair Distribution Function Computed Tomography Analysis of the Local Atomic Structure of Carbonated Alkali-activated Slag Paste: Eric McCaslin; Claire White; ’Princeton University
11:40 AM
X-ray and Neutron Pair Distribution Function Studies of Ferroelectric Nanocrystals: Tedi-Marie Usher-Ditzian1; Daniel Olds1; Yue Liu1; Katharine Page1; 1Oak Ridge National Laboratory

Next Generation Biomaterials — Biomaterials I
Program Organizers: Roger Narayan, University of North Carolina; Vipul Davé, Johnson & Johnson; Mohan Ediriisinghe, University College of London; Sanjiv Lalwani, Lynntech, Inc.

Monday AM  Room: D182
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Steven Jung, Mo-Sci Corporation; Donglu Shi, University of Cincinnati

8:00 AM Invited
Additive Manufacturing of Low Modulus β-Titanium Alloys for Implants: Srinivas Aditya Mantri1; Eugene Ivanov2; Rajarshi Banerjee3; 1University of North Texas; 2Tosoh SMD Inc

8:20 AM Invited
Advanced Tissue Engineering Scaffolds for Postoperative Cancer Patients: Min Wang1; 1The University of Hong Kong

8:40 AM Invited
Bouncy Bioglass for Osteochondral Regeneration: Julian Jones1; 1Imperial College London

9:00 AM
Cancer Cell Targeting, Imaging and Combined Chemo-photothermal Therapy by Core-shell Structured Theranostics: Qingwen Guan1; Li-wu Zheng1; Min Wang1; 1The University of Hong Kong

9:20 AM Invited
Effects of Protein Corona Decoration on Oxide Nanoparticles for Medical Diagnosis and Treatment: Jian Zhao1; Shengming Wu1; Yilong Wang1; Donglu Shi1; 1Qingdao University of Science & Technology; 2Tongji University School of Medicine; 3Tongji University School of Medicine & University of Cincinnati

9:40 AM
The Complexity of Chemistry, Physiology, Anatomy and Bone Structure for Bioceramic Implants: Thomas McGee1; 1Osteoceramics, LLC

10:00 AM Break

10:20 AM Invited
Structure/Property Relationships in Biomaterials at the Nanoscale: Federico Rosset1; 1INRS Centre for Energy, Maths & Telecommunications

10:40 AM Invited
Synthetic Bone Grafting Materials Used in Orthopedics: Steven Jung1; 1Mo-Sci Corporation

11:00 AM Invited
Calcium Phosphate based 3D Printed Scaffolds and Coatings for Treatment of Bone Disorders: Sujit Bose1; Amit Bandypadhyay1; 1Washington State University

11:20 AM Invited
Engineered Nanomaterials with New “Touch and Kill” Mechanism to Fight Bacteria and Bacteria Resistance: Tolou Shokuhfar1; 1University of Illinois at Chicago

11:40 AM Invited
Bioinspired Design of Next Generation Structural and Thermal Materials: Nima Rahbar1; 1Worcester Polytechnic Institute

Perspectives for Emerging Materials Professionals — Session I
Program Organizers: Andrew Frerichs, The NanoSteel Company; Dharma Maddala, Arconic Technology Center

Monday AM  Room: B231
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Andrew Frerichs, The NanoSteel Company; Christopher Marvel, Lehigh University

8:00 AM Invited
Researching for a Mission: Shawn Coleman1; 1U.S. Army Research Laboratory

8:20 AM Invited
The Professor Is In: My Transition from Graduate Student to Assistant Professor: Ashwin Shahani1; 1University Of Michigan

8:40 AM Invited
The Winding Path to an Exciting Career in a DOD Laboratory: Billy Hornbuckle1; 1U.S. Army Research Laboratory

9:00 AM Invited
A Perspective: Working at a National Laboratory: Elizabeth Hoffman1; 1Savannah River National Laboratory

9:20 AM Invited
From College to Career: Preparing Yourself for Life in Industry: William Podrazky1; 1Hitachi High Technologies America, Inc.

9:40 AM Invited
Making a Career Out of the Unknown: Brett Leister1; 1Exponent, Inc.

10:00 AM Break

10:20 AM Invited
Studying Technology to Predict the Future of the Materials Science and Engineering Discipline: Career Planning: David Farrer1; 1Pratt & Whitney

10:40 AM Panel Discussion

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum and Minerals - KFUPM; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Victoria Blair, Army Research Laboratory

Monday AM  Room: A125
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Morsi Mahmoud, King Fahd University of Petroleum & Minerals - KFUPM; B. Reeja Jayan, Carnegie Mellon University

8:00 AM Invited
Microstructure and Microtexture of Induction Sintered Copper-based Powder Metal Parts: Daoudi Waryoba1; 1Pennsylvania State University
8:40 AM Invited
Innovative Gas Hydrate Decomposition Method by Electromagnetic Wave Irradiation of UHF to S Band: Shinn Nakatani1; Motoyasu Sato2; Masao Yukumoto 1; Motohiko Tanaka1; ‘Chubu University

9:20 AM
One-dimension Magnetoelectric Gyration: Power Conversion: Xin Zhuang1; Chung-ming Leung2; Jiefang Li3; Dwight Viehland1; ‘Virginia Polytechnic Institute; ‘Virginia Tech

9:40 AM
Viscous Flow Mediated Spark Plasma Sintering of Iron Based Amorphous Alloy: Tanaji Paul1; Sandip Harimkar1; ‘Oklahoma State University

10:00 AM Break

10:20 AM
Morphology Effect of Oxide Particles for Microwave Applications: Christina Wildfire1; Terence Musho2; Edward Sabolsky3; Dushyant Shekhawat3; Robert Tempke1; ‘National Energy Technology Laboratory; ‘West Virginia University; ‘NETL

10:40 AM
Laser Soldering Process for Manufacturing Camera Module: Heesin Kang1; Jiwon Noh1; ‘Korea Institute of Machinery & Materials

PSDK XIII: Phase Stability and Diffusion Kinetics — Gibbs Award Session I
Program Organizers: Zi-Kui Liu, Pennsylvania State University; Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Wei Xiong, University of Pittsburgh, Raymundo Arroyave, Texas A & M University

Monday AM Room: A213 Location: Greater Columbus Convention Center

Session Chairs: Carelyn Campbell, National Institute of Standards & Tech; Ji-Cheng Zhao, Ohio State University

8:00 AM Keynote
High Temperature Corrosion Kinetics and the P-Pt-Rh Phase Diagram: Anna Nakano1; Jinichiro Nakano1; James Bennett2; John Morrill3; ‘U.S. Department of Energy National Energy Technology Laboratory; AECOM; ‘U.S. Department of Energy National Energy Technology Laboratory; ‘The Ohio State University

8:40 AM Invited
Thermodynamic Calculation of Aqueous Phase Diagrams: Arthur Pelton1; Gunnar Eriksson1; Klaus Hack2; Christopher Bale1; ‘Ecole Polytechnique; ‘GTG-Technologies

9:00 AM Invited

9:20 AM Invited
Accessible Diffusion Data: Challenges and Opportunities: Carelyn Campbell1; Greta Lindwall1; ‘National Institute of Standards & Tech; ‘Royal Institute of Technology (KTH)

9:40 AM Invited
CALTIPP: A General Program to Calculate Thermophysical Properties: Yong Du1; Zhoushan Zheng2; Cong Zhang2; Yuling Liu1; Changfa Du1; Shuhong Liu1; ‘Central South University; ‘University of Science and Technology Beijing

10:00 AM Break

10:20 AM Invited
Efficient Exploration of the High Entropy Space: Raymundo Arroyave1; ‘Texas A & M University

10:40 AM Invited
Experimental Determination of Phase Diagrams and Diffusion Coefficients: The Ins and Outs: Ji-Cheng Zhao1; ‘Ohio State University

11:00 AM Invited
Interdiffusion and Phase-equilibria Studies in Multi-principal Element Alloys: Kaushik Kulkarni1; A. Bhargav Krishna2; ‘Indian Institute of Technology Kanpur; ‘IIT Kanpur

Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Rare Earth Metals - Mining and Extraction
Program Organizers: Yellapu Murty, MC Technologies LLC; Jack Lifton, Jack Lifton, LLC; Eric Klier, U. S. Army Research Laboratory; Michael McKittrick, U.S. Department of Energy; Ian London, Avalon Rare Metals Inc

Monday AM Room: B131 Location: Greater Columbus Convention Center

Session Chairs: Yellapu Murty, MC Technologies; Jack Lifton, Jack Lifton LLC

8:00 AM Invited
Rare Earth Elements from Coal and Coal-based Resources: Mary Anne Alvin1; ‘National Energy Technology Laboratory

8:40 AM Invited
Rare Earth Mining Outside of China: The Current Landscape of Operating Mines and Known Deposits: Roderick Eggert1; ‘Colorado School Of Mines

9:20 AM Invited
Beneficiation of Rare Earths: Corby Anderson1; ‘Colorado School of Mines

10:00 AM Break

10:20 AM Invited
Reduction of Rare Earth Elements through Electrochemical, Metallothermic, and Arc Furnace Methods: A Review: Patrick Taylor1; Matt Earlam1; Fangyu Liu1; ‘Colorado School of Mines; ‘Infinium

11:00 AM
Rare Earth Salts: A Breakthrough Separation Technology for Rare Earths: Alastair Neill1; ‘Rare Earth Salts

11:30 AM Invited
The Use of Centrifuge Technology for Treatment of Crud and Fine Particles in Mineral Processing: Marc Janson1; Derek Ettie2; ‘GEA Mechanical Equipment US, Inc.
Responsive Functional Nanomaterials — Multi-functional Nanosensors
Program Organizers: Wenzhuo Wu, Purdue University; Weiyang Li, Dartmouth College; Sarina Sarina, Queensland University of Technology; Wenxian Li, University of Wollongong; Jiahua Zhu, University of Akron

Monday AM  Room: D181
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Weiyang Li, Dartmouth College

8:00 AM
Surface Interactions on Nanostructured Metal Oxides for Gas Sensing Applications: Janine Walker; Sheikh Akbar; Patricia Morris; ‘The Ohio State University - College of Engineering Department of Materials Science and Engineering

8:20 AM
Investigation of Mechanical Behavior of Ionic Diblock Copolymer, via Molecular Dynamics Simulation: Menge Ma; Yao Fu; ‘University of Cincinnati

8:40 AM Invited Preparation of NiO Nanosstructure by Hydrothermal for H2S Gas Sensor: Gotan Jain; ‘KTHM College

9:10 AM
Nanocrystalline Electro-chemo-mechanical Actuator Operating at Room Temperature: Eran Mishuk; Evgeniy Makagon; Sidney Cohen; Ellen Wachtel; Igor Lubomirsky; ‘Weizmann Institute of Science

9:30 AM
Direct fabrication of Graphene-based Strain Gauge on 3D-printed ULTEM: Roberto Aga; Eric Kreit; Carrie Bartsch; Emily Heckman; ‘KBRWYLE/Air Force Research Lab; ‘AFRL

9:50 AM Break

10:10 AM Invited Fundamental Understanding and Rational Design of Multifunctional Hydrogels: Jie Zheng; Yanxian Zhang; Baiping Ren; ‘University of Akron

10:50 AM
Emerging Piezoelectricity in Two-dimensional Chiral-Chain Van der Waals Tellurene for Energy Harvesting and Sensing: Shengjie Gao; Yixiu Wang; Wenzhuo Wu; ‘Purdue University; ‘School of Industrial Engineering, Purdue University

Selection of Materials for Application in Corrosive Environments — Materials Selection Symposium - Session I
Program Organizers: Ajit Mishra, Haynes International; Matthew Asmussen, Pacific Northwestern National Laboratory; Sudhakar Mahajanam, Pinnacle Advanced Reliability Technologies; Wilfred Binns, Nuclear Waste Management Organization; John Zhang, Gamry Instruments; Guang-Ling Song, Xiamen University; Eric Schindelholz, Sandia National Laboratories; Raul Rebak, GE Global Research

Monday AM  Room: A220
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Ajit Mishra, Haynes International; Eric Schindelholz, Sandia National Laboratories

8:00 AM Keynote
Localized Corrosion of Stainless Steel in Effluent Treatment Facility of a Nuclear Waste Processing Operation: Narasi Sridhar; Sandeep Chawla; Kenneth Evans; Brandon Rollins; John Beavers; ‘DNVGL

8:40 AM
Corrosion Risk Factors in Kr-85 Storage Canisters and Implications for Long Term Storage: Matthew Asmussen; Charles Demarest; James Neeway; Sean Agnew; Carolyn Pearce; John Scully; ‘Pacific Northwest National Laboratory; ‘University of Virginia

9:00 AM
Corrosion Studies of the Canadian Used Nuclear Fuel Container: Wilfred Binns; Peter Keech; Nick Senior; ‘NWMO; ‘CanmetMATERIALS

9:20 AM
Application of Electrochemical Quartz Crystal Microbalance in Corrosion: Xueyuan Zhang; ‘Gamry Instruments

9:40 AM
Bond-Energy Models of Alloy Oxides for Corrosion Resistant Alloys: Szu-Chia Chien; Wolfgang Windl; ‘The Ohio State University

10:00 AM Break

10:20 AM
Corrosion Behavior of Spark Plasma Sintered Magnesium in Salt Water: Somi Doja; Antonia Ciocoiu; Lukas Bichler; ‘University of British Columbia; ‘Univ of British Columbia

10:40 AM
Corrosion Resistance of an Electric Field Modified Polymer Film: Zhenliang Feng; Guang-Ling Song; Dajuang Zheng; ‘Center for Marine Materials Corrosion and Protection, State Key Laboratory of Physical Chemistry of Solid Surfaces, College of Materials, Xiamen University

11:00 AM
Erosion-corrosion of 90° Carbon Steel Elbow in Potash Brine-sand Slurries: Raheem Elemaen; Richard Evitts; Ikechukwuka Oguocha; Akindele Odeshi; ‘University of Saskatchewan

11:20 AM

11:40 AM
High-temperature Oxidation of Dissimilar Welds at 982°C: Joseph Meyer; ‘Haynes International
Sintering and Related Powder Processing Science and Technologies — Sintering and Microstructural Evolution

Program Organizers: Ricardo Castro, University of California, Davis; Zachary Cordero, Rice University; Eugene Olevsky, San Diego State University; Wolfgang Rheinheimer, Purdue University

Monday AM  Room: B142/143
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Zachary Cordero, Rice University

8:00 AM Invited
Sintering and Grain Boundary Segregation Behavior of Silica and Rare-earth Doped Boron Suboxide Armor Ceramics: Christopher Marvel1; Kristopher Behler2; Jerry LaSalvia3; Martin Harner3; Leigh University; U.S. Army Research Laboratory; SURVICE Engineering; U.S. Army Research Laboratory

8:40 AM Invited
Solute Segregation and Enhanced Grain Boundary Mobility in Alumina: Ruth Moshe1; Wayne Kaplan1; Technion - Israel Institute of Technology

9:20 AM
Microstructural Evolution of Al-Cu-Mg Sintered Alloys during Semi-solid Extrusion Process: M Davidson1; Asit Kumar Khanra2; Katti Bharath3; National Institute of Tech

9:40 AM Invited
Investigating Anomalous Grain Growth in Calcia and Silica Doped Specialty Alumina: Christopher Marvel1; Kevin Anderson2; Animesh Kundu3; Martin Harner3; Tobias Fruch4; Charles Compson4; GrainBound LLC; Leigh University; Leigh University; Almatis Inc

10:00 AM Break

10:20 AM Invited
Investigation of Li and Ta Addition on Physical and Electrical Properties of KNN Ceramics: Mehmet Ozmen1; Baris Yavas1; Ipak Akin2; Onuralp Yucel2; Filiz Sahin3; Gultekin Goller1; Istanbul Technical University Metallurgical and Materials Engineering

10:40 AM Invited
Microstructure Development of Alumina during Liquid Phase Sintering in the CaO-Al2O3-SiO2 System: Sarah Whipkey1; Hyojin Lee2; William Carty3; Alfred University

Small-scale Properties of Materials and Length-scale Phenomena — Size Effect

Program Organizers: Meysam Haghshenas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

Monday AM  Room: A121
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Meysam Haghshenas, University of North Dakota; Hesam Askari, University of Rochester

8:00 AM Invited
Gradient Theory in Small Scales: Elias Afantitis1; Aristotle University of Thessaloniki

8:20 AM Invited
Absence of Size Effect in a TWIP Steel: Xiaoxue Chen1; Vincent Hammond2; Laszlo Kecskes3; Quening Wei3; UNC-Charlotte; US ARL; University of North Carolina Charlotte

8:40 AM Invited
Size Effects in High-entropy Alloys and Quasicrystals: Yu Zou1; University of Toronto

9:00 AM Invited
Size Effects in Mechanical Properties of Graphene Oxide Nanosheets: Chandra Veer Singh1; University of Toronto

9:20 AM Invited
Size Effects in Microparticle Impact-bonding: Mostafa Hassan-Gangeraj1; David Veysset2; Keith Nelson3; Christopher Schuh3; Massachusetts Institute of Technology

9:40 AM Invited
Size Effects in Static and High Cycle Fatigue Micro-cantilever Tests: Jicheng Gong1; Angus Wilkinson1; Materials Department, Oxford University

10:00 AM Break

10:20 AM Invited
Indentation Size and Microstructure Effects on Cyclic Deformation in Rare-earth Phosphate Ceramics: Corinne Packard1; Colorado School of Mines

10:40 AM Invited
Nanoindentation of High Purity Vapor Deposited Lithium Films: A Mechanistic Rationalization of Diffusion-mediated Flow: Erik Herbert1; Stephen Hackney1; Nancy Dudney2; Violet Thole3; Sudharshan Phani3; Michigan Technological University; Oak Ridge National Laboratory; International Advanced Research Centre for Powder Metallurgy and New Materials

11:00 AM Invited
Size Effects in FCC Metals: Influence of Temperature and Stacking Fault Energy: Yuan Xiao1; Jeffrey Wheeler2; ETH Zurich

11:20 AM Invited
Intermittent Plasticity in Microcrystals: Scale-free and Universal?: Robert Maass1; University of Illinois at Urbana Champaign

Surface Properties of Biomaterials — Biomedical Device Surface Properties and Biological Interactions

Program Organizers: Venu Varanasi, University of Texas at Arlington; Ryan Bock, Amedica Corporation; Jason Langhorne, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandopadhyay, Washington State University

Monday AM  Room: D281
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Venu Varanasi, University of Texas at Arlington; Ryan Bock, Amedica Corporation; Neelam Ahuja, University of Texas at Arlington

8:00 AM Invited
Use of Diamond Thin Films in Medical Device Applications: Roger Narayan1; University of North Carolina

8:40 AM
Calcium Phosphate Coated Ti for Musculoskeletal Applications: Effect of Aloe Vera Gel Extract Acemannan on Biological Properties: Dishary Banerjee1; Susmita Bose1; Washington State University
9:00 AM
Characterization of Osteoconductive Si-Y-O-N Phase Present at Annealed Silicon Nitride Surface: Ryan Bock; David Cullen; Donovan Leonard; Karren More; B. Sonny Bal; Bryan McEntire; Amedica Corporation; Oak Ridge National Laboratory; University of Missouri

9:20 AM
Invited
Quantification of Nanoscale Adhesion Force of Staphylococcus Aureus on the Surface of Biomaterials Using Atomic Force Microscopy: Fahad Alam; Kantesh Balani; Indian Institute of Technology Kanpur; Indian Institute of Technology Kanpur

10:00 AM Break

10:20 AM
Effect of Patterned Bioactive Amorphous Silicon Oxynitride and Phosphorus Doped Silicon Oxynitride Coatings on the C2C12 Muscle Cells: Kamal Awad; Jian Huang; Leticia Brotto; Pranesh Aswathi; Marco Brotto; Venu Varanasi; University of Texas at Arlington

10:40 AM Invited
Evaluation for Immunity of Biomaterials Based on Raman Spectroscopy: Hideyuki Kanematsu; Yuta Sakagami; Dana Barry; Michiko Yoshitake; Akiko Ogawa; Nobumitsu Hirai; Takeshi Kougou; Daisuke Kuroda; Yoshimitsu Mizuno; National Institute of Technology, Suzuka College; Clarkson University; National Institute for Materials Science; The Jikei University School of Medicine

11:20 AM
Prospect of Hydroxyapatite Powder Produced from Waste Poultry Eggshells for Biomedical Applications: Alafara Babajide; Adeola Womilolu; Abdullah Ibrahim; Fatimah Abubakar; Anoka Najib; Folahan Adekola; Abdulganiyu Alabi; University of Ilorin; Kwara State University, Malete

11:40 AM
Nanostructured Magnesium Implants with Enhanced Biofunctionalization: TS Sampath Kumar; Indian Institute of Technology Madras

Program Organizers: Lan Li, Boise State University; Winnie Wong-Ng, National Institute of Standards and Technology; Kevin Huang, University of South Carolina

Monday AM
Location: Greater Columbus Convention Center
Room: B144/145

Session Chair: Lan Li, Boise State University

8:00 AM Introductory Comments

8:05 AM Invited
A Simple Mixed Matrix Membrane Fabrication Method with In-situ MOF Growth for Gas Separation: David Hopkinson; Anne Marti; Surendar Venna; Jeffrey Culp; Elliot Roth; Doe/Netl

8:25 AM Invited
Synchrotron Structural Studies of Ni(CN)4-based Flexible Metal-organic Framework (MOF) Crystals: Winnie Wong-Ng; Jeffrey Culp; Yu-Sheng Chen; Jeffrey Deschamps; Lan Li; National Institute of Standards and Technology; NETL; The University of Chicago; Naval Research Laboratory; Boise State University

8:45 AM Invited
Bio-template Synthesis of Zeolitic Imidazolate Framework-8 (ZIF-8): Qi Wang; Hong-Cai Zhou; Hongmin Qin; Texas A&M University

9:05 AM Invited
In situ Powder Diffraction Measurements of Metal Organic Frameworks at 17-BM: Modern Techniques and Methods of Structural Analysis: Andrey Yakovenko; Argonne National Laboratory

9:25 AM Invited
Metal-organic Cages as Sorbent Materials: A DFT Study: Eric Cockayne; National Institute of Standards and Technology

9:45 AM Invited
Neutron Scattering Studies of Small Molecules Adsorbed in Metal-organic Frameworks: Craig Brown; NIST

10:05 AM Break

10:25 AM Invited
Applications of Physisorbents as Sensor Coatings for Near Ambient Leak Detection of CO2 and CH4: Jeffrey Culp; Ki-Joong Kim; Jagannath Devkota; Paul Ohodnicki; National Energy Technology Laboratory

10:45 AM Invited
Characterization of Gas-solid Interactions with In Situ X-ray Powder Diffraction: Tomce Runceski; Southern Methodist University

11:05 AM Invited
Neutron Diffraction: A Unique Technique to Study Gas Adsorption in Functional Porous Crystalline Materials: Hui Wu; National Institute of Standards and Technology

11:25 AM
Foam Glass Insulator Properties Understanding through Microscopy Characterization: Alisa Stratulat; Carl Zeiss Microscopy Limited

11:45 AM Invited
Porous Covalently-bonded Porphyrinic Materials: Predictions, Properties, and Applications: Lawrence Cook; Greg Brewer; Winnie Wong-Ng; Lan Li; Catholic University of America; National Institute of Standards and Technology; Boise State University

User-related Failures — Non-Metallic Failures I
Program Organizers: Andrew Havica, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMS)

Monday AM
Location: Greater Columbus Convention Center
Room: A210
Session Chairs: Ronald Parrington, ESI; Dave Moore, Unified Engineering Inc.; Dennis McGarry, Sea Limited

8:00 AM Invited
General Considerations in Failure Analysis of Rubber and Elastomers: Jason Poulton; Akron Rubber Development Laboratory
8:40 AM
Failure Analysis of Coatings to Support Product Improvement: Jessica Crimone; Brittan Sinagra; iPPG

9:00 AM
Mechanical Properties and Fractography of Polyetheretherketone (PEEK) Composites as a Function of Filler Content: Farzana Ansari; MariAnne Sullivan; Ryan Siskey; iExponent

9:20 AM
Fractographic Analysis of Amorphous Polymers – A Comparison of Tensile, Impact and ESC Fracture Surfaces of PC, ABS and PMMA: Farzana Ansari; iExponent

9:40 AM
Analysis of a Ruptured Reinforced Thermoplastic Pipe: Emily Gates; Barbara Padgett; iDNV GL

10:00 AM Break

10:20 AM
Compression Fittings on PVC: An Industry-wide Mistake?: David Riegner; Greg Ciojekcki; Tom Easley; iS-E-A

10:40 AM Invited
Failure Analysis of Plumbing Components: Flexible Toilet Water Connectors: Dinu Matei; Eduardo Mari; Origin and Cause

11:00 AM Invited
Collaboration with a Forensic Architect: Andrew Havics; Daniel Neeb; PH2 LLC; Halliwell Engineering Associates

11:20 AM
Non-destructive Method of Detecting Cracks in Fiberglass-reinforced Bucket Truck Booms: Charles Dickinson; Bryson Brewer; iExponent

11:40 AM Invited
Utilizing a Combination of TGA and GC-MS to Estimate Health-based Risks from Off-gassed Volatile Compounds: Joseph Lemberg; Eric Guyer; Scott Seidel; Michael Garry; Joyce Tsuji; Steven Valenty; iExponent, Inc.; iAnalyze, Inc.

2:20 PM Invited
Selective Laser Sintering of Ceramic Components, Challenges and Issues: Tatsuki Ohji; iNational Institute of Advanced Industrial Science and Technology (AIST)

2:40 PM Invited
Spallation Resistance Enhancement of Thermal Barrier Coatings by Hybrid Microwave Sintering: Brian T. M.Ong; T. L. Koh; Shijie Wang; L. T. Koh; W. K. Na; iInstitute of Materials Research and Engineering (IMRE), A*STAR (Agency for Science); iST Aerospace Engines Pte Ltd

3:00 PM
Recent Advances in Green Concrete: Allen Apblett; iOklahoma State University

3:20 PM Break

3:40 PM
Luminescence Properties of Dy3+ Doped Ga2O3 Materials Synthesized by Using Wet Chemical Process: Guangran Zhang; Yiquan Wu; iAlfred University

4:00 PM
On the Design of Novel Lignin Based Green Materials: Kathryn Hall; Maharshi Dey; Yun Ji; Surojit Gupta; iUniversity of North Dakota

4:20 PM
Novel Alkali-activation Based Process for the Manufacturing of Soda-lime Glass Foamed Granules: Enrico Bernardo; Acacio Rincon Romero; iUniversity of Padova

4:40 PM
Energy Audit and Efficiency in an Aluminium Gravity Die Casting Foundry Towards Sustainability: Hamid Mehrabi; iIslamic Azad University

5:00 PM
Highly Efficient Solvolysis of Epoxy Resin Using Polyethylene Glycol/NaOH Systems: Yang Peng; Li Xiaoang; iInstitute of Electronic Engineering, China Academy of Engineering Physics

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session II
Program Organizers: Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagoya University of Technology; Surajit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Alfred Apblett, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Mrittunjay Singh, Ohio Aerospace Institute

Monday PM
Room: B233
Location: Greater Columbus Convention Center

Session Chairs: Ralf Riedel, T U Darmstadt; Vojislav Mitic, University of Nis

2:00 PM Invited
Microstructure and Mechanical Properties of B4C-TiB2-SiC Composites Fabricated via Hot Pressing Assisted by Ball Milling: Wang Weimin; Fu Zhengyi; Wang Hao; Wuhan University of Technology
Additive Manufacturing of Composites and Complex Materials III — Additive Manufacturing of Metallic Composites
Program Organizers: Dirk Lehnhuis, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Monday PM  Room: A222
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM  Invited
Shock Engineering the Additive Manufactured Graphene-metal Nanocomposite with High Density Nanotwins and Dislocations for Ultra-stable Mechanical Properties: Dong Lin1; 1Kansas State University

2:30 PM
Additive Manufacturing of Metal Matrix Composites via MELD: Joey Griffiths1; Chase Cox2; Nanci Hardwick3; Hang Yu4; 5Virginia Tech; 3Aeroprobe Corporation

2:50 PM
Additive Manufacturing (AM) of Novel Aluminum Metal Matrix Composites: Adam Polizzii1; Jeremy Iten2; 6Elementum 3D

3:10 PM
Development of Nano-Silicon Carbide Strengthened Aluminum Materials via MELD™ Processing: Wayne Daye1; Thomas Pelletiers II2; Kévin Demoulin1; Nanci Hardwick3; 7Kymera International; 6Nanomakers Corporation; 3Aeroprobe Corporation

3:30 PM  Break

3:50 PM
Microstructure and high-temperature deformation behavior of TiB2-reinforced 316L stainless steel nanocomposite developed by selective laser melting: Kye-Aho Lee1; Bandar AlMangour2; Young-Kyun Kim3; Dariusz Grzesiak4; 1Inha Univ; 2Harvard University; 3West Pomeranian University of Technology

4:10 PM
Additive Manufacturing of Copper-alumina Composite Materials: Sumit Bhattacharya1; Kun Mo2; Yinbin Miao3; Abdellatif Yacout4; 5Argonne National Laboratory

4:30 PM
Evaluation of Zirconium Oxide Nanoparticle Inks for Production of 316L Matrix Composites via the Binder Jetting Process: Dirk Lehnhuis1; Sebastian Hein1; Axel von Hehl2; Martin Ehlers3; Daniel Falkowski2; Omor Ortac1; 1Fraunhofer IFAM; 2Leibniz Institut für Werkstofforientierte Technologien (IWT); 3University of Bremen

4:50 PM
Additive Manufacturing of Cemented Tungsten Carbide with a Cobalt-free Alloy Binder by Selective Laser Melting for High-hardness Applications: Nicholas Kato1; John Pittari2; Steven Kileczewski2; Andelle Kudzal2; 1US Army Research Laboratory

Additive Manufacturing of Metals: Microstructure and Material Properties — AM Stainless Steel - Microstructure and Properties
Program Organizers: Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Monday PM  Room: A215
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Ulf Ackelid, Freemelt Company

2:00 PM  Invited
Stress-state Dependent Plasticity Model for Additively Manufactured Stainless Steel: Linking of Microstructural Phase Transformation to Macroscopic Behavior: Zhuqing Wang1; Allison Beese2; 1Pennsylvania State University

2:40 PM
Deformation Mechanisms of L-PBF 316L Stainless Steels: Thomas Voisin1; Joseph McKeown2; Jianchao Ye3; Nicholas Calta4; Zan Li5; Tien Roehling6; Melissa Santala1; Philip Depond7; Manyalibo Matthews7; Alex Hamza8; Yinmin Wang8; 2Lawrence Livermore National Laboratory; 3Oregon State University

3:00 PM
Three-dimensional Registration of Part Design, Melt Pool History and Resultant Structure in Additively Manufactured 316L Stainless Steel: Thomas Ivanoff1; Jonathan Madison2; Joshua Koepke3; Erich Schwaller3; Bradley Jared3; John Mitchell4; Laura Swiler5; 3Sandia National Laboratories

3:20 PM  Break

3:40 PM
The Effects of Alloy Composition on Microstructure of Duplex Stainless Steel Produced by Additive Manufacturing: Andrew Iams1; Todd Palmer1; 2Pennsylvania State University

4:00 PM
Three Dimensional Grain Morphologies and Local Growth Textures of AM 316L: David Rowenhorst1; Richard Fonda2; 1The US Naval Research Laboratory

4:20 PM
Understanding the size and location dependence of microstructure and Mechanical Properties of Stainless Steel 316L Rods Produced by Laser Powder Bed Fusion Process: Xianglong Wang1; Jose Alberto Muñiz-Lerma2; Mohammad Attarian Shandiz3; Oscar Sánchez-Mata4; Mathieu Brochu5; 1McGill University

4:40 PM
The Relationship Between Post-build Microstructure and the Corrosion Resistance of Additively-manufactured 17-4 Stainless Steel: Mark Stoudt1; Eric Lass2; Maureen Williams2; Richard Ricker2; Carelyn Campbell2; Kyle Levine2; 1National Institute of Standards and Technology

5:00 PM
Twinning-induced Plasticity (TWIP) in Austenitic Stainless Steel 316L Produced by Means of Additive Manufacturing: Clodualdo Aranas1; Mohsen Mohammadi2; Amir Hadadzadeh3; 3University of New Brunswick
Additive Manufacturing: Microstructure and Material Properties — Properties of AM Components
Program Organizers: Andrezj Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Monday PM
Room: A214
Location: Greater Columbus Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee

2:00 PM
Localized Dynamic Mechanical Behaviour Assessment Using Single and Cyclic nano-impact Indentations for Laser Powder Bed Fusion (L-PBF) Part Sections: Abhi Ghosh1; Mathieu Brochu1; ‘McGill University

2:20 PM
Mechanical Performance of Ti-6Al-4V Octet Truss Lattice Structures Produced Via Powder Bed Fusion (PBF): Michael Brand1; Colt Montgomery1; Robin Pacheco1; John Carpenter1; ‘Los Alamos National Laboratory

2:40 PM
Effect of Flaws on the Fatigue Behavior of Additively Manufactured Ti-6Al-4V: Griffin Jones1; Jayme Keist1; ‘Pennsylvania State University

3:00 PM
In-situ Process Monitoring and Closed-loop Control System for Metal Powder Bed Fusion: Prabir Chaudhury1; ‘Divergent3D

3:20 PM Break

3:40 PM
Direct Process Feedback in Extrusion-based Additive Manufacturing Using an ILC-based Approach: Ashley Armstrong1; Amy Wagoner Johnson1; Andrew Alleyne1; ‘University of Illinois

4:00 PM
Using Laser Ultrasounds to Measure Responses of Nickel, Titanium, and Stainless Steel Alloys Processed by Laser-based Directed Energy Deposition: Marissa Brennan1; Todd Palmer2; Max Wiedmann2; Marvin Klein2; ‘Penn State University; ‘Intelligent Optical Systems

4:20 PM
Rigorous Time Monitoring of Additive Manufacturing Processes Using High-speed Synchrotron X-ray Imaging: Niranjan Parab1; Cang Zhao1; Kamel Fezzaa1; Tao Sun1; ‘Argonne National Laboratory

4:40 PM
In-situ Defect Detection in Three-dimensional Metal Printing, Using the Structure being Built to Sense Itself: Wenyi Yang1; Sanjaya Somaratna1; Deborah Chung1; ‘State University of New York Buffalo

5:00 PM
In-situ High-energy X-ray Diffraction on Wire Arc Deposition of 308 Stainless Steel and Titanium: Adrian Losko1; Don Brown1; Maria Strantza1; Rejya Pokhare1; John Carpenter1; Jason Cooley1; Erik Watkins1; Nicholas Calu1; Ibo Matthews1; Jun-Sang Park1; Peter Kenesi1; ‘Los Alamos National Laboratory; ‘Lawrence Livermore National Laboratory; ‘Argonne National Laboratory

Additive Manufacturing: In-situ Process Monitoring and Control — Session II
Program Organizers: Ulf Ackelid, Freemelt AB; Andrezj Wojcieszynski, ATI Specialty Materials; Sudarsanam Babu, The University of Tennessee, Knoxville; Ola Harrysson, North Carolina State University

Monday PM
Room: A221
Location: Greater Columbus Convention Center

Session Chair: Ola Harrysson, North Carolina State University

2:00 PM Invited
AM Process Monitoring and Control at Layer and Melt Pool Scales: Luke Scime1; Brian Fisher1; Jack Beuth1; ‘Carnegie Mellon University

2:40 PM
3:00 PM
3D Printing of Zircon for Ceramic Molds: Piyush Pai Raikar1; Jing Zhang1; Hye-Young Park2; Yeon-Gil Jung1; 1Indiana University Purdue University Indianapolis; 2Changwon National University, Republic of Korea

3:20 PM Break

3:40 PM
Creep Modelling of 3D Printed Nickel Based Super alloy: Vighnesh Shetty1; Jing Zhang1; 1Indiana University Purdue University, Indianapolis

4:00 PM
Design of 3D Printer Component for 17-4PH Based Slurry Extrusion Printing: Harshal Dhamade1; Jing Zhang1; 1Indiana University - Purdue University Indianapolis

Additive Manufacturing: Powder Characterization and Recycling — Role of Powder Characteristics on Additive Manufacturability

Program Organizers: Sudarsanam Babu, The University of Tennessee, Knoxville; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University

Monday PM  Room: A224
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Peeyush Nandwana, ORNL

2:00 PM
Effects of Powder Characteristics and Process Parameters on the Microstructural and Mechanical Properties of LENS Ti-6Al-4V: Courtney Morgan1; William Young1; Aref Yadollahi1; Haley Doude1; Linkan Bian1; 1Mississippi State University

2:20 PM
Investigation of the Properties of Electron Beam Melted Parts Using Coarse Ti6Al4V Powder Feedstock: Hengfeng Gu1; Timothy Horn1; Harvey West1; Ola Harrysson1; 1UNC State University

2:40 PM
From Powder to Part: Powder Evolution Effects on Processing-microstructure-properties Relationship in AM: Biju Na Kim1; Pedro Rivera2; 1LPW / Lancaster University; 2Lancaster University

3:20 PM Break

3:40 PM
Selective Laser Melting of Al10SiMg Alloys from Gas Atomized Powders with Variable Size Distribution: Sharon Park1; Holden Hyer1; Le Zhou1; Bjorn Toltentino1; Edward Dein1; Brandon McWilliams2; Kyu Cho2; Yongho Sohn1; 1University of Central Florida; 2U.S. Army Research Laboratory

4:00 PM
The Role of Powder Properties on Additive Manufacturability of AlSi10Mg: Nathan Kistler1; 1LPW Technology

4:20 PM
Use of 316L Stainless Steel Powder with Bimodal Size Distribution in Selective Laser Melting: Hannah Coe1; Somayeh Pasebani1; 1Oregon State University

4:40 PM
Powder Characterization and LPBF Parameter Development for AF9628: Erin Hager1; 1AFIT/ENY

Advanced Coatings for Wear and Corrosion Protection — Advanced Coatings for Wear and Corrosion Protection II

Program Organizers: Evelina Vogli, LM Group Holdings Inc; Fei Tang, Dnv Gl; Timothy Hall, Faraday Technology Inc.; Jing Xu, Faraday Technology Inc.; Santosh Vijapur, Faraday Technology Inc.

Monday PM  Room: C160A/160B
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Evelina Vogli, LiquidMetal Group Holdings Inc.; Jing Xu, Faraday Technology Inc.; Santosh Vijapur, Faraday Technology Inc.

2:00 PM
Characterizations of CrN-based Hard Coating Materials with Addition of GaN: Yusei Mizuno1; Tadachika Nakayama1; Hisayuki Sueatsu1; Tsuneo Suzuki1; 1Extreme Energy-Density Research Institute, Nagakyo University of Technology

2:20 PM
Ultrathin Graphene Coating on Monel 400 Alloy for Durable Corrosion Resistance: Sanjib Patwary1; RK Singh Raman1; Parna Chakraborty Banerjee1; 1Monash University

2:40 PM
Plasma Electrolytic Oxidation Coatings on Light Alloys (Al, Mg, Ti): Properties and Applications: Vahid Dehnavi1; Mojtaha Vakil-azghand1; Arash Fatollah-alhosseini1; James Noel1; David Shoesmith1; 1Western University; 2Bu-Al Sina University

3:00 PM
Formation Mechanisms of Wear-protective Tribofilms by ZDDP, Ionic Liquid, and their Combination: Wei Guo1; Yan Zhou1; Xiahan Sang3; Donovan N. Leonard1; Jun Qu1; Jonathan D. Poplawsky2; 1Material Science Research and Development, Timken World Headquarters; 2Materials Science and Technology Division, Oak Ridge National Laboratory; 3Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

3:20 PM Break

3:40 PM
Coating Wear Performance of REACH Compliant Trivalent Chromium Hard Chrome: Timothy Hall1; Rajeswaran Radhakrishnan2; Stephen Snyder1; Jing Xu1; Maria Inman1; EJ Taylor1; George Bokisa2; Mark Feathers2; 1Faraday Technology Inc.; 2COVENTYA Inc.; 3U.S. Army Aviation and Missile Command

4:00 PM
Direct Electrodeposition on 6061 Aluminum: Timothy Hall1; Jing Xu1; Stephen Snyder1; Maria Inman1; EJ Taylor1; 1Faraday Technology Inc

4:20 PM
Inhibition of Engineering Materials in Sulphuric Acid Solution Using Waste Product: Omotayo Sanni1; API Popoola2; N. Leonard3; 1U.S. Army Aviation and Missile Command

4:40 PM
Variables that Effect Reproducibility in Cyclic Corrosion Testing and their Relation to Coating’s Physical Properties: Nicole Rakers1; Kathryn Hoffman1; Arif Mubarek1; 1PPG
Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Advanced Manufacturing I

Program Organizers: Mohammad Elahinia, University of Toledo; Markus Chmielus, University of Pittsburgh; Reginald Hamilton, The Pennsylvania State University; Hamdy Ibrahim, University of Tennessee at Chattanooga; Haluk Karaca, University of Kentucky; Mohammad Mahtabi, University of Tennessee at Chattanooga; Reza Mehrabi, University of Toledo; Reza Mirzaeifar, Virginia Tech

Session Chairs: Haluk Karaca, University of Kentucky; Mohammad Mahtabi, University of Tennessee at Chattanooga; Vibhor Chaswal, University of Cincinnati; Sayed Ehsan Saghaian, University of Kentucky

Monday PM
October 15, 2018
Room: B230
Location: Greater Columbus Convention Center

2:00 PM Invited
Wire Size Effect on Kirkendall Pore Evolution in Ti-coated Nickel Wires: Arun Bhattacharjee¹; Ajith Achuthankutty¹; Aaron Yost²; Dinc Erdeniz³; David Dunand³; Ashley Paz y Puente¹; ¹University of Cincinnati; ²Northwestern University

2:40 PM
Metal-polymer and Polymer-polymer Shape Memory Hybrids: Vibhor Chaswal¹; Ruchinda Gooneratne¹; Mangu Srilharsha¹; ¹University of Cincinnati; ²University of Kentucky

3:00 PM
Piezoelectric and Pyroelectric Behavior of Three-dimensionally Printed Polymer without Filler or Poling, with Relevance to Monitoring and Actuation: Yashvardhan Mandhana¹; Patatri Chakraborty¹; Chi Zhou¹; Deborah Chung¹; ¹State Univ of New York Buffalo

3:20 PM Break

3:40 PM
Comparative Analysis of Internal Features of EBM with a Flash Tomography and Computed Topography Technique: Ohluwaseun Adewumi¹; ¹North Carolina A&T

4:00 PM
Magnetocaloric Effect in Heusler Alloys Derived from Cellular Automata Simulations: Javier Blázquez¹; Alejandro Manchón-Gordon¹; Clara Conde¹; Victorino Franco¹; Alejandro Conde¹; ¹University of Sevilla

4:20 PM
Influence of Cu Addition and Laser Processing Parameters on the Geometrical Characteristics of Icosahedral Al-Cu-Fe Coatings on Ti-6Al-4V Alloy: Esther Akinlabi¹; Olawale Fatoba¹; Stephen Akinlabi¹; Mamookho Makhatha¹; ¹University of Johannesburg

Advanced Materials for Harsh Environments — Advanced Materials for Harsh Environments II

Program Organizers: Navin Manjooran, Siemens AG; Gary Pickrell, Virginia Tech

Monday PM
Location: Greater Columbus Convention Center

Session Chairs: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

2:00 PM Invited
Metallic Alloys Development for Additive Manufacturing Using Gas Atomization and Powder Bed Fusion: Le Zhou¹; Yongho Sohn¹; ¹University of Central Florida

2:40 PM
Laboratory-scale Replication of Complex High Temperature Corrosion Behavior Found in Service: Matthew Kovalchuk¹; ¹University of Pittsburgh

3:00 PM
New Insights into Type II Hot Corrosion of a Current Generation Nickel-based Turbine Blade and Disk Superalloy: Emily Kistler¹; Brian Gleeson¹; ¹University of Pittsburgh

3:20 PM
Thermo-mechanical Performance and Microstructural Correlation in ZrB₂-based Ultra-high Temperature Ceramic Composites: Ambreen Nisar¹; Kantesh Balani²; ¹Indian Institute of Technology Kanpur

3:40 PM Break

4:00 PM
Thick Film Electroceramic Composites for Harsh-environment Sensor Applications: Kavin Sivaneri Varadharajan¹; Katarzyna Sabolsky¹; Edward Sabolsky¹; Harish Palakurthi¹; Daryl Reynolds¹; Konstantinos Sierros¹; ¹West Virginia University

4:20 PM
Transition Metal Silicide-based Ceramic Composites for High Temperature and Harsh Environment Sensing: Gunes Alp Yakaboylu¹; Rajalekshmi Chockalingam¹; Katarzyna Sabolsky¹; Tugrul Yumak²; Edward Sabolsky³; ¹West Virginia University; ²SRS Holdings LLC

4:40 PM
Wireless Embedded Multifunctional Sensor System for In-situ Health Monitoring of Refractory Liners in Fossil Energy Systems: Rajalekshmi Pillai¹; Sreekumar Chockalingam¹; Samuel Baker²; ¹SRS Holdings LLC
Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Session II

Program Organizers: Iver Anderson, Iowa State University / Ames Laboratory; Carol Handwerker, Purdue University; Albert T. Wu, National Central University

Monday PM  Room: B140/141
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Iver Anderson, Iowa State Univ; Eric Cotts, Binghamton University

2:00 PM Invited
Thermomechanical Reliability of Lead-free High Temperature Solder Alloys: Faramarz Hadian1; Francis Mutuku1; Harry Schoeller2; Eric Cotts3; Binghamton Univ; Universal Instruments; Binghamton University

2:20 PM
Inhibiting the Large Primary Ag3Sn in Cu/Sn-Ag/ENIG Solder Joints with Additional Pd Deposit: Rui-Wen Song1; Jenq-Gong Duh2; National Tsing Hua University

2:40 PM
Growth Behavior of Recrystallization Grain in Lead-free Solder Joint after Deformation: Fu Guo1; Xuewei Zhao1; Yishu Wang1; Jing Han1; Beijing University of Technology

3:00 PM
Improving Shear Strength of Sn-3.0Ag-0.5Cu Solder Joints via Adding Minor Ni into Solder Alloy: Tzu-Ting Chou1; Wei-Yu Chen1; Rui-Wen Song1; Jenq-Gong Duh2; National Tsing Hua University

3:20 PM Break

3:40 PM Invited
Mechanism of Recrystallization in Sn-based Ball Grid Array Lead-free Solder Joints during Thermomechanical Fatigue: Fu Guo1; Shihai Tan1; Beijing University of Technology

4:00 PM
IMC Growth Behavior Along c-axis of Sn Grain under Current Stressing: Fu Guo1; Yan Wang2; Limin Ma3; Beijing University of Technology; Beijing University of Technology

4:20 PM
Ostwald Ripening in near eutectic SnAgCu solder alloys: Randy Owen1; Mohammed Genanu1; Eric Cotts1; Binghamton University, Physics Departement

Advanced Steel Metallurgy: Products and Processing — Lightweight Steels

Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

Monday PM  Room: A226
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Allan Arenas-Serrano, Bilstein Cold Rolled Steel; Daniel Baker, GM Global Propulsion Systems

2:00 PM Keynote
Newly Commercialized High Mn Steel Products and Process for Various Applications: Sang-Hyeon Lee1; Imshick Suh1; Sung Kyu Kim1; TaeKyo Han1; Won-Tae Cho1; Unhae Lee1; Myeong Hun Kang1; Dongho Lee1; Sang Ho Han1; POSCO

2:40 PM
Characterizing Microstructures in High Mn, High Al Steels for Next Generation Thick Plate Applications: Katherine Sebeck1; Demetrios Tsilepis1; Ian Toppler1; TARDEC

3:00 PM
Effects of Micro-alloying and Processing History on Fe-Mn-Al-C Steel: Krista Limmer1; Daniel Field1; Bryan Cheeseman1; Ryan Howell1; US Army Research Laboratory; US Army PEO GCS

3:20 PM
Low-density Steels Scientific and Technological Macro-indicators: Malena Andrade1; Bráulio Oliveira2; Douglas Milanez2; Daniel Leiva1; Guilherme Zepot1; Federal University of São Carlos

3:40 PM Break

4:00 PM
Trade-off between Strength and Ductility by Variation in Microstructural Features and Recrystallization Kinetics of Medium Mn Multicomponent Alloy: Arnab Sarkar1; Tapas Kumar Bandyopadhyay1; Indian Institute of Technology Kharagpur

4:20 PM
Hot Deformation Behavior of a Low Density Austenitic Steel: Dean Pierce1; Katherine Sebeck2; Krista Limmer3; Govindarajan Muralidharan1; Tom Muth1; David Frederick2; Zhili Feng3; Oak Ridge National Laboratory; US Army Tank Automotive Research Development & Engineering Center (TARDEC); US Army Research Laboratory

4:40 PM
Microstructural Evolution and Age Hardening Behavior of a Lightweight Ultrahigh Strength Fe-15Mn-11Al-0.9C-6Ni Steel: Michael Piston1; Missouri Science & Technology

5:00 PM
A Study on the Micromechanical Deformation and Phase Transformation Behaviors in Lightweight Duplex Steel: Shi-Hoon Choi1; Eun-Young Kim1; Wan-Chuck Woo1; Dong-Kyu Kim1; Sunchon National University; Korea Atomic Energy Research Institute
Advances in Dielectric Materials and Electronic Devices — Dielectrics and Magnetoelectrics II
Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, The University of Texas at San Antonio; Rick Ubic, Boise State University; Danilo Suvorov, Jožef Stefan Institute

Monday PM Room: B132 Location: Greater Columbus Convention Center
October 15, 2018

Session Chairs: Rick Ubic, Boise State University; Luiz Fernando Cotica, State University of Maringa

2:00 PM Invited
Magnetoelectric Gyrators for I-V Conversion: Dwight Viehland1; Chung Ming Leung2; Xin Zhuang1; 1Virginia Tech

2:20 PM Invited
NSMM Modeling and Design of Energy Conversion Materials: Steven Tidrow1; 1Alfred University

2:40 PM
A Phenomenological Theory for Lead-free Piezoelectrics based on Ba(Zr,Ti)2:40 PM
O3-(Ba,Ca)TiO3 (BZT-BCT) Solid Solutions: George Rossetti2; Nasser Khakpash3; 1University of Connecticut

3:00 PM
Dipole Engineering: Increasing Material Breakdown Strength and Capacitor Energy: Steven Tidrow1; Soutik Betal1; Dustin Travis3; Jessica Scoones1; Walter Schulze1; Steven Pilgrim1; 1Alfred University

3:20 PM Break

3:40 PM
Orientation-modulated Crystal Structure and Energy Storage Behavior of Epitaxial Antiferroelectric (Pb0.98La0.02)(Zr0.02Ti0.98)O3 thin films: Min Gao1; Xiao Tang1; Chung Ming Leung2; Jiefang Li3; Dwight Viehland4; 1Virginia Tech

4:00 PM
Lead Free Ferroelectric [K(NbO3)1-x](BaNi1/2Nb1/2O3-d)1-x : An Insight into Its Dielectric, Ferroelectric Ordering, and Phonon Behaviors.: Blanca Rosas1; Karuna Mishra1; Alvaro Instan1; Ram Katiyar1; 1University of Puerto Rico

4:20 PM
Effects of Electrode Microstructure on Resistance Degradation of SrTiO3 thin films: Daniel Long1; Biya Cai1; Elizabeth Dickey1; 1North Carolina State University

4:40 PM
Mechanochemical synthesis of High Tp La2,Ti3O9 Piezoceramic: Kaustubh Kambale1; Ajit Kulkarni1; Narayanavankataramani1; Anruta Vairagade1; Sandeep Butee1; 1College of Engineering Pune; 2Indian Institute of Technology Bombay

Advances in Zinc-coated Sheet Steel Processing and Properties — Advances in Zinc-coated Sheet Steel Processing and Properties II
Program Organizers: Frank Goodwin, ILZRO; Joseph McDermid, McMaster University

Monday PM Room: A225 Location: Greater Columbus Convention Center
October 15, 2018

Session Chair: Erika Bellhouse, ArcelorMittal Dofasco

2:00 PM
A Novel Approach to the Direct Quantification of Iron Dissolution from the Steel Strip into the 55Al-2Mg-1.6Si-Zn Coating Alloy Bath: Syed Islam1; Daniel Parker2; Nega Setargew2; Abdul Khaliq1; Ma Qian3; 1RMIT University/ARC Research Hub for Australian Steel Manufacturing; 2BlueScope/ARC Research Hub for Australian Steel Manufacturing

2:20 PM Invited
Growth of Intermetallic Compounds (IMCs) in an Al-Zn-Si-Mg Alloy Coating Bath: Abdul Khaliq1; Daniel J. Parker2; Nega Setargew2; Ma Qian3; 1RMIT University, Melbourne Australia/ ARC Research Hub for Australian Steel Manufacturing, University of Wollongong; 2BlueScope Innovation/ARC Research Hub for Australian Steel Manufacturing, University of Wollongong

2:50 PM
Microstructural Evolution in Al-Si Coating of Different Thickness of Hot Stamping Steels: Igor Yakubtsov1; Raj Sohmshetty1; 1Ford Motor Company

3:10 PM
Corrosion Resistance of Zinc Coatings Doped with Aluminum Obtained under Conditions of SHS: Borys Sereda1; Dmytro Sereda2; 1Zaporizhzhya State Engineering Academy; 2DITU

3:30 PM Break

3:50 PM
Investigation of the Microstructure and Mechanical Properties of Sheet Steel after Obtaining Zinc Coatings under SHS Conditions: Borys Sereda1; Dmytro Sereda2; Irina Sereda1; 1DITU

4:10 PM
TEM Characterisation of the Intermetallic Alloy Layer on 55%Al-Zn-2%Mg-1.5%Si Alloy Coated Steel: Syed Islam1; Daniel Parker2; Nega Setargew2; Abdul Khaliq1; Ma Qian3; 1RMIT University/ARC Research Hub for Australian Steel Manufacturing; 2BlueScope/ARC Research Hub for Australian Steel Manufacturing

4:30 PM
Effect of Shearing Quality on Forming Limit Diagram for Vinyl Coated Metal: Jonghun Yoon1; 1Hanyang Univ. ERICA
Monday PM  Room:  C170
October 15, 2018  Location:  Greater Columbus Convention Center

2:00 PM  Invited
Alpha Sigma Mu Lecture

2:20 PM  Invited
Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — Novel Synthesis & Boron Suboxide
Program Organizers: Jens Kunstmann, Technische Universitat Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

Monday PM  Room:  B244/245
October 15, 2018  Location:  Greater Columbus Convention Center

Session Chair:  Scott Beckman, Washington State University

2:00 PM
Boron Suboxide: Changes in Densification and Microstructure Using Silica and Rare Earth Silicate Additives: Kristopher Behler1; Jerry LaSalvia1; Chris Marvel1; Jenn Synovczenksy-Dunn1; Scott Walck1; W. Shoulders1; Martin Harmer1; 1Air (Survive Engineering); 2ARL; 3Lehigh University; 4ARL (ORAU)

2:20 PM
Experimental Investigation of the Stoichiometry-hardness Relationship in Boron Suboxide: Taylor Shoulders1; Kristopher Behler1; Jerry LaSalvia1; 1ORAU; 2SURVICE; 3US Army Research Lab

2:40 PM
Synthesis, Sintering and Mechanical Properties of Boron Suboxide (B6O) and Its Composites: Attu Khan1; Kelvin Xie1; Vladyslav Domnich1; Kevin Henker1; Richard Haber1; 1Rutgers University; 2Johns Hopkins University

3:00 PM
Effects of Oxygen Partial Pressure on the Oxidation of Boron-rich Silicon Boride: Muhammad Imam1; Ramana Reddy1; 1University of Alabama

3:20 PM  Break

3:40 PM
Boron Nitride Aerogel as a Thermal Conductive 3D Network for Phase Change Materials: Marjan Kashipour1; Russell Dent1; Niin Mehra1; Jiahua Zhu1; 1University of Akron

4:00 PM
Improvement in Wear Resistance of AISI H13 Steel by Pack-boronizing Method: Niketan Mankhani1; 1Kalyani Center for Technology and Innovation

4:20 PM
Hardening of Steels with Boron Coatings Obtained under Self-propagating High Temperature: Borys Sereda1; Dmytro Sereda1; 1Zaporizhzhya State Engineering Academy; 2DDTU

2:00 PM  Invited
Ceramic and Crystal Materials for Optics and Photonics — Session II
Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikuesue, World-Lab. Co., Ltd; Mark Dubinskiy, Amy Research Laboratory

Monday PM  Room:  A113
October 15, 2018  Location:  Greater Columbus Convention Center

Session Chairs:  Jonathan Salem, NASA; Ivar Reimann, Colorado School of Mines

2:00 PM  Invited
Micro Domain and Boundary Control for Ubiquitous Power Laser: Takunori Taira1; 1Inst. for Molecular Science

2:40 PM
Double Cladded Single Crystal Fiber for High-energy Lasers: Shyam Bayrur1; Woonhong Kim1; Brandon Shaw1; Jason Myers1; Syed Qadri1; Rajesh Thapa1; Charles Askins1; John Peele1; Daniel Rhonehouse1; Steven Bowman1; Daniel Gibson1; Joseph Kolis1; Brad Stadler1; Jashinder Sanghera1; 1Naval Research Laboratory; 2KeyW Corp.; 3Clemson University

3:00 PM
Methods to Improve Particle Segregation and Mixing in Transparent Ceramic Nanocomposites for Mid-IR Solid State Lasers: Victoria Blair1; 1Air Force Research Laboratory; 2Steven Kilczewski1; Aubrey Fry2; Anthony DiGiovanni2; Zackery Fleischman2; 1Army Research Laboratory; 2ORAU

3:20 PM  Break

3:40 PM  Invited
Development of Transparent Ceramic Fibers for Laser Applications: Hyunjun Kim1; Randall Hay1; Randall Corns1; 1Air Force Research Laboratory & UES, Inc.; 2Air Force Research Laboratory

4:20 PM  Invited
Fluorescent MgAlON Spinel Transparent Ceramics Doped by Functional Metallic Cations: Preparation, Structure and Properties: Hao Wang1; Bowen Chen1; Bingtian Tu1; Weimin Wang1; Zhengyi Fu1; 1Wuhan University of Technology

5:00 PM  Invited
Spark Plasma Sintering of Transparent Birefringent Ceramics with Fine Microstructures: Byungnam Kim1; 1National Inst for Materials Science

Characterization & Methods in Failure Analysis — Tools & Techniques II
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculte polytechnique de MONS (FPMs)

Monday PM  Room:  A211
October 15, 2018  Location:  Greater Columbus Convention Center


2:00 PM
Rapid, Large Elemental Profiles by SEM/EDS Facilitated by a Silicon Drift Detector: John Konopka1; 1Thermo Fisher Scientific
2:00 PM Invited
Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Deformation and Transformations
Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Carl Boehler, Michigan State University; Kayla Calvert, TIMET- HTL; Yufeng Zheng, The Ohio State University
Monday PM Room: C150 Location: Greater Columbus Convention Center
Session Chairs: Adam Pilchak, US Air Force Research Lab; Asli Bulutsuz, Yildiz Technical University

2:20 PM Case Studies of Large Elemental Profiles Acquired by SEM/EDS Using a Silicon Drift Detector: John Konopka; Thermo Fisher Scientific
2:40 PM Invited
Failure Analysis of Rapid-aged Porcelain Insulators: Max Modugno; Hyojin Lee; William Carthy; Alfred University; New York State College of Ceramics at Alfred University
4:00 PM Invited
Failure Analysis of Masonry Building: Ankit Mahajan; Chandigarh University
4:20 PM Invited
Characterization of the Composition of Plastic Parts as an Often Necessary Step in a Failure Analysis: Tim Jur; Richard Edwards; Caleb Davis; Engineering Design & Testing Corp

3:00 PM Invited
A Procedure for Examination of Combustion Product Analysis: Andrew Havics; PH2 LLC

3:20 PM Break
3:40 PM
Strain Path Dependency of Damage Evolution in Titanium Alloy: A Multi-field Mapping Study: Jiyun Kang; Cernal Cem Tasan; MIT
5:20 PM
Effect of Caliber Rolling Temperature on Room and Elevated Temperature Tensile Properties of Ti-6Al-4V Alloy: Jogadeesh Babu S M; S. V. S. Narayana Murty; N. Prabhu; Indian Institution Of Technology Bombay; Vikram Sarabhai Space Center, ISRO; Indian Institute of Technology Jodhpur

2:50 PM Break
4:10 PM Invited
Development of a Quantitative Microstructure Simulator to Decipher Composition-processing-microstructure Relationships in Titanium Alloys: Rongpei Shi; Tae Wook Heo; Saad Khairallah; Joseph Mckewon; Manyalibho Matthews; Lawrence Livermore National Laboratory
4:40 PM
Investigation of Different Severe Plastic Deformation Methods Effect on Ti3Nb13Zr: Asli Günay Bulutsuz; Kadir Özaltin; Witold Chrominski; Malgorzata Lewandowska; Mehme Emir Yurç; Yildiz Technical University; Warszawa University of Technology

5:00 PM
Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session I
Program Organizers: Hailao Zhang, University of North Carolina at Charlotte; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory; Gurpreet Singh, Kansas State University; Kejie Zhao, Purdue University; Jian Shi, Rensselaer Polytechnic Institute
Monday PM Room: D180 Location: Greater Columbus Convention Center
Funding Support provided by: MilliporeSigma
Session Chairs: Hailao Zhang, University of North Carolina at Charlotte; Jian Shi, Rensselaer Polytechnic Institute

2:00 PM Invited
Metal Nanoparticles Synthesized via Metal-in-Li Solutions: Tao Xu; Department of Chemistry and Biochemistry
2:50 PM
Nanorods: From Synthesis Science to Metallic Glue Technology: Hanchen Huang; Northeastern University

3:10 PM
Novel Soldering of Magnetic-assisted Self-assembled Multi-segment Metallic Nanowires: Jirui Wang; Fan Gao; Chefu Su; Junwei Su; Hongwei Sun; Zhiyong Gu; University of Massachusetts Lowell
3:30 PM Break
3:50 PM Invited
Three-dimensional Mapping of Topological Relicts of Symmetry Breaking in Functional Nanomaterials: Edwin Foltyn; Dmitry Karpov; New Mexico State University
Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium — The Classroom and Laboratory

Program Organizers: Gregg Janowski, University of Alabama at Birmingham; Devarajan Venugopalan, University of Wisconsin-Milwaukee; Thomas Bieler, Michigan State University; Jeffrey Fergus, Auburn University; Janet Callahan, Boise State University; Ronald Gibala, University of Michigan; Tonya Stone, Mississippi State University

Monday PM  Room: B232
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Jeffrey Fergus, Auburn University; Gregg Janowski, University of Alabama at Birmingham

2:00 PM  Invited
Incorporating Service-learning and Storytelling for a More Inclusive Materials Science Education: Eric Jankowski; ‘Boise State University

2:40 PM
Engaging Students through Research Sprints: Daniel Christie; Matteo Caligaris; ‘Elsevier

3:00 PM
Additive Manufacturing in Undergraduate Engineering Curriculum: Alison Polak; Cindy Waters; ‘The Ohio State University; ‘North Carolina A&T State University

3:20 PM  Break

3:40 PM
Utilizing Digital Data in an Undergraduate Materials Kinetics Course: Susan Gentry; ‘University of California, Davis

4:00 PM
Curricular Innovations at the South Dakota School of Mine and Technology: Experimental Learning Outcomes and Assessment: Michael West; William Cross; Jon Kellar; Bharat Jasthi; Grant Crawford; Sadegh Safarazadeh; ‘South Dakota School of Mines and Technology

4:20 PM
Micro-projects to Engage, Educate and Entertain: Mike Ashby; Hannah Melia; Luca Masi; Marc Fry; ‘University of Cambridge; ‘Granta Design

4:40 PM
The Role of Locally Sourced Materials in Engineering for Humanity Education: Ian Netleship; Kent Harries; ‘University of Pittsburgh

5:00 PM
Experiences and Outcomes of Teaching Senior Capstone Course: Raghu Echempati; ‘Kettering University

Environmental Degradation and Embrittlement of Structural Metals — Stress Corrosion Cracking II

Program Organizers: Jun Song, McGill University; Ankit Srivastava, Texas A&M University; Homero Castaneda, Texas A&M University; Salim Brahimi, McGill University / IBECA Technologies; Frank Cheng, University of Calgary; Ronald Miller, Carleton University; Xin Pang, Corrmatmaterials,Natural Resources Canada; Stephen Yue, McGill University

Monday PM  Room: C162A/162B
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Ankit Srivastava, Texas A&M University

2:00 PM  Invited
An Experimental Irradiation Assembly for the Performance of In-Reactor IASCC Tests under Cyclic Loading: Sergei Shipilov; ‘Corrosion Engineering Solutions Ltd.

2:30 PM
An Application of Stochastic Modeling to PitCrack of Spent Nuclear Fuel Canisters: Zeev Shayer; ‘Colorado School of Mines

2:50 PM
Direct Observation of Pitting Corrosion Evolutions on Carbon Steel Surfaces at the Nano-to-micro-scales: Erika La Plante; Peng Guo; Bu Wang; Xin Chen; Magdalena Balonis; Mathieu Bauchy; Gaurav Sant; ‘University of California Los Angeles; ‘University of Wisconsin-Madison

3:10 PM
Water Infrastructure Corrosion: What Prevents Us from Preventing It?: Sergei Shipilov; ‘Corrosion Engineering Solutions Ltd.

3:30 PM  Break

3:50 PM Invited
Localised Corrosion of Stainless Steel Reinforcements in Concrete: David Bastidas; ‘The University of Akron-NCERCAMP

4:20 PM
Microstructure and Hydrogen Accelerated Fatigue Crack Growth Rates of Pipeline Steels: Eun-Ju Song; Joseph Ronevich; ‘Sandia National Laboratories

4:40 PM
Evaluating the Potential for Atmospheric Corrosion and Subsequent Stress Corrosion Cracking of SS304 Used for Dry Storage of Spent Nuclear Fuel: Tim Weirich; Christopher Alexander; Charles Bryan; Eric Schindelholz; Jenifer (Warner) Locke; ‘Ohio State University; ‘Sandia National Laboratories
Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Mechanical Properties of Glasses
Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Monday PM
Room: A115
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Increasing the Strength of Glass: Sheldon Wiederhorn¹; Theo Fett²; ¹National Institute of Standards and Technology; ²Karlsruhe Institute of Technology

2:30 PM Invited
High Strength Glass for Foldable Applications: Timothy Gross¹; ¹Coming Research and Development Corporation

3:00 PM
Indentation Behavior of Glass Studied by Large Scale Molecular Dynamics Simulation: Liping Huang¹; Binghui Deng¹; Haidong Liu¹; Yunfeng Shi¹; ¹Rensselaer Polytechnic Institute

3:20 PM Break

3:40 PM Invited
Network Topology and Property Understanding in Borate Glasses: Randall Youngman¹; ¹Coming Incorporated

4:10 PM Invited
Pressure Effects on Boron and Aluminum Coordination Numbers and Mechanical Properties: Jongshi Wu¹; Timothy Gross¹; Liping Huang¹; Siva Priya Jaccani¹; ¹Coming Inc.; ²Rensselaer Polytechnic Institute

4:40 PM
Applying Topological Constraint Theory to Six-fold-coordinate Amorphous Hydrogenated Boron Carbide: Michelle Paquette¹; Bradley Nordell¹; Anthony Caruso¹; Paul Rulis¹; Nathan Oyler¹; William Lanford¹; David Gidley¹; Ridwan Sakidja¹; Jinwoo Hwang¹; Sean King¹; ¹University of Nebraska-Lincoln; ²University at Albany; ³University of Michigan; ⁴Missouri State University; ⁵Ohio State University; ⁶Intel Corporation

5:00 PM
Understanding the Role of Zirconia on Crystallization, Microstructure and Mechanical Performance K-Mg-B-Al-Si-F Based Glasses: Mrinmoy Garai¹; Shibayan Roy¹; ¹Indian Institute of Technology (IIT) Kharagpur

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties I
Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frajford, IMR Test Labs - Portland

Monday PM
Room: A212
Location: Greater Columbus Convention Center

Session Chairs: Jaret Frajford, IMR Test Labs - Portland; Chris Bagnall, MCS Associates, Inc; Mike Keeble, Buehler, A Division of ITW

2:00 PM Invited
Analyzing the Effect of Overheating HY-80/100 Steel: Gabriel Lucas¹; Brian Battle¹; Johnathon Brehm¹; ¹Scot Forge Company; ²University of Wisconsin-Madison

2:20 PM
Austenite-bainite Transformation Kinetics in Austempered AISI 5160 Steel: Xue Han¹; Gary Barber¹; Zhenpu Zhang¹; Xichen Sun¹; Bingxu Wang¹; Jian Zhu¹; ¹Oakland University; ²Fiat-Chrysler LLC

2:40 PM
Dynamic Hall-petch Effect in AISI 321 Austenitic Stainless Steel: Role of Grain Size and Deformation Mode: Ahmed Tiamiyu¹; Akindele Odeshi¹; Jerzy Szpunar¹; ¹University of Saskatchewan

3:00 PM Invited
The Application of Fracture Toughness Testing Using Vickers Indents: Michael Keeble¹; ¹Buehler

3:20 PM Break

3:40 PM Invited
Hardness Testing Per ASTM E18: Daniel Dennies¹; James Lane²; ¹DMS, Inc.; ²Professional Analysis and Consulting, Inc.

4:00 PM Invited
Evaluation of Hardness Test Blocks: George Vander Voort¹; ¹Vander Voort Consulting L.L.C.

4:20 PM Panel Discussion: The members of this panel shall represent various industries, ASTM and ISO committees, etc.; shall discuss the various types of hardness testing; and debate issues brought up by the moderator and the audience.
Innovative Processing and Synthesis of Ceramics, Glasses and Composites — Processing II  
Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jitendra Singh, Retired, U.S. Army Research Laboratory  
Monday PM Room: A120  
October 15, 2018 Location: Greater Columbus Convention Center  
Session Chairs: Narsingh Singh, University of Maryland, Baltimore County  

2:00 PM Invited  
Development of Large Bandgap Materials Using Reactive Growth in Al-Si Eutectic for Optical and RF Applications: Narsingh Singh; Ching Hua Su; Puneet Gill; Bradley Arnold; Fow-Sen Choa; Brian Cullum; Kamdeo Mandal; Christopher Cooper; University of Maryland, Baltimore County; NASA Marshall Space Flight Center  

2:30 PM  
Innovation of Graphene Fibre Composite Processing Using Pressurised Gyration: Amalina Amir; Harshit Porwal; Santharavathanan Mahalingam; Mohan Edirisinghe; University College London; Queen Mary University of London  

2:50 PM  
Governing Mechanisms of Crack-Healing in Ceramic Materials: Fariborz Tavangarian; Pennsylvania State University, Harrisburg  

3:10 PM  
In-situ High Temperature Micromechanical Testing of Ultrafine Grained Yttria-stabilized Zirconia Processed by Spark Plasma Sintering: Jaehun Cho; Jin Li; Qiang Li; Han Wang; Jie Ding; Sichuang Xue; Haiyan Wang; Troy Holland; Amiya Mukherjee; Xinghong Zhang; Purdue University, Colorado State University; University of California, Davis  

3:30 PM Break  
3:50 PM  
Morphology Control of Metallic Coatings by Electrochemical Deposition: Manoj Mahapatra; Mark King; University of Alabama at Birmingham  

4:10 PM  
Processing Effects on Dielectrics Produced via Aerosol Deposition: Eric Patterson; Scooter Johnson; Edward Gorzkowski; U.S. Naval Research Lab  

4:30 PM  
Single Crystal Alpha-alumina Nanofibers: Faez Mikaeli; Ohio State University  

4:50 PM  
Physical, Structural and Optical Properties of Doped Vanadate Systems: Savidh Khan; Kulvir Singh; Thapar Institute of Engineering and Technology  

5:10 PM  
Morphological Transition and Evolution of Shapes in Glassy State: Narsingh Singh; Fow-Sen Choa; Stacey Sova; Christopher Cooper; Brad Arnold; Lisa Kelly; K.D. Mandal; Narayan Singh; University of Maryland, Baltimore County; Indian Institute of Technology (BHU) Varanasi  

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Structure & Chemistry  
Program Organizers: John Blendell, Purdue University; Ming Tang, Rice University; Shen Dillon, University of Illinois; Wayne Kaplan, Technion - Israel Institute of Technology; Dominique Chatain, CNRS, Aix-Marseille University  
Monday PM Room: A122  
October 15, 2018 Location: Greater Columbus Convention Center  
Session Chair: Hadas Sternlicht, Brown University  

2:00 PM Invited  
Electric Field Effects on Ceramic Grain Boundaries: Wei Qin; Lauren Hughes; Klaus Van Benthen; University of California, Davis  

2:30 PM Invited  
Combining Density Functional Theory Calculations with Machine Learning for Multi-scale Insights into Mo Alloy Grain Boundaries: Richard Tran; Hui Zheng; Chi Chen; Xiangguo Li; Naixue Zhou; Jian Luo; Shyue Ping Ong; University Of California, San Diego  

3:00 PM Invited  
Grain Boundary Microscopic Degrees of Freedom: The Key(s) to Understanding Radiation Damage?: Mitra Taheri; Drexel University  

3:30 PM Break  
3:50 PM Invited  
The Effect of Grain Size and Grain Boundary Energy on Complexion Transitions: Amanda Krause; Animesh Kundu; Richard Vinci; Martin Harmer; Lehigh University  

4:10 PM  
Applications of QTAIM toward an Understanding of Segregation Phenomena: Malavikha Rajivmoorthy; Michael Hoerner; John Speer; Mark Eberhart; Colorado School of Mines  

4:30 PM  
Atomistic Modeling of Interfacial Segregation and Structural Transitions in Ternary Alloys: Yang Hua; Timothy Rupert; University of California, Irvine  

4:50 PM  
Thermal Grooving Study of Grain-boundary Energies and Diffusion Mechanisms during Ni Coarsening in an SOFC-anode: Patricia Haremski; Matthias Wieler; Anika Maruszczyk; Michael Hoffmann; Paul Hoffrogge; Daniel Schneider; Britta Nestler; Piero Lupetin; Robert Bosch GmbH & Karlsruhe Institute of Technology; Robert Bosch GmbH; Karlsruhe Institute of Technology; Karlsruhe Institute of Technology; Karlsruhe University of Applied Sciences; Karlsruhe University of Applied Sciences & Karlsruhe Institute of Technology  

5:10 PM  
Understanding Interfacial Behavior in Aluminum-carbon Hybrid Materials through Atomistic Modeling: Christopher Shameyko; Daniel Cole; Christopher Weinberger; US Army Research Lab; Colorado State University
International Symposium on Ceramic Matrix Composites — Testing and Damage Characterization
Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Monday PM Room: A114
October 15, 2018 Location: Greater Columbus Convention Center

Session Chair: George Jefferson, US Air Force Research Laboratory

2:00 PM
Characterization of SiC Fibers Creep in Air and Vacuum: Anjali Almansoori1; James Kiser1; Ramakrishna Bhatt1; 1NASA Glenn Research Center; 2Ohio Aerospace Institute at NASA Glenn Research Center

2:20 PM
Multi-axial Failure Characterization of Oxide-oxide CMCs: George Jefferson1; Larry Zawada2; Jennifer Pierce3; Eric Jones4; Craig Przybyla4; 1Air Force Research Laboratory; 2UTC; 3University of Dayton Research Institute; 4AFRL

2:40 PM
Investigating Damage Mechanisms of CMC Blade Root Sub-element Coupons: Eric Jones1; George Jefferson1; Larry Zawada2; Jennifer Pierce3; Craig Przybyla4; 1AFRL; 2UTC; 3UDRI

3:00 PM
Oxidation and Embrittlement of SiC/SiC Composites: Ken Kawanishi1; Shinji Muto2; Ben Callaway3; Frank Zok4; 1IHI INC.; 2IHI Corporation; 3University of California at Santa Barbara

3:20 PM Break

3:40 PM
Degradation of BN Interfaces in SiC-SiC Composites at Elevated Temperatures: Evan Callaway1; Frank Zok1; 1University of California, Santa Barbara

4:00 PM
Mode I and Mode II Interlaminar Fracture Properties of a SiC/SiC Ceramic Matrix Composite: Michael Presby1; Hariraran Rangarajan2; Nkemjika Ike3; Yogesh Singh1; Gregory Morsch1; Frank Abrdi1; Sung Choi1; 1The University of Akron; 2AlphaSTAR Corporation; 3Naval Air Systems Command

4:20 PM
Analyzing Damage Progression in SiC/SiC CMCs Using In-situ Microtomography: Ashley Hilmas1; Kathleen Sevener1; John Halloran1; Michael Thowless1; 1University of Michigan

International Symposium on Defects, Transport and Related Phenomena — Defect and Novel Devices
Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

Monday PM Room: B242/243
October 15, 2018 Location: Greater Columbus Convention Center

Session Chairs: Xin Guo, Huazhong University of Science and Technology; Yoshihiro Yamazaki, Kyushu University

2:00 PM Invited
Developments of New Lithium Ion Conductors and Their Application to All-solid-state Batteries: Ryoji Kanno1; Satoshi Hosoi2; Kota Suzuki3; Masaaki Hirayama4; 1Tokyo Institute of Technology

2:40 PM Invited
Solid State Ionics Approach towards Artificial Intelligence: Xin Guo1; 1Huazhong University of Science and Technology

3:20 PM Break

4:20 PM
Study of the Modes of Adsorption and Electronic Structure of p-aminobenzoic Acid over (001) SrTiO3 Crystal Surface: Luis Villamagua1; Freddy Marcello1; Manuela Carini1; 1Universidade Tecnica Particular de Loja; 2University of Calabria

4:40 PM
Measurement of Thermal Conductivity in GaN Thin Films and Interface Resistance between GaN and Its Substrate: Vinay Chauhan1; Matar Khafizov1; 1The Ohio State University

Joining of Advanced and Specialty Materials (JASM XX) — Brazing of Advanced Materials
Program Organizers: Mathieu Brochu, McGill University; Anning Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barborak, WeldQIC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Monday PM Room: C172
October 15, 2018 Location: Greater Columbus Convention Center

Session Chair: Michael Halbig, NASA Glenn Research Center

2:00 PM
Porous Nickel Interlayer Enabled Silver Brazing for Ceramic-ceramic Joining and/or Dual Atmosphere Stainless Steel-ceramic Joining: Quan Zhou; Lindsay Fricano; Yuxi Ma; Thomas Bieler; Jason Nicholas; 1Michigan State University

2:20 PM
Interface Reaction and Wetting Kinetics of Ag-CuO Doped with TiO2 over YIG Ceramics: Wangji Zhao; Tiesong Lin; Peng He; Dusan P Sekulic; 1Harbin Institute of Technology; 2University of Kentucky
2:40 PM
Multiscale Modeling and Damage Zone Analysis of Ni-based Superalloy Brazed Joints for High Temperature Gas Turbine Engine Applications: Jacob Wildofofsky; 1The Ohio State University

3:00 PM
Effect of In Addition on the Thermal Property, Wettability and Interfacial Reaction of Novel Sn–Zn–Bi–In Lead-free Solder: Jian-Chun Liu; Xinhua Gao; Zhijun Yue; Haiyan Zhang; Gong Zhang; Katsuaki Suganuma; 1China Ship Development and Design Center; 2Tsinghua University; 3Osaka University

3:20 PM Break

3:40 PM
3-D Micro Joining in Stereolithographic Additive Manufacturing of Ceramic Components: Soshu Kirihara; 1Osaka University

4:00 PM
Silver Oxide Decomposition Assisted Direct Bonding of Silicon Carbide: Tomoki Matsuda; Keita Motoyama; Tomokazu Sano; Akio Hirose; 1Osaka University; 2Osaka Univ

4:20 PM
Seal Ring Method for High-temperature, High-pressure Metal to Ceramic Transitions: Alyssa Bateman; Yaiza Rodriguez; Luke Schoensene; Timothy Phero; Kyo Han; Jesse Nachlas; Brian Jaques; 1Boise State University; 2HiFunda, LLC.

4:40 PM
Brazing WC-CO to Inconel 600 Using Carbon Nanotubes Reinforced Cu-Zn Filler Metal: G. Castro-Sanchez; G. Mendoza-Suarez; Jose Lemus-Ruiz; A.L. Drew; 1Universidad Michoacana de San Nicolas de Hidalgo; 2Concordia University

5:10 PM
Influence of Microstructure on the Fracture Behavior of Friction Stir Spot Welded Joint between Zinc Coated Steel and 6061 Aluminum Alloy: Kiriko Owada; Tomoki Matsuda; Tomokazu Sano; Akio Hirose; Atsushi Takada; Munehiro Masubuchi; Naoya Hayakawa; Rinsei Ikeda; 1Osaka University; 2JFE Steel Corporation

5:45 PM
High-frequency Linear Friction Welding of Aluminum Alloys and Stainless Steel: Hirohisa Adachi; Tomoki Matsuda; Tomokazu Sano; Akio Hirose; Ryo Yoshida; Hisashi Hori; Qinglong Pan; Hiroto Kinosaki; Shozo Ono; 1Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University; 2Nippon Light Metal Company, Ltd.; 3Mitsui Engineering & Shipbuilding Co., Ltd.

6:10 PM
Effect of In Addition on the Thermal Property, Wettability and Interfacial Reaction of Novel Sn–Zn–Bi–In Lead-free Solder: Jian-Chun Liu; Xinhua Gao; Zhijun Yue; Haiyan Zhang; Gong Zhang; Katsuaki Suganuma; 1China Ship Development and Design Center; 2Tsinghua University; 3Osaka University

6:30 PM Break

6:50 PM
560 MPa Grade Steel: Kohei Takeya; Tomoki Matsuda; Tomokazu Sano; Akio Hirose; Ryo Yoshida; Hisashi Hori; Qinglong Pan; Hiroto Kinosaki; Shozo Ono; 1Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University; 2Nippon Light Metal Company, Ltd.; 3Mitsui Engineering & Shipbuilding Co., Ltd.

7:10 PM
Development of a Numerical Model for Dissimilar Joining by FSW: Fumikazu Miyazaki; Kenta Mitsufuji; 1Osaka University

7:30 PM Break

7:50 PM
Friction Stir Welding of Hot Rolled and Annealed Armor Steel: William Evans; Martin McDonnell; Antonio Ramirez; Mike Elf; 1The Ohio State University; 2TARDEQ, EWI

8:10 PM
Development of V-Alloy/SUS316L Dissimilar Joint Using Friction Stir Welding: Hisashi Serizawa; Hirotsuka Ogura; Yoshiaki Morisada; Hidetoshi Fujii; Hiroki Morii; Takuya Nagasaka; 1JWRI, Osaka University; 2Osaka University; 3National Institute for Fusion Science

8:30 PM
Microstructures and Mechanical Properties of FSW Joint of 430 MPa and 560 MPa Grade Steel: Kohei Takeya; Tomoki Matsuda; Tomokazu Sano; Akio Hirose; Ryo Yoshida; Hisashi Hori; Qinglong Pan; Hitokoro Ochiha; Shozo Ono; 1Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University; 2Nippon Light Metal Company, Ltd.; 3Mitsui Engineering & Shipbuilding Co., Ltd.

9:10 PM
Influence of Microstructure on the Fracture Behavior of Friction Stir Spot Welded Joint between Zinc Coated Steel and 6061 Aluminum Alloy: Kiriko Owada; Tomoki Matsuda; Tomokazu Sano; Akio Hirose; Asahi Numata; Hiroto Shoji; Mitsuru Ohata; 1Osaka University

Light Metal Technology – Applications for the Transportation Industry — Titanium/Aluminum Alloys Development

Program Organizers: Julie Levesque, Quebec Metallurgy Center; Mihaiela Isac, McGill Metals Processing Centre; Xiaoming Wang, Purdue University; Roderick Guthrie, McGill University; Sa Ge, Hatch Ltd.; Kaan Inal, University of Waterloo; Frederic Laroche, Rio Tinto

Monday PM
Room: B130
Location: Greater Columbus Convention Center

Session Chairs: Mihaiela Isac, McGill University; Julie Lévesque, Quebec Metallurgy Center; Roderick Guthrie, McGill University; Carsten Siemers, Technische Universität Braunschweig / Institute for Materials

2:00 PM Keynote
Advanced Titanium Alloys with Tailored Properties for Aerospace and Automotive Applications: Carsten Siemers; Florian Brunke; Martin Bäker; 1Technische Universität Braunschweig / Institute for Materials

2:40 PM Orientation Dependent Spheroidization Response of α-colonies during Sub-ß-transus Annealing of Ti-6Al-4V Alloy: Shibayan Roy; Satyam Suwas; 1Materials Science Center, Indian Institute of Technology Kharagpur; 2Department of Materials Engineering, Indian Institute of Science, Bangalore
3:00 PM
Superplasticity and Constitutive Relationship in a Ti-based Metallic Glassy Composite: Wang Y.S.

3:20 PM Break

3:40 PM
Redesigning AA6201 Aluminum Alloy to Achieve a Combination of High Strength, Electrical Conductivity and Thermal Stability: Vincent Jansen; Francisco Flores; David Dunand; Nhon Vo; NanoAl; Northwestern University

4:00 PM
Development of Ultra-conductive Aluminum Alloys as Low-weight Electrical Conductors in Transportation Applications: Keerti Kappagantula; Aditya Nittala; Frank Kraft; Ohio University

4:20 PM
High-temperature Performance of 3000-series Aluminum Alloys with Addition of Thermally Stable Nano-precipitates: Francisco Flores; Evander Ramos; David Dunand; Nhon Vo; NanoAl LLC; NanoAl; Northwestern University

4:40 PM
Microstructure and Mechanical Properties of Al-Mg Alloys with High Contents of Mg: Yaojun Lin; Jiani Sun; Zhigang Yan; Zhibo Liu; Wuhan University of Technology; Wuhan University of Technology; Yanshan University

5:00 PM
Effect of Alternate Drawing on the Ductility of Drawn Wires for Aluminum Wire Harness: Chihiro Takama; Kazunari Yoshida; Tokai University

Materials for Nuclear Applications and Extreme Environments — Radiation Effects on Materials’ Structure and Properties
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Dev Chidambaram, University of Nevada, Reno; Raul Rebak, GE Global Research; YuTai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

Monday PM
Room: D183
Location: Greater Columbus Convention Center

Session Chair: Karl Whittle, University of Liverpool

2:00 PM
Microstructural Evolution of NFA and Cr2C3@SiC-NFA Derived Materials under Thermal Treatment: Kaustubh Bawane; Kathy Lu; Virginia Tech

2:20 PM
Microstructural and Conductivity of Second-generation High Temperature Superconductors Irradiated at ORNL’s HFIR: Philip Edmondson; Oak Ridge National Laboratory

2:40 PM
Phase Field Study of the Formation Mechanism of Gas Bubble Superlattice in Irradiated Materials: Yipeng Guo; Daniel Schwen; Chao Jiang; Yongfeng Zhang; Idaho National Laboratory

3:00 PM
Influence of the Enthalpy Landscape on the Irradiation-induced Disordering of Minerals: N. M. Anoop Krishnan; Matthieu Bauchy; IIT Delhi; University of California, Los Angeles

3:20 PM Break

3:40 PM
Post Irradiation Annealing Kinetics and Mechanisms in RPV Steels with Nanoscale Mn-Ni-Si Precipitates: Nathan Almirall; Shipeng Shu; Peter Wells; Takuya Yamamoto; Dane Morgan; Souptik Pat; G. R. Odette; University of California Santa Barbara; University of Wisconsin-Madison

4:00 PM
Quantification of Defects Using Raman Spectroscopy in Low Dose Irradiation in 3C-SiC: Vinay Chauhan; Marat Khatizov; The Ohio State University

4:20 PM
Two-temperature Model Simulations of High Energy Cascades: Eva Zarkadoula; German Samolyuk; William Weber; Oak Ridge National Laboratory; University of Tennessee

4:40 PM
Radiation Effects in Binary Carbides: Karl Whittle; University of Liverpool

5:00 PM
Radiation Response of Nanoporous Metals: Xinghang Zhang; Jin Li; Purdue University

Materials Issues in Nuclear Waste Management — Nuclear Waste Form Processing and Synthesis II
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Jason Lonergan, Washington State University; Jake Amoroso, Savannah River National Laboratory; YuTai Katoh, Oak Ridge National Laboratory; Kevin Fox, Savannah River National Laboratory; Josef Matyas, Pacific Northwest National Laboratory

Monday PM
Room: D282
Location: Greater Columbus Convention Center

Session Chair: Devon McClane, Savannah River National Laboratory

2:00 PM Invited
Increasing the Liquor Throughput of the UK Vitrification Plants: Nick Gribble; James Stevens; National Nuclear Laboratory

2:40 PM
Silver Functionalized Silica Aerogel: Effect of Aging on Iodine Sorption Performance: Josef Matyas; Eugene Ilton; Libor Kovalik; PNNL

3:00 PM
The Feasibility of Melt-processing Ceramic Waste Forms for High-level Waste: Jake Amoroso; Christopher Kundeneau; Savannah River National Laboratory

3:20 PM Break

3:40 PM Invited
Vitrification of Highly Active Waste Streams in the UK: the Zirconium Molybdate Hydrate (ZMH) Challenge: Donna McKendrick; National Nuclear Laboratory

4:20 PM Invited
Fabrication of Ceramic Technetium Waste Forms: Thomas Hartman; University of Nevada, Las Vegas
Materials Property Understanding through Characterization — Metals I
Program Organizers: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated

Monday PM
October 15, 2018
Room: B240/241
Location: Greater Columbus Convention Center

Session Chairs: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated; Bryan Wheaton, Corning Incorporated

2:00 PM  Invited
Dynamic Physical Simulation of Cr-Mo Steel at Elevated Temperatures: Adam Foltz1; Stephen Bartolucci1; 1US Army ARDEC

2:40 PM
Characterization of Creep-fatigue Deformation in 9Cr-1MoV Steel and Weldments: Harrison Whitt1; Tyler Payton1; Wei Zhang1; Michael Mills1; 1Ohio State University

3:00 PM  Invited
Microstructure Characterization of Electrodeposited Nickel Tested at High Strain Rates: Jonathan Ligda1; Daniel Casem1; Heather Murdoch1; 1US Army Research Laboratory

3:40 PM  Break

4:00 PM
Influence of Cryogenic Treatment on Electrical and Thermal Properties of Gray Cast Iron: Susil Putatunda1; Deepak Joshi1; James Boileau1; 1Wayne State University; 2Ford Motor Company

4:20 PM
Quantitative Assessment of Short-range Order In Magnetostrictive Fe-rich Binary Alloys: Richard Laroche1; Travis Willhard1; Sivaraman Guruswamy1; 1University of Utah

4:40 PM
Statistical Modeling of Effect of Porosities on Mechanical Behavior of High Performance Cast Metals: Mustafa Rifat1; Robert Voigt1; Saurabh Basu1; 1Penn State University; 2Ohio State University

Next Generation Biomaterials — Biomaterials II
Program Organizers: Roger Narayan, University of North Carolina; Vipul Davé, Johnson & Johnson; Mohan Edirisinghe, University College of London; Sanjiv Lalwani, Lynntech, Inc.

Monday PM
October 15, 2018
Room: D182
Location: Greater Columbus Convention Center

Session Chairs: Pelagia Gourna, The Ohio State University; James Earhtman, University of California, Irvine

2:00 PM
Growth Factor-encapsulated and Cell-laden Scaffolds for Gastrointestinal Tract Regeneration: Lin Guo1; Min Wang1; 1The University of Hong Kong

2:20 PM  Invited
High-throughput Electrospinning of Advanced Biomaterials: Pelagia Gourna1; 1The Ohio State University

2:40 PM  Invited
Making Antimicrobial Fibrous Patches and Filters using Novel Electrohydrodynamics and Pressurised Gyration Devices: Mohan Edirisinghe1; 1University College of London

3:00 PM  Invited
Precision Assembly through Tunable Interfaces: Cannd Tamerler1; 1University of Kansas

3:20 PM  Break

3:40 PM  Invited
Quantitative Percussion Diagnostics of Cracks and Other Closed Defects: A New Paradigm in Dentistry and Beyond: Aboozar Mapar1; Alejandra Lopez1; Heejun Clough1; Cherilyn Sheets1; James Earthman1; 1University of California, Irvine; 2Newport Coast Oral Facial Institute

4:00 PM  Invited
Synergistic Combination of Surface Texturing and Nitric Oxide Release to Improve Biomaterial Resistance to Infection and Coagulation: Lichong Xu1; Christopher Siedlecki1; 1Penn State College of Medicine

4:20 PM  Invited
The Antioxidant Role of Silicon in the Reduction of Oxidative Damage to Bone and Vascular Cells: Venu Varanasi1; Felipe Monte1; Pranesh Aswath1; Harry Kim1; 1Texas A&M HSC; 2University of Texas at Arlington; 3Texas Scottish Rite Hospital

4:40 PM
Synthesis, Characterization, and In Vitro Study of Drug Loaded Biodegradable Magnesium Alloys for Anti-inflammatory Implantable Applications: Zia Ur Rahman1; Waseem Haider1; 1Central Michigan University

Perspectives for Emerging Materials Professionals — Session II
Program Organizers: Andrew Frerichs, The NanoSteel Company; Dharma Maddala, Arconic Technology Center

Monday PM
October 15, 2018
Room: B231
Location: Greater Columbus Convention Center

Session Chair: Andrew Frerichs, The NanoSteel Company

2:00 PM
Developing a Keen Eye for the Presence of Leadership to Help Develop Your Own Professional Abilities: Robert Schwartz1; 1Missouri S&T

2:20 PM
International Experience: Preparing American Engineers with Global Perspective: Mufti Akinc1; 1Iowa State University

2:40 PM  Invited
No Speed Limit! How to Fast Track Your Scientific Career by Taking a Detour through Germany: Carl Krill1; 1Ulm University

3:00 PM
Making Time to Think at Work: Daniel Miracle1; 1Air Force Research Laboratory

3:20 PM  Break

3:40 PM  Invited
Making the Most of Mentoring: Emily Kinser1; 1IBM

4:00 PM
Scientific and Technical Leadership in Government Labs: Daniel Miracle1; 1Air Force Research Laboratory

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum and Minerals - KFUPM; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Victoria Blair, Army Research Laboratory

Monday PM
Room: A125
Location: Greater Columbus Convention Center

Session Chairs: Masahiro Yoshimura, National Cheng Kung University; Daudi Waryoba, Penn State DuBois

4:20 PM Invited
Energy and Productivity Potential of Electrotechnologies in Industrial Process Heating Systems: Joe Cresko1; Arvind Thekdi2; Kiran Thirumaran2; Sachin Nimbalkar1; 'DOE Advanced Manufacturing Office; 2E3M Inc; 'Oak Ridge National Laboratory

2:40 PM Invited
Biofilm Formation Behaviors Formed by E.Coli and S. Epidermis under Weak Alternating Electromagnetic Fields: Hikaya Katsuragawa1; Duna Barry1; Senshin Umekii1; Akiko Ogawa1; Nobumitsu Hira1; Takeshi Kogou1; Yoshimizu Mizuno1; 'National Institute of Technology, Suzuki College; 'Clarkson University; 'Tohoku University; 'The Jikei University School of Medicine

3:20 PM Break

3:40 PM Invited
Investigating Far-from-equilibrium Effects of External Electric Fields In Ceramics Processing: B. Reeea Jaya1; 'Carnegie Mellon University

4:20 PM
Utilization of Magnetic Fields and Mechanical Loads in the Fabrication of Enhanced Alnico Magnets with Near-Final Shape: Emily Rink1; Iver Anderson1; Aaron Kassen2; Emma White2; Wei Tang2; Lin Zhou2; Matthew Kramer2; 'Iowa State Univ1; 'Ames Laboratory

4:40 PM
Effects of Pore Size and Heating Method on Drying Porous Fused Silica: Peter Loomis1; 'Virginia Polytechnic Institute

5:00 PM
Microwave Enhanced Digestion of Gibbsite in Sodium Hydroxide: Ben Dillinger1; David Clark1; Carlos Suchcia1; Sam Kingman2; Andrew Batchelor2; Chris Dedds1; 'Virginia Polytechnic Institute and State University; 'University of Nottingham

5:20 PM
Effect of Electric Current Pulse Treated above Liquidus on Microstructure and Properties of Primary Carbide in Hypereutectic High Cr Cast Irons: Geng BaoYu1; Zhou RongFeng1; 'Kunning University of Science and Technology

PSDK XIII: Phase Stability and Diffusion Kinetics — Gibbs Award Session II/ Modeling of Properties

Program Organizers: Zhi-Kui Liu, Pennsylvania State University; Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Wei Xiong, University of Pittsburgh; Raymundo Arroyave, Texas A & M University

Monday PM
Room: A213
Location: Greater Columbus Convention Center

Session Chairs: Michael Gao, National Energy Technology Laboratory; Yongho Sohn, University of Central Florida

2:00 PM Invited
Modeling of Solidification and Precipitation in Magnesium Alloys: Alan Luo1; Jiashi Miao1; Chuan Zhang1; 'The Ohio State University; 'CompuTherm LLC

2:20 PM Invited
Thermodynamic Assessment of Slag-matte-metal Equilibria in the Cu–Fe–Al–Ca–Si–O–S System for Pyrometallurgical Production of Copper: Sergei Decterov1; Denis Shishin2; Evgenii Jak3; 'Ecole Polytechnique De Montreal; 'Pyrosearch, University of Queensland

2:40 PM Invited
Gibbs, Schreinemakers, and Mechanisms to Form Three-phase Miscibility Gaps: Shuanglin Chen1; John Morral1; 'CompuTherm LLC; 'The Ohio State University

3:00 PM Invited
Multicomponent Phase Equilibria and Diffusion: Critical Knowledge in Alloy Development for Additive Manufacturing: Yongho Sohn1; Le Zhou1; 'University of Central Florida

3:20 PM Break

3:40 PM Invited
Computational Modeling of High-Entropy Alloys: Michael Gao1; Jeffrey Hawk1; David Alman2; Mike Widoni1; 'National Energy Technology Lab; 'Carnegie Mellon University

4:10 PM
CALPHAD Modeling of the Molar Volume: Ursula Kattner1; 'National Institute of Standards & Technology

4:30 PM
Computational Investigations of Interface Stability between Thermoelectric Materials Yb14MnSb11 and Co: Xiaoyu Chong1; Jorge Paz Soldan Palma1; Yi Wang1; Drymiotis Fivos2; Kurt Star2; Jean-Pierre Fleuria1; Vilupanur Ravi2; Zhi-Kui Liu1; 'Pennsylvania State University; 'Jet Propulsion Laboratory

4:50 PM
Effect of Composition Dependent Molar Volume on Accuracy of Interdiffusion Analysis in Multicomponent Systems: Aparna Tripathi1; Kaustubh Kulkarni1; 'Indian Institute of Technology Kanpur; 'Indian Institute of Technology Kanpur

5:10 PM
In/Bl(Se,Te)3 Interfacial Reactions and Bi-In-Se-Te Phase Diagram: Sinn-wen Chen1; Yohanes Hutabali1; 'National Tsing Hua University; 'Department of Chemical Engineering, National Tsing Hua University
Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Rare Earth Magnets and Critical Materials

Program Organizers: Yellapu Murty, MC Technologies LLC; Jack Lifton, Jack Lifton, LLC; Eric Klier, U. S. Army Research Laboratory; Michael McKittrick, U.S. Department of Energy; Ian London, Avalon Rare Metals Inc

Monday PM  Room: B131
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Yellapu Murty, MC Technologies; Jack Lifton, Jack Lifton LLC

2:00 PM  Invited
Are Rare Earths Critical for the Electrification of Motor Vehicles?: Jack Lifton; Jack Lifton, LLC

2:40 PM  Invited
Current Technology Status and Future Needs for Rare Earth Permanent Magnets for Industrial Applications: John Ormeord; JOC LLC

3:20 PM  Break

3:40 PM
Thermomagnetic Processing and Differential Scanning Calorimetry of Permanent Magnet Materials: Michael Kesler; Orlando Rios; Brandt Jensen; Ikenna Nlebedim; Scott McCall; Alexander Baker; Matthew Kramer; Lin Zhou; Michael McGuire; Oak Ridge National Laboratory; Ames Laboratory; Lawrence Livermore National Laboratory

4:10 PM
Separation of Rare Earth from Nd-Fe-B Magnet Scraps Using Molten Salt Electrolysis: Hirokazu Konishi; Hideki Ono; Tetsu Shimizu; Toshiyuki Nohira; Yuichiro Kosumai; Osaka University; National Institute of Advanced Industrial Science and Technology; Kyoto University

4:40 PM
Pyrometallurgical Recycling of NdFeB Magnet Scrap by Using Silicon Wafer Cutting Sludge: Kim Jong Ho; Rist

Responsive Functional Nanomaterials — Responsive Smart Nanomaterials

Program Organizers: Wenzhuo Wu, Purdue University; Weiyang Li, Dartmouth College; Sarina Sarina, Queensland University of Technology; Wenxian Li, University of Wollongong; Jiahua Zhu, University of Akron

Monday PM  Room: D181
October 15, 2018  Location: Greater Columbus Convention Center

Session Chair: Jiahua Zhu, University of Akron

2:00 PM
Boosting Thermal Conduction in Polymers by Lowering Inter-chain Thermal Resistance via Organic Molecules: Nitin Mehra; Marjan Kashifpour; Jiahua Zhu; University of Akron

2:20 PM
Computational Design of Thermochromic Film for Building Energy Efficiency: Influence of Particle Size, Shape, and Concentration: Jianying Hu; Xiong Yu; Case Western Reserve University

2:40 PM
Field-effect Transistors Made from Solution-grown Two-dimensional Tellurene: Yixiu Wang; Gang Qiu; Ruoxing Wang; Peide Ye; Wenzhuo Wu; Purdue University

3:00 PM
Electrically and Thermally Triggered Three-dimensional Graphene Foam-reinforced Shape Memory Epoxy Composites: Adeyinka Idowu; Benjamin Boesl; Arvind Agarwal; Florida International University

3:20 PM  Break

3:40 PM
Embedding Conductive Nanomaterials into Polymers by Direct Printing for Flexible Pressure Sensors: Rachel Aga; Roberto Aga; Emily Heckman; Wright State University; Air Force Research Laboratory

4:00 PM
Highly Deformable Hierarchical Heterostructure Printed Liquid Electrode Self-assembled Two-dimensional Semiconductor for Wearable Electronics and Sensors: Ruoxing Wang; Wenzhuo Wu; Purdue University

Selection of Materials for Application in Corrosive Environments — Materials Selection Symposium - Session II

Program Organizers: Ajit Mishra, Haynes International; Matthew Asmussen, Pacific Northwestern National Laboratory; Sudhakar Mahajan; Pinnacle Advanced Reliability Technologies; Wilfred Binx; Nuclear Waste Management Organization; John Zhang; Gamry Instruments; Guang-Ling Song; Xiamen University; Eric Schindelholz; Sandia National Laboratories; Raul Rebak; GE Global Research

Monday PM  Room: A220
October 15, 2018  Location: Greater Columbus Convention Center

Session Chairs: Ajit Mishra, Haynes International; Matthew Asmussen, Pacific Northwest National Laboratory

2:00 PM  Keynote
Cast Alumina-forming Stainless Steels for High Temperature Corrosive Environments: Govindarajan Muruthibham; Yukinori Yamamoto; Michael Brady; Donovan Leonard; Ercan Cakmak; Tanya Ross; Stanley Fauske; Garrett Hadley; Roman Pankiw; Jim Myers; Oak Ridge National Laboratory; Oak Ridge National Lab; ArcelorMittal Global R & D; ArcelorMittal Coatesville; Durayloy Technologies; MetalTek International

2:40 PM
Galvanic Corrosion Resistance of Mixed-material Joints Fabricated by Resistance Spot Riveting: Paul Krell; Jennifer Locke; The Ohio State University

3:00 PM
Crevice Corrosion: A Critical Degradation Mechanism in Reinforced Concrete: Lei Yan; Guangling Song; Dajiang Zheng; Center for Marine Materials Corrosion and Protection, Xiamen University

3:20 PM  Break

3:40 PM
Understanding the Effect of Anodic Polarization on SCC Resistance of AA6111 to Simulate Coupling with CFRP for Automotive Applications: Katrina Catledge; Jennifer (Warner) Locke; The Ohio State University

4:00 PM
Overview of an Innovative Approach to SCC Inspection and Evaluation of Canister in Dry Storage: Zeeyi Shayer; Colorado School of Mines
Small-scale Properties of Materials and Length-scale Phenomena — In-situ Assessments

Program Organizers: Meysam Haghshenas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

Monday PM  Room: A121  Location: Greater Columbus Convention Center

Session Chair: Steve Bull, Newcastle University; Robert Klassen, Western University

2:00 PM Invited
In-situ Stable Fracture of Ceramic Interfaces: Finn Giuliani; 1 Imperial College London

2:20 PM Invited
Dislocation Transmission through Grain Boundaries: Insights from In-situ Micromechanical Experiments: Gerhard Dehm; Natalya Malyar; Christoph Kirchlechner; 1 Max-Planck-Institute

2:40 PM Invited
In-situ Deformation Behavior of Metallic Glass Composites at the Small Length-scales: Vahid Hasannaeimi; Saideep Muskerti; Sundee Makherjee; 1 University of North Texas

3:00 PM Invited
In-situ Mechanics of a Super-lightweight and Ultra-stiff 3D Graphene-Metal Metamaterial: Pranjal Nautiyal; Mubarak Mujawar; Benjamin Boesl; Arvind Agarwal; 1 Florida International University

3:20 PM Break

3:40 PM Invited
In-situ Microcompression Transient Plasticity and Fatigue Tests for Reliable Extraction of Deformation Activation Parameters: Creep, Stress Relaxation, Strain Rate Sensitivity and High Cycle Fatigue Tests: Gaurav Mohants; Johann Michler; 1 Tampere University of Technology; 2 Empa - Swiss Federal Laboratories for Materials Science and Technology

4:00 PM Invited
Specimen Considerations in Quantitative In-situ Micromechanical Testing: Robert Wheeler; 1 Microtesting Solutions LLC

4:20 PM
In-situ TEM Investigations of Ductile Thin Films on Brittle Substrates: Role of Film Microstructure on Interface Stability: Alice Lassnig; Christoph Gammer; Velislava Terziyska; Tanja Jörg; Daniel Kiener; Christian Mitterer; Megan Cordill; 1 Erich Schmid Institute of Materials Science; 2 Montanuniversität Leoben

4:40 PM Invited
Atomic-scale Insights into Contacts between Nanoscale Bodies: In-situ Experiments and Matched Atomistic Simulations: Tevis Jacobs; Sai Bharadwaj Vishnuhhotla; Subarna Khanal; Rimei Chen; Xiaoli Hu; Ashlie Martin; 1 University of Pittsburgh; 2 University of California, Merced

5:00 PM Invited
Enhanced fracture Toughness of Ceramic Coated Carbon Nanotube Foams through Efficient Stress Delocalization: An In-situ Study: Atieh Moridi; Cem Tasan; John Hart; 1 Massachusetts Institute of Technology

5:20 PM Invited
In-situ Spectroscopic Analysis of the Indentation-induced Phase Transformation of Crystalline and Amorphous Silicon Thin Films by Raman Spectroscopy Enhanced Indentation Technique (RS-IT): Yvonne Gerbig; Chris Michaels; Robert Cook; 1 National Institute of Standards and Technology
Surface Properties of Biomaterials — Biomedical Devices for Tissue Engineering and Regenerative Medicine

Program Organizers: Venu Varanasi, University of Texas at Arlington; Ryan Bock, Amedica Corporation; Jason Langhorn, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University

Monday PM  Room: D281  Location: Greater Columbus Convention Center
October 15, 2018

Session Chair: Venu Varanasi, University of Texas at Arlington; Ryan Bock, Amedica Corporation; Neelam Ahuja, University of Texas at Arlington

2:00 PM Invited
Bone-muscle Crosstalk: The Power of the “Kines” and Their Future Tissue Engineering Applications
ChengLin Mo; Jian Huang; Zhiying Wang; Leticia Brotto; Lynda Bonewald; Venu Varanasi; Marco Brotto; University of Texas at Arlington

2:40 PM Invited
3D Live Printed Gelatin and Chitosan Nanosilicate Scaffolds for Bone and Vascular Regeneration
Venu Varanasi; Taha Azimaie; Azhar Ilyas; Tugba Cebi; Phillip Kramer; Neelam Ahuja; Texas A&M HSC; New York Institute of Technology; University of Texas at Arlington

3:20 PM Break

3:40 PM
Starch–hydroxyapatite Based Bone Scaffolds Using a Slurry Based 3D Printer
Caitlin Koski; Bonny Onuiku; Amit Bandyopadhyay; Susmita Bose; Washington State University

4:00 PM
Osteogenic Silicon Nitride Implants for Rapid Bimaterial Formation
Neelam Ahuja; Kamal Awad; Pranesh Austh; Venu Varanasi; University of Texas at Arlington; Texas A&M College of Dentistry

4:20 PM
Compounded PEEK/Silicon Nitride Composite Exhibits Enhanced Osteoconductivity and Bacteriostasis
Ryan Bock; Giuseppe Pezzotti; Wenzhang Zhu; Elia Marin; Alfredo Rondinella; Francesco Boschetto; Bryan McNiece; Sonny Bal; Amedica Corporation; Kyoto Institute of Technology; University of Missouri

4:40 PM
Additive Manufacturing of Heterogeneous Bio-resorbable Constructs for Soft Tissue Applications
Parimal Path; Panos Shiakolas; Prashanth Ravi; Tre Welch; Tushar Saini; University of Texas at Arlington; University of Texas Southwestern Medical Center

5:00 PM
Antimicrobial Property of Zn Doped Hydroxyapatite
Arjak Bhattacharjee; Anshul Gupta; Pram Murugan; Pradyyut Sengupta; Saravanan Matheshwaran; Indranil Manna; Kantesh Balani; IIT Kanpur; IMMT Bhabhaneswar; IIT Kharagpur

Symposium on Large Fluctuations and Collective Phenomena in Materials VI - Mean Field Theory and Other Theoretical Models — Mean Field Theory and Other Theoretical Models

Program Organizers: Peter Liaw, University of Tennessee; Karin Dahmen, University of Illinois at Urbana Champaign; Xie Xie, FCA US LLC; Yong Zhang, University of Science and Technology Beijing

Monday PM  Room: B235  Location: Greater Columbus Convention Center
October 15, 2018

Session Chair: Peter Liaw, The University of Tennessee

2:00 PM Invited
Effect of Microstructural Features, Strain Rate and Temperature on the Deformation Mechanism of Al-Mg-Sc Alloy
Mageshwari Komarasamy; Rajiv Mishra; University of North Texas

2:20 PM Invited
Characteristic Orientation Relationships and Unusual Deformation Mechanisms in Al-A1ZCu Nano-laminates
 Jian Wang; Shijuan Wang; Guisien Liu; Amit Misra; University of Nebraska–Lincoln; University of Michigan

2:40 PM Invited
Serrated Flow in AlMgCuZn-based Lightweight High Entropy Alloys
Yong Zhang; Beijing University of Science and Technology

3:00 PM
Shear-band Dynamics in Bulk Metallic Glasses by Thermal Imaging
Xie Xie; Yu-Chieh Lo; Yang Tong; Junwei Qiao; Gongyao Wang; Shigenobu Ogata; Hairong Qi; Karin Dahmen; Yanfei Gao; Peter Liaw; The University of Tennessee; National Chiao Tung University; City University of Hong Kong; Taiyuan University of Technology; Osaka University; University of Illinois at Urbana Champaign; The University of Tennessee; Oak Ridge National Laboratory; The University of Tennessee

3:20 PM Break

3:40 PM
Nanoscale Serration and Creep Characteristics of A0.5CoCrCuFeNi High-entropy Alloys
Xie Xie; Weidong Li; Xie Xie; Jameson Brechtl; Bilin Chen; Peizhen Li; Guangfeng Zhao; Fuqian Yang; Junwei Qiao; Karin Dahmen; Peter Liaw; The University of Tennessee; University of Kentucky; Taiyuan University of Technology; University of Illinois at Urbana Champaign; University of Tennessee

4:00 PM Invited
Scaling Behaviors of Serrated Flows in Bulk Metallic Glasses
Junwei Qiao; Xiaojiao Li; Zhong Wang; Yucheng Wu; Peter Liaw; Karin Dahmen; Taiyuan University of Technology; University of Illinois at Urbana Champaign

4:20 PM Invited
A Comprehensive Analysis of the Serration Behavior in Multi-principle Element Systems
Jameson Brechtl; Xie Xie; Shuying Chen; Zhong Wang; Rui Feng; Haoyan Diao; Bilin Chen; Wenliang Liu; Yong Zhu; Karin Dahmen; Peter Liaw; Steven Zinkle; University of Tennessee; Taiyuan University of Technology; University of Science and Technology Beijing; University of Illinois Urbana-Champaign

4:40 PM Invited
Plastic Dynamics of the High Entropy Alloy at Cryogenic Temperatures
Jingli Ren; Zhengzhou University
User-related Failures — Transportation
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de Mons (FPMs)

Monday PM
Room: A210
October 15, 2018
Location: Greater Columbus Convention Center

Session Chairs: Matthew Fox, National Transportation Safety Board; Joseph Lemberg, Exponent; William Carden, McSwain Engineering; Craig Clauser, Craig Clauser Engineering Consulting; Dale Alexander, Engineering Systems Incorporated

2:00 PM
Failure Analysis of a Propeller from a Curtiss Jenny: Matthew Fox;
‘National Transportation Safety Board

2:20 PM
Investigation of a Compressor Turbine Blade Failure Involving the Fir Tree Attachment Condition: Ellen Wright, Gary Novak, Richard Baron, David Ahearn, Dale Alexander; ‘Engineering Systems Inc. (ESi)

2:40 PM
Failure Analysis of Diesel-electric Locomotive Components: Marcel Pitz; ‘General Electric

3:00 PM
Investigation of a Train Derailment from a Fractured Wheel: Erik Mueller; ‘NTSB

3:20 PM Break

3:40 PM Invited
Passenger Ferry Loss of Propulsion: David Shamrell; ‘Engineering Design & Testing Corp.

4:00 PM Invited
Environmental Cracking in Aluminum Ship Material: Benjamin Palmer, John Lewandowski; ‘Case Western Reserve University

4:20 PM Invited
Mechanism of Crack Initiation and Propagation in a Stryker Light Armored Vehicle: Sergei Shipilov; ‘Corrosion Engineering Solutions Ltd.

4:40 PM Invited

MS&T18 Plenary Session
Tuesday AM
Room: Union Station B
October 16, 2018
Location: Greater Columbus Convention Center

8:00 AM Introductory Comments

8:10 AM Plenary
10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session III

Program Organizers: Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technology; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Allen Apblett, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Mritunjay Singh, Ohio Aerospace Institute

Tuesday PM  October 16, 2018  Room: B233  Location: Greater Columbus Convention Center

Session Chairs: Yiquan Wu, Alfred University; Zhengyi Fu, Wuhan University of Technology

2:00 PM  Invited
SiOC-based Energy Storage Materials: Ralf Riedel1; Magdalena Graczyk-Zajac1; Dragoljub Vrankovic1; T U Darmstadt

2:20 PM  Invited
Porosity Control of Geopolymer Hydrogen Recombination Catalyst Support for Radioactive Waste Containers: Hisayuki Suematsu1; Taro Utsumi1; Isamu Kudo1; Tadachika Nakayama1; Koichi Niihara1; Nagaoka University of Technology; ADVAN ENG Co. Ltd.

2:40 PM  Invited
Polymer-derived Porous Mo2C/Mo5Si3/C/SiC Ceramic Nanocomposites for Hydrogen Evolution Reaction: Zhaoju Yu1; Xiamen University

3:00 PM  Invited
Sintering Ceramics with Limited Grain Growth by Quasi-plastic Deformation as Dominating Mechanism: Zhengyi Fu1; Weimin Wang1; Hao Wang1; Wuhan University of Technology

3:20 PM
Synthesis of Intermetallic Silicide Powders by Microwave Assisted Combustion Reaction: Rajalekshmi Pillai1; Sreekumar Chockalingam1; Sam Baker1; SRS Holdings LLC

3:40 PM
Metallurgical History of Tellurium: Kristian Mackowiak1; Lukas Bichler1; University of British Columbia - Okanagan Campus

4:00 PM
Strategies for Patenting “Green” Technologies: Van Vekris1; Sim & McBurney

4:20 PM
Successfully Patenting “Green” Materials and Processes: Van Vekris1; Sim & McBurney

ACerS Frontiers of Science and Society - Rustum Roy Lecture

Tuesday PM  October 16, 2018  Room: A111/112  Location: Greater Columbus Convention Center

Session Chair: L. David Pye, Alfred University

1:00 PM  Invited
Imagination and Innovation in the Land of Machines: David Morse2; Coming Incorporated

Additive Manufacturing of Composites and Complex Materials III — Ceramic Additive Manufacturing

Program Organizers: Dirk Lehnhus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Tuesday PM  October 16, 2018  Room: A222  Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM  Introductory Comments

2:10 PM
Additive Manufacturing of Ceramic Materials for Aerospace Applications: Matthew Dickerson1; Lisa Rueschhoff1; Luke Baldwin1; Connor Wyckoff1; Michael Cini2; Hilmar Koerner1; Matthew Dalton1; Air Force Research Laboratory

2:40 PM
Direct Writing LTCC Stacks Utilizing Ceramic On-Demand Extrusion: Wenbin Li1; Austin Martin1; Jeremy Watts1; Ming Leu1; Gregory Hilmas1; Tieshu Huang2; Missouri University of Science and Technology; NNSA’s Kansas City National Security Campus

3:00 PM
Extrusion-based 3D Printing of Molecular Sieve Zeolite for Gas Adsorption Applications: Nishant Hawaldar1; Hye-Young Park1; Yeon-Gil Jung1; Jing Zhang1; Indiana University Purdue University Indianapolis; Changwon National University, Republic of Korea

3:20 PM
Optimizing Process Parameters to Binder Jet Ceramics: Edgar Mendoza1; Daming Ding1; Baby Rejja Jya1; Jack Beuth1; Carnegie Mellon University

3:40 PM
Preparation of Ceramic Core through 3D Printing Technology: Hye-Yeong Park1; Hyun-Hee Choi1; Bong-Gu Kim1; Geun-Ho Cho1; Eun-Hee Kim1; Yeon-Gil Jung1; Jing Zhang1; Changwon National University

4:00 PM
Optimization of Printing Parameters for 3D Printed PLA: Nishant Hawaldar1; Piyush Raikar1; Tejesh Dube1; Jing Zhang1; IUPUI
Advantage of Metal Additive Manufacturing of Nanofunctionalized Materials

Program Organizers: Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Tuesday PM Room: A214
October 16, 2018 Location: Greater Columbus Convention Center

Session Chair: Timothy Horn, North Carolina State University

2:00 PM
Additive Manufacturing of Biocompatible Ti Alloy (Ti-Nb-Zr-Ta) for Implant Applications: Majda Nyström, Juha Kotila, Eugene Ivanov, Eduardo Del-Rio, EOS Finland; Tosoh SMD Inc.

2:20 PM

2:40 PM
Electron Beam Melting Approaches for Titanium Alloy Octet Lattice Structure Fabrication: Andrew Netsi, Abbas Mofakhar, Liang Dong, Haydn Wadley, University of Virginia Department of Materials Science; General Electric

3:00 PM
Tensile Properties and Processing Induced Variability in Laser Additive Manufactured Ti-6Al-4V Cellular Structure: Husain Almasri, Anthony Sanders, Ravi Chandran, University of Utah; Ortho Development Corp.

3:20 PM
Fundamental Characterization of Porosity in SLM by Micro-CT Scan: Sudin Shreehta, Tom Starr, Kevin Chou, University of Louisville

2:00 PM
Nanoindentation: A Suitable Tool in Metal Additive Manufacturing: Carlos Botero, Emilio Jiménez-Paqué, Stefan Roos, Per Skoglund, Andrei Koptyug, Lars-Erik Rämmar, Mikael Bäckström, SportsTech Research Centre, Mid Sweden University; Barcelona Research Center in Multiscale Science and Engineering, Universitat Politècnica de Catalunya

2:40 PM
Validation of Methods for Mechanical and Microstructural Property Measurement of Sub-standard Sized SLM Test Specimens: Tanni Alam, Jonathan Rausch, Congyuan Zeng, Shengmin Guo, University of Louisiana at Lafayette; Louisiana State University

3:00 PM
Texture Analysis of Additively Manufactured Ti-6Al-4V Using Neutron Diffraction: Gennadi Rafaelov, Asaf Pesach, Eitan Tiferet, Sven C. Vogel, Elad N Caspi, LANL

3:20 PM
Microstructural Characterization of Alternative Manufacturing Techniques of U6Nb: Additive Manufactured, Cast and Wrought: Eloisa Zepeda-Alarcon, Donald Brown, Bjorn Clausen, Amanda Wu, Los Alamos National Laboratory; Lawrence Livermore National Laboratory

3:40 PM
Manipulation of Mechanical Properties of WAAM Deposited Material through Active Cooling: Andre Corpus, Michael Maughan, University of Idaho

4:00 PM
Feasibility of Repairing Parts Using Electron Beam Melting: Per Skoglund, Carlos Botero, Andrei Koptyug, Lars-Erik Rämmar, Mikael Bäckström, SportsTech Research Centre, Mid Sweden University

4:20 PM
Near net-shape, Additively Manufactured Metal Parts with Stress-free Isotropic Microstructures via Sintering: Shashank Holenarasipura Raghu, Michael Gibson, Nihan Tuncer, Brian Kerman, Anna Trump, Jesse Cataldo, Ellen Benn, Shannon Taylor, Alexander Barbari, Aminesh Bose, Lisa Maiocco, Desktop Metal
Additive Manufacturing of Metals: Post Processing — Heat Treatment I
Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszyński, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras
Tuesday PM  Room: A216 Location: Greater Columbus Convention Center

Session Chair: Ola Harrysson, NC State University

2:00 PM Invited
To Post-process Or Not to Post-process: Moataz Attallah; Uriel Tradowsky; Luke Carter; Ji Zu; Sheng Li; Chunlei Qiu; University of Birmingham

2:40 PM
Microstructure and Properties of Additive Laser Powder Bed Fusion Processed and Heat-treated Co-Cr-Mo Alloy: Boateang Twum Donkor; Vijay Vasudevan; Seetha Mannava; Michael Kattoura; University of Cincinnati

3:00 PM
Parametric Investigation of Selective Laser Melting and Post-Heat Treatment for Al10SiMg Alloys: Holden Hyer; Sharon Park; Le Zhou; Bjorn Tolentino; Edward Deim; Brandon McWilliams; Kyu Cho; Yongho Sohn; University of Central Florida; U.S. Army Research Laboratory

3:20 PM
Impact of Hot Isostatic Pressing (HIP) on the Mechanical Behavior of Additively Manufactured Ti-6Al-4V by Directed Energy Deposition: Jayme Kest; Todd Palmer; Penn State

Additive Manufacturing: In-situ Process Monitoring and Control — Session III
Program Organizers: Ulf Ackelid, Freemelt AB; Andrzej Wojciechowski, ATI Specialty Materials; Sudarsanam Babu, The University of Tennessee, Knoxville; Ola Harrysson, North Carolina State University
Tuesday PM  Room: A221 Location: Greater Columbus Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee, Knoxville

2:00 PM
Overview of In-situ Quality Assurance: Why Is It Needed and Which Tools Can Be Used?: Robin Day; RWTH Aachen University Digital Additive Production

2:20 PM
The Potential of Backscatter Electron Imaging in Selective Electron Beam Melting for Quality Management: Fuad Osmanlic; Friedrich-Alexander-Universität Erlangen-Nürnberg

Program Organizers: Jing Zhang, Indiana University-Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Xinghua Yu, Oak Ridge National Laboratory; Yeongil Jung, Changwon National University
Tuesday PM  Room: A223 Location: Greater Columbus Convention Center

Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Xinghua Yu, Oak Ridge National Laboratory; Yeongil Jung, Changwon National University

2:00 PM
Simulation Assisted Design for Additive Manufacturing: Lukas Masseling; Ulrich Thombsen; Kevin Briggs; Pam Whitaker; Javier Gutierrez; Mustafa Megahed; Fraunhofer ILT; Renishaw; ITP Aero; Esi Group

2:20 PM
Temperature-dependent Charpy Impact Property of 3D Printed 15-5 Stainless Steel: Sagivin Sagar; Yi Zhang; Yeon-Gil Jung; Jing Zhang; Hye-Young Park; Indiana University-Purdue University Indianapolis; Changwon National University

2:40 PM
A Microstructural Modelling Approach for Ni Superalloys Built by Additive Manufacturing: Guillermo Farias; Kamal Kadirvel; Wei Zhang; Yunzi Wang; Antonio Ramirez; Dept. of Materials Science and Eng. - The Ohio State University

3:00 PM
Phase Field Modeling of Dendritic Formation in Additively Manufactured Ti-6Al-4V: Limmin Wu; Lingbin Meng; Jing Zhang; IUPUI
Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Session III

Program Organizers: Iver Anderson, Iowa State University / Ames Laboratory; Carol Handwerker, Purdue University; Albert T. Wu, National Central University

Tuesday PM  Room: B230
October 16, 2018  Location: Greater Columbus Convention Center

Session Chairs: Carol Handwerker, Purdue University; Eric Chason, Brown University

2:00 PM Invited
Comparisons between Orientation Measurements in Solder Joints and Solder Bumps Using High Energy X-ray Diffraction and Electron Backscattered Diffraction Mapping: Quan Zhou; Justin Roe; Thomas Bieler; Tae-Kyu Lee; 1Michigan State University; 2Portland State University

2:20 PM
Microstructural Evolution due to Thermal Cycling Leadless Chip Carriers: Alyssa Yaege; Carol Handwerker; John Blendell; Ganesh Subbarayan; Travis Dale; Elizabeth McClamrock; 1Purdue University

2:40 PM
Solid State Interfacial Reactions at Pb-free Solder / Surface Finish Interface: Faramarz Hadian; Harry Schoeller; Eric Cotts; 1Binghamton University; 2Universal Instruments Corporation

3:00 PM Invited
What Makes Sn Whiskers Nucleate and Grow: Insight from Real-time Measurements and Modeling: Eric Chason; Napur Jain; Andrew Hitt; Fei Pei; 1Brown University; 2Amphenol-ics

3:20 PM
Formation and Evolution of Tin Surface Defects Using Cyclic Thermal and Mechanical Loading: Xi Chen; Carol Handwerker; John Blendell; 1Purdue University

3:40 PM
Dislocations Resulted Recrystallization in Tin Whiskers Formation during Thermal Cycling: Congying Wang; Carol Handwerker; John Blendell; 1Purdue University

4:00 PM
Simulation of Microstructural Evolution and Whisker Growth in Thin Films: Xiaorong Cai; Marisol Koslowski; 1Purdue University
Advanced Steel Metallurgy: Products and Processing — Iron and Steelmaking, Processing, and Cleanliness

Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

Tuesday PM  Room: A226  Location: Greater Columbus Convention Center

Session Chairs: Ashish Singh, Welspun Tubular LLC; Shobhit Bhartiya, Big River Steel LLC

2:00 PM  Numerical Simulation of Fluid Flow during the Steel Refining Process in an Electric Arc Furnace: Yuchao Chen1; Armin Silaen1; Chenn Zhou1; 1Purdue University Northwest

2:30 PM  Formation and Evolution of Inclusions in GCR15 Bearing Steels: Gong Cheng1; Jaheng Duan1; Wenbo Wang1; Lifeng Zhang1; 1University of Science and Technology Beijing

2:50 PM  Complex Precipitation of MnS and Oxides in Heavy Rail Steels: Wen Ying1; Xuewei Zhang1; Yanping Chu1; Lifeng Zhang1; Gong Cheng1; 1University of Science and Technology Beijing

3:10 PM  Application of Ultrasonic Non-destructive Testing System and ANSYS Simulation to Assess Defects in Continuously Cast Steel Slabs: Zhanfang Wu1; Hsiang Ling Juan1; C. Isaac Garcia1; 1University of Pittsburgh

3:30 PM  Control of the Slab Corner Precipitation Behavior for Micro-alloyed Steels Continuous Casting: Zhaochen Cai1; Miao-yong Zhu1; 1Northeastern University

3:50 PM  The Influence of SEN and Upnozzle Design on the Flow Character for the Slab Quality: Yu Yanwen1; 1Baoshan Iron Steel Co. Ltd.

4:10 PM  Improvement in Refractory Life of Smelting Reduction Furnace: Koichi Takahashi1; Daisuke Kondo1; Sohei Takagaki1; Keisuke Adachi1; Masanori Nishikori1; 1JFE Steel Corporation

Advances in Dielectric Materials and Electronic Devices — Advanced Dielectrics and Energy

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, The University of Texas at San Antonio; Rick Ulic, Boise State University; Danilo Suvorov, Jozef Stefan Institute

Tuesday PM  Room: B132  Location: Greater Columbus Convention Center

Session Chair: Steven Tidrow, Alfred University

2:00 PM  Invited  Factors Affecting the Electrocaloric Cooling Performance of Ferroelectric Perovskites: Florian Weyland1; Nikola Novak1; George Rosse1; 1Technical University of Darmstadt; 2University of Connecticut

2:20 PM  Processing of 2-D Ceramic Nanofillers/PVDF Dielectric Nanocomposites for Enhanced Energy Storage Capability: Dokyun Kwon1; Yumin Goh1; Hyunseung Cho1; Hyunjong Bae1; Hoisub Shin1; 1Korea Aerospace University

2:40 PM  Invited  Features of the PbTiO3-CaTiO3 Morphotropic Phase Boundary: Ducinei Garcia1; Flavia Estrada1; 1Federal University of Sao Carlos

3:00 PM  Antiferroelectric Materials as Dielectric Coolants: Theory and Experiments: Bouchra Asbani1; Brigita Rozic2; Hana Ursic2; Mimoun El Marsi1; Rasa Piric2; Jurij Koruz2; Barbara Malic2; Zdravko Kuntaj2; 1University of Picardie Jules Verne; 2Jozef Stefan Institute; 3Technische Universitaet Darmstadt

3:20 PM  Capacitors as Thermal-to-Electric Energy Conversion Devices: Steven Tidrow1; Jessica Scoones1; Dustin Travis1; Souvik Bera1; Steven Pilgrim1; Walter Schulze1; 1Alfred University

3:40 PM  Pyrolytic Graphite-copper Thermocouple for Non-invasive Direct Temperature Measurement: Abdul-Sommed Hadi1; Jonathan Lanni2; Tyler Fricks2; Bryce Hill2; 1Montana Tech of the University of Montana; 2Montana Technological University

4:00 PM  Invited  Electric Field Control of Interfacial Magnetism through Ionic Liquid Gating: Zhongqiang Hu1; Ziyao Zhou1; Ming Liu1; Xi’an Jiaotong University

4:20 PM  Effect of Calcination and Sintering Temperature on Dielectric Properties of Giant Dielectric Ti0.9-(Al0.5-Nb0.5)0.1O2 Ceramics: Ranabratu Mazumder1; Subhra Sourav Jana1; Sumit Choudhary1; S. Abhinay1; 1National Institute of Technology Rourkela

Advances in Solid Oxide Fuel Cell Technology — SOFCs for Stationary Applications

Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Tuesday PM  Room: D281  Location: Greater Columbus Convention Center

Session Chairs: Jeff Stevenson, Pacific Northwest National Laboratory; Patcharin Burke, Department of Energy

2:00 PM  Invited  Solid Oxide Fuel Cell Stack Technology: Status and Challenges: Nguyen Minh1; 1University of California, San Diego

2:20 PM  Invited  Overview of DOE Office of Fossil Energy’s Solid Oxide Fuel Cell Program: Patcharin Burke1; Shailesh Vora1; 1Department of Energy, National Energy Technology Laboratory

2:40 PM  Invited  Innovative Natural-gas Technologies for Efficiency Gain in Reliable and Affordable Thermochemical Electricity-generation (Integrate): David Test1; 1ARPA-E

3:00 PM  Invited  Functional Interfacial Layers to Reduce Detrimental Cell Interactions: Neil Kidner1; Steve Bradshaw1; Kari Rigg1; David Kopcevich2; Gene Arkenberg1; Matthew Seabaugh1; Scott Swartz1; 1Nexceris LLC
OCTOBER 14 – 18, 2018
GREATER COLUMBUS CONVENTION CENTER
COLUMBUS, OHIO, USA

3:20 PM Invited
Combining Experiments, Modeling, and Systems Analysis to Enable Solid Oxide Fuel Cell Technology: Harry Abernathy1; Gregory Hackett1; Shiwoo Lee1; Thomas Kalapos1; National Energy Technology Laboratory

3:40 PM
SupirCATM: A High Performing Internal Reforming Catalyst Technology for SOFC Applications: Naftali Opmbe; Matthew Seabaugh; Scott Swartz; Douglas Mitchell1; Sergio Ibanez2; Nexceris LLC

4:00 PM
Nano-CeO2 Catalyst Deposition Using Bio-adhesive Catechol Surfactants for Efficient Enhancement of SOFC Electrodes: Ozcan Ozmen1; John Zondlo1; Edward Sabolsky1; Shiwoo Lee2; Gregory Hackett2; Harry Abernathy3; Neil Kidner1; Matthew Seabaugh1; West Virginia University; US DOE-National Energy Technology Laboratory; Nexceris, LLC

4:20 PM
Quantitative Analysis of Multi-scale Microstructural Heterogeneities in SOFC Electrodes: Rabahat Mahbub1; Mingzheng Feng1; Tim Hsu1; William Epting2; Ross Cunningham1; Gregory A Hackett1; Harry Abernathy2; Anthony D Rollett1; Shawn Lisier1; Peter Kennes1; David B Menasche1; Robert Suter1; Paul A Salvador1; Carnegie Mellon University; US DOE-National Energy Technology Laboratory; Nexceris, LLC

ASM Edward DeMille Campbell Memorial Lecture
Tuesday PM
Room: C170
Location: Greater Columbus Convention Center
October 16, 2018

12:45 PM Invited
Sustainable Materials Development: A Case Study Approach: Julie Schoenung1; University of California, Irvine

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — Physical Properties of Bulk Systems
Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University
Tuesday PM
Room: B244/245
Location: Greater Columbus Convention Center
October 16, 2018

Session Chair: Jens Kunstmann, TU Dresden

2:00 PM Invited
Chemical Space Partitioning in New Intermetallic Borides MNi2-xBx (M = In, Sn): Andreas Leithe-Jasper1; Frank Wagner1; Qiang Zheng1; Juri Grin1; MPI-CPS

2:40 PM Invited
Thermoelectric Properties of Boron-rich Metal Borides: Masatoshi Takeda1; Nagaoka University of Technology

3:20 PM Question and Answer Period

3:40 PM Invited
Temperature-dependent Site Occupation in Elemental Beta Boron: Michael Widom1; Carnegie Mellon University

4:20 PM Invited
Insights on Hydogenated Alpha-tetragonal Boron and the Phase Diagram of Two-dimensional Boron Oxide: Jens Kunstmann1; Tu Dresden

Careers in Industry — Networking and Careers for Material Scientists
Program Organizers: Kathleen Shugart Cissel, UES Inc; Krista Grayson, Mo-Sci Corporation
Tuesday PM
Room: B231
Location: Greater Columbus Convention Center
October 16, 2018

Session Chairs: Amanda Krause, Lehigh; Kathleen Cissel, UES, Inc

2:00 PM Invited
Networking: Kristen Brosnan1; GE Global Research

2:40 PM Invited
How Advanced Degrees in MSE Enable Business Opportunities: Robert Wheeler1; Microtesting Solutions LLC

3:00 PM Invited
Developing Your Career at a National Laboratory: Marissa Reigel1; Savannah River National Lab

3:40 PM Invited
So What Next? Careers at Large Companies for Graduates with Materials Science Backgrounds: Adam Stevenson1; Saint-Gobain

4:00 PM Invited
Airplane Material Advancements to Meet Future Industry Demand: Daniel Stevens1; Boeing

Ceramic and Crystal Materials for Optics and Photonics — Session III
Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikeshue, World-Lab. Co., Ltd; Mark Dubinskiy, Amy Research Laboratory
Tuesday PM
Room: A113
Location: Greater Columbus Convention Center
October 16, 2018

Session Chairs: Do-Kyung Kim, Korea Advanced Institute of Science & Tech; Victoria Blair, Army Research Laboratory

2:00 PM Invited
The Elusiveness of Tough, Transparent Ceramics: Ivar Reimanis1; Colorado School of Mines

2:20 PM Invited
Testing and Design of Nd:YVO4 Laser Amplifier Components for the ICESat-2 Altimeter: Jonathan Selam1; Nicholas Sawruk1; Eric Bäcker1; NASA Glenn Research Center; Fiberbyte

3:00 PM
Updated Advances in Coherent Poly-propagation of Diffracted White Light in Natural Silicates: Michelle Stem1; Complete Consulting Services LLC
3:20 PM Invited
Transparent Ceramics for Laser and Optical Applications: Long Zhang; Benxue Jiang; Xiaojiao Mao; Qianguang Zhu; ‘Shanghai Institute of Optical and Fine Mechanics, Chinese Academy of Science

Characterization & Methods in Failure Analysis — Fatigue & Fracture I
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)
Tuesday PM, October 16, 2018, Location: Greater Columbus Convention Center
Session Chairs: Giri Liu, Progress Rail; Nicholas Cheronis, Baker Risk; Wesley Pridemore, General Electric-Aviation; Pierre Dupont, Schaeffler Belgium Sprl/bvba; Conrad Park, Case Western Reserve University

3:40 PM Invited
The Role of Non-conventional Transformation Pathways and Structural Instabilities on the Microstructural Evolution in Metastable Beta-titanium Alloys: Yufeng Zheng; Yunzhi Wang; Rajarshi Banerjee; Dipankar Banerjee; Hamish Fraser; ‘Ohio State University; ‘University of North Texas; ‘Indian Institute of Science

4:10 PM Invited
Tuning the Scale of a Precipitates in β-titanium Alloys for Achieving High Strength: Srinivas Aditya Mantri; Deep Choudhuri; Talukder Alam; Rajarshi Banerjee; ‘University of North Texas

4:40 PM Invited
Microstructure Design by Two Step Phase Transformation in β Ti-alloys: Dong Wang; Tianlong Zhang; Yunzhi Wang; ‘Xi’an Jiaotong University; ‘The Ohio State University

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session II
Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory; Gurpreet Singh, Kansas State University; Kejie Zhao, Purdue University; Jian Shi, Rensselaer Polytechnic Institute
Tuesday PM, October 16, 2018, Location: Greater Columbus Convention Center
Funding Support provided by: MilliporeSigma
Session Chairs: Kathy Lu, Virginia Tech; Haitao Zhang, University of North Carolina at Charlotte

3:00 PM Invited
Advanced Mill Roll Life Cycle Management: Konstantin Redkin; Christopher Hrizo; Kevin Marsden; ‘WHEMCO Inc

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Phase Transitions & Alloy Design
Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Carl Boehlerl, Michigan State University; Kayla Calvert, TIMET - HTL; Yufeng Zheng, The Ohio State University
Tuesday PM, October 16, 2018, Location: Greater Columbus Convention Center
Session Chairs: Benjamin Morrow, Los Alamos National Laboratory; Yufeng Zheng, The Ohio State University

2:00 PM Keynote
Wafer Scale Two-dimensional Transition Metal Dichalcogenide Materials and Devices: Linyou Cao; ‘North Carolina State University

2:40 PM Keynote
Study of Low-temperature Photocatalytic Protonation of 2D MoO3 Nanoflakes with Pure Alcohol: Soheil Razmyar; Haitao Zhang; ‘UNC Charlotte

3:00 PM Keynote
Permselective H2/CO2 Separation and Desalination of Hybrid GO/rGO Membranes with Controlled Pre-crosslinking: Han Liu; Ruochen Liu; Shailesh Dangwal; Seok-Jhan Kim; Nitin Mehra; Yifan Li; Jiahua Zhu; ‘The University of Akron; ‘Oklahoma State University

3:20 PM Keynote
Complexity of Intercalation In-between 2D Transition Metal Carbides “MXenes” and Their Applications as Energy Storage Materials: Michael Naguib; ‘Tulane University
Deformation and Transitions at Grain Boundaries VI — Grain Boundary Energy and Structure I

Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

Tuesday PM
October 16, 2018
Room: A123
Location: Greater Columbus Convention Center

Session Chairs: Shengfeng Yang, Indiana University Purdue University Indianapolis; Timothy Rupert, University of California Irvine

2:00 PM Invited
Charting the Chemical Landscape of Grain Boundaries: An Atomic Method to Determine Ground-state Complexions: Peter Larsen1; Arvind Kalidindi1; Christopher Schuh1; 1MIT

2:30 PM Invited
Decorating Defects with Segregating Dopants to Tailor Mechanical Properties: Timothy Rupert1; 1University of California Irvine

3:00 PM Invited
Modeling Grain Boundary Phases Transitions with Atomic Simulations: Shengfeng Yang1; Jian Luo1; Indiana University Purdue University Indianapolis; 1University of California, San Diego

3:30 PM Invited
Grain Boundary Energy and Velocity Shift during Grain Growth of Nanocrystalline Magnesium Aluminate: Ricardo Castro1; Derek Muche1; 1University of California, Davis

4:00 PM
Mechanical Properties of Nanocrystalline-nanotwinned Silver Strengthened by Copper Impurity Segregation: Xing Ke1; Frederic Sansoz2; Y. Morris Wang2; Ryan Ortiz3; Iaine Marian3; 3The University of Vermont; 2Lawrence Livermore National Laboratory; 1Ames Laboratory; 1University of California Los Angeles

4:20 PM
Role of Grain Boundaries on Damage Evolution in Wrought and Additively Manufactured (AM) Tantalu: George Gray1; Veronica Livescu1; Thomas Nizolek1; Carl Trujillo1; Roberta Beal1; David Jones1; 1Los Alamos National Lab

Environmental Degradation and Embrittlement of Structural Metals — Hydrogen Embrittlement I

Program Organizers: Jun Song, McGill University; Ankit Srivastava, Texas A&M University; Homero Castaneda, Texas A&M University; Salim Brahimi, McGill University / IBeca Technologies; Frank Cheng, University of Calgary; Ronald Miller, Carleton University; Xin Pang, CanmetMaterials/Natural Resources Canada; Stephen Yue, McGill University

Tuesday PM
October 16, 2018
Room: C162A/162B
Location: Greater Columbus Convention Center

Session Chair: Jun Song, McGill University

2:00 PM Invited
Relating the Crystallographic Character of Individual Grain Boundaries to Their Hydrogen Embrittlement Susceptibility: Michael Demkowicz1; 1Texas A&M University

2:30 PM
A Novel Experimental-numerical Approach to Investigate Hydrogen Enhanced Localized Plasticity (HELP) Mechanism: Seyyedeh Mohadeseh Taheri Mousavi1; Benjamin Cameron1; Motonichiy Koyama1; C. Cem Tasan1; 1MIT; 2Kyushu University

2:50 PM
Hydrogen Effects on the Evolution of Plastic Deformation and Intergranular Failure of Ni: A Study across Length Scales: Kaila Bertsch1; Shuai Wang2; Akhilesh Nagao3; Ian Robertson3; 3University of Illinois at Urbana-Champaign; 2University of Wisconsin-Madison; 1International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University

3:10 PM Invited
Hydrogen-microvoid Interactions in Metals: Zhiliang Zhang1; 1Norwegian University of Science and Technology

3:30 PM
Hydrogen Trapping and Kinetics at Phase Boundaries in High-strength Steels: An Atomic Study: Xiao Zhou1; Xiaohan Bie2; Jun Song2; 1McGill University

3:50 PM
Hydrogen Embrittlement of 4340 Steel with Martensitic and Bainitic Microstructures for Fastener Applications: Dane Hyer-Peterson1; Kip Findley1; 1Colorado School of Mines

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — ACers GOMD Alfred R. Cooper Award Session

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Tuesday PM
October 16, 2018
Room: A115
Location: Greater Columbus Convention Center

Session Chair: Neville Greaves, University of Cambridge

2:00 PM Introductory Comments

2:10 PM Invited
A Multiscale Approach to the Mechanical Properties of Glass: Tanguy Rouxel1; 1University of Rennes 1

2:50 PM
Structural Relaxation versus Crystallization in a Deeply Undercooled Glass: Ricardo Felipe Lancelotti1; Daniel Roberto Cassar2; Edgar Zanotto2; 2Federal University of Sao Carlos

3:30 PM Invited
Alfred R. Cooper: The Melody Lingers On: John Mauro1; 1The Pennsylvania State University

4:10 PM Invited
Effects of B2O3/SiO2 Substitution on Structure and In Vitro Bioactivity of Phosphosilicate Bioactive Glasses: Jincheng Du1; Xiaohan Lu1; Mengguo Ren1; 1University of North Texas

4:50 PM Invited
Therapeutic Bioactive Glass Nanoparticles and the Challenge of Ion Incorporation: Julian Jones1; 1Imperial College
Notched Bar Creep Tests
Macrocharacterization and Mapping of Creep Damage in Semi-circular Notched Bar Creep Tests: John Sieferd; Tapasvi Lolla; Electric Power Research Institute

Martempering and the Fracture Toughness of a Medium Carbon Secondary Hardening Steel: Warren Garrison; Yu Lin; Yaxu Zheng; Carnegie Mellon University; University of Science and Technology Beijing

The Study of the Embrittlement of a Medium Carbon Secondary Hardening Steel on Cooling from the Austenitizing Temperature: Yu Lin; Yaxu Zheng; Warren Garrison; Carnegie Mellon University; University of Science and Technology Beijing

The Effect of Long-period Stacking-ordered Structure (LPSO) on Deformation Behavior of Magnesium Rare Earth Alloys: Kan Li; R.D.K. Misra; University of Texas El Paso; UTEP

Experimental Investigation and Computational Modeling of the Multiaxial Plasticity Behavior of DP600 at Macro and Microscales: Shipin Qin; Ross McLeod; Victor Oancea; Allison Beece; Department of Materials Science and Engineering, Pennsylvania State University; Dassault Systemes SIMULIA Corp.

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Surface Properties
Program Organizers: John Blendell, Purdue University; Ming Tang, Rice University; Shen Dillon, University of Illinois; Wayne Kaplan, Technion - Israel Institute of Technology; Dominique Chatan, CNRS, Aix-Marseille University

Tuesday PM  Room: A122
October 16, 2018  Location: Greater Columbus Convention Center

Session Chair: Wolfgang Rheinheimer, Purdue University

2:00 PM Invited
Development of Electronic Materials Using Combinatorial Substrate Epitaxy: Elizabeth Mao; Julia Wittkamper; Haobo Li; Catherine Zhou; Wilfrid Prellier; Gregory Rohrer; Paul Salvador; Carnegie Mellon University; Laboratoire CRISMAT, CNRS UMR 6508, ENSICAEN, Normandie Université

2:30 PM
Role of Hydrogen-bond Reorientation and Second Shell Waters and Surfaces on Proton Transport: Jesse Lentz; Stephen Garofalini; Rutgers University

3:00 PM
On the Kinetics of Si Grain Boundary Segregation in an Iridium Alloy during Continuous Cooling: Dean Pierce; Govindarajan Muralidharan; Lee Heatherly; Cecil Carmichael; George Ulrich; Oak Ridge National Laboratory

3:20 PM
Adsorption and Diffusion of Oxygen on Pure and Partially Oxidized Al and Ni Surfaces: Krishan Kanhaiya; Hendrik Heinz; University of Colorado Boulder

3:40 PM
Influence of Polarization Magnitude on the Photochemical Reactivity of BaTiO3: Wenjia Song; Paul Salvador; Gregory Rohrer; Carnegie Mellon University

4:00 PM
Atomistic Methods for Prediction of Static Friction: William Joost; Kelly Harrington; Pantho Stoyanov; Pratt & Whitney

International Symposium on Ceramic Matrix Composites — Damage Evaluation and Modeling
Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Tuesday PM  Room: A114
October 16, 2018  Location: Greater Columbus Convention Center

Session Chair: Triplicane Parthasarathy, UES, Inc.

2:00 PM Invited
Role of Extreme Values in Constituent Geometry and Property Distributions in Design of SiC/SiC CMCs: Frank Zok; University of California Santa Barbara
2:40 PM Invited
Modeling Environment Induced Property Degradation of SiC-fiber Reinforced CMCs: Triplcane Parthasarathy; Qingda Yang; Brian Cox; Michael Braginsky; Olivier Sudre; Dipen Patel; Craig Przybyla; Michael Cinibulk; UES Inc; University of Miami; Arachne Consulting; UDRI; Teledyne Scientific; Air Force Research Laboratory

3:20 PM
Life Limiting Behavior of Ceramic Matrix Composites (CMCs) under Static Interlaminar Shear Loading at Elevated Temperatures: Sean Kane; Sung Choi; D. Faucett; Luis Sanchez; NAVAIR

4:00 PM
Effects of Rebounding Velocity of Projectiles on Foreign Object Damage (FOD) in Ceramic Matrix Composites (CMCs): David Faucett; Cajer Gong; Nes Kedir; Sung Choi; NAVAIR; Purdue University

4:40 PM
Deformation and Failure in Pin-loaded All-oxide fiber Composites: Paul Christodoulou; Avery Samuel; Frank Zok; University of California, Santa Barbara

International Symposium on Defects, Transport and Related Phenomena — Gas-Solid Interface Transport
Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

Tuesday PM
Room: B242/243
Location: Greater Columbus Convention Center

Session Chairs: Nicola Perry, University of Illinois at Urbana-Champaign; Koji Amezawa, IMRAM, Tohoku University

2:00 PM Invited
Cathodic Reaction in SOFC and PCFC Investigated by Using Patterned Thin Film Model Electrode: Koji Amezawa; Keita Mizuno; Yuki Shinomiya; Yoshinobu Fujimaki; Takashi Nakamura; Yuta Kimura; Kiyofumi Nitta; Oki Sekizawa; Keiji Yashiro; Fumitada Iguchi; Hiroo Yugami; Tatsuya Kawada; Tohoku University; JASRI

2:40 PM Invited
Crystallinity and Microstructure Effects on Oxygen Surface Exchange Kinetics of Mixed Conducting Oxides: Ting Chen; George Harrington; Kazumari Sasaki; Nicola Perry; wp-I2CNER, Kyushu University; MIT; University of Illinois at Urbana-Champaign

3:20 PM Invited
A Comparison of the Wafer Curvature and X-ray Diffractionmetry Determined Mechanical Properties, Defect Chemistry, and Electrochemical Performance of Praseodymium Doped Ceria Thin Films: Yuze Ma; Jason Nicholas; Michigan State University

4:00 PM
Oxygen Reduction Reaction on Ceria: Doping Matters: Maximilian Schaube; Rotraut Merkle; Joachim Maier; Max Planck Institute for Solid State Research

4:20 PM
Equivalent Circuit Analysis of Impedance Response and Potential Distribution in Multiple Carrier Electrolytes: Keiji Yashiro; Kotaro Okuyama; Arthur Bourdon; Tatsuya Kawada; Tohoku University

Joining of Advanced and Specialty Materials (JASM XX) — Friction Stir and Friction Welding II/Other Solid State Joining Processes
Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barbour, WeldQC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Tuesday PM
Room: C171
Location: Greater Columbus Convention Center

Session Chairs: Zhenzhen Yu, Colorado School of Mines; Judy Schneider, University of Alabama at Huntsville

2:00 PM
Joining of Dissimilar Metals - Inconel718 and En24 Alloys by Continuous Drive Friction Welding: Vijay Gaikwad; Bharat Forge Ltd.

2:20 PM Invited
High Speed Friction Stir Lap Welding of Automotive Al Alloys: Pyush Upadhyay; Xiao Li; Tim Roosendaal; Pacific Northwest National Laboratory; Pacific Northwest National Laboratory

2:40 PM
Liquid Metal Embrittlement in Resistance Spot Welding of Zinc Coated Advanced High Strength Steel: Erica Wintjes; Andrew Macwan; Elliot Biro; Norman Zhou; University of Waterloo; ArcelorMittal Global Research

3:00 PM
Impact Welding for Rapid Repair of Full-hard Precipitation Hardened Steel: Bert Liu; Anthony Palazotto; Anupam Vivek; Glenn Daehn; Air Force Institute of Technology; The Ohio State University

3:20 PM
Microstructure and Strength of Aluminum Alloy Jointed by Piezoelectric Actuator Augmented Resistance Spot Welding: Na Wu; Shujun Chen; Jun Xiao; Wei Zhang; Chaoxiong Hu; Beijing University of Technology; The Ohio State University

3:40 PM
Effect of Surface Condition on Resistance Spot Welding of Press-hardened Steel: Xu Han; Mohammad Hadi Razmpoosh; Andrew Macwan; Elliot Biro; Norman Zhou; University of Waterloo; ArcelorMittal Global Research

4:00 PM Invited
Spot Joining of AA 7085 and DP 1180 Steel Using a Friction Riveting Approach: Kevin Shirley; Michael Miles; Scott Grimshaw; Yong-Chae Lim; Zhili Feng; Eric Boettcher; Brigham Young University; Oak Ridge National Lab; Honda R&D

4:20 PM
Spot Impact Welding AA6111 Using Vaporizing Foil Actuator Welding: Angshuman Kapil; Taeseon Lee; Anupam Vivek; Ronald Cooper; Elizabeth Hetrick; Glenn Daehn; The Ohio State University; The Ohio State University, Department of Materials Science and Engineering; Ford Motor Company
Joining of Advanced and Specialty Materials (JASM XX) — Welding Metallurgy I
Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barbarak, WeldQC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhijong Gu, University of Massachusetts Lowell

Tuesday PM
October 16, 2018
Room: C172
Location: Greater Columbus Convention Center

Session Chairs: Hiroaki Mori, Osaka University; Carolin Fink, The Ohio State University

2:00 PM
Cracking During Powder Injection Laser Welding of Alloy G-30: Ben Sutton; Jeff Enneking; Antonio Ramirez; The Ohio State University; Framatome Inc.

2:20 PM
Hot Cracking Susceptibility of Alloy 617 by Varestraint Test: Shotaro Yamashita; Yusuke Morikawa; Kosei Hiramatsu; Tomo Ogura; Kazuyoshi Saida; Kenji Kamimura; Yasuhito Kaniyado; Takahiro Niki; Osaka University; Toshiba Energy Systems & Solutions Corporation

2:40 PM
Weldability of Ta-bearing Ni-base Filler Metal 52XL: Luke Johnson; Carolin Fink; John Lippold; Steve McCracken; The Ohio State University

3:00 PM
Quantitative Evaluation of Reheat Cracking Susceptibility in Weld Metal of Ni-based Alloys: Tomo Ogura; Keisuke Kubota; Yuki Asahara; Shotaro Yamashita; Kazuyoshi Saida; Osaka University

3:20 PM
Quantification of the Susceptibility to Ductility Dip Cracking in Welds of Ni-based Alloys: Samuel Luther; Boian Alexandrov; The Ohio State University

3:40 PM
Effect of Interstitial Elements on the Solidification Behavior of High Chromium, Nickel Base Filler Metals: Louise Aguilar; Carolin Fink; Steve McCracken; The Ohio State University; Electric Power Research Institute

4:00 PM
Stress Relief Cracking of High Temperature Alloys: Riski Kant; John DuPont; Lehigh University

4:20 PM
Welding Metallurgy and Weldability of High-temperature HEA System AlCoCrCuFeNi: Alec Martin; Carolin Fink; The Ohio State University

Light Metal Technology – Applications for the Transportation Industry — High Strength Aluminium Alloys
Program Organizers: Julie Levesque, Quebec Metallurgy Center; Mihaela Isac, McGill Metals Processing Centre; Xiaoming Wang, Purdue University; Rodenick Guthrie, McGill University; Sa Ge, Hatch Ltd.; Kaan Inal, University of Waterloo; Frederic Larouche, Rio Tinto

Tuesday PM
October 16, 2018
Room: B130
Location: Greater Columbus Convention Center

Session Chairs: Kaan Inal, University of Waterloo; Francisco Flores, NanoAl

2:00 PM
Characterization and Modeling of Aluminium Alloy 7075 in Naturally and Artificially Aged Conditions: Julie Levesque; Waqas Muhammad; Augustin Gakwaya; Laval University; University of Waterloo

2:20 PM
Forming of High Strength Aerospace Alloys Using the Vaporizing Foil Actuator Method: Bhuv Naradiddi; Yu Mao; Anupam Vivek; Glenn Daehn; The Ohio State University

2:40 PM
Mechanical Behaviors and Deformation Control of As-quenched Al-Cu Alloy for Large Aerospace Structures: Qingyao Yuan; Gang Wang; Ke Ren; Wenguang Wang; Yiming Rong; State Key Laboratory of Tribology, Tsinghua University; Tsinghua University; Mechanical and Energy Engineering Department, Southern University of Science and Technology of China

3:00 PM
The Effects of Laser Shock Peening on Fatigue, Corrosion and Corrosion Fatigue Properties of Al7075: Anurag Sharma; Vijay Vasudevan; Seetha Mannava; Domenico Furfari; University of Cincinnati, Ohio; Airbus

3:20 PM
Laser Shock Processing of AZ31B Magnesium Alloy: The Generation of Gradient Twinning Microstructure: Bo Mao; Yiliang Liao; Bin Li; University of Nevada, Reno

Manufacturing-Related Failures — Welding/Joining Failures
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de Mons (FPMs)

Tuesday PM
October 16, 2018
Room: A210
Location: Greater Columbus Convention Center

Session Chairs: Thomas Kozina, NTN Bearing Co.; Jonathan Trenkle, The NanoSteel Company; Debbie Aliya, Aliya Analytical Incorporated; Ronald Pietrowski, Con Edison; Mark Hineman, Engineering Systems Incorporated; Craig Schroeder, EWI

2:00 PM
Failure Analysis of an Aircraft Fuel Line: Milo Kraft; University of Canterbury

2:20 PM
Fatigue Life Simulation of Pipeline Elbow under Cyclic Loading: Xiankui Zhu; EWI
2:20 PM Invited
Membrane Fuel Cell (PEMFC) Performance During Leach Testing. Matthew Asmussen, University of Cincinnati; Hari Paudel, Georgia Tech; Zhi Zeng, The University of Texas at Austin; Yuhua Duan, Pacific Northwest National Laboratory

3:00 PM Invited
The Theoretical Investigation of Tritium Formations on the Surfaces of γ-LiAlO$_2$. Ting Jia, National Institute of Standards and Technology; Hari Paudel, Pacific Northwest National Laboratory; Zhi Zeng, University of Texas at Austin; Yuhua Duan, Pacific Northwest National Laboratory

Materials Issues in Nuclear Waste Management — Corrosion Science in Nuclear Waste Management
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Jason Lonergan, Washington State University; Jake Amoroso, Savannah River National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Kevin Fox, Savannah River National Laboratory; Josef Matyas, Pacific Northwest National Laboratory

Tuesday PM Room: D282
October 16, 2018 Location: Greater Columbus Convention Center

Session Chair: Cory Trivelpiece, Savannah River National Laboratory

2:00 PM Invited

2:20 PM Invited
The Role of CO$_2$ upon Early-stage Corrosion Reactions of ISG. Robert Schaut, Corning Incorporated; Steven Tietje, Nicholas Smith, Chris Bourgeois, Corning Incorporated

3:00 PM Invited

3:40 PM
The Evolving Distribution of Technetium within Cementitious Waste Forms
By: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Pacific Northwest National Laboratory; Hari Paudel, University of Texas at Austin; Raul Rebak, National Institute of Standards and Technology; Ben Caplins, Pacific Northwest National Laboratory

4:00 PM
Formation and Structure of Passivating Gels by Reactive Molecular Dynamics Simulations: Tao Du, Mathieu Bauchy, University of California, Los Angeles

Materials for Nuclear Applications and Extreme Environments — Theory and Modeling of Nuclear Materials
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Dev Chidambaram, University of Nevada, Reno; Raul Rebak, GE Global Research; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

Tuesday PM Room: D183
October 16, 2018 Location: Greater Columbus Convention Center

Session Chair: Philip Edmondson, Oak Ridge National Laboratory

2:00 PM Invited
Thermodynamics of Nuclear Fuel: Model Development and Application. Jacob McMurray, Theodore Besmann, Dongwon Shin, Oak Ridge National Laboratory; University of South Carolina

2:40 PM
Compositional Control of Radionuclide Retention in Hollandite-based Ceramic Waste Forms for Cs-Immobilization: Kyle Brinkman, Mingyang Zhao, Jake Amoroso, Kristina Lilova, Alexandre Navrotsky, Oak Ridge National Laboratory; Clemson University; Savannah River National Laboratory; University of California Davis

3:00 PM
Density Functional Theory Study of the Point Defect Energies in γ-LiAlO$_2$, Li$_2$ZrO$_3$, and Li$_2$TiO$_3$: Yueh-Lin Lee, Jamie Holber, Hari Paudel, Dan Sorescu, Yuhua Duan, National Energy Technology Laboratory

3:20 PM Invited
Mechanistic Mesoscale Modeling of Sintering for UO$_2$ Fuel Pellets: Ian Greenquist, Michael Tomks, Yongfeng Zhang, Penn State University; University of Florida; Idaho National Laboratory

4:00 PM
Experimental Thermochemistry of Neptunium Compounds: Lei Zhang, Ewa Dzik, Samuel Perry, Sarah Hickam, Ginger Sigmon, Jennifer Szymanowski, Alexandre Navrotsky, Peter Burns, University of Notre Dame
3:20 PM  
Describing Brain Boundary Character through a Triple Junction Distribution Function: Benjamin Schuessler; David Field; Washington State University

3:40 PM  
The Reverse Direction of Modelin of Material Properties: Vladimir Ginzburg; Int’l Rolling Mill Consultants, Inc.

4:00 PM  
Domain Investigation in Lead-free Bi4Na3TiO12 Based Thin Films and Ceramics by Piezoresponse Force Microscope: Wei Ren; Jinyan Zhao; Gang Niu; Nan Zhang; Lingyang Wang; Peng Shi; Ming Liu; Zuo-Guang Ye; Xi’an Jiaotong University

4:20 PM  
Use of Waste Gypsum from Hydrometallurgical Plant for the Recovery of Nickel from a Nickel Slag by Sulfurization: Michel Kalenga Wa Kalengo; Nurse Chauke; Willy Nheta; University of Johannesburg

Microalloyed Steels — Microalloyed Steels I  
Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Jansto, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

Tuesday PM  
Room: A225  
Location: Greater Columbus Convention Center

Session Chair: Emmanuel De Moor, Colorado School of Mines

2:00 PM  
Development of Steel Plate for Large Heat Input Welding: JaeYong Cha; JaeYoung Cho; HwanGyo Jung; POSCO

2:30 PM  
The Effects of Alloying on High Deformation Behavior of Nb Microalloyed Steels: Evgeni Poliak; Olga Girina; Steven Jansto; ArcelorMittal

2:50 PM  
Modelling Precipitation and Austenite Grain Growth in Ti-Nb Microalloyed Steels: Alexis Gruau; David De Castro; Sophie Cazottes; Damien Fabrègue; Frédéric Danoix; Matthieu Baguet; Silvia Molas; Jose Maria Cabrera; Sebastian Schreiber; Djordje Mirkovic; Michel Perez; MATEIS - INSIA LYON; CENIM; GPM - Rouen; CERIMAT; Universitat Politécnica de Catalunya; Thyssenkrupp Steel Europe; Salzgitter Mannesmann Forschung

3:10 PM Invited  
Revisiting the Role of Nb Microalloying in Medium-high Carbon Long Products: Felipe Bastos; Beatriz Pereda; Beatriz López; Jose Rodriguez-Ibabe; Marcelo Rebelatto; Pello Uranga; RMS and Tecnun (University of Navarra); CEIT and TECNUN (University of Navarra); RMS

3:30 PM  
Effect of Al and B Alloying on Phase Transformation in Nb Microalloyed Q&P Steels: Olga Girina; Oleg Yakubovsky; Damon Panahi; Steve Jansto; ArcelorMittal; CBMM North America, Inc.

3:50 PM  
Interphase Precipitation in a Low-carbon, Titanium-molybdenum- vanadium Microalloyed Steel: Caleb Felker; John Sper; Gang Liu; Emmanuel De Moor; Colorado School of Mines; Baoshan Iron and Steel Co.

4:10 PM  
Effect of Nb and Ti on the Microstructure, Texture and Tensile Properties of Al Added Low Density Medium Mn Steel: Arnab Sarkar; Tapas.Kr Bandyopadhyay; Indian Institute of Technology Kharagpur

Modern Ceramic Manufacturing Methods and Applications — Modern Ceramic Manufacturing Methods and Applications  
Program Organizers: Keith DeCarlo, Blasch Precision Ceramics; William Carty, Alfred University; Nik Ninos, Calix Ceramic Solutions

Tuesday PM  
October 16, 2018  
Room: A120  
Location: Greater Columbus Convention Center

Session Chair: Keith DeCarlo, Blasch Precision Ceramics

2:00 PM Invited  
A Unified Approach to Ceramic Forming Processes Using Specific Volume Diagrams: William Carty; Alfred University

2:40 PM  
Electrostatic and Electrosteric Stabilization of SiC and B4C: Alexander Turner; Hyojin Lee; Holly Shulman; William Carty; New York State College of Ceramics at Alfred University

3:00 PM  
Eliminating Ceramic Powder Agglomerates for Improved Microstructures: Sarah Whippy; Hyojin Lee; William Carty; Alfred University

3:20 PM Invited  
Perspectives on Additive Manufacturing of Ceramics via Robocasting: Joe Cesarano; Robocasting Enterprises

3:50 PM Invited  
Design and Characterization of Ceramics by Lithography-based Additive Manufacturing: Shawn Allan; Lithoz America LLC

4:20 PM  
Engineering Powders for Ceramic 3-D Printing: Patrick Cigno; William Carty; Alfred University


Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

Tuesday PM  
October 16, 2018  
Room: C161A/161B  
Location: Greater Columbus Convention Center

Session Chairs: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

2:00 PM Invited  
Excellent Friction and Anti-wear Reduction Properties of Carbon Nanomaterials Dispersed Mineral Oil: Sneh Sruhti V; Ramaprabh S; Kamraju M; Indian Institute of Technology Madras

2:40 PM  
3D Self-supported Anatase-Brookite Photocatalytic Nanomats: Gagan Jodhani; William Carty; Pelagia Gouma; Ohio State University; Erciyes University

3:00 PM  
Biofuel Cells with Pressure-immobilized Enzymes on Carbon Nanotube Sheets: Biao Leng; Laila Al-Qarni; New Jersey Institute of Technology
3:20 PM
Conduction Mechanisms in Nanostructured Metal-oxide Gas Sensors: 
Mohamad Al-Hashem1; Sheik Akbar1; Patricio Morris1; 'Ohio State University;

3:40 PM
Effect of Electrosyn Nanofibers on Growth Behavior of Fungal Cells: 
Artifa Parveen2; 'North Carolina A & T State University

4:00 PM
Effect of Graphene Hybridization on the Photocatalytic Behavior of Au Doped 
ZnO-GO Nanocomposite: Syed Ahmed1; Waseem Haider1; 'Central Michigan University

4:20 PM
Electrocatalytic Disinfection Using Nanostructured Titanium Suboxides: 
Hammad Malik4; Krista Carlson4; 'University of Utah

Next Generation Biomaterials — Biomaterials III
Program Organizers: Roger Narayan, University of North Carolina; Vipul Davé, Johnson & Johnson; Mohan Edirisinghe, University College of London; Sanjiv Lahwani, Lynntech, Inc.

Tuesday PM  Room: D182
Location: Greater Columbus Convention Center

Session Chairs: Enrico Bernardo, University of Padova; Xanthippi Chatzistavrou, Michigan State University

2:00 PM Invited
SEM Study of Simulated Clinical Use for Third-generation NiTi Files: 
Thomas Burke2; John Nussteim2; Melissa Drum1; Sara Fowler1; William Brantley1; John Draper1; 'Ohio State University

2:20 PM Invited
Glass-ceramic Scaffolds by Additive Manufacturing of Engineered Glass-
Silicone Mixtures: Hamada Elsayed1; Martinoiano Piccioc2; Jozef Kraxner1; Arish Dasan1; Enrico Bernardo1; 'University of Padova; CETMIC, La Plata; 'FurGlass – Centre for Functional and Surface Functionalized Glass

2:40 PM Invited
Improvement of Mechanical Properties of the Mg – Zr – Nd Alloy by Chemical 
Composition Optimization and Alloying with Silver: Nikita Akin1; Vadm Shalomeev2; Sergey Sheyko2; 'Zaporozhyn National Technical University

3:00 PM Invited
Microscale Processing of Bioceramics: Yufu Ren1; Prabaha Sikder1; Sarit Bhanduri1; 'University of Toledo

3:20 PM Invited
New Dental Composites with Bioactive and Bactericidal Properties: 
Xanthippi Chatzistavrou1; Anna Lefkeidou1; Lambiri Papadopoulos1; Christopher Fenno1; Susan Flanagan1; Carlos Gonzalez-Cabezaz1; Nikos Kotsanos1; Petros Papagerakis1; 'Michigan State University; 'Aristotle University of Thessaloniki; 'University of Michigan

3:40 PM
The Antibacterial Efficiency & Biocompatibility of an Ag Containing Bioactive 
Bone Void Filler: Lawrence Sanders1; Kapil Raghuraman1; Aisling Coughlan1; 'University of Toledo

4:00 PM Invited
Structural Design of Borosilicate Based Bioactive Glasses: 
Ashutosh Goel1; Nicholas Stone-Weiss2; Randall Youngman2; Hellmut Eckert2; Eric Pierce2; Nicholas Smith2; 'Rutgers, The State University of New Jersey; 'Corning Incorporated; 'Universidade de Sao Paulo; 'Oak Ridge National Laboratory

4:20 PM
An Osteoconductive Zn-bioactive Glass Treats 99.99% of Common Surgical 
Site Infections: Kapil Raghuraman1; Lawrence Sanders1; Aisling Coughlan1; 'University of Toledo

Symposium — Session III
Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum and Minerals - KFUPM; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Victoria Blair, Army Research Laboratory

Tuesday PM  Room: A125
Location: Greater Columbus Convention Center

Session Chairs: Joe Cresko, U.S. Department of Energy; Hideyuki Kanematsu, Suzuka National College of Technology

2:00 PM Invited
Soft Processing (= Green Processing) for Nano Carbons: Direct Fabrication 
of Functionalized Graphenes and Their Hybrids Inks via Submerged Liquid 
Plasma [SLP] and Electrochemical Exfoliation [ECE] under Ambient 
Conditions: Masahiro Yoshimura1; 'National Cheng Kung University

2:40 PM Invited
Interpreting Non-thermal Microwave Effects on Materials Process 
Enhancements: A Straightforward Irreversible Thermodynamic Approach: 
Boon Wong2; 'Retired

3:10 PM Invited
Microwave Effect in the Crystallization Process of Glass-ceramics Materials: 
Morsi Mahmoud3; 'King Fahd University of Petroleum & Minerals

3:30 PM
Experimental Measurement of Dielectric Properties of Powdery Materials: 
Towards a Standard Testing Procedure for Paraffin Mixtures: Robert Tempke1; Terrence Musbo2; Christina Wildfire2; Dushyant Shekhawat2; Michael Spencer1; 'WVU; 'NETL/OREISE; 'NETL; 'AEOM

4:00 PM
Microwave Radiation-assisted Synthesis of Ceramic Oxide Thin Films: 
Electromagnetic Field Effects on Atomic Structure: Nathan Nakamura1; 
Maxwell Telmon2; Elizabeth Culbertson2; Simon Billinge1; B. Reega Jayan1; 'Carnegie Mellon University; 'Columbia University

4:20 PM
Enrichment of Rare Earths from Coal Fly Ash through Microwave-assisted 
Communciation and Microwave Pyrometallurgy: Edward Sabolsky1; Gunes Yakaboylu1; Kataryyna Sabolsky1; John Zondlo2; Terence Musbo1; Christina Wildfire2; Dushyant Shekhawat2; 'West Virginia University; 'US DOE-National Energy Technology Laboratory

4:40 PM
Development of Magnetoelectric Gyroscopes with Multi-outputs: 
Chung Ming Leung1; Xin Zhuang2; Junran Xu1; Jiefang Li1; Dwight Viehland1; Virginia Polytechnic Institute; 'Virginia Tech
PSDK XIII: Phase Stability and Diffusion Kinetics — Thermodynamics: Modeling and Experiments

Program Organizers: Zi-Kui Liu, Pennsylvania State University; Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Wei Xiong, University of Pittsburgh; Raymond Arroyave, Texas A & M University

Tuesday PM  Room: A213
October 16, 2018  Location: Greater Columbus Convention Center

Session Chairs: Hans Seifert, KIT; Hojong Kim, PSU

2:00 PM Invited
Determining Thermodynamic Properties of Alkaline-earths (Ba, Ca, and Sr) in Liquid Metals Using Electromotive Force Technique: Hojong Kim¹; ¹Pennsylvania State University

2:30 PM
The Impact of Alloy Elements to the Secondary Phase Stabilities in Grade 91 Alloy: Andrew Smith¹; Mohammad Asadikia²; Yu Zhong³; ³Florida International University; ²Worcester Polytechnic Institute

2:50 PM
High Throughput Magnetic Modeling of Cr-Fe-Ni Sigma Phase Working Toward a Description of Nickel Based Alloys: Matthew Feuer¹; Pinwen Guan¹; Shuni Shang²; Alison Besse³; Zi-Kui Liu⁴; ⁴Penn State University

3:10 PM
Re-assessment of the Ga-Li System: Joel Fels¹; Thomas Reichmann¹; Dajian Li²; Hans Jürgen Seifert³; ¹Karlsruhe Institute of Technology; ³G-Technology GmbH

3:30 PM Invited
Electrochemical-thermodynamics of Lithium Batteries: Hans Seifert¹; Weibin Zhang²; Yong Du³; ²Karlsruhe Institute of Technology; ³Central South University (CSU)

4:00 PM
Thermodynamic Evaluation of La₁-xSrₓMnO₃±d Cathode in the Presence of Cr-containing Humidified Air: Shadi Darvish¹; Yu Zhong³; ³Florida International University

4:20 PM
Phase Stability and Mechanical Properties of Beta-phase Dendrites in Metallic Glass Matrix Composites: Yaxian Wang¹; Michael Gibbons²; Nicolas Antolin³; Wolfgang Windl⁴; ³Ohio State University

Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Rare Earth Metals for Medical and Light Weight Structural Applications

Program Organizers: Yellapu Murty, MC Technologies LLC; Jack Lifton, Jack Lifton, LLC; Eric Klier, U. S. Army Research Laboratory; Michael McKittrick, U.S. Department of Energy; Ian London, Avalon Rare Metals Inc

Tuesday PM  Room: B131
October 16, 2018  Location: Greater Columbus Convention Center

Session Chairs: David Dunand, Northwestern University; Yellapu Murty, MC Technologies

2:00 PM Invited
Nanophotonic Rare-earth Based Probes for Early Detection of Cancer: Vidya Ganapathy¹; Charles Roth¹; Mark Pierce¹; Prabhas Moghe¹; Richard Riman¹; ¹Rutgers University

2:40 PM
Developing Lanthanoid-bearing Aluminum-based Metallic Glasses for Selective Laser Melting: Joe Croteau¹; David Seidman¹; David Dunand²; Nhon Vo¹; ¹NanoAl LLC; ²Northwestern University

3:10 PM
Aluminum-cerium Alloys for Laser Powder Bed Fusion and Direct Metal Write Applications: Hunter Henderson¹; Zachary Sims²; Michael Kesler³; Alex Plotkowski; Max Neveu⁴; Scott McCull⁴; David Weiss⁴; Ryan Ott⁴; Ryan Dehoff⁴; Orlando Rios⁵; ⁵Oak Ridge National Laboratory; ¹University of Tennessee; ²Oak Ridge National Lab; ³Lawrence Livermore National Laboratory; ⁴Eck Industries, Inc.; ⁵Ames Laboratory

3:40 PM Invited
Developments in Al-Ce Alloy Casting and Post-processing: David Weiss¹; Orlando Rios²; Zachary Sims²; Hunter Henderson; Scott McCull; Ryan Ott; Aurelien Perron¹; ¹ECK Industries Inc; ²Oak Ridge National Laboratory; ³Lawrence Livermore National Laboratory; ⁴The Ames Laboratory

4:20 PM Invited
Partially Replacing Sc with Er and Yb in L12-Strengthened Aluminum Alloys: David Dunand¹; David Seidman¹; Nhon Vo¹; ¹Northwestern University; ²Nanoal, LLC

Responsive Functional Nanomaterials — Functional Nanomaterials for Energy and Sensing

Program Organizers: Wenzhuo Wu, Purdue University; Weiyang Li, Dartmouth College; Sarina Sarina, Queensland University of Technology; Wenxian Li, University of Wollongong; Jiahua Zhu, University of Akron

Tuesday PM  Room: D181
October 16, 2018  Location: Greater Columbus Convention Center

Session Chair: Zhen Liu, Frostburg State University

2:00 PM
Kinetic Studies of Indoor Volatile Organic Compounds Removal with Functional TiO₂-based Coating: Xiong (Bill) Yu¹; Zhuoqing Jiang¹; ¹Case Western Reserve University
2:20 PM Light Illumination Room Temperature Gas Sensing Mechanism of ZnO/SnO2 Heterostructures: BuYu Ye$^{1}$, Akbar Sheikhi$^{1}$, Morris Patricia$^{1}$; $^{1}$The Ohio State University

2:40 PM Localizing Microwave Heat by Surface Polarization of Titane Nanostructures for Enhanced Catalytic Reaction Efficiency: Tao Ji$^{1}$, Jahua Zhu$^{1}$; $^{1}$University of Akron

3:00 PM Invited
Highly Transparent and Flexible Triboelectric Nanogenerators: Fengru Fan$^{1}$; $^{1}$University of California, Santa Barbara

3:40 PM Organic Bullet Resistance System: Brent Patterson$^{1}$, Zhen Liu$^{1}$; $^{1}$Frostburg State University

4:00 PM Panel Discussion

Selection of Materials for Application in Corrosive Environments — Materials Selection Symposium - Session III
Program Organizers: Ajit Mishra, Haynes International; Matthew Asmussen, Pacific Northwestern National Laboratory; Sudhakar Mahajanam, Pinnacle Advanced Reliability Technologies; Wilfred Binns, Nuclear Waste Management Organization; John Zhang, Garrity Instruments; Guang-Ling Song, Xiame University; Eric Schindelholz, Sandia National Laboratories; Raul Rebak, GE Global Research

Tuesday PM Room: A220 Location: Greater Columbus Convention Center

Session Chairs: Matthew Asmussen, Pacific Northwest National Laboratory; Jeff Binns, NWMO

2:00 PM Keynote
The Roles of Alloy Composition, External Oxygen Reduction and Internal Proton Reduction in the Crevice Corrosion of Ni-Cr-Mo Alloys: Jeff Henderson$^{1}$, Nafiseh Ebrahimi$^{1}$, Vahid Dehnavi$^{1}$, David Shoesmith$^{1}$, James Noel$^{1}$; $^{1}$The University of Western Ontario

2:40 PM Materials Selection to Avoid Corrosion in Wet Flue Gas Desulfurization (FGD) System Absorbers and Components: John Shingledecker$^{1}$, Steve Kung$^{1}$; $^{1}$Epi

3:00 PM Comparison of the Corrosion Behavior of Automotive Wrought and Ablation Cast Al-Mg-Si Alloys: Dadi Zhang$^{1}$, Jenifer Locke$^{1}$; $^{1}$The Ohio State University

3:20 PM Machine Learning Approach to Predict Cyclic Oxidation Behavior of Ni-based Alloys: Jiheon Jun$^{1}$, Dongwon Shin$^{1}$; $^{1}$Sebastien Dryepondt$^{1}$, Govindarajan Muralidhan$^{1}$, J. Allen Haynes$^{1}$, Bruce Pint$^{1}$, Bruce Pint$^{1}$; $^{1}$Oak Ridge National Lab

3:40 PM Diffusion of CR In the Haynes 230 Alloy during Corrosion in MGCL2-KCL Molten Salt: Yuxiang Peng$^{1}$, Ramuna Reddy$^{1}$; $^{1}$University of Alabama

4:00 PM Dew Point Corrosion Behavior of Steels in Exhaust Systems: Minho Jo$^{1}$, Byoung Ho Lee$^{1}$; $^{1}$Posco

4:20 PM The Influence of Thermal Cycle Frequencies on the Parabolic Rate Constants of Alloys: Joseph Meyer$^{1}$; $^{1}$Haynes International

Sintering and Related Powder Processing Science and Technologies — Field Assisted Sintering I: Fundamentals
Program Organizers: Ricardo Castro, University of California, Davis; Zachary Cordero, Rice University; Eugene Olevsky, San Diego State University; Wolfgang Rheinheimer, Purdue University

Tuesday PM Room: B142/143 Location: Greater Columbus Convention Center

Session Chair: Zachary Cordero, Rice University

2:00 PM Invited
On the Mixed Conduction in Yttria Stabilized Zirconia in High Electric Fields: Reiner Kirchheim$^{1}$; $^{1}$University of Goettingen

2:40 PM Invited
The Scientific Questions and Technological Opportunities of Flash Sintering: From a Case Study of ZnO to Other Ceramics: Jian Luo$^{1}$; $^{1}$University of California, San Diego

3:20 PM Invited
Grain Growth during Spark Plasma and Flash Sintering of Ceramic nanoparticles: Rachman Chaim$^{1}$, Geoffroy Chevallier$^{1}$, Alicia Weibel$^{1}$, Claude Estournes$^{1}$; $^{1}$Israel Institute of Technology; $^{1}$Université de Toulouse

4:00 PM A Mathematical Approach to Spark Plasma Sintering of Amorphous Alloys: Tanaj Paul$^{1}$, Sandip Harimkar$^{1}$; $^{1}$Oklahoma State University

4:20 PM
Controllable Interface Approach in Field-assisted Sintering: Eugene Olevsky$^{1}$; Charles Maniere$^{1}$, Geuntak Lee$^{1}$, Elisa Torresani$^{1}$; $^{1}$San Diego State University; $^{1}$San Diego State Univ

Small-scale Properties of Materials and Length-scale Phenomena — Structure I
Program Organizers: Meyesam Haghshenas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

Tuesday PM Room: A121 Location: Greater Columbus Convention Center

Session Chairs: Erik Herbert, Michigan Technological University; Alfrooz Barnoush, Norwegian University of Science and Technology

2:00 PM Invited
Pop-in Behavior during Nanoindentation: Elastic-plastic Transitions Versus Limited Slip Conditions: David Bahr$^{1}$, Realeh Rahimi$^{1}$, Alexandra Burch$^{1}$, Michael Maughan$^{1}$, Sichuang Xue$^{1}$, Xinghang Zhang$^{1}$; $^{1}$Purdue University; $^{1}$University of Idaho
2:20 PM Invited
Modeling Slip Transmission across Alpha/Beta Interface in Ti-alloys Using Microscopic Phase-field: Pengyang Zhao; Chen Shen; Ju Li; Stephen Niezgoda; Michael Mills; Yunzhi Wang; Ohio State University; GE Global Research; MIT

2:40 PM Invited
Quantifying Crack Growth in Ultrathin Ductile Sheets: Wade Lanning; Syed Javiaid; Camilla Johnson; Christopher Muhlstein; Georgia Institute of Tech

3:00 PM
In-situ Stable Crack Growth at the Micron Scale: Giorgio Sernicola; T. Ben Britton; Finn Giuliani; Imperial College London

3:20 PM Invited
Analysis of Indentation Creep for High Hardness/Modulus Ratio Materials: Donald Stone; Z. Humberto Melgarejo; Joseph Jakes; Yousuf Mohammed; Abdelmageed Elmustafa; University of Wisconsin; Univ of Wisconsin; USDA Forest Products Laboratory; Old Dominion University

3:40 PM Invited
Defect Structure and Migration Dynamics in Two Dimensional (2d) Crystals and Van Der Waals Heterostructures: Nasim Alem; Pennsylvania State University

4:00 PM Invited
Understanding the Role of Interfaces on Solute Segregation in Nanocrystalline Materials and Its Influence on Mechanical Behavior: Ankit Gupta; Garritt J. Tucker; Colorado School of Mines

Solid State Processing — Friction Stir Processing and Other Torsion Processing Techniques
Program Organizers: Richard Fonda, Naval Research Laboratory; Simon Larose, National Research Council Canada

Tuesday PM
Room: B140/141
Location: Greater Columbus Convention Center

Session Chair: Paul Allison, University of Alabama

2:00 PM Invited
The Non-equilibrium Processing Nature of Additive Friction Stir Deposition: Hang Yu; Virginia Tech

2:20 PM
Microstructure-property Relationship on Stress-state and Strain-rate Behavior of AM AFS-Deposition Aluminum Alloy 6061: Brandon Phillips; Dustin Avery; C. J. T. Mason; Paul Allison; J. B. Jordan; The University of Alabama

2:40 PM
Friction Stir Processing of Super Duplex Stainless Steel and its Effect on Tensile Properties: Nithyanand Prabhu; Manjesh Kumar Mishra; A. Gourav Rao; I. Balasundar; B. P. Kashyap; Indian Institute Of Technology Bombay; Naval Materials Research Laboratory; Defence Metallurgical Reesarch Laboratory; Indian Institute of Technology Jodhpur

3:00 PM
Processing, Microstructural Evolution and Strength Properties of Copper Matrix Composites Containing Nano-sized Polymer Derived SiCN Particles: Ajay Kumar P.; Satish Kailas; University of Wisconsin-Milwaukee, Materials Dept; Indian Institute of Science, Bangalore

3:20 PM
Characterization of Pure Copper Wire Produced by Shear-assisted Processing and Extrusion: Xiao Li; Glenn Grant; Pacific Northwest National Lab

3:40 PM
Achieving High-strength Zn-Mg Hybrids through High-pressure Torsion: David Hernandez Escobar; Hakan Yilmazer; Megumi Kawasaki; Carl Boehlert; Michigan State University; Yildiz Technical University; Oregon State University

4:00 PM
Multi-objective Optimization of Multi-channel Spiral Twist Extrusion Process Using a Response Surface Approach and Finite Element Analysis: Dina Fouad; Amr Moataz; Waleed El-Garaiby; Hanadi Salem; The American University in Cairo, Egypt; Suez Canal University, Ismailia, Egypt

Special Session on Innovation by Entrepreneurs, Startups, and Small Businesses — Special Session on Innovation by Entrepreneurs, Startups, and Small Businesses
Program Organizer: Amber Black, Los Alamos National Laboratory

Tuesday PM
Room: B232
Location: Greater Columbus Convention Center

Session Chair: Amber Black, Los Alamos National Laboratory

2:00 PM
Current and Future Applications of Rare Earth Phosphors and Nanophosphors: Josh Collins; Intelligent Material Solutions, Inc.

2:20 PM
ALD NanoSolutions, Inc. — from Lab Curiosity to Commercial Market Development Plants: Alan Weimer; University of Colorado

2:40 PM
Magnetically Textured Ceramic-Polymer Composites for High Strength Applications: Randall Erb; DAPS Lab

3:00 PM
Patenting Strategies for Small Business: Van Vekris; Sim & McBurney

3:20 PM
The Transition to Commercialization: Alexander Smith; Swift Textile Metalizing

3:40 PM Panel Discussion
Session Chairs: Jun Song, McGill University; Richard Chromik, McGill University

2:00 PM Invited
The Effect of Metal Powder Properties on the Cold Spray of Ti Metal-matrix Composites: 
Venkata Naga fiance Munagala; Rohan Chakrabarty; Jun Song; Richard Chromik; McGill University

2:40 PM
The Role of Ceramic Characteristics in Cold Sprayed Metal/Ceramic Interfaces: 
Sara Imbriglio; Raynald Gauvin; Nicolas Broodsky; Maniya Aghashleib; Richard Chromik; McGill University; National Research Council Canada

3:00 PM
Cold Spraying of Mixed Sn-Al Powders: 
Andre Liberati; Hanzqing Che; Phuong Vo; Stephen Yue; McGill University; National Research Council Canada

3:20 PM
Understanding Ceramic Deposition and Bonding in Metal-ceramic Composite Cold Spray from Finite-element Studies: 
Rohan Chakrabarty; Jun Song; McGill University

3:40 PM
Cold Spray Characteristics of Bimodal Size 316L/Fe Powder Mixtures: 
Xin Chu; Phuong Vo; Stephen Yue; McGill University; National Research Council Canada

Synergy in Multiscale Modeling and Experiments to Resolve Complex Disordered Solids — Session I: Multiscale Modeling-driven Synergy
Program Organizers: Ridwan Sakidja, Missouri State University; Jinwoo Wong-Ng, National Institute of Standards and Technology; Kevin Huang, University of South Carolina

2:00 PM Invited
Defect-driven Nanoporous ELECTrode Materials for Energy Storage Systems: 
Hui Xiong; Boise State University

2:20 PM
Freeze Tape Casting: A Promising Fabrication Technique for High Energy Density Electrodes for Li-Ion Batteries: 
Mikul Azami Ghalakolli; Lakshman Venkatpragada; Stephen Creager; Rajendra Bordia; Clemson University

2:40 PM
Hybrid Silicon and Carbon-based Polymers: Processing, Characterization and Properties: 
Michelle Greenough; Rajendra Bordia; Clemson University

3:00 PM
Freeze Tape Casting: A Promising Fabrication Technique for High Energy Density Electrodes for Li-Ion Batteries: 
Mikul Azami Ghalakolli; Lakshman Venkatpragada; Stephen Creager; Rajendra Bordia; Clemson University

3:40 PM
Ultrahigh Surface Area Meso/Microporous Carbon Formed with Self-template for High-voltage Aqueous Supercapacitors: 
Haibiao Chen; Peking University

4:00 PM
Silica-based Aerogel Membranes Fabricated Using Removable Nitrocellulose Scaffolds: 
Bonan Wang; Krista Carlson; Alexander Reifsnnyder; University of Utah
Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — High Performance Additively Manufactured Alloys

Program Organizers: Ali Yousefani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Tuesday PM  Room:  B235
October 16, 2018  Location: Greater Columbus Convention Center

Session Chair: Robert Dillon, NASA Jet Propulsion Laboratory

2:00 PM Invited
High-performance Magnetic Alloys and Gradients through Additive Manufacturing: Robert Dillon1; Samad Firdosi1; Ryan Conversano1; Bryan McEnaney1; John Paul Borgonia1; Dan Goebel1; Andrew Shapiro-Scharlotta1; Jet Propulsion Laboratory

2:30 PM Invited
Mechanical and Wear Properties of Zr-based Bulk Metallic Glasses Produced by Additive Manufacturing: Punnathat Bordeenithikasem1; Yisu Shen1; Moritz Stolpe1; Alexander Elesn1; Hai-Lung Tsai2; Douglas Hofmann1; Jet Propulsion Laboratory, California Institute of Technology; Missouri University of Science and Technology; Heraeus Additive Manufacturing GmbH

3:00 PM
Binder Jetting 3D Printing of Fe77Ni5.5Cu5.5Zr7B4Cu1 Magnetic Powders: Rafaela Vannatelli1; Matthew Caputo1; Stephen Isacco1; Yash Trivedi1; Matthew Willard1; C. Virgil Solomon1; Youngstown State University; Case Western Reserve University

3:30 PM
Spall Prevention in Additively Manufactured Composites under Hypervelocity Impact Conditions: Lauren Poole1; Matthew French1; William Yarberry1; Zachary Cordero1; Rice University

4:00 PM Invited
Developing Aluminum-rich Metallic Glasses for Selective Laser Melting: Joe Croteau1; David Seidman2; David Dunand2; Nhon Vo3; NanoAI LLC; Northwestern University

4:20 PM
Production of a Coal Fly Ash-based Coagulant Using Sulphuric Acid Solutions: Momboyo Clotilde Apua1; Geoffrey S. Simate1; University of the Witwatersrand

4:40 PM  Concluding Comments

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session IV

Program Organizers: Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technology; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Allen Apblett, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Miritunjay Singh, Ohio Aerospace Institute

Wednesday AM  Room:  B233
October 17, 2018  Location: Greater Columbus Convention Center

Session Chairs: Shijie Wang, Institute of Materials Research and Engineering (IMRE), A*STAR (Agency for Science); Surojit Gupta, University of North Dakota

8:00 AM Invited
Importance of Soft (= Green,Solution & Low-Energy) Processing of Advanced Ceramics for Sustainable Society: Masahiro Yoshimura1; National Cheng Kung University

8:20 AM Invited
Assembling of Graphene Scaffolds by Three-dimensional Printing: Shaoming Dong1; Kai Huang2; Jinshan Yang2; Shanghai Institute of Ceramics; Shanghai Institute of Ceramics, Chinese Academy of Sciences

8:40 AM
Low Emission Production Route for Titanium from Iron-sand Slag Using Ultra-high Temperature Electrolysis: Thomas Hughes1; Samuel Martin-Treceno1; Catherine Bishop1; Aaron Marshall1; Matthew Watson1; University of Canterbury

9:00 AM
Improvements in Environmental Impact of Industrial Chrome Stripping Processes: Holly Garlich1; Maria Inman1; Stephen Snyder1; Tim Hall1; Brian Skinner1; E. Jennings Taylor1; Faraday Technology, Inc.

9:20 AM Invited
Thermodynamics and Fractals on the Way to New Energy Frontiers: Vojislav Mitic1; Goran Lazovic2; Vesna Paunovic2; Zoran Vosika3; Sandra Voljovic1; Branislav Vlahovic1; University of Nis; Institute of Technical Sciences of SASA; University of Belgrade; University of Nis; North Carolina Central University

10:00 AM  Break

10:20 AM
Upgrading Ores or Concentrates which Contain Iron and One or More Metals via Selective Carbothermic Reduction and Smelting: Basak Anameric1; NRRI Coleraine Labs

10:40 AM
Sustainability Analysis of Die-casting Part at the Design Stage: Simranjit Sidhu1; Manoj Kaush1; Mechanical Engineering Department, Punjabi University Patiala; Punjabi University Patiala

11:00 AM
The Reaction of Molten Iron and CO2 in Limestone Slagging Process: Wenwen Mao1; Chenxiao Li2; Menglong Li1; Mengying Li1; HBIS Group Tangsteel Company; North China University of Science and Technology
11:20 AM  Production of Ferrosilicon Alloy from the Pudo Iron Ore Using End-of-life Rubber Tyre as Reductant: James Dankwah; James Dankwah; Jessica Dankwah; Pramod Koshy; University of Mines and Technology; Goldfields Ghana Limited (Damang Mine); University of New South Wales

11:40 AM  Pyrite as a Green Reagent for Remediation of Chromate-containing Wastewater: Allen Ashlett; Travis Reed; Amelia Bergeson; Oklahoma State Univ; Tulane University

3D Inkjet Printing of Electrically Induced Metal-polymeric Actuators: Deborah Chung; State University of New York Buffalo

9:10 AM  In-situ Fabrication of Electro-mechanical Structures Using Multi-material and Multi-process Additive Manufacturing: Tushar Saini; Kashish Dhal; Panos Shiakolas; University of Texas at Arlington

9:10 AM  Powder Modification to Enhance Alloys for Laser Based Additive Manufacturing: John Sharon; Paul Sheedy; United Technologies Research Center

9:30 AM  High-throughput 3D Metal-matrix Composite Printing: Michael Sullivan; Deborah Chung; State University of New York Buffalo

10:40 AM  Selective Laser Melting (SLM) of Nitinol Stents: Parasoot Jamsi; Sophie Cox; Jiling Feng; Liguo Zhao; Moataz Attallah; University of Birmingham; Manchester Metropolitan University; Loughborough University

11:20 AM  A Segregation Model Study of Suspension-based Additive Manufacturing: Chang-Jun Bae; John Halloran; Korea Institute of Materials Science (KIMS); University of Michigan

Additive Manufacturing of Metals: Microstructure and Material Properties — AM Superalloys - Microstructure and Properties

Program Organizers: Andrzej Wojciechynski, ATI Specialty Materials; Ulf Ackeild, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Wednesday AM  Room: A214  Location: Greater Columbus Convention Center

Session Chair: Christopher Rock, North Carolina State University

8:00 AM  Microstructural Evolution in Nickel Alloy 718 Produced by Laser-powder Bed Fusion Additive Manufacturing: Hyeun Song; Alber Sadek; Boulware Paul; Heindall Mendoza; Rodrigo Enriquez; Curt Taylor; EWI

8:00 AM  Scan Strategy Effects on Microstructure and Hardness of SLM IN718: Gregory Cobb; Ryan O’Hara; David Newell; Ben Doane; Air Force Institute of Technology

8:40 AM  The Relationship between Geometry and Microstructure of Inconel 718 during Selective Laser Melting: Lova Chechik; Gavin Baxter; Iain Todd; MSE University of Sheffield; Rolls Royce plc
9:00 AM  
The Effect of Part Size on Additive Manufactured IN718 Parts: Oliver Holzmond\(^1\); Guofeng Wang\(^2\); Xiaodong Li\(^3\); University of Virginia; University of Pittsburgh

9:20 AM  
The Utility of Laser Powder Bed Parameters and Deposition Strategies in Creating Functionally Graded Microstructures in IN718: Bonnie Attard\(^1\); Sam Cruchley\(^1\); Yu-Lung Chiu\(^1\); Moataz Atallah\(^1\); University Of Birmingham

9:40 AM  
Inconel 718 Powder with Chemistry Variations and its Impact on L-PBF Printed Samples: Gerrit Kool\(^1\); Marc Smit\(^1\); Ludo Bautmans\(^2\); Steve Nardone\(^3\); Netherlands Aerospace Centre NLR; Oerlikon Eldim BV; ENGIE Laborelec

10:00 AM  Break

10:20 AM  
Abnormal Transient Creep of EBM Processed Alloy 718 at Intermediate Temperature: Tita Tanaka\(^1\); Tomomichi Ozaki\(^1\); Keiji Kubashiro\(^1\); IHI Corporation

11:00 AM  
Notched Fatigue Testing of Inconel 718 Prepared by Selective Laser Melting: David Witkin\(^1\); Dhruv Patel\(^2\); Glenn Bean\(^2\); Aerospace Corp

11:20 AM  
Mechanical Properties and Microstructure Control of Alloy718 by Powder Based Processes: Keiji Kubashiro\(^1\); Akhiro Sato\(^1\); Koji Nezaki\(^1\); IHI Corporation

11:40 AM  
Material Characterisation of Selectively Laser Melted Haynes 282: Alistair Lytle\(^1\); Alphons Antonyssamy\(^1\); Iain Todd\(^1\); University of Sheffield; GKN Aerospace

Additive Manufacturing of Metals: Microstructure and Material Properties — Microstructure Control in AM Components

Program Organizers: Andrzej Wojcieszyński, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Sudarsanam Babu, The University of Tennessee, Knoxville

Wednesday AM  
Room: A215  
Location: Greater Columbus Convention Center  
Session Chair: Ola Harrysson, North Carolina State University

8:00 AM  Invited  
Microstructure Control across AM Alloy Systems: Sneha Narra\(^1\); Rahi Patel\(^1\); Jack Beuth\(^1\); Carnegie Mellon University

8:40 AM  
Microstructural and Compositional Optimizations for AM Ni-based Superalloys: Marc Thomas\(^1\); Onera

9:00 AM  
Microstructural and Mechanical Properties Control Using Direct Laser Deposition in IN718 Ni-superalloy: Abdullah Alhazaim\(^1\); Luke Carter\(^1\); R. Mark Ward\(^1\); Moataz Atallah\(^1\); University of Birmingham

9:20 AM  
Microstructural Evaluation of AM Fabricated Rene 41 Alloy: Sila Ece Atabay\(^1\); Kevin Plucknett\(^1\); Mathieu Brochu\(^1\); McGill University; Dalhousie University

9:40 AM  
Microstructure and Mechanical Properties Nickle Super Alloys Produced by Renishaw's Laser Powder Bed Fusion Systems: Ravi Aswathanarayanaswamy\(^1\); Laura Howlett\(^1\); Marc Saunders\(^1\); Renishaw Plc

10:00 AM  Break

10:20 AM  
Microstructures and Mechanical Properties of a 3D Printed Ti Alloy: Punit Kumar\(^1\); Upadrastra Ramamuurti\(^1\); Department of Materials Engineering, ISc Bangalore

10:40 AM  
Microstructural Studies of the Effect of Process Parameters on Additively Manufactured NiTi: Alejandro Hinojos\(^1\); Narges Shayanesteh Moghaddam\(^1\); Soheil Saedi\(^1\); Natalie Zeleznik\(^1\); Peter Anderson\(^1\); Mohammad Elahinia\(^1\); Haluk Karaca\(^1\); Michael Mills\(^1\); The Ohio State University; University of Toledo; University of Kentucky

11:00 AM  
Microstructural and Tensile Behavior of Selective Laser Melting Additive Manufacturing GRCop-84 Start-Stop Build Lines: Ryan Anderson\(^1\); Stephen Cooke\(^1\); Joseph Sims\(^1\); Judy Schneider\(^1\); ASRC Federal Aeronautics; University of Alabama at Huntsville

Additive Manufacturing of Metals: Post Processing — Heat Treatment II

Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszyński, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

Wednesday AM  
Room: A216  
Location: Greater Columbus Convention Center  
Session Chair: Carter Keough, NC State University

8:00 AM Invited  
High Pressure Heat Treatment of AM Parts: Combining HIP and Heat treatment: Magnus Akhifora\(^1\); Quintus Technologies

8:40 AM  
Scan Strategy Effects on SLM IN718, and Mitigating these Effects via Post Process Annealing: David Newell\(^1\); Ryan O’Hara\(^1\); Gregory Cobb\(^1\); Ben Doane\(^1\); Air Force Institute of Technology

9:00 AM  
Evolution of Microstructure During Thermal Post-treatment of EBM Processed Alloy 718: Sneha Goel\(^1\); Fouzi Bahbou\(^1\); Anders Eklund\(^1\); Uta Klement\(^1\); Shrikant Joshi\(^1\); University West; Arcam AB; Quintus Technologies AB; Chalmers University of Technology

9:20 AM  
Effects of Hot Isostatic Pressing and Annealing Heat Treatment on the Microstructure Evolution and Mechanical Properties of Selective Laser Melted Co-Cr-Mo Alloy: Kyo-Sik Kim\(^1\); Iae-Won Hwang\(^1\); Kee-Ahn Lee\(^1\); Inha University; Changsung Corp.
9:40 AM
Additive Manufacturing and Hot Isostatic Pressing of Niobium-based Refractory Alloys: Calvin Mikler; Brian Welk; Gopal Viswanathan; Benjamin Georgin; Zachary Kloenne; Kevin Chapur; John Foltz; Hamish Fraser; Ohio State Univ; Air Force Research Laboratory; ATI Specialty Alloys and Components

10:00 AM Break

10:20 AM
Effect of Heat Treatment on Microstructure and Mechanical Properties of Laser Deposited Haynes 282 Superalloy: Abhishek Ramakrishnan; Guru Dinda; Aniket Dighe; Wayne State University

10:40 AM
Influence of Processing and Post-processing Parameters on the Final Properties of Powder-bed Laser Additively Manufactured Parts: Aziz Chnioul; Fernando Lomello; Pierre-François Giroux; Pascal Aubry; Icham Maskrot; Den-Service d’Etudes Analytiques et de Réactivité des Surfaces (SEARS), CEA, Université Paris-Saclay; Den-Service de Recherches Métallurgiques Appliquées (SRMA), CEA, Université Paris-Saclay

11:00 AM
LBPF Processed Nickel-iron Soft-magnetic Alloy: Influence of Heat Treatments on Density, Microstructure and Magnetic Properties: Thomas Bauer; Adriaan Spierings; Konrad Wegener; Inspire AG

11:20 AM
Elementary Guide to Heat Treating Additive Manufacturing Parts: John Morral; Shaunglin Chen; Ohio State University; Computherm

Program Organizers: Jing Zhang, Indiana University-Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Xinghua Yu, Oak Ridge National Laboratory; Yeongil Jung, Changwon National University

Wednesday AM
Room: A223
Location: Greater Columbus Convention Center

Session Chair: Jing Zhang, Indiana University - Purdue University Indianapolis

8:00 AM

8:20 AM
Characterization of Downward Facing Surface Roughness Impacting Performance in Additive Manufacturing: Eric-Paul Tatman; Joy Gockel; Wright State University

8:40 AM
Prediction of Mechanical Behavior of Lattice Structures Using Experimentally Driven Finite Element Modeling: Behzad Bahramibabamin; Hesam Askari; Kavan Hazelt; University of Alabama in Huntsville; University of Rochester

9:00 AM
Uncertainty Quantification in Solidification Modeling of Additive Manufacturing: Supriyo Ghosh; E. Chin; J. Knapp; D. Allaire; A. Elwany; R. Arroyave; Texas A&M University; U.S. Army Research Laboratory

9:20 AM
Physics-based Process-microstructure Modeling in Powder Bed Metal Additive Manufacturing: Jingfu Liu; Behrooz Jalalahmadi; Sentient Science

9:40 AM
Microstructural Evolution Simulation for Property Prediction in Cold Spray Processing: Danielle Cote; Victor Champagne; Jr.; Worcester Polytechnic Institute; U.S. Army Research Laboratory

10:00 AM Break

10:20 AM
Modeling of Phase Transformation in the Production of Self-propagating High-temperature Synthesis of Wear-resistant Coatings: Borys Sereja; Dmytro Sereda; Irina Palehova; DDTU

10:40 AM
Influence of Powder Size Distribution on Porosity and Surface Roughness in Powder Bed Fusion Additive Manufacturing: Alexander Rausch; Matthias Markl; Carolin Körner; Chair of Materials Science and Engineering for Metals

Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Shape Memory Alloys
Program Organizers: Mohammad Elahinia, University of Toledo; Markus Chmielus, University of Pittsburgh; Reginald Hamilton, The Pennsylvania State University; Hamdy Ibrahim, University of Tennessee at Chattanooga; Haluk Karaca, University of Kentucky; Mohammad Mahdavi, University of Tennessee at Chattanooga; Reza Mehrabi, University of Toledo; Reza Mirzaeifar, Virginia Tech

Wednesday AM
Room: B230
Location: Greater Columbus Convention Center

Session Chairs: Mohammadreza Nematomaliha, University of Toledo; C. Virgil Solomon, Youngstown State University; Mohammad Mahdavi, University of Tennessee at Chattanooga; Othmane Benafan, NASA Glenn Research Center

8:00 AM Invited
The Effect of Re-melting on the Surface Condition of the Additively Manufactured NiTi Parts: Ahmadreza Jahadakbar; Amir Dehghan; Mohammadreza Nematomaliha; Parisa Bayatimalayeri; Mohammad Mahdavi; Hamdy Ibrahim; Mohammad Elahinia; University of Toledo

8:40 AM
Investigation of the Mechanical Properties of NiMnGa Magnetic Shape Memory Alloys Using Nanoindentation Techniques: Yash Trivedi; Matthew Caputo; Jae Joong Ryu; C. Virgil Solomon; Youngstown State University

9:00 AM
Impact of Building Orientation and Scanning Strategy on the Tensile Properties of SLM Fabricated Ni-rich NiTi: Syed Ehsan Saghaian; Narges Shayesteh Moghaddam; Peizhen Li; Guher Toker; Mohammadreza Nematomaliha; Mohammad Elahinia; Haluk E. Karaca; University of Kentucky; University of Toledo

9:20 AM
Modeling of Additively Manufactured Shape Memory Alloys: Natalie Zeleneznik; Alejandro Hinojos; Narges Moghaddam; Soheil Saedi; Haluk Karaca; Mohammad Elahinia; Michael Mills; Peter Anderson; Ohio State University; University of Toledo; University of Kentucky
9:40 AM
Enhancing the Surface Quality of Additively Manufactured NiTi by Electropolishing: Amir Dehghandehkolaeei; Hamdy Ibrahim; Mohammad Mahdavi; Ahmadreza Jahadkari; Mohammadreza Nematiollahi; Parisa Bayatimalayeri; Mohammad Elahinia; The University of Toledo

10:00 AM Break

10:20 AM
Sintering of Binder jet 3D Printed Ni-Mn-Ga Alloys: An Overview of Sintering Conditions and Microstructural Effects: Matt Caputo; C. Virgil Solomon; Younstown State University

10:40 AM
The Effect of Process Parameters on the Properties of Selective Laser Melted NiTiHf Alloys: Guher Toker; Mohammadreza Nematiollahi; Ehsan Saghaiian; Mohammad Elahinia; Othmane Benefain; Haluk Karaca; University of Kentucky; University of Toledo; NASA Glenn Research Center

11:00 AM
The Effects of Size and Geometry on the Microstructure and Transformation Temperatures of Additively Manufactured NiTi: Nazanin Farjam; Mohammad Mahdavi; Mohammad Reza Nematiollahi; Mohammad Elahinia; The University of Toledo

11:20 AM
Thermomechanical Characterization of SLM manufactured Porous Structured NiTi Devices: Ankur Majumdar; Sayed Saghaiian; Amirhosem Amerinatanz; Narges Moghaddam; Mohammadreza Nematiollahi; Guher Toker; Mohammad Elahinia; Haluk Karaca; University of Kentucky; University of Toledo

11:40 AM
Welding of High Temperature Shape Memory Alloys: A Feasibility Study: Kaleb Ponder; Antonio Ramirez; Othmane Benefain; Joao Oliveira; Ohio State University; NASA; UNIDEMI

Advanced Steel Metallurgy: Products and Processing — Stainless and High Alloy Steels and Cast Iron
Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

Wednesday AM Room: A226
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Mingzhi Xu, Georgia Southern University; Konstantin Redkin, WHEMCO Inc

8:00 AM Invited
The Effect of Cooling Condition on the δ-to-γ Transformation in Selected Ferritic Stainless Steels: Suk-Chun Moon; Jong-Chul Kim; Seong-Young Kim; Rian Dippenaar; University of Wollongong; POSCO

8:20 AM
Effect of Starting As-cast Structure on the Microstructure-texture Evolution during Subsequent Processing and Finally Ridging Behavior of Ferritic Stainless Steel (FSS): Pranabananda Modak; Sudipta Patra; Rahul Mitra; Debalya Chakrabarti; Indian Institute of Technology Kharagpur

8:40 AM
Tempering Machine Design and Construction for PC Strand Production Process: Yilmaz Yildirim; Mustafa Ozmen; Guney Celik R&D Center

9:00 AM
Comparison of the Mechanical Properties of Different Quality Austenitic Stainless Steels after Wire Drawing: Yilmaz Yildirim; Guney Celik, R&D Center

9:20 AM
Influence of Cooling Rate Immediately before Hot Working on Flow Stress of Duplex Stainless Steel: Shunsuke Sasaki; Tatsuro Katsumura; Hiroki Ota; Jun Yanagimoto; JFE Steel Corporation; The University of Tokyo

9:40 AM
Microstructure and Mechanical Behavior of a TWIP Steel under Quasi-static and Dynamic Loading: Xiaoxue Chen; Jianguo Li; Laszlo Keskes; Vincent Hammond; Qiuming Wei; University of North Carolina Charlotte; Northwestern Politechnical University; US Army Research Laboratory; UNCC

10:00 AM Break

10:20 AM
Deformation Behavior and Mechanism of Ultrahigh-strength Cobalt-free 19Ni33Mo1.5Ti Maraging Steel in Tensile Deformation: Kun Li; B. Yu; R.D.K. Misra; University of Texas El Paso; UTEP

10:40 AM
Analysis of Mg Yield of Ductile Cast Iron by Neural Network: Takeaki Kobayashi; Kazuki Akiyama; Toshitake Kanno; Nozomu Uchida; Nagasaki University of Technology; Kimura Chuzosho Co., Ltd. Research & Development Dep.

11:00 AM
Developing a Graphitic White Cast Iron: Jie Wan; Jingjing Ping; Mingzhi Xu; MST

11:20 AM
Carbide Precipitation in Thin Wall Ductile Iron Cast in Silica Sand / Rice Husk Ash Mould: Fidelia Ocholur; Samson Adesosun; University of Lagos

11:40 AM
Magnetic Barkhausen Noise (MBN) Analysis of Unknown Pipeline Steels: Clodualdo Aranas; Youliang He; Maciej Podlesny; Muhammad Arafain; CanmetMATERIALS, Natural Resources Canada

Advances in Solid Oxide Fuel Cell Technology — SOFC Durability
Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Wednesday AM Room: D281
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Matthew Seabaugh, Nexceris LLC; Neil Kidner, Nexceris LLC

8:00 AM
Evidence of Space Charge Layer Evolution at YSZ Grain Boundaries in Solid Oxide Fuel Cell Anodes Operated Using Humidified Hydrogen: Yun Chen; Harry Abernathy; Gregory Hackett; Xueyan Song; Kirk Gerdes; West Virginia University; US Department of Energy/AECOM; US Department of Energy

8:20 AM
Large-scale, High-performance Computation of Local Electrochemistry in Heterogeneous Solid Oxide Fuel Cell Microstructures: Yu-Ting Hsu; William Epting; Rubayyat Mahbub; Harry Abernathy; Gregory Hackett; Anthony Roller; Shawn Lister; Paul Salvador; US DOE National Energy Technology Laboratory; Carnegie Mellon University

8:40 AM
Improvement in Lifetime of SOFCs, Utilizing Novel, In-situ Methods to Remove Cathodic Chromium Deposits: Michelle Sagimoto; Zhiqian Zhu; Uday Pal; Soumendra Basu; Srikanth Gopalan; Boston University
9:00 AM
Nanostructure Degradation at LSM/YSZ and YSZ/YSZ Grain Boundaries in Solid Oxide Fuel Cell Cathodes Operated in Humidified Air: Yun Chen; Yueying Fan†; Shiwoon Lee; Gregory Hackett; Harry Abernathy; Xueyan Song; Kirk Gerdes; †West Virginia Univ; US Department of Energy/AECOM; †US Department of Energy

9:20 AM
Towards an Understanding of Zero Degradation in a High-performance SOFC: Xiao-Dong Zhou; Emir Dogdibegovic; Yudong Wang; †University of Louisiana at Lafayette; †University of South Carolina

9:40 AM
Study of La1-xSrxC80.2Fe0.8 as Cr Gettering Materials for Solid Oxide Fuel Cells: Yeong-Shyang Chou; Jung-Pyung Choi; Nathan Canfield; Jeffry Stevenson; †PNLN

10:00 AM Break

10:20 AM
Impacts of Accelerated Vapor Phase Nickel Transport within Ni-YSZ Cermet Anodes: Paul Gasper; †Yanchen Lu; †Soumendra Basu; †Srikanth Gopalan; †Uday Pal; †Boston University

10:40 AM
Novel LScO-Mullite Composite Cathode Contact Material for Solid Oxide Fuel Cells: Yeong-Shyang Chou; Nathan Canfield; Jeff Bonett; Jeffry Stevenson; †PNLN

11:00 AM
Effects of Manganese Excess on the Microstructure and Performance of LSM-Based SOFC Cathodes Operated under Aggressive Conditions: Andrew Cal; Chexin Deng; Naima Hilili; Mark De Gaire; Arthur Heuer; †Case Western Reserve University

11:20 AM
Evaluation of Spinel-based Contact Layer Synthesized with Alloy Powder Precursors for SOFC Cathode-side Contact Application: Jiahong Zhu; Yutian Yu; †Tennessee Tech University

11:40 AM
Improving Ni-YSZ Cermet Anode Performance by Liquid Infiltration of Nickel Catalyst Particles with LSCM: Yanchen Lu; Paul Gasper; †Boshan Mo; †Srikanth Gopalan; †Uday Pal; †Soumendra Basu; †Boston University

**Advances in Surface Engineering — Carburization/ Nitridation/Boronization and Engineering of Surface Geometry/Structure/Roughness**

Program Organizers: Brian Skinner, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harinar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

Wednesday AM Room: B144/145
October 17, 2018 Location: Greater Columbus Convention Center


**8:00 AM**
ToF-SIMS Studies of Surface Activation for Low-temperature Carburization or Nitridation: Cyprian Illing; Kevin Abbasi; Frank Ernst; †Case Western Reserve University; †Swagelok Center for Surface Analysis of Materials

**8:40 AM**
Surface Engineering of Co-Cr-based Alloys by Low-temperature Nitrocarburization: Zhe Ren; Steven Eppell; Clare Rimnac; Sunniva Collins; Frank Ernst; †Case Western Reserve University

9:00 AM
Boron-induced Surface Modification of Nickel-based Alloys: Virendra Singh; Tatiana Ayers; †Manuel Marya; †Schlumberger

9:20 AM
Isolated Properties of AISI 316 Stainless Steel Infused with Concentrated Interstitial Carbon: Zhe Ren; Arthur Heuer; Frank Ernst; †Case Western Reserve University

9:40 AM
A Novel TiN Formation Method on the Ti-added Ferritic Stainless Steel: JhungHyun Kong; SangSeok Kim; †POSCO/Stainless Steel Research Group

10:00 AM Break

10:20 AM
Electrofinishing of Passivating Biomedical Materials (like Nitinol, Ti, Ta, CoCr, and Mo) in HF-Free Low Viscosity Water Based Electrolytes: Timothy Hall; †Holly Garich; †EL Taylor; †Maria Inman; †Faraday Technology Inc

10:40 AM
Wetting Behavior of Al 2024 Alloy Surfaces after Spot-by-spot Laser-interference Processing: Adrian Sabau; Jianlin Li; Sheng Yangping; †Harry Meyer; †Jian Chen; †Oak Ridge National Laboratory

11:00 AM
Passive and Active Biomimetic Micro-patterned Surfaces and Actuators for Flow Manipulation and Aerodynamic Drag Reduction: Allison Arnold; †Justin Schrout; †Kavin Sivaneri Varaadharajan; †Idhaia; †Zach Fahey; †Kevin Tennant; †Wade Huebsch; †Patrick Browning; †Edward Sabolsky; †West Virginia University

11:20 AM
Forming of Passive and Poorly-machinable Materials by Pulse-reverse Electrochemical Processing: Brian Skinner; Timothy Hall; †Stephen Snyder; †Maria Inman; †E Jennings Taylor; †Faraday Technology, Inc.

**Art and Cultural Heritage: Reverse Engineering — Art and Cultural Heritage: Reverse Engineering**

Program Organizers: Glenn Gates, Walters Art Museum; John McCloy, Washington State University

Wednesday AM Room: B232
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Jamie Weaver, NIST; Marie Jackson, University of Utah

**8:00 AM**
Invited Conservation of Historical Coin from 1853 Rescued in the Fortin Villa 25 de Mayo-Mendoza: Patricia Carrizo; †Universidad Tecnológica Nacional Regional Mendoza(UTNFRM)

**8:20 AM**
Degradation Makers of Cellulose Acetate during Aging: Liu Liu; Lukasz Bratusz; †Northwestern Polytechnical University; †Yale Institute for the Preservation of Cultural Heritage

**8:40 AM**
Natural fibers from the Colombian Amazonia as Cultural Materials: Henry Colorado; †Universidad De Antioquia
9:00 AM Invited
Archeometallurgy, Heritage and Preservation of Iron Bridge over Mendoza River: Patricia Carzzo; Universidad Tecnológica Nacional Regional Mendoza (UTNFRM)

9:20 AM
Moisture Expansion of Porcelain: William Carty; Duncan Martin; Alfred University

9:40 AM Keynote
Numbered Jun Ware: Colors and Origins: Lucy Cooper; Katherine Eremin; Susan Costello; Jules Gardener; Stephan Kraemer; Marc Walton; Emeline Pouyet; Laure Dussubieux; Andrew Shortland; Harvard Art Museums; Harvard Center for Nanoscale Systems; Northwestern University Art Institute of Chicago Center for Scientific Studies in the Arts; Field Museum; Cranfield Forensic Institute

10:20 AM Break

10:40 AM Invited
Viscous Flow of Medieval Cathedral Glass: John Mauro; Ozgur Gulbiter; Xiaoju Gu; Olus Boratav; The Pennsylvania State University; Corning Incorporated

11:20 AM
The Lost Craftsmanship of the Cheapside Hoard: Ann-Marie Carey; Keith Adcock; School of Jewellery

**Bulk Metallic Glass Matrix Composites - Challenges and Triumphs — Alloy Design and Theoretical Modeling**

*Program Organizers: Muhammad Rafighe, RMIT University; Weidong Li, The University of Tennessee; Junwei Gao, Taiyuan University of Technology; Gang Wang, Shanghai University*

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<th>Time</th>
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<td>Wednesday AM</td>
<td>Room: B244/245</td>
<td>Greater Columbus Convention Center</td>
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**Wedded Wednesday 17th October 2018**

Monday AM Room: A113

Session Chairs: Takeshi Egami, The University of Tennessee; Jan Schroers, Yale University

8:00 AM Invited
Structure and Dynamics of BMG Forming Liquid: Takeshi Egami; University of Tennessee

8:30 AM
Slip Statistics for a Bulk Metallic Glass Composite Reflect Its Ductility: Wendelin Wright; Alan Long; Xiaojun Gu; Xin Liu; Todd Hufnagel; Karin Dahmen; Bucknell University; University of Illinois at Urbana Champaign; Johns Hopkins University

8:50 AM Invited
Iron-based Bulk Metallic Glass Larger than the Critical Casting Thickness Fabricated via Laser-based Additive Manufacturing: Ola Harysson; Zaynab Mahbooba; Lena Thorsson; Mattias Unossen; Peter Skoglund; Sindre Metals; North Carolina State University; Sindre Metals

9:10 AM Invited
Confinement of Helium Precipitates Growth within Metal Nanolayers and Implications to Helium Irradiation Damage in Fusion: Yongqiang Wang; Di Chen; Nan Li; Dina Yurev; K. Baldwin; Michael Demkowicz; Los Alamos National Laboratory; Massachusetts Institute of Technology; Texas A&M University

9:30 AM Invited
Rare Events and Uncertainty Quantification in Crystal and Amorphous Plasticity: Stefanos Papanikolaou; West Virginia University

9:50 AM
Panorama of Patent Activity in Amorphous Metallic Glasses: Alloys, Usages and Assignees: Douglas Milanez; Braulio Oliveira; Daniel Leiva; Walter Botta; Claudio Kiminami; Federal University of São Carlos

10:10 AM Break

10:30 AM Invited
Shear Banding in Bulk Metallic Glass Matrix Composites with Dendrite Reinforcements: Stephen Niezgoda; Michael Giibbons; Wolfgang Windl; Katharina Floes; The Ohio State University; Washington University in St. Louis

10:50 AM
High Throughput Design of Mg-based Metallic Glasses: Janine Erickson; John Perepezko; Dan Thoma; University of Wisconsin Madison

11:10 AM
Mechanical Properties and Atomic Bonding Character in Metallic Glasses: Tanguy Rouxel; University of Rennes 1

**Ceramics and Glasses Simulations and Informatics — Machine Learning and Materials Design**

*Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory*

**Wednesday AM**

**Room: A113**

**Location: Greater Columbus Convention Center**

Session Chairs: Peter Kroll, University of Texas at Arlington; Ye Cao, University of Texas at Arlington

8:00 AM Keynote
Informatics Driven Discovery of Chemical Signatures for Designing Complex Oxides: Krishna Rajan; University At Buffalo- State University of New York

8:40 AM Invited
Grand Challenges for Machine Learning in Glass Science: John Mauro; The Pennsylvania State University

9:10 AM
Development of Empirical Force-fields for Glass Simulations Using Machine Learning: Mathieu Bauchy; University of California, Los Angeles

9:30 AM
Optimizing Elastic Moduli of the Silicate Glasses through High-throughput Atomistic Modeling and Machine Learning Techniques: Yong-Jie Hu; Ge Zhao; Tyler Del Rose; Liang Qi; University of Michigan; The Pennsylvania State University

9:50 AM
Parametric Sensitivity and Exploratory Data Analysis of the ReaxFF Potential as Applied to Boron Carbide: Efain Hernandez-Rivera; Souma Chowdhury; Shawn Coleman; Payam Ghassemi; Mark Tschopp; US ARL; University at Buffalo

10:10 AM Break

10:30 AM Keynote
Machine Learning in Materials Science: Recent Progress and Critical Next Steps: Rampi Ramprasad; Georgia Institute of Technology
11:10 AM Invitation

Atomic Computing Simulations and Design of Lithium Ion Solid State Electrolytes: Jincheng Du; University of North Texas

Characterization & Methods in Failure Analysis — Fatigue & Fracture II

**Program Organizers:** Andrew Havics, PH2 LLC; Burak Alysz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de Mons (FPMs)

**Wednesday AM**

**Session Chairs:** Guiru Liu, Progress Rail; Nicholas Cherolis, Baker Risk; Wesley Pridemore, General Electric-Aviation; Pierre Dupont, Schaeffler Belgium Sprl/Bvba; Conrad Park, Case Western Reserve University

**8:00 AM Invited**

Failure Analysis of Rolling Elements and Plain Bearings: Methodologies for Its Systematic Approach: Pierre Dupont; Schaeffler Belgium Sprl/Bvba

8:20 AM

The Failure Analysis & Prevention of a Large and Critical Extrusion Gearbox Part 1/2: The Case Study an International FAS Network Analysis: Pierre Dupont; Donato Firna; Véronique Vitry; Fabienne Daenaoui; Schaeffler Belgium Sprl/Bvba; Politecnico di TORINO, Italy; UMONS - Faculté polytechnique de Mons (FPMs)

8:40 AM

The Failure Analysis & Prevention of a Large and Critical Extrusion Gearbox Part 2/2: From Failure Analysis to Prevention, an International FAS Network Answer: Pierre Dupont; Donato Firna; Véronique Vitry; Fabienne Daenaoui; Schaeffler Belgium Sprl/Bvba; Politecnico di TORINO, Italy; UMONS - Faculté polytechnique de Mons (FPMs)

9:00 AM

On the Gear Failure Modes Prevention & Their Estimations in Industrial Designs: Pierre Dupont; UMONS Faculté polytechnique de Mons (FPMs)

9:20 AM

Fatigue Behavior of 2124/25%SiCp/3Al Composites: Ji Xiu; Conrad Park; Matthew Willard; John Lewandowski; Don Hashiguchi; Kyung Chung; Case Western Reserve University; Materion Brush Incorporated; Materion Brush Incorporated

9:40 AM

Electrical Arc Induced Fatigue Crack Initiation on Commercial Aircraft Engine Components: Wesley Pridemore; GE Aviation

10:00 AM Break

10:20 AM

Fuselage Nozzle Intergranular Cracking: Robert Ware; AFRL/RXSA

10:40 AM


11:00 AM

Metallurgical Evaluation of Fractured Gas Turbine HPT Shroud C-clips and Associated Data Generated to Support Root Cause: William Rossey; General Electric Aviation
Program Organizers: Hailtuo Zhang, University of North Carolina at Charlotte; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory; Gurpreet Singh, Kansas State University; Kejie Zhao, Purdue University; Jian Shi, Rensselaer Polytechnic Institute

Funding Support provided by: MilliporeSigma

Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Hailtuo Zhang, UNC Charlotte

8:00 AM
Effects of Precursors on Preparation of SiOC Bulk Ceramics: Kathy Lu1; Lixia Wang1; ‘Virginia Tech’

8:20 AM Invited
Single-source-precursor Synthesis of Si-based Ceramic Nanocomposites for Environmental Applications: Zhaoyu Yu1; ‘Xiamen University’

8:50 AM
Programming Nanoparticle Assembly for Silica-based Ionogels: Ruel McKenzie1; Sainath Jadhav1; Marisa Tukpah1; Daria Lazareno1; ‘The University of Akron’

9:10 AM
Influence of Bond Characteristics of Polymer Precursors on the Pore Structure of Polymer Derived Ceramics: Kathy Lu1; Donald Erb1; ‘Virginia Tech’

9:30 AM Invited
Synthesis and Functionality of Lead Halide Perovskites Studied by Time-resolved Laser Spectroscopy. Clemens Burda2; ‘Case Western Reserve University’

10:00 AM
Solution Combustion Synthesis of Nanosized Ferroelectric (1-x)KNbO3-10:00 AM
of Polymer Derived Ceramics

10:20 AM Break

10:40 AM
Synthesis of Silicon Nano Particles from Cassava Periderm by Reduction Method: Saleim Hassan1; Johnson Agunsoye1; Joseph Agboola1; Adebolu Jeelie1; Seliu Bello1; ‘University of Lagos, Nigeria’; ‘University of Ilorin, Nigeria’; ‘Kwara State University, Malete’

11:00 AM
Fabrication of 3D Phononic Crystals Using Polystyrene Spheres and Nano-Si Particles: Shun-Ju Chiang1; Leon Shaw1; ‘Illinois Institute of Technology’

11:20 AM
Synthesis of Nanostructured Li1,La2,ZrO3 Solid Electrolyte Powders in Molten Salt Eutectics: Jon Weller1; Justin Whetten1; Candace Chan1; ‘Arizona State University’

Corrosion of Additively Manufactured Metals — Session III
Program Organizers: Eric Schindelholz, Sandia National Laboratories; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International

Wednesday AM
Room: D180
October 17, 2018
Location: Greater Columbus Convention Center

Session Chairs: Eric Schindelholz, Sandia National Laboratories; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International

8:00 AM Invited
Corrosion of Additively Manufactured Metallic Materials: Pin Lu1; Dana Frankel1; Thomas Kozmel1; Chris Kantner1; James Saal1; ‘QusTek Innovations’

8:20 AM
Corrosion Characteristics of Additively Manufactured Stainless Steel: Jamie Stull1; Mary Ann Hill1; Daniel Hooks1; Thomas Liener1; Justin Tokash1; Kevin Bohn1; ‘Los Alamos National Lab’; ‘Oak Ridge National Laboratory’

8:40 AM
Accelerated Sensitization in Laser Additively Manufactured 316L: Duane Armell Macatangay1; ‘University of Virginia’

9:00 AM
Correlating the Microstructure and Surface Morphology of Laser Engineered Net Shape (LENS) 304L Series Stainless Steel to Its Corrosion Response: Michael Mela1; Rebecca Schaller1; Hai-Duy Nguyen1; Jason Taylor1; Jeffrey Rodelas1; Eric Schindelholz1; ‘Sandia National Laboratory’; ‘University of British Columbia’

9:20 AM Invited
On the Corrosion Characteristics of 316L Manufactured by Selective Laser Melting: Sebastian Thomas1; Guilherme Sander1; Victor Cruz1; Cristian Costa1; Derui Jiang1; Xiang Gao1; Wenwen Sun1; Michael Brameld1; Christopher Hutchinson1; Nick Birbilis1; ‘Monash University’; ‘Woodside Energy’

9:40 AM Invited
Effect of Immersion Time on Electrochemical Characteristics of Additively Manufactured 316L Stainless Steel Exposed to Artificial Seawater: Barbara Shaw1; Elizabeth Sikora1; Dailin Wang1; ‘Pennsylvania State University’

10:00 AM Break

10:20 AM
Environmental Degradation of Stainless Alloys Made by Additive Manufacturing: Xiaoyuan Lou1; Miao Song1; Raul Rebak1; ‘Auburn University’; ‘University of Michigan’; ‘GE Global Research’

10:40 AM
Hydrogen Uptake and Diffusivity in Additively Manufactured Stainless Steels: Rebecca Schaller1; Jason Taylor1; Jeffrey Rodelas1; Eric Schindelholz1; ‘University of British Columbia’; ‘Sandia National Laboratories’

11:00 AM
Hydrogen Embrittlement of Additively Manufactured Inconel 718 in Seawater: Liu Cao1; Ramgopal Thodla1; ‘DNV GL’

11:20 AM
High Temperature Oxidation Behavior of Additively Manufactured Alloys: Sedighbeh Rashidi1; Amit Pandey1; Rajeev Kumar Gupta1; ‘University of Akron’; ‘Rolls Royce LG Fuel Cell Systems Inc.’
### Covetic Nanomaterials for Energy Applications — Covetic Materials I

**Program Organizers:** David Forrest, US Department of Energy; Uthamalingam Balachandran, Argonne National Laboratory

**Wednesday AM**
- **Session Chair:** U (Balu) Balachandran, Argonne National Laboratory

#### 8:20 AM Invited
**Covetic Nanomaterials 101:** David Forrest; 1 US Department of Energy

#### 9:00 AM Invited
**Melt Processing of Covetic Materials for Energy Applications:** Paul Jablonski; Martin Detrio; David Alman; U. Balachandran; David Forrest; 1 DOE/NETL; 2NETL and AECOM; 3ANL; 4DOE

#### 9:40 AM
**Mechanism Studies and Fabrication of Carbon Nanostructures Incorporated into Al Alloys by Electrocharging Assisted Process:** Xiaoxiao Ge; Christopher Klingshirn; Manfred Wuttig; Karen Gaskell; Peter Y Zavali; Balu Balachandran; Daniel P Cole; Lourdes Salamanca-Riba; 1 University of Maryland; 2 Argonne National Laboratory; 3 U.S Army Research Laboratory

#### 10:00 AM Break

#### 10:20 AM
**Manufacture and Characterization of Aluminum Covetics:** Iwona Jasiuk; Siyuan Pang; Ivan Shchelkanov; Mete Bakir; David Ruzic; 1 University of Illinois

#### 10:40 AM
**Characterization of Metal-carbon Interfaces in Covetic Materials:** Christopher Shumeyko; Daniel Cole; Xiaoxiao Ge; Lourdes Salamanca-Riba; 1 US Army Research Lab; 2 University of Maryland

#### 11:00 AM
**Conductive Carbon-metal Composite Materials by Covetic Process:** Shenjia Zhang; Cornelius Muojekwu; Harry Couch; Michael Braydich; 1 General Cable; 2 GDC Industries

#### 11:20 AM Invited
**Networks of Graphene Nanoribbons and Nanosheets Formed in Metals by the Electrocharging Assisted Process:** Lourdes Salamanca-Riba; Xiaoxiao Ge; Manfred Wuttig; Daniel Cole; Christopher Shumeyko; Karen Gaskell; Oded Rabin; Bahu Balachandran; 1 University of Maryland; 2 Army Research Laboratory; 3 Argonne National Laboratory

### Deformation and Transitions at Grain Boundaries VI — Dislocation-Grain Boundary Interactions

**Program Organizers:** Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

**Wednesday AM**
- **Session Chair:** Samuel Hemery, Institute Prime - ENSMA; Eric Homer, Brigham Young University

#### 8:00 AM
**Fatigue Crack Initiation at Grain Boundaries Due to Grain Boundary Resistance against Crack Transfer and Local Stresses:** Philipp Weiler; Florian Schaefer; Michael Marx; 1 Saarland University

#### 8:20 AM
**Role of Slip Transfer in Heterogeneous Deformation between a Soft and a Hard Grain in Grade 1 Titanium:** Harsha Phukan; Thomas Bieler; Chen Zhang; Ruqing Xu; Philip Eisenlohr; Martin Crimp; Carl Boehler; 1 Michigan State University

#### 8:40 AM
**Phase Transformation Strengthening in Metastable fcc Materials:** Carlyn LaRosa; Changning Niu; Jiashi Miao; Michael Mills; Maryam Ghazisaeidi; 1 The Ohio State University

#### 9:00 AM Invited
**Atomistic Survey of Grain Boundary-dislocation Interactions in FCC Nickel:** Devin Adams; Eric Homer; David Fullwood; Robert Wagner; 1 Brigham Young University

#### 9:30 AM Invited
**Slip Activity in Ti Alloys: Interactions with Grain Boundaries:** Samuel Hemery; Cyril Lavogiez; Patrick Villechaise; 1 Institute Prime - ENSMA

#### 10:00 AM Break

#### 10:20 AM
**Simulation of Slip Transfer in Tensile Deformed Bicrystals Using a Dislocation Density Based Crystal Plasticity Model:** Sarra Haouala; Thomas Bieler; Javier Segurado; Javier Llorca; 1 IMDEA Materials; 2 Michigan State University; Polytechnic University of Madrid; 3 IMDEA Materials; Polytechnic University of Madrid

#### 10:40 AM
**TEM Characterization of Dislocations Generated by Nanoindentation around Grain Boundary with Fe-3% Si Bicrystals:** Seichiro Hira; Ya-Ling Chang; Toru Hara; Takahito Ohmura; 1 National Institute for Materials Science

#### 11:00 AM
**Exploring Grain Boundary Dependent Deformation Mechanisms in Nanocrystalline Materials Through In-situ TEM High Cycle Fatigue:** Christopher Barr; Khalid Hattar; 1 Sandia National Laboratories

#### 11:20 AM
**An Atomistic Method of Predicting Thermodynamic Force for Deformation:** Mulaine Shih; Michael Mills; Maryam Ghazisaeidi; Peter Anderson; 1 Ohio State University
From Diversity to Inclusion — Session I
Program Organizers: Elvi Dalgaard, Pratt & Whitney Canada; Lynnette Madsen, Svedberg Science, Inc.
Wednesday AM Room: B231
Location: Greater Columbus Convention Center

10:30 AM Keynote
Rising to the Challenge: Personal Reflections on My Leadership Journey: Priti Wanjara²; ¹NRC Aerospace

11:00 AM Invited
Wells: How Gender Diversity Can Drive Innovation in the STEM Fields: Mary Wells¹; ¹University of Guelph

11:30 AM
Multi-layered Mentorship Approaches in Summer Engineering Programs: Kimberly Cook-Chennault; ¹Rutgers, the State University of New Jersey

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute
Wednesday AM Room: A115
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Optical Ceramic Materials in Solid State Lasers: Historical Evolution and Current Perspectives: Yiquan Wu²; ¹Alfred University

8:30 AM Invited
Photo-induced Property Changes in Chalcogenide Glasses: Pierre Lucas¹; Anmy Khanolkar¹; Pierre Deymier¹; Nicholas Boechler¹; William Warfel¹; Neil Jenkins¹; Lizhu Li¹; ¹University of Arizona; ¹University of Washington; ¹UC San Diego

9:00 AM Invited
Thin Film Storage Phosphors for Medical Imaging: Jacqueline Johnson¹; Charles Bond¹; Anthony Lubinsky¹; Yu Jin¹; Amanda Petford-Long¹; ¹University of Tennessee Space Institute; ¹Utis; ¹SUNY Stony Brook; ³Northwestern University; ³Argonne National Laboratory

9:30 AM Invited
Science of Chalcogenide-based Conductive-bridging Random Access Memory: Gang Chen¹; Kirtankumar Dixit¹; Sunday Agbo¹; Mayur Sundararajan¹; ³Ohio University

10:00 AM Break

10:20 AM Invited
Geopolymers to Inertize Chromium Liquid Waste from Inks for Digital Decoration of Ceramic Tiles: Isabella Lancellotti¹; Luisa Barbieri¹; Eugenio Caponetti¹; Cristina Leonelli¹; ¹University of Modena and Reggio Emilia; ²University of Palermo

10:50 AM Inorganic Polymers from FeO-CaO-SiO₂ Slags: Influence of CaO on Reactivity and Strength Development: Christina Siakati²; Arne Peys²; Yiannis Pontikes²; ²KU Leuven

11:00 AM Uncommon Aluminosilicates as Sustainable Precursors for Geopolymers: Isabella Lancellotti¹; Luisa Barbieri¹; Cristina Leonelli¹; ¹University of Modena and Reggio Emilia

11:10 AM Aromatic Polycondensation: Novel Adhesive Polymers from Phenylsilanes: Yiannis Pontikes²; ²KU Leuven

8:00 AM Introductory Comments

8:10 AM Invited
Carbonate Ceramics for the Reduction of Global Carbon Footprint: Richard Riman¹; Daniel Kopp¹; ¹Rutgers University

8:50 AM Phosphate Cements Made from Battery Waste: Henry Colorado¹; ¹Universidad De Antioquia

9:10 AM Fe-silicate Binders as an Alternative to Cement: a Comparison in Performance and Environmental Footprint: Yiannis Pontikes²; ²KU Leuven

9:40 AM Waste Tire Rubber in Calcium Phosphate Cement Blends: Carlos Revelo¹; Henry Colorado¹; ¹Universidad De Antioquia

10:00 AM Break

10:20 AM Invited
Uncommon Aluminosilicates as Sustainable Precursors for Geopolymers: Isabella Lancellotti¹; Luisa Barbieri¹; Cristina Leonelli¹; ¹University of Modena and Reggio Emilia

10:50 AM Inorganic Polymers from FeO-CaO-SiO₂ Slags: Influence of CaO on Reactivity and Strength Development: Christina Siakati²; Arne Peys²; Yiannis Pontikes²; ²KU Leuven

11:10 AM Geopolymers to Inertize Chromium Liquid Waste from Inks for Digital Decoration of Ceramic Tiles: Isabella Lancellotti¹; Luisa Barbieri¹; Eugenio Caponetti¹; Cristina Leonelli¹; ¹University of Modena and Reggio Emilia; ²University of Palermo
**IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Optical and Electron Characterization of Microstructures**

**Program Organizers:** Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

**Wednesday AM**

**Room:** A212

**Location:** Greater Columbus Convention Center

**Session Chairs:** James Martinez, NASA Johnson Space Center; Mary O’Brien, Colorado School of Mines; Eric Cole, Carpenter Technology Corp

**8:00 AM Invited**

Quantifying Microstructural Morphologies through Automated Image Analysis of Optical and Electron Micrographs: Matthew Hecht1; Anna Weiss1; Txai Sibley1; Brian DeCost3; Elizabeth Holm1; Bryan Weber1; Yoosuf Picard1; Carnegie Mellon University

8:20 AM Invited

Process-microstructure-property Relationships in Fe-Co-2V: Donald Susan1; Andrew Kustas2; Zahra Ghanbari1; Jeff Rodelas1; Joseph Michael1; Sandia National Lab

8:40 AM

Development of Transfer Functions for Estimating 3D Particle Distributions from 2D Cross Sections via Computational Modeling: A. Gerb1; A. Criner2; S. Serniatur1; E. Payton1; Air Force Research Lab Materials and Manufacturing Directorate; UES, Inc.; Air Force Research Lab Materials and Manufacturing Directorate

9:00 AM Invited

Analysis of Defects in Tungsten Heavy Alloy: Zahra Ghanbari1; Donald Susan1; Alice Kilgo1; Christina Profazi1; Sandia National Laboratories

9:20 AM

Extending Grain Mapping into the Third Dimension Using Lab-based Diffraction Contrast Tomography: William Harris1; Hrishikesh Bale3; Steve Kelly1; Nicolas Gueninchault1; Jun Sun2; Erik Lauridsen1; Carl Zeiss X-ray Microscopy Inc; Xnovo Technology ApS

9:40 AM Invited

Analysis of Defect Structures in Deformed Metals Using EBSD: David Field1; Washington State University

10:00 AM Break

10:20 AM

Bondability Study on High-strength Strip Steel with Bainitic-martensitic Structure: Abhishek Mandal1; Debay Chakrabarti2; IIT Kharagpur

10:40 AM

Mapping of Sigma Phase in Creep Tested Super304H Advanced Austenitic Steels: Tapaswi Lolla1; John Siefert1; Michael Gagliano1; EPRI

11:00 AM Invited

Effect of Microstructure on Hydrogen Induced Cracking in X52 and X70 Pipeline Steels: Mary O’Brien1; Kip Findley1; Colorado School of Mines

11:20 AM

Numerical Modelling of Laser Metal Deposited Coatings on Ti-6Al-4V Alloy: Olawale Fatoba1; Rezvan Gharehbaghi1; Stephen Akinlabi1; Esther Akinlabi1; University of Johannesburg

**Interfaces, Grain Boundaries and Surfaces from Atomic and Macroscopic Approaches — Kinetics**

**Program Organizers:** John Blendell, Purdue University; Ming Tang, Rice University; Shen Dillon, University of Illinois; Wayne Kaplan, Technion - Israel Institute of Technology; Dominique Chatain, CNRS, Aix-Marseille University

**Wednesday AM**

**Room:** A122

**Location:** Greater Columbus Convention Center

**Session Chair:** Lauren Hughes, University of California, Davis

**8:00 AM Invited**

Interpreting Faceted Grain Boundary Migration as an Optimal Transport Problem: Ian Chesser1; Brandon Runnels2; Elizabeth Holm3; Carnegie Mellon University; University of Colorado Colorado Springs

8:30 AM Invited

Dynamic Simulation of Oxygen Transport through Oxide Films: Markus Taustchi1; Nicholas Harrison1; Michael Finnis2; Max-Planck-Institut für Eisenforschung GmbH; Imperial College London

9:00 AM Invited

Disconnections and Grain Growth in SrTiO3: Hadas Sternlicht1; Wolfgang Rheinheimer1; Alex Mehmann1; Avner Rothchild1; Michael Hoffmann1; Wayne Kaplan1; School of Engineering, Brown University; School of Materials Engineering, Purdue University; Department of Materials Science and Engineering, Technion; Institute of Applied Materials, Karlsruhe Institute of Technology

9:30 AM Invited

Unravelling Complex Nanoscale Deformation Mechanisms and Interfacial-mediated Behavior In Nanocrystalline Materials through Atomistic Modeling: Ankita Gupta1; Jacob Gruber1; Garratt Tucker1; Colorado School of Mines

10:00 AM Break

10:20 AM

Is the Grain Growth Transition of Strontium Titanate a Space Charge Transition?: Wolfgang Rheinheimer1; Jana Paras2; Roger de Souza3; Michael Hoffmann1; Purdue University; RWTH Aachen University; Karlsruhe Institute of Technology

10:40 AM

Simulation of Grain Boundary Migration and Phase Transformation in Metals with Overdamped Langevin Dynamics: Carolina Baruffi1; Alphonse Finel1; Brigitte Bacroix1; Oguz Umut Salman1; Yann Le Bouar1; ONERA; Université Paris 13

11:00 AM

Slip-induced Twinning in Titanium: Mohammad Shahriar Hooshmand1; Maryam Ghazisacidi1; Ohio State University

11:20 AM

Transition from Source- to Stress-controlled Plasticity in Nanotwinned Materials Below a Softening Temperature: Seyyedeh Mohadeseh Taheri Mousavi1; Gujin Zou1; Haofei Zhou1; Huajian Gao1; MIT; Brown University
International Symposium on Defects, Transport and Related Phenomena — Bulk and Grain Boundary Transport

**Program Organizers:** Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

**Wednesday AM**

**8:00 AM Invited**

**Linear Diffusion Model for Determination of the Height of the Potential Barrier at Grain Boundaries of Ion-conducting Oxides:** Chih-Yuan Chang; Sergey Khodorov; Igor Lubomirsky; Sangtae Kim; University of California, Davis; Weizmann Institute of Science

**8:40 AM Invited**

**Application of Kelvin Probe Force Microscopy to Measure Room Temperature Transport Characteristics of Oxygen Ion Conductors:** Kerstin Neuhaus; Hans-Dieter Wiemhöfer; University of Münster

**9:20 AM**

**Electron Localization Enhances Cation Diffusion in Doped Zirconia and Ceria:** Yanhao Dong; I-Wei Chen; Massachusetts Institute of Technology; University of Pennsylvania

**9:40 AM Invited**

**Diffusion of Cation Impurities through Ceria Grain Boundaries:** WooChul Jung; NoWoo Kwak; KAIST

**10:20 AM Break**

**10:40 AM**

**Density Functional Theory Modeling of the Cation Diffusion in Bulk Zirconia and in La$_{1-x}$Sr$_x$MnO$_{3\alpha}$ (x=0.0-0.25) for Solid Oxide Fuel Cells:** Yush Lin Lee; Yuhua Duan; Dane Morgan; Dan Sorescu; Harry Abernathy; Gregory Hackett; National Energy Technology Laboratory; University of Wisconsin-Madison

**11:00 AM Invited**

**Grain Boundary Hydrogen Transports in Nanocrystalline Metal Nitride Thin Films:** Yoshitaka Aoki; Hokkaido University

**Joining of Advanced and Specialty Materials (JASM XX) — Nano- and Micro-Joining**

**Program Organizers:** Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barbarok, WeldQC, Inc; Akio Hirose, Osaka University; Peng Hu, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

**Wednesday AM**

**8:00 AM Invited**

**Molecular Simulations of Transient Liquid Phase Bonding of Ni-based Superalloy with Ni Nanoparticles:** Jiaqi Wang; Seungha Shin; Anming Hu; Jackson Wilt; University of Tennessee

**8:20 AM Invited**

**Chemically Induced Joining of Silver Nanomaterials for Flexible Electrodes:** Peng Peng; Beihang University

**8:40 AM**

**Laser Nanojoining of Copper Nanowires:** Anming Hu; Yangbao Deng; Yongchao Yu; Yanfeng Bai; University of Tennessee Knoxville

**9:00 AM**

**Site-selective Solder Deposition on Multi-segment Nanowires for Nanowire Joining:** Edward Fratto; Jirui Wang; Hongwei Sun; Zhiyong Gu; University of Massachusetts Lowell

**9:20 AM Invited**

**Photic Conventional Structuring and Joining of Graphene and Metal-nanostuctures for Flexible Electronics:** Ruozhou Li; Jing Yan; Ying Yu; Anming Hu; Nanjing University of Posts and Telecommunications; University of Tennessee - Knoxville

**9:40 AM**

**Metal-to-Silicon Bonding Using Silver Oxide Reduction Reaction and Its Mechanism:** Kota Inami; Tomoki Matsuda; Tomokazu Sano; Akio Hirose; Osaka University

**10:00 AM Break**

**10:20 AM**

**Fabrication and Performance of MnCoCuNiFe High Entropy Alloy Nanopastes for Brazing Inconel 718:** Denzel Bridges; Samantha Lang; Suhong Zhang; Raymond Xu; Anming Hu; University of Tennessee; Rolls-Royce Corporation

**10:40 AM**

**Nanosolder Additions to Solder Pastes and their Effect on IMC Formation and Growth on Cu Substrate:** Evan Wernick; Zhiyong Gu; University of Massachusetts Lowell

**11:00 AM**

**Transit Liquid Phase Bonding of Inconel 718 Superalloy Using Ni Nanoparticle Based Filler:** Suhong Zhang; Denzel Bridges; Zhiyi Feng; Anming Hu; University of Tennessee; Oak Ridge National Laboratory
Joining of Advanced and Specialty Materials (JASM XX) — Welding Processes

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barborak, WeldQC, Inc; Akio Hirose, Osaka University; Pong He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Wednesday AM  Room: C172
October 17, 2018  Location: Greater Columbus Convention Center

Session Chair: Vikas Patel, ArcelorMittal USA

8:00 AM
Effect of Electron Beam Weld bead Geometry on the Mechanical Properties of Ti6Al4V Alloy: Sandeep Thakare

8:20 AM
Effects of Process Parameters and Interface Gap on Laser Welding Quality of Ti6Al4V Alloy: Kyung-Min Hong1; Yung Shin1; 1Purdue University

8:40 AM
Three-dimensional Numerical Simulation of Keyhole Dynamics based on Calculation of Coupled Multiphase Transfer during Laser Welding for Aluminum: Qiaofeng Zhou1; Fumikazu Miyasaka1; Hiroaki Mori1; 1Osaka University

9:00 AM
Effects on Hardness and Cooling Rates of 3-D Printed 4047 Aluminum for Electromagnetic Focusing Plasma: Comparison of MIG and SLS: Adam Pringle1; Paul Sanders1; Joshua Pearce1; 1Michigan Technological University

9:20 AM
Effect of Mass Deposition on Fatigue Properties of Newly Developed Ultra-narrow Gap Multipass PC-GMA Weld for Thick Section: Ramkishor Anant1; P.K. Ghosh1; 1Indian Institute of Technology Roorkee

9:40 AM
Modeling of Severe Plastic Deformation in Mash Seam Welding Using Improved Electro-thermo-mechanical Simulation: Alexey Kaprinenko1; Wei Zhang1; Bruce Krakauer2; Menachem Kimchi1; 1The Ohio State University; 2A. O. Smith

10:00 AM Break

10:20 AM Invited
Microstructure Characterization and Evaluation of Mechanical Properties for Friction Welded EN-24 Alloy Steel: Vijay Gaikwad1; 1Bharat Forge Ltd.

10:40 AM
Modeling and Advanced Characterization of Nickel Base Alloys for Nuclear Propulsion Applications: Allison Fraser1; John DuPont1; 1Lehigh University
**Light Metal Technology — Applications for the Transportation Industry — Modeling and Formability/Magnesium Alloys**

*Program Organizers:* Julie Levesque, Quebec Metallurgy Center; Mihaiela Isac, McGill Metals Processing Centre; Xiaoming Wang, Purdue University; Roderick Guthrie, McGill University; Sa Ge, Hatch Ltd.; Kaan Inal, University of Waterloo; Frederic Laroche, Rio Tinto

**Wednesday AM**

- **9:00 AM**
  - Session Chairs: Julie Levesque, Quebec Metallurgy Center; Keerti Kappagantula, Ohio University; Stefan Walzer, IFU Stuttgart

- **9:00 AM**
  - Keynote Integrated Computational Materials Engineering (ICME) for Vehicle Lightweighting: Kaan Inal\(^1\); University of Waterloo

- **8:40 AM**
  - Numerical Investigation of Significant Process Parameters in a Tempered Deep Drawing Process of Magnesium Sheet Metal: Stefan Walzer\(^2\); Mathias Liewald\(^2\); University of Virginia

- **9:00 AM**
  - Unveiling Low Current Electroplasticity in Aluminum Alloys: Clifton Bumgardner\(^3\); Brendan Croom\(^3\); Ningning Song\(^3\); Xiaodong Li\(^3\); University of Virginia

- **9:20 AM**
  - Improving Formability of Magnesium Alloy Sheet at Room Temperature by Texture Control: Se Jong Kim\(^4\); Jinwoo Lee\(^4\); Young-Geun Lee\(^4\); Daeyong Kim\(^4\); Korea Institute of Materials Science

- **9:40 AM**
  - The Influence of Recrystallization Temperature on Textural Evolution during Grain Growth in Mg Alloy AZ31B: Matthew Steiner\(^5\); Jishnu Bhattacharyya\(^5\); Sean Agnew\(^5\); University of Cincinnati; University of Virginia

- **10:00 AM**
  - Break

- **10:20 AM**
  - APSO Containing Mg-Alloys for Automotive and Aerospace Applications: Joshua Caris\(^1\); Nick Farkas\(^1\); Andrew Sherman\(^1\); Terves, LLC.

- **10:40 AM**
  - Lightweight Road Wheels Manufactured by High Temperature Shear Forming of Mg Alloys Sheets: Yoon Oh\(^6\); Woo Jin Park\(^6\); Ki Hyuk Kwon\(^6\); Research Institute of Science and Technology

- **11:00 AM**
  - A Ceria Based Conversion Coating on Squeeze Cast Mg-4wt. %Y Alloy for Improved Corrosion Resistance in 0.1 M NaCl Solution: Meeta Kamde\(^7\); Yogendra Malton\(^7\); Partha Saha\(^7\); NIT Rourkela

- **11:20 AM**
  - The Effect of Sn and Ca Addition on Mechanical Properties and Ignition Behavior of Magnesium Alloys Subjected to Direct Extrusion Process: Yohan Go\(^8\); Jae Ok Choi\(^8\); Joung Sik Suh\(^8\); Su Mi Jo\(^8\); Bong Sun You\(^8\); Young Min Kim\(^8\); Korea University of Science and Technology; Kyungpook National University; Korea Institute of Materials Science

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**Manufacturing-Related Failures — Casting Failures**

*Program Organizers:* Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

**Wednesday AM**

- **8:00 AM**
  - Keynote A Brief History of Time: From Sand Castings to Investment Castings (Diverse Failures of Assorted Hydrostatic Transmission Components): Jacob Auliff\(^9\); Danfoss

- **8:20 AM**
  - Invited Understanding Steel Casting Failures: David Poweleit\(^10\); SFSA

- **8:40 AM**
  - Factor Effecting the Prevention of a Failure: Charles White\(^11\); Kettering University

- **9:00 AM**
  - Invited Failure Analysis of Casting Failure in the Field: Michael Gatougo\(^12\); John Deere

- **9:40 AM**
  - Invited Welding Complications Caused By Steel Casting Defects: Why Process Control and Product Quality Are Critical For Customers: Alex Kinsey\(^13\); Joseph Lemberg\(^13\); Myra Dyer\(^13\); Eric Guyer\(^13\); Exponent

- **10:00 AM**
  - Break

- **10:20 AM**
  - Cracking Failures of Copper Alloy Hot Rolled Plates: Phenomenological Approach and Root Cause Analysis: George Pantazopoulos\(^14\); Athanasios Vazirvandis\(^14\); Ioannis Contopoulos\(^14\); ELKEM - Hellenic Research Centre for Metals S.A.

- **10:40 AM**
  - Invited Pusher Furnace Ingot Failure Analysis: Ifeanyichukwu Nweke\(^15\); Skyvalue Aluminum Limited
Materials Degradation in CO₂ Environments — Session I
Program Organizers: Richard Oleksak, National Energy Technology Laboratory; Julie Tucker, Oregon State University; Matthew Walker, Sandia National Laboratories

Wednesday AM
Room: C162A/162B
October 17, 2018
Location: Greater Columbus Convention Center

Session Chairs: Julie Tucker, Oregon State University; Richard Oleksak, National Energy Technology Laboratory

8:30 AM Invited
Dynamic Corrosion Tests in CO₂ Rich Environment: Xiija Lu¹; Mike McGraddy¹; Brock Forrest¹; David Freed²; Kay John²; Jason Laumb³; Joshua Stanislawski³; John Hurley³; ¹8 Rivers Capital, LLC; ²Energy & Environmental Research Center

9:00 AM
The Effect of Surface Finish during High-temperature Oxidation of Fe Alloys in CO₂: Gordon Holcomb¹; Richard Oleksak¹; Casey Carney¹; Ömer Dogan¹; ¹National Energy Technology Laboratory

9:20 AM
Investigating the Electrical Resistance (ER) Technique for In-situ Structural Alloy Corrosion Monitoring within Supercritical CO₂ Power Cycles: Matthew Walker¹; ¹Sandia National Laboratories

9:40 AM
Corrosion and Carburation Behavior of Fe- and Ni-base Alloys in S-CO₂ Environment at Two Temperatures: Sung Hwan Kim¹; Gokul Obulan Subramanian¹; Changheui Jang¹; ¹Korea Advanced Institute of Science & Technology

10:00 AM Break

10:20 AM Invited
The Effect of Pressure and Impurities on Oxidation in Supercritical CO₂: Bruce Pint¹; James Keiser¹; ¹Oak Ridge National Laboratory

10:50 AM
High-temperature Oxidation of Steels and Nickel Alloys in CO₂ Containing Impurities: Richard Oleksak¹; Joseph Tylczak¹; Gordon Holcomb¹; Ömer Dogan¹; ¹National Energy Technology Laboratory

11:10 AM
The Effect of CO₂ Pressure on Chromia Scale Microstructure at 750°C: Kinga Unoçi¹; Bruce Pint¹; ¹Oak Ridge National Laboratory

Materials for Nuclear Applications and Extreme Environments — Processing and Behavior of Novel Fuels I
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Dev Chidambaram, University of Nevada, Reno; Rauf Rebak, GE Global Research; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

Wednesday AM
Room: D183
October 17, 2018
Location: Greater Columbus Convention Center

Session Chair: Jake Amoroso, Savannah River National Laboratory

8:00 AM
Optimising Processing of Thorium Dioxide-silicon Carbides Composite Pellets Using Spark Plasma Sintering: Anil Prasad¹; Linu Malakkal²; Lukas Bichler²; Jerzy Szpunar²; ¹University of British Columbia; ²University of Saskatchewan; ²UBC

8:20 AM Invited
Microstructure Evolution and Response Behavior of U3Si2 by Extensive Ion Beam Irradiation: Tiankai Yao¹; Bowen Gong¹; Lingfeng He¹; Jason Harp²; Michael Tonks¹; Jie Liu¹; ¹Rensselaer Polytechnic Institute; ²Idaho National Laboratory; ²University of Florida

9:00 AM
The High-temperature Deformation Behavior of Depleted Uranium + 10 wt% Molybdenum: Cody Miller¹; Rodney McCabe¹; Daniel Coughlin¹; David Dombrowski¹; ¹Los Alamos National Laboratory

9:20 AM Invited
New Insights Into the Fabrication and Properties of Enhanced UO₂ Fuel: Sarah Finkeldei¹; Jim Kiggans¹; Rodney Hunt¹; Kurt Terrani¹; ¹Oak Ridge National Laboratory

10:00 AM Break

10:20 AM
Uranium Nitride Corrosion and High-temperature Irradiation Resistant Thermocouples: Lan Li¹; Ember Sikorski¹; Richard Skiffon¹; Patrick Calderoni¹; ¹Boise State University; ²Idaho National Laboratory

10:40 AM
Microstructure and Mechanical Properties of Silicon Carbide Layer in TRISO-coated Fuel Particle Coated by Fluidized Bed Chemical Vapor Deposition at Various Temperatures: Yoonku Kim¹; InJin Sah¹; Eung-Seon Kim¹; ¹Korea Atomic Energy Research Institute; ²KAERI

11:00 AM
Pulse Electric Current Joining of Oxide-dispersion-strengthened Alloys: Bai Cui¹; Xueliang Yan¹; Fei Wang¹; Qin Zhou¹; Michael Nastasi¹; ¹University of Nebraska–Lincoln
Mechanochemical Synthesis and Reactions in Materials Science III — Session I
Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Huot Jacques, University Du Quebec A Trois Rivieres

Wednesday AM Room: B131
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Challapalli Suryanarayana, University of Central Florida

8:00 AM Invited
Mechanochemical Reactions of Oxides Followed by Multi-nuclear Magnetic Resonance Spectroscopy: Vladimir Sepelak1; Karlruhe Institute of Technology

8:30 AM
Mechanochemical Synthesis of Highly Fluorescent Carbon Quantum Dots: Richard Blav2; 1University of Central Florida

9:00 AM
Mechanically Driven Phase Transformation in Sn Reinforced Al-Cu- Fe Quasicrystalline Matrix Nanocomposite: Nilay Mukhopadhyay; Yagnesh Shadangi; Joysurya Basu; Kausik Chattopadhyay; 2Department of Metallurgical Engineering

9:30 AM
Formation, Structure, and Reactivity of Mechanically Activated Composites Based on Transition Metal Oxides: Andrey Streletskii; Igor Kolbanev; Olga Morozova; 1Institute of Chemical Physics RAS

10:00 AM Break

10:20 AM
Mechanochemically Induced C-Transformation: Olena Vizniak; Michael Felderhoff; Ferdi Schüth; 1Max-Planck-Institut für Kohlenforschung

10:40 AM
Ordering Processes in Oxides Obtained by Mechanical Milling: Revisiting the Existing Criteria to Predict the Formation and Stability of the Pyrochlore Structure: Antonio Fuentes1; Sagario Montemayor; Miroslaw Maczka; Ulises Amador; 1Cinvestav Unidad Saltillo; Centro de Investigación en Quimica Aplicada; 2Institute of Low Temperature and Structure Research; 3Universidad San Pablo CEU

Microalloyed Steels — Microalloyed Steels II

Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Jansto, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

Wednesday AM Room: A225
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Pello Uranga, CEIT

8:00 AM Invited
Canadian HSLA Steel Pipelines: History and Technology Developments: Mohsen Mohammadijoo; Laurie Collins; Hani Henein; Douglas Ivey; 1Univ of Alberta; 1EVRAZ Inc. NA

8:00 AM Invited
Mechanochemical Reactions of Oxides Followed by Multi-nuclear Magnetic Resonance Spectroscopy: Vladimir Sepelak1; Karlruhe Institute of Technology
8:30 AM  Microstructure and Toughness of Electric Resistance Welded API X70 Line Pipe: Neil Anderson1; Yiyu Wang1; Rangasayee Kannan1; Atish Ray2; Muhammad Rashid2; Laurie Collins3; Leijun Li4; 1University of Alberta; 2Evraz Inc NA

8:50 AM  Modeling of the Effect of Run-out Table Cooling on the Microstructure of a Thick Walled X70 Skelp: Hani Hencin1; Antoine Van der Laan1; Barry Wiskel1; Doug Ivey1; 1University of Alberta

9:10 AM  Austenite Grain Growth in the HAZ of Line Pipe Steels: Nicolas Romualdi1; Matthias Militzer1; Warren Poole1; Laurie Collins1; Robert Lazor1; 1The University of British Columbia; 2Evraz, Inc.; 3Transcanada PipeLines Ltd.

9:30 AM  Development of Hot Rolled Ultra High Strength Steel with Enhanced Mechanical Properties: Tiehe Zhou1; David Overby1; Peter Badgley1; Chris Martin-Root1; Xiang Wang2; Shenglong Liang2; Hatem Zurob1; 1Stelco Inc.; 2McMaster University

9:50 AM Invited  Niobium-containing Steel Metallurgy, Product Segments and Applications: Steven Jansto1; 1CBMM-North America Inc

10:10 AM Break

10:30 AM  A Case Study on Niobium Substituting Vanadium in Long Products: Rafael Mesquita1; Yan Wang1; Bryan Williams1; John Heerema1; Steve Jansto1; Bhaskar Yalamanchili1; 1CBMM North America; 2Gerdau Long Steel North America, Cartersville Mill; 3Gerdau Long Steel North America, Saint Paul Mill; 4Gerdau Long Steel North America, Tampa Office

10:50 AM  Effect of Mo And Ti Addition on the Recrystallization Kinetics during Sub-critical Annealing and Tensile Property of HSLA Steel: Pranabanda Modak1; Anish Karmakar1; Richa Gupta1; Debajyoti Chakrabarti1; 1Indian Institute of Technology Kharagpur; 2IISc Bangalore; 3Indian Institute of Technology Bombay

11:10 AM  Grain Size Distribution on a Forged Ni-Cr-Mo Low-alloy Steel: Maria Jose Quintana1; Matt Kenney2; Thomas Ales2; Peter Collins2; Roberto Gonzalez2; 1Panamerican Univ; 2Iowa State University

Multiscale Modeling of Microstructure Deformation in Material Processing — Multiscale Modeling of Microstructure Deformation in Material Processing - Part I

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research

Wednesday AM  Room: C170  Location: Greater Columbus Convention Center

Session Chair: Jaimie Tiley, Air Force Office of Scientific Research (AFOSR/RTA)

8:00 AM Invited  Intermetallic Precipitates Enhance Twinability and Strain-hardenability of fcc-based High Entropy Alloys: Deep Choudhuri1; Bharat Gwalani2; Stephane Gorse3; Mageshwari Komarasamy4; Srinivas Mantri5; Srivilliputhur Srinivasan6; Rajiv Mishra1; Rajarshi Banerjee1; 1University of North Texas; 2ICMCB-CNRS; 3Bordeaux INP

8:40 AM  Development of Multi-component EAM Potential for Ni-based Superalloys: Muztoba Rabbani1; Sabila Kader Pinky1; Ridwan Sakidja1; 1Missouri State University

9:00 AM  Evolution of Twin Boundary–dislocation Structures in Chemical Vapor Deposited Nickel upon Annealing: Hao Sun1; Zhirui Wang1; Chandra Veer Singh1; 1University of Toronto

9:20 AM  Molecular Dynamics Study of Creep Deformation in Nickel-based Superalloys: Sabila Kader Pinky1; Muztoba Rabbani1; Ridwan Sakidja1; 1Missouri State University

9:40 AM  Texture Evolution in Materials with Layered Crystal Structures: Vamsi Krishna Vempati1; Raghavan Srinivasan1; 1Wright State University

10:00 AM Break

10:20 AM  Thermodynamics and Kinetics of Segregation in Ni-based Superalloys: You Rao1; Maryam Ghazisaeidi1; 1Ohio State University

10:40 AM  Atomic Disordering during the Deformation of Ag Nanoparticles: Tushar Chitrakar1; Michael Becker2; John Keto2; Desiderio Kovar2; 1University of Texas at Austin

11:00 AM  Developing Novel Microstructures Balancing between Strength and Ductility without Restoration Process in Commercial Al Alloys: Kholel Adam1; David Field1; 1Washington State University

11:20 AM  Molecular Dynamics Simulation of the Influence of Voids and Vacancies to the Mechanical Properties of Single Crystal Aluminum: Maosheng Li1; 1Institute of Applied Physics and Computational Mathematics
Multiscale Simulation and Experimental Validation of Additive Manufacturing Technologies: A Status Update by Academia, Solution Providers and Industry on Its Intake, Market Opportunities Now and Going Forward — Multiscale Simulation in Additive Manufacturing and 3DSIM-ANSYS AM Capabilities Demonstration

Program Organizers: Deepankar Pal, 3DSIM; Ankit Saharan, EOS; Anthony Rollett, Carnegie Mellon University; Adrian Sabau, Oak Ridge National Laboratory

Wednesday AM
October 17, 2018
Room: A221
Location: Greater Columbus Convention Center

Session Chairs: Kyle Johnson, Sandia National Laboratories; Javed Akram, ANSYS

8:00 AM Invited
Multiscale Modeling of Microstructure and Damage Evolution in the Performance of Additively Manufactured Parts: Kyle Johnson⁴; Theron Rodgers¹; Joseph Bishop⁴; Bradley Jared⁴; Olivia Underwood⁴; John Emery⁴; Jonathan Madison⁴; Sandia National Laboratories

8:40 AM
A Modeling Tool for Mechanical Performance Prediction of Additive Manufacturing Parts: Behrooz Jalalahmadi¹; Sentient Science

9:00 AM AM Invited
9:20 AM
Development of a Simulation Tool that Predicts the Structural Evolution of Parts Produced by Metal Additive Manufacturing: Pradeep Chalavadi¹; Deepankar Pal¹; Javed Akram¹; Brent Stucker¹; Dave Conover¹; ANSYS Inc

9:50 AM
Effect of Processing Parameters on Melt Pool Size, Porosity, and Microstructure in Inconel 718 Fabricated by Laser Powder Bed Fusion: Huan Zhang¹; Jano Farahi¹; Olivia Pratt¹; Pankaj Kuma²; Javed Akram¹; Chong Teng¹; Deepankar Pal¹; Manoranjan Misra¹; Z. Fang¹; University of Utah

10:10 AM Break

10:30 AM Demonstration ANSYS AM Software Capabilities


Program Organizers: James Hemrick, Reno Refractories, Inc.; William Headrick, Jr, Missouri Refractories; Michel Rigaud, École Polytechnique

Wednesday AM
October 17, 2018
Room: A120
Location: Greater Columbus Convention Center

Session Chairs: James Hemrick, RENO Refractories Inc; William Headrick, Missouri Refractories; Michel Rigaud, École Polytechnique de Montréal

8:00 AM Introductory Comments: Dr. James Hemrick

8:05 AM Invited
The Glass Formation Boundary in Silicate Systems: Potential to Predict Corrosion Products: William Carty²; Hyojin Lee²; Alfred University; Alfred Univ

8:45 AM
Corrosion of ZrO₂-C Refractories for Submerged Entry Nozzle on the Interface between Molten Slag and Molten Iron Containing Different Amount of Carbon: Goto Kiyoshi; Shigemori Tatsumu; Tamotsu Wakita; Katsumi Morikawa¹; Hatsuo Taira¹; Jouki Yoshitomi¹; Krosaki Harima Corporation

9:05 AM
Protection Mechanism of CMA-additive in MgO-C Ladle Bricks: Scot Graddick¹; Christoph Wöhmeyer; Chris Parr¹; Josh Pellelter; Christos Aneziris²; Patrick Gehre²; Imerys Aluminates; TU Bergakademie Freiberg

9:25 AM
Phosphates Occurring in Refractories Caused by Sintering and Use: James Bennett¹; Kyei-Sing Kwong¹; Anna Nakano¹; Jinichiro Nakano²; Hugh Thomas¹; National Energy Technology Laboratory; AECOM
9:45 AM Introductory Comments Dr. William Headrick

10:05 AM Break

10:25 AM Corrosion of Refractories in Gaseous Environments: Role of Binders and Additives: Manoj Mahapatra¹; 'University of Alabama at Birmingham

10:45 AM Effect of Clays Minerals Contained in Copper Sulphide Concentrates on Refractory Brick Wear during the Smelting Stage: Julio Ossandón¹; Leandro Voisin²; Camila Pizarro²; 'Universidad de Chile

11:05 AM Concluding Comments: Dr. Michel Rigaud

Next Generation Biomaterials — Biomaterials IV
Program Organizers: Roger Narayan, University of North Carolina; Vipul Davâ, Johnson & Johnson; Mohan Edirisinghe, University College of London; Sanjiv Lalwani, Lynntech, Inc.

Wednesday AM Room: D182
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Biqiong Chen, Queen’s University Belfast; Akiyoshi Osaka, Henan University of Science & Technology

8:00 AM Invited
Bioactive Polymer Nanocomposite Hydrogels for Healthcare Applications: Biqiong Chen¹; Sungkown Yoon²; 'Queen’s University Belfast

8:20 AM
Investigation of Nanomechanical Properties of Dentin-bioceramic Interface: Satish Alapati¹; William Brantley²; Masahiro Iijima²; Shuichi Ito²; Takeshi Muguruma²; Takashi Saito²; Itaru Mizoguchi²; 'University of Illinois at Chicago; 'Ohio State University; 'Health Sciences University of Hokkaido

9:00 AM Invited
Honeycomb Models for Cancellous Bone: FEM Simulation: Akiyoshi Osaka²; Xuwen Chen; Guangxin Wang³; Mitsugu Todo³; Jiqiu Liu; Jie Wang³; 'Henan University Science & Technology; 'Kyushu University

9:20 AM
In-vivo and Ex—vivo Studies of Biosynthetized Magnetic Nanoparticles for Specific Targeting of Triple Negative Breast Cancer: John Obayemi⁴; Jingjie Hu²; Vanessa Uzonwanne²; Ali Salifu²; Karen Malatesta²; Derek Adler²; Edward Yurkow⁴; Winston Soboyejo¹; 'Worcester Polytechnic Institute; 'Princeton University; 'Wpi; 'Rutgers University

9:40 AM
Discovery of Biomaterials by Simulation and Experiment: Molecular Recognition, Assembly, Applications: Hendrik Heinz¹; 'University of Colorado Boulder

10:00 AM Break

10:20 AM Manufacturing Of Nanostructured Mg-Zn-Zr Wrought Sheets for Potential Application as a Biomaterial: Peter Morcos¹; Nancy Hassanein¹; Asma Amleh¹; Hanadi Salem¹; 'American University in Cairo

10:40 AM Micro-XRD Investigation of Bioactive Precipitates in Dental Bioceramics: Satish Alapati¹; Masahiro Iijima²; William Brantley²; Shuichi Ito²; Takeshi Muguruma²; Takashi Saito²; Itaru Mizoguchi²; 'University of Illinois at Chicago; 'Ohio State University; 'Health Sciences University of Hokkaido; 'Ohio State University

11:00 AM Nanopatterned Bulk Metallic Glass Biosensors: Emily Kinser¹; 'IBM

11:20 AM Effect of Catalysts Used in Synthesis of Biodegradable Poly(p-dioxanone) on Its Thermal Degradation Behaviors: Xiaoyang Li¹; Peng Yang¹; 'Institute of Electronic Engineering, China Academy of Engineering Physics

11:40 AM Active Multi-particle Micro rheology and the Importance of Bead Separation: David Gutschick¹; Tyler Heisler-Taylor¹; David Yeung¹; Gunjan Agarwal¹; 'Heather Powell¹; Peter Anderson¹; Gregory Lafyatis¹; 'The Ohio State University

Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute

Wednesday AM Room: A124
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Pankaj Sarin, Oklahoma State University

8:00 AM Invited
In-situ Characterization of Solid-state Materials Using Synchrotron X-ray Diffraction Methods: Sanjit Ghose¹; Eric Dooryhee¹; 'Brookhaven National Laboratory

8:30 AM Invited
In-situ Phase Diagram Determination of the HHO2-Ta2O5 Binary Up to 3000 °C: Scott Mccormack¹; Richard Weber¹; Denys Kapush¹; Alexandra Navrotsky¹; Waltraud Kriven¹; 'University of Illinois Urbana-Champaign; 'Materials Development Inc; 'University of California Davis; 'University of Illinois Urbana-Champaign

9:00 AM Invited
Rare Earth Disilicate Phase Transformations: Randall Hay¹; Emmanuel Boakye¹; Pavel Mogilevsky¹; Thomas Key¹; 'USAF

9:30 AM Invited
Topotactic Motifand Orientation Relation Extraction for Phase Transformations from In-situ X-ray Powder Diffraction: Scott Mccormack¹; Waltraud Kriven¹; 'University of Illinois Urbana-Champaign

9:00 AM Invited
Rare Earth Disilicate Phase Transformations: Randall Hay¹; Emmanuel Boakye¹; Pavel Mogilevsky¹; Thomas Key¹; 'USAF

9:30 AM Invited
Topotactic Motifand Orientation Relation Extraction for Phase Transformations from In-situ X-ray Powder Diffraction: Scott Mccormack¹; Waltraud Kriven¹; 'University of Illinois Urbana-Champaign

10:00 AM Break

10:20 AM The Effect of Mg²⁺ Doping on the Phase Transformation and Thermal Expansion Properties of DyNbO₄: Dan Lowry¹; Pankaj Sarin¹; 'Oklahoma State University

10:40 AM Tailoring the RENbO₃ Phase Transformation through Zr⁴⁺ Co-Substitution: Dan Lowry¹; Pankaj Sarin¹; 'Oklahoma State University
11:00 AM
Thermal Expansion and Phase Transformation Kinetics in the Lanthanide Dii-
titante System: Benjamin Hu1; 1Materials Science Dept. at the University of Illinois

11:20 AM
Ferroelectric e-WO3: Synthesis and Application: Owen Abe1; Gagan Jodhani1; Perena Gouma1; 1The Ohio State University

11:40 AM
Structurally Stable, High-entropy, Lanthanide Sesquioxides: Kuo-Pin Tseng1; Waltraud Kriven1; 1University of Illinois Urbana Champaign

PSDK XIII: Phase Stability and Diffusion Kineti —
Computational Tools and Diffusion
Program Organizers: Zi-Kul Liu, Pennsylvania State University; Michael Gao, National Energy Technology Laboratory; Haix Seifert, Karlsruhe Institute of Technology; Wei Xiong, University of Pittsburgh; Raymundo Arroyave, Texas A & M University

Wednesday AM Room: A213
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Raymundo Arroyave, Texas A & M University; James Saal

8:00 AM Invited
Developing the Next Generation of Tools for Materials by Design: James Saul1; Jeff Doak1; Abhinav Saboo1; Ricardo Komai1; Greg Olson1; 1QuesTek Innovations LLC

8:30 AM
Towards the Automated Development of a Cr-Fe-Ni-Ti-V CALPHAD Database: Brandon Bockland1; Richard Otis2; Zi-Kui Liu1; 1Pennsylvania State University; 2NASA Jet Propulsion Lab

8:50 AM
Diffusion Kerf Couples for Synthesis and Screening of Non-equimolar High Entropy Alloys: Nagraj Kulkarni1; 1

9:10 AM
Simultaneous Measurement of Tracer and Interdiffusion Coefficients via Isotope Free Diffusion Couple Experiments for Cu-Ni and Co-Cr-Fe-Ni Alloys: Abhishek Mehta1; Esin Schulz1; Irina Belova2; Graeme March2; Yongho Sohn3; 1Univ of Central Florida; 2The University of Newcastle; 3University of Central Florida

9:30 AM
A First-principles Investigation of Various Vibrational Entropy Contribution Methods on Self-diffusion Coefficient Calculations in FCC Metals: John O’Connell1; Chelsey Hargather1; Harrison Lee1; 1New Mexico Institute of Mining &Technology

9:50 AM
Self-diffusion of Ti Interstitial Based Point Defects and Complexes in TiC: Weiwei Sun1; Hossein Ehteshami1; Paul Kent2; Pavel Kozhavv2; 1Oak Ridge National Laboratory; 2KTH-Royal Institute of Technology; 3Oak Ridge National Laboratory

10:10 AM Break

10:30 AM
Diffusion of Co-Cr, Co-Ta, and Co-Cr-Ta: Kil-Won Moon1; Maureen Williams1; Greta Lindwall2; Carelyn Campbell1; 1National Institute of Standards & Tech; 2KTH
### 8:00 AM Introductory Comments

### 8:10 AM

**Atomic-scale Digital Alloying for III-Sb Metamorphic Buffers:** Tyler Grassman; Vinita Dahiya; Julia Deitz; Sanjay Krishna; ‘Ohio State University; ‘Ohio State Univ

**Heterostructures to Limit Dislocation Propagation in GaAs on Flexible-Ge/ metal Substrates:** Phil Ahrenkiel; Xavier Pasala; Nathan Smaaglik; Nikhil Pokharel; Monika Rathi; Pavel Dutta; Venkat Selvaminiyakam; ‘South Dakota School of Mines & Technology

### 8:30 AM

**Modeling Charge Transport through Metal/Oxide Heterostructures:** Maytal Caspary Toroker; ‘Technion - Israel Institute of Technology

**TEM and EDS Based Investigation of Failure Mechanism in III-Sb Semiconductor Diodes:** Sadhvikas Addamane; Emma Renteria; Ahmad Mansoori; Kevin Reilly; Ganesh Balakrishnan; ‘University Of New Mexico

### 8:50 AM

**Strain Effect on Electrical and Thermal Transport Properties of 2D Transition Metal Dichalcogenide Heterostructures:** Lan Li; ‘Boise State University

### 9:10 AM

**The Properties of Sputter-deposited Gallium Oxide Thin Films:** Tom Oder; Sundar Isukapati; ‘Youngstown State University

**Theoretical Optimization of Graded Semiconductor Buffer Layers:** Tedi Kajofsa; Minglei Cai; Xinkan Chen; Md Tanvirul Islam; John Ayers; ‘University Of Connecticut

### 9:10 AM Session Chair:

**Phil Ahrenkiel, South Dakota School of Mines and Technology**

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### Sintering and Related Powder Processing Science and Technologies — Field Assisted Sintering II: Applications

**Program Organizers:** Ricardo Castro, University of California, Davis; Zachary Cordero, Rice University; Eugene Olevsky, San Diego State University; Wolfgang Rheinheimer, Purdue University

**Wednesday AM**

**Room:** B142/143

**Location:** Greater Columbus Convention Center

**October 17, 2018**

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**8:00 AM**

**Investigation the Effects of Mo-Si-B and Mo-Si-Al Coatings on Oxidation Behavior of TZM Alloy Prepared by Spark Plasma Sintering:** Baris Yavas; Gultekin Goller; ‘Istanbul Technical University

**Preparation and Characterization of B4C- ZrB2 Composites by Reactive Spark Plasma Sintering:** Leyla Yarraz; Gultekin Goller; Onuralp Yucel; Filiz Sahin; Gultekin Goller; ‘Istanbul Technical University

**Production and Characterization of Spark Plasma Sintered Hybrid GNT Reinforced ZrC-TiC composites:** Burak Cugur Oacak; Baris Yavas; Ipek Akin; Onuralp Yucel; Filiz Sahin; Gultekin Goller; ‘Istanbul Technical University

**Production and Characterization of TZM Based TiC or ZrC Reinforced Composites Prepared by Spark Plasma Sintering:** Cansinem Tüzemen; Baris Yavas; Ipek Akin; Sebahattin Gurmen; Onuralp Yucel; Filiz Sahin; Gultekin Goller; ‘Istanbul Technical University

**Spark Plasma Sintering of High-energy Ball Milled Mg-Al Alloys:** Mohammad Umar Furruq Khan; Taban Larimian; Tushar Borkar; Rajeev Gupta; ‘University of Akron; ‘Cleveland State University

**Spark Plasma Sintering of Pure Cadmium:** Somi Doja; Anil Prasad; Lukas Bichler; ‘University of British Columbia

**Spark Plasma Sintering of Soft Magnetic Materials:** Taban Larimian; Tushar Borkar; ‘Cleveland State University

**Spark Plasma Sintering Behaviour of BaTiO3 Ceramics under Different Atmospheres:** Denet Aydogmus; Gultekin Goller; Onuralp Yucel; Filiz Sahin; ’Istanbul Technical University

**Densification and Microstructure of Fe-Cr-Mo-B-C Alloy Fabricated by Spark Plasma Sintering:** Ahmad Sorour; Taban Larimian; Adadayo Adeniyi; Mohamed Hussein; Choongnyoum Kim; Nasser Al-Aqeeli; ‘King Fahd University of Petroleum & Minerals; ‘LiquidMetal Coatings
### Small-scale Properties of Materials and Length-scale Phenomena — Stress/Strain Behavior

**Program Organizers:** Meysam Haghshenas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

**Wednesday AM**

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<thead>
<tr>
<th>Time</th>
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<tr>
<td>8:00 AM</td>
<td>Invited</td>
<td>Room: A121</td>
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<tr>
<td>9:00 AM</td>
<td>Invited</td>
<td>Location: Greater Columbus Convention Center</td>
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**Session Chairs:** David Bahr, Purdue University; Charles Lu, University of Kentucky

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00 AM</td>
<td>Critical Film Thicknesses of DuctileBrittle Multilayers for Optimized ElectroMechanical Behavior: Megan Cordill; Erich Schmid Institute</td>
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<tr>
<td>8:20 AM</td>
<td>The Mechanical Properties of Small-scale 122 Compounds: Christopher Weinberger; Ian Bakst; John Sypek; Keith Dusoe; Keara Frawley; Seok-Woo Lee; Paul Canfield; Colorado State University; University of Connecticut; Iowa State University</td>
</tr>
<tr>
<td>8:40 AM</td>
<td>Small-scale Testing in Harsh Environments: A New Insight into Hydrogen Embrittlement: Afroz Barmouch; Yun Deng; Tarlan Hajilou; Bjorn Rune Rogne; Dong Wang; Xu Lu; Norwegian University of Science and Technology; Ntnu</td>
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<td>9:00 AM</td>
<td>Nanomechanical Mapping for Measuring Individual Phases: Douglas Stauffer; Eric Hintsala; Ude Hagen; Bruker Nano Surfaces</td>
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<tr>
<td>9:20 AM</td>
<td>Novel Mechanical Properties of Core-shell Nanostructures: Robert Fleming; Jason Steck; Min Zou; University of Arkansas</td>
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<td>10:00 AM</td>
<td>Mechanical Characterization and Determining Flow Behavior of Dual Phase Steels Using Nanoindentation: Raheleh Mohammad Rahimi; David Bahr; Purdue University</td>
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<tr>
<td>10:20 AM</td>
<td>Nickel Nanoparticles Set a New Record of Strength: Amit Sharma; James Hickman; Nimrod Gazit; Eugen Rahbin; Yuri Mishin; Technion; George Mason University</td>
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<tr>
<td>10:40 AM</td>
<td>Understanding the Mechanical Behavior of Electrode Materials for Improving the Performance and Durability of Lithium ion batteries: Yang-Tse Cheng; University of Kentucky</td>
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<tr>
<td>11:00 AM</td>
<td>Small-scale Mechanics of Super-strong Silver Nanostructures: Frederic Sauvée; The University of Vermont</td>
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<td>11:20 AM</td>
<td>Insights from Continuum Dislocation Dynamics on the Micro-mechanics of Polycrystals from Yielding to Large Deformation: Hesam Askari; University of Rochester</td>
</tr>
<tr>
<td>11:40 AM</td>
<td>The Design of Core-shell Structure Carbides in Ultrahigh Strength Steels: Wei Sheng; Zurui Zhang; Ye Tian; Wei Xiong; Gregory Olson; Northwestern University; Beijing Institute of Aeronautical Materials; University of Pittsburgh</td>
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### Solid State Processing — Solid State Processing

**Program Organizers:** Richard Fonda, Naval Research Laboratory; Simon Larose, National Research Council Canada

**Wednesday AM**

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<tr>
<td>8:00 AM</td>
<td>Solid State Processing of Ultra-high Conductivity Alloys via Hot Extrusion Alloying: Keerti Kappagantula; Frank Kraft; Ohio University</td>
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<tr>
<td>8:20 AM</td>
<td>Effect of Spark-plasma Sintering Parameters on the Hardness and Porosity of High-energy Ball Milled Al-20 at.% V alloys: Javier Esquivel; Taban Larimian; Tushar Borkar; Rajeev Gupta; The University of Akron; Cleveland State University</td>
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<td>8:40 AM</td>
<td>Analysis of Aluminum Alloy Feedstock Powder used in Solid State Processes: Caitlin Walde; Danielle Cote; Richard Sisson; Victor Champagne; Worcester Polytechnic Institute; US Army Research Laboratory</td>
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<td>9:00 AM</td>
<td>Microstructure Evolution during Solid-state Ambient Condition Metal Additive Manufacturing: Anagh Deshpande; Keng Hsu; University of Louisville</td>
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<td>9:20 AM</td>
<td>Evaluation of Ultrasonic Additive Manufacturing Part Tolerances via X-ray Computed Tomography: Jennifer Sietins; Adam Hehr; Justin Wenning; Mark Norfolk; Army Research Laboratory; Fabrisonic</td>
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<td>9:40 AM</td>
<td>Effects of Squeeze Factor on the Microstructure and Surface Finish of Incrementally Formed Parts: Maya Nath; Ankush Bansal; Jeaekwang Shin; Randy Cheng; Mihaela Banu; Alan Taub; University of Michigan</td>
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<td>10:00 AM</td>
<td>Break</td>
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<tr>
<td>10:20 AM</td>
<td>Introducing Gradient Structure for Improving Mechanical Properties of TRC-AZ31: Maryam Jamalian; David Field; Washington State University</td>
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<tr>
<td>10:40 AM</td>
<td>Surface Roughness Study of Al6061 Alloy by Burnishing: Mohammed Tashkandi; Northern Border University</td>
</tr>
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</table>
Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application — Environmental and Thermal Barrier Coatings

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Murmm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

Wednesday AM Room: B234
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Kang Lee, NASA Glenn Research Center; Dongming Zhu, NASA Glenn Research Center

Synergy in Multiscale Modeling and Experiments to Resolve Complex Disordered Solids — Session II: Experimentally-driven Synergy

Program Organizers: Ridwan Sakidja, Missouri State University; Jinwoo Hwang, Ohio State University; Jincheng Du, University of North Texas; Matthew Kramer, Iowa State University; David Drabold, Ohio University

Wednesday AM Room: B246
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Jinwoo Hwang, The Ohio State University; Matthew Kramer, Ames National Laboratory

8:00 AM Invited
Local Structure Evolution of Amorphous Chalcogel Electrodes: Vicky Doan-Nguyen1; 'The Ohio State University

8:40 AM
Quantification of Correlated Disorder in Alloy Systems Through Complex PDF Modelling: Robert Koch1; Shahham Pandey; Guangfang Li1; Hui Wang1; Simon Phillipot1; Scott Mixture1; 'Alfred University; 'University of Florida; 'University of South Carolina

9:10 AM
Atomistic Modelling of Amorphous Boron Carbide Materials (B4C): Rajan Khadka1; Nirmal Baishnab1; Ridwan Sakidja1; 'Missouri State University

9:30 AM
Multiscale Modeling of the Elasto-plastic Behavior of Architectured and Nanostructured Cu-Nb Composite Wires and Comparison with Neutron Diffraction Experiments: Tang Gu1; David McDowell1; 'Georgia Tech; 'Georgia tech

10:00 AM Break

10:20 AM Invited
Nanoscale Origins of Structure-property Correlation in Metallic Glasses: Combining Kinetic Monte Carlo with 4D STEM: Pengyang Zhao1; Ju Li2; Jinwoo Hwang1; Yanzhi Wang1; 'The Ohio State University; 'MIT

11:00 AM
Direct Mapping of Structural Heterogeneity in Amorphous Hydrogenated Boron Carbide Thin Films Using Four-dimensional Scanning Transmission Electron Microscopy: Soohyun Im1; Menglin Zhu1; Ridwan Sakidja1; Nathan Oyler1; Michelle Paquette1; Paul Rulis1; Jinwoo Hwang1; 'Ohio State University; 'Missouri State University; 'University of Missouri Kansas City

11:30 AM
On the Connection between the Electronic Structure and the Thermomechanical Properties of Zr-based Bulk Metallic Glass: Ridwan Sakidja1; Batu Hunca1; Chamilu Dharmawardhana1; Wai-Yim Ching1; 'Missouri State Univ; 'Trakya University; 'Georgetown University; 'University of Missouri- Kansas City
Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — High Entropy Alloys

Program Organizers: Ali Yousefiani, Boeing Research & Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

8:00 AM Keynote
Development and Exploration of Refractory High Entropy Alloys: A Review: Oleg Senkov1; Daniel Miracle2; Jean-Philippe Couzinie3; Kevin Chaput4; Air Force Research Laboratory; Universite Paris Est ICMP

8:40 AM An Integrated Computational Materials Engineering (ICME) Design and Scale-up of High-entropy Alloys (HEAs) for Turbine Alloy Replacement: Ricardo Komai1; David Smathers2; Marie Thomas1; James Saal1; Francois Dary1; QueTek Innovations LLC; H.C. Starch

9:00 AM The Microstructure and Mechanical Properties of High Strength, Ductile, Eutectic FeNiMnAl(Cr,Ti) High-entropy Alloys: Ian Baker1; Zhangwei Wang1; Margaret Wu1; Fanling Meng1; Dartmouth College

9:20 AM First-principles Methods of Calculating Stacking Fault Energies in Refractory High Entropy Alloys: Joshua Strother1; Alexandre Scheer1; Chelsey Hargather1; New Mexico Institute of Mining & Technology

9:40 AM Invited Processing, Microstructure and Mechanical Characterization of MgAlLiZnCaCu High Entropy Alloy: Khin Tun1; Angad Yadav2; Abhishek Sharna1; Manoj Gupta1; Trinumati Srinivasan1; National University of Singapore; National Institute of Technology Agartala; IIT(ISM) Dhanbad, Jharkhand; University of Akron

10:10 AM Break

10:30 AM Mechanical and Thermal Stability of Nanocrystalline High-entropy Alloys: Yu Zou1; University of Toronto

10:50 AM Hydrogen-induced Intergranular Failure of Compositionally Complex Equi-molar FeNiCoCr Alloy: Kelly Nygren1; Shuai Wang1; Kailu Bertsch1; Hongbin Bai1; Akhide Nagao1; Ian Robertson1; Cornell University; University of Wisconsin-Madison; Oak Ridge National Laboratory; International Institute for Carbon-Neural Energy Research (WPI-I2CNER)

11:10 AM Long-term Annealing of Mechanically-allowed Refractory High Entropy Alloy: Joshua Smeltzer2; B. Chad Hornbuckle1; Anit Giri1; Christopher Marvel1; Kristopher Darling1; Jeffrey Rickman1; Helen Chan1; Martin Hamner1; Lehigh University; Army Research Laboratory
ACerS Robert B. Sosman Award Symposium: Lead-free Piezoceramics: From Local Structure to Application — ACerS Basic Science Division Robert B. Sosman Lecture

Program Organizers: Jurij Koruza, Technische Universität Darmstadt; Jürgen Rödel, Technische Universität Darmstadt

Wednesday PM
Room: A111/112
Location: Greater Columbus Convention Center

1:00 PM Invited
Lead-free Piezoceramics: From Local Structure to Application: Jürgen Rödel
1 Technische Universität Darmstadt

ACerS Robert B. Sosman Award Symposium: Lead-free Piezoceramics: From Local Structure to Application — Session II

Program Organizers: Jurij Koruza, Technische Universität Darmstadt; Jürgen Rödel, Technische Universität Darmstadt

Wednesday PM
Room: A111/112
Location: Greater Columbus Convention Center

Session Chair: Rajendra Bordia, Clemson University

2:00 PM Invited
Relaxor-ferroelectric Transitions: Sodium-bismuth-titanate Derivatives: Jacob Jones
1 North Carolina State University

2:40 PM Invited
High Piezoelectricity in BaTiO3-based Pb-free Materials: The Role of Multi-phase Coexisting Point: Ren Xiaosheng
1 National Institute For Materials Science

3:20 PM Break

3:40 PM Invited
Industrial Development of Lead-free Piezoelectric Materials and Devices: Ruiping Wang
1 Kenji Shibata; Tonshaku Tou; Jurij Koruza
2 National Institute of Advanced Industrial Science and Technology; 3SCI-OCS Co.Ltd; 1Honda Electronics Co. Ltd; 1Technische Universität Darmstadt

Additive Manufacturing of Composites and Complex Materials III — Polymer Additive Manufacturing

Program Organizers: Dirk Lehnhus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Wednesday PM
Room: A222
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Morphology-performance-processing Relationships in Additively Manufactured Epoxy Composites for Thin-walled Cellular Structures: Andrew Abbott
1 Kyle Johnson; Harry Pierson; Emrah Celikt; Gyaneshwar Tandon; Hilmar Koerner; Jeffery Baur; Katie Thorp
1 UDRI; 1UES; 1University of Arkansas; 1University of Miami; 1Air Force Research Laboratory

2:30 PM
Effect of Lattice Density on the Mechanical Behavior of FDMed Composites: Ozgur Keles
1 Eric Anderson; Jimmy Huynh; Jeff Gelb; Jouni Freund; Alk Karakoc
1 San Jose State University; 1Sigray, Inc.; 1Aalto University

2:50 PM
Large Scale Additive Manufacturing of Tunable Reactive Polymers: William Carter
1 Orlando Rios; 1Cynthia Kutchko; 1Oak Ridge National Laboratory; 1PPG Industries

3:20 PM
Thermo-mechano-rheological Principles of Filament Manufacturing for Additive Manufacturing: Ashish Singh
1 Rakesh Behera; 1Mrityunjay Doddamanii; Nikhil Gupta
1 New York University; 1National Institute of Technology, Surathkal

3:40 PM Break

4:00 PM
Additive Manufacturing of Structural Energetic Nanocomposites: Keerti Kappagantula
1 Ohio University

4:20 PM
Applications Mixture Design Statistical Method with Special Focus on Simplex Centroid Design: Betiglu Jimma
1 Saint-Gobain

4:40 PM
Polymer Derived Ceramics with High Geometric Accuracy: Xuehui Yang
1 Jing Zhang; 1Hye-Young Park; 1Yeong-Gil Jung
1 Indiana University - Purdue University Indianapolis; 1Changwon National University

5:00 PM Question and Answer Period

5:20 PM Concluding Comments

Additive Manufacturing of Metals: Microstructure and Material Properties — Microstructure and Properties of AM Ti-64 Alloy

Program Organizers: Andrzej Wojciesynski, ATI Specialty Materials; Ulf Ackelid, Freermelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Wednesday PM
Room: A214
Location: Greater Columbus Convention Center

Session Chair: Andrzej Wojciesynski, ATI Specialty Materials

2:00 PM
Microstructure and Properties of Additively Manufactured Ti-6Al-4V: V. Siosa
1 K.J. Chaper; 1E.J. Schwalbach; 1T.M. Butler; 1N. Schehl; 1R. Johnl; 1Air Force Research Laboratory/UES, Inc.; 1Air Force Research Laboratory; 1University of Dayton Research Institute

2:20 PM
Microstructure Control and Mechanical Testing of Electron Beam Additively Manufactured Ti-6Al-4V: Ruki Patel
1 Sneha Narra; 1Jack Beuth
1 Carnegie Mellon University

2:40 PM
Novel Ti-6Al-4V Microstructure Design Pathways via Cyclic Heat Treatments during Selective Laser Melting: Alzieh Moridi
1 Ali Gokhan Demir; 1Leonardo Caprio; 1Barbara Privitali; 1Bianca Colosimo; 1John Hart; 1Cem Tasan
1 Massachusetts Institute of Technology; 1Politecnico di Milano

3:00 PM
Elevated Temperature Deposition of Ti-6Al-4V in the Laser Powder Bed Fusion Process: Brian Fisher
1 Jack Beuth
1 Carnegie Mellon University

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Components Fabricated Using DED Additive Manufacturing Process
The Non-uniform Mechanical Properties and Microstructure of Ti6Al4V
5:00 PM
Sahoo
Porosity in Ti6Al4V Cellular Structure
The Influence of Processing Parameters on Strut Diameter and Internal
In-situ Synchrotron X-ray Diffraction Line-profile Analysis during Tensile
Deformation in Additively Manufactured Ti-6Al-4V Alloy: Kenta Yamanaka1; In-situ Synchrotron X-ray Diffraction Line-profile Analysis during Tensile
Deformation in Additively Manufactured Ti-6Al-4V Alloy: Shihayan Roy2; Souvik
Sahoo1; Anuja Joshi1; Anoop Maurya1; Vamsi Balla1; Mitun Das2; 1Materials
Science Center, Indian Institute of Technology Kharagpur; 2Bioengineering & Coating
Division, CSIR-Central Glass and Ceramic Research Institute, Kolkata,
4:20 PM
Influence of Microstructure and Porosity on the Mechanical Properties of Laser
PBF Ti-6Al-4V: Thomas Voisin1; Nicholas Calia2; Joseph McKeown2; Ross
Cunningham2; Anthony Rollett1; Yinnin Wang1; 1Lawrence Livermore National
Laboratory; 2Carnegie Mellon University
4:40 PM
The Influence of Processing Parameters on Strut Diameter and Internal
Porosity in Ti6Al4V Cellular Structure: Hala Salem1; L.N. Carter2; M.M.
Atallah2; H.G. Salem1; 1AUC; 2University of Birmingham
5:00 PM
The Non-uniform Mechanical Properties and Microstructure of Ti6Al4V
Components Fabricated Using DED Additive Manufacturing Process: Chang
Keun Chun1; Sung-wook Kim1; Dae-jung Kim1; Yeong-do Park2; 1RIST; 2Instek;
1Dong-Eui University/Department of Advanced Materials Engineering
Additive Manufacturing of Metals: Post Processing — Surface Post Processing I/ Heat Treatment III
Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras
Wednesday PM
Room: A216
Location: Greater Columbus Convention Center
Session Chair: Christopher Rock, NC State University
2:00 PM
Optimizing Hot-isostatic Pressing of Additively Manufactured Ti-6Al-4V for Fatigue Performance: Kelvin Leung1; Anahita Imanian1; Nicole Apetre1; Peipei Li2; Derek Warner3; 1Technical Data Analysis, Inc; 2Carnegie Mellon University
3:20 PM Break
3:40 PM
Multi-material AM Structures with Controlled Thermal Expansion: Nicholas Jones1; Maarten De Boer1; Jack Beuth1; Sneha Narra1; 1Carnegie Mellon University
4:00 PM
New Routes to Alloys and Research Parts Using Additive Manufacturing: Daniel Hooks1; Thomas Lienert1; Terry Holesinger1; 1Los Alamos National Lab
4:20 PM
Investigating the Effect of Surface Active Elements on the Microstructure of Laser Re-melted Steel: Debomita Basu1; Jack Beuth1; Bryan Webler1; 1Carnegie Mellon University
4:40 PM
Improving the Printability of Nickel Superalloys for Selective Laser Melting: Yevgeni Briff1; Iain Todd1; 1University of Sheffield
5:00 PM
Isotropic Microstructure and Defect Tolerant Behavior by Microstructural Design of Additively Manufactured TRIP-steel: Julia Richter1; Johannes Guenther1; Florian Breiten1; Matthias Droste1; Marco Wendler1; Olena Volkova1; Horst Biermann1; Thomas Niendorf1; 1University of Kassel; 2Freiberg University of Mining and Technology
Additive Manufacturing of Metals: Microstructure and Material Properties — Modeling and Alloy Development for AM
Program Organizers: Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville
Wednesday PM
Room: A215
Location: Greater Columbus Convention Center
Session Chair: Jack Beuth, Carnegie Mellon University
2:00 PM
High-throughput Screening for Metal Additive Manufacturing Processes: Simulation and Experiment: Yu Zou1; 1University of Toronto
2:20 PM
Experiment and Modeling of the Two-peak Dynamic Behaviour of Additively Manufactured AISi10Mg_200C: Edward Cyr1; Amir Hadadzadeh1; Babak Amirkhiz1; Mohsen Mohammad1; 1University of New Brunswick; 2CanmetMATERIALS, Natural Resources Canada
2:40 PM
A Combinatorial Approach for Ni-base Superalloy Design via Direct Laser Metal Deposition: Guru Dinda1; Abhishek Ramakrishnan1; Husam Alrehaili1; Ajay Bhagavatam1; Aniket Dighe1; Ajol Shah1; Chaitanya Amilkanthwar1; 1Wayne State University
3:00 PM
Development of Titanium and Steel Alloys Optimized for AM: Yining He1; Bryan Webler1; Jack Beuth1; 1Carnegie Mellon University
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OCTOBER 14 – 18, 2018
GREATER COLUMBUS CONVENTION CENTER
COLUMBUS, OHIO, USA

4:20 PM
The Effects of Post Processing in Additively Manufactured 316L: Richard Fonda; David Rowenhorst; Scott Olig; Jerry Feng; Lily Nguyen; Adelina Beckwith; Beth Stiles; Naval Research Laboratory; National Research Council

Program Organizers: Mohammad Elahinia, University of Toledo; Markus Chmielus, University of Pittsburgh; Reginald Hamilton, The Pennsylvania State University; Hamdy Ibrahim, University of Tennessee at Chattanooga; Haluk Karaca, University of Kentucky; Mohammad Mahtabi, University of Tennessee at Chattanooga; Reza Mehrabi, University of Toledo; Reza MirzaeiFar, Virginia Tech

Wednesday PM
Room: B230
Location: Greater Columbus Convention Center

Session Chairs: Markus Chmielus, University of Pittsburgh; Hamdy Ibrahim, University of Tennessee at Chattanooga; Ahmadreza Jahadakbar, The University of Toledo

2:00 PM
Epitaxial Growth of Magnetic Shape-memory Alloys: Re-melting and Directed Energy Deposition of Ni-Mn-Ga: Jakub Toman; Peter Müllner; Markus Chmielus; University of Pittsburgh; Boise State University

2:20 PM
Improving the Mechanical Properties of FeGa through NbC Additions: Nicholas Jones; Suok-Min Na; Paul Lambert; Naval Surface Warfare Center - Carderock

2:40 PM
Magnetostriction Measurements on Large-grained FeCo Samples: Nicholas Jones; Paul Lambert; Deborah Schlage1; Thomas Lograsso; Naval Surface Warfare Center, Carderock Division

3:00 PM
Rapid Intense Pulsed Light Sintering of Silver Nanowire Networks as Transparent Conducting Electrodes on Polycarbonate: Experiments and Modeling: Michael Dexter; Zhongwei Gao; Rajiv Malhotra; Chih-hung Chang; Hyunjun Hwang; Rutgers University; Oregon State University

3:20 PM Break

3:40 PM
Synthesis of High Sn Concentration GeSn by Recrystallization of Amorphous Phase: Masashi Higashiyama; Manabu Ishimaru; Masayuki Okugawa; Ryusuke Nakamura; Kyushu Institute of Technology; Osaka Prefecture University

4:00 PM
Microstructural Analysis of Oligocrystalline HIPed FeGa Rods: Nicholas Jones; Paul Lambert; Naval Surface Warfare Center, Carderock Division

4:20 PM Invited
Achieving Favorable Microstructure and Properties in Additively Manufactured Ni-Mn-based Functional Magnetic Materials: Markus Chmielus; Erica Stevens; Katerina Kimes; Pierangeli Rodriguez; Amir Mostafaei; Jakub Toman; University of Pittsburgh

Advanced Materials for Oil and Gas Applications - Performance and Degradation — Advanced Materials for Oil and Gas Applications - Performance and Degradation
Program Organizers: Yellapu Murty, MC Technologies LLC; Andrzej Wojcieszynski, ATI Specialty Materials; Riad Asfahani, US Steel

Wednesday PM
Room: B140/141
Location: Greater Columbus Convention Center

Session Chairs: Ronald Radziulowski, AK Steel; Riad Asfahani, US Steel

2:00 PM
Considerations and Guideline on Materials Selection and Qualification for HPHT Oil and Gas Applications: Fei Tang; Dnv Gl

2:30 PM
Inconel Alloy 725 and Variants for Use in High-temperature Environments: Martin Detroit; Kyle Rozman; Paul Jablonski; Jeffrey Hawk; National Energy Technology Laboratory

3:00 PM
Study on the Interfacial Reaction of Secondary Reaction Zone during Cyclic Thermal Fatigue in Single Crystal Ni-base Superalloy: Joong Eun Jung; In Soo Kim; Baig Gyu Choi; Jeonghyeon Do; In-Yong Jung; Chang-Yong Jo; Korea Institute of Materials Science (KIMS)

3:20 PM Break

3:40 PM
A Microstructural Approach to Understanding the Corrosion Behavior of Cu-Ni-Sn Alloys in Chlorine Environments: Carole Trybus; Sam Imanieh; Robert Kusner; Fritz Grensing; Materion, Alloy Technology; Center for Materials and Sensor Characterization, University of Toledo; Materion, Technical Services

4:10 PM
A Cu-bearing Pipeline Steel for Microbial Corrosion Control: Yinin Shan; Xiao-Bo Shi; Wei Yan; Institute of Metals Research

4:30 PM
Mitigation of Carbonaceous Deposit Formation on Structural Alloys via Surface Modification: Pralav Shetty; Runyu Zhang; Velu Subramani; Paul Braun; Jessica Kroogstad; University of Illinois Urbana-Champaign; BP

5:00 PM
Development of a Standardized Test for Stress Relief Cracking Susceptibility in Low Alloy Steels: Conner Sarich; The Ohio State University

Advanced Steel Metallurgy: Products and Processing — Dual Phase and Q&P Steels
Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

Wednesday PM
Room: A226
Location: Greater Columbus Convention Center

Session Chairs: Charles Enloe, General Motors; Keith Taylor, SSAB

2:00 PM Invited
Processing Challenges of Dual Phase Steels: Hot Band Property Variation Caused by Rewetting on the Runout Table: Erika Bellhouse; Adam Silvestri; Eugen Ianos; ArcelorMittal Dofasco
2:30 PM
Production of Cold Rolled and Annealed DP-590 (Dual-phase) Steel through Continuous Galvanizing Line (CGL) of a Flex Mill at Big River Steel, USA: Shobhit Bhartiya1; Amar De2; Denis Hennessy3; Matt Hill1; Bilin Chen1; Ricky Averion1; 1Big River Steel LLC

2:50 PM
Processing, Microstructures and Properties of Ultra-high Strength, Low Carbon and V-bearing Dual-phase Steels Produced on Continuous Galvanizing Lines: Yingjie Wu1; Anthony Deardo1; 1University of Pittsburgh

3:10 PM
Advanced Characterization of Microstructures in Ultra High Strength Dual Phase Steel: Jason Andring1; 1University of Pittsburgh

3:30 PM Break

3:50 PM
The Influence of Chemistry on the Microstructure and Mechanical Property of DP980: Mingsheng Xiu1; ChunYu Liu1; Yunge Wang1; Binquan Ai1; 1HBIS Tangsteel

4:10 PM
Role of Processing Parameters in Q&P Steels: Experimental Analysis and Thermodynamic Modeling: Amit Behera1; Gregory Olson1; 1Northwestern University

4:30 PM
Quenching, Partitioning and Tempering of Experimental Steel: Aqil Inam1; Muhammad Hassan1; Muhammad Ishitaq1; Tariq Hassan1; 1University of the Punjab

Advances in Solid Oxide Fuel Cell Technology — SOFCs for Military Applications
Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Wednesday PM Room: D281 Location: Greater Columbus Convention Center

October 17, 2018

Session Chairs: Scott Swartz, Nexceris LLC; Gene Arkenberg, Nexceris, LLC

Advances in Solid Oxide Fuel Cell Technology — SOFCs for Military Applications
Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Wednesday PM Room: D281 Location: Greater Columbus Convention Center

October 17, 2018

Session Chairs: Scott Swartz, Nexceris LLC; Gene Arkenberg, Nexceris, LLC

2:00 PM Invited
Solid Oxide Fuel Cells for Long Endurance Unmanned Aerial Systems, an Air Force Perspective: Michael Rottmayer1; Thomas Howell1; 1AFRL/RQOE

2:20 PM Invited
Solid Oxide Fuel Cell System Applications and Requirements from the Army’s Perspective: Theodore Bury1; Kevin Centeck1; 1Tank Automotive Research Development and Engineering Center (TARDEC)

2:40 PM Invited
Portable Solid Oxide Fuel Cell Systems for Military and Aerospace Applications: Tom Westrich1; 1USSI

3:00 PM Invited
Paradigm Shifts in Materials to Enable Breakthrough Fuel Cell Systems: Comas Haynes1; 1GTRI

3:20 PM Break

3:40 PM Invited
Considerations for Standalone Diesel/Jet-fueled Fuel Cell Generators: Subir Roychoudhury1; Christian Junaedi1; Saurabh Vilekar1; Tim LaBrecque1; 1Precision Combustion, Inc.

4:00 PM Invited
Power and Energy Solutions for Remote Off-grid Applications: Praveen Cheekatamarla1; 1Atrex Energy Inc

4:20 PM Invited
Update on Nexceris’ SOFC stack technology: Gene Arkenberg1; Scott Swartz1; David Kopechek1; Chad Sellers1; 1Nexceris, LLC

4:40 PM Invited
Novel Titanate-based Electrodes for Solid Oxide Fuel Cells with Improved Performance and Stability: Scott Barnett1; Shan-Lin Zhang1; Liliana Mogni1; 1Northwestern University; 1Centro Atomico Bariloche

Advances in Surface Engineering — Tribology/ Tribocorrosion, Surface Stresses, and Surface Microstructure
Program Organizers: Brian Skinner, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

Wednesday PM Room: B144/145 Location: Greater Columbus Convention Center

October 17, 2018

Session Chair: Jing Xu, Faraday Technology, Inc.

2:00 PM Invited
Development of Functional Multi-layered Coatings Using Cathodic Arc Physical Vapor Deposition (CAPVD) Technique: G Sundararajan1; Krishna Valleti1; D Srinivasa Rao1; 1International Advanced Research Centre for New Materials (ARCI), Hyderabad

2:40 PM Invited
Synergistic Role of Carbonaceous Reinforcements on Multi Length Scale Tribology of Electrophoretically Deposited Nickel-boron Nitride Coatings: Shikha Awasthi1; Chandra Pandey2; Kanchai Balani3; 1Indian Institute of Technology Kanpur; 1Babu Banarsi Das University; 1Indian Institute of Technology Kanpur

3:20 PM Break

3:40 PM Invited
Laser Assisted Synthesis of High Entropy Alloy Coating on Aluminum: Tribocorrosion Behavior: Sameehan Joshi1; Gaurav Argade1; Aditya Ayyagari1; Sundeep Mukherjee1; Narendra Dahiote1; 1University of North Texas

4:00 PM
Use of Advanced Regression Techniques to Explain Variance in Stress Concentrations Due to Rough Surfaces: Christopher Kantzou1; Anthony Rollett1; 1Carnegie Mellon University

4:20 PM
Microstructural Evolution during Laser Surface Treatment of Biocompatible AZ31B Mg Alloy: Mangesh Pantawane1; Sameehan Joshi2; Yee-Hsien Ho3; Tsai-Chang Wu1; Narendra Dahiote1; 1University of North Texas

4:40 PM
Investigation on Multiple Parametric Optimization of Cold Sprayed Coatings Process: Tarun Goyal1; 1IKG Punjab Technical University

5:00 PM
The Methodological Principles of the Engineering of Tribocoupling Details Surface under Multicomponent Loading: Volodymyr Tsyganov1; Leonid Ivshchenko1; 1Zaporizhy National Technical University
5:20 PM Invited
A Novel Laser Shock Surface Patterning Process Towards Tribology Applications: Bo Mao1; Arpith Siddiaiah2; Pradeep Menezes1; Yiliang Liao1
1University of Nevada, Reno

Art and Cultural Heritage: Reverse Engineering — Art and Cultural Heritage: Reverse Engineering II

Wednesday PM Room: B232
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Glenn Gates, Walters Art Museum

2:00 PM Invited
Experimental Confirmation of Rock Melting in Iron Age Swedish Vitrified Hillfort: John McClay1; Jose Marcial1; Mahmood Abasamha2; Carolyn Pearce2; Michael Schweiger3; Jarrod CRM3; Connor Appel3; Jack Clare3; Jamie Weaver4; Rolf Sjöblom2; Erik Ogenhall2; Eva Hjärthner-Holdar2; Mia Englund2; Albert Kruger1
1Washington State University; 2Pacific Northwest National Laboratory; 3University of Sheffield; 4National Institute of Standards & Technology; 5Luleå University of Technology; 6Arkeologerna; 7Department of Energy - Office of River Protection

2:40 PM Invited
Sifting the Past From Over a 1000 Years of Alteration: Jamie Weaver4; Rolf Sjöblom2; Carolyn Pearce1; Joseph Ryan1; Edgar Buck1; John McClay1; David Peeler1
1National Institute of Standards and Technology; 2Luleå University of Technology; 3Pacific Northwest National Laboratory; 4Washington State University

3:20 PM Break

3:40 PM Invited
Principles of Roman Cementitious Systems in Architectural and Marine Concretes: Marie Jackson; Juhhyuk Moon; Heng Chen; Yi Zhang
1University of Utah; 2Seoul National University; 3Southeast University; 4National University of Singapore

4:20 PM Using Trace Element Ratios to Establish Provenance of Brick and Terra Cotta: Emily Steiner2; Pippa Merrick3; Susan Tunick1; Kathryn Tierny2; Hyojin Lee1; William Carty1
1New York State College of Ceramics at Alfred University; 2historical Hillsborough Research Group; 3Friends of Terra Cotta; 4Boston Valley Terra Cotta

4:40 PM Invited
Deriving History from Isolated Late Classic Maya Ceramic Vessels: Ronald Bishop4
4NMNH-Smithsonian Institution

5:20 PM Invited
Analysis of Inorganic Pigments in Unknown Paintings by Painter Fernando Fader through X-ray Fluorescence (XRF): Patricia Carrico3; Cristian Aguilara1; Julio Ortigala1
1Universidad Tecnológica Nacional Regional Mendoza(UTNFRM)
Ceramics and Glasses Simulations and Informatics — Multiscale Modeling of Materials  
**Program Organizers:** Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory  

**Wednesday PM**  
**Room:** A113  
**Location:** Greater Columbus Convention Center  

**Session Chairs:** Rampi Ramprasad, Georgia Institute of Technology; Jincheng Du, University of North Texas  

**2:00 PM Invited**  
Using Advanced Simulation Techniques to Understand Vapor Deposited Glass Formation and Melting: *Elizibeth Flenner*; Patrick Charbonneau; Ludovic Berthier; Francesco Zamponi; ‘Colorado State University; ‘Duke University; ‘Laboratoire Charles Coulomb, University de Montpellier and CNRS; ‘Laboratoire de Physique Theorique, Ecole Normale Superieure, PSL Research University, Sorbonne Universites, UPMC Universites Paris 06, CNRS  

**2:30 PM Invited**  
Phase-field Simulation of Pressure-induced and Light-controlled Ferroelectric Switching in Nanoscale Thin Film: *Ye Cao*; ‘University of Texas at Arlington  

**3:00 PM**  
Ab-initio Estimation and Experimental Measurement of the Fracture Surface Energy and Toughness of Glass: *Theany To*; Fabrice Célarié; Tangyu Rouxel; ‘University of Rennes 1  

**3:20 PM Break**  

**3:40 PM Invited**  
Modeling Anisotropic Grain Growth with the SPPARKS Framework: *Efrain Hernandez-Rivera*; Philip Goins; ‘US Army Research Laboratory  

**4:10 PM Invited**  
Fracture Mechanics of Phase-separated Glasses by Peridynamics Simulations: Longwen Tang; N. M. Anoop Krishnan; Mathieu Bauchy; ‘University of California, Los Angeles; ‘IIT Delhi  

**4:40 PM**  
Molecular Dynamics Study on SiO2 Interfaces as Non-fire Solids: *Tomohiro Sato*; Ken-ichi Saitoh; Masayoshi Fujii; Chika Takai; Hadi Razavi; Masanori Takuma; Yoshimasa Takahashi; ‘Kansai University; ‘Nagoya Institute of Technology  

**5:00 PM**  
Computational Studies of Si NMR in Crystalline and Amorphous Silicon Nitrides: *Ilia Ponomarenv*; Peter Kroll; ‘The University of Texas at Arlington  

Characterization & Methods in Failure Analysis — Corrosion  
**Program Organizers:** Andrew Havig, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)  

**Wednesday PM**  
**Room:** A211  
**Location:** Greater Columbus Convention Center  

**Session Chairs:** Veronique Vitry, UMONS; Courtney Pape, DNV GL; Thomas Traubert, EDT Engineering; Aaron Tanzer, Element Materials Technology; Jake Auliff, DANFOSS  

**2:00 PM**  
Case Histories of Some Failures of Fittings and Tanks in the Petroleum Industry: Barry Hindin; ‘Kiefner & Assoc  

**2:20 PM Invited**  
Characterization of Copper Tubing and Pipe Ruptures: *G. Maltry*; ‘Engineering Design & Testing  

**2:40 PM**  
Case Study of Internal Corrosion Mechanisms in Pipelines: *Courtney Pape*; ‘DNV GL  

**3:00 PM**  
Corrosion of 304 Stainless Steel Pneumatic Pressure Tubes: *Dana Medlin*; Donald Johnson; ‘SEAL Laboratories (EAG Inc.); ‘University of Nebraska-Lincoln  

**3:20 PM Break**  

**3:40 PM**  
External Stress Corrosion Cracking Under Mineral Wool Insulation on a Carbon Steel Pipeline: *Dave Norfleet*; Barbara Padgett; Kevin Ralston; John Beavers; Liu Cao; Burke Delanty; ‘DNV GL  

**4:00 PM**  
Failure of Galvanized Steel Water Pipes: It's Not Always What You Think: *Véronique Vitry*; Fabienne Delaunois; ‘UMONS  

**4:20 PM**  
Grooving Corrosion: Differentiating Weld Defects from Corrosion Failure: *Vir Nirankari*; Brad James; Ockert Van Der Schijff; ‘Exponent, Inc  

**4:40 PM**  
Failure Analysis of Corroded Cooling Deck Pan: *Adam Boesenberg*; ‘Iowa State University  

**5:00 PM**  
Effect of Ni to Cu Ratio on Formation of Oxide Scale at High Temperature: *Shriskant Jadhav*; ‘Kalyani Center for Technology and Innovation
Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session IV

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory; Gurpreet Singh, Kansas State University; Kejie Zhao, Purdue University; Jian Shi, Rensselaer Polytechnic Institute

Wednesday PM  Room: D180
October 17, 2018  Location: Greater Columbus Convention Center

Funding Support provided by: MilliporeSigma

Session Chairs: Kathy Lu, Virginia Tech; Jian Shi, Rensselaer Polytechnic Institute

2:00 PM Invited
Particle ALD for Sintering Yttria-stabilized Cubic Zirconia (YSZ): Rebecca O’Toole1; Christopher Bartel1; Maila Kodas1; Alexa Horrell1; Sandrine Ricote1; Neal Sullivan1; Robert Hall1; Charles Musgrave1; Alan Weimer1; 1University of Colorado; 2Colorado; 31AD NanoSolutions

2:30 PM Invited
Reduced Thermal Conductivity in 7 wt% Yttria Doped Zirconia Nanocrystalline Ceramics: John Drazin1; Edward Gorzkowski2; 1ASEE; 2Naval Research Laboratory

2:50 PM Invited
Particle Size Dependence of Growth and Growth Mode of Atomic Layer Deposition in a Rotary Reactor: James Wollnershauser1; Kedar Manandhar1; Boris Feigelson1; 1U.S. Naval Research Laboratory; 2American Society for Engineering Education Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory

3:10 PM Invited
Synthesis of Nanostructured Ferroic Materials for Energy Conversion: Todd Monson1; Baolong Zheng2; Tyler Stevens3; Renee Van Ginthoven4; David Vargas1; Yizheng Zhou1; Enrique Lavernia1; 1Sandia National Labs; 2University of California, Irvine; 3Air Force Research Lab

3:40 PM Break

4:00 PM Invited
Engineering Iron Oxide Nanoparticles for Optimal Magnetic Hyperthermia Performance: Anna Cristina Samia1; 1Case Western Reserve University

4:30 PM Invited
Optically Transparent (Fully Dense) Nanocrystalline Ceramics Manufactured via CIP-sinter-HIP Processing: John Drazin1; Edward Gorzkowski2; James Wollnershauser1; 1ASEE; 2Naval Research Laboratory

4:50 PM Invited
Negative Hall-Petch Relationship and Plateau in Nanocrystalline Ceramics: Heonjune Ryu1; John Drazin1; Kathryn Wahl1; Syed Qadri1; Edward Gorzkowski2; Boris Feigelson1; James Wollnershauser1; 1American Society for Engineering Education Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory; 2U.S. Naval Research Laboratory

Covetic Nanomaterials for Energy Applications — Covetic Materials II

Program Organizers: David Forrest, US Department of Energy; Uthamalingam Balachandran, Argonne National Laboratory

Wednesday PM  Room: D282
October 17, 2018  Location: Greater Columbus Convention Center

Session Chair: David Forrest, U.S. Department of Energy

2:00 PM Invited
Development of Covetic Materials for Energy Applications: Uthamalingam Balachandran1; Beihai Ma1; Stephen Dorris1; Tae Lee1; Jie Wang2; Jianguo Wen2; Paul Jablonski2; David Forrest2; 1Argonne National Laboratory Energy Systems Division; 2Argonne National Laboratory; 3National Energy Technology Laboratory; 4U.S. Dept. of Energy

2:40 PM Invited
Processing Cu-covetic Materials in a Controlled Atmosphere: Steve Dorris1; U. (Balu) Balachandran1; B. Ma1; T. H. Lee1; P. D. Jablonski2; 1Argonne National Laboratory; 2National Energy Technology Laboratory

3:00 PM Overview on Copper Covetic Materials: Iwona Jasiuk1; Sabrina Nilufar1; Gabriela Couvertier-Santos1; Sakshi Braroo1; 1University of Illinois

3:20 PM Break

3:40 PM Invited
Microstructural Characterization of Nano and Ultrananocrystalline Materials: Beihai Ma1; U. (Balu) Balachandran1; Stephen Dorris1; Tae Lee1; Jie Wang2; Jianguo Wen2; Adam Rondinone2; 1Argonne National Laboratory; 2Oak Ridge National Laboratory

4:00 PM Two Step Synthesis and Properties of Cobalt Covetics: Zafer Turpul1; Gregory Kozlowski1; Michael Susner1; Michael McLeod1; John Horwath1; 1AFLR/RQQM; 2Wright State University; 3UES Inc.; 4UDRI

4:20 PM Concluding Comments

Deformation and Transitions at Grain Boundaries VI — Grain Boundary Energy and Structure II

Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jion Luo, University of California San Diego; Douglas Spearot, University of Florida

Wednesday PM  Room: A123
October 17, 2018  Location: Greater Columbus Convention Center

Session Chairs: Kiran Solanki, Arizona State University; Fadi Abdeljawad, Sandia National Laboratories

2:00 PM Invited
Stiffness Matters: The Role of the Interface Stiffness Tensor on Grain Boundary Dynamical Processes: Fadi Abdeljawad1; Stephen Foiles2; Khalid Hattar2; Brad Boyce3; 1Clemson University; 2Sandia National Laboratories

2:20 PM Invited
Stiffness Matters: The Role of the Interface Stiffness Tensor on Grain Boundary Dynamics: Fadi Abdeljawad1; Stephen Foiles2; Khalid Hattar2; Brad Boyce3; 1Clemson University; 2Sandia National Laboratories
2:30 PM
Structure and Properties of bcc Mg Synthesized Using Interface Strain Engineering: Siddhartha Pathak1; Manish Jain1; Marko Knezevic1; Irene Beyerlein1; 1Univ of Nevada, Reno; 2University of New Hampshire; 3University of California, Santa Barbara

3:00 PM  Invited
Towards Controlling Grain Boundary Stability through Ion Beam Modification: Khalid Hattar1; Christopher Barr1; Samuel Briggs1; Brittany Munifering1; Daniel Bufford1; Caitlin Taylor1; Nan Li1; Aman Haque1; 1Sandia National Laboratories; 1Los Alamos National Laboratory; 2Pennsylvania State University

3:10 PM  Invited
Revealing the Role of Grain Boundary Structures on Magnetic Flux Trapping Behavior in Niobium: A First-principles Study: P Greg1; T Bieler1; Kiran Solanki1; 1Arizona State University; 2Michigan State University

3:30 PM  Break

3:50 PM
ECCI Characterization of Dislocation Evolution near Grain Boundaries and Its Effect on the Superconducting Properties of Niobium for SRF Cavities: Mingmin Wang1; Shreyas Balachandran1; Santosh Chetri1; Anatoli Polyanskii1; Peter Lee1; Christopher Compton1; Thomas Bieler1; 1Michigan State University; 1National High Magnetic Field Laboratory; 1Facility for Rare Isotope Beams

4:20 PM
On The Influence of Thermo-mechanical Process History on Stress Corrosion Cracking Of Solution Annealed Type 304 Stainless Steel: Osama Alyousif1; 1Kuwait University

Eco-Friendly and Sustainable Ceramics — Novel Waste-derived Cellular Materials
Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancelotti, Universitalia di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry; Rostislav Kaischew1; Vlma Duceran, Slovenian National Building and Civil Engineering Institute

Wednesday PM Room: A114
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Isabella Lancelotti, University of Modena and Reggio Emilia; Yiannis Pontikes, KU Leuven

2:00 PM  Invited
From Waste CRT Glasses to Foam Glass: A Case of Study to Re-use Electric and Electronic End of Life Materials: Francois Mear1; 1Lille University

2:30 PM  Invited
Glassy Foams from Recycling: Some Examples of Study and Applications: Ronan Lebballenger1; 1University of Rennes

3:00 PM  Invited
Production of Hollow Glass Microspheres from Waste Glasses by Flame Synthesis with Na2SO4 Blowing Agent: Josef Kraxner1; Dušan Galusek1; 1FunGlass – Centre for Functional and Surface Functionalized Glass

3:20 PM  Break

3:40 PM
High Strength Cellular Glass-ceramics from Glass By-products of Metal Extraction Processes Applied on MSWI Bottom Ash: Patricia Rabelo Monich1; Hugo Lucas2; Bernd Friedrich2; Enrico Bernardo1; 1University of Padova; 2RWTH Aachen

4:00 PM
Upcycling of Vitreous By-product of the Plasma Heating of MSW into Multifunctional Porous Glass-ceramics: Patricia Rabelo Monich1; Daniele Desideri1; Enrico Bernardo1; 1University of Padova

Environmental Degradation and Embrittlement of Structural Metals — Hydrogen Embrittlement II
Program Organizers: Jun Song, McGill University; Ankit Srivastava, Texas A&M University; Hornero Castaneda, Texas A&M University; Salim Brahim1, McGill University / IBECA Technologies; Frank Cheng, University of Calgary; Ronald Miller, Carleton University; Xin Pang, Canmetmaterials,Natural Resources Canada; Stephen Yue, McGill University

Wednesday PM Room: C161A/161B
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Sriraman Rajagopalan, McGill University

2:00 PM  Invited
Role of Grain Boundaries in Hydrogen Diffusion in Metals: Fast or Slow?: Jun Song1; Xiao Zhou1; 1McGill University

2:30 PM
A Novel Approach to Assess Material Susceptibility to Hydrogen Embrittlement (HE) Using Finite Element Analyses (FEA): Tuhin Das1; Esaie Legrand1; Salim Brahimi1; Jun Song1; Stephen Yue1; 1Department of Mining and Materials Engineering, McGill University; 1Laboratoire des Sciences de l’Ingénieur pour l’Environnement, LaSIE, Bat. Marie Curie, Av. Michel Crepeau; 1IBECA Technologies Corp

2:50 PM  Invited
Fracture Mechanics Analysis of a High Strength Hydrogen Embrittled L43 BOP Connector Bolt Failure: Herman Amaya1; Bryan Fahimi1; Ramgopal Thodla1; 1Schlumberger; 1DNVGL USA, Inc

3:20 PM  Break

3:50 PM
Microstructural Variation at Different Layers of API 5L X80 Pipeline Steel Thickness and Its Relation to Hydrogen Degradation: Enyinnaya Ohaeri1; Jerzy Szpunar1; 1University of Saskatchewan

4:10 PM  Invited
Hydrogen Embrittlement of High Strength Alloys: Understanding the Similarities and Differences: Xu Lu1; Dong Wang1; Di Wan1; Mohammad Ahmadzadeh1; Afroz Barnoudek1; 1Norwegian University of Science and Technology
Fast/Ultrafast Characterization of Irreversible Transformations in Materials with X-rays and Electrons — Synchrotron X-ray and XFEL Imaging

Program Organizers: Tian Li, Lawrence Livermore National Laboratory; Tao Sun, Argonne National Laboratory; Anders Madsen, European XFEL

Wednesday PM  Room: B246
October 17, 2018  Location: Greater Columbus Convention Center

Session Chair: Tao Sun, Argonne National Laboratory

2:00 PM  Invited
Visualization and Measurement with Dynamic X-ray Radiography of Laser Melting in 3D Printing: Anthony Rollett; Ross Cunningham; Tao Sun; Christopher Kantzos; Cang Zhao; Carnegie Mellon University; Argonne National Laboratory

2:30 PM  Invited
Characterizing the Dynamics of Melting and Solidification in Laser Powder Bed Fusion Additive Manufacturing Process by High-speed X-ray Imaging and Diffraction: Lianghua Xiong; Niranjan Parabi; Qilin Guo; Tao Sun; Lianyi Chen; Missouri S&T; Argonne National Laboratory

3:30 PM  Invited
Investigation of Dynamic Fracture Behavior of Additively Manufactured Al-10Si-Mg Using High-speed Synchrotron X-ray Imaging: Niranjan Parabi; Lianghua Xiong; Cang Zhao; Yizhou Nie; Cody Kirk; Zherui Guo; Xianghui Xiao; Weinong Chen; Lianyi Chen; Tao Sun; Argonne National Laboratory; Missouri University of Science and Technology; Purdue University

3:40 PM  Invited
Tracking of Stochastic Processes with Full Field Hard X-ray MHz Rate Single-Pulse Imaging: Patrik Jagovic; Tokushi Sato; Rita Graceffa; Pablo Villanueva-Perez; Ladislav Mikes; Christian David; Margie Olbinado; Alexander Rack; Andrej Hovan; Jozef Ulicny; Marcin Sikorsky; Alke Meents; Joachim Schulz; Thomas Tsentschersch; Adrian Mancuso; CFEL, DESY; European XFEL, PSI, ESRF; Safarik University

4:00 PM  Invited
Ultrafast Structural Behavior in Shock-compressed Iron Probed Using XFEL: Tomokazu Sano; Osaka University

4:20 PM  Invited
Dynamic X-ray Characterization of Reactive Materials: Emre Gunduz; Purdue University

From Diversity to Inclusion — Session II

Program Organizers: Elvi Dalgaard, Pratt & Whitney Canada; Lynnette Madsen, Svedberg Science, Inc.

Wednesday PM  Room: B231
October 17, 2018  Location: Greater Columbus Convention Center

2:00 PM  Invited
Diversity & Inclusion: Everyone has a Responsibility: Lana Eagle; Industry Council for Aboriginal Business (ICAB)

2:30 PM  Invited
Observations, Learnings and Outlooks from the 3rd TMS Summit on Diversity: Jonathan Madison; Jennifer Andrew; Megan Brewer; Amy Clarke; Kristen Constant; Oscar Dubon; Emily Kinser; Matthew Korey; Natalie Larson; Michael Rawlings; Rosa Rojas; Sandia National Laboratories; University of Florida; Launch Forth; Colorado School of Mines; Iowa State University; University of California, Berkeley; IBM; Purdue University; University of California, Santa Barbara

3:00 PM  Invited
Bring Your Whole Self to Work: Raul Rebak; GE Global Research

3:20 PM  Break

3:40 PM  Invited
Raising Awareness of the Existing Diversity and Inspiring the Next Generation: Lynnette Madsen; Svedberg Science, Inc.

4:00 PM  Panel: Diversity and Inclusion at MS&T and Beyond

5:00 PM  Cocktail Reception

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Glass Formation, Relaxation, and Crystallization

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Wednesday PM  Room: A115
October 17, 2018  Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM  Invited
Surface Relaxation of Glasses: Its Effects on Fibers and Thin Films: Minoru Tomczak; Rensselaer Polytechnic Institute

2:30 PM  Invited
Statistical Mechanical Modeling of Fluctuations in Glass-forming Systems: John Mauro; The Pennsylvania State University

3:00 PM
On the Prony Series Representation of Stretched Exponential Relaxation: John Mauro; Yihong Mauro; The Pennsylvania State University

3:20 PM  Break

3:40 PM
Thermal History-insensitive Glasses: Alexandra Mitchell; Timothy Gross; Corning

4:00 PM
Viscosities, Activation Energies, and Working Region Predictions for Bismuth Aluminoborosilicate Glasses: Levi Gardner; Michael Simpson; Krista Carlson; University of Utah

4:20 PM
Crystallization Kinetics of Amorphous Semiconductors and Phase Change Material Thin Films Studied with Nanosecond-scale Dynamic TEM: Thaddeus Rahn; Al Rise; Victoria Bird; Mark Winseck; Hua-Yu Cheng; Simone Raoux; Geoffrey Campbell; Melissa Santala; Oregon State University; IBM/Macronix; Helmholtz-Zentrum Berlin für Materialien und Energie; Lawrence Livermore National Laboratory
IMS Symposium on Metallurgy and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties –
Metallurgy and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties III

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center, Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Wednesday PM Room: A212
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Jaret Frafjord, IMR Test Labs - Portland; Chris Bagnall, MCS Associates, Inc; Mike Keeble, Buehler, A Division of ITW

2:00 PM
Effects of Aging Treatment on the Microstructure and Hardness of Pb-free Solder Alloys: Carina Morando¹; Osvaldo Fornaro¹; ¹IFIMAT-CIFICEN-UCPBAA-CONICET

2:20 PM
Characterization of a Thermomechanically Processed Mg-Li-Al Ultralight Alloy: Microstructure and Properties: Rezawana Islam¹; A Hadadzadeh¹; Mary Wells¹; Meysam Haghsenas¹; ¹University of North Dakota; ²University of Waterloo; ³University of Guelph

2:40 PM
Assessing the Impact of Image Acquisition and Processing Methods on Three-dimensional Microstructural Reconstructions: Thomas Ivanoff¹; Jonathan Madison¹; Joshua Koepke¹; Bradley Jared¹; ³Sandia National Laboratories

3:00 PM
Computer Vision and Transfer Learning: A Multi-scale Approach to Quantify Microstructure for Correlation to Mechanical Properties: Andrew Kitahara¹; Elizabeth Holm¹; ³Carnegie Mellon University

3:20 PM Break

3:40 PM
Composite Overwrapped Pressure Vessel (COPV) Life Test: Richard Russell¹; Jacob Hochhalter¹; David Dawicke¹; ¹NASA Ksc; ²NASA LaRC

4:00 PM
The Effect of Heat Treatment on Precipitation and Recrystallization Behavior of Selective Laser Melted Inconel 718: Runbo Jiang¹; Joseph Pauza¹; Anthony Rollett¹; ³Carnegie Mellon University

4:20 PM
Microstructure Quantification and Reduced Order Crystal Plasticity Modelling Using a Machine Learning Approach: Mengfei Yuan¹; Stephen Niezgoda¹; ³The Ohio State University

4:40 PM
The Effect of Tool Rotational Speed on the Mechanical Properties of Friction Stir Welding of Steel: Monatadhor Al-moussawi¹; Alan Smith¹; 1Al-Furat Al-Awsat Technical University; 2Sheffield Hallam University

5:00 PM
A Dislocation Density-based Model for Deformation of a 3D Printed Silver Micro-pillars: Mehdi Hamidi¹; Mohammad Sadeq Salehi¹; Rahul Panat¹; Hussein Zbib¹; 1Washington State University; 2Carnegie Mellon University

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches –
Thermodynamics
Program Organizers: John Blendell, Purdue University; Ming Tang, Rice University; Shen Dillon, University of Illinois; Wayne Kaplan, Technion - Israel Institute of Technology; Dominique Chatain, CNRS, Aix-Marseille University

Wednesday PM Room: A122
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Amanda Krause, Lehigh University

2:00 PM Invited
Thermodynamics and Kinetics of Layering Transitions at Grain Boundaries: Jeffrey Rickman¹; Martin Harmer¹; Helen Chan¹; ¹Lehigh University

2:30 PM Invited
Computing Grain Boundary Diagrams: From Phenomenological Thermodynamic Models to Atomistic Simulations: Chongze Hu¹; Shengfeng Yang¹; Jian Luo¹; 1Univ of California San Diego; 2UCSD/IUPUI

3:00 PM Invited
Ab Initio Modeling of Two-dimensional Interfaces and Surfaces: Maytal Caspary Toroker¹; ¹Technion - Israel Institute of Technology

3:30 PM
Sintering Kinetics in Direct Ink Write Processes: Atomistic and Mesoscopic Modeling Perspectives: Fadi Abdeljawad¹; Jesse Sestito²; Yan Wang³; Allen Roach¹; 1Sandia National Laboratories; 2Georgia Institute of Technology

3:50 PM Break

4:10 PM
Atomistic Simulation of Field Evaporation from Field Emitter Tips: Christian Oberdorfer¹; Travis Withrow²; Iman Ghanaran³; Emmanuelle Marquis³; Wolfgang Windl¹; 1Ohio State Univ; 2University of Michigan

4:30 PM
Atomistic Study of Helium Effects in Nickel: Edmanuel Torres¹; Jeremy Pencer¹; Lori Walters¹; ¹Canadian Nuclear Laboratories

4:50 PM
Coarsening Statistics in an Iron Polycrystal and Advances in Grain Boundary Energy Extraction: Yi-Feng Shen¹; Xiaoting Zhong¹; Aditi Bhattacharya¹; He Liu¹; Gregory Rohrer¹; Robert Suter¹; ¹Carnegie Mellon University

5:10 PM
Ab-initio Characterization of Organic Functionalized Titania Membranes: Evan Hyde¹; Matthew Beck¹; ¹University of Kentucky

5:30 PM
Insights into the Structure and Energies of Interfaces Between Iron and Cementite from Atomistic and Continuum Modeling: Christopher Weinberger¹; Matthew Guziewski¹; Shawn Coleman¹; 2Colorado State University; 3Army Research Laboratory
Joining of Advanced and Specialty Materials (JASM XX) — Ultrasonic Joining

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barborak, WeldQC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Wednesday PM  Room: C171
October 17, 2018  Location: Greater Columbus Convention Center

Session Chair: Vikas Patel, ArcelorMittal USA

2:00 PM
Effect of Steel Microstructure on the Bonding of Steel and Nickel by Ultrasonic Welding: Jheyu Lin¹; 'University of Tokyo

2:20 PM
Weld Formation during Ultrasonic Welding of Al Alloy to Cu: Hiromichi Fujii¹; Hiroki Endo¹, Yutaka Sato¹, Hiroaki Kokawa¹; 'Tohoku University

2:40 PM
Determination of Interfacial Wavelength and Process Parameters in Impact Welds: Taeceon Lee¹; Jackson Peck¹, Isabel Boona¹, Anupam Vivek¹, Glenn Duch¹; 'Ohio State University

3:00 PM
Thermal Fatigue Properties of Ultrasonic Bonded Copper Joint: Takahito Fushimi¹; Tomoki Matusa¹; Tomokazu Sano¹; Akio Hirose¹; 'Osaka University

3:20 PM  Break

3:40 PM
Development of a Hybrid Ultrasonic-resistance Spot Welding System for Aluminum Sheet: Lindsey Lindamood¹; David Workman¹; Jerry Gould¹; 'EWI

4:00 PM
Ultrasonic Bonding for LED Device Mounted on E-textile Using Plastic Flow of Solder as Cushioning Material: Hiroaki Mori¹; Kazushi Matsuo¹; Hiromichi Fujii¹; Atsushi Masuda¹; 'Osaka University; 'Tohoku University; 'Industrial Technology Center of Fukui Prefecture

4:20 PM
Multi-material Integration for Automotive Structures Using Ultrasonic Additive Manufacturing: Hongyi Guo¹; Mark Gingerich¹; Leon Headings¹; Ryan Hahlhen¹; Marcelo Dapino¹; 'The Ohio State University; 'Honda R&D Americas, Inc.

Joining of Advanced and Specialty Materials (JASM XX) — Welding Metallurgy II

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barborak, WeldQC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Wednesday PM  Room: C172
October 17, 2018  Location: Greater Columbus Convention Center

Session Chairs: Doris Ivette Villalobos Vera, Instituto Tecnológico de Veracruz; Ivan Mendoza-Bravo, Instituto Tecnologico de Veracruz

2:00 PM
Weldability of Additively Manufactured 304L Stainless Steel: Jeffrey Rodelas¹; Daniel Tung¹; Alexander Barr¹; Matthew Vieira¹; 'Sandia National Laboratory

2:20 PM
Chloride-induced Stress Corrosion Cracking Behavior in 304 Stainless Steel Weldments: Xin Wu¹; Zhenzhen Yu¹; Scott Gordon¹; Stephen Liu¹; Zeev Shayer¹; Christopher Alexander¹; Eric Schindelholz²; Charles Bryan²; 'Colorado School of Mines; 'Sandia National Laboratories

2:40 PM
Preliminary Investigations into LME Induced Failures in Austenitic Stainless Steels: Dean Sage¹; Carolin Fink¹; 'Ohio State University

3:00 PM
Strength Recovery in Welds of 17-4 and 13-8+Mo Maraging Stainless Steels: Dean Sage¹; Carolin Fink¹; 'Ohio State University

3:20 PM
Tempering Response of Type 410 Welding Consumables and Base Metals: Benjamin Lawson¹; Boian Alexandrov³; 'The Ohio State University

3:40 PM  Break

4:00 PM
Phase Transformations and Mechanical Properties of Welds Produced with a 10 wt% Ni Steel Welding Consumable: Erin Barrick³; John DuPont³; 'Lehigh University

4:20 PM
Quantification of the Tempering Response in Grade 22 Steel for Tempering Bead Welding Applications: Jeff Stewart¹; Boian Alexandrov³; 'The Ohio State University

4:40 PM
Effect of Multipass Welding on the Microstructural Evolution and Mechanical Properties of High Strength Low Alloy 100 Steel: Jonath Duch³; John DuPont³; 'Lehigh University

5:00 PM
Effect of Materials on Weld Residual Stress of Ship Structures: Yu-Ping Yang¹; TD Huang¹; Wei Zhang¹; Charles Fisher¹; Steve Scholler¹; Randy Dull¹; 'Huntington Ingalls Shipbuilding; 'The Ohio State University; 'Naval Surface Warfare Center – Carderock Division; 'Huntington Ingalls Shipbuilding; 'EWI
2:00 PM Invited
Emerging Opportunities in Ceramics and Glass Research: Follow-up from a 2016 NSF Workshop: Katherine Faber1; ’California Institute of Tech

2:30 PM Invited
Current Understanding and Future Research Directions at the Onset of the Next Century of Sintering Science and Technology: Rajendra Borka1; Suk-Joong Kang2; Eugene Olevsky3; ’Clemson University; 2Korea Advanced Institute of Science and Technology (KAIST); ’San Diego State University

3:00 PM Invited
Mobility Transition is the Mechanism behind Two-step Sintering: Yanhao Dong1; I-Wei Chen2; ’Massachusetts Institute of Technology; 2University of Pennsylvania

3:30 PM Break

4:00 PM Invited
Characterization and Modeling of Microstructural Level Stresses in Alumina: Melissa Teague1; Theron Rodgers1; Scott Grutzik1; Stephen Meserole1; ’Sandia National Laboratories

4:30 PM Invited
Viscosity of Glass-forming Systems: From Medieval Stained Glass Windows to Advanced Functional Glasses: John Mauro1; ’The Pennsylvania State University

5:00 PM Invited
Energetics and Structure Relations of Solid Phases in Silicon–oxygen–carbon System: Jiewei Chen1; Sean King2; Alexandra Navrotsky1; ’University of California Davis; 2Intel Corporation; 3Intel Corporation; 4Peter A. Rock Thermochemistry Laboratory and NEAT ORU, University of California Davis

5:30 PM Invited
Environmental Resistance of Cr2AlC MAX Phase at High Temperature: Jesus Gonzalez-Julian1; Olivier Guillon1; Robert Vassen1; ’Forschungszentrum Jülich

6:00 PM Concluding Comments
3:20 PM Invited
Incidence and Characterization of Corrosion in Stainless Steel Percutaneous Lead Systems Located Exterior to the Body: Janet Ghur; Dustin Tyler; John Lewandowski1; ‘Case Western Reserve University

3:40 PM Break

4:00 PM
Case Studies on Sterilization-induced Failures in Metallic Medical Devices: Matthew Bowers1; Brad James1; ‘Exponent, Inc.

4:20 PM Invited
Failure Analysis of Fracture Fixation Devices for Medical Implant Applications: Dana Medlin1; ‘EAG Laboratories, Inc.

Materials Degradation in CO2 Environments — Session II
Program Organizers: Richard Oleksak, National Energy Technology Laboratory; Julie Tucker, Oregon State University; Matthew Walker, Sandia National Laboratories

Wednesday PM
Room: C162A/162B
Location: Greater Columbus Convention Center

Session Chairs: Matthew Walker, Sandia National Laboratories; Richard Oleksak, National Energy Technology Laboratory

2:00 PM Invited
Considerations in Materials Selection due to Oxidation in sCO2 Compact Heat Exchangers: John Shinglesdecker1; Steven Kung1; Ian Wright2; Adrian Sabau2; ‘EPRI, ‘WrightIT; ‘Oak Ridge National Laboratory

2:30 PM
Corrosion and In-situ Low Cycle Fatigue of 316L Stainless Steel in Supercritical CO2: Julie Tucker1; Lucas Teeter1; Benjamin Adam1; Sebastien Teyssye1; ‘Oregon State University; ‘Idaho National Laboratory

2:50 PM
Effect of Supercritical CO2 Exposure on Fatigue Thresholds in Nickel Superalloys Compared to Steam and Vacuum Exposures: Kyle Rozman1; Omer Dogan1; Gordon Holcomb1; Casey Carney1; Jeffrey Hawk1; ‘National Energy Technology Laboratory

3:10 PM Invited
Evaluation of Diffusion-bonded Joints of Austenitic Alloys Exposed to S-CO2 Environment: Changheui Jang1; Ho Jung Lee1; Sung Hwan Kim1; Sunghoon Hong1; ‘Korea Advanced Institute of Science & Technology; ‘Korea Hydro and Nuclear Co., Ltd.

3:40 PM Break

4:00 PM
Corrosion and Mechanical Performance of Grade 92 F-M Steel after Exposure to s-CO2: Andrew brittan1; Mark Anderson1; ‘University of Wisconsin-Madison

4:20 PM
Effect of Carburation on Deformation Behavior of a Metal-weld in sCO2 Power Cycle Applications: Sajedur Akanda1; Kyle Rozman1; Reyiixiat Repukait1; Omer Dogan1; Jeffrey Hawk1; ‘National Energy Technology Laboratory

4:40 PM
The Effect of Carbon Dioxide Environment on the Spark Plasma Sintering of Cerium(IV) Oxide: Anil Prasad1; Linu Malakka1; Lukas Bichler1; Jerzy Szpunar1; ‘University of British Columbia; ‘University of Saskatchewan

5:00 PM
The Thermodynamic Investigation of the Effect of CO2 to the Stability of (La0.8Sr0.2)0.98MnO3+δ and La0.6Sr0.4Co0.2Fe0.8O3+δ as Cathodes of Solid Oxide Fuel Cells: Shadi Darvish1; Yu Zhong1; ‘Florida International University; ‘Worcester Polytechnic Institute

Materials for Nuclear Applications and Extreme Environments — Processing and Behavior of Novel Fuels II
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Dev Chidambaram, University of Nevada, Reno; Raul Rebak, GE Global Research; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

Wednesday PM
Room: D183
October 17, 2018
Location: Greater Columbus Convention Center

Session Chair: Cory Trivelpiece, Savannah River National Laboratory

2:00 PM Invited
Technology Development for Applying a Two-stage Endcap to High Thermal Stability Fuel Rods: Jerry Gould1; Cem Topbasi2; Bo Cheng1; Lindsey Lindamood1; Steve Manning1; Tim Mikel1; ‘Edison Welding Inst; ‘Electric Power Research Institute

2:40 PM Invited
Microstructural and Microchemical Characterization of Nuclear Fuels: Assel Aitkalyyeva1; ‘University of Florida

Mechanochemical Synthesis and Reactions in Materials Science III — Session II
Program Organizers: Antonio Fuentes, Cineast United Sattillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Huot Jacques, University Du Quebec A Trois Rivieres

Wednesday PM
Room: B131
October 17, 2018
Location: Greater Columbus Convention Center

Session Chair: Antonio Fuentes, Cineast United Sattillo

2:00 PM Invited
Kinetics of Mechanical Amorphization: Effective Avrami Exponents: Javier Blazquez1; Alejandro Manchon-Gordon1; Ifon Ipus1; Clara Conde1; Alejandro Conde1; ‘University of Sevilla

2:30 PM
A Multiscale Model of Solid State Amorphization during Milling of Pharmaceutical Materials: Yefei Zeng1; Lorena Alzate-Vargas1; Pilsun Yoo1; Chanyu Li; Rachel Irocino1; Jeff Brum1; Peilin Liao1; Alejandro Strachan1; Marisol Kowalski1; ‘Purdue University; ‘GlaxoSmithKline, Analytical Sciences and Development

3:00 PM
Phase Evolution during Mechanical Alloying of Equiatomic Iron-cobalt-nickel Alloy: Anuj Rathi1; Vamsi Meka1; Tanjore Jayaraman1; ‘University of Michigan-Dearborn
3:20 PM Break

3:40 PM
The Effect of Yttrium on the Grain Growth of Nanocrystalline Titanium: Peter Feldmann¹; Carl Koch¹; Ron Scattergood¹; ¹North Carolina State University

4:00 PM
Power Law Modeling of Acoustic Cavitation Erosion as a Materials Processing Technique: Jeremy Wright¹; Brian Mitchell¹; ¹Tulane University; ²Tulane University

4:20 PM
Combined Mechanochemical/Thermal Route for Smart Synthesis of LiFeSi2O6 from Different Fe and Si Sources: Erika Tóthová¹; Ralf Wüte¹; Michal Hegeduš¹; Mamoru Senna¹; Horst Hahn²; Paul Heizjans³; Vladimir Sepelák²; ¹Institute of Geotechnics, Slovak Academy of Sciences; ²Institute of Nanotechnology, Karlsruhe Institute of Technology; ³Institute of Chemistry, P. J. Šafárik University in Košice; ¹Faculty of Science and Technology, Keio University; ²Institute of Physical Chemistry and Electrochemistry, Leibniz University Hannover

4:40 PM
Effect of Cold Rolling and Ball Milling on the First Hydrogenation of Air Exposed TiFe + 4% Zr Alloy: Joydev Manna¹; Huot Jacques¹; ¹University Du Quebec A Trois Rivieres

Microalloyed Steels — Microalloyed Steels III
Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Janslo, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

Wednesday PM Room: A225
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Quality Assessment and Suggestion of Standard Revision for High Strength Rebars in China: Caifu Yang¹; Xuehui Chen¹; Ruizhen Wang¹; ¹Central Iron and Steel Research Institute

2:30 PM
Recrystallized Controlled Forging: The Key to Strong, Tough, Economical Microalloyed Steel Forgings with Relaxed Forging Conditions and No Heat Treatment: Aaron Stein¹; Anthony DeArdo¹; ¹University of Pittsburgh

2:50 PM
Characterization of Microalloyed Armor Steels Produced in Small Scale: William Williams¹; Haley Doude¹; Andrew Oppedal¹; Wilburn Whittington¹; Hongjoo Rhee¹; ¹CAVS

3:10 PM
Effect of Aluminum and Vanadium Fine Grain Practice on the Machinability of 4140 Steel: Mark Emmendorfer¹; Simon Lekahi¹; Laura Bartlett¹; Ronald O’Malley¹; Geary Ridenour²; Eduardo Sheid¹; John Heerema¹; ¹Missouri Univ of Science & Technology; ²Gerdau Special Steel North America; ³Gerdau Long Steel North America

3:30 PM Break

3:50 PM
Effect of Nitrogen Content on the Microstructures and Mechanical Properties in Simulated CGHAZ of Normalized Vanadium Microalloyed Steel: Feng Chai¹; Zhongran Shi¹; Caifu Yang¹; Xuehui Chen¹; ¹Central Iron and Steel Research Institute

4:10 PM
Study of Heat Treatment Process on Mechanical Properties of 10CrNiMoV Bulb Flat Steel: Xuehui Chen¹; Caifu Yang¹; Feng Chai¹; Qian Zhang¹; Yaqing Hou¹; Li Yang¹; ¹Central Iron and Steel Research Institute

4:30 PM
Research and Development of Low Cost x65 and x70 Niobium Microalloyed Pipeline Steel: Xiaolong Yang¹; Qiang Wang¹; Shaojiang Yin¹; Miao Zang¹; Zhixiu Zheng¹; Weijian Liu¹; Yunge Wang¹; ¹Hebei Iron and Steel Group Tangsteel Company

Multiscale Modeling of Microstructure Deformation in Material Processing — Multiscale Modeling of Microstructure Deformation in Material Processing - Part II
Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szelig, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research

Wednesday PM Room: C170
Location: Greater Columbus Convention Center

Session Chairs: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology

2:00 PM
Simulation of Dendrite Formation during Unstable Solidification Using a Second Order Level Set Method: Vimal Ramanav¹; Ramanan Sankaran¹; ¹Oak Ridge National Laboratory

2:20 PM
Phase-field Approach Coupled with Crystal Plasticity for Three-Dimensional Static Recrystallization in Ti-7Al Alloys and Comparison with Experiment: Arunabha Mohan Roy¹; Sriram Ganesan¹; Pinar Aca¹; Anna Trump¹; Susan Gentry¹; John Allison¹; Katsuyo Thornton¹; Veera Sundararaghavan¹; ¹University of Michigan-Ann Arbor

2:40 PM
Deep Learning to Predict Stress Levels in a Microstructure under Uniaxial Tensile Deformation: Ankita Mangal¹; Elizabeth Holm¹; ¹Carnegie Mellon University

3:00 PM
Micromechanics-based Modeling of Grain Boundary Sliding Mechanism: Shoieb Chowdhury¹; Hasam Askari¹; ¹University of Rochester

3:20 PM
Modelling of Recrystallization Kinetics with Combined Finite Element and Phase Field Method: Krzysztof Muszka¹; Maciej Paszynski¹; Grzegorz Gurgul¹; Paulina Lisecka-Grac¹; Danuta Szelig¹; ¹AGH University of Science and Technology

3:40 PM Break

4:00 PM
A Crystal Plasticity Model for Dynamic Recrystallization in Ti-6Al-4V Alloy: Arunabha Mohan Roy¹; Veera Sundararaghavan¹; ¹University of Michigan-Ann Arbor

4:20 PM
Concepts of Communication Interface in the FE2 Method: Adam Legwand¹; Lukasz Madej¹; ¹AGH University of Science and Technology
4:40 PM
Viscoplastic Self-consistent Modeling of Grain Size Effects on Slip and Twinning in High Purity a-Ti: Daniel Savage; Zhangxi Feng; Nicholas Ferreri; Marko Knezevic; University of New Hampshire

Multi-scale Simulation and Experimental Validation of Additive Manufacturing Technologies: A Status Update by Academia, Solution Providers and Industry on Its Intake, Market Opportunities Now and Going Forward — Multi-scale Simulation in Additive Manufacturing and AM Panel Discussion
Program Organizers: Deepankar Pal, 3DSIM; Ankit Saharan, EOS; Anthony Rollett, Carnegie Mellon University; Adrian Sabau, Oak Ridge National Laboratory

Wednesday PM Room: A221
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Ankit Saharan, EOS

2:00 PM
Beyond Single Part Qualification in AM: Mikkel Pedersen; Simon Sankare; Simon Mckown; Shawn Kelly; Blanka Szost; Dan Johns; Oerlikon AM GmbH; Oerlikon AM (US) Inc.

2:30 PM Invited Microstructure Modeling of Inconel 718 Processed through Additive Manufacturing Process: Javed Akram; Pradeep Chalavadi; Deepankar Pal; Dave Conover; Brent Stucker; ANSYS

2:50 PM Process Monitoring in Additive Manufacturing: Anja Loesser; Eos Na

3:20 PM Simulation Driven Design for Additive Manufacturing: Spencer Thompson; EOS of North America

3:50 PM Break

4:10 PM Simulation and Validation for Better Build Plate Designs: Abdul Khader Khan; Deepankar Pal; Kevin Chou; Ansys, Inc; University of Louisville

4:30 PM Invited New Support Structure Generation Methodologies in Metal Melting Based Additive Manufacturing Technologies: Deepankar Pal; Kevin Chou; Abdul Khan; 3DSIM; University of Louisville; ANSYS

4:50 PM Panel Discussion

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

Wednesday PM Room: D181
October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

5:00 PM Concluding Comments

Program Organizers: James Hemrick, Reno Refractories, Inc.; William Headrick, Jr, Missouri Refractories; Michel Rigaud, École Polytechnique de Montréal

Wednesday PM
Room: A120
October 17, 2018
Location: Greater Columbus Convention Center

Session Chairs: James Hemrick, RENO Refractories Inc; William Headrick, Missouri Refractories; Michel Rigaud, École Polytechnique de Montréal

2:00 PM Introductory Comments Dr. James Hemrick

2:05 PM Invited
Thermo-chemo-mechanical Modelling of Refractories Behavior in Service: Keypoints and New Developments: Eric Blond1; Anh Khoa Nguyen1; Thomas Sayet1; Athanasios Batakis1; Emmanuel De Bilbao1; Minh-Duc Duong1; 1University of Orleans

2:45 PM
Applications of Kinetic Models to the Chemical Corrosion of Refractory in the Steelmaking Process: Marie-Aline Van Ende1; In-Ho Jung1; 1Seoul National University

3:05 PM
Dissolution of Ceramic Particle into Molten Slags: Design of Experiment and Interpretation of Result: Youn-Bae Kang1; 1POSTECH

3:25 PM Break

3:45 PM Introductory Comments Dr. William Headrick

3:50 PM
Isolation or Corrosion of Microporous Magnesia in Contact with Slags of Different Basicity: Ao Huang1; Huazhi Gu1; Lvping Fu1; 1State Key Laboratory of Refractories and Metallurgy

4:10 PM Invited
How to Match the Refractory Industry Needs for Continuous Innovation?: Michel Rigaud1; Jacques Poirier1; 1École Polytechnique

4:50 PM Concluding Comments Dr. Michel Rigaud

5:10 PM TRI Reception

Next Generation Biomaterials — Biomaterials V

Program Organizers: Roger Narayanan, University of North Carolina; Vipul Davé, Johnson & Johnson; Mohan Edirisinghe, University of College of London; Sanjiv Lalwani, Lynntech, Inc.

Wednesday PM
Room: D182
October 17, 2018
Location: Greater Columbus Convention Center

Session Chairs: Anthony Wren, Inamori School of Engineering; Yusuf Khan, University of Connecticut

2:00 PM Invited
Germanium Based Glass Polyalkenoate Cements for Skeletal Applications: Glass Characterization and Physical and Bioactive Properties. Anthony Wren1; Sahar Mokhtar1; Emily Krull2; Aisling Coughlan2; Nathan Mellott3; 1Alfred University; 2University of Toledo; 3Michigan State University

2:20 PM
Effect of Radiation on Biologically Active Glasses: Areeba Tufail1; Brit Lee1; Punoot Gill1; Eric Bowman1; Bradley Arnold1; Fow-Sen Chou1; Brian Cullum1; Ching-Hua Su1; Narsingh Singh1; 1University of Maryland, Baltimore County

2:40 PM
Effects of Silver and Aluminum Addition in the Zirconium Based Thin Film Metallic Glass: Akib Jabed1; Wasem Haider1; Ishraq Shabib1; 1Central Michigan University

3:00 PM Invited
Dual Growth Factor Delivery from Devitalized Allografts Enhances Healing in a Large Scale Segmental Bone Defect Model: Yusuf Khan1; 1University of Connecticut

3:20 PM Break

3:40 PM
Towards Superior Bio-implant Steels through Submerged Friction Stir Processing: Gopinath Perumal1; Anritta Chakrabarti3; Aditya Ayyagari2; Deepika Kannan1; Soumya Pati1; Harpreet Grewal1; Sundeep Mukherjee1; Shailja Singh1; Harpreet Arora1; 1Shiv Nadar University; 2University of North Texas

4:00 PM
Tribocorrosion Behavior of Nanostructured Biomedical Co-Cr-Mo Alloys through High Pressure Torsion: Hakan Tilmazer1; Fatih Toptan1; Mitsuo Niinomi1; Burak Dikici2; Alexandra Alves1; Ihsan Çała1; Murat Isik1; Hasan Korkut1; Zenji Horita1; 1Yıldız Technical University; 2Universidade do Minho; 3Tokoh University; 4Atatürk University; 5Washington State University; 6Kyushu University

4:20 PM
Graphene Dispersed Silane Compound Coating and Its Immunity: Hideyuki Kanematsu1; Katashiko Sano1; Dana Barry1; Akiko Ogawa1; Nobumitsu Hirai2; Takeshi Kougo1; Daisuke Kurita1; Yoshimitsu Mizuno1; 1National Institute of Technology, Suzaoka College; 2D&D Corporation, Japan; 3Clarkson University; 4The Jikei University School of Medicine

4:40 PM
Cu-bearing Antibacterial Stainless Steels as Novel Metallic Biomaterials: M. Babar Shafqat1; Wei Wang1; Yiyan Shan1; Ke Yang1; 1Institute of Metal Research
Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute

Wednesday PM  Room: A124
October 17, 2018  Location: Greater Columbus Convention Center

Session Chair: Waltraud M. Kriven, University of Illinois at Urbana-Champaign

2:00 PM Invited
Microstructural Engineering of Powders for Scalable Processing of Metal-ceramic Nanocomposites: Helen Chau; Kevin Anderson; Richard Vinci; Edward Gorzkowski; Eric Patterson; Scooter Johnson; ¹Lehigh University; ²Naval Research Laboratory

2:30 PM Invited
Unusual Phase Transformations during Flash Sintering: Rishi Raj; ¹University of Colorado

3:00 PM
In-situ Study on Mechanical Behavior of Flash-sintered Yttria Stabilized Zirconia at Elevated Temperature: Jachun Cho; Qiang Li; Han Wang; Zhe Fan; Jin Li; Sichuang Xue; Haiyan Wang; Troy Holland; Amiya Mukherjee; Xinghang Zhang; ¹Purdue University; ²Colorado State University; ³University of California, Davis

3:20 PM Break

3:40 PM
New Heat Treatment Method to Manipulate the Structure of PMN-PT Single Crystals: Hooman Sabarou; Vadym Drozd; Osama Awadallah; Andrty Durygin; Dehua; Yu Zhong; ¹Worcester Polytechnic Institute; ²Florida International University; ³Navy Undersea Warfare Center; ⁴Worcester Polytechnic Inst

4:00 PM Invited
In-situ SEM & XRD Study of Selective Reduction of Metals from Oxides: Scott Mixture; ¹Alfred University

4:30 PM
BaO-doped TiO2 Nanostability: The Role of Surface Segregation on Phase Transition: Andre Da Silva; Douglas Gouvêa; Ricardo Castro; ¹University of São Paulo; ²University of California, Davis

4:50 PM
Domain-selective and Facet-selective Photoreactivity on the Surface of Ferroelastic CaTiO2: Kayla Zitello; Paul Salvador; Gregory Rohrer; ¹Carnegie Mellon University

PSDK XIII: Phase Stability and Diffusion Kinetics — Manufacturing and Phase Transformations
Program Organizers: Zi-Kui Liu, Pennsylvania State University; Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Wei Xiong, University of Pittsburgh; Raymundo Arroyave, Texas A & M University

Wednesday PM  Room: A213
October 17, 2018  Location: Greater Columbus Convention Center

Session Chairs: Chelsey Hargather, New Mexico Institute of Mining and Tech; Xiaochun Li, University of California, Los Angeles

2:00 PM Invited
Breaking Metallurgical Barriers by Nanotechnology Enabled Microstructure Control: Xiaochun Li; ¹University of California

2:20 PM
Predicting Precipitation Strengthening in Mg-Nd Alloys Using Phase Field Modeling, Dislocation Dynamics, and Experiments: Stephen DeWitt; Chaoming Yang; Arunabha Roy; Zhihua Huang; Amit Misra; Liang Qi; ¹John Allison; ²University of Michigan

2:40 PM
B4C-TiC to TiB2-C High Temperature Transformation: Boron Carbide Stability and Boron Transport Mechanisms: Oleksii Popov; Oleksandra Klepko; Serhii Chornobuk; Edward Lutsak; ¹Taras Shevchenko National University of Kyiv; ²V. Bakul Institute for Superhard Materials

3:00 PM
Phase Separation and Ordering in FCC/BCC Solid Solutions Using Steepest-entropy-ascent Quantum Thermodynamics: Ryo Yamada; Michael Von Spakovsky; William Reynolds, Jr.; ¹Virginia Polytechnic Institute

3:20 PM Break

3:40 PM Invited
A First-principles Investigation of an Improved 5-Frequency Model for Solute Diffusion: Chelsey Hargather; Shun-Li Shang; Zi-Kui Liu; ¹New Mexico Institute of Mining and Technology; ²Pennsylvania State University

4:10 PM
Carburization and Nitridation of Fe-based Diffusion Multiples for Carbonitride Characterization: Chris Eastman; Ji-Cheng Zhao; ¹TimkenSteel Corporation; ²The Ohio State University

4:30 PM
0° to 0 Transformation in Al-Cu Alloys Investigated with Phase Field Simulations, Advanced Characterization, and Mathematical Analysis: Patrick Shower; Dongwon Shin; Lawrence Allard; James Morris; Jonathan Poplawsky; Amit Shyam; ¹Oak Ridge National Laboratory

4:50 PM
Computational Thermodynamic and Kinetic Modeling for Phase Dissolution and Growth in Al Alloys: Kyle Fitzpatrick-Schmidt; Victor Champagne; Danielle Cote; ¹Worcester Polytechnic Institute; ²US Army Research Laboratory

5:10 PM
Thermodynamic Analysis of the Suitability of Binary Oxides for MBE Source Materials: Kate Adkison; Brandon Bocklund; Darrell Schlom; Zi-Kui Liu; ¹Pennsylvania State University; ²Cornell University
Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications — Semiconductor Heterostructures II

Program Organizers: John Ayers, University of Connecticut; Ganesh Balakrishnan, University of New Mexico; Phil Ahrenkiel, South Dakota School of Mines & Technology

Wednesday PM
October 17, 2018
Room: B132
Location: Greater Columbus Convention Center

Session Chair: Ganesh Balakrishnan, University of New Mexico

2:00 PM  Introductory Comments

2:05 PM  
Epitaxial Growth of Photonic Crystal Surface Emitting Lasers: Kevin Reilly1; Sadhvikas Addamane1; Emma Renteria1; Akhil Raj Kumar Kalapala1; Seungwon Yeom1; Weidong Zhou1; Ganesh Balakrishnan1; 1University Of New Mexico; 2University Of Texas at Arlington

2:25 PM  
Effect of Core Material on Gas Sensing Properties of Core Shell Nanostructures: Priyanka Karnati1; Sheikh Akbar1; Patricia Morris1; 1The Ohio State University; 2Department of Material Science and Engineering The Ohio State University

2:45 PM  
Electrical Properties of Mo/SiC Schottky Barrier Diodes: Sai Naredla1; Tom Oder1; 1Youngstown State University

3:05 PM  
Plasma-enhanced MOCVD for Growth of Elemental Al on III-V Surfaces: Nikhil Pokharel1; Nathan Smaglik1; Phil Ahrenkiel1; 1South Dakota School of Mines & Technology

3:25 PM  
Restraint of Surface Degeneration during the High Temperature Annealing of AlN Buffer Layer in N2–CO Gas Ambient by Quasi-closed System: Cheng Cheng1; 1National Central University

Small-scale Properties of Materials and Length-scale Phenomena — Mechanical Testing

Program Organizers: Meysam Haghighasas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

Wednesday PM
October 17, 2018
Room: A121
Location: Greater Columbus Convention Center

Session Chairs: Finn Giuliani, Imperial College London; Gaurav Mohanty, Tampere University of Technology

2:00 PM  Invited
Role of Surfaces on the Length-scale Dependence of the Incipient Yield Stress of Ductile Metals: Robert Klassen1; Azm Islam1; Mahdi Bagheripoor1; 1University of Western Ontario

2:20 PM  Invited
Small Scale Mechanical Testing Techniques Applied to Engineering Materials. Benefits and Challenges: Peter Rosemann1; David Frazer1; Cameron Howard1; Anya Prasitthipayongp1; Hi Vo1; David Krumwiede1; 1University of California, Berkeley

2:40 PM  Invited
Exploring the Limits of Additive Strengthening Mechanisms in Nanocrystalline, Nanotwinned Metallic Thin Films: Jessica Krogstad1; 1University of Illinois, Urbana-Champaign

3:00 PM  Invited
Recent Applications of Nanoindentation for Further Understanding of Advanced Structural Materials: Dong-Hyun Lee1; Guanhui Yang1; Jeong-Min Park1; Jae-il Jang1; 1Hanyang University

3:20 PM  Break

3:40 PM  Invited
Reduced Geometry Tensile Samples For Property Evaluation In Stampings From 3rd Generation AHSS: Andrew Forrether1; Grant Justice1; Brian Meacham1; Sheng Cheng1; Alla Sergueeva1; Daniel Branagan1; 1NanoSteel Company Inc

4:00 PM  Invited
The Effect of Thin Carbon and Chemomechanically Softened Layers on the Near Surface Mechanical Properties of Sapphire Tested by Nanoindentation: Stephen Bull1; Arti Yadav1; 1Newcastle University

4:20 PM  
Mechanical Behavior of High Strength Nanotwinned AlMg Alloy: Sichuang Xue1; Qiang Li1; Yifan Zhang1; Han Wang1; Haiyan Wang1; Xinghang Zhang1; 1Purdue University

4:40 PM  Invited
Bulk Moduli and High-Pressure Crystal Structures of Uranium Silicide: Xiaofeng Guo1; Xujie Li1; Joshua White1; Andrew Nelson1; Robert Roback1; Hongwu Xu1; 1Washington State University; 2Center for High Pressure Science & Technology Advanced Research; 3Los Alamos National Laboratory

5:00 PM  Invited
Mechanical Interface Energies for Capturing Grain Boundary Effect in Sub Micron Volumes: Katerina Afantis1; Bryan Kuhr1; 1University of Florida

5:20 PM  Invited
Dynamic TEM In Situ Mechanical Testing: Characterization of Defects Motion at High Strain Rates: Thomas Voisin1; Michael Grapes1; Tian Li1; Jonathan Ligda1; Nicholas Lorenzo1; Brian Schuster1; Melissa Santala1; Yong Zhang1; Geoffrey Campbell1; Timothy Wells1; 1Lawrence Livermore National Laboratory; 2Army Research Laboratory; 3Oregon State University; 4Johns Hopkins University
OCTOBER 14 – 18, 2018
GREATER COLUMBUS CONVENTION CENTER
COLUMBUS, OHIO, USA


Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Mummm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

Wednesday PM
Room: B234
OCTOBER 17, 2018
Location: Greater Columbus Convention Center

Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory

2:00 PM
Assessment of Ferromagnetic Properties of Materials Deposited by Aerosol Deposition: Scooter Johnson1; Syed Qadir1; Sanghoon Shin1; ‘Naval Research Laboratory

2:20 PM
Corrosion Characterization of Thin Aluminium Films Deposited on Mild Steel Substrates by rf Magnetron Sputtering: Fredrick Mwema1; Oluseyi Oladijo1; Esther Akinlabi1; 'University of Johannesburg, APK; 'Botswana International University of Science and Technology

2:40 PM
Applications of Thin Pure Aluminium Films Deposited by Sputtering Techniques: Fredrick Mwema1; Oluseyi Oladijo1; Esther Akinlabi1; 'University of Johannesburg, APK; 'Botswana International University of Science and Technology

3:00 PM
Understanding of Droplets Dynamics and Deposition Area in Electrospraying by Experimental and Modeling Approaches: Xiong (Bill) Yu1; Zhuoying Jiang1; 'Case Western Reserve University

3:20 PM Break

3:40 PM
Die Lubricant Characterization and Properties in High Pressure Die Casting Applications: Chunlei Wang1; Charles Monroe1; 'University of Alabama at Birmingham

4:00 PM
Heat Treatment Optimization of Inconel 718 Cladding on Hot Forging Dies: Aaron Washburn1; Matthew Willard1; David Schwam1; 'Case Western Reserve University

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — Ultrafine Grained / Nanostructured / Composites / Hybrids

Program Organizers: Ali Yousefian1, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linrui Zhao, NRC Aerospace

Wednesday PM
Room: B235
OCTOBER 17, 2018
Location: Greater Columbus Convention Center

Session Chair: Troy Topping, California State University, Sacramento

2:00 PM
Design and Development of Ultrafine-grained, High-strength Silver: Vladilena Gaisina1; Ricardo Komai1; Erik Sease2; Evander Ramos2; Suveen Mathur1; James Saal2; ‘QuesTek Innovations LLC; ‘University of California, Riverside

2:20 PM
High Strength and Deformability of Super-strong Nanotwinned Al(Fe) Alloys: Qiang Li1; Sichuang Xue1; Jian Wang1; Haiyan Wang1; Xinghang Zhang1; ‘Purdue University; ‘University of Nebraska–Lincoln

2:40 PM
Toward Understanding the Negative Influence of Oxygen in Nanograin Size Stability of Fe14Cr4Hf Alloy: Peiman Shabbeigi Roodposhti1; Mostafa Saber1; Ronald Scatteringgood1; Sina Shahbazmohamadi1; ‘University of Connecticut; ‘Oregon Tech; ‘North Carolina State University

3:00 PM
Densification and Flow Stress Analysis of Al-SiCp Metal Matrix Composites Processed by Direct Powder Forging: Erica Bindas1; Jwom Kint1; John Lewandowski1; Matthew Willard1; Don Hashiguchi1; Kyung Chung1; ‘Case Western Reserve Univ; ‘Materion Brush Inc.; ‘Materion Brush Inc.

3:20 PM Break

3:40 PM
Mechanical Anisotropy in Extruded Metal Matrix Composites: Conrad Park1; Erica Bindas1; Ji Xia1; Don Hashiguchi1; Kyung Chung1; John Lewandowski1; Matthew Willard1; ‘Case Western Reserve University; ‘Materion Brush Incorporated

4:00 PM
Nanoporous Stainless Steel with Structural Hierarchy: Alexander Preston1; Kaka Ma1; ‘Colorado State University

4:20 PM
Addressing the Need for Thermophysical Property Data of Metal and Alloys for New Material Development: Boris Wilhan1; V. Diky1; A. Kazakov1; S. Townsend1; Ken Kroelen1; ‘National Institute of Standards and Technology
Additive Manufacturing of Metals: Microstructure and Material Properties — Jet Binder and Wire-based AM Processes

Program Organizers: Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Thursday AM
October 18, 2018
Room: A214
Location: Greater Columbus Convention Center

Session Chair: Howard Kuhn, University of Pittsburgh

8:00 AM
Kinetics of Densification and Microstructural Evolution during Sintering of Binder 3D Printed Alloy 625 Powders: Amir Mostafaei1, Josh Porter1; Pierangeli Rodriguez2; Markus Chinicius1; ‘University of Pittsburgh

8:20 AM
Microstructure and Mechanical Properties of Solid-state Additive Friction Stir Processed Alloy 600 Claddings on 304L Stainless Steel: Biswajit Dalai1; Vijay Vasudevan1; Nanci Hardwick1; Jiangsu Wu1; Chase Cox1; Benjamin Sutton1; Nicholas Mohr; Seetha Mamavadi1; Young Pyun1; ‘ University of Cincinnati; 1Aeroprobe Corp; 1EPRI; 1Sun Moon University

8:40 AM
Parameter Selection for Wire Arc Additive Manufacturing (WAAM) Process: Lobha Wash1; Ahmed El-Shater1; Faress Handy1; Mahmoud Torky1; Hanadi Salem1; Ahmed Mansour1; Mohamed Azzam1; ‘ American University in Cairo; 1American University in Cairo

9:00 AM
Deposition of Aluminum 4043 during Wire Arc Additive Manufacturing: Paul Korinsky1; Eric Kriikku1; Andrew Duncan1; Anna D’Entremont1; John Bobbitt1; Matthew Fosom1; Matthew Van Swol1; Poh-Sang Lam1; William Housley1; 1Savannah River National Laboratory

9:20 AM
Additive Manufacturing of Ti-6Al-4V through Fused Filament Fabrication: Matthew Dunstan1; James Paramore1; Brady Butler1; ‘United States Army Research Laboratory

9:40 AM
In-situ Microstructure Growth Characterization of Wire-fed Electron Beam Additively Manufactured Ti-6Al-4V Components: Nathan Johnson1; Aaron Stebner1; Branden Kappes1; ‘Colorado School of Mines

10:00 AM Break

10:20 AM
Mechanical Properties and Microstructural Characterization of 308L Stainless Steel Processed via Wire Feed Electron Beam Additive Manufacturing: Daniel Coghlin1; Matt Dvornik1; Andrew Duffield1; Patrick Hochanadel1; John Carpenter1; 1Los Alamos National Laboratory

11:00 AM
The Porosity and Mechanical Behavior of 2219-Al Fabricated by Wire and Arc Additive Manufacturing: Xuewei Fung1; Lijuan Zhang1; Hui Li1; Chaolong Li1; Bingheng Lu1; ‘Xi’an Jiaotong University; 1National Innovation Institute of Additive Manufacturing, Xi’an

10:40 AM
Binder-Jet Sintered SAM Alloy vs. SAM Alloy Infiltrated with Bronze: Rina Mudany1; Cameron Shackleford1; Cindy Waters1; Amy Elliott1; ‘North Carolina A&T State University; ‘Oak Ridge National Laboratory

Additive Manufacturing of Metals: Microstructure and Material Properties — Performance of AM Materials

Program Organizers: Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville

Thursday AM
October 18, 2018
Room: A215
Location: Greater Columbus Convention Center

Session Chair: Anthony Rollett, Carnegie Mellon University

8:00 AM
Enhanced Corrosion Response of Additive Manufactured over Wrought 316L Stainless Steel in Acidic Environment: Jahangir Khan Lodhi1; Waseem Haider1; Kashif Miraj Deen1; ‘Central Michigan University; ‘University of British Columbia

8:20 AM
Fatigue Resistance of AlSi10Mg SLM Material Related to Microstructure’s 5 Scales: Julius Domfang1; Ives Nadot1; Gilbert Henaff1; Julien Nicola1; Lionel Ridouz1; ‘ENSMA; ‘École Nationale Supérieure de Mécanique et d’Aérotechnique; 1Pprime / Univ Poitiers; 1Zodiac Aerospace

8:40 AM
High-temperature Performance of Selective Laser Melted AddAlloy™, a L12-Precipitation-strengthened Aluminum Superalloy: Joe Croten2; Seth Griffiths1; Rolf Erni2; Marta Rossell2; Christian Leitenbach2; David Seidman1; David Dunand2; Nhon Vo2; 1NanoAl LLC; 1Empa; 1Northwestern University

9:00 AM
Investigation of the Molybdenum – Titanium System with Additive Manufacturing Methods: Michael Niezgoda1; Dan Thoma1; John Perepeko1; 1University of Wisconsin Madison

9:20 AM
Property Development of New Generation Aluminum Materials via MELD™ Processing: Wayne Daye1; Thomas Pelletiers1; Nanci Hardwick1; Chase Cox1; 1Kymera International; 1Aeroprobe Corporation

9:40 AM
Quantifying the Effect of Preferred Orientations on Response during Plane-Strain Indentation: Mustafa Rifat1; Xi Gong1; Guha Manoharan1; Edward Demeter1; Saurabh Basu1; ‘Penn State

10:00 AM Break

10:20 AM
Role of Composition on Microstructure of Additively Manufactured Functionally Graded Titanium-chromium Alloys: Jonova Thomas1; Deep Choudhuri1; Jon-Erik Mogonye1; Srinivas Manter2; Thomas Scharf1; Rajarshi Banerjee1; ‘Purdue University; 1University of North Texas; 1Army Research Laboratory

10:40 AM
Additive Manufacturing of Magnetically Graded Materials: Felicity Freeman1; Alex Lincoln1; Al Lambourne1; Iain Todd1; ‘University of Sheffield; 1University of Manchester; 1Rolls-Royce plc

11:00 AM
Gas Atomization and Additive Manufacturing of Al-Zn-Mg-Sc-Zr Alloy: Le Zhao1; Holden Hyer1; Sharon Park1; Brandon McWilliams1; Kyu Cho1; Yongho Sohn1; ‘Univ of Central Florida; 1U.S. Army Research Laboratory

11:20 AM
A Study of the Process-geometry Dependency of Material Characteristics in Thin Strut Features Fabricated via Laser Powder Bed Fusion Additive Manufacturing: Shanshan Zhang1; Li Yang1; ‘University of Louisville
Additive Manufacturing of Metals: Post Processing — Post Processing
Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszyński, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

Thursday AM  Room: A216  Location: Greater Columbus Convention Center
Session Chair: Ulf Ackelid, Freemelt

8:00 AM  Comparison of HAZ Simulated Microstructures of As-printed and Wrought 17-4 Stainless Steel: Franklyn Kellogg; Andelle Kudiza; Josh Taggart-Scarf; Brandon McWilliams; SURVICE Engineering; ORAU; US Army Research Laboratory

8:20 AM  Developing Relationships between as Deposited Microstructure and Precipitation Strengthening in Additively Manufactured Materials: Todd Palmer; Scott Meredith; Andrew Iams; Pennsylvania State University

8:40 AM  Gas-phase Alloying and Sintering Kinetics of 3D Printed Nickel Scaffolds: Safa Khodabakhsh; Ashley Paz y Puente; University of Cincinnati

9:00 AM  How Can Digital Technologies and Craftsmanship Provide Solutions for the Heritage Sector?: Ann-Marie Carey; School of Jewellery

9:20 AM  Microstructure of Binder Jet 3D Printed Ti-6Al-4V Parts after Sintering or Hot Isostatic Pressing: Erica Stevens; Samantha Schloder; Eric Bono; David Schmidt; Markus Chmielus; University of Pittsburgh; Carpenter Technology Corporation

10:00 AM Break

10:20 AM  Post-process Curing Effects on Conductivity of Additively Manufactured Silver Pastes for Electric Motor Applications: Valerie Wiesner; Michael Halbig; Mitunyaj Singh; NASA Glenn Research Center; Ohio Aerospace Institute

10:40 AM  Process Chain Optimization in the Case of SLM-based Tool Making: Franz-Josef Villner; Olaf Elstermeyer; OWL UAS; Realizer GmbH, DMG Mori AG

11:00 AM  Production and Post Processing of a Hybrid Additive Manufacturing Heat Exchanger: Adam Hehe; Mark Norfolk; Justin Wenning; John Sheridan; Scott Roberts; Arthur Mastropietro; Fabrisonic LLC; Sheridan Solutions LLC; Jet Propulsion Laboratory

Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Advanced Manufacturing II
Program Organizers: Mohammad Elahiinia, University of Toledo; Markus Chmielus, University of Pittsburgh; Reginald Hamilton, The Pennsylvania State University; Hamdy Ibrahim, University of Tennessee at Chattanooga; Haluk Karaca, University of Kentucky; Mohammad Mahdavi, University of Tennessee at Chattanooga; Reza Mehrabi, University of Toledo; Reza Mirzaefar, Virginia Tech

Thursday AM  Room: B230  Location: Greater Columbus Convention Center

Session Chairs: C. Virgil Solomon, Youngstown State University; Mohammad Mahtabi, University of Tennessee at Chattanooga; Ajay Kumar P., University of Wisconsin-Milwaukee, Materials Dept; Parsa Bayatimalayeri, University of Toledo

8:00 AM Invited  Exploiting Severe Plastic Deformation during Orthogonal Cutting Processes to Prepare Mn-Al Base Alloys for Permanent Magnet Applications: Jaeheuk Jo; Vishwanadh Bathula; Subarna Khanal; Ravi Shankar; Hasso Weiland; Jörg Wiezorek; University of Pittsburgh; Arconic Inc.

8:40 AM  Numerical Modeling of Deformation Behavior of Lattice Structures 3D Printed from Inconel 718 and NiMnGa Powders: C. Virgil Solomon; Stephen Issacco; Rafaela Vannutelli; Christopher Barrett; Matthew Caputo; Youngstown State University

9:00 AM  A Comparative Experimental Investigation of Electric Discharge Machining Process Variants: Krishnakant Dhakar; Akshay Drivedi; Maulan Azad National Institute of Technology; Indian Institute of Technology Roorkee

9:20 AM  The Effect of Mold Temperature on Exudation in Heated Mold Continuous Casting Cu–15%Ni–8%Sn Alloy: Jihui Luo; Yangtze Normal University

9:40 AM  First-principles Study on the Electronic, Optical and Thermodynamic Properties of La _3yo _1-xFe _xO _3 y (x, y =0.0 – 1.0) Perovskites: Ting Jia; Hao Hao; Paul Ohodnicki; Benjamin Charpening; Gregory Hackett; Zhi Zeng; Yuhua Duan; National Energy Technology Laboratory, United States Department of Energy; Key Laboratory of Materials Physics, Institute of Solid State Physics, Chinese Academy of Sciences

10:00 AM Break

10:20 AM  Large-scale Molecular-dynamics Simulations of Solid Phase Epitaxy in Si: Kayo Kohno; Manabu Ishimaru; Kyushu Institute of Technology

10:40 AM  Pressure Development and Wear Analysis of Tapered Screw Extruder Biomass Briquetting Machines: Sunday Ojojo; Ifeoluwa Osialaye; Sehinde Ajiboye; University of Lagos
Advanced Steel Metallurgy: Products and Processing
— General Steel Session II

Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

Thursday AM  Room: A226
October 18, 2018  Location: Greater Columbus Convention Center

Session Chair: Daniel Baker, GM Global Propulsion Systems; Mingzhi Xu, Georgia Southern University

8:00 AM Invited
Nucleation of Graphite Particles Formed in Medium Carbon Steel after Graphitising Anneal: Aqil Inam1; David Edmonds2; Rik Drummond-Brydson2; 1University of the Punjab; 2University of Leeds

8:30 AM
An Investigation of the Machinability of Abrasion Resistant AR450 Steel: Mark Emmendorfer1; Simon Lekakh1; Laura Bartlett1; Ronald O’Malley2; Rick Bodnar2; Sunday Abraham3; Yufeng Wang3; Matthew Werner3; 1Colorado School of Mines; 2Los Alamos National Lab; 3National Institute of Standards And Technology; 3SSAB Americas

8:50 AM
Toughness and Separation Improvement for X70 Pipeline Steel: Emily Mitchell1; Amy Clarke2; Sven Vogel3; Enrico Lucon3; Kester Clarke2; 1Colorado School of Mines; 2Colorado School of Mines; 3University of Leeds

9:10 AM
Cyclic Intercritical Heat Treatment of AISI 1045 Steel: Srinath Bayya1; Saeed Saboury2; 1Bradley University; 2Bradley University

9:30 AM
Hydrogen Effects in Microstructure Development during Steel Processing: Haoxue Yan1; Zhiyuan Liang1; Mohadesheh Mousavi1; C. Cem Tasan2; 1Massachusetts Institute of Technology; 2Texas A&M University

9:50 AM
Effect of Fire on Mechanical Properties and Microstructure of Steel Bars Produced in Bangladesh: Shubhrodev Bhowmik1; Rashidun Shaowun1; Sayem Shahriar1; 1Bangladesh University of Engineering and Technology

10:10 AM Break

10:30 AM
Microstructure Evolution and Dynamic Recrystallization Kinetics under Heavy Reduction: Ji Cheng1; Yang Qi1; Zhu Miaoyong1

10:50 AM
The Influence of Transformation Induced Plasticity on Damage Development in QP1500: Concetta Pelligr1; Javad Samei2; David Wilkinson1; 1McMaster University

Advanced Steel Metallurgy: Products and Processing
— General Steel Session III

Program Organizers: Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

Thursday AM  Room: A223
October 18, 2018  Location: Greater Columbus Convention Center

Session Chairs: Justin Raines, SSAB Americas; Charles Enloe, General Motors

8:00 AM
Electron and Atom Probe Microscopic Analysis of Inverse Bainite Transformation in Hypereutectoid Steels: Rangasayee Kannan1; Yiyu Wang1; Sudarsanam Babu1; Leijun Li2; 1University of Alberta; 2University of Tennessee

8:20 AM
Analysis of Orientation and Size of the Cylindrical Voids Inside Steel Blocks Using FEM and Ultrasonic Time of Flight Diffraction Technique: Abolfazl Zolfaghari1; Davood Shahriari1; Amin Zolfaghari1; 1Department of Mechanical Engineering, Tennessee Technological University; 1Department of Mechanical Engineering, École de Technologie Supérieure; 1Department of Mechanical Engineering, Ferdowsi University of Mashhad

8:40 AM
Reverse Transformation Behavior from Martensite to Austenite in Ni-C Steels Studied by In-situ SEM/EBSD Analysis: Ooura Natsum1; Kazuki Fujwara1; Kaori Kawano1; Nobuhiro Tsuji1; 1Nippon Steel & Sumitomo Metal; 1Kyoto University

9:00 AM
Steel Self-monitoring of Stress and defects by Capacitance Measurement, Enabled by the Electric Permittivity and Piezoelectricity of Steel: Deborah Chung1; Kairong Shi2; 1State University of New York Buffalo; 2Central Iron and Steel Research Institute

9:20 AM
Effect of SO2 on Rust Evolution and Anti-corrosion Performance of Weathering Steel: Guiqin Fu1; Dongliang Li1; Miaoyong Zhu1; 1Northeastern University

9:40 AM
Development and Application of Anti-corrosion Steel for the Inner Bottom of Cargo Oil Tanks: Xiaobing Luo1; Feng Chai1; Hang Su1; Cifu Yang1; Hao Li1; Yaqing Hou1; Xuehui Chen1; 1Central Iron and Steel Research Institute

10:00 AM Break

10:20 AM
Thermodynamics Study of Siderite Fluidized Magnetization Roasting Process: Qiang Zhao1; Jilai Xue1; 1University of Science and Technology Beijing

10:40 AM
Flow Field Simulation Study on the Iron Ore Particle in Fluidized Magnetization Roasting Reactor: Qiang Zhao1; Jilai Xue1; 1University of Science and Technology Beijing
**Advances in Solid Oxide Fuel Cell Technology — SOFC Research and Development**

*Program Organizers:* Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

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<td>8:20 AM</td>
<td>Optimised Composite Cathodes for SOFC: Guttorm Syvertsen-Wig; Sophie Labornote-Weber; Maria Angelvet; Andreas Richter; Kjell Wiik</td>
<td>Cerotech; Norwegian University of Science and Technology</td>
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<td>Engineering of Microstructures of Protonic Ceramics by A Novel Rapid Laser Deposition for IT-SOFC Fabrication of LSGM Thin Films on Porous Anode Supports by Pulsed Laser Sintering and Electrical Conductivity Properties of La1-xCaxCr0.33Fe0.33Ni0.33O3 For SOFC Applications: Sai Gajjala; Rasit Koc</td>
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<td>9:00 AM</td>
<td>Fabrication of LSGM Thin Films on Porous Anode Supports by Pulsed Laser Deposition for IT-SOFC: Subhajit Pan; Koushik Biswas</td>
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<td>Effect of Nickel Catalyst Impregnation on Ni-YSZ Cermet Electrode Polarization Using Symmetric Cells: Boshan Mo; Paul Gasper; Yanchen Lu; Soumendra Basu; Uday Pal; Srikant Gopalan</td>
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**Advances in Surface Engineering — Functional Coatings/Films/Surface Features**

*Program Organizers:* Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

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<td>Surface Modification of Carbon Nanotube Carpets for Wettability Tailoring: Kimia Kiaei; Lvmeng He; Sharmila Mukhopadhyay</td>
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<td>8:20 AM</td>
<td>Carbon Nanotube Dispersion in Solvents and Polymer Solutions: Mechanisms, Assembly, and Preferences: Chandrani Pramanik; Jacob Gissinger; Satish Kumar; Hendrik Heinz</td>
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<td>Thermal Conductivity of Poly (3,4-ethylenedioxythiophene) Films Engineered by Oxidative Chemical Vapor Deposition (oCVD): Phil Smith; B. Reeja-Jayan</td>
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<td>Electro Chemical Characterization of Mechanically Exfoliated Graphite Based Organic Dye Sensitized Solar Cell (DSSC): Muhammad Manzoor; Muhammad Butt; Tahir Ahmad; Muhammad Kamran</td>
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**Ceramics and Glasses Simulations and Informatics — Atomistic Simulations**

*Program Organizers:* Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory

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Predicting Reduction Conditions and Temperature Dependent Properties of Mayenite Electrode by Density Functional Theory Calculations: Zheng Yi1; Bu Wang2; ‘University of Wisconsin Madison; ‘UW-Madison

9:20 AM
Phonon Engineering for Tunable Thermal Expansion of RE-silicate EBC
Candidates: Jingyang Wang1; ‘Shenyang National Laboratory for Materials Science, Institute of Metal Research,

9:40 AM
Fission Product Diffusion in Silicon Carbide: A Computational Study: Nanjun Chen1; Qing Peng1; Fei Gao1; Zhijie Jiao1; Isabella Van Rooyen2; ‘University of Michigan; ‘Idaho National Laboratory

10:00 AM Break

10:20 AM
Transparency Enhancement for SrVO3 by SrTiO3 Mixing: A First-principles Study: Zhi Liu1; Nikolas Podraza2; Sanjay Khare3; Pankaj Sarin4; ‘University of Toledo; ‘Oklahoma State University

10:40 AM
MXenes with Wide Band Gaps and Novel Magnetic Properties: Weiwei Sun1; Yu Xie2; Paul Kent1; ‘Oak Ridge National Laboratory; ‘Rice University

11:00 AM
Accurate Simulation of Oxides and Hydroxides Up to the Large Nanometer Scale: Krishan Kanhaiya1; Michael Nathanson2; Hendrik Heinz3; ‘University of Colorado Boulder

11:20 AM
Effect of Water Vapor Pressure on Phase Transformation Rate of t’-Yttria Stabilized Zirconia: Amir Saeidi1; Daniel Mumm1; ‘University of California Irvine

11:40 AM
Ion Irradiation and Microstructure Alterations of Ceramic Materials: Eva Zarkadoula1; Yanwen Zhang1; William Weber2; ‘Oak Ridge National Laboratory; ‘University of Tennessee

Characterization & Methods in Failure Analysis — FAS-IMS Failure Analysis Applications of Microanalysis, Microscopy, Metallography & Fractography
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Thursday AM Room: A211
October 18, 2018 Location: Greater Columbus Convention Center

Session Chairs: Daniel Dennies, DMS, Inc.; Amber Dalley, RJ Lee Group; James Lane, Professional Analysis and Consulting Inc; Burak Akyuz, Applied Technical Services Inc; Brett Miller, IMR Metallurgical Services; Andrew Havics, pH2, LLC

8:00 AM Invited
In-situ Micro Mechanical Testing on High-strength Nanotwinned Al Alloys and Gradient Structured Ni Alloys: Qiang Li1; Jie Ding1; Sichuang Xue1; Haiyan Wang2; Xinghang Zhang3; ‘Purdue University

8:40 AM Invited
Improvements in EDS Design and the Impact on Analyzing Polymer Materials: Michael Hjelmstad1; ‘Oxford Instruments

9:00 AM
Ganilization of Metallurgical Lab Practice Teaching by Failure Analysis: Véronique Vitry1; Fabienne Deaunois1; ‘UMONS

9:20 AM
The Metallurgy of Fire Cause and Origin Analysis: Kale Stephenson1; Brad James1; ‘Exponent

9:40 AM Invited
Failure Analysis of a Dissimilar Metal Braze Joint: Brett Miller1; Phillip Swartzentruber1; Justin Barnes1; ‘IMR Test Labs- Louisville

10:00 AM Break

10:20 AM
Failure Analysis of Heating Coils: Abdulmohsen Alsahl1; Abdelgader Abdelgalil1; Abdulaziz Al-Meshari1; ‘Saudi Basic Industries Corp. (Sabic)

10:40 AM
Failure Analysis of T91 Grade Reheater Tube of a Supercritical Power Plant: Ravi Kumar Yadavalli1; Anand Varma1; ‘NTPC LTD

11:00 AM
Metallurgical Evaluation of a 9310 Steel Bevel Gear Used for a Commercial Aircraft Engine Application: Jonathan Morales1; ‘GE Aviation

11:20 AM
Oil Heater Tube Failure due to Excessive Untended Carburization: David Williams1; ‘Engineering Design & Testing Corp.

Deformation and Transitions at Grain Boundaries VI — Gradients near Grain Boundaries
Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

Thursday AM Room: A123
October 18, 2018 Location: Greater Columbus Convention Center

Session Chairs: Bing Liu, Xi’an Jiaotong University; Jicheng Gong, Oxford University

8:00 AM
After Six Decades of Hall-petch Relationship: A New Exponential Function for Better Correlation of Grain Size Effect on Strength of Iron/Steel over Multiple Length Scales: K. S. Ravi Chandran1; ‘University of Utah

8:20 AM
Anisotropy Grading Enables Simultaneous Increase in Strength and Ductility in Nanostructured Alloys: Seyyedeh Mohadeseh Taheri Mousavi1; Dingshun Yan2; Dierk Raabe3; C. Cem Tasan1; ‘MIT; ‘Institute of Mechanics, Chinese Academy of Sciences; ‘Max-Planck-Institut für Eisenforschung

8:40 AM
Leveraging FFT Based Crystal Plasticity Models to Predict Texture Evolution and Activity of Deformation Modes in NiCoCr Medium Entropy Alloy: Supriyo Chakraborty1; Connor Slone1; Michael Mills1; Stephen Niezgoda1; ‘The Ohio State University

9:00 AM
Mechanical Behavior Study of Structurally Gradient Ni Alloy by In-situ Micropillar Compression Tests: Jie Ding1; Qiang Li1; Jin Li1; Sichuang Xue1; Zhe Fan2; Haiyan Wang2; Xinghang Zhang3; ‘Purdue University; ‘Oak Ridge National Lab

9:20 AM
Microstructure Analysis of Ti-6Al-4V Chips Obtained from Turning Using Electron Backscatter Diffraction Mapping: Jianwei Lu1; Thomas Bieler1; Patrick Kwon1; ‘Michigan State University
9:40 AM Invited

Size Effect in Sn Grain Boundary Sliding: Jicheng Gong; Angus Wilkinson; 1Materials Department, Oxford University

10:10 AM Break

10:30 AM Invited

Characterization of Interface Dislocations: Jian Wang; 1University of Nebraska–Lincoln

11:00 AM

The Effect of Grain Size, Parent Orientation and Loading History on Crystallographic Misorientation after Deformation in Two BCC Titanium Alloys: Fahad Khadem; Carl Boehler; Thomas Bieler; 1Michigan State University

11:20 AM

The Role of Phase Boundaries in Damage Behavior of Metastable Dual-phase High-entropy Alloy: An In-situ SEM/EBSD Investigation: Shaohou Wei; Jinwoo Kim; Cemal Tasan; 1Massachusetts Institute of Technology

11:40 AM

Deformation Accommodation at Triple Junctions in Columnar-grained Nickel: Mingjie Li; David Duquette; Ying Chen; 1RPI

12:00 PM

Formation of the Grain Boundary Structure of Low-allowed Steels in the Process of Plastic Deformation: Sergey Sheiko; George Sukhomlin; Valerii Mishchenko; Vadim Shalomcev; Valentina Tretiak; 1Zaporizhzhya National Technical University; 2Pridneprovsk State Academy of Civil Engineering and Architecture; 3Zaporozhye National University

Eco-Friendly and Sustainable Ceramics — Innovative Sustainable Building Materials

Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancelotti, Universita di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry “Rostislav Kaischew”; Vilma Ducman, Slovenian National Building and Civil Engineering Institute

Thursday AM

Room: A114

October 18, 2018

Location: Greater Columbus Convention Center

Session Chairs: Francois Mear, Université Lille 1; Ronan Lebullenger, Université de Rennes 1

8:00 AM Introductory Comments

8:20 AM

Mechanical and Fracture Performance of Cellulose Fibers Based Geopolymeric Composite Incorporating Wastes: Gianmarco Tavari; Ivo Dlouhy; 1Institute of Physics of Materials (IPM)

8:40 AM

Marble-like Cordierite-containing Glass-ceramics from ‘Reactive Sinter-crystallization’ of Recycled LCD Glass and Engineered Additives: Enrico Bernardo; Acacio Rincon Romero; Yuta Nagano; Ken Choji; 1University of Padova; 2Nippon Electric Glass Co., Ltd

9:00 AM

Production of Low-temperature Stoneware Tiles with Borosilicate Glass Waste as Flux: Magdalena Lassinantti Gualtieri; Consuelo Mugoni; Denia Mazzini; Cristina Siligardi; 1University of Modena and Reggio Emilia, Department of Engineering “Enzo Ferrari”; 2Colorobbia Italia S.P.A.

9:20 AM

Microwave Process Development of the Municipal Solid Waste Incinerator Bottom Ash: Georgia Flesoura; Beatriz Garcia-Banos; Jose Manuel Catala-Civera; Josef Vleugels; Yiannis Pontikes; 1KU Leuven; 2Universitat Politècnica de Valencia

9:40 AM

Upcycling of Porcelain Stoneware Polishing Waste into Highly Porous Ceramic Foams: Patricia Rabelo Monich; Acacio Rincon Romero; Federico Bottaro; 1Enrico Bernardo; 2University of Padova

10:00 AM

Fatigue Mechanisms of Lead Free (Bi1/2Na1/2)TiO3-BaTiO3 Piezoceramic System: xi shi; Nitish Kumar; Mark Hoffman; 1University of New South Wales

Fast/Ultrafast Characterization of Irreversible Transformations in Materials with X-rays and Electrons — Fast TEM Imaging - Phase Transformation and Beyond

Program Organizers: Tian Li, Lawrence Livermore National Laboratory; Tao Sun, Argonne National Laboratory; Anders Madsen, European XFEL

Thursday AM

Room: B246

October 18, 2018

Location: Greater Columbus Convention Center

Session Chair: Tian Li, Lawrence Livermore National laboratory

8:00 AM Invited

Rapid Solidification of Al-based Alloys Using In-situ Dynamic Transmission Electron Microscopy: Joseph McKeown; 1Amy Clarke; Christian Leinenbach; Seth Griffiths; John Roehling; Jörg Wiesorek; Manyalibo Matthews; 2Lawrence Livermore National Laboratory; 3Colorado School of Mines; 4Empa; University of Pittsburgh

8:30 AM Invited

New Insights into Metallic Alloy Microstructural Evolution by In-situ Characterization: Amy Clarke; Joseph McKeown; 2Damien Tourret; Seth Imhoff; Paul Gibbs; John Roehling; Kamil Fezzaa; Tao Sun; Francisco Coury; Joseph Jankowski; Adam Stokes; Yaofeng Guo; Dan Coughlin; Michelle Espy; Frank Merrill; Therion Rodgers; Jonathan Madison; Alain Karma; 2Colorado School of Mines; 3Lawrence Livermore National Laboratory; 4IMEDA Materials Institute; 5Los Alamos National Laboratory; 6Argonne National Laboratory; 7Sanda National Laboratories; 8Northeastern University

9:00 AM

Transmission Electron Microscopy Study of the Transition from Cooperative Two-phase Growth to Partitionless Single-phase growth in Hypo-eutectic Al-Cu Alloys during Rapid Solidification: Jörg Wiesorek; Joseph McKeown; Vishnuwadah Bathula; 1University of Pittsburgh; 2Lawrence Livermore National Laboratory

9:20 AM

Observing Nanometer-scale Dendrite Growth in Aluminum Alloys: John Roehling; Tomorr Hashimali; Aurelien Perron; Adam Stokes; Amy Clarke; Manyalibo Matthews; Joseph McKeown; 2Lawrence Livermore National Laboratory; 3Colorado School of Mines
9:40 AM Invited
Measuring Crystal Growth Rates in an Amorphous Ag-In-Sb-Te Phase-change Material over Large Temperature Ranges Using In-situ Microscopy Techniques: Victoria Bird; Al Rise; Khim Karki; Daan Heijnse; Geoffrey Campbell; Melissa Santala; Tae Wook Heo; Geoffrey Campbell; Lawrence Livermore National Laboratory

10:00 AM Break

10:00 AM Dynamic TEM Characterization of a Liquid-mediated Nucleation Mechanism for Explosive Crystallization of Amorphous Germanium: Garth Egan; Tae Wook Heo; Geoffrey Campbell; Lawrence Livermore National Laboratory

10:20 AM Break

10:40 AM Invited
Computational Design of Metal Oxides to Enhance the Wetting and Adhesion of Silver-based Brazes on Yttria-Stabilized-Zirconia: Thanaphong Phongsrithamm; Jason Nicholas; Thomas Bieler; Yue Qi; Michigan State University

10:40 AM Atomistic Modeling of La3+ Doping Segregation Effect on Nanocrystalline Yttria-stabilized Zirconia: Shendi Zhang; Haoyan Sha; Ricardo Castro; Roland Faller; University of California, Davis

11:00 AM Modeling 3D Dendritic Solidification Using Lattice Boltzmann Method with Multiple Grids: Elaebeh Dorari; Mohsen Esfrazghi; Sergio Felicelli; The University of Akron; California State University

11:20 AM A Discrete Dislocation Loop Based Model to Study Elastic Fields Due to a Twin: Yubrej Paudel; Christopher Barrett; Haitham El Kadi; Mississippi State University

Joining of Advanced and Specialty Materials (JASM XX) — Dissimilar Materials Joining
Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barbarok, WeldQC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Thursday AM
Room: C171
Location: Greater Columbus Convention Center

Session Chairs: Zhenzhen Yu, Colorado School of Mines; Judy Schneider, University of Alabama At Huntsville

8:00 AM Characterization of Dissimilar Metal Welds between Low Alloy Steel Butter Welds and Grade F65 Steel Using Alloy 625 Filler Wire: Ryan Buntain; Ohio State University

8:20 AM Development of Graded Transition Joints for Avoiding Failure of Dissimilar Welds in High Temperature Service.: Jonathan Gallet; John DuPont; Lehigh University

8:40 AM High Temperature Mechanical Behavior near the Fusion Boundary in Grade 91 Steel Dissimilar Metal Welds: Michael Kuper; Boian Alexandrov; Joshua Burgess; Ohio State University; GE Power

9:00 AM Microstructural Evolution of Dissimilar Metal Welds Involving Grade 91: Sean Orzolek; John DuPont; John Seifert; Lehigh University; Electric Power Research Insitute

9:20 AM Microstructural Characterization of Low Alloy Steel Girth Welds for Joining of Internally Clad X65 Pipes: Alejandro Alvarez; Boian Alexandrov; The Ohio State University
9:40 AM  
Improving Dissimilar Titanium-stainless Steel Fiber Laser Joint Strength through the Changing of Single Interlayer Thickness: Seyed Reza Elmi Hosseini; Kai Feng; Pulin Nie; Ke Zhang; Jian Huang; Zhuguo Li; Hiroyuki Kokawa; 'Shanghai Key Laboratory of Materials Laser Processing and Modification; 'Shanghai Key Laboratory of Materials Laser Processing and Modification, School of Materials Science and Engineering, Shanghai Jiao Tong University

10:00 AM  Break

10:20 AM  
Effect of Electrode Material on Dissimilar Joints between Grade 70 SA-516 and Grade B SA-517 Carbon Steels: Fahad Riaz; Muhammad Kamran; Atif Makhdoom; Tahir Ahmad; Faran Bilal; 'University Punjab Lahore

10:40 AM  
Can Polymer be Welded to Metal?: Fengchao Liu; Pingsha Dong; Wei Lu; Kai Sun; 'University of Michigan

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Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

Thursday AM  Room: D181  Location: Greater Columbus Convention Center
October 18, 2018

Session Chairs: Gary Pickrell, Virginia Tech; Navin Manjooran, Siemens AG

8:00 AM  Introductory Comments

8:40 AM  
The Effect of Core Size and Coating Layers on the Hypertermia Performance of Iron Oxide, Manganese Ferrite, Magnesium Ferrite and Strontium Ferrite Superparamagnetic Nano Particles: Celaleddin Ergun; Mona Nejatpour; Esra Alveroglu; Yakup Boke; 'Istanbul Technical University

9:00 AM  
Two-dimensional Chiral-chain Van Der Waals Crystal Tellurene for High Performance Photothermal Conversion: Ruoxing Wang; Wenzhao Wu; 'Purdue University

9:20 AM  
Understanding the Mechanism of TiO2 Nanotubes Formation at Low Potentials (= 8 V) through Electrochemical Methods: Umar Shah; Waseem Haider; 'Central Michigan University

9:40 AM  
On the Design of Novel Paticulates from MAX Phases: Surejit Gupta; 'University of North Dakota

10:00 AM  Break

10:20 AM  
Nanoscale Materials for Catalysis, Synthetic Fuels and for Chemical Energy Conversion: Khurram Joya; 'KFUPM

10:40 AM  
Novel, Non-toxic Graphene Quantum Dots for Cancer-imaging and Diagnostic Systems: Suparnamaaya Prasad; 'Massachusetts Institute of Technology

11:00 AM  Concluding Comments
Small-scale Properties of Materials and Length-scale Phenomena — Structure II
Program Organizers: Meyssam Haghshenas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

Thursday AM  Room: A121
October 18, 2018  Location: Greater Columbus Convention Center

Session Chairs: Jessica Krogstad, University of Illinois at Urbana-Champaign; Meyssam Haghshenas, University of North Dakota

8:00 AM Invited
Interlayer Confinement Phenomena and Thermodynamics – Structure – Property Relations in Layered Double Hydroxide Nanostructures: Xi Wu1; Gengnan Li1; Dantong Qu1; Chen Yang1; Washington State University

8:20 AM
Time-dependent Mechanical Properties of Lithium Metal Studied by Nanoindentation: Ikhai Wang1; Xingcheng Xiao1; Yang-Tse Cheng2; University of Kentucky; Chemical and Materials Systems, General Motors Global Research and Development Center

8:40 AM Invited
On Determining Stress-Strain Curves and the Fracture Toughness of Metal Feedstock Powder for Additive Manufacturing with Nanoscale Instrumented Indentation Testing: Bryer Sousa1; Derek Tsaknopoulos1; Victor Champagne2; Danielle Cote3; Worcester Polytechnic Institute; US Army Research Laboratory

9:00 AM Invited
Synthesis of Two-dimensional Transition Metal Nitrides for Energy Storage and Beyond: Xu Xiao1; Yury Gogotsi2; Drexel University

9:20 AM Invited
The Mechanics of Reinforcement of Nanocomposites by 2D Materials: Dimitrios Papageorgiou1; Ian Kinloch1; Robert Young1; University of Manchester

9:40 AM Invited
Collective Motion of Dislocation Associated with Local Plasticity Initiation and Subsequent Behavior in bcc Metals: Takahito Ohmura1; National Institute for Materials Science

10:00 AM Break

10:20 AM
Investigating the Effect of Severe Surface Plastic Deformation on Sensitization and the Tensile Behavior of AA5083: Denise Yin1; Heather Murdoch1; B. Hornbuckle2; Joseph Labukas3; U.S. Army Research Laboratory

10:40 AM
Nanoscale Structure-Property Relationships of Polyacrylonitrile/CNT Composites as a Function of Polymer Crystalinity and CNT Diameter: Jacob Gissinger1; Chandrani Pramanik2; Bradley Newcomb3; Satish Kumar4; Hendrik Heins5; University of Colorado Boulder; Georgia Institute of Technology

11:00 AM
Isolating Solute Effects in Grain Boundary Strengthening Using Nanoindentation: Prasad Pramod Soman1; Erik Herbert1; Katerina Aifantis2; Stephen Hackney3; Michigan Technological University; University of Florida
Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications —
High Temperature and other High Performance Alloys

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Thursday AM
October 18, 2018
Location: Greater Columbus Convention Center

Session Chair: Linruo Zhao, National Research Council of Canada

8:00 AM
Quality Assurance of the GTE Cast Blades Protective Coating: Pavel Zhemanyuk1; Vladimir Klochikhin1; Valeriy Shilo1; Aleksey Pedash1; Valeriy Naumyk2; 1JSC «Motor Sich»; Zaporozhye National Technical University

8:20 AM
Processing Scalability and Quaternary Additives for Improved Mo Matrix Mo-Si-B: Peter Marshall1; 1Imaging Systems Technology

8:40 AM
Cyclic Oxidation Performance of Three Ni-based Superalloys at 900°C in Air: Mallikarjuna Heggdahdevanapura Thammaiah1; William Caley1; Norman Richards1; 1University of Manitoba

9:00 AM
Heat Treatable Cr-based Alloys and the Improvement of their Oxidation Resistance by Alloying: Anke Ulrich1; Petra Pfizenmaier2; Ali Soleimani-Dorcheh1; Uwe Glatzel1; Mathias Galetz1; 1DECHEMA-Forschungsinstitut; 2University Bayreuth

9:20 AM
Ultra-conductive Alloys for Low-volume, Low-weight Applications: Keerti Kappagantula1; Frank Kraft1; 1Ohio University

9:40 AM
Hot Cracking Phenomena in Light-weight Armor Steel: William Evans1; Katherine Sebeck2; 1The Ohio State University; 2TARDEQ
POSTER SESSION
WITH PRESENTERS

The poster session is divided into 3 separate presentation times (P1, P2, and P3) and grouped by topic area.

Poster presenters only need to stand by their posters during their designated presentation time.

All poster sessions will be held on Tuesday, October 16.

**Poster Session I (P1) - 11:00 a.m. – 12:00 pm.**
- Additive Manufacturing
- Ceramic and Glass Materials
- Failure Analysis
- Iron and Steel (Ferrous Alloys)
- Materials-Environment Interactions
- Nanomaterials

**Poster Session II (P2) - 12:00 p.m. – 1:00 p.m.**
- Biomaterials
- Electronic and Magnetic Materials
- Energy
- Fundamentals, Characterization, and Computational Modeling

**Poster Session III (P3) - 4:45 p.m. – 5:45 p.m.**
- Processing and Manufacturing
- Late News Poster Session
Additive Manufacturing of Composites and Complex Materials III — Poster Session
Program Organizers: Dirk Lehnhus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-1: 3D Printed, Carbon Fiber Reinforced Functionally Graded Lattices for Energy Absorption: Jason Walker1; Emil Bonanno1; Trevor Leonard1; Mckenzie Scheckelhoff1; Efrain Velez2; Brett Conner1; 'Youngstown State University
P1-2: Additive Manufacturing of Clay Modified with Electric Arc Furnace Steel Dust (EAF Dust): Edisson Ordonez1; Henry Colorado1; 'Universidad de Antioquia
P1-3: Additive Manufacturing of Waste Tire Powders Based Composite Materials: Carlos Revelo1; Mauricio Correa1; Henry Colorado1; 'Universidad De Antioquia
P1-4: Evaluation of Multiple Additive Manufacturing Approaches to Design and Fabricate Functionally Graded Materials: Timothy Daugherty1; Brian Vukasanovich1; Jason Walker1; Pedro Cortes1; Brett Conner1; 'Youngstown State University

Additive Manufacturing of Metals: Microstructure and Material Properties — Poster Session
Program Organizers: Andrzej Wojcieszynski, ATI Specialty Materials; Sudarsanam Babu, The University of Tennessee, Knoxville

Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-5: Effect of the Powder Fusion Vector on the Properties of Samples, Manufactured by Additive Technology: Pavel Zhemanyuk1; Vladimir Klochikhin1; Nicolay Rud1; Valery Naumykh1; 'JSC «Motor Sich»; 'Zaporozhzhya National Technical University
P1-6: Fatigue Life Study of Additively Manufactured IN718 under Varied Process Parameters: Mahemaa Rajasekaran1; Christopher Kantzov1; Anthony Rollet1; 'Carnegie Mellon University
P1-7: Microstructure and Mechanical Properties of Al-Si-Fe-Cu-Zn Alloys with Mn and Ca Addition: Jong-Ho Kim1; Hyo-Sang Yoo1; Hyeon-Taek Son1; 'Korea Inst Of Industrial Tech
P1-8: Microstructure and Mechanical Properties of Binder Jet 3D Printed Co-Cr-Mo Biomedical Alloy: Pierangeli Rodriguez1; Amir Mostafaei1; Markus Chmielius1; 'Univ of Pittsburgh
P1-9: Residual Stress Mapping of As-built and HIP GRCop-84 Fabricated by SLM: Robert Minneci1; Jeff Bunn1; Zachary Jones1; Terri Tramel1; Claudia Rawn1; 'The University of Tennessee; 'Oak Ridge National Laboratory; 'NASA Marshall

Additive Manufacturing of Metals: Post Processing — Poster Session
Program Organizers: Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville; Ola Harrysson, North Carolina State University; Ulf Ackelid, Freemelt AB; Sudarsanam Babu, Indian Institute of Technology Madras

Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-10: Study Effects of Cyclic Thermal Gradients on Ti-6Al-4V by In-situ TEM Heating Experiment upon Additive Manufacturing Growth Conditions: Meiyue Shao1; Cheng-Han Li1; Curtis Frederick2; Sudarsanan Babu1; Joerg Jinschel1; 'The Ohio State University; 'The University of Tennessee
P1-11: The Investigation of Defects in Additively Manufactured Nickel Superalloy and Optimized Processing Parameter: Cong Liu1; Iain Tod1; 'University of Sheffield

Additive Manufacturing: In-situ Process Monitoring and Control — Poster Session
Program Organizers: Ulf Ackelid, Freemelt AB; Sudarsanam Babu, The University of Tennessee, Knoxville; Ola Harrysson, North Carolina State University

Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-12: Effect of HIP on Laser Powder Bed Fused & Electron Beam Melted Parts: Jason Walker1; William Bevan1; Michael Juhasz1; Brett Conner1; Anna Rashid1; 'Youngstown State University
P1-13: Influence of Post Processing upon the Mechanical Properties of Additively Manufactured Titanium Alloy Octet Lattice Structures: Andrew Neils1; Abbas Moftakhar1; Liang Dong1; Haydn Wadley1; 'University of Virginia Department of Materials Science; 'General Electric

Additive Manufacturing: Post Processing — Poster Session
Program Organizers: Ola Harrysson, North Carolina State University; Sudarsanam Babu, The University of Tennessee, Knoxville; Ola Harrysson, North Carolina State University

Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-14: A Flash Thermography Technique for In-situ Inspection for the Laser Powder Bed Fusion Process: Bin Zhang1; Letchuman Sriparagash1; Zachary Reese1; Angela Allen1; Christopher Evans1; 'University of North Carolina at Charlotte; 'Siemens Corporate Technology

POSTERS
Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics — Poster Session

*Program Organizers:* Jing Zhang, Indiana University-Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Xinghua Yu, Oak Ridge National Laboratory; Yeongil Jung, Changwon National University

**Tuesday AM**
**October 16, 2018**
**Location:** Greater Columbus Convention Center
**11:00 AM - 12:00 PM**

**Session Chairs:** Jing Zhang, Indiana University - Purdue University Indianapolis; Jing Zhang, Indiana University - Purdue University Indianapolis

**P1-15:** Microstructure Evolution during Cold Spray by Molecular Dynamics Simulation: Bowen Deng1; David Hobbs1; 'Montana Tech of the University of Montana

**P1-16:** Using Computer Vision for Microstructure Analysis: Bo Lei1; Elizabeth Holm1; 'Carnegie Mellon University

Advanced Coatings for Wear and Corrosion Protection — Poster Session

*Program Organizers:* Evelina Vogli, LM Group Holdings Inc; Fei Tang, DNV GL; Timothy Hall, Faraday Technology, Inc.; Jing Xu, Faraday Technology Inc.; Saitosh Vojap, Faraday Technology, Inc.

**Tuesday AM**
**October 16, 2018**
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**11:00 AM - 12:00 PM**

**Session Chairs:** Evelina Vogli, LGMH; Fei Tang, DNV GL; Timothy Hall, Faraday Technology Inc.

**P1-54:** Microstructure and Densification of Al-Cr-Si Alloy Target Prepared by Using Gas-atomization and Spark Plasma Sintering: Hyoem-Taek Son1; Yong-Ho Kim1; Hyo-Sang Yoo1; 'Korea Institute of Industrial Technology

Advanced Steel Metallurgy: Products and Processing — Poster Session

*Program Organizers:* Justin Raines, SSAB Americas; Charles Enloe, General Motors; Emmanuel De Moor, Colorado School of Mines

**Tuesday AM**
**October 16, 2018**
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**11:00 AM - 12:00 PM**

**P1-38:** Computational Prediction of Hot Cracking during Welding of HSLA Steels: Maddie McAllister1; Badri Narayanan1; Michael Kottman1; Eric Gulliver1; 'Case Western Reserve University; 'Lincoln Electric

**P1-40:** Effects of Pre-dispersed and Surface-modified ALTi-MgO Nanoparticles on Inclusion Characteristics in Carbon Structural Steel: Hao Guo1; Shufeng Yang1; Jingshe Li1; Jikang Li1; Tianlian Wang1; Hongbo Zheng1; 'University of Science and Technology Beijing

**P1-41:** Evolution Behaviors and Mechanisms of Internal Crack Healing in Steels at Elevated Temperatures: Ruishan Xin1; 'HBIS Group Technology Research Institute

**P1-42:** Research on Improving Slab Internal Quality under Heavy Reduction Technology: Guangyun Wei1; Jianxin Li1; Jinbao Chang1; Shuangjiang Li1; Li Sun1; 'HBIS GROUP

**P1-43:** Steel Inclusion Classification Using Computer Vision and Machine Learning: Nan Gao1; Elizabeth A. Holm1; 'Carnegie Mellon University

Ceramic and Crystal Materials for Optics and Photonics — Poster Session

*Program Organizers:* Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikuesu, World-Lab. Co., Ltd; Mark Dubinsky, Amy Research Laboratory

**Tuesday AM**
**October 16, 2018**
**Location:** Greater Columbus Convention Center
**11:00 AM - 12:00 PM**

**P1-17:** Densification and Grain Growth of Y2O3-MgO Nanocomposite during Two-step Sintering: Doo Hyun Choi1; Seok-Min Yong1; Seok-Young Ko1; Kisum Lee1; Dong-Ik Cheong1; 'Agency for Defense Development

**P1-18:** Fabrication of Nano-grained MgAl2O4 Spinel Using Sinter-HIP Process: Seok-Young Ko1; Kisum Lee1; Doo Hyun Choi1; Seok-Min Yong1; Dong-Ik Cheong1; 'Agency for Defense Development

Ceramics and Glasses Simulations and Informatics — Poster Session

*Program Organizers:* Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory

**Tuesday AM**
**October 16, 2018**
**Location:** Greater Columbus Convention Center
**11:00 AM - 12:00 PM**

**P1-19:** First-principles Study of the Tribology of Glass in Different Environments: Jordan Barr1; Susan Sinnott1; 'Penn State University
Characterization & Methods in Failure Analysis — Poster Session
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)
Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM
Session Chair: Andrew Havics, pH2, LLC

P1-33: Strain Analysis of Geometric Stress Concentrations in Nanostructured CuAg Composite: Rongmei Niu1; Ke Han1; 1National High Magnetic Field Lab.

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Poster Session
Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Kathy Lu, Virginia Tech; Edward Gorzowski, Naval Research Laboratory; Gurpreet Singh, Kansas State University; Kejie Zhao, Purdue University; Jian Shi, Rensselaer Polytechnic Institute
Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-65: Biomineralized ZnS Nanoparticle Dissolution: An in-Situ Electron Microscopy Study: Eric Pierce1; Jeremy Eskelsen1; Jie Xu2; Ji Won Moon1; David Graham1; Michelle Chiu1; Baohua Gu1; 1Oak Ridge National Laboratory; 2University of Texas-El Paso

P1-66: Engineering Nano-structure of Perovskite Ceramics: Habibollah Aminirastakh1; Dongliang Peng1; Gouli Ji1; Hao Xue1; 1Xiamen University

P1-68: Liquid Phase Epitaxial Growth of Nickel Zinc Ferrite Films and Studies on Converse Magneto-electric Effects in a Composite with PZT: Peng Zhou1; Tianjin Zhang1; Gopal Srinivasan1; 1Oakland University; 2Habei University

P1-69: Load Dependent Hardness of Nanocrystalline and Microcrystalline Ceramics: James Wollmershauser1; Heonjune Ryu2; Boris Feigelson1; Edward Gorzowski1; Kathryn Wahl1; 1U.S. Naval Research Laboratory; 2American Society for Engineering Education Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory

Eco-Friendly and Sustainable Ceramics — Poster Session
Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancellotti, Universita‘ di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry “Rostislav Kaischew”; Vilma Ducman, Slovenian National Building and Civil Engineering Institute
Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-20: A Novel Lightweight Low-temperature Stoneware Tile: Cristina Siligardi1; Magdalena Lassinantti Guaitieri1; Denia Mazzini1; 1University of Modena and Reggio Emilia, Department of Engineering “Enzo Ferrari”; 2Colorrobia Italia S.P.A.

P1-21: Eco-friendly and Sustainable Lightweight Aggregates for Building and Agronomic Purpose: Luisa Barbieri1; Fernanda Andreola1; Alessandro Borghi1; Anna Maria Ferrari1; Isabella Lancellotti1; 1UNIMORE

P1-22: Evaluation of the Durability in Hydraulic Concrete, a Waste from the Aggregates Trituration, and Additives to Reduce the Reactivity Alkali-aggregate: Guilliana Agudelo-Buitrago1; Henry Colorado1; 1Universidad De Antioquia

P1-23: Obtainment of Lightweight Ceramic Materials by Biochar Addition: Giulio Allesina1; Fernanda Andreola1; Luisa Barbieri1; Isabella Lancellotti1; Simone Pedrazzi1; Paolo Tartarini1; Vittorio Vezzali1; 1University of Modena and Reggio Emilia

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Poster Session
Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute
Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-25: Role of Iron in Sodium Aluminosilicates and Sodium Silicates: Mostafa Ahmadzadeh1; John McCloy1; 1Washington State University

Innovative Processing and Synthesis of Ceramics, Glasses and Composites — Poster Session
Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jitendra Singh, Retired, U.S. Army Research Laboratory
Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-26: Fabrication of Thick Films of Alumina Nanoparticles Using Electrophoretic Deposition: Prabul Tivari1; Jennifer Andrew1; 1University of Florida
International Symposium on Ceramic Matrix Composites — Poster Session
Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command
Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

Session Chair: Jitendra Singh, Retired, U.S. Army Research Laboratory


Manufacturing-Related Failures — Poster Session
Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMons Faculté polytechnique de MONS (FPMs)
Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

Session Chair: Andrew Havics, pH2, LLC

P1-34: Effect of Strain Rate on the Rolling of Nickel Based Alloy: Chien-Lin Lai1; Ming-Yen Li1; Shih-Ming Kuo7; Yeong-Tsuen Pan1; ’China Steel Corporation

P1-35: Evaluation of the Relationship between Surface Roughness and Stress Concentration Factor in Fatigue Failure of Ti6Al4V EB M Parts: Oluwatobi Kaleja1; Cynthia Waters1; Christopher Evans1; Boyce Collins1; Oluwaseun Adewumi1; Manisha Banker1; ’North Carolina A&T State University; ’UNCC

P1-36: The Influence of Microporosity on the Mechanical Properties of K4169 Alloy with/without HIP Treatment: Moudong Kang1; Yun Wu1; Yahui Liu1; Junwei Yu1; Jun Wang1; Haiyan Gao1; ’Shanghai Jiao Tong University

Microalloyed Steels — Poster Session
Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Janso, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC
Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-48: Detection of Inclusions in Steel by Electrochemical Corrosion Methods: Xuwei Zhong1; ’Central Iron and Steel Research Institute

P1-51: Influence of Carbide Precipitation on Stability of Grain-refined Reversed Structures in a 321 Austenitic Stainless Steel under Tensile Loading: Yuming He1; Tiansheng Wang1; ’Yanshan University

Phase Transformations in Ceramics: Science and Applications — Poster Session
Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute
Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-28: Effect of A-site Alloivalent Doping on the Thermophysical Properties of RENbO3 Materials: Dan Lowry1; Leah McMillan1; Pankaj Sarin1; ’Oklahoma State University

P1-29: Influence of W and Mo Substitution on Phase Stability and Transformation Properties of CeNbO3: Dan Lowry1; Tony Thomas1; Edward Sabolsky1; Pankaj Sarin1; ’Oklahoma State University; ’West Virginia University

P1-30: In-situ High Temperature X-ray Diffraction up to 1500°C in Air: Lab Source XRD and Quadrupole Lamp Furnace: Dan Lowry1; Gregory Dillard1; Pankaj Sarin1; ’Oklahoma State University

P1-31: Role of Thermodynamic Miscibility Gap in Phase Selection in Sol-gel Synthesis of (Y, Yb) Silicates: Surendra Anantharaman1; Raghunandan S1; Hari Kumar K.C.1; Suresh Kumar R.1; Kamaraj M.; Ashutosh Gandhi1; ’Indian Institute of Technology Madras; ’Liquid Propulsion Systems Centre, Indian Space Research Organization; ’Indian Institute of Technology Bombay

Selection of Materials for Application in Corrosive Environments — Poster Session
Program Organizers: Ajit Mishra, Haynes International; Matthew Asmussen, Pacific Northwestern National Laboratory; Sudhakar Mahajanam, Pinnacle Advanced Reliability Technologies; Wilfred Binns, Nuclear Waste Management Organization; John Zhang, Gamry Instruments; Guang-Ling Song, Xiamen University; Eric Schindelholz, Sandia National Laboratories; Raul Rebak, GE Global Research
Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P1-55: A Superhydrophobic Composite Coating and Its Corrosion Resistance: Jiuhua Wang1; Dajiang Zheng2; Guang-Ling Song3; ’Xiamen University; ’General Motors

P1-56: Corrosion Inhibition Effect by Dimethylethanolamine on Concrete Steel-reinforcement in Aggressive Environments: Joshua Okenyi4; Elizabeth Okenyi5; ’Covenant University; ’Covenant University, Ota, Nigeria

P1-57: Influence of Microstructure on Electrochemical Corrosion Behavior of a Pure Al Coating: Yanyan Zhang1; Dajiang Zheng2; Guang-Ling Song3; ’Xiamen University

P1-58: Investigating Anticorrosion Performance of Syzygium Samarangense Leaf-extract on Steel-reinforcement in Concrete: Joshua Okenyi4; Elizabeth Okenyi5; ’Covenant University

P1-59: Microstructural Evolution and Corrosion Assessment in Saline Water of 2xx:0 Aluminium Alloys Developed by Squeeze Casting Technique: Yogendra Mahlon1; Meeta Kamde1; Partha Saha2; ’NT Rourkela; ’National Institute of Technology Rourkela
P1-62: Study of Inhibitive Performance of Eco-friendly Material on Stainless Steel in Simulated Saline Environment: Omotayo Samuel1; API Popoola1; Tshwane University of Technology

P1-63: The Characteristic Change of Oxygen Free Copper Based Welding Material in High Temperature Environment Containing a Large Amount of Hydrogen: Doryun Lee1; Gyootaek Lee1; Kanghyouk Choi1; Changho Moon1; POSCO

User-related Failures — Poster Session
Program Organizers: Andrew Havics, pH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Tuesday AM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM
Session Chair: Andrew Havics, pH2, LLC

P1-37: Analysis on Effect of Expensive Soil Using Polumeric Stabilizing Agents: Xijin Zhang1; Xiong Yu1; Yuan Guo1; Xudong Fan1; Case Western Reserve University

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Poster Session
Program Organizers: Yiquau Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technology; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Allen AppleT, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Mritunjay Singh, Ohio Aerospace Institute

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
11:00 AM - 12:00 PM

P3-1: Investigation of Carbon Fiber Reinforced Silica Sol Shell for Investment Casting: Rui Guo1; Hebei University of Automotive Technology

P3-2: Mathematical Modelling of Residual Stresses in End Milling: Sunday Ojolo1; Adebayo Ogunade1; University of Lagos

P3-3: Novel Material Properties from High Turbulence Coaxial Jet Mixing: modeling and Characterization: David Spang1; Rowan College at Burlington County

P3-4: Numerical Simulation of Physical Field in a Continuous Hot-dip Galvanizing Bath: Jianfeng He1; Baosteel

P3-5: Polymer-derived Porous Carbon Spheres Modified Superhydrophobic Melamine Formaldehyde Sponge (PCS@MF) for Oil Spill Remediation: Love Dashairy1; Partha Saha1; NIT Rourkela

P3-6: Tensile Strength Evaluation of Aluminium Alloy 6063 Hybrid Metal Matrix Composite by Using Stir Casting Method.: Balwinder Singh1; GZS Campus CET Bathinda

P3-7: Thermo-mechanical Coupled Analysis of Hot Press Forming with 22MnB5 Steel: Jonghun Yoon1; Hanyang University ERICA

Advances in Dielectric Materials and Electronic Devices — Poster Session
Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, The University of Texas at San Antonio; Rick Ubic, Boise State University; Danilo Suvorov, Jožef Stefan Institute

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
12:00 PM - 1:00 PM
Session Chair: José de los Santos Guerra, Universidad de San Carlos de Guatemala

P2-8: Anelastic Behavior in GaN LED under Forward and Reverse Bias: Chun-Kail Huang1; National Central University

P2-9: Capacitor: Constant Voltage/Current Sources: Steven Tidrow1; Jessica Scoones1; Dustin Travis1; Souvik Babel1; Walter Schulze1; Steven Pilgrim1; Alfred University

P2-10: CoFeO2-BaTiO3 Core-shell Nanocomposites: Synthesis, Structural, Microstructural and Ferroelectric Properties: Luiz Fernandez Cotica1; Denise Alanis1; Raquel Bini1; Gustavo Dias1; Ivair Santos1; Ruyan Guo1; Amar Bhalla1; State University Of Maringa; University Of Texas At San Antonio

P2-11: Electronic Properties of Rare-earth-modified Barium Titanate Ferroelectrics by DFT: Abraham Pablo Aslla Quispe1; Roberto Hiroki Miwa1; José de los Santos Guerra1; Universidad Federal de Uberlândia

P2-12: Fabrication and Characterization of PVDF/ Ba0.85-Ca0.15-Zr<0.15>Ti<0.9>O<3> (BCZT) Composite Film: Effect of Two Different Method Prepared BCZT Powder: Ranabara Mazumder1; Pragya Dixit1; National Institute of Technology Rourkela

P2-13: Integrated Piezoelectric and Thermoelectric Sensing and Energy Conversion: Bryan Gambou1; Maximilian Estrada1; Albert Djikeng1; Daniel Nsek1; Samer Dessouky1; Amar Bhalla1; Ruyan Guo1; University of Texas at San Antonio

P2-15: Shorty Barrier Fractal Nature Correction: Vojislav Mitevic1; Goran Lazovic1; Zoran Vlahovic1; Vesna Paunovic1; Sandra Veljkovic1; Branislav Vlahovic1; University of Nis; Institute of Technical Sciences of SASA; University of Belgrade; University of Nis; North Carolina Central University

P2-16: Spatial Magnetic Source Detection Based on Magnetoelectric Heterostructures with 2D & 3D Configurations: Junran Xu1; Chung Ming Leung1; Xin Zhuang1; Jiefang Li1; Dwight Viehland1; Virginia Tech
P2-17: Synthesis and Analysis of Structural and Microstructural CoFe2O4:BaTiO3 Core-Shell Nanocomposites: Denise Alanis1; Luis Cóttica2; Ruyan Guo3; Amar Bhalla4; Moumita Dutta5; 1UTSA / UEM; 2UETM; 3UTSA

P2-18: Temperature and Pressure Dependent Dielectric Properties of Sugary Carbonated Solutions: Carlos Acosta1; Amar Bhalla2; Ruyan Guo3; 1University of Texas at San Antonio; 2University of Texas at San Antonio

P2-19: Thermal and Structural Properties of Glass-ceramic Based Composites Containing Ferroelectric Nanocrystals: Renato Cruvinel de Oliveira1; Anielle Almeida Silva2; Noélio Oliveira Dantas3; Jose de los Santos Guerra4; 1Universidade Estadual Paulista; 2Universidade Federal de Uberlandia

Advances in Solid Oxide Fuel Cell Technology — Poster Session
Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
12:00 PM - 1:00 PM

P2-23: Comparison of H2S Poisoning for Proton Conducting SOFC Versus Oxide Ion Conducting SOFC: Shijun Sun1; Zhuo Cheng2; 1Florida International Univ

P2-24: High-temperature Redox Stable Anode Materials for SOFC: Tony Thomas1; He Qi2; Edward Sabolsky3; Xingbo Liu4; John Zondlo5; Richard Hart6; 1West Virginia University; 2GE Global Research Centre

P2-25: Sintering and Electrical Conductivity Properties of Calcium Doped La(Ni,Fe,Cr,Co)O3 for SOFC Cathode Materials: Sai Gajjala1; Rasit Koc2; Abhigna Kolisetty3; 1Southern Illinois University Carbondale; 3AECOM

Advances in Surface Engineering — Poster Session
Program Organizers: Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
4:45 PM - 5:45 PM

Session Chair: Brian Skinn, Faraday Technology, Inc.

P3-8: Scanning Auger Microprobe Signal Optimization: Ji Xia1; Frank Ernst2; 1Case Western Reserve University

P3-9: Surface Free Energy and Moisture Susceptibility Evaluation of Modified and Foamed Asphalt Binders: Jianying Hu1; Xiong Yu2; 1Case Western Reserve University

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — Poster Session
Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
4:45 PM - 5:45 PM

P3-10: Boronitride Nanosheet Aerogel Phase Change Material Composites: Russell Dent1, Marjan Kashifpour2, Jiahua Zhu3; 1University of Akron

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Poster Session
Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Carl Boehlert, Michigan State University; Kayla Calvert, TIMET - HTL; Yufeng Zheng, The Ohio State University

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
4:45 PM - 5:45 PM

P3-11: Continuous Severe Plastic Deformation Methods: Asli Güray Bulusuz1; Mehmet Emin Uryuc1; 1Yildiz Technic University

P3-12: Development of Low Cost Titanium-manganese System Shape Memory Alloys: Masahiko Ikeda1; Masato Ueda2; 1Kansai University

P3-13: Modeling Elastic Modulus in the Ti-Al-V Alloy System: Sawyer Gill1; Joshua Strother2; Albert Ostlind3; Chelsey Hangarter4; James Saal5; Ricardo Komai6; 1New Mexico Institute of Mining & Technology; 2QuesTek Innovations, LLC

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Poster Session
Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
12:00 PM - 1:00 PM

Session Chair: Daniel Dennies, DMS, Inc.

P2-31: Controlled Atmosphere Creep Testing for High Resolution Strain Localization Measurement: Ashton Egan1; Connor Stone1; Michael Mills2; 1The Ohio State University

P2-32: EBSD and Metallogrphy of Hydroformed /Annealed CRES Liner for Cryo COPVs Used in Human Rated Spacecraft: James Martinez1, 2NASA Johnson Space Center
P2-33: Machine Learning and Physical Simulation to Solve the Missing Boundary Problem: Thomas Matsen\textsuperscript{1}; Eric Li\textsuperscript{1}; Keith Kozlosky\textsuperscript{1}; Jingxi Cai\textsuperscript{1}; Elizabeth Holm\textsuperscript{1}; \textsuperscript{1}Carnegie Mellon University

Interfaces, Grain Boundaries and Surfaces from Atomicistic and Macroscopic Approaches — Poster Session

Program Organizers: John Blendell, Purdue University; Ming Tang, Rice University; Shen Dillon, University of Illinois; Wayne Kaplan, Technion - Israel Institute of Technology; Dominique Chatain, CNRS, Aix-Marseille University

Tuesday PM
October 16, 2018
12:00 PM - 1:00 PM
Room: Hall A
Location: Greater Columbus Convention Center

P2-35: Controlling Surface Charge and the Photochemical Reactivity on SrTiO\textsubscript{3} Surfaces with the Solution pH: Mingyi Zhang\textsuperscript{1}; Paul Salvador\textsuperscript{1}; Gregory Rohrer\textsuperscript{1}; \textsuperscript{1}Carnegie Mellon University

P2-36: Modeling the Effects of Bubble Dynamics on Dendrite Growth during Solidification of Binary Alloys: Seyed Amin Nahavandi\textsuperscript{1}; Mohsen Eshraghi\textsuperscript{1}; Sergio Felicelli\textsuperscript{1}; \textsuperscript{1}University of Akron; \textsuperscript{2}California State University

P2-37: Understanding the Mechanism of Metal Oxidation on the Nanoscale: Vacancy Transport, Energy Barriers, and Rate Predictions: Krishan Kanhaiya\textsuperscript{1}; Michael Nathanson\textsuperscript{1}; Hendrik Heinze\textsuperscript{1}; \textsuperscript{1}University of Colorado Boulder

Joining of Advanced and Specialty Materials (JASM XX) — Poster Session

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee Knoxville; Boian Alexandrov, Ohio State University; Darren Barbarok, WeldQIC, Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell

Tuesday PM
October 16, 2018
4:45 PM - 5:45 PM
Room: Hall A
Location: Greater Columbus Convention Center

P3-14: Additive Manufacturing for the Fabrication of Pylon in Lower Limb Prosthesis: Fariborz Iavgarian\textsuperscript{1}; \textsuperscript{1}Pennsylvania State University, Harrisburg

P3-15: Comparative Analysis of the Mechanical Properties of Aluminum Alloys Welded Joints Obtained by Friction Stir Welding: Fedor Isispov\textsuperscript{1}; Anton Naumov\textsuperscript{1}; Oleg Panchenko\textsuperscript{1}; Leonid Zhabrev\textsuperscript{1}; Anatoly Popovich\textsuperscript{1}; \textsuperscript{1}Peter the Great Saint-Petersburg Polytechnic University

P3-16: Effect of Beam Oscillation on Porosity & Intermetallic Compounds Formation of Electron Beam welded DP600 Steel to Al 5754 Alloy Joints: Soumitra Dinda\textsuperscript{1}; Prakash Srinargam\textsuperscript{1}; Gour Gopal Roy\textsuperscript{1}; \textsuperscript{1}Indian Institute Of Technology Kharagpur; \textsuperscript{2}University of Warwick

P3-17: Effects of Titanium on Active Bonding between Sn3.5Ag0.5Cu (Sn, Cu) Alloy Filler and GaAs Substrate: Xiaoyang Wang\textsuperscript{1}; Yue Zhi\textsuperscript{1}; Hongwei Luo\textsuperscript{1}; Zhigang Cai\textsuperscript{1}; Lanxian Cheng\textsuperscript{2}; China Electronic Product Reliability and Environmental Testing Research Institute; \textsuperscript{3}South China Agricultural University

P3-18: Finite Element Simulation of Temperature Field during FSW of Dissimilar Al-Cu Joint: Evgenii Rylko\textsuperscript{1}; Fedor Isispov\textsuperscript{1}; Oleg Panchenko\textsuperscript{1}; Anton Naumov\textsuperscript{1}; Iuri Golubev\textsuperscript{1}; \textsuperscript{1}Peter the Great St.Petersburg Polytechnic University

P3-19: TEM-Investigation on Eutectic Phase Formation in Ni-30Cr Filler Metal 52XL: Cheng-Han Li\textsuperscript{1}; Meiyue Shao\textsuperscript{1}; Carolin Fink\textsuperscript{1}; John Lippold\textsuperscript{1}; Joerg Jinschek\textsuperscript{1}; \textsuperscript{1}The Ohio State University

Late News Poster Session

Tuesday PM
October 16, 2018
4:45 PM - 5:45 PM
Room: Hall A
Location: Greater Columbus Convention Center

P3-38: 4D and In Situ X-ray Microscopy for Studying Change & Evolution in Materials Across Multiple Length Scales: William Fadgen\textsuperscript{1}; Will Harris\textsuperscript{1}; Hirshikesh Bale\textsuperscript{1}; Steve Kelly\textsuperscript{1}; Benjamin Hornberger\textsuperscript{1}; \textsuperscript{1}Carl Zeiss X-ray Microscopy

P3-39: A Computational Approach for Predicting Mechanical Properties of Plasma Sprayed Ceramic Oxide Coatings: Sadhana Bhushal\textsuperscript{1}; Cheng Zhang\textsuperscript{1}; Jennifer Bustillos\textsuperscript{1}; Pranjal Nautiyal\textsuperscript{1}; Benjamin Boesl\textsuperscript{1}; Arvind Agarwal\textsuperscript{1}; \textsuperscript{1}Florida International University

P3-40: A Fast Microwave Synthesis Method of TiP\textsubscript{2}O\textsubscript{7}/Carbon Composites for Aqueous Electrolyte Lithium-ion Batteries: Haosheng Song\textsuperscript{1}; Jinming Wu\textsuperscript{1}; Wei Wu\textsuperscript{1}; \textsuperscript{1}Carnegie Mellon University

P3-41: Application of Automated Scripting with CALPHAD to Explore the Sensitivity of Chemical Composition in Alternative Titanium Alloys for Additive Manufacturing: Ryan Jennings\textsuperscript{1}; Ben Brown\textsuperscript{1}; Benjamin Sikora\textsuperscript{1}; \textsuperscript{1}Kansas City National Security Campus

P3-42: Characterization of Zirconia Produced by Nano Particle Jetting: John Martin\textsuperscript{1}; Brett Conner\textsuperscript{1}; Pedro Cortes\textsuperscript{1}; Eric MacDonald\textsuperscript{1}; \textsuperscript{1}Youngstown State University

P3-43: Characterization of Zirconia Produced by Nano Particle Jetting: John Martin\textsuperscript{1}; Brett Conner\textsuperscript{1}; Pedro Cortes\textsuperscript{1}; Eric MacDonald\textsuperscript{1}; \textsuperscript{1}Youngstown State University

P3-44: Cluster Formation of Network-Modifer Cations in Cesium Silicate Glasses Studied with \textsuperscript{21}Si MAF NMR: Daniel Jardon-Alvarez\textsuperscript{1}; Kevin Sanders\textsuperscript{1}; Pyae Phyo\textsuperscript{1}; Jyoti Balsilberger\textsuperscript{1}; Philip Grandinetti\textsuperscript{1}; \textsuperscript{1}Ohio State University; \textsuperscript{2}Université de Lyon; \textsuperscript{3}Femto-ST

P3-45: Comparison of TiAlC Thick Coatings Deposited by Plasma Spray and Kerosene-fuelled High Velocity Oxy-fuel (HVOF) Spray: Zheng Zhang\textsuperscript{1}; Jisheng Pan\textsuperscript{1}; Doreen Mei Ying Lai\textsuperscript{1}; Sue Hon Lim\textsuperscript{1}; \textsuperscript{1}Institute of Materials Research and Engineering

P3-46: Constraints of NiO-GDC/GDC/LSCF-GDC Manufactured by Tape Casting and Reactive Magnetron Sputtering Processes of Solid Oxide Fuel Cells: carlos ignacio londoño\textsuperscript{1}; \textsuperscript{1}Kansas City National Security Campus

P3-47: Corrosion Mechanism of Spinel-Periclase-Zirconia (MgAl2O4-MgO-ZrO2) Refractories for RH Degasser: Somnath Mandal\textsuperscript{1}; C. J. Dileep Kumar\textsuperscript{1}; Devendra Kumar\textsuperscript{1}; \textsuperscript{1}Indian Institute of Technology (Banaras Hindu University); \textsuperscript{2}TRI-Krosaki Refractories Limited

P3-48: Cracking in Forged 1½" dia SA 182 F304L Integrally Reinforced Nozzles from a Fourth Stage Suction Separator for a CO\textsubscript{2} Compressor: Riza Khan\textsuperscript{1}; Allan Ramkhelawan\textsuperscript{1}; \textsuperscript{1}In-Corr-Tech Ltd

P3-49: Development of High Strength Hot-rolled Steel Products for Automotive Applications: Esther Huttun\textsuperscript{1}; Hadem Zurobi\textsuperscript{1}; Sujay Sarkar\textsuperscript{1}; Erika Bellhouse\textsuperscript{1}; Yaping Lu\textsuperscript{1}; \textsuperscript{1}McMaster University; \textsuperscript{2}ArcelorMittal Global R&D Maizieres; \textsuperscript{3}ArcelorMittal Global R&D Hamilton
P3-52: Development of Manufacturing Process for ‘Ni-42Cr-0.1N’ Fuel Clad Tube Alloy: Ashmita Patra; Narahari Prasad; Sivasubramanian Krishnan; Mishra Dhara Nigam LTD

P3-53: Development of Pore Network in Binder-jetted Reactive Materials: Kartik Ganjoo; Pragnya Kunchala; Keerti Kappagantula; Ohio University

P3-54: Development of Rhenium Free Heat-resistant Nickel Alloy for the Cast Blades Production by the Method of Directional Crystallization: Evgeny Milonin; Pavel Malinovsky; Valery Naumyek; Sergey Gayduk; JSC «Motor Sich»; Zaporozhye National Technical University

P3-55: Diffusion Studies for Ceramic-to-Metal Joining for Heat Exchanger Applications: Yitzhak Rodriguez; Alyssa Bateman; Luke Schoensee; Timothy Phero; Brian Jaques; Boise State University

P3-56: Effect of Additive Defect Density on High Temperature Electrical Performance of Ultra-Conductive Copper Alloys: Keerti Kappagantula; Jacob Smith; Ohio University

P3-57: Effect of Ca/SiO2 and Al2O3/SiO2 on the Oxygen Activity in S32205 Duplex Stainless Steel Melts: Jianhao Zheng; Xiaojun Hu; Shaopeng Fu; Ping Lin; Kuo-chih Chou; University of Science and Technology Beijing; Ruipu Technology Group Co., Ltd.

P3-59: Effect of Pyrolysis Temperature on Biomass Char's CO2 Gasification Reactivity: Wei Tong; Qingcai Liu; Chen Yang; Tianshi Zhang; Shan Ren; Chongqing University

P3-62: Effects of Manufacturing Parameters on Electrical and Mechanical Performance of Ultra-conductive Aluminum Alloys: Aditya Nittal; Keerti Kappagantula; Ohio University

P3-63: Effects of Ti Addition on the Mechanical Properties of Magnesium Alloy AZ31: Baleegh Aloibaid; University of Kentucky

P3-64: Electrical and Mechanical Performance of 3D Printed Hybrid Polymer Composites: Yahya Al Majali; Keerti Kappagantula; Ohio University

P3-65: Electrochemical Behavior and Microstructural Study of Traditionally and Additively Manufactured Ti6Al4V: Hafiz Muhammad Hanza; M.J.K. Lodhi; Waseem Haider; Central Michigan University

P3-66: Electrostatic Levitation for Studies of Additive Manufacturing Materials for Extreme Environments: Michael SanSoucie; Jan Rogers; Robert Hyers; NASA MSFC; University of Massachusetts

P3-67: Embedded Sensors within Ceramic Refractory for High-temperature Process and Health Monitoring: Kathy Sabolsky; Gunes Yukaboylu; Kavin Sivanesi; Benjamin Buzzo; Edward Sabolsky; Jeffrey Bogan; Margaret Raughley; West Virginia University; HarbisonWalker International Technology Center

P3-68: Engineering Mechanical, Biodegradable, and Sorption Behaviours of a Biocastomer by Clay: Sungkivon Ioon; Bqiong Chen; Queen’s University Belfast

P3-70: Experimental Benchmarks for Mechanical Properties of Highly-loaded Carbon Nanotube-reinforced Polyether Ether Ketone: Margie Guerrero Fernandez; Carlos Marin; University of Puerto Rico at Mayaguez

P3-71: Experimental Considerations for Producing Reliable High-pressure Adsorption Isotherms Using the Volumetric Method: Christopher Sims; Huang Giang Nguyen; Jarod Horn; Laura Espinal; National Institute of Standards and Technology

P3-72: Extrusion Based 3D Printing of Metallic Scaffolds Using Particle Based Liquid Inks: Kameswara Pavan Ajjarapu; Safa Khodabakhsh; University of Cincinnati

P3-73: Fabrication of Co-Cr-Mo Fiber from the Melt by Unidirectional Solidification: Yuji Yokota; Takayuki Nihei; Masao Yoshino; Akihiro Yamaji; Yuji Ohashi; Shunsuke Kurosawa; Kei Kamada; Akira Yoshikawa; Tohoku University; C&A Corporation

P3-74: Fabrication of Cyto-compatible Porous Poly(Lactic Acid) Scaffold by Porogen Leaching Method for Bone Tissue Engineering: Rungsiman Chollakup; Pinchanok Pinton; Pimpon Uttayaart; Tatsaneer Phermthai; KAPI, Kasetsart University; Walaikak University; Thailand Institute of Nuclear Technology; Faculty of Medicine Siriraj Hospital, Mahidol University

P3-75: Fabrication of Porous Metals via Selective Phase Dissolution of an Al-Cu Alloy: Juan Vargas Martinez; Oscar Suarez; University of Puerto Rico Mayaguez

P3-76: Facile Synthesis of Citric AcidDerived Carbon Nanodots and Their Application As Exogenous Hydrogen Peroxide Sensor: Olayemi Fakayode; University of Johannesburg

P3-77: Four Decades of CALPHAD: Statistical Trends in Published Thermodynamic Models: Richard Otis; Axel Van de Walle; Jet Propulsion Laboratory; Brown University

P3-78: Freeze-casting and Freeze-drying Solid Oxide Fuel Cells: Yinhui Du; Nader Hedaya; Dhruva Panthi; Hoda Ilkhani; Benjamin Emley; Theo Woodson; Kent State University; University of Houston

P3-79: Friction Stir Welding of Precipitation Strengthened Aluminum to Solid Solution Strengthened Aluminum for Military Applications: Martin McDonnell; Nelson Martinez; Demetrios Tzelepis; US Army-TARDEC; Concurrent Technologies Corporation

P3-80: Grain Boundary Segregation and Precipitate Behavior in Inconel 718 Superalloys: Matt Pietrucha; Katherine Rice; Robert Ullig; David Larson; Yimeng Chen; Cameca Instruments

P3-81: Growth Rate Dependence of Microstructure and Mechanical Properties on Co-Cr-Mo Fibers Fabricated by Unidirectional Solidification: Shoki Abe; Yuji Yokota; Takayuki Nihei; Masao Yoshino; Akihiro Yamaji; Yuji Ohashi; Shunsuke Kurosawa; Kei Kamada; Akira Yoshikawa; IMR, Tohoku University; NICHe, Tohoku University; C&A; NICHe, Tohoku University; Yamagata University; NICHe, Tohoku University; C&A; IMR, Tohoku University, NICHe, Tohoku University, C&A

P3-82: High-yield Synthesis of Nanostructured Boron Phosphide via a Pyrotechnic Pathway: Zhaohua Lian; Lauren Morris; Anthony Shaw; Christopher Haines; Jay Poret; ARDEC

P3-83: Hydrogen Behaviour in a Duplex Stainless Steel: Zoha Ghorani; Afshin Yousef; Ibaraki University

P3-84: Improving Hardness and Corrosion Resistance of Aluminum Alloys by Mechanical Alloying and V Additions: Javier Esquivel; Rajeev Gupta; University of Akron

P3-85: In-situ Neutron Diffraction to Study the Solidification of Al-Si Alloys: Eli Vandersluis; Comodore Ravindran; Dimitry Sedacko; Abdullah Elsayed; Glenn Byczynski; Ryerson University; University of British Columbia; University of Guelph; Nemak Canada Corporation

P3-86: Induced Porosity via Powder Bed Fusion: Scott Roberts; Ben Forst; Stefano Cappucci; Timothy O’Donnell; Eric Sunada; NASA/Jet Propulsion Laboratory

P3-87: Integrating Boron Nitride Nanotubes in Aluminum for Superior Mechanical Properties: Pranjali Nautyal; Benjamin Boesl; Arvind Agarwal; Florida International University
P3-88: Investigation of KNN-based Materials for Multifunctional Energy Harvesting Applications: Guoyang Ye1; Engineering North Campus

P3-90: Mandibular Plates Prototypes for Maxillofacial Surgery by Additive Manufacturing: Design Evaluation and Accuracy: Ilaria Campionti1; Ilaria Cacciotti1; Nikhil Gupta1; Niccolo Curiano1; ‘New York University Tandon School of Engineering

P3-91: Mechanical Properties of Al-SiO2 Metal Ceramic Composite 3D Printed via Stereolithography: Bhargavi Mammarreddy1; Michael Maravola1; Eric MacDonald1; Jason Walker1; Brian Hetzel1; Brett Conner1; Pedro Cortes1; Youngstown State University

P3-92: Mechanism of Etching of Al-4.5Mg-1.0Mn Alloy: Aline D. Gabbardo1; Xi Wang1; Angezire Huggins1; Frankel1; ‘Ohio State University

P3-93: Melt-pool Surface Topography for Single Tracks of Alloy 718 and TiAl Powders Deposited by Powder Bed Fusion (PBF) Technique: Seul Bi Lee1; Jae Woong Kim1; Jae Keun Hong1; Yoon Suk Choi1; ‘Pusan National University; ‘Korean Institute of Materials Science

P3-94: Microstructural and Doping Effects on Thermoelectric Properties of Si1-xFeSi2x Composite: Rajasekar Parasarumani1; Arun Umarji1; ‘Indian Institute of Science

P3-95: Microstructural Evolution of Ion-irradiated ZrC: Raul Flores1; ‘Missouri University of Science & Technology

P3-96: Microstructures and Mechanical Properties of Carbon-containing FeCuCrNi High Entropy Alloys Prepared by Selective Laser Melting: Yong Liu1; Rui Zhou1; Kechao Zhou1; Ping Zhou1; Min Song1; ‘Central South University

P3-98: Modeling Single Tracks of Alloy 718 and TiAl Powders Deposited by Powder Bed Fusion (PBF) Technique: Jae Woong Kim1; Seul Bi Lee1; Jae Keun Hong1; Yoon Suk Choi1; ‘Pusan National University; ‘Korean Institute of Materials Science

P3-99: Modeling the Sensitization of 5XXX Series Aluminum Alloys: Matthew Steiner1; Lisan Sun1; ‘University of Cincinnati

P3-100: Multiplex Viral Detection Platform Using Aptasensor: Nilesi Saraf1; Michael Villegas1; Sudipta Seal1; ‘University of Central Florida

P3-101: Phase Separation in Silicate Glasses Revealed Through Inverse Laplace Analysis of S/ST Relaxation: Mark Bove1; ‘Ohio State University

P3-102: Potential Barrier at the Grain Boundary of LaGaO3-based Solid Solution Deduced from a Linear Diffusion Model: Chih-Yuan Chang1; Igor Lubomirsky1; Sangtae Kim1; ‘University of California, Davis; ‘Weizmann Institute of Science

P3-103: Potential of the Al2-xGaxW3012 System for High Thermal Shock Resistance: Isabella Costa1; Victoria Blair1; Bojan Marinkovic1; ‘Pontifical Catholic University of Rio de Janeiro; ‘US Army Research Laboratory

P3-104: Preliminary Investigations into the Mechanical/Current-Activated Reactive Processing of Nickel-Aluminode-CNT Composites: Kautil Keh1; Mehul Chauhan1; Prathmesh Modi1; Khaled Morsi1; ‘San Diego State University


P3-107: Pulsed Laser Deposition of VOxThin Films for Optical Applications: Arun Umarji1; Devanshi Bhaward1; S. B. Krupanidhi1; ‘Indian Institute of Science

P3-108: Reheating Characteristics of Semi-solid AC7A Al alloy Fabricated by Cooling Slope Method: Ashwin Beck1; Sedong Lee1; Seoyeon Kim1; Duckhyun Kim1; Sugun Lim1; ‘Gyeongsang National University

P3-112: Simulating Fresnel-mode Lorentz TEM Images Using a Python Environment: Yakun Liu1; Maxwell Li1; Marc DeGraef1; ‘Carnegie Mellon University

P3-113: Surface Modification of Iron Oxide Nanoparticles with Catechol-based Ligands for Improved Stability in Biocompatible Fluids: Minseon (Stella) Ju1; Anna Samia1; ‘Case Western Reserve University

P3-114: Spark Plasma Sintering of In Situ Nickel-Titanium-Graphite based Composites: Amit Patil1; Tushar Borkar1; ‘Cleveland State University

P3-115: Surface Modification of Na0.44MnO2 Positive Electrode Material Via Graphite for Aqueous Electrolyte Sodium-ion Batteries: Jinming Wu1; Haosheng Song1; Wei Wu1; ‘Carnegie Mellon University

P3-116: Stabilization of Brownmillerite type SrCoO3, for Oxygen Enrichment Applications: Arun Umarji1; Aswathay Narayanani1; Rajasekar Parasarumani1; ‘Indian Institute of Science

P3-119: Study on the Solid-state Diffusion of the Al2O3-TiO2 System: Srinivasan Shriram1; Arun Umarji1; Ruben De La Plaza1; Raul Florez1; ‘New York University

P3-120: Substitution of Critical Elements in RECo4 based Permanent Magnet: Kinjal Gandhi1; Rakesh Chaudhary1; Fanqiang Meng1; Matthew Kramer1; Ryan Orf1; Caietan Niebedin1; ‘Ams Laboratory

P3-121: Synergistic Antimicrobial Effect of Rambutan Peel Extract and Cinnamon Essential Oil on Properties of Whey Protein Isolate Based Film: Udomlak Sukatta1; Prapassorn Rugthawon1; Nattapon Khanoomkon1; Prakit Sukay1; Kunat Kongsin1; Natdanai Harmkarnsujarit1; Rungsine Soothornvit1; ‘KPI, Kasetsart University

P3-122: The Assessment of Local Lattice Strains in Alloys Using Total Scattering: Lewis Owen1; Howard Stone1; Helen Playford1; ‘University of Cambridge; ‘ISIS Neutron and Muon Source

P3-123: The Effect of Sn Addition on Heat Treatment of Extruded AM80 Magnesium Alloy: Seoeyong Kim1; Sedong Lee1; Duckhyun Kim1; Ahruee Beck1; Sugun Lim1; ‘Gyeongsang National University

P3-124: The Influence of the Defects of MoO3, Contact Surface and Morphology of Al to the Ignition of the Mechanical Activated Composites Al/MoO3: Arvind Shresthakoti1; Michail Sivak1; ‘Institute of Chemical Physics RAS

P3-125: The Manufacture of W and Mo Layers on Metallic Sheets Through Intense Plastic Deformation Induced by Ball Collisions: Sergey Romankov1; ‘Chonbuk National University

P3-126: Thermal Conductivity of Epoxy Resin Composites Filled with Combustion Synthesized AlN and h-BN Powders: Shyan-Lung Chung1; Jeng-Shuang Lin1; Li-Hsuan Wei1; Hsu-Pin Wu1; Yu-De Wang1; Tsung-Lin Hsieh1; Jun-Wei Syu1; Wei-Lun Wang1; Robert Vasudevan1; ‘National Cheng Kung University

P3-127: Thermal Effects on the Structure and Magnetic Properties of Multicomponent Nanocrystalline Fe26.67Co26.67Ni26.67Al10Si10 Alloy Powder: Kuthem Bazzi1; Ana Rash1; Vanssi Meka1; Tanjore Jayaraman1; ‘University of Michigan-Dearborn

P3-128: Transverse Rupture Strength of Ceria as a Surrogate Nuclear Fuel: Adrianna Lupercio1; Jennifer Watkins1; Jayson Foster1; Brian Jaques1; ‘I2MSE at Boise State University and CAES; ‘I2MSE at Boise State University and Dixie State University

P3-129: Tribological and Corrosive Behavior of Cold Sprayed Coating: Harminder Singh Chauhan1; ‘Guru Nanak Dev University

P3-130: Understanding the Role of Lattice Activation in the Corrosion of the Mineral Chalcopyrite: Adam Karze1; Anne Juul Danish1; Kim Dam-Johansen1; David Chaiko1; ‘Technical University of Denmark; ‘FLSmidth USA
P3-131: VO(M1) Thin Films Synthesized by Ultrasonic Nebulized Spray Pyrolysis of Aqueous Combustion Mixture for IR Photodetection: Avan Umarji1; Inyatek Tadeo1; Mahkohosi Panzi1; Krupanidhi Saluru1; ‘Indian Institute of Science

P3-132: Modified Natural Rubber Latexes for Coating Applications: Nantana Jirattanakkul1; Phutrachaya Sitthichan1; ‘Chulalongkorn University

P3-133: Sintering Effect on Thermal Conductivity of Metallic Powder in Laser Powder-bed Fusion: Shanshan Zhang1; Brandon Lane2; Justin Whiting2; Kevin Chou1; ‘University of Louisville; ‘National Institute of Standards and Technology

P3-134: A Study on Formation of Island Shaped Surface Oxide in AHSS Steels: Wonbri Lee1; ‘POSCO

P3-135: 3D Printed ABS and its Tensile, Creep, and Fatigue Behavior: Mingyo Jung

P3-136: 3D Printing of Zircon for Thin Walled and Biomimetic Structures: Piyush Pai Raikan1; Jing Zhang1; ‘Indiana University Purdue University Indianapolis

P3-137: Additive Manufacturing of Polymers with High Geometric Accuracy: Xuedai Yang1; Jing Zhang1; Yeon-Gil Jung1; ‘Indiana University - Purdue University Indianapolis; ‘Changwon National University

P3-138: Centrifugal Weeder: Abhilkash Gulhane1; Jing Zhang1; ‘IUPUI

P3-139: Effects of Octahedral Tilting/Untilting Transition on the Piezoelectricity at Morphotropic Phase Boundary: Kang Ian1; Shuai Ren1; Minxia Fang1; Xiaobing Ren1; ‘Nanjing University of Aeronautics and Astronautics; ‘Xi’an Jiaotong University; ‘National Institute for Materials Science

P3-140: Materials and Process Design for Metal Fused Filament Fabrication (MF3): Paramjot Singh1; Sundar Atre1; Kunal Kate1; ‘University of Louisville

P3-141: Properties and Microstructure of Water Atomized Duplex Stainless Steel Processed by Laser-Powder Bed Fusion: Chang woo Gal1; Subrata Nath1; Harish Irrink1; Emma Clinning1; Gautam Gupta1; Sundar Atre1; ‘University of Louisville

Materials for Nuclear Applications and Extreme Environments — Poster Session
Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Dev Chidambaram, University of Nevada, Reno; Raul Rebak, GE Global Research; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

Materials Property Understanding through Characterization — Poster Session
Program Organizers: Indrajit Dutta, Coming Incorporated; Nicholas Smith, Coming Incorporated

Light Metal Technology – Applications for the Transportation Industry — Poster Session
Program Organizers: Julie Levesque, Quebec Metallurgy Center; Mihaela Isac, McGill Metals Processing Centre; Xiaohong Wang, Purdue University; Roderick Guthrie, McGill University; Sa Ge, Hatch Ltd.; Kaan Inal, University of Waterloo; Frederic Larchro, Rio Tinto

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P3-20: Development of the Commercial Automotive Wheel Manufacturing Process through the Lightweight Aluminum Multi-Cavity Forging Process: Min Sook Moon1; GunSung Chung1; MyeongHan Yoo1; JongHyuk Song1; NaRa Park1; WonTae Kim1; JeHa Oh1; JongDae Yoon1; GeeWon Kim1; DongChul Chung1; ‘Korea Institute of Carbon Convergence; ‘Rheoforge, Co., Ltd.

P3-21: Effects of the Eutectic Silicon on Microstructure Mechanical Properties of Sand Casting Al-Si-0.35%Mg Alloy during Solution Treatment: Myounggyun Kim1; ‘Research Institute of Industrial Science

P3-22: In-situ Manufacturing Techniques for Aluminum Matrix Nanocomposites: Jeremy Fedors1; Eunkyung Lee1; Brajendra Mishra1; ‘Worcester Polytechnic Institute

P2-26: Density Functional Theory Study of Trinitium Solubility and Diffusivity in Lithium Aluminate and Lithium Zirconate Pellets: Hari Paudel1; Yueh-Lin Lee1; Yuhua Du1; ‘National Energy Technology Lab

P2-27: Microstructure Based Process Modeling and Integration of U-10%wt Mo Alloys: Chao Wang1; Xiaowo Wang1; Jianye Li1; ‘National Energy Technology Lab

P2-39: Characterization of Spacecraft Materials Using Reflectance Spectroscopy: Jacqueline Reyes1; ‘University of Texas El Paso

P2-40: Correlation of Physical and Mechanical Properties with Structural Changes curing Cold Deformation of 3rd Generation AHSS: Daniel Branagan1; Andrew Frerichs1; Brian Meacham1; Sheng Cheng1; Allen Bergman1; ‘Pacific Northwest National Laboratory; ‘Ansys Inc.; ‘Independent Scholar

P2-41: Development and Characterization of a Mouthguard (MG) Biocomposite Made from a Polymer and a Natural Fibre: Analysis of Mechanical, Physical and Antibacterial Properties: Alejandro Restrepo Carmona1; Henry Colorado1; ‘University of Antioquia


P2-43: Effect of Basicity and Ferro-silicon Addition Matte Formation from Ge-copper Bearing Slag: Michel Kalenga Wa Kalenga1; Junior Kayembe1; Didier Amoroso1; ‘Pacific Northwest National Laboratory; ‘Ansys Inc.; ‘Independent Scholar

P2-44: First-Order-Reversal-Curve (FORC) Study of Magnetic Materials: Brad Dodrill1; ‘Lake Shore Cryotronics

P2-45: Investigation of Transformation Plasticity Peculiarities of Alloyed Steel: Rasa Kandrotaite Janutiene1; Darius Mažėka1; Arunas Baluškinas1; ‘Klaipeda University of Technology; ‘Lithuanian Energy Institute

P2-46: Neutron Irradiation Effect on 0.4t-CT Specimen of Alloy 690 Tested at Elevated Temperature: Joo-hag Kim1; ‘Korea Atomic Energy Research Institute
P2-47: Structural, Electronic and Magnetic Properties of Heusler Alloys under Pressure from a Theoretical Approach: Emilio Olivos; Navdeep Singh; Gerardo Trápaga; D. Altamirano-Juárez; Raymundo Arroyave; 1Texas A&M University; 1University Of Houston; 1CINVESTAV (on sabbatical leave at CIATEQ A.C.); 1Universidad Tecnológica del Centro de Veracruz

P2-48: Synthesis, Characterization, and Performance of Transition Metal Sulfide-based Anodes in Electrochemical Cells: Amanda Gibson; William McCulloch; Yiying Wu; Vicky Doan-Nguyen; 1Ohio State University; 1Department of Chemistry, The Ohio State University; 1Department of Materials Science and Engineering, The Ohio State University

Mechanochemical Synthesis and Reactions in Materials Science III — Poster Session
Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Huot Jacques, University Du Quebec A Trois Rivieres

Tuesday PM Room: Hall A Location: Greater Columbus Convention Center
October 16, 2018 4:45 PM - 5:45 PM

P3-24: Mechanical Activation Assisted Synthesis of Akermanite/Forsterite Nanocomposite: Fariborz Tavangarian; Sophia Novak; Canryn Shope; 1Pennsylvania State University, Harrisburg

P3-25: Microstructural Evolution of Metastable Mixed Oxides in the Bi2O3-Ta2O5 System Induced by Mechanical Alloying: Poe-Yew Lee; Pei-Hao Lin; 1National Taiwan Ocean University

P3-27: Synthesis and Characterization of Akermanite Powder by Mechanical Activation and Thermal Treatment: Fariborz Tavangarian; Caleb Zolko; 1Pennsylvania State University, Harrisburg

Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance — Poster Session
Program Organizers: Martin Pech-Canal, Cinvestav IPN Sattillo; Golam Newaz, Wayne State University; Xiaoming Wang, Purdue University

Tuesday PM Room: Hall A Location: Greater Columbus Convention Center
October 16, 2018 12:00 PM - 1:00 PM

P3-28: Numerical Evaluation of Static Recrystallization Progress in Microalloyed Steels through Cellular Automata Model: Lukasz Madej; Mateusz Siti; Krzysztof Muszka; Janusz Majta; 1AGH University of Science and Technology

Neutron and Synchrotron Techniques for Advanced Materials Characterization — Poster Session
Program Organizers: Helen Playford, ISIS Facility; Lewis Owen, University of Cambridge

Tuesday PM Room: Hall A Location: Greater Columbus Convention Center
October 16, 2018 12:00 PM - 1:00 PM

P3-29: Characterizing Subsurface Dislocation Content Using Micro- laue Diffraction and Frank-hilty Streak Analysis: Chen Zhang; Shanoob Balachandran; Philip Eisenlohr; Martin Crimp; Carl Bochler; Ruqing Xu; Thomas Bieler; 1Michigan State University; 1Argonne National Laboratory

P3-54: In-situ 3D Mapping of Spatially Resolved Stress Fields Associated with Twinning in Bulk HCP Magnesium: M Arul Kumar; Bjorn Clausen; 1Lauren Capolungo; Rodney McCabe; W Liu; J Tischler; Carlos Tome; 1Los Alamos National Laboratory; 1Argonne National Laboratory

P3-55: In-situ Neutron Diffraction Investigation of Shear Deformation in IF and AHS Steel: Thomas Gnauel-Herdol; Justin Milner; 1National Institute of Standards and Technology

P3-56: Microstructural Evolution of Ti-7AI under Cyclic Loading: Rachel Lim; Darren Pagan; Yufeng Shen; Vahid Tari; Joel Bernier; Robert Suter; Anthony Rollett; 1Carnegie Mellon University; 1Cornell High Energy Synchrotron Source; 1Lawrence Livermore National Laboratory

P2-49: A Revamped Classification of Composite Materials: Martin Pech-Canal; Socorro Valdez; Milka Acosta-Enriquez; Hector Hdo-Garcia; Eulices Acosta-Enriquez; Jose Flores-Garcia; 1Cinestav IPN Sattillo; 1UNAM; 1Universidad de Sonora; 1Corporación Mexicana de Investigación en Materiales (COMIMSA)

P2-50: CNT/Cu Composite for Improved Functional and Structural Materials: Shengchen Xue; Christopher Kovacs; Michael Sumption; Edward Collings; CJ Thong; John Phillips; Michael Tomsic; 1Ohio State University; 1GO; 1Hyper Tech Research, Inc.

P2-51: Microstructure and Mechanical Properties of Coconut Shell Reinforced Epoxy Composites: Suleiman Hassan; Johnson Agunsoye; Seffu Bello; Adedeji Adebiyi; Joseph Agboola; 1University of Lagos; 1Kwara State University; 1University of Ilorin

P2-52: Updating Definitions and Concepts in the Discipline of Composite Materials: Martin Pech-Canal; Socorro Valdez; Luis González; Golam Newaz; Xiaoming Wang; Carlos León-Patiño; 1Cinestav IPN Sattillo; 1UNAM; 1Wayne State University; 1Purdue University; 1Universidad Michoacana

Multiscale Modeling of Microstructure Deformation in Material Processing — Poster Session
Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research

Tuesday PM Room: Hall A Location: Greater Columbus Convention Center
October 16, 2018 4:45 PM - 5:45 PM
Next Generation Biomaterials — Poster Session
Program Organizers: Roger Narayan, University of North Carolina; Vipul Davé, Johnson & Johnson; Mohan Edirisinghe, University College of London; Sanjiv Lalwani, LynnTech, Inc.

Tuesday PM
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Location: Greater Columbus Convention Center
12:00 PM - 1:00 PM

Session Chair: Roger Narayan, NC State University

P2-1: Effects of Cold Swaging and Annealing on the Microstructures and Mechanical Properties of Biomedical Co-Cr-Mo Alloy Rods: Mori Manami1; Nanae Sato1; Kenta Yamanaka2; Kazuo Yoshida2; Koji Kuramoto2; Akihiko Chiba2; 1National Institute of Technology, Sendai College; 2Tohoku University; Eiwa Co., Ltd.

P2-2: Fabrication of Biocompatible Bijels-derived Hybrid Hydrogel Membranes for Growth Factor Delivery: Haoan Sun1; Min Wang1; 1The University of Hong Kong

P2-3: Use of Computational Tools in the Search for the Next Generation of Materials for Regenerative Medicine Applications: Felipe Fabricio Paci Evaristo1; Wolfgang Windl1; 1The Ohio State University

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum and Minerals - KFUPM; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Victoria Blair, Army Research Laboratory

Tuesday PM
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Location: Greater Columbus Convention Center
4:45 PM - 5:45 PM

P3-30: Structure and Properties of Induction Sintered Copper-based Powder Metal Parts: Christian Muth1; Kurt Diehl2; Daadi Waryoba1; 1Pennsylvania State University

Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications — Poster Session
Program Organizers: John Ayers, University of Connecticut; Ganesh Balakrishnan, University of New Mexico; Phil Ahrenkiel, South Dakota School of Mines & Technology

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
12:00 PM - 1:00 PM

Session Chair: John Ayers, University of Connecticut

P2-20: Carbon Doping of 2D Transition Metal Dichalcogenides by Plasma Enhanced CVD: Jianfu Lu1; Susan Sinnott1; 1Penn State University

P2-21: Comparison of Chirped and Unchirped Superlattices as Dislocation Filters for Metamorphic in GaAs/GaAs (001) Devices: Md Tanvirul Islam1; Xinkan Chen1; Minglei Cai2; Tedi Kujofsa3; John Ayers2; 1University of Connecticut

P2-22: Plastic Flow in Lattice Mismatched III-V (001) Heterostructures: Tedi Kujofsa1; John Ayers2; 1University of Connecticut

Sintering and Related Powder Processing Science and Technologies — Poster Session
Program Organizers: Ricardo Castro, University of California, Davis; Zachary Cordero, Rice University; Eugene Olevsky, San Diego State University; Wolfgang Rheinheimer, Purdue University

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
4:45 PM - 5:45 PM

P3-31: Microstructural Evolution of WE43 Powder Processed by Spark Plasma Sintering: Julie Soderlind1; 1Department of Materials Science and Engineering

Small-scale Properties of Materials and Length-scale Phenomena — Poster Session
Program Organizers: Meyesam Haghshenas, University of North Dakota; Charles Lu, University of Kentucky; Finn Giuliani, Imperial College London

Tuesday PM
Room: Hall A
Location: Greater Columbus Convention Center
12:00 PM - 1:00 PM

P2-60: Effect of Sm on Mechanical Properties of Cu-Zr-Al Bulk Metallic Glasses: Faith Sikan1; Sila Atabay2; Sezer Özêring1; Ilkay Kalay3; Eren Kalay4; 1Middle East Technical University; 2McGill University; 3Cankaya University

P2-61: In Situ Observation of Microbuckling Failure in Carbon Fibre Reinforced Polymers: Giorgio Sernicola1; Mary Ryan2; Finn Giuliani3; 1Imperial College London

P2-62: Measurement of Fiber-matrix Interface Strength by In-situ Push-out Tests: Eden Spencer1; Giorgio Sernicola1; Finn Giuliani3; Mary Ryan2; 1Imperial College London
P2-63: Micropillar Compression Study of the Size and Internal Boundary Effects on the Strength of HT9 Tempered Martensitic Steel: Sangyeob Lim1, Chunsun Shin1; Hyung-Ha Jin1; 1Korea Atomic Energy Research Institute; 2Myongji University

P2-65: Multi-Length Scale Measurements of Mechanical Properties of Age Hardened 18Ni (350) Maraging Steel: Sepideh Parvinian1; Ali Khosrvan1; Hamid Gar mestani2; Surya Kalidindi1; 1Georgia Institute of Technology

P2-66: Nanomechanically Supported Computational Modeling for Thermomechanical Property Design and Optimization in Small-scale Powder Metallurgy: Derek Tsaknopoulous1; Bryer Sousa1; Victor Champagne2; Danielle Cote1; 1Worcester Polytechnic Institute; 2Army Research Laboratory

P2-67: Predicting the Shape Memory Response of New Alloys: Richard Blecher1; Anindyia Ghoshal1; Mathuvel Murugan1; Luis Bravo1; Peter Anderson2; 1Ohio State University; 2Army Research Laboratory

P2-68: The Limits of Delta-K Controlled Fatigue Crack Growth in Ultrathin Sheets: Syed Javaid1; Wade Lanning1; Christopher Mulistein1; 1Georgia Institute of Technology

Solid State Processing — Poster Session
Program Organizers: Richard Fonda, Naval Research Laboratory; Simon Larose, National Research Council Canada

Tuesday PM
October 16, 2018
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Room: Hall A
Location: Greater Columbus Convention Center

Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application — Poster Session
Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Mummm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

Tuesday PM
October 16, 2018
Location: Greater Columbus Convention Center
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Room: Hall A

P3-32: Smoothed Particle Hydrodynamics Simulation of Additive Friction Stir Manufacturing of Aluminum Alloy 6061: George Stubblefield1; Kirk Fraser2; Paul Allison3; Brian Jordon3; 1University of Alabama; 2National Research Council Canada

Surface Properties of Biomaterials — Poster Session
Program Organizers: Venu Varanasi, University of Texas at Arlington; Ryan Bock, Amedica Corporation; Jason Langhom, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University

Tuesday PM
October 16, 2018
12:00 PM - 1:00 PM
Room: Hall A
Location: Greater Columbus Convention Center

Synthesis, Characterization, Modeling, Properties and Applications of Functional Porous Materials — Poster Session
Program Organizers: Lan Li, Boise State University; Winnie Wong-Ng, National Institute of Standards and Technology; Kevin Huang, University of South Carolina

Tuesday PM
October 16, 2018
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Room: Hall A
Location: Greater Columbus Convention Center

P3-35: Study on Anti-impact Performance of Closed Aluminum Foam Sandwich Panels: Guo Qian1; Yao Wenjin2; Li Wenbing; Tang Jun3; Wang Xiaoming3; 1Nanjing University of Science and Technology; 2Nanjing CEPREI Industrial Technology Research Institute
Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — Poster Session

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Tuesday PM 
October 16, 2018 
Location: Greater Columbus Convention Center
4:45 PM - 5:45 PM

P3-37: The Effect of Titanium on the Tungsten-free Cobalt-base Superalloys: 
Semanti Mukhopadhyay1; Prafull Pandey2; Surendra Makineni2; Krishanu Biswas3; 
Dierk Raabe3; Kamanio Chattopadhyay4; ‘The Ohio State University; 3Indian Institute of Science Bangalore; 4Max-Planck-Institut für Eisenforschung GmbH; 1Indian Institute of Technology Kanpur; 4Max-Planck-Institut für Eisenforschung GmbH
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