Technical Meeting and Exhibition

MS&T20

MATERIALS SCIENCE & TECHNOLOGY

MS&T20 VIRTUAL

NOVEMBER 2-6, 2020

PRELIMINARY TECHNICAL PROGRAM

The content in this preliminary program was generated on October 20, 2020. However, changes are still being implemented for the technical program. Please refer to the online session sheets for the most up-to-date information.

The American Ceramic Society
www.ceramics.org

AIST
ASSOCIATION FOR IRON & STEEL TECHNOLOGY

TMS
The Minerals, Metals & Materials Society

PROGRAM At A Glance

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PROGRAM At A Glance

12th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Manufacturing of Ceramics I

Program Organizers: Surojit Gupta, University of North Dakota; Rajiv Asthana, University of Wisconsin; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, AIST; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Tatami Junichi, Yokohama national university; Yiquan Wu, Alfred University; Allen Apblett, Oklahoma State University

Monday AM November 2, 2020

8:00 AM
Introductory Comments: 12th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing: *Surojit Gupta*[1]; [1]University of North Dakota

8:05 AM Invited
Manganese Dioxide Compounds for Carbon Capture and Storage: *Lan Li*[1]; [1]Boise State University

8:45 AM Invited
Effects of Transition Metals and External Field on The Evolution of Polymer-Derived Si-O-C Ceramics: *Kathy Lu*[1]; Ni Yang[1]; Jiaqi Zheng[1]; [1]Virginia Polytechnic Institute and State University

9:25 AM Invited
Pressureless and Spark Plasma Sintering of Lunar Soil Simulants: *Bai Cui*[1]; Xiang Zhang[1]; Mahdieh Khedmati[1]; Yong-Rak Kim[2]; Hyu-Soung Shin[3]; Jangguen Lee[3]; Young-Jae Kim[3]; [1]University of Nebraska-Lincoln; [2]Texas A&M University; [3]Korea Institute of Civil Engineering and Building Technology

10:05 AM
Green Process for Recycling of Nickel Hydroxide from End of Life Batteries into Films and Membranes: *Allen Apblett*[1]; Dewan Rahman[1]; Audrey Vecoven[1]; [1]Oklahoma State University

10:45 AM
Thermal Insulators with Macroscopic and Microscopic Anisotropy Created by Gelation Freezing Method with Alumina Platelets and Nano-rods: *Manabu Fukushima*[1]; Yu-ichi Yoshizawa[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

10:25 AM Invited
Studies on Electrolyte, Anode and Cathode for Developing Safe Sodium-ion Battery Technology: Abhinav Tripathi[1]; Kang Du[1]; Markas Law[1]; Karthikeyan Kavitha[1]; Lihil Uthpala Subasinghe[1]; *Palani Balaya*[1]; [1]National University of Singapore

ACerS-ECerS Joint Symposium - Emerging Ceramic Technologies; Challenges and Future Prospects — Emerging Ceramic Technologies I

Program Organizers: Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Jon Binner, University of Birmingham; Martha Mecartney, University of California, Irvine; Anne Leriche, Université Polytechnique Hauts-de-France

Monday AM November 2, 2020

8:00 AM
Introductory Comments: ACerS-ECerS Joint Symposium - Emerging Ceramic Technologies; Challenges and Future Prospects: *Tatsuki Ohji*[1]; [1]National InstituteofAdvanced Industrial Science and Technology

8:05 AM Invited
Ceramics and Computing: Modelling, Informatics, Machine Learning and Computational Materials Science: *David Smith*[1]; [1]IRCER - University of Limoges

8:35 AM Invited
Advanced Microscopy and Data Analysis in Electronic Ceramic Research and Development: *Elizabeth Dickey*[1]; [1]North Carolina State University

9:05 AM Invited
Nanochemical Approaches to Materials for Energy and Health Applications: *Sanjay Mathur*[1]; [1]University of Cologne

9:35 AM Invited
Ceramics in Higher Education Nowadays: New Pedagogical Formats Searching a Balance Between Material and Immaterial: *Laura Montanaro*[1]; Tatiana Mazali[1]; Paola Palmero[1]; [1]Politecnico di Torino

10:05 AM Invited
Industrial Refractory Ceramics: Challenges, Innovation and Visioneering: *Dana Goski*[1]; [1]Allied Mineral Products Inc.

10:35 AM Invited
Dense Powder Beds for AM of Ceramics: *Jens Günster*[1]; [1]BAM

11:05 AM Invited
Advanced Ceramics and Composites for Nuclear Energy – Challenges and Future Prospect: *Yutai Katoh*[1]; [1]Oak Ridge National Laboratory

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

Monday AM November 2, 2020

9:00 AM Invited
Ceramic and Glass Science Enabled Energy Technologies: *John Hellmann*[1]; [1]Pennsylvania State University

Additive Manufacturing Modeling and Simulation: AM Materials, Processes, and Mechanics — Additive Manufacturing Modeling and Simulation - Microstructure Evolution

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Brandon Mcwilliams, US Army Research Laboratory; Li Ma, Johns Hopkins University Applied Physics Laboratory; Yeongil Jung, Changwon National University

Monday AM November 2, 2020

8:00 AM Keynote
A Discrete Dendrite Dynamics Model for Fast Epitaxial Columnar Grain Growth in Metal Additive Manufacturing: Santanu Paul[1]; Yunhao Zhao[1]; Soumya Sridar[1]; Wei Xiong[1]; Michael Klecka[2]; *Albert To*[1]; [1]University of Pittsburgh; [2]United Technologies Research Center

8:40 AM Invited
Cellular Automata Modeling of Microstructure Resulting from Novel Scan Patterns in Selective Laser Melting: *Matthew Rolchigo*[1]; Benjamin Stump[2]; Alex Plotkowski[2]; James Belak[1]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory

9:00 AM Invited
Transient Evolution of Columnar Dendrites during Additive Manufacturing – Implications for Process Simulations: *Bala Radhakrishnan*[1]; Younggil Song[1]; Alex Plotkowski[1]; Gerald Knapp[1]; John Turner[1]; [1]Oak Ridge National Laboratory

9:20 AM
Phase Field Simulations of Solid-state Precipitation in AM-processed 625 and 718 Alloys during Post-process Annealing: *Bala Radhakrishnan*[1]; Younggil Song[1]; Sarma Gorti[1]; Steve DeWitt[1]; John Turner[1]; Lyle Levine[2]; Ranadip Acharya[3]; William Tredway[3]; Amrita Basak[4]; Tanjheel Mahdi[4]; [1]Oak Ridge National Laboratory; [2]National Institute of Standards and Technology; [3]United Technologies Research Corporation; [4]Pennsylvania State University

9:40 AM
Modeling Hot Cracking in Metal Additive Manufacturing: *Eric Clough*[1]; Brennan Yahata[1]; Mark O'Masta[2]; Hunter Martin[2]; Matt Begley[3]; [1]University of California, Santa Barbara / HRL Laboratories; [2]HRL Laboratories; [3]University of California, Santa Barbara

10:00 AM
Finite Element Analysis of High-strain-rate Deformation: *Elizabeth Hodges*[1]; Victor Champagne[2]; Robert Hyers[1]; [1]University of Massachusetts Amherst; [2]Cold Spray Innovations International

Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications — Additive Manufacturing of Ceramic-based Materials Process Development, Materials, Process Optimization and Applications I

Program Organizers: Lei Chen, University of Michigan-Dearborn; Xuan Song, University of Iowa; Nahum Travitzky, University of Erlangen-Nuremberg; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, Pennsylvania State University

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications: *Lei Chen*[1]; [1]University of Michigan-Dearborn

8:05 AM Invited
Ultra-fast, Selective Laser Sintering during Additive Manufacturing of Alumina: Xiao Geng[1]; Jincheng Lei[1]; Shenglong Mu[1]; Hai Xiao[1]; Jianhua Tong[1]; Rajendra Bordia[1]; *Fei Peng*[1]; [1]Clemson University

8:45 AM
Fast Fabrication of Bioceramics Parts by Combining Stereolithography and Microwave Sintering: *Anne Leriche*[1]; Hugo Curto[1]; Florian Jean[1]; Shaan Chamary[1]; Anthony Thuault[1]; Fabrice Petit[2]; [1]Université Polytechnique Hauts-de-France; [2]BCRC

9:05 AM
Additive Manufacturing of 8 mol % Yttria Stabilized Zirconia Ceramics: *John Zaengle*[1]; S.K. Sundaram[1]; Shawn Allan[2]; [1]Alfred University; [2]Lithoz America LLC

9:25 AM
Effects of Printing Parameters on Microstructure and Mechanical Properties of Binder Jet 3D Printed WC-Co: *Katerina Kimes*[1]; Pierangeli Rodriguez De Vecchis[1]; Danielle Brunetta[1]; Drew Elhassid[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]General Carbide Corp.

9:45 AM
Direct Ink Writing of Chopped Fiber Ultra-High Temperature Ceramic Matrix Composites (UHTCMCs): *Lisa Rueschhoff*[1]; Zlatomir Apostolov[1]; James Kemp[2]; Brett Compton[2]; Abel Diaz[3]; Surya Kalidindi[3]; Brendan Croom[1]; [1]AFRL; [2]University of Tennessee-Knoxville; [3]Georgia Institute of Technology

10:15 AM
Laser-based Additive Manufacturing of Bi-metallic & Tri-metallic Oxide Layers: Yi Lu[1]; Michael Hurst[2]; Subramaniam Velumani[3]; Mathew Kuttolamadom[4]; Homero Castaneda[1]; *Olivia Esmacher*[5]; [1]Department of Materials Science and Engineering, Texas A&M University; [2]Department of Engineering Technology & Industrial Distribution Texas A&M University; [3]Departamento de Ingeniería Eléctrica (SEES), Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV-IPN), Av. Instituto Politécnico Nacional 2508, Col. San Pedro Zacatenco, Ciudad de México, México, CP 07360; [4]Department of Engineering Technology & Industrial Distribution, Texas A&M University; [5]Texas A&M University

10:35 AM
Fused Filament Fabrication of Metal Matrix Composites (MMC): *Nancy Bhardwaj*[1]; Hani Henein[1]; Tonya Wolfe[2]; [1]University of Alberta; [2]InnoTech Alberta

10:55 AM
Geometry Limitations of Indirect Laser Sintering of Alumina: *Doug Sassaman*[1]; Joseph Beaman[1]; Desiderio Kovar[1]; Matthew Ide[2]; [1]Univ of Texas Austin; [2]ExxonMobil Research and Development Company

Additive Manufacturing: Equipment, Instrumentation and Measurement — Session I

Program Organizers: Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University

Monday AM November 2, 2020

8:00 AM
Adaptive Multi-Beam Laser Additive Manufacturing (AMB-LAM) Technology: Instrumentation and Processes Development and Demonstration: *Mikhail Vorontsov*[1]; Nathan Farwell[2]; Michael Massey[2]; Geunsik Lim[2]; [1]University of Dayton; [2]II-VI Corporation

8:20 AM Invited
Dynamics of Laser-powder-metal Interactions in L-PBF Captured by High Speed Imaging: *Manyalibo Matthews*[1]; Nicholas Calta[1]; Philip Depond[1]; Gabe Guss[1]; Saad Khairallah[1]; Jonathan Lee[1]; Aiden Martin[1]; Rongpei Shi[1]; Maria Strantza[1]; Alexander Rubenchik[1]; [1]Lawrence Livermore National Laboratory

9:00 AM
Investigations on Optical Emissions and Their Relation to Processing Parameters and Processing Regimes in The Laser Powder Bed Fusion Process: *Christopher Stutzman*[1]; Abdalla Nassar[1]; [1]Penn State University

9:20 AM
Machine Learning Enabled Acoustic Monitoring for Flaw Type Detection in Laser Powder Bed Additive Manufacturing: *Brandon Abranovic*[1]; Wentai Zhang[1]; Haiguang Liao[1]; Jack Beuth[1]; Levent Kara[1]; Qingyi Dong[1]; [1]Carnegie Mellon University

9:40 AM
Mechanical In-situ µCT Testing of Lattice Structures Manufactured by Selective Laser Melting: *Pascal Pinter*[1]; Stefan Dietrich[2]; Lukas Englert[2]; [1]Volume Graphics GmbH; [2]KIT / IAM-WK

10:00 AM
Using In-situ Process Monitoring Data to Identify Defective Layers in TI-6AL-4V Additively Manufactured Porous Biomaterials: *Darragh Egan*[1]; Denis Dowling[1]; [1]UCD

10:20 AM
Polyspectral Analysis for In-situ Prediction of Deviations in Laser Powder Bed Fusion Additive Manufacturing: *Arthur French*[1]; Yuri Plotnikov[2]; John Sions[2]; Kyle Snyder[2]; Afroditi Filippas[1]; [1]Virginia Commonwealth University; [2]Commonwealth Center for Advanced Manufacturing

Additive Manufacturing: Materials, Alloy Development, Microstructure and Properties — Additive Manufacturing of Metallic Materials (Cu, Co, Mo, and Ni)

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University Of Technology; Zhi Wang, South China University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science; Filippo Berto, Norwegian University of Science and Technology

Monday AM November 2, 2020

8:00 AM Invited
Metal Powder Recyclability within Binder Jet Additive Manufacturing Process: Saereh Mirzababaei[1]; Brian K. Paul[1]; *Somayeh Pasebani*[1]; [1]Oregon State University

8:20 AM
Multi-objective Optimization of Binder Jetting Process Parameters for the Co-Cr-Mo Alloy: Ahmet Koca[1]; Baris Kirim[1]; Recep Onler[2]; *Emrecan Soylemez*[1]; [1]Department of Mechanical Engineering, Istanbul Technical University; [2]Department of Mechanical Engineering, Gebze Technical University

8:40 AM
Reparation of Co-based Parts Using Additive Manufacturing Technologies: *Wilfried Pacquentin*[1]; Jérome Varlet[1]; Hicham Maskrot[1]; Gilles Rolland[2]; Pierre Wident[1]; [1]CEA; [2]EDF – R&D, Département Matériaux et Mécanique des Composants, Site des Renardières, F-77818 Moret sur Loing

9:00 AM
Process and Characterization of 3D-printed Copper: *Tawfiq Shamsudeen*[1]; Schuyler Mann[1]; Leo Santala[1]; David Betolatti[1]; Louis Pate[1]; Jose Alarcon[1]; Michael Bianco[1]; Ping-Chuan Wang[1]; [1]SUNY New Paltz

9:20 AM
Sintering and Alloying Kinetics of Particle-Based Ink Extruded Nickel-Based Scaffolds: *Safa Khodabakhsh*[1]; Ashley Paz y Puente[1]; [1]University of Cincinnati

9:40 AM
A New Sintering Process for Binder-Jet Printed 625 Alloy: *Chuyuan Zheng*[1]; Pierangeli Rodriguez de Vecchis[1]; Markus Chmielus[1]; Ian Nettleship[1]; [1]University of Pittsburgh

10:00 AM
Co-design of Parts and Processing for Thin-walled Structures Produced via Laser Powder Bed Fusion: *Nicholas Lamprinakos*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

Additive Manufacturing: Mechanical Behavior of Lattice Structures Produced via AM — Additive Manufacturing of Lattices - Session I

Program Organizers: John Carpenter, Los Alamos National Laboratory; Matthew Begley, University of California, Santa Barbara; Sneha Prabha Narra, Worcester Polytechnic Institute; Michael Groeber, Ohio State University; Isabella Van Rooyen, Idaho National Laboratory; Kyle Johnson, Sandia National Laboratories; Krishna Muralidharan, University of Arizona

Monday AM November 2, 2020

8:00 AM Invited
Process-Aware Design of Additively Manufactured Lattice Structures: *Carolyn Seepersad*[1]; Conner Sharpe[1]; [1]University of Texas at Austin

8:30 AM Invited
High-Throughput Screening of Additive Lattices using a Deep Neural Network: *Brad Boyce*[1]; Anthony Garland[1]; Benjamin White[1]; Bradley Jared[1]; Michael Heiden[1]; Emily Donahue[1]; [1]Sandia National Laboratories

9:00 AM Invited
Mesoscale Open Structures for Lightweight Structures: *Joseph Newkirk*[1]; K. Chandrashekhara[1]; [1]Missouri University of Science and Technology

9:30 AM Invited
Effect of Processing on Micro/Mesoscale Structures and Properties of Stainless Steel 316L Lattices: *Allison Beese*[1]; Cole Britt[1]; [1]Pennsylvania State University

10:00 AM
Additive Manufacturing Laser Powder Bed Fusion Optimization for Dissolvable Supports with SS 316L: *Shawn Hinnebusch*[1]; Kevin Glunt[1]; Robert Hoffman[2]; Owen Hildreth[2]; Albert To[1]; [1]University of Pittsburgh; [2]Colorado School of Mines

Additive Manufacturing: Qualification and Certification — Approaches and Challenges

Program Organizers: Faramarz Zarandi, Raytheon Technologies; Jacob Hochhalter, University of Utah; Douglas Wells, NASA / Marshall Space Flight Center; Richard Russell, NASA Kennedy Space Center; Mohsen Seifi, ASTM International/Case Western Reserve University; Eric Ott, GE Additive; Mark Benedict, Air Force Research Laboratory; Craig Brice, Colorado School Of Mines; J Hector Sandoval, Lockheed Martin

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Additive Manufacturing: Qualification and Certification: *Faramarz Zarandi*[1]; [1]Raytheon Technologies

8:05 AM Invited
Physics-based Qualification for Laser Powder Bed Fusion AM: *Anthony Rollett*[1]; [1]Carnegie Mellon University

8:35 AM
A Comprehensive Digital Platform for Additive Manufacturing: *Luke Scime*[1]; Alka Singh[1]; Daniel Robertson[1]; Brandon Mathis[1]; William Halsey[1]; James Haley[1]; Samuel Leach[1]; Kyle Saleeby[1]; Amir Ziabari[1]; Michael Sprayberry[1]; Derek Rose[1]; Ryan Dehoff[1]; Vincent Paquit[1]; [1]Oak Ridge National Laboratory

8:55 AM
Similarity Analysis and Clustering of Thermal History to Understand Process-structure Relationships: *Sujana Chandrasekar*[1]; Jamie Coble[1]; Amy Godfrey[1]; Serena Beauchamp[1]; Fred List III[2]; Vincent Paquit[2]; Sudarsanam Babu[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

9:15 AM
Effect of Sample Geometry and Orientation on Tensile Properties of Ti-6Al-4V Manufactured by Electron Beam Melting: *Gitanjali Shanbhag*[1]; Evan Wheat[1]; Shawn Moylan[2]; Mihaela Vlasea[1]; [1]University of Waterloo; [2]National Institute of Standards & Technology

9:35 AM
The Effects of Powder Particle Size Distribution on the Powder and Part Performance of Laser Powder Bed Fusion 17-4 PH Stainless Steel: *Jordan Weaver*[1]; Justin Whiting[1]; Carlos Beauchamp[1]; Max Peltz[1]; Thien Phan[1]; Vipin Tondare[1]; Jared Tarr[1]; Alkan Donmez[1]; [1]National Institute of Standards and Technology

9:55 AM
Connecting Metal Powder Morphological Characteristics with Flowability Properties Using Machine Learning: *Srujana Rao Yarasi*[1]; Andrew Kitahara[1]; Ryan Cohn[1]; Elizabeth Holm[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

Advances in Synthesis and Integration Methods for Enhanced Properties, and Applications in Emerging Nanomaterials — 2D Materials Synthesis and Device Integration

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jung-Kun Lee, University of Pittsburgh; Zubaer Hossain, University of Delaware

Monday AM November 2, 2020

8:00 AM Invited
Integration of Synthesis and Computation to Investigate Two-dimensional Transition Metal Chalcogenides: Strain, Defect, and Moiré Engineering: Yanfu Lu[1]; Fu Zhang[1]; Wenkai Zheng[2]; Daniel Schulman[1]; Lavish Pabbi[1]; Kazunori Fujisawa[1]; Ana Laura Elias[1]; Anna Binion[1]; Tomotaroh Granzier-Nakajima[1]; Tianyi Zhang[1]; Yu Lei[1]; Zhong Lin[1]; Eric Hudson[1]; Saptarshi Das[1]; Luis Balicas[2]; Mauricio Terrones[1]; *Susan Sinnott*[1]; [1]Pennsylvania State University; [2]Florida State University

8:30 AM Invited
Van der Waals and Remote Epitaxy for Quantum Materials Research: *Jinkyoung Yoo*[1]; [1]Los Alamos National Laboratory

9:00 AM Invited
Ideal Graphene Schottky Junctions:
The Building Block for Reconfigurable Logic and 3D Monolithic Integration: *Ji Ung Lee*[1]; [1]SUNY Polytechnic Institute

9:30 AM Invited
Mixed-Dimensional Hetero-structures for Advanced Logic and Memory Devices: *Deep Jariwala*[1]; [1]University of Pennsylvania

10:00 AM Invited
Critical Elastic Interactions that Govern Effective Mechanical Behavior of Defective hBN and Graphene: *Zubaer Hossain*[1]; [1]University of Delaware

Artificial Intelligence for Materials Design and Process Optimization — AI for Materials Design and Process Optimization

Program Organizers: Adama Tandia, Corning; Venkatesh Botu, Corning Inc.

Monday AM November 2, 2020

8:00 AM
Physics-Informed Machine Learning for Predicting Glass Properties: Kai Yang[1]; Han Liu[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

8:30 AM
Stacking Fault Energy Prediction for Austenitic Steel: A Machine Learning Approach Aided by Thermodynamic Model: *Xin Wang*[1]; Wei Xiong[1]; [1]University of Pittsburgh

Ceramic Matrix Composites — CMC I

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Sung Choi, Naval Air Systems Command; Jacques Lamon, CNRS

Monday AM November 2, 2020

8:00 AM
Characterizing Environment-dependent Fracture Mechanisms of SiC-SiC CMCs via Novel Four-point Bend / Hermeticity Test Frame: *Clifton Bumgardner*[1]; Frederick Heim[1]; David Roache[1]; Xiaodong Li[1]; [1]University of Virginia

8:20 AM
Size-dependent Toughness and Strength in Defective SiC and Diamond Nanowires: *Zubaer Hossain*[1]; [1]University of Delaware

8:40 AM Invited
Properties of Thermally Grown Borosilicate Glasses and Their Impact on CMC Oxidation and Life Prediction: Kaitlin Detwiler[1]; Bohuslava McFarland[1]; Megan Watza[1]; *Elizabeth Opila*[1]; [1]University of Virginia

9:20 AM
Processing and Characterization of Al /Al_2O_3 Metal Matrix Composites Produced Using Magnetic Field-Assisted Freeze Casting of Porous Ceramic Structures: *Said Bakkar*[1]; Jihyung Lee[1]; Nicholas Ku[2]; Diana Berman[1]; Samir Aouadi[1]; Raymond Brennan[2]; Marcus Young[1]; [1]University of North Texas; [2]U.S. Army Research Laboratory

9:40 AM
Mechanically-robust, Oxidation-resistant, Thermally-cyclable Oxide/Metal Composites for Concentrated Solar Power: *Camilla McCormack*[1]; Mario Caccia[1]; Thuan Nguyen[1]; Gregory Scofield[1]; Grigorios Itskos[1]; Michael Sangid[1]; Kenneth Sandhage[1]; [1]Purdue University

Ceramics and Glasses Simulations and Machine Learning — Machine Learning and Artificial Intelligence

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Ceramics and Glasses Simulations and Machine Learning: *Mathieu Bauchy*[1]; [1]University of California Los Angeles

8:05 AM Keynote
Application of Natural Language Processing to Zeolites and Cementitious Materials: *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

8:45 AM Keynote
Data, Materials and Disorder: *Stefano Curtarolo*[1]; [1]Duke University

9:25 AM Keynote
JAX, M.D.: End-to-End Differentiable, Hardware Accelerated, Molecular Dynamics in Pure Python: *Samuel Schoenholz*[1]; Ekin Cubuk[1]; [1]Google Brain

10:05 AM Invited
De Novo Discovery of Nanoporous Structures with Tailored Sorption Isotherm by Machine Learning: Yuhan Liu[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

Computation Assisted Materials Development for Improved Corrosion Resistance — Residual Lifetime Assessment and Multiscale Modeling Methods

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Christopher Taylor, Dnv Gl

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Computation Assisted Materials Development for Improved Corrosion Resistance: *Rishi Pillai*[1]; [1]Oak Ridge National Laboratory

8:05 AM Invited
Assessing High Temperature Durability for Long-term Applications: *Bruce Pint*[1]; [1]Oak Ridge National Laboratory

8:35 AM
Development of a Multiscale Corrosion Model for Valve Steels in a Gasoline Engine Environment: *Michael Tonks*[1]; Xueyang Wu[1]; Simon Phillpot[1]; Robert Ullberg[1]; Iman Abdallah[2]; Adrien Couet[2]; John Perepezko[2]; Mark Carroll[3]; Wen Jiang[4]; [1]University of Florida; [2]University of Wisconsin-Madison; [3]Tenneco; [4]Idaho National Laboratory

8:55 AM
High Temperature Oxidation Lifetime Modeling of FeCr and NiCr Foils in Water Vapor: *Marie Romedenne*[1]; Rishi Pillai[1]; Sebastien Dryepondt[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

9:15 AM
Simulation of Dissolution of GammaPrime Precipitates in Ni-base Superalloys during Oxidation: *Taiwu Yu*[1]; Christopher Taylor[2]; Babu Viswanathan[1]; Brett Tossey[2]; Yunzhi Wang[1]; [1]Ohio State University; [2]DNV GL

9:35 AM
Machine Learning to Predict Cyclic Oxidation of NiCr-based alloys: *Jian Peng*[1]; Marie Romedenne[1]; Rishi Pillai[1]; Govindarajan Muralidharan[1]; Bruce Pint[1]; J. Haynes[1]; Dongwon Shin[1]; [1]Oak Ridge National Laboratory

9:55 AM Invited
Tailoring the Microstructure of Eutectoid Steels during Annealing for Improved Corrosion Resistance: Insights from Phase-field Simulations: *Kumar Ankit*[1]; [1]Arizona State University

10:25 AM
Metal-Oxide Bond-energy Models for Bond Energies of Alloy Oxides in Corrosion: *Szu-Chia Chien*[1]; Wolfgang Windl[1]; Gerald Frankel[1]; [1]The Ohio State University

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Development of Nanomaterials and Nanostructures

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory ; Jian Shi, Rensselaer Polytechnic Institute; Kejie Zhao, Purdue University ; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials: *Haitao Zhang*[1]; [1]University of North Carolina at Charlotte

8:05 AM Invited
The Formation Mechanism of TiO2 Polymorphs under Hydrothermal Conditions: *Wenbin Cao*[1]; Zefu Tan[2]; [1]University of Science and Technology Beijing; [2]Chongqing Three Gorges University

8:35 AM Invited
Oxide Nucleation and Growth during In Situ Oxidation of Cu and Cu Alloys: *Judith Yang*[1]; [1]University of Pittsburgh

9:05 AM
Explore Different Roles of Catalysts in the Growth of Si-based Nanostructures: Shifat Us Sami[1]; Samuel Bultman[1]; *Haitao Zhang*[1]; [1]University of North Carolina at Charlotte

9:25 AM
Direct Synthesis of Nanoclusters from Cu Nanowires: *Diego Santa Rosa Coradini*[1]; Matheus Araujo Tunes[1]; Thomas Kremmer[1]; Peter Uggowitzer[2]; Stefan Pogastscher[1]; Claudio Geraldo Schön[3]; [1]Montauniversty Leoben; [2]ETH Zürich; [3]Escola politécnica da Universidade de São Paulo

9:45 AM
Purification of Carbon Nanotube Yarns via Incandescent Annealing: *Pouria Khanbolouki*[1]; Mehran Tehrani[1]; [1]The University of Texas at Austin

10:05 AM Invited
Multiscale Modeling of Radiation-induced Precipitation Hardening by Cu Nanoclusters in Fe-Cu Alloys: *Xian-Ming Bai*[1]; [1]Virginia Polytechnic Institute and State University

10:35 AM Invited
Nanocomposites with Extremely High Fractions of Nanomaterials via Infiltration of Polymers into Nanoparticle Packings: *Daeyeon Lee*[1]; [1]University of Pennsylvania

11:05 AM
ZnO Nanoparticle-Poly(methyl methacrylate) Hybrid Ultraviolet Shielding Films: *Kathy Lu*[1]; Lingchen Kong[1]; Advaith Rau[1]; Ni Yang[1]; [1]Virginia Polytechnic Institute and State University

11:25 AM
Towards Superhard Binderless Nanocrystalline Tungsten Carbide: *Kevin Anderson*[1]; James Wollmershauser[1]; Heonjune Ryou[1]; Edward Gorzkowski[1]; Boris Feigelson[1]; [1]U.S. Naval Research Laboratory

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

Program Organizers: Jeffrey Fergus, Auburn University; Assel Aitkaliyeva, University of Florida; Kester Clarke, Colorado School of Mines; Subhadra Gupta, University of Alabama; Gregg Janowski, University of Alabama at Birmingham; Karteek Kesavamatham, ZF TRW; Janelle Wharry, Purdue University

Monday AM November 2, 2020

8:00 AM
Introdutory Comments: Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium: *Jeffrey Fergus*[1]; [1]Auburn University

8:05 AM
(AM) Recent Changes in ABET Engineering General Criteria: *Jeffrey Fergus*[1]; [1]Auburn University

8:25 AM
(AM) Preparing for an ABET Evaluation – Common Issues: *Jeffrey Fergus*[1]; [1]Auburn University

8:45 AM
(AM) COVID-19 has Worked to Prepare Our Students for Tomorrow's Industrial World: *Robert Kimel*[1]; [1]Pennsylvania State University

9:05 AM
(AM) Outreach and Recruitment Activities of Undergraduate Materials Science and Engineering Students: *Isabel Lloyd*[1]; [1]University of Maryland

9:25 AM
(AM) Comprehensive Review in Graduate Admission – Implementation and First Outcomes: *Wolfgang Windl*[1]; Maryam Ghazisaeidi[1]; La'Tonia Stiner-Jones[1]; [1]Ohio State University

Engineered Phase Transformations — Engineered Phase Transformations

Program Organizers: Eric Lass, University of Tennessee, Knoxville; Niyanth Sridharan, Oak Ridge National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Bij-Na Kim, Carpenter Additive

Monday AM November 2, 2020

8:00 AM
Phase Fraction Measurements in Textured Materials: *Adam Creuziger*[1]; Michael Cox[2]; Kip Findley[2]; Thomas Gnaupel-Herold[1]; Whitney Poling[1]; Chris Calhoun[1]; [1]National Institute of Standards and Technology; [2]Colorado School of Mines, Metalllurgical and Materials Engineering Department

8:20 AM
Microstructure Engineering in Metastable Beta Titanium Alloy: Stoichko Antonov[1]; Zachary Kloenne[2]; Xing Zhang[3]; Dian Li[3]; Yiliang Liao[3]; Hamish Fraser[2]; *Yufeng Zheng*[3]; [1]Max-Planck-Institut für Eisenforschung; [2]Ohio State University; [3]University of Nevada, Reno

8:40 AM
Grain Size-effect on the Survivability of Shape Memory Zirconia during Cyclic Martensitic Transformations: *Isabel Crystal*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

Engineering Ceramics: Microstructures, Properties, and Applications — Microstructure and Properties of Engineering Ceramics

Program Organizers: Young-Wook Kim, University of Seoul; Hua-Tay Lin, Guangdong University of Technology; Junichi Tatami, Yokohama National University

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Engineering Ceramics: Microstructure-Property-Performance Relations and Applications: *Young-Wook Kim*[1]; [1]University of Seoul

8:05 AM
Influence of Three-dimensional Microstructure on the Impact Response of Advanced Ceramics: Jonathan Ligda[1]; *Brendan Koch*[2]; Debjoy Mallick[1]; David Hogan[2]; [1]Combat Capabilities Development Command Army Research Laboratory; [2]University of Alberta

8:25 AM
Effect of Hot Forging on The Mechanical and Thermal Properties of Fine-grained SiC-TiC Composite: *Rohit Malik*[1]; Young-Wook Kim[1]; [1]University of Seoul, Dept. of Materials Science & Engineering, Republic of Korea

8:45 AM
Characterizing the Flexural Strength of Nanocrystalline Ceramics and Associated Challenges: *Heonjune Ryou*[1]; Kevin Anderson[1]; John Drazin[2]; James Wollmershauser[1]; Boris Feygelson[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory; [2]Washington State University

9:05 AM Invited
Control of Electrical Conductivity in Liquid-phase Sintered Silicon Carbide Ceramics: *Young-Wook Kim*[1]; Gyoung-Deuk Kim[1]; [1]University of Seoul

9:35 AM
New Insights into Deformation Mechanisms of Amorphous Silicon Nitride Nanoporous Membranes from Atomistic Simulations: *Ali K. Shargh*[1]; James McGrath[1]; Niaz Abdolrahim[1]; [1]University of Rochester

Environmentally Assisted Cracking: Theory and Practice — Environment Assisted Cracking

Program Organizers: Jenifer Locke, Ohio State University; Wenjun Cai, Virginia Polytechnic Institute and State University; Bai Cui, University of Nebraska-Lincoln; Srujan Rokkam, Advanced Cooling Technologies Inc; Kaila Bertsch, University of Wisconsin-Madison

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Environmentally Assisted Cracking: Theory and Practice: *Jenifer Locke*[1]; [1]Ohio State University

8:05 AM Invited
Cracking Mechanism of Carbon Steel in Presence of H2S/CO2 and H2S Scavenger, a Theory Based on Electrochemistry, Raman, and Tensile Testing: Vinicio Ynciarte[1]; Leonardo Caseres[2]; James Dante[2]; *Brendy Rincon Troconis*[1]; [1]University of Texas at San Antonio; [2]Southwest Research Institute

8:45 AM
Analyzing High-angle Grain Boundary Network Connectivity Using Graph Theory: *Syeda Noor E Sumaiya*[1]; Matthew Steiner[1]; [1]University of Cincinnati

9:05 AM
Elucidating the Loading Rate Dependence of Hydrogen Environment-assisted Cracking Behavior in Ti, Fe, Al, and Ni-based Structural Alloys: *Zachary Harris*[1]; Erin Dubas[1]; James Burns[1]; [1]University of Virginia

9:25 AM
Pit-to-Crack Transition in Stress Corrosion Cracking of Type 304 Stainless Steels Under Marine Exposure Conditions: *Alana Parey*[1]; [1]Sandia National Laboratories; The Ohio State University

9:45 AM
SCC Resistance of 304 Stainless Steel after Friction Stir Welding, Soldering, Cold Spray, Vaporizing Foil Actuated Welding, or Conventional Tungsten-arc Welding: *Jenifer Locke*[1]; Jay Srinivasan[1]; Benjamin Sutton[1]; Jianxiong Li[1]; Glenn Daehn[1]; Anupam Vivek[1]; Thodla Ramgopal[2]; Alexander Shapiro[3]; Antonio Ramirez[1]; [1]Ohio State University; [2]DNV GL; [3]Ohio State University and Titanium Brazing Inc

Functional Defects in Electroceramic Materials — Defect Engineering in Functional Ceramics

Program Organizers: Hui Xiong, Boise State University; Hua Zhou, Argonne National Laboratory; Yanhao Dong, Massachusetts Institute of Technology

Monday AM November 2, 2020

8:00 AM Invited
Designing Optimal Defect Environments for High Ionic Conductivity and Surface Catalytic Reactions: *Lane Martin*[1]; [1]University of California, Berkeley

8:30 AM Invited
Co-doping Strategies for Controlling Electrical Conductivity of BaTiO3 Ceramics: *Elizabeth Dickey*[1]; Gyung Hyun Ryu[1]; Preston Bowes[1]; Jonathon Baker[1]; Douglas Irving[1]; [1]North Carolina State University

9:00 AM Invited
Functional Defects by Design in Energy and Quantum Materials: *Panchapakesan Ganesh*[1]; [1]Oak Ridge National Lab.

9:30 AM Invited
Defects Engineering in Epitaxial Complex Oxides for Designed Functionality: *Yingge Du*[1]; [1]Pacific Northwest National Laboratory

Glasses, Optical Materials, and their Functional Applications: Current Issues in Science & Technology — Structure, Dynamics and Surface Reactivity of Glass Materials

Program Organizers: Jincheng Du, University of North Texas; S. K. Sundaram, Alfred University

Monday AM November 2, 2020

8:00 AM Invited
Surface Reactivity of Multi-component Glasses: *Alastair Cormack*[1]; [1]Alfred University

8:30 AM
Melt-Quenching vs. Sol-gel vs. Vapor Deposition vs. Irradiation: Influence of the Synthesis Method on the Structure of SiO2: Zhe Wang[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

8:50 AM
Photo-elastic Confirmation of Fast Surface Relaxation of Silica Glasses in the Presence of Water: *Bronson Hausmann*[1]; Emily Aaldenberg[1]; Minoru Tomozawa[1]; [1]Rensselaer Polytechnic Institute

9:10 AM
Enhanced Optical Nonlinearity in Bismuth Borosilicate Glass Dispersed with Eu2O3 Stabilized Gold Nanoparticles: *Shivani Singla*[1]; Venu Gopal Achanta[2]; Om Prakash Pandey[1]; Gopi Sharma[3]; [1]Thapar Institute of Engineering & Technology; [2]Tata Institute of Fundamental Research, Mumbai; [3]Kanya Maha Vidyalaya, Jalandhar

9:30 AM Invited
Elucidating Defect Behaviors and Lithium Ion Diffusion Mechanisms in Solid State Electrolytes from Atomistic Computer Simulations: *Jincheng Du*[1]; [1]University of North Texas

10:00 AM
Relative Roles of O and Si in Crack Nucleation and Propagation Mechanisms in Amorphous Silica: *Zubaer Hossain*[1]; [1]University of Delaware

High Entropy Materials: Concentrated Solid Solution, Intermetallics, Ceramics, Functional Materials and Beyond — Materials Discovery and Design I

Program Organizers: Xingbo Liu, West Virginia University; Michael Gao, National Energy Technology Laboratory; Peter Liaw, University of Tennessee; Jian Luo, University of California, San Diego; Yiquan Wu, Alfred University; Yu Zhong, Worcester Polytechnic Institute

Monday AM November 2, 2020

8:00 AM
Introductory Comments: High Entropy Materials: *Xingbo Liu*[1]; [1]West Virginia University

8:05 AM Keynote
The Department of Energy's High Performance Materials Program and Its High Entropy Alloy R&D: *Briggs White*[1]; [1]U.S. Department of Energy - NETL

8:45 AM Invited
Beyond Mechanical Metastability in FeMnCoCr?: Haoxue Yan[1]; Maria Ronchi[1]; Shaolou Wei[1]; *C. Tasan*[1]; [1]Massachusetts Institute of Technology

9:05 AM Invited
High-Entropy Alloy Approach to Thermoelectric Materials: *Joseph Poon*[1]; [1]University of Virginia

9:25 AM Invited
Computational Techniques to Study High-entropy Materials: *Stefano Curtarolo*[1]; [1]Duke University

9:45 AM Invited
The Role of Large Static Displacements in Stabilizing BCC High Entropy Alloys: German Samolyuk[1]; Yuri Osetsky[1]; Malcolm Stocks[1]; *James Morris*[2]; [1]Oak Ridge National Laboratory; [2]Ames Laboratory

10:05 AM Invited
Computationally Guided High Entropy Alloy Discovery: *John Sharon*[1]; Ryan Deacon[1]; Soumalya Sarkar[1]; Kenneth Smith[1]; [1]UTRC

10:25 AM Invited
Using Machine Learning, CALPHAD, and DFT to Accelerate Materials Development: Kenneth Vecchio[1]; *Kevin Kaufmann*[1]; [1]University of California, San Diego

High Temperature Corrosion and Degradation of Structural Materials — CO2-rich Environments/Nuclear Reactor Environments

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Raul Rebak, GE Global Research; David Shifler, Office of Naval Research; Richard Oleksak, National Energy Technology Laboratory

Monday AM November 2, 2020

8:00 AM
Introductory Comments: High-temperature Corrosion and Degradation of Structural Materials: *Kinga Unocic*[1]; [1]Oak Ridge National Laboratory

8:05 AM
Long-term Oxidation Behavior of Chromia-forming Alloys in High-temperature CO_2 and Air: *Richard Oleksak*[1]; Casey Carney[1]; Gordon Holcomb[1]; Omer Dogan[1]; [1]National Energy Technology Laboratory

8:25 AM Invited
Exploring Materials Options for sCO_2 Applications: Steels to Cermets: *Bruce Pint*[1]; Rishi Pillai[1]; James Keiser[1]; [1]Oak Ridge National Laboratory

9:05 AM
Corrosion Study of Stainless Steel 316 with Different Coatings in MgCl2-KCl Heat Transfer Fluid: *Yuxiang Peng*[1]; Ramana Reddy[1]; [1]University of Alabama

Joining and Integration of Advanced and Specialty Materials — Joining and Integration of Advanced and Specialty Materials

Program Organizers: Milena Salvo, Politecnico di Torino; Rajiv Asthana, University of Wisconsin; Valentina Casalegno, Politecnico di Torino; Monica Ferraris, Politecnico di Torino - Italy; Michael Halbig, NASA Glenn Research Center; Dietmar Koch, University of Augsburg; Hans-Peter Martin, Fraunhofer-Institut für Keramische Technologien und Systeme IKTS; Michael Reece, Queen Mary, University of London; Peter Tatarko, Institute of Inorganic Chemistry Slovak Academy of Sciences; Fabrizio Valenza, National Research Council, Institute of Condensed Matter Chemistry and Technologies for Energy

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Joining and Integration of Advanced and Specialty Materials: *Monica Ferraris*[1]; [1]Politecnico di Torino

8:05 AM Keynote
Adhesive Bonding of Carbon Fiber Reinforced Polymers to Dual Phase 980 Steel: *Yong Chae Lim*[1]; Jian Chen[1]; Ngoc Nguyen[1]; Yuan Li[1]; Amit Naskar[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

8:45 AM
Controlling the Formation of Intermetallic Compounds in TLP Joining of Grade-2 Titanium Alloy: *AHM Rahman*[1]; [1]Pennsylvania State University, Harrisburg

9:05 AM
Effects of Strength Overmatching on the Assessment of Toughness in Hybrid Laser Arc Welded High Strength Steel: *Daniel Bechetti*[1]; Matthew Sinfield[1]; Maximilian Kinsey[1]; Nathan Korinchak[1]; [1]NSWC Carderock Division

9:25 AM
Functionally-graded Interlayers for Enhanced Divertor/Heatsink Bonding: *Huong Le*[1]; Kamyar Ahmadi[2]; Brian Skinn[1]; Stephen Snyder[1]; Ed Liguori[3]; Timothy Hall[1]; [1]Faraday Technology Inc; [2]University of Houston; [3]Braze Engineering and Design

9:45 AM
Development of Interlayer Technology to Join Advanced and Dissimilar Materials: *Bryan Lara*[1]; Rafael Giorjao[1]; Antonio Ramirez[1]; [1]The Ohio State University

10:05 AM
Spark Plasma Joining of Ultra-high Temperature Ceramics: *Ambreen Nisar*[1]; Cheng Zhang[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]FIU

Light Metal and Composites Technology — Composites I: Microstructure and Mechanical Properties

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Xiaoming Wang, Purdue University; Alex Moser, U.S. Naval Research Laboratory; Alan Luo, Ohio State University; Manoj Kolel-Veetil, Naval Research Laboratory; Kumar Sadayappan, CanmetMATERIALS; Tanjore Jayaraman, University of Michigan-Dearborn

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Light Metals and Composite Technology: *Ramasis Goswami*[1]; [1]Naval Research Laboratory

8:05 AM Invited
Joining of Light Metals to Polymer Composites by Overcasting Technique: *Aashish Rohatgi*[1]; Kumar Sadayappan[2]; [1]Pacific Northwest National Laboratory; [2]CANMET Materials

8:25 AM Invited
Nanostructured Composites via Environmentally Controlled Pressure Assisted Sintering: *James Wollmershauser*[1]; Boris Feigelson[1]; Kevin Anderson[2]; Benjamin Greenberg[2]; Kedar Manandhar[3]; Heonjune Ryou[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory; [2]National Research Council Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory; [3]University of Maryland

8:45 AM Invited
Revisiting Phase Field Simulations of Theta' Variant Selection during Stress Aging of Al-Cu Alloys: *Bala Radhakrishnan*[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

9:05 AM
Microstructure, Interfaces, and Mechanical Properties of Ceramic Matrix Composites: *Alex Moser*[1]; Ramasis Goswami[1]; [1]Naval Research Laboratory

9:25 AM
Functional Relationships between Treatment Time, Microstructure and Mechanical Properties of Ultrasonically Cast Metal Matrix Nanocomposites: *Tanaji Paul*[1]; Cheng Zhang[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

9:45 AM
Microstructure and Interfaces of Nanocomposites Manufactured in Solid State: *Ramasis Goswami*[1]; [1]Naval Research Laboratory

10:05 AM Invited
Poly(Carborane-siloxane-(aryl)Acetylene)s: A Versatile Inorganic-Organic Polymer Platform for Advanced Materials Applications: *Manoj Kolel-Veetil*[1]; [1]Naval Research Laboratory

Machine Learning for Discovery of Structure-Process-Property Relations in Electronic Materials — Machine Learning in Materials Engineering I

Program Organizers: B. Reeja Jayan, Carnegie Mellon University; Aarti Singh, Carnegie Mellon University

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Machine Learning for Discovery of Structure-Process-Property Relations in Electronic Materials: *B. Reeja Jayan*[1]; [1]Carnegie Mellon University

8:05 AM
Expert-guided Learning for Data-constrained Materials Science Problems: *Gopaljee Atulya*[1]; Shuyan Zhang[1]; Alexander Davis[1]; [1]Carnegie Mellon University

8:25 AM Invited
3D Printing and Machine Learning: *Anthony Rollett*[1]; Srujana Yarasi[1]; Christopher Kantzos[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

8:55 AM
Parametric Analysis to Quantify Process Input Influence on the Printed Densities of Binder Jetted Alumina Ceramics: *Edgar Mendoza*[1]; Jack Beuth[1]; Baby Reeja-Jayan[1]; [1]Carnegie Mellon University

9:15 AM
SimuLearn: Machine Learning-empowered Fast and Accurate Simulator to Support 4D Printing Design: *Humphrey Yang*[1]; Kuanren Qian[1]; Haolin Liu[1]; Yuxuan Yu[1]; Jianzhe Gu[1]; Matthew McGehee[1]; Yongjie Zhang[1]; Lining Yao[1]; [1]Carnegie Mellon University

9:35 AM
Neural Network Potential for Lattice Dynamics Calculations and Thermal Conductivity Prediction: *Jie Gong*[1]; Hyun-Young Kim[1]; Alan McGaughey[1]; [1]Carnegie Mellon University

9:55 AM
Uncertainty Quantification and Active Learning of Neural Network Models for Predicting ZrO2 Crystal Energy: *Jayanth Koushik*[1]; Sungjun Choi[1]; Aarti Singh[1]; [1]Carnegie Mellon University

Materials vs Minerals: Bridging the Gap between Materials Science and Earth and Planetary Science — Session I

Program Organizers: Jessica Rimsza, Sandia National Laboratories; Krishna Muralidharan, University of Arizona; Thomas Zega, University of Arizona

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Materials vs Minerals: Bridging the Gap between Materials Science and Earth and Planetary Science: *Jessica Rimsza*[1]; [1]Sandia National Laboratories

8:05 AM
Thermodynamic Origins of the First Solids in the Solar System: The Need for Computational Materials Science: *Thomas Zega*[1]; Venkat Manga[1]; Krishna Muralidharan[1]; [1]University of Arizona

8:35 AM
New Worlds - New Chemistry: *Alexandra Navrotsky*[1]; [1]Arizona State University

9:05 AM
Formation of Carbon Nano-fragments from Silicon Carbide Surfaces: Implications for Carbon Reservoirs in Circumstellar Envelopes: *Abhishek Thakur*[1]; Venkateswara Manga[1]; Krishna Muralidharan[1]; Thomas Zega[1]; L.M. Ziurys[1]; [1]University of Arizona

9:25 AM
Deformation of Pyrometric Cones and Coal Ash Cones at High Temperatures: *Peter Hsieh*[1]; [1]National Energy Technology Laboratory

9:45 AM
Uncertainty of Phase Equilibrium: *Marius Stan*[1]; [1]Argonne National Laboratory

10:15 AM
Thermodynamic Modeling of Al-Ti-rich Pyroxene Solid Solutions: Deducing the Nebular Conditions of Condensation of Ti+3 and Ti+4 Oxidation States: *Venkateswara Manga*[1]; Tom Zega[1]; [1]University of Arizona

10:35 AM
Quantum Mechanical Modeling of Mineral-water Interfaces with Surface Defects: *James Kubicki*[1]; [1]University of Texas at El Paso

Micro- and Nano-Mechanical Behavior of Materials — Micro/Nano-Mechanics I

Program Organizers: Sundeep Mukherjee, University of North Texas; Mahmoud Baniasadi, Georgia Southern University; Meysam Haghshenas, University of Toledo

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Micro- and Nano-Mechanical Behavior of Materials: *Sundeep Mukherjee*[1]; [1]University of North Texas

8:05 AM Invited
Microparticle Impacts at Supersonic Speeds, and the Role of Surface Layers: Ahmed Tiamiyu[1]; Jasper Lienhard[1]; *Christopher Schuh*[1]; [1]Massachusetts Institute of Technology

8:25 AM Invited
Spatial-temporal Investigation of Shear Bands in Bulk Metallic Glasses: Xie Xie[1]; Yu-Chieh Luo[2]; Yang Tong[3]; Junwei Qiao[4]; Gongyao Wang[1]; Shigenobu Ogata[5]; Hairong Qi[1]; Karin Dahmen[6]; Yanfei Gao[1]; *Peter Liaw*[1]; [1]University of Tennessee; [2]National Chiao Tung University; [3]City University of Hong Kong; [4]Taiyuan University of Technology; [5]Osaka University; [6]University of Illinois at Urbana-Champaign

8:45 AM
An Integrated In Situ Solution for Automated Material Testing in SEM: *William Harris*[1]; Fang Zhou[1]; Luyang Han[1]; Kyle Crosby[1]; Hrishikesh Bale[1]; [1]Carl Zeiss Microscopy

9:05 AM
Computer Vision Approach to Study Surface Deformation of Materials: *Chaoyi Zhu*[1]; Haoren Wang[2]; Kevin Kaufmann[2]; Kenneth Vecchio[2]; [1]Carnegie Mellon University; [2]University of California, San Diego

9:25 AM Invited
Characterization of Electroless Copper Deposits on Electrospun PAN Fibers in Aligned and Random Configurations: *Temitope Aminu*[1]; Molly Brockway[2]; Jack Skinner[2]; David Bahr[1]; [1]Purdue University; [2]Montana Technological University

9:45 AM Invited
Time-resolved Atomic-scale Observations of Deformation and Fracture of Nanostructured Materials: *Pan Liu*[1]; Mingwei Chen[2]; [1]Shanghai Jiao Tong University; [2]Johns Hopkins University

10:05 AM
Quantitative Evaluation of Large Nanoindentation Data Sets: Bernard Becker[1]; Benjamin Stadnick[1]; Eric Hintsala[1]; Ude Hangen[1]; *Douglas Stauffer*[1]; [1]Bruker Nano

Microstructure and Physical Property Optimization in High Entropy Alloys — Microstructure and Physical Property Optimization in High Entropy Alloys

Program Organizers: Bharat Gwalani, Pacific Northwest National Laboratory; Arun Devaraj, Pacific Northwest National Laboratory; Eric Lass, University of Tennessee, Knoxville; Rajarshi Banerjee, University of North Texas

Monday AM November 2, 2020

8:00 AM
3D Twinning in High Entropy Alloys: Scott Mao[1]; *Zhengwu Fang*[1]; [1]University of Pittsburgh

8:30 AM Cancelled
Best Strength-ductility Combination in an Fcc Based High Entropy Alloy: *Bharat Gwalani*[1]; Sriswaroop Dasari[2]; Abhinav Jagetia[2]; Vishal Soni[2]; Rajarshi Banerjee[2]; [1]Pacific Northwest National Laboratory; [2]University of NorthTexas

9:00 AM
Short-range Atomic Order Drives Exceptional Mechanical Properties of Multi-principal Element Alloys: *Sezer Picak*[1]; Prashant Singh[2]; Yuriy Chumlyakov[3]; Duane D Johnson[2]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University; [2]Ames Laboratory; [3]Siberian Physical Technical Institute

9:20 AM
On the Low Cycle Fatigue Response of CoCrNiFeMn High Entropy Alloy with Ultra-fine Grain Structure: *Sezer Picak*[1]; Thomas Wegener[2]; Seyedvahid Sajjadifar[2]; Julia Richter[2]; César Sobrero[2]; Thomas Niendorf[2]; Ibrahim Karaman[1]; [1]Texas A&M University; [2]University of Kassel

9:40 AM
Hierarchical Eutectoid Nano-lamellar Decomposition in an Al0.3CoFeNi Complex Concentrated Alloy: *Sriswaroop Dasari*[1]; Bharat Gwalani[1]; Abhinav Jagetia[1]; Vishal Soni[1]; Stephane Gorsse[2]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]University of Bordeaux, France

10:00 AM Cancelled
Intergranular Fracture of HfNbTaTiZr at Elevated Temperature: *Megan Emigh*[1]; Leah Mills[1]; Sean Murray[1]; Noah Phillips[2]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]ATI Metals

10:20 AM Cancelled
In Situ Atom Probe Tomography of Early State Oxidation Mechanism in High Entropy Alloys: *Bharat Gwalani*[1]; Matthew Olszta[1]; Sten Lambeets[1]; Elizabeth Kautz[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

10:40 AM Cancelled
Effects of Advanced Mechanical Surface Treatments on Residual Stress, Microstructure and Mechanical Properties of a FeMnCoCrSiCu High Entropy Alloy: *Anurag Sharma*[1]; Chung Seok Kim[1]; Jie Song[1]; Seetha Mannava[1]; Saurabh Nene[2]; Rajiv Mishra[2]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]University of North Texas

11:00 AM Cancelled
Micro Structure and Corrosion Responses of Laser Deposited High Entropy Alloys: *Modupeola Dada*[1]; Patricia Popoola[1]; Ntombizodwa Mathe[2]; Sisa Pityana[2]; Samson Adeosun[3]; Olufemi Aramide[1]; [1]Tshwane University of Technology; [2]Council for Scientific and Industrial Research; [3]University of Lagos, Akoka

MS&T20 Plenary Session — AIST Adolf Martens Memorial Steel Lecture

Monday AM November 2, 2020

11:00 AM
Introductory Comments: MS&T20 Plenary Session: *Chirag Mahimkar*[1]; [1]Big River Steel

11:05 AM Plenary
Effects of Retained Austenite Stability and Microstructure Refinement on Properties of Advanced High Strength Sheet Steels: *Nina Fonstein*[1]; [1]Retired, ArcelorMittal in East Chicago

11:45 AM
Concluding Comments: MS&T20 Plenary Session: *Chirag Mahimkar*[1]; Clifton Bumgardner[2]; [1]Big River Steel; [2]University of Virginia

Next Generation Biomaterials — Next Generation Biomaterials I

Program Organizers: Roger Narayan, University of North Carolina; David Dausch, RTI International; Sanjiv Lalwani, Lynntech, Inc.

Monday AM November 2, 2020

8:00 AM Invited
Functionalization of Titanium for Biomedical Use: *Masanori Kikuchi*[1]; [1]National Institute for Materials Science

8:40 AM Invited
A Failing Healthcare System with Decreasing Life Expectancies: Are Conventional Biomaterials to Blame?: *Thomas Webster*[1]; [1]Northeastern University

9:20 AM
Bioceramics in the Ca2P2O7 – Mg2P2O7 System with a Tailored Architecture for Bioimplantation: *Gilyana Kazakova*[1]; Tatiana Safronova[1]; Tatiana Shatalova[1]; Vladimir Zaitsev[2]; Irina Selezneva[3]; [1]Lomonosov Moscow State University; [2]Priorov National Medical Research Center of Traumatology and Orthopaedics; [3]Institute of Theoretical and Experimental Biophysics of RAS

9:40 AM
Biomimetic Patterns of Metallic Nanoparticles for Antimicrobial Applications: *Srikanthan Ramesh*[1]; Chaitanya Mahajan[1]; Iris Rivero[1]; Denis Cormier[1]; [1]Rochester Institute of Technology

10:00 AM Invited
Fibrin-modulating Nanogels for the Treatment of Disseminated Intravascular Coagulation: *Ashley Brown*[1]; [1]North Carolina State University

10:20 AM
Corrosion Modelling of Coated Pure Magnesium Towards Degradation-Controlled Bone Fixation Implants: *Moataz Abdalla*[1]; Hamdy Ibrahim[1]; [1]University of Tennessee at Chattanooga

Phase Transformations in Additively Manufactured Materials — Additive Manufacturing - Phase Transformations - In-situ and Ex-situ Experimental Work

Program Organizers: Antonio Ramirez, Ohio State University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati; Vijay Vasudevan, University of Cincinnati; Bij-Na Kim, Lancaster University/LPW Technology; Eric Lass, National Institute of Standards and Technology

Monday AM November 2, 2020

8:00 AM Invited
Understanding the Effect of Thermal Gradients on Additively Manufactured (AM) Builds Using In Situ TEM: *Sriram Vijayan*[1]; Meiyue Shao[1]; Joerg Jinschek[1]; [1]The Ohio State University

8:40 AM
Laser Powder Bed Fusion of Grade 300 Maraging Steel for Tooling Applications: Peeyush Nandwana[1]; *Rangasayee Kannan*[1]; Andrew Nguyen[1]; Donovan Leonard[1]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory

9:00 AM
Nitrogen Effects in Additively Manufactured Martensitic Precipitation-hardenable Stainless Steels: *Eric Lass*[1]; [1]University of Tennessee, Knoxville

9:20 AM
Process Optimization and Microstructure Analysis to Understand Laser Powder Bed Fusion of Stainless Steel 316L: *Nathalia Diaz Vallejo*[1]; Cameron Lucas[1]; Nicolas Ayers[1]; Holden Hyer[1]; Brandon McWilliams[2]; Kyu Cho[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]US Army Research Laboratory

9:40 AM
In-situ Characterization of Rapid Phase Evolution of AM Metals with High Energy Synchrotron X-ray Diffraction: *Seunghee Oh*[1]; Rachel Lim[1]; Joseph Aroh[1]; Joseph Pauza[1]; Runbo Jiang[1]; Venkata Satya Surya Amaranth Karra[1]; Sidi Feng[1]; Andrew Chuang[2]; Joel Bernier[3]; Benjamin Gould[2]; Robert Suter[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory; [3]Lawrence Livermore National Laboratory

10:00 AM
Effects of Laser Powder Bed Fusion Parameters and Heat Treatment on Microstructure and Mechanical Behavior of Inconel 718 Alloy: *Thinh Huynh*[1]; Abhishek Mehta[1]; Sharon Park[1]; Holden Hyer[1]; Le Zhou[1]; Devin Imholte[2]; Nicolas Woolstenhulme[2]; Daniel Wachs[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]Idaho National Laboratory

Processing and Performance of Materials Using Microwaves, Electric and Magnetic Fields, Ultrasound, Lasers, and Mechanical Work – Rustum Roy Symposium — Session I

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum & Minerals; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado

Monday AM November 2, 2020

8:00 AM
Deforming Polycrystalline Ceramics by Dislocation Based Plastic Deformation: *Lukas Porz*[1]; Michael Scherer[1]; Wolfgang Rheinheimer[1]; Atsutomo Nakamura[2]; Jürgen Rödel[1]; [1]Technical University of Darmstadt; [2]Nagoya University

8:20 AM
Laser Processing Cokes and Chars: *Randy Vander Wal*[1]; Joseph Abrahamson[1]; [1]Penn State University

8:40 AM
Laser Ablation & Passivation of Aluminum Alloys: *Robert Lavelle*[1]; David Rearick[1]; Melissa Klingenberg[1]; David Snyder[1]; Joshua Fox[1]; Austin Witt[2]; Joshua Robinson[2]; [1]Penn State University; [2]NSWC Crane

9:00 AM
Recent Developments In Microwave-metal Discharge Based Machining Process and Associated Challenges: Anurag Singh[1]; Gaurav Kumar[1]; *Apurbba Sharma*[1]; [1]Indian Institute of Technology Roorkee

9:20 AM
Study of Mechanical Properties of Microwave Processed Biodegradable Metal Composites: *Shivani Gupta*[1]; Apurbba Sharma[1]; Dinesh Agrawal[2]; Inderdeep Singh[1]; [1]Indian Institute of Technology Roorkee; [2]The Pennsylvania State University

9:40 AM
Microwave-assisted Hydrothermal Carbonization of Switchgrass and Low Rank Coals for Solid Fuel Production: *Pranjali Muley*[1]; Christina Wildfire[1]; Dushyant Shekhawat[1]; [1]National Energy Technology Laboratory

10:00 AM
The Effect of Microwave Sintering on Additively Manufactured Ceramics: *Maxwell Telmer*[1]; Tania Slawecki[2]; Edgar Mendoza[1]; Dinesh Agrawal[2]; B. Reeja Jayan[1]; [1]Carnegie Mellon University; [2]Penn State University

10:20 AM Invited
Ionic and Mixed Ionic Electronic Conductor Oxides for Microwave Active Catalysis: *Christina Wildfire*[1]; Anthony Carter[2]; Edward Sabolsky[2]; Dushyant Shekhawat[1]; Daniel Haynes[1]; [1]National Energy Technology Laboratory; [2]West Virginia University

Sintering and Related Powder Processing Science and Technologies — Field Assisted Sintering and Other Novel Methods

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

Monday AM November 2, 2020

8:00 AM Invited
Modification of Grain Boundary Core Structures by Applied Electric Fields: *Klaus Van Benthem*[1]; Lauren Hughes[1]; Sean Russell[1]; [1]University of California, Davis

8:30 AM
Flash Sintering Solid State Ceramic Electrolytes Using a Novel Multi-electrode Approach: *Gareth Jones*[1]; Christopher Green[2]; David Pearmain[2]; Geoff West[1]; Emma Kendrick[3]; Claire Dancer[1]; [1]University of Warwick; [2]Lucideon Limited; [3]University of Birmingham

8:50 AM Invited
Grain Growth Measurements of Anti-thermal Strontium Titanate with Non-destructive High Energy X-ray Diffraction Microscopy (HEDM): *Amanda Krause*[1]; He Liu[2]; Christopher Marvel[3]; Bryan Conry[1]; Michael Hoffmann[4]; Robert Suter[2]; Carl Krill[5]; Martin Harmer[3]; [1]University of Florida; [2]Carnegie Mellon University; [3]Lehigh University; [4]Karlsruhe Institute of Technology; [5]Ulm University

9:20 AM
Electron Microscopy Observation of Electric Field Assisted Sintering of Stainless Steel Nanoparticles: *Fei Wang*[1]; Qin Zhou[1]; Xingzhong Li[1]; Michael Nastasi[1]; Bai Cui[1]; [1]University of Nebraska Lincoln

9:40 AM Invited
Selective Sintering Technique: Modeling and Experimentation: *Elisa Torresani*[1]; Geuntak Lee[1]; Eugene Olevsky[1]; [1]San Diego State University

10:10 AM
Reduced Pressure Nanosintering during Environmentally Controlled – Pressure Assisted Sintering: *Kevin Anderson*[1]; James Wollmershauser[1]; Mason Wolak[1]; Boris Feigelson[1]; [1]U.S. Naval Research Laboratory

Substrate Protection for Corrosion Prevention — Substrate Protection for Corrosion Prevention I

Program Organizers: Mary Lyn Lim, PPG Industries; Cortney Crane, Exponent; Qixin Zhou, The University of Akron; Kylee Fazende, NSWC Carderock Division; Raul Rebak, GE Global Research; Tushar Borkar, Cleveland State University

Monday AM November 2, 2020

8:00 AM
Characterizations of Corrosion Tested CFRC-AZ31B Joint by Friction Self-pierce Riveting Process: *Yong Chae Lim*[1]; Jiheon Jun[1]; Jian Chen[1]; Michael Brady[1]; Donovan Leonard[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

8:20 AM
The Effect of Mg added Al-Si Coating on the Corrosion of Hot-stamped Boron Steels: *Changkyu Kim*[1]; Seongkoo Cho[2]; Wonseog Yang[3]; Homero Castaneda[1]; [1]Texas A&M University; [2]Lawrence Livermore National Laboratory; [3]Hyundai Steel Corportation

8:40 AM
Advanced Composite Coating for Carbon Steel Corrosion Prevention: *Fangming Xiang*[1]; Christy Koerner[1]; David Hopkinson[1]; Margaret Ziomek-Moroz[1]; [1]National Energy Technology Laboratory

9:00 AM
Enhancing Corrosion Resistance of Steel Substrates with Reduced Graphene Oxide Reinforced Polymer Composite Coatings: Recep Onler[1]; *Samet Akturk*[1]; Erdal Topac[2]; Ercan Ozdemir[1]; Ahmet Oktem[1]; Ongun Saban[1]; Ilke Dolaner[1]; [1]Gebze Technical University; [2]Hazerfen Kimya Malzeme ve Enerji Teknolojileri Sanayi Ticaret A.S.

Synthesis, Characterization, Modeling and Applications of Functional Porous Materials — Functional Porous Materials I

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

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Synthesis, Characterization, Modeling and Applications of Functional Porous Materials: *Lan Li*[1]; [1]Boise State University

8:05 AM Invited
Synchrotron Structure and Sorption Properties of a Metal Organic Framework Compound Ni(3-methyl-4,4'-bipyridine)[Ni(CN)4] for CO2 Mitigation Application: *Winnie Wong-Ng*[1]; Jeffrey Culp[2]; Yu-Sheng Chen[3]; SuYin Wang[3]; Daniel Siderius[1]; Andrew Allen[1]; Eric Cockayne[1]; [1]National Institute of Standards and Technology; [2]LRST/Battelle, National Energy Technology Laboratory; [3]University of Chicago

8:35 AM Invited
Density Functional Theory Study of the Porous Metal-organic Framework Material Ni-Bpy-Me: *Eric Cockayne*[1]; Winnie Wong-Ng[1]; Andrew Allen[1]; [1]National Institute of Standards and Technology

9:05 AM Invited
Experimental Thermodynamics of Zeolites and Metal-organic Frameworks: Xianghui Zhang[1]; Cody Cockreham[1]; Esra Yilmaz[1]; Baodong Wang[2]; Hui Sun[3]; *Di Wu*[1]; [1]Washington State University; [2]National Institute of Clean-and-Low-Carbon Energy; [3]East China University of Science and Technology

9:35 AM
Luminescent Metal-organic Framework-Based Sensors of Rare Earth Elements in Aqueous Streams: *Scott Crawford*[1]; John Baltrus[1]; Paul Ohodnicki[1]; [1]National Energy Technology Laboratory

9:55 AM Invited
Porous Organic Cage Composite Membranes for Post-combustion CO_2 Separation: *Fangming Xiang*[1]; David Hopkinson[1]; [1]National Energy Technology Laboratory

10:25 AM
Thermodynamics of Naturally Occurring 2D and 3D Mineral Hosts: Zeolites, Layered Double Hydroxides and Clays: *Xianghui Zhang*[1]; Cody Cockreham[1]; Su Ha[1]; Di Wu[1]; [1]Washington State University

Thermodynamic Properties, Structure and Phase Stabilities of Special Alloys — Thermodynamic Properties, Structure and Phase Stabilities of Special Alloys

Program Organizers: Erwin Povoden-Karadeniz, TU Wien CDL-IPE; Ernst Kozeschnik, Vienna University of Technology

Monday AM November 2, 2020

8:00 AM
Introductory Comments: Thermodynamic Properties, Structure and Phase Stabilities of Special Alloys: *Erwin Povoden-Karadeniz*[1]; [1]TU Wien CDL-IPE

8:05 AM Invited
Development of High-performance Al-Ce-Based Alloys: *Aurelien Perron*[1]; Emily Moore[1]; Joel Berry[1]; Zachary Sims[2]; Hunter Henderson[2]; Orlando Rios[2]; David Weiss[3]; Scott McCall[1]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory; [3]Eck Industries

8:35 AM
Deformation Induced Precipitation in Microalloyed Al-Cu: *Roman Schuster*[1]; Tomasz Wojcik[1]; Erwin Povoden-Karadeniz[1]; [1]Christian Doppler Laboratory for Interfaces and Precipitation Engineering (CDL-IPE), Institute of Materials Science and Technology, TU Wien

8:55 AM
Thermal Decomposition of Quasicrystals in Powder-processed Icosahedral-Phase-strengthened Aluminum Alloys: *Hannah Leonard*[1]; Sarshad Rommel[1]; Mingxuan Li[1]; Thomas Watson[2]; Tod Policandriotes[3]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

9:15 AM
Thermodynamic Properties of Special Alloys of the Ti-Al System Formed under SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda[1]; Yuriy Belokon[2]; Irina Kruglyak[2]; [1]Dneprovsky State Technical University; [2]ZNU

9:35 AM
Interdiffusion in Ternary Ti-Al-Mo System and Its Application during Homogenization Treatment: *Gyanendra Chauhan*[1]; Kaustubh Kulkarni[1]; [1]Indian Institute of Technology Kanpur

9:55 AM
Examining the Oxidation in NiAl Binary Alloys Using Cellular Automata: *Indranil Roy*[1]; Pratik Ray[2]; Ganesh Balasubramanian[1]; [1]Lehigh University; [2]IIT Roper

10:15 AM Invited
Thermodynamic Modeling of the Ga-Mn-Ni System for Heusler Alloy Development: *Liangyan Hao*[1]; Jakub Toman[1]; Markus Chmielus[1]; Wei Xiong[1]; [1]University of Pittsburgh

12th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Materials from Agriculture-based Precursors

Program Organizers: Surojit Gupta, University of North Dakota; Rajiv Asthana, University of Wisconsin; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, AIST; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Tatami Junichi, Yokohama national university; Yiquan Wu, Alfred University; Allen Apblett, Oklahoma State University

Monday PM November 2, 2020

2:00 PM Invited
Processing and Mechanical Characterization of Continuous Natural Fiber Reinforced Composites: *Satoshi Kobayashi*[1]; [1]Systems Design, Tokyo Metropolitan University

2:40 PM
On the Design of Porous Materials by Using Agriculture Based Precursors: *Surojit Gupta*[1]; [1]University of North Dakota

3:10 PM
A Sustainable and Energy-efficient Electrochemical Technology for Dewatering of Cellulosic Nanomaterials: *Santosh Vijapur*[1]; Huong Le[1]; Timothy Hall[1]; Jennings Taylor[1]; Maria Inman[1]; Stephen Snyder[1]; Kim Nelson[2]; [1]Faraday Technology Inc; [2]AVAPCO LLC

ACerS-ECerS Joint Symposium - Emerging Ceramic Technologies; Challenges and Future Prospects — Emerging Ceramic Technologies II

Program Organizers: Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Jon Binner, University of Birmingham; Martha Mecartney, University of California, Irvine; Anne Leriche, Université Polytechnique Hauts-de-France

Monday PM November 2, 2020

2:00 PM Invited
Colloidal Processing as an Effective Tool for Manufacturing Functional Ceramics with Enhanced Properties: *Rodrigo Moreno*[1]; [1]Institute of Ceramics and Glass, CSIC

2:30 PM Invited
Transformation-induced Plasticity in Ceria-doped Zirconia Composites: Towards Ductile and Shape-memory Ceramics: Alethea Liens[1]; Helen Reveron[1]; Damien Fabrègue[1]; *Jerome Chevalier*[1]; Mike Swain[2]; [1]MATEIS, UMR CNRS 5510, INSA de Lyon, University of Lyon; [2]University of Sydney

ACerS Richard M. Fulrath Award Session

Monday PM November 2, 2020

2:00 PM Invited
Bottom-up Growth Design and Property Control for Dielectric Thin Films and Nanostructures: *Tomoaki Yamada*[1]; [1]Nagoya University

2:40 PM Invited
Novel Design and Fabrication of Piezoelectric MEMS and their Application to IoT: *Takeshi Kobayashi*[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

3:00 PM Invited
Bulk Nanostructured Ceramics Using Novel Processing Techniques: *Edward Gorzkowski*[1]; [1]Naval Research Laboratory

3:20 PM Invited
Development of Co-fired All Solid State Lithium Ion Battery with Multilayer Ceramic Technology: *Hiroshi Sato*[1]; [1]TDK Electronics GmbH & Co OG

3:40 PM Invited
Energy Harvesting Materials and Devices: *Shashank Priya*[1]; [1]Pennsylvania State University

Additive Manufacturing Modeling and Simulation: AM Materials, Processes, and Mechanics — Additive Manufacturing Modeling and Simulation - Residual Stress, Fatigue Property, and Thermal Property

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Brandon Mcwilliams, US Army Research Laboratory; Li Ma, Johns Hopkins University Applied Physics Laboratory; Yeongil Jung, Changwon National University

Monday PM November 2, 2020

2:00 PM
Development of Temperature History Profiles for Production of Ti-6Al-4V Using a Semi-Analytical Model: *Lonnie Smith*[1]; Amit K Verma[1]; Andrew (Drew) Huck[1]; P. Chris Pistorius[1]; Anthony (Tony) Rollett[1]; [1]Carnegie Mellon University

2:20 PM Invited
A System Dynamics approach to submodels for Residual Stress Predictions of SLM Parts: *Jose Mayi-Rivas*[1]; Seetha Raghavan[1]; [1]University of Central Florida

2:40 PM
Stress State Dependent Plasticity and Fracture Properties of Additively Manufactured Stainless Steel 316L: *Alexander Wilson-Heid*[1]; Allison Beese[1]; [1]Pennsylvania State University

3:00 PM
Defect-based Fatigue Model for AlSi10Mg Produced by Laser Powder Bed Fusion Process: *Avinesh Ojha*[1]; Wei-Jen Lai[1]; Ziang Li[1]; [1]Ford Motor Company

Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications — Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications II

Program Organizers: Lei Chen, University of Michigan-Dearborn; Xuan Song, University of Iowa; Nahum Travitzky, University of Erlangen-Nuremberg; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, Pennsylvania State University

Monday PM November 2, 2020

2:00 PM Invited
Toughening of SiC-based Ceramics by Chopped Fiber via Selective Laser Sintering: Preliminary Thinking and Attempts: *Jie Yin*[1]; Xuejian LIU[1]; Zhongming Chen[1]; Zhengren HUANG[1]; [1]Shanghai Institute of Ceramics Chinese Academy of Sciences

2:40 PM
Process Parameter Variations and 3D Printing of Ceria Ceramics: *Ryan Fordham*[1]; S. K. Sundaram[1]; Shawn Allan[2]; [1]New York State College of Ceramics, Alfred University; [2]Lithoz America, LLC

3:00 PM
Initiation of Selective Laser Flash Sintering in Yttria-Stabilized Zirconia: *Deborah Hagen*[1]; Joseph Beaman[1]; Desiderio Kovar[1]; [1]University of Texas at Austin

3:30 PM
Uncertainty Quantification in Additive Manufacturing of Piezocomposites through Physics-informed Data-driven Modelling: Zhuo Wang[1]; Li He[1]; Chen Jiang[1]; Zhen Hu[1]; Xuan Song[1]; *Lei Chen*[1]; [1]University of Michigan-Dearborn

Additive Manufacturing: Equipment, Instrumentation and Measurement — Session II

Program Organizers: Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University

Monday PM November 2, 2020

2:00 PM
Optical Emission Sensing for Laser-based Additive Manufacturing – What Are We Actually Measuring?: *Christopher Stutzman*[1]; Abdalla Nassar[1]; Wesley Mitchell[1]; [1]Penn State University

2:20 PM
Combining In-situ Monitoring and X-ray Computed Tomography to Assess the Quality of Parts Manufactured by Powder Bed Fusion: *Philip Sperling*[1]; Patrick Fuchs[1]; [1]Volume Graphics GmbH

2:40 PM
Characterization of 3D-printed Metals with Ultrasonic Technique: *Terence Costigan*[1]; Ping-Chuan Wang[1]; Rob Van Pelt[2]; [1]SUNY New Paltz; [2]Sono-Tek Corporation

3:00 PM
In-Process Quality Control and Optimization for Ceramic 3D Printing: *Zhaolong Zhang*[1]; Richard Sisson[1]; Christopher Brown[1]; Jianyu Liang[1]; [1]Worcester Polytechnic Institute

Additive Manufacturing: Materials, Alloy Development, Microstructure and Properties — Additive Manufacturing Process Control and Optimization

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University Of Technology; Zhi Wang, South China University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science; Filippo Berto, Norwegian University of Science and Technology

Monday PM November 2, 2020

2:00 PM
Additive Manufacturing of Nuclear Spacer Grids: *Syed Zia Uddin*[1]; Qu He[1]; Jack Beuth[1]; [1]Carnegie Mellon University

2:20 PM
Characterization of the Balling Ddefect during Laser Powder Bed Additive Manufacturing: *Debomita Basu*[1]; Jack Beuth[1]; Bryan Webler[1]; [1]Carnegie Mellon University

2:40 PM
Mesoscale crystallographic texture control via beam path sequencing in electron beam melting: *Patxi Fernandez-Zelai*[1]; Michael Kirka[1]; Yousub Lee[1]; Sebastien Dryepondt[1]; Maxim Gussev[1]; [1]Oak Ridge National Laboratory

3:00 PM
Prediction and validation of successful multi-material AM interfaces: *Nicholas Jones*[1]; Rishikesh Magar[1]; Amir Farimani[1]; Jack Beuth[1]; Maarten de Boer[1]; [1]Carnegie Mellon Univ

Additive Manufacturing: Mechanical Behavior of Lattice Structures Produced via AM — Additive Manufacturing of Lattices - Session II

Program Organizers: John Carpenter, Los Alamos National Laboratory; Matthew Begley, University of California, Santa Barbara; Sneha Prabha Narra, Worcester Polytechnic Institute; Michael Groeber, Ohio State University; Isabella Van Rooyen, Idaho National Laboratory; Kyle Johnson, Sandia National Laboratories; Krishna Muralidharan, University of Arizona

Monday PM November 2, 2020

2:00 PM Invited
Mechanical Properties of Additively Manufactured Metal Lattices: *Manyalibo Matthews*[1]; Bradley Jared[2]; John Carpenter[3]; Benjamin Brown[4]; Paul Korinko[5]; [1]Lawrence Livermore National Laboratory; [2]Sandia National Laboratories; [3]Los Alamos National Laboratory; [4]Kansas City National Security Complex; [5]Savannah River National Laboratory

2:30 PM
Direct Metal Laser Sintering Strategies for Fabrication of Finer Resolution Cellular Structures: *Ebrahim Asadi*[1]; Fatemeh Hejripour[1]; Muhammad Abdus Salam[1]; [1]University of Memphis

2:50 PM Invited
Tailoring Hierarchical Material Performance Through Process Manipulation: *Bradley Jared*[1]; Brad Boyce[1]; Anthony Garland[1]; Michael Heiden[1]; Scott Jensen[1]; David Moore[1]; David Saiz[1]; Benjamin White[1]; Timothy Ruggles[1]; [1]Sandia National Laboratories

3:20 PM
Microstructure and Mechanical Properties of Additively Manufactured Lattice Structures of Co-Cr-Mo Alloy: *Bandar AlMangour*; [1]

Additive Manufacturing: Qualification and Certification — Microstructure and Properties

Program Organizers: Faramarz Zarandi, Raytheon Technologies; Jacob Hochhalter, University of Utah; Douglas Wells, NASA / Marshall Space Flight Center; Richard Russell, NASA Kennedy Space Center; Mohsen Seifi, ASTM International/Case Western Reserve University; Eric Ott, GE Additive; Mark Benedict, Air Force Research Laboratory; Craig Brice, Colorado School Of Mines; J Hector Sandoval, Lockheed Martin

Monday PM November 2, 2020

2:00 PM Invited
Microstructure to Aerostructure: Retrospectives and Microstructural Challenges in Industry for Titanium Additive Manufacturing: *Andrew Baker*[1]; Matthew Crill[1]; Fatmata Barrie[1]; [1]The Boeing Company

2:30 PM
A Multi-Sensor Comparative Study for Fatigue Prognosis of Additively Manufactured Metallic Specimens: *Susheel Dharmadhikari*[1]; Asok Ray[1]; Amrita Basak[1]; [1]Pennsylvania State University

2:50 PM
Simulation of the Effect of Texture on Anisotropy in SLM-Produced IN718 Microstructures: *Wesley Tayon*[1]; Saikumar Yeratapally[2]; Joseph Pauza[3]; Anthony Rollett[3]; Jacob Hochhalter[4]; [1]NASA Langley Research Center; [2]National Institute of Aerospace; [3]Carnegie Mellon University; [4]University of Utah

3:10 PM Invited
Reducing Anisotropic Deformation of LPBF Inconel 718 for Applications in Extreme Conditions: *Nadia Kouraytem*[1]; John Varga[1]; Benham Amin-Ahmadi[2]; Raphael Chanut[1]; Ashley Spear[1]; Owen Kingstedt[1]; [1]University of Utah; [2]Colorado School of Mines

3:40 PM
Pore Formation in Laser Powder Bed Fusion Inconel 718 through Multiphysics Modeling: *Qian Chen*[1]; Seth Strayer[1]; Albert To[1]; [1]University of Pittsburgh

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments — Novel Techniques

Program Organizers: Samuel Briggs, Oregon State University; Christopher Barr, Sandia National Laboratories; Emily Aradi, University of Huddersfield; Michael Short, Massachusetts Institute of Technology; Janelle Wharry, Purdue University; Cheng Sun, Idaho National Laboratory; Dong Liu, University of Oxford; Khalid Hattar, Sandia National Laboratories

Monday PM November 2, 2020

2:00 PM Invited
Characterization of Microstructure Evolution in Ceramic Materials Using Acoustic and Thermal Transport Measurements: *Marat Khafizov*[1]; [1]Ohio State University

2:40 PM
Study on Hydrogen Isotopes Solubility and Diffusivity in Y- and Co-doped Barium-zirconates Using Tritium Imaging Plate Technique: *M. Khalid Hossain*[1]; Y. Hatano[2]; K. Hashizume[1]; [1]Kyushu University; [2]University of Toyama

3:00 PM
Mobility of Hydrogen in YH_2 Probed by Nuclear Magnetic Resonance: *Scarlett Widgeon Paisner*[1]; Aditya Shivprasad[1]; Erik Luther[1]; [1]Los Alamos National Laboratory

3:20 PM Invited
Nonlinear Ultrasound for Nondestructive Evaluation of Microstructural Defects: *Kathryn Matlack*[1]; [1]University of Illinois Urbana-Champaign

4:00 PM Invited
In Situ Observation of Short- and Long-Timescale Material Property Evolution Under Extreme Conditions: *Cody Dennett*[1]; [1]Idaho National Laboratory

4:40 PM
STEM Characterization of Dislocation Loops for an Irradiated Model FCC Alloy: *Pengyuan Xiu*[1]; Lumin Wang[1]; Kevin Field[1]; [1]University Of Michigan

5:00 PM
Selective Irradiation Behavior in Dual Phase 308L Filler of SA508-304L Dissimilar Metal Weldment after Proton Irradiation: *Zhen Li*[1]; Xun Zhan[1]; Weicheng Zhong[1]; Benjamin Sutton[2]; Ovidiu Toader[3]; Gary Was[3]; Brent Heuser[1]; [1]University of Illinois at Urbana-Champaign; [2]Electric Power Research Institute; [3]University of Michigan

Advanced Materials for Harsh Environments — Session I

Program Organizers: Navin Manjooran, Solve Technology and Research, Inc.; Gary Pickrell, Virginia Tech

Monday PM November 2, 2020

2:00 PM
Introductory Comments: Advanced Materials for Harsh Environments: *Gary Pickrell*[1]; [1]Virginia Tech

2:05 PM Keynote
Multi-Material Optical Fibers for Cryogenic Temperature Sensing: *Daniel Homa*[1]; Navin Manjooran[2]; Zachary Hile[1]; Gary Pickrell[1]; [1]Virginia Tech; [2]Solve Technology and Research, Inc.

2:35 PM Invited
Impact of Intermediate Ratio on the Corrosion Between Interface of Alumino-silicate Glasses and Crofer 22APU/YSZ: *Gurbinder Kaur*[1]; [1]Simon Fraser University

3:05 PM
Air Stable Molten Salts and Corrosion Resistant Containment for High-Temperature Thermal Energy Storage and Heat Transfer for Concentrated Solar Power: *Adam Caldwell*[1]; Grigorios Itskos[1]; Kenneth Sandhage[1]; [1]Purdue University

3:25 PM
Evaluation of Electroceramic-based LC Resonator for Monitoring High Temperature Systems: *Kavin Sivaneri Varadharajan Id*[1]; Gunes Yakaboylu[1]; Peter Dreher Pozo[1]; Matthew Thomas[1]; Riley Vozar[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; Daryl Reynolds[1]; [1]West Virginia University

3:45 PM
Revealing Temperature Dependence of Electronic Structures and Optical Properties of High-temperature Gas Sensing Perovskites via First-principles Simulation: *Jongwoo Park*[1]; Ting Jia[1]; Wissam Saidi[2]; Benjamin Chorpening[1]; Yuhua Duan[1]; [1]National Energy Technology Laboratory; [2]University of Pittsburgh, Department of Mechanical Engineering and Materials Science

Advanced Steel Metallurgy — Plate, Pipe & Tube

Program Organizers: Chirag Mahimkar, Big River Steel; Justin Raines, SSAB Americas; Kip Findley, Colorado School of Mines; Alla Sergueeva, NanoSteel Company Inc; Daniel Branagan, The NanoSteel Co

Monday PM November 2, 2020

2:00 PM
Parametric study of cold wire tandem submerged arc welding of heavy gauge X70 linepipe steel: *Tailin Ren*[1]; Hani Henein[1]; J Barry Wiskel[1]; Douglas Ivey[1]; Mohsen Mohammadijoo[2]; Robert Lazor[3]; [1]University of Alberta; [2]EVRAZ Inc. NA; [3]TC Energy Corporation

2:20 PM
A Predictive Tool to Aid the Design, Heat Treatment and Qualification of Pipeline Fittings: *Fateh Fazeli*[1]; Robert Cicoria[2]; James Saragosa[1]; Cindy Guan[3]; [1]CanmetMATERIALS; [2]McMaster University; [3]TC Energy

Advances in Synthesis and Integration Methods for Enhanced Properties, and Applications in Emerging Nanomaterials — 2D and Neuromorphic Materials

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jung-Kun Lee, University of Pittsburgh; Zubaer Hossain, University of Delaware

Monday PM November 2, 2020

2:00 PM Invited
Electrochemical 2D Synapses for Neuromorphic Computing Applications: *Feng Xiong*[1]; [1]University of Pittsburgh

2:30 PM Invited
Iontronic Devices for Energy Efficient Electronics and Neuromorphic Computing: *Ke Xu*[1]; Zhongmou Chao[1]; Susan Fullerton-Shirey[1]; [1]University of Pittsburgh

3:00 PM Invited
Impact of Processing Parameters on Metal Oxide Resistive Random Access Memory (RRAM) Performance and Implications for non-von Neumann Computing Approaches: *Nathaniel Cady*[1]; [1]SUNY Polytechnic Institute

3:30 PM Invited
Efficient Neuromorphic Computing Enabled by Spin-Transfer Torque: Devices, Circuits and Systems: *Abhronil Sengupta*[1]; [1]Penn State University

4:00 PM
Introduction to Research Capabilities at Center for Functional Nanomaterials, a DOE National User Facility: *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory

Applications of Modern Characterization Techniques to Ferrous Alloys and Steel Products — Applications of Modern Characterization Techniques to Ferrous Alloys and Steel Products

Program Organizers: Steven Thompson, Colorado School of Mines; Calixto Garcia, University of Pittsburgh

Monday PM November 2, 2020

2:00 PM
Photons, Electrons, and X-rays: A New Platform for Rapid Imaging and Characterization of Engineering Materials: *William Harris*[1]; Hrishikesh Bale[1]; Kyle Crosby[1]; Tobias Volkenandt[1]; Fabian Perez-Willard[1]; [1]Carl Zeiss Microscopy

BSD/PCSA: Humanitarian Engineering Symposium — Humanitarian Engineering

Program Organizers: Victoria Christensen, University of California Santa Barbara; Scott Mccormack, University of California, Davis; Michael Walden, Colorado School of Mines; Christopher Kassner, University of Virginia; Kimiko Nakajima, University of California, Davis; Adrianna Lupercio, Boise State University

Monday PM November 2, 2020

2:00 PM Invited
Service Learning and Ceramic Material Research on Point-of-Use Water Treatment Technologies for Use in Marginalized Communities: *Ian Nettleship*[1]; [1]University of Pittsburgh

2:30 PM Invited
Harder, Better, Faster, Greener Building Materials by Cold Sintering Process: *Sun Hwi Bang*[1]; Arnaud Ndayishimiye[1]; Esther Obonyo[1]; Clive Randall[1]; [1]Pennsylvania State University

3:00 PM Invited
SciBridge Project: Preparing the Next-generation of Scientists through Renewable Energy Kits: *Michael Spencer*[1]; [1]North Carolina State University

3:30 PM Panel Discussion

Bulk and Sheet Thermal-Deformation Processing and Microstructure Development in Metals – Characterization, Experiments and Modeling — Session I

Program Organizers: Daniel Coughlin, Los Alamos National Laboratory; Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory

Monday PM November 2, 2020

2:00 PM
Microstructure and Mechanical Properties of Diffusion Bonded IN740H: *Kaimiao Liu*[1]; Tao Liu[1]; Omer N Dogan[1]; [1]National Energy Technology Laboratory

2:20 PM
Characterisation of static recrystallisation and grain growth in designed gradient microstructures: a pathway to high-throughput microstructural testing?: Nicholas Breeuwer[1]; Daniel Lewis[2]; Milo Kral[1]; *Catherine Bishop*[1]; [1]University of Canterbury; [2]Rennselaer Polytechnic Institute

Ceramic Matrix Composites — CMC II: Foreign Object Damage/NDE

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Sung Choi, Naval Air Systems Command; Jacques Lamon, CNRS

Monday PM November 2, 2020

2:00 PM
Multi-scale Physics-based Modeling of Particle-Impact Erosion of CMCs: *David Newsome*[1]; Rae Waxman[1]; Stephen Giles[1]; Debasis Sengupta[1]; Ashok Raman[1]; Stewart Silling[2]; [1]CFD Research Corporation; [2]Sandia National Laboratory

2:20 PM Invited
In Situ Observation of Crack Formation in CMCs Using X-ray Computed Tomography up to 1200°C: *Dong Liu*[1]; Jon Ell[2]; Harold Barnard[2]; Stefan Reh[3]; Robert Ritchie[2]; [1]University of Bristol; [2]Lawrence Berkeley National Laboratory; [3]DLR

3:00 PM
Quantifying Damage Mechanisms by Observing Damage Evolution in SiC/SiC Composites using Micro-CT Techniques: *Ashley Hilmas*[1]; Kathleen Sevener[2]; John Halloran[2]; [1]Air Force Research Lab; [2]University of Michigan

Ceramics and Glasses Simulations and Machine Learning — Atomistic Modeling

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Monday PM November 2, 2020

2:00 PM Invited
Ab-initio and Reactive MD Simulations of Polymer Pyrolysis and Formation of Silicon-based Ceramics
: *Peter Kroll*[1]; [1]University of Texas at Arlington

2:30 PM
A Reactive Force Field (ReaxFF) for Polymer-derived Ceramics: *Shariq Haseen*[1]; Ilia Ponomarev[2]; Peter Kroll[1]; [1]University of Texas Arlington; [2]Czech Technical University in Prague

2:50 PM
Theoretical Calculation of Formation Energies and Site Preference of Substitutional Divalent Cations in Carbonated Apatite: *Tatsushi Saito*[1]; Tatsuya Yokoi[1]; Atsutomo Nakamura[1]; Katsuyuki Matsunaga[1]; [1]Nagoya University

3:10 PM
The Role of Pore Pattern on The Ductility Enhancement of Crystalline Silicon Nitride Nanoporous Membranes: *Ali K. Shargh*[1]; James McGrath[1]; Niaz Abdolrahim[1]; [1]University of Rochester

3:30 PM Invited
Beyond the Average: Fluctuations in Glass-forming Systems: *Katelyn Kirchner*[1]; John Mauro[1]; [1]Pennsylvania State University

4:00 PM
The Energy Landscape Governs Brittle-to-Ductile Transitions in Glasses: Longwen Tang[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Complicated Ceramics and Layered Nanomaterials

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory ; Jian Shi, Rensselaer Polytechnic Institute; Kejie Zhao, Purdue University ; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne

Monday PM November 2, 2020

2:00 PM
Light Transmission Modulation in Ceramics through Mesoscale Modelling: Lukasz Kuna[1]; James Wollmershauser[2]; John Mangeri[3]; Boris Feigelson[2]; *Edward Gorzkowski*[2]; Serge Nakhmanson[1]; [1]University of Connecticut; [2]Naval Research Laboratory; [3]Institute of Physics, Academy of Sciences of the Czech Republic

2:20 PM Invited
Chemical Pre-intercalation Synthesis and Exfoliation of Bilayered Vanadium Oxides for Energy Storage Applications: *Ekaterina Pomerantseva*[1]; [1]Drexel University

2:50 PM
d-Spacing Effect on the Electrochemical Performance of MXene in Organic and Room Temperature Ionic Liquids: *Kun Liang*[1]; Naresh Osti[2]; Eugene Mamontov[2]; Bishnu Thapaliya[3]; Sheng Dai[2]; Michael Naguib[1]; [1]Tulane University; [2]Oak Ridge National Laboratory; [3]University of Tennessee

3:10 PM
Effect of Cation Pre-intercalation on the Electrochemical Performance of Multilayer Ti_3C_2 MXene in Aqueous Electrolyte: *Kaitlyn Prenger*[1]; Ameer Al-Temimy[2]; Kun Liang[1]; Simone Raoux[2]; Tristan Petit[2]; Michael Naguib[1]; [1]Tulane University; [2]Helmholz-Zentrum Berlin für Materialien und Energie GmbH

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

Program Organizers: Jeffrey Fergus, Auburn University; Assel Aitkaliyeva, University of Florida; Kester Clarke, Colorado School of Mines; Subhadra Gupta, University of Alabama; Gregg Janowski, University of Alabama at Birmingham; Karteek Kesavamatham, ZF TRW; Janelle Wharry, Purdue University

Monday PM November 2, 2020

2:00 PM
(PM) ABET Related Topics: Recent Changes in ABET Engineering General Criteria: *Jeffrey Fergus*[1]; [1]Auburn University

2:05 PM
(PM) ABET Related Topics: Program Criteria for Materials, Metallurgical, Ceramics Engineering Programs: *Gregg Janowski*[1]; [1]University of Alabama at Birmingham

2:10 PM
(PM) ABET Related Topics: Preparing for an ABET Evaluation – Common Issues: *Jeffrey Fergus*[1]; [1]Auburn University

2:15 PM Question and Answer Period

2:40 PM
(PM) Remote and Virtual Instruction: Online Delivery of a Mechanical Properties of Materials Laboratory Course: *Susan Gentry*[1]; [1]University of California, Davis

2:45 PM
(PM) Remote and Virtual Instruction: COVID-19 has Worked to Prepare Our Students for Tomorrow's Industrial World: *Robert Kimel*[1]; [1]Pennsylvania State University

2:50 PM
(PM) Remote and Virtual Instruction: Capstone Meets Pandemic; Experiences of Students and Mentors Working through the COVID-19 Lockdown: *Benjamin Church*[1]; [1]University of Wisconsin Milwaukee

2:55 PM Question and Answer Period

3:20 PM
(PM) Outreach, Admission and Laboratory Experience: Outreach and Recruitment Activities of Undergraduate Materials Science and Engineering Students: *Isabel Lloyd*[1]; [1]University of Maryland

3:25 PM
(PM) Outreach, Admission and Laboratory Experience: Comprehensive Review in Graduate Admission – Implementation and First Outcomes: *Wolfgang Windl*[1]; [1]Ohio State University

3:30 PM
(PM) Outreach, Admission and Laboratory Experience: Metallurgical Lab Experience through the Development of a Metal Additive Manufacturing Process: *Ping-Chuan Wang*[1]; [1]SUNY New Paltz

3:35 PM Question and Answer Period

4:00 PM Panel Discussion: Preparing Students for the Materials Genome Initiative Workforce – Moderator - Jeffrey Fergus, Auburn University; Panelists -
Michele Manuel, University of Florida; Wenhao Sun, University of Michigan; and Katsuyo Thornton, University of Michigan

4:40 PM Panel Discussion: Workforce Development: Do Our Materials Science & Engineering Curricula Meet Workforce Needs? - Moderator - Kester Clark, Colorado School of Mines; Panelists - Simona Hunyadi Murph, Savannah River National Laboratory and Ashish Singh, Nucor Steel Arkansas

Environmentally Assisted Cracking: Theory and Practice — Investigating the Role of Hydrogen

Program Organizers: Jenifer Locke, Ohio State University; Wenjun Cai, Virginia Polytechnic Institute and State University; Bai Cui, University of Nebraska-Lincoln; Srujan Rokkam, Advanced Cooling Technologies Inc; Kaila Bertsch, University of Wisconsin-Madison

Monday PM November 2, 2020

2:00 PM Invited
Assessing the Influence of Hydrogen on The Deformation Behavior of a Precipitation-hardened Nickel-based Alloy: *Zachary Harris*[1]; Jishnu Bhattacharyya[1]; Joseph Ronevich[2]; Sean Agnew[1]; James Burns[1]; [1]University of Virginia; [2]Sandia National Laboratories

2:40 PM
Atomistic Simulations of the Transport and Trapping of Hydrogen in Zirconium: *Richard Smith*[1]; Natalia Tymiak-Carlson[1]; Mikael Christensen[2]; Erich Wimmer[3]; [1]Naval Nuclear Lab - Bettis; [2]Materials Design, Inc. ; [3]Materials Design, Inc.

3:00 PM
Hydrostatic Instability as the Underlying Mechanism of Hydrogen Embrittlement: *Michael McGuire*

3:20 PM
The Relationship between Post-build Stress-relief Heat Treatment and the Hydrogen Embrittlement Susceptibility of Additively Manufactured IN625: *Mark Stoudt*[1]; Richard Ricker[1]; Maureen Williams[1]; Fan Zhang[1]; [1]National Institute of Standards and Technology

Functional Defects in Electroceramic Materials — Defect Design for Energy Storage Materials

Program Organizers: Hui Xiong, Boise State University; Hua Zhou, Argonne National Laboratory; Yanhao Dong, Massachusetts Institute of Technology

Monday PM November 2, 2020

2:00 PM Invited
Design of Functional Decompositions for Solid State Batteries: *Xin Li*[1]; [1]Harvard University

2:30 PM Invited
Energetic Compromise for Achieving "Redox-Site-Rich" in Pseudocapacitive Energy Storage Materials: A Case Study of Nickel – aluminum Layered Double Hydroxides: Xianghui Zhang[1]; Cody Cockreham[1]; Su Ha[1]; Hongwu Xu[2]; *Di Wu*[1]; [1]Washington State University; [2]Los Alamos National Laboratory

3:00 PM
Structure and Energetics of Point Defects in Titanium Dioxide: *Shuyan Zhang*[1]; Alan McGaughey[1]; Reeja Jayan[1]; [1]Carnegie Mellon University

3:20 PM Invited
Formation of Two-dimensional Heterointerface in Layered Oxides for Improved Electrode Performance: *Ekaterina Pomerantseva*[1]; [1]Drexel University

3:50 PM
Thermodynamic Insights into Engineering 2D Nano-ceramics Towards Powering Portable Electronic Devices: *Cody Cockreham*[1]; Xianghui Zhang[1]; Gengnan Li[1]; Hongwu Xu[2]; Di Wu[1]; [1]Washington State University; [2]Los Alamos National Laboratory

Glasses, Optical Materials, and their Functional Applications: Current Issues in Science & Technology — Advanced Characterizations and Functional Applications

Program Organizers: Jincheng Du, University of North Texas; S. K. Sundaram, Alfred University

Monday PM November 2, 2020

2:00 PM Invited
Glasses beyond Megabar Pressures: *Sung Keun Lee*[1]; [1]Seoul National University

2:40 PM Invited
Terahertz Time-domain Spectroscopy of Glasses: *S. K. Sundaram*[1]; [1]Alfred University

3:10 PM
Effect of Transition Metal Impurities on the Properties of ZnSe Single Crystals: *Brett Setera*[1]; Charmain Su[1]; Fow-Sen Choa[1]; Bradley Arnold[1]; Ching Hua Su[1]; Shruti Singh[1]; Puneet Gill[1]; Kamdeo Mandal[1]; Ian Emge[1]; Narsingh Singh[1]; [1]University of Maryland, Baltimore County

3:30 PM
Development of YAG-alumina Composites for the Lightening Applications: *Sekyung Chang*[1]; Robert Kusner[1]; Fritz Grensing[1]; Wenbo Zhang[1]; [1]Materion Corporation

High Entropy Materials: Concentrated Solid Solution, Intermetallics, Ceramics, Functional Materials and Beyond — Materials Discovery and Design II

Program Organizers: Xingbo Liu, West Virginia University; Michael Gao, National Energy Technology Laboratory; Peter Liaw, University of Tennessee; Jian Luo, University of California, San Diego; Yiquan Wu, Alfred University; Yu Zhong, Worcester Polytechnic Institute

Monday PM November 2, 2020

2:00 PM Invited
Investigating Multi-principal-element Alloys (MPEAs) at Larger Scales: From Melt Processing to New Design Approaches: *Martin Detrois*[1]; Kyle Rozman[1]; Michael Gao[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

2:20 PM Invited
Electrodepositionof Nanocrystalline Medium and High-entropy Alloys: Michel Haché[1]; *Yu Zou*[1]; [1]University of Toronto

2:40 PM Invited
The Use of CALPHAD Based Tools to Simulate Applications of HEA Materials: Huahai Mao[1]; Lina Kjellqvist[1]; *Paul Mason*[2]; Qing Chen[2]; [1]Thermo-Calc Software AB; [2]Thermo-Calc Software Inc.

3:00 PM Invited
Control of Discontinuous and Continuous Precipitation of Gamma-prime Strengthened High-entropy Alloys: Lei Fan[1]; *Zengbao Jiao*[1]; [1]The Hong Kong Polytechnic University

3:20 PM
Machine Learning and Data Analytics for Identification of HEA Compositions and Processing Conditions Resulting in Enhanced Fatigue Resistance: Xuesong Fan[1]; Baldur Steingrimsson[2]; Orlando Rios[3]; Anand Kulkarni[4]; Duckbong Kim[5]; *Peter Liaw*; [1]University of Tennessee; [2]Imagars LLC; [3]Oak Ridge National Laboratory; [4]Siemens Corporation; [5]Tennessee Tech University

3:40 PM
Using alloy phase diagrams to predict formation of high-entropy alloy phases: *Jie Qi*[1]; Mark Wischhusen[2]; Samuel Inman[2]; John Scully[2]; Sean Agnew[2]; S. Poon[1]; [1]Department of Physics, University of Virginia; [2]Department of Materials Science and Engineering, University of Virginia

High Temperature Corrosion and Degradation of Structural Materials — Effects of Water Vapor/Ni-based Alloys and High Temperature Effects

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Raul Rebak, GE Global Research; David Shifler, Office of Naval Research; Richard Oleksak, National Energy Technology Laboratory

Monday PM November 2, 2020

2:00 PM
Influence of the Water Vapor on Oxide Scale and Alpha Case Layer in Ti6Al4V: *Beyza Öztürk*[1]; Lukas Mengis[1]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut

2:30 PM Invited
Thermochemical Stability of EBC Silicates in High-temperature High-velocity Water Vapor: Mackenzie Ridley[1]; *Elizabeth Opila*[1]; [1]University of Virginia

3:00 PM
Metal Dusting of Ni-based Alloys at Elevated Pressure in Different Gas Compositions: *Clara Schlereth*[1]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut

3:20 PM
The Effect of Surface Treatment on the Formation, Structure, and Chemistry of Protective Oxide Scale on High-temperature Oxidation-resistant Nickel Alloys: *Stephen House*[1]; Henry Ayoola[1]; John Lyons[1]; Meng Li[1]; Bingtao Li[1]; Judith Yang[1]; Wissam Saidi[1]; Brian Gleeson[1]; [1]University of Pittsburgh

Innovations in Refractory Ceramic Technology for Iron and Steel Applications — Innovations in Refractory Ceramic Technology for Iron and Steel Applications

Program Organizers: James Hemrick, Reno Refractories Inc.; Josh Pelletier, Imerys Aluminates

Monday PM November 2, 2020

2:00 PM
Aging of Refractory Castables: *Joshua Sayre*[1]; Margaret Raughley[1]; Jeffrey Bogan[1]; [1]HarbisonWalker International

2:20 PM
New Refractory Solutions: Supporting Induction Melting Manufacturing Challenges: *Dana Goski*[1]; Ryan Hershey[1]; Gary Hallum[1]; Benjamin Hunsicker[1]; Yuechu Ma[1]; [1]Allied Mineral Products LLC

2:40 PM
Refractory Developments for BOF and Furnace Taphole Applications: *Sean Carden*[1]; Keith Beale[1]; [1]Vesuvius

Integration between Modeling and Experiments for Crystalline Metals: From Atomistic to Macroscopic Scales II — Session I

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Levente Balogh, Queen's University; Josh Kacher, Georgia Institute of Technology; Caizhi Zhou, University of South Carolina; Lei Cao, University of Nevada

Monday PM November 2, 2020

2:00 PM Invited
Bridging Computational Modeling and In Situ Experiment to Decipher Microscopic Deformation Mechanics: *Ting Zhu*[1]; [1]Georgia Institute of Technology

2:30 PM
Ultra-high strength and plasticity mediated by partial dislocations and defect networks: Ruizhe Su[1]; Dajla Neffati[2]; Yifan Zhang[1]; Yashashree Kulkarni[2]; *Xinghang Zhang*[1]; Zhongxia Shang[1]; [1]Purdue University; [2]University of Houston

2:50 PM
Integrating Materials Models and Dynamical Electron Diffraction Simulations for Dislocation Analysis using STEM-Defect Contrast Imaging: *Joseph Tessmer*[1]; Mulaine Shih[2]; Yejun Gu[3]; Jafaar El-Awady[3]; Maryam Ghazisaeidi[2]; Marc De Graef[1]; [1]Carnegie Mellon University; [2]Ohio State University; [3]Johns Hopkins University

3:10 PM
Predicting the Stress Strain Behavior of Nickel Single Crystal Through an Integrated First-principles Calculation and Crystal Plasticity Finite Element Modeling Approach: Shipin Qin[1]; Shun-Li Shang[1]; *John Shimanek*[1]; Zi-Kui Liu[1]; Allison Beese[1]; [1]Pennsylvania State University

3:30 PM
ECCI Image Simulations for Arbitrary Defect Displacement Fields: *Marcus Ochsendorf*[1]; Joseph Tessmer[1]; Marc De Graef[1]; [1]Carnegie Mellon University

Light Metal and Composites Technology — Composites II: Development in Light Weight Alloys

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Xiaoming Wang, Purdue University; Alex Moser, U.S. Naval Research Laboratory; Alan Luo, Ohio State University; Manoj Kolel-Veetil, Naval Research Laboratory; Kumar Sadayappan, CanmetMATERIALS; Tanjore Jayaraman, University of Michigan-Dearborn

Monday PM November 2, 2020

2:00 PM Invited
Developments in Titanium Alloys for Aero-engine Applications: *Ramachandra Canumalla*[1]; [1]Self Employed

2:20 PM
Effect of Cu Content on Tensile and Low Cycle Fatigue Properties of Cast Al-Cu-Mn-Zr Alloys: *Sumit Bahl*[1]; Xiaohua Hu[1]; Jiahao Cheng[1]; Eric Hoar[1]; Kevin Sisco[2]; J. Allen Haynes[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee

2:40 PM
Metastable f.c.c. Phase and Its Influence on the Soft-magnetic Properties of FeCoNiAlxSix (0.2 < x < 0.5) Alloys: *Tanjore Jayaraman*[1]; Ramasis Goswami[2]; [1]University of Michigan-Dearborn; [2]Naval Research Laboratory

3:00 PM Invited
A Novel Equiatomic and Non-equiatomic Low-density High Entropy Alloys and Composites: Nandini Singh[1]; Yagnesh Shadangi[1]; Vikas Shivam[1]; Vivek Pandey[1]; Varalakshmi Somarauthu[1]; *Nilay Mukhopadhyay*[1]; [1]Indian Institute of Technology (BHU) Varanasi

Machine Learning for Discovery of Structure-Process-Property Relations in Electronic Materials — Machine Learning in Materials Engineering II

Program Organizers: B. Reeja Jayan, Carnegie Mellon University; Aarti Singh, Carnegie Mellon University

Monday PM November 2, 2020

2:00 PM
Cycle Life Prediction of Lithium Ion Batteries Based on Data Driven Methods: *Laisuo Su*[1]; Mengchen Wu[1]; B. Jayan[1]; [1]Carnegie Mellon University

2:20 PM
Fast and Generalizable Detailed Router Using Attention-based Reinforcement Learning: *Haiguang Liao*[1]; Levent Kara[1]; Qingyi Dong[1]; Xuliang Dong[1]; Wentai Zhang[1]; Wangyang Zhang[2]; Weiyi Qi[3]; Elias Fallon[3]; [1]Carnegie Mellon University; [2]Uber ATG; [3]Cadence Design Systems

Materials Design through AI Composition and Process Optimization — Session I

Program Organizers: Noah Paulson, Argonne National Laboratory; Tiberiu Stan, Northwestern University; Brandon Bocklund, Pennsylvania State University; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Monday PM November 2, 2020

2:00 PM Invited
Realistic 3D Microstructure Generation via Generative Adversarial Networks: *Elizabeth Holm*[1]; Tim Hsu[1]; William Epting[2]; Hokon Kim[1]; Harry Abernathy[2]; Gregory Hackett[2]; Anthony Rollett[1]; Paul Salvador[1]; [1]Carnegie Mellon University; [2]U.S. DOE National Energy Technology Laboratory

2:25 PM Invited
Artificial Intelligence for Material and Process Design: *Marius Stan*[1]; Noah Paulson[1]; Debolina Dasgupta[1]; Jessica Pan[2]; Joseph Libera[1]; [1]Argonne National Laboratory; [2]Princeton University

2:50 PM
Statistics-based Microstructural Digital Image Correlation Method for Estimating Ex-situ Strain from Dissimilar Micrographs: *Patxi Fernandez-Zelai*[1]; Quinn Campbell[1]; Yousub Lee[1]; Michael Kirka[1]; Sebastien Dryepondt[1]; [1]Oak Ridge National Laboratory

3:10 PM Invited
Text and Data Mining for Materials Synthesis: *Elsa Olivetti*[1]; [1]Massachusetts Institute of Technology

3:35 PM Invited
Deep Materials Informatics: Illustrative Applications of Deep Learning in Materials Science: *Ankit Agrawal*[1]; [1]Northwestern University

4:00 PM
Machine Learning Prediction of Glass Properties Informed by Synthetic Data: Kai Yang[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

4:20 PM
Learning Through Domain Knowledge: A Hierarchical Machine Learning Approach Towards the Prediction of Thermoplastic Polyurethane Properties: *Joseph Pugar*[1]; Newell Washburn[1]; [1]Carnegie Mellon University

Materials Informatics for Images and Multi-dimensional Datasets — Session I

Program Organizers: Amanda Krause, University of Florida; Kristen Brosnan, General Electric Research; Alp Sehirlioglu, Case Western Reserve University

Monday PM November 2, 2020

2:00 PM
Introductory Comments: Materials Informatics for Images and Multi-dimensional Datasets: *Amanda Krause*[1]; [1]University of Florida

2:05 PM Invited
Neural Networks and Community Driven Software for Scanning Transmission Electron Microscopy: *James LeBeau*[1]; [1]MIT

2:35 PM
Developing Granular Dielectrics Based on Reconstructed Micro-CT Images: *Kevin Hager*[1]; Christina Wildfire[2]; Edward Sabolsky[1]; Terence Musho[1]; [1]West Virginia University; [2]National Energy Technology Laboratory

2:55 PM
Feature Characterization of Electron Backscatter Patterns from Rotating Lattice Single Crystals Using Machine Learning: *Evan Musterman*[1]; Joshua Agar[1]; Volkmar Dierolf[1]; Himanshu Jain[1]; [1]Lehigh University

3:15 PM
Automated Optical Microscopy for Rapid Defect Screening: *Andrew Kitahara*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

3:35 PM
Assessment of the Ability of Laboratory Accelerated Corrosion Tests to Accurately Predict On-road Corrosion of 6xxx Al Alloys: Dadi Zhang[1]; Jayendran Srinivasan[1]; *Jenifer Locke*[1]; [1]The Ohio State University

3:55 PM
Towards Smart Categorization of Growth Morphology by Machine Learning: *Kimberly Gliebe*[1]; [1]Case Western Reserve University

Micro- and Nano-Mechanical Behavior of Materials — Micro/Nano-Mechanics II

Program Organizers: Sundeep Mukherjee, University of North Texas; Mahmoud Baniasadi, Georgia Southern University; Meysam Haghshenas, University of Toledo

Monday PM November 2, 2020

2:00 PM Invited
Persistent, Inelastic Cycling Behavior in Rare Earth Orthophosphate Ceramics: *Corinne Packard*[1]; [1]Colorado School of Mines

2:20 PM
Exploring Small-scale Quasicrystal Plasticity in Unknown Temperature Regimes and Compositions: Changjun Cheng[1]; *Yu Zou*[1]; [1]University of Toronto

2:40 PM Invited
In Situ Nanomechanics of Ni-based Superalloys and Bond Coating: Effect of Temperature: *Sanjit Bhowmick*[1]; Eric Hintsala[1]; Douglas Stauffer[1]; [1]Bruker

3:00 PM Invited
Temperature-dependent Intermittent Plasticity of Nb Microcrystals: Quentin Rizzardi[1]; Douglas Stauffer[2]; Jaime Marian[3]; *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign; [2]Bruker Nano Surfaces; [3]University of California, Los Angeles

3:20 PM
Characterization of Dislocation Avalanches by In Situ Micropillar Compression Tests with Simultaneously Detected Acoustic Emission: *David Ugi*[1]; Péter Ispánovity[1]; Michal Knapek[2]; Kristián Máthis[2]; Zoltán Dankházi[1]; István Groma[1]; [1]Loránd Eötvös University; [2]Charles University

MS&T Student Events — PCSA Humanitarian Pitch Competition

Monday PM November 2, 2020

To be announced.

Next Generation Biomaterials — Next Generation Biomaterials II

Program Organizers: Roger Narayan, University of North Carolina; David Dausch, RTI International; Sanjiv Lalwani, Lynntech, Inc.

Monday PM November 2, 2020

2:00 PM Invited
Nanostructured Surface Bioactive Composite Scaffold for Filling of Mandibular Bone Defects: A Pilot Study: *Leonardo Ciocca*[1]; Claudio Marchetti[1]; Achille Tarsitano[1]; [1]University of Bologna

2:20 PM Invited
4D Printing of Advanced Scaffolds with Controlled Growth Factor Delivery for Tissue Engineering: *Min Wang*[1]; [1]University of Hong Kong

2:40 PM Invited
Creating Smart Biopolymer Fibers for Healthcare Applications: *Ayda Afshar*[1]; Mohan Edirisinghe[1]; [1]University College London

3:00 PM Invited
Stereolithographic Additive Manufacturing of Bioceramic Implants: *Soshu Kirihara*[1]; [1]Osaka University

3:20 PM Invited
New Materials for Medical Implants: Diamond: *Kate Fox*[1]; [1]RMIT University

3:40 PM Invited
Photopolymerization-Based 3D Printing of Medical Devices: *Roger Narayan*[1]; [1]University of North Carolina

4:00 PM Invited
Three High Entropy Alloys and their Ability to Control Biofilm Formation: *Hideyuki Kanematsu*[1]; David Kemény[2]; Eva Fazakas[2]; Attila Szabo[3]; Dana Barry[4]; Nobumitsu Hirai[1]; Akiko Ogawa[1]; Takeshi Kogo[1]; Noriyuki Wada[1]; Hidemi Nakamura[5]; Paul McGrath[6]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Budapest University of Technology and Economics; [3]University of Dunaújváros; [4]Clarkson University/SUNY Canton; [5]National Institute of Technology, Nara College; [6]Clarkson University

Phase Transformations in Additively Manufactured Materials — Additive Manufacturing - Phase Transformations - Modelling

Program Organizers: Antonio Ramirez, Ohio State University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati; Vijay Vasudevan, University of Cincinnati; Bij-Na Kim, Lancaster University/LPW Technology; Eric Lass, National Institute of Standards and Technology

Monday PM November 2, 2020

2:00 PM Invited
Phase Field Simulations of Cellular-to-Dendritic Transition under Additive Manufacturing Conditions: *Younggil Song*[1]; Steve DeWitt[1]; Bala Radhakrishnan[1]; John Turner[1]; [1]Oak Ridge National Laboratory

2:40 PM
Development of Non-equilibrium Thermodynamic Tools for Additive Manufacturing: *Kaisheng Wu*[1]; Paul Mason[1]; Deepankar Pal[2]; [1]Thermo-Calc Software Inc.; [2]ANSYS Inc

3:00 PM
Design of Post-fabrication Heat Treatments for Ti Free Grade 300 Maraging Steel Manufactured Using Laser Powder Bed Fusion (LBPF) Process: *Rangasayee Kannan*[1]; Donovan Leonard[1]; Peeyush Nandwana[1]; [1]Oak Ridge National Laboratory

3:20 PM
Microstructure Engineering through Post-heat Treatment of Inconel 718 Superalloy Made by Laser Powder Bed Fusion: *Yunhao Zhao*[1]; Kun Li[1]; Noah Sargent[1]; Wei Xiong[1]; [1]University of Pittsburgh

3:40 PM
Rapid Solidification of Aluminium 6061 Using Fast Scanning DSC: *Lakshmi Ravi Narayan*[1]; Cain Hung[1]; Rainer Hebert[1]; [1]Department of Materials Science and Engineering, University of Connecticut

4:00 PM
Real-time Observation of the Competition between Ferritic vs Austenitic Solidification in Micro-laser Welding of 316L Using Synchrotron X-ray Diffraction: *Joseph Aroh*[1]; Seunghee Oh[1]; Benjamin Gould[2]; Andrew Chuang[2]; P. Pistorius[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory

4:20 PM
Laser Powder Bed Fusion of Stainless Steel 15-5PH: Microstructure Analysis and Process Optimization: *Cameron Lucas*[1]; Nathalia Diaz Vallejo[1]; Holden Hyer[1]; Brandon McWilliams[2]; Kyu Cho[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]US Army Research Laboratory

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — Session I

Program Organizers: Ma Qian, Royal Melbourne Institute of Technology; James Paramore, U.S. Army Research Laboratory; David Yan, San Jose State University

Monday PM November 2, 2020

2:00 PM Keynote
By-products from Laser-material Interactions in Laser Powder Bed Fusion of Metal Powders: *Aijun Huang*[1]; Haopeng Shen[1]; Xinhua Wu[1]; [1]Monash University

2:30 PM Keynote
Influence of Powder Characteristics, Temperature and Cooling Rate on the Development of the Properties in Ni-Superalloys Processed Using Powder Hot Isostatic Pressing: *Moataz Attallah*[1]; Alessandro Sergi[1]; James MacDonald[1]; [1]University of Birmingham

3:00 PM Invited
Hot Isostatic Pressing of Niobium-based Refractory Alloy Powders: *Calvin Mikler*[1]; Brian Welk[1]; Benjamin Georgin[1]; Todd Butler[2]; Noah Philips[3]; Hamish Fraser[1]; [1]The Ohio State University; [2]Air Force Research Laboratory; [3]ATI Specialty Alloys and Components

3:20 PM
Diffusion Behavior and Mechanical Properties of the Aluminum / Tungsten Metallic System: *Ammar Alyasari*[1]; Raghavan Srinivasan[1]; [1]Wright State University/ The Middle Technical University-Baghdad

3:40 PM
Deformation-free Refinement of Prior ß Grain Size in Powder Metallurgical Titanium Alloys: *Daniel Lewis*[1]; James Paramore[2]; Brady Butler[2]; Griffin Turner[1]; Trevor Hastings[1]; [1]Texas A&M University; [2]U.S. Army Research Laboratory

4:00 PM
The Role of Processing and Texture on the Dynamic Mechanical Behavior of Powder Metallurgy Processed Ti-6Al-4V: *James Paramore*[1]; Brady Butler[1]; Matthew Dunstan[1]; Hongjoo Rhee[2]; Haitham El Kadiri[2]; Wilburn Whittington[2]; Shiraz Mujahid[2]; [1]U.S. Army Research Laboratory; [2]Mississippi State University

Processing and Performance of Materials Using Microwaves, Electric and Magnetic Fields, Ultrasound, Lasers, and Mechanical Work – Rustum Roy Symposium — Session II

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum & Minerals; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado

Monday PM November 2, 2020

2:00 PM Invited
Engineering Far-from-Equilibrium Materials Using Electromagnetic Fields: *B. Reeja Jayan*[1]; Nathan Nakamura[1]; Laisuo Su[1]; Shikhar Jha[1]; [1]Carnegie Mellon University

2:30 PM Invited
The Use of Alternate Electromagnetic Fields to Control Biofilm: *Hideyuki Kanematsu*[1]; Hidekazu Miura[2]; Ryota Tachi[1]; Runa Okada[2]; Dana Barry[3]; Stefan Zimmerman[4]; Nobumitsu Hirai[1]; Akiko Ogawa[1]; Takeshi Kogo[1]; Noriyuki Wada[1]; Paul McGrath[5]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Suzuka University of Medical Science; [3]Clarkson University/SUNY Canton; [4]Leibniz University, Hannover; [5]Clarkson University

Sintering and Related Powder Processing Science and Technologies — Modelling and Processing-related Topics

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

Monday PM November 2, 2020

2:00 PM
Coarsening of Several Ceramic Particle Systems: *Daniel Delia*[1]; William Carty[1]; Hyojin Lee[1]; [1]Alfred University

2:20 PM
Novel Low-temperature Copper Sintering Paste for Large-area Die Attachment at 200°C in Nitrogen Atmosphere: *Hao Zhang*[1]; Takanori Kobatake[1]; Yasuyuki Akai[1]; Minoru Ueshima[1]; Katsuaki Suganuma[1]; [1]Daicel Corporation

2:40 PM
The Effect of Cryogenic Milling and Parameters of Spark Plasma Sintering on Microstructure, Phase Composition and Mechanical Properties of Metastable Beta Titanium Alloy Ti-15Mo: *Anna Veverkova*[1]; Jirí Kozlík[1]; Kristína Bartha[1]; Cinthia Correa[1]; Tomáš Chráska[2]; Josef Stráský[1]; [1]Charles University; [2]Czech Academy of Sciences

Substrate Protection for Corrosion Prevention — Substrate Protection for Corrosion Prevention II

Program Organizers: Mary Lyn Lim, PPG Industries; Cortney Crane, Exponent; Qixin Zhou, The University of Akron; Kylee Fazende, NSWC Carderock Division; Raul Rebak, GE Global Research; Tushar Borkar, Cleveland State University

Monday PM November 2, 2020

2:00 PM
Corrosion Resistant Coatings on 6061 Aluminum: Jing Xu[1]; *Rajeswaran Radhakrishnan*[1]; Cory Crowley[2]; Timothy Hall[1]; Jennings Taylor[1]; Maria Inman[1]; Stephen Snyder[1]; [1]Faraday Technology Inc; [2]Fermi National Lab

2:20 PM
Effect of Surface Coating and PTFE Tape Insulation on Galvanic Corrosion of AZ31B Bolt-joined with CFRP: Charles Warren[1]; Jiheon Jun[1]; *Yong Chae Lim*[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

2:40 PM
Improving the Corrosion Performance of Carbide-reinforced Martensitic Steels via Adding Trace Cu: *Kenta Yamanaka*[1]; Chen Zhang[1]; Manami Mori[2]; Huakang Bian[1]; Akihiko Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College

Synthesis, Characterization, Modeling and Applications of Functional Porous Materials — Functional Porous Materials II

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

Monday PM November 2, 2020

2:00 PM Invited
An Overview of High-temperature Ceramic-carbonate Dual-phase Membranes for CO2 Capture and Conversion: *Kevin Huang*[1]; [1]University of South Carolina

2:30 PM Invited
Designing Multi-phase Reaction Pathways for CO2 Capture and Enhanced H2 Production from Ca- and Mg-bearing Precursors to Produce Stable Porous Carbonates Using Cross-scale X-ray Scattering Measurements: *Greeshma Gadikota*[1]; Tianhe Yin[1]; Xun Gao[1]; Ivan Kuzmenko[1]; [1]Cornell University

3:00 PM Invited
Surface Modified ScSZ-MC Dual-phase Membrane for Pre-combustion CO2 Capture: *Shichen Sun*[1]; Kevin Huang[1]; [1]University of South Carolina

3:30 PM Invited
Porous Crystalline Porphyrinic Structures for Functional Materials Applications: *Lawrence Cook*[1]; Greg Brewer[1]; Daniel Siderius[2]; Winnie Wong-Ng[2]; [1]The Catholic University of America; [2]National Institute of Standards and Technology

4:00 PM
Hierarchical Porosity in \948-MnO2 Nanosheet Assemblies via Layer-tunnel Conversion: *Alec Ladonis*[1]; Peter Metz[1]; Trevyn Hey[1]; Peng Gao[1]; Scott Misture[1]; [1]Alfred University

4:20 PM
Compositional Influence on Kirkendall Pore Formation during Fabrication of Gamma Prime Strengthened Superalloy Microtubes: *Haozhi Zhang*[1]; Ashley Paz y Puente[1]; [1]University of Cincinnati

4:40 PM
Highly Controlled and Steerable Porosity for Ceramic Structures via Freeze Casting: *Mert Arslanoglu*[1]; Burak Ozdoganlar[1]; Rahul Panat[1]; [1]Carnegie Mellon University

MS&T20 Plenary Session — ACerS Edward Orton, Jr. Memorial Lecture

Tuesday AM November 3, 2020

11:00 AM
Introductory Comments: MS&T20 Plenary Session: Tatsuki Ohji[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

11:05 AM Plenary
Additive Manufacturing: Disruptive Threat to Global Supply Chains and Enabler for Sustainable Development: *Mritunjay Singh*[1]; [1]Ohio Aerospace Institute

11:45 AM
Concluding Comments: MS&T20 Plenary Session: Tatsuki Ohji[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

12th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Manufacturing of Ceramics II

Program Organizers: Surojit Gupta, University of North Dakota; Rajiv Asthana, University of Wisconsin; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, AIST; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Tatami Junichi, Yokohama national university; Yiquan Wu, Alfred University; Allen Apblett, Oklahoma State University

Tuesday PM November 3, 2020

2:00 PM
Solid State Single Crystal Growth of YAG by SPS Sintering: *Iva Milisavljevic*[1]; Yiquan Wu[1]; [1]Alfred University

2:20 PM Invited
Microwave-assisted Synthesis of Lanthanide-based Nano- and Microscale Materials: Ilias Halimi[1]; Nan Liu[1]; Nikita Panov[1]; Emille Rodrigues[1]; *Eva Hemmer*[1]; [1]University of Ottawa

2:40 PM
Microwave-assisted Pretreatment of Coal Fly Ash for Enhanced Recovery of Rare-Earth Elements: *Gunes Yakaboylu*[1]; Daniel Baker[1]; Katarzyna Sabolsky[1]; John Zondlo[1]; Christina Wildfire[2]; Edward Sabolsky[1]; [1]West Virginia University; [2]US DOE-National Energy Technology Laboratory & Leidos

ACerS Frontiers of Science and Society — Rustum Roy Lecture

Tuesday PM November 3, 2020

1:00 PM Invited
Early Retrospectives from the Time of COVID: *James Adair*[1]; [1]Pennsylvania State University

Additive Manufacturing Modeling and Simulation: AM Materials, Processes, and Mechanics — Additive Manufacturing Modeling and Simulation - Machine Learning, Design and Optimization

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Brandon Mcwilliams, US Army Research Laboratory; Li Ma, Johns Hopkins University Applied Physics Laboratory; Yeongil Jung, Changwon National University

Tuesday PM November 3, 2020

2:00 PM
Reduced-order Process-structure Linkages during Post-Process Annealing of an Additively Manufactured Ni-base Alloy: *Andrew Marshall*[1]; Surya Kalidindi[1]; Bala Radhakrishnan[2]; John Turner[2]; [1]Georgia Institute of Technology; [2]Oak Ridge National Laboratory

2:20 PM
Phase Field Modeling of AM Solidification Microstructure with Algorithmic Feature Extraction to Facilitate Reduced Order Model Development: *Stephen DeWitt*[1]; Bala Radhakrishnan[1]; Yuanxun Bao[2]; George Biros[2]; Jean-Luc Fattebert[1]; John Turner[1]; [1]Oak Ridge National Laboratory; [2]University of Texas at Austin

2:40 PM
A Process Parameter Prediction Framework for Metal Additive Manufacturing: *Praveen Sreeramagiri*[1]; Ankit Roy[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

3:00 PM
Feature Engineering for Surrogate Models of Consolidation Degree in Additive Manufacturing: Mriganka Roy[1]; *Olga Wodo*[1]; [1]University at Buffalo

3:20 PM
Multi-Fidelity Surrogate Assisted Prediction of Melt Pool Geometry in Additive Manufacturing: *Nandana Menon*[1]; Sudeepta Mondal[1]; Daniel Gwynn[1]; Amrita Basak[1]; [1]Pennsylvania State University

3:40 PM
Expanding Process Space of Laser Powder Bed Additive Manufacturing Using Alternative Scan Strategies: *Elizabeth Chang-Davidson*[1]; Nicholas Jones[1]; Jack Beuth[1]; [1]Carnegie Mellon University

4:00 PM
Design Optimization for Residual Stress in Complex Low-density Support Regions: *Kevin Glunt*[1]; Shawn Hinnebusch[1]; Owen Hildreth[2]; Wen Dong[1]; Xuan Liang[1]; Florian Dugast[1]; Albert To[1]; [1]University of Pittsburgh; [2]Colorado School of Mines

Additive Manufacturing of Metals: Complex Microstructures and Architecture Design — Microstructure and Mechanics in Metal AM

Program Organizers: Yu Zou, University of Toronto; Hang Yu, Virginia Polytechnic Institute and State University

Tuesday PM November 3, 2020

2:00 PM Invited
Modeling of Grain Growth in Metal Printing: *Tarasankar DebRoy*[1]; Tuhin Mukherjee[1]; [1]The Pennsylvania State University

2:40 PM Invited
Material Flow and Microstructure Evolution during Additive Friction Stir Deposition: *Hang Yu*[1]; [1]Virginia Polytechnic Institute and State University

3:10 PM Invited
Complex Microstructures in Cold-spray Additive Manufactured Materials: *Yu Zou*[1]; [1]University of Toronto

3:40 PM
Cracking in Additively Manufactured Refractory Metals: *Elizabeth Ellis*[1]; Yousub Lee[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

4:00 PM
Powder Bed Electron Beam Melting of Crack-prone Refractory Materials: *Jameson Hankwitz*[1]; Alex Helmer[1]; Chris Rock[1]; Mike Kirka[2]; Betsy Ellis[2]; Michael Sprayberry[2]; Tim Horn[1]; [1]North Carolina State University; [2]Oak Ridge National Laboratory

Additive Manufacturing: Equipment, Instrumentation and Measurement — Session III

Program Organizers: Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University

Tuesday PM November 3, 2020

2:00 PM Invited
Real Time Monitoring of Electron Emissions during Electron Beam Powder Bed Fusion and Process Control for Arbitrary Geometries and Toolpaths: *Tim Horn*[1]; Chris Rock[1]; [1]North Carolina State University

2:40 PM
A New Preheating Method for Electron Beam Powder Bed Fusion, Opening a Wider Range of Processable Feedstocks: *Ulf Ackelid*[1]; Martin Wildheim[1]; Philip Nilsson[1]; Ulric Ljungblad[1]; [1]Freemelt AB

3:00 PM
Analysis of In-Situ, 3D Surround Digital Image Correlation with Mapped Thermography in Directed Energy Deposition: *James Haley*[1]; Samuel Leach[1]; Brian Jordan[1]; Ryan Dehoff[1]; Vincent Paquit[1]; [1]Oak Ridge National Laboratory

3:20 PM
Benefits of In-situ Monitoring in Metal Additive Manufacturing: *Kevin Luo*[1]; [1]FormAlloy

Additive Manufacturing: Materials, Alloy Development, Microstructure and Properties — Additive Manufacturing of 316L

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University Of Technology; Zhi Wang, South China University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science; Filippo Berto, Norwegian University of Science and Technology

Tuesday PM November 3, 2020

2:00 PM
Microstructure Analysis of Laser Additive Manufactured 316L Stainless Steel: *Sudhakar Vadiraja*[1]; Penn Rawn[1]; [1]Montana Technological University

2:20 PM
Grain Orientation Analysis of Additively Manufactured 316L Stainless Steel: *Ann Choi*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

2:40 PM
Microstructure and Corrosion Characteristics of 316L Stainless Steel Fabricated by Laser Powder Bed Fusion Process: *Balachander Gnanasekaran*[1]; Yao Fu[1]; [1]University of Cincinnati

3:00 PM
Failure Evolution and Mechanisms in Additively Manufactured Stainless Steel 316L Under Dynamic Loading Conditions: *Katie Koube*[1]; Kaila Bertsch[2]; Greg Kennedy[1]; Dan Thoma[2]; Josh Kacher[1]; Naresh Thadhani[1]; [1]Georgia Institute of Technology; [2]University of Wisconsin - Madison

3:20 PM
Understanding The Influence of Porosity and Microstructure On Mechanical Behavior in Additive Manufactured 316L Stainless Steel Using In-situ X-ray Computed Tomography and Electron Microscopy: *Aeriel Murphy-Leonard*[1]; David Rowenhorst[1]; Richard Fonda[1]; [1]Naval Research Laboratory

Additive Manufacturing: Mechanical Behavior of Lattice Structures Produced via AM — Additive Manufacturing of Lattices - Session III

Program Organizers: John Carpenter, Los Alamos National Laboratory; Matthew Begley, University of California, Santa Barbara; Sneha Prabha Narra, Worcester Polytechnic Institute; Michael Groeber, Ohio State University; Isabella Van Rooyen, Idaho National Laboratory; Kyle Johnson, Sandia National Laboratories; Krishna Muralidharan, University of Arizona

Tuesday PM November 3, 2020

2:00 PM Invited
Predicting Interfacial Cracking between Solid and Lattice Support Structure during Laser Powder Bed Fusion Processing: Hai Tran[1]; Xuan Liang[1]; *Albert To*[1]; [1]University of Pittsburgh

2:30 PM
Residual Stress Mitigation in Lattice Structures Built by Laser Powder Bed Fusion: *Anna Hayes*[1]; Rachel Gorelik[1]; Krishna Muralidharan[1]; [1]The University of Arizona

2:50 PM Invited
Predicting the Response of Additively Manufactured IN625 Thin-walled Elements: Arunima Banerjee[1]; Sara Messina[2]; Jeff Rossin[2]; Edwin Schwalbach[3]; William Musinski[3]; Paul Shade[3]; Marie Cox[3]; Mo-Rigen He[1]; Tresa Pollock[2]; Matthew Begley[2]; *Kevin Hemker*[1]; [1]Johns Hopkins University; [2]University of California, Santa Barbara; [3]Air Force Research Laboratory/RXCM

Additive Manufacturing: Qualification and Certification — Process and Control

Program Organizers: Faramarz Zarandi, Raytheon Technologies; Jacob Hochhalter, University of Utah; Douglas Wells, NASA / Marshall Space Flight Center; Richard Russell, NASA Kennedy Space Center; Mohsen Seifi, ASTM International/Case Western Reserve University; Eric Ott, GE Additive; Mark Benedict, Air Force Research Laboratory; Craig Brice, Colorado School Of Mines; J Hector Sandoval, Lockheed Martin

Tuesday PM November 3, 2020

2:00 PM Invited
Reducing Heat Buildup and Regularizing Melt Pool Dimensions in Laser Powder Bed Fusion through a "Powder Moat" Scan Strategy: Evan Diewald[1]; Christian Gobert[1]; Nicholas Jones[1]; *Jack Beuth*[1]; [1]Carnegie Mellon University

2:30 PM Invited
Ensuring Build Quality thru Physics-based Support Design Optimization for Residual Stress: *Albert To*[1]; Lin Cheng[1]; Qian Chen[1]; Xuan Liang[1]; [1]University of Pittsburgh

3:00 PM Invited
Unveiling the Relationships between Powder Bed Conditions and Materials Quality during Selective Laser Melting: Tan Phuc Le[1]; *Matteo Seita*[1]; [1]Nanyang Technological University

3:20 PM
Recyclability of Ti-6Al-4V Powders Used in Additive Manufacturing: *Nicholas Derimow*[1]; Nikolas Hrabe[1]; [1]National Institute of Standards and Technology

3:40 PM
CT Based Analysis of Generation and Characterization of Parameter- and Process-induced Defects in Powder Bed Fusion Additive Manufacturing: *Brett Diehl*[1]; Abdalla Nassar[1]; David Corbin[1]; [1]The Applied Research Laboratory

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments — Fusion Materials & In-Situ Ion Irradiation

Program Organizers: Samuel Briggs, Oregon State University; Christopher Barr, Sandia National Laboratories; Emily Aradi, University of Huddersfield; Michael Short, Massachusetts Institute of Technology; Janelle Wharry, Purdue University; Cheng Sun, Idaho National Laboratory; Dong Liu, University of Oxford; Khalid Hattar, Sandia National Laboratories

Tuesday PM November 3, 2020

2:00 PM
Controlling Helium Morphology in Pure Metals: Effects of Helium Defects on Deformation and Strength: *Calvin Lear*[1]; Jonathan Gigax[1]; Nan Li[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

2:20 PM
Nanomechanical Change of Tungsten in ELM Conditions: *Minsuk Seo*[1]; Leigh Winfrey[1]; [1]The Pennsylvania State University

2:40 PM
Modified stereo TEM for 3D analysis of defects: *Benjamin Eftink*[1]; Stuart Maloy[1]; [1]Los Alamos National Laboratory

3:00 PM Invited
Fundamental In-situ Experiments Coupled to High-throughput Approaches to Understand Radiation Damage in FCC and BCC Compositionally Complex Alloys: *Adrien Couet*[1]; Michael Moorehead[1]; Calvin Parkin[1]; Mohamed Elbakhshwan[1]; Hongliang Zhang[1]; Chuan Zhang[2]; Meimei Li[3]; Wei-Ying Chen[3]; Lin Shao[4]; Dan Thoma[1]; Kumar Sridharan[1]; [1]University of Wisconsin-Madison; [2]Computherm, LLC; [3]Argonne National Laboratory; [4]Texas A&M University

3:40 PM
Analysis of Heavy Ion Irradiation Damage in Commercially Pure Titanium and Titanium Alloys: *Aida Amroussia*[1]; Carl Boehlert[1]; Frederique Pellemoine[2]; Wolfgang Mittig[3]; David Grummon[1]; Thomas Bieler[1]; Clara Grygiel[4]; Meimei Li[5]; Wei-Ying Chen[5]; Isabelle Monnet[4]; [1]Michigan State University; [2]Faclity for Rare Isotope Beam - Michgan State University; [3]National Superconducting Cyclotron Laboratory - Michigan State University; [4]CIMAP; [5]Argonne National Laboratory

4:00 PM
In Situ Observation of Irradiation Damage in Polycrystalline Nuclear Graphite: *Dong Liu*[1]; David Cherns[1]; Joshua Kane[2]; Weiying Chen[3]; Steve Jones[4]; Karthik Chinnathambi[4]; William Windes[2]; [1]University of Bristol; [2]Idaho National Laboratory; [3]Argonne National Laboratory; [4]Boise State University

Advanced Materials for Harsh Environments — Session II

Program Organizers: Navin Manjooran, Solve Technology and Research, Inc.; Gary Pickrell, Virginia Tech

Tuesday PM November 3, 2020

2:00 PM Keynote
AM Smart Components: Additively Manufactured Gas Turbine Components, with Embedded Sensors for Harsh Environment Applications: *Ramesh Subramanian*[1]; Jeff Brogan[2]; Navin Manjooran[3]; [1]Siemens Energy Inc.; [2]Mesoscribe Technologies Inc.; [3]Solve Technology and Research, Inc.

2:30 PM Invited
Processing, Stability, And High Temperature Properties of Transition Metal Silicide-refractory Oxide Composites for Harsh Environment Sensing Applications: *Gunes Yakaboylu*[1]; Katarzyna Sabolsky[1]; Rajalekshmi Chockalingam[1]; Tugrul Yumak[2]; Edward Sabolsky[1]; [1]West Virginia University; [2]West Virginia University; Sinop University

3:00 PM Invited
Versatile Acoustic and Optical Sensing Platforms for Passive Structural System Monitoring: *Daniel Homa*[1]; Jaiji He[1]; Alexander Braatz[1]; Anbo Wang[1]; Gary Pickrell[1]; [1]Virginia Tech

3:30 PM
Evaluation of Doped-$LaCrO_3$ Ceramics for High Temperature Sensor Applications: *Javier Mena*[1]; Kavin Sivaneri Varadharajan Idhaiam[1]; Gunes Yakaboylu[1]; Edward Sabolsky[1]; Katarzyna Sabolsky[1]; Konstantinos Sierros[1]; [1]West Virginia University

Advanced Steel Metallurgy — Simulation & Modeling

Program Organizers: Chirag Mahimkar, Big River Steel; Justin Raines, SSAB Americas; Kip Findley, Colorado School of Mines; Alla Sergueeva, NanoSteel Company Inc; Daniel Branagan, The NanoSteel Co

Tuesday PM November 3, 2020

2:00 PM Invited
Modelling of Precipitation and Grain Growth in Ti-Nb Microalloyed Steels: Alexis Graux[1]; Sophie Cazottes[1]; M. Perez[1]; M. Bugnet[1]; *Damien Fabregue*[1]; [1]Univ. Lyon, INSA Lyon, MATEIS, UMR CNRS 5510, F-69621

2:20 PM
Modeling and Experimental Validation of the Precipitation Kinetics of Vanadium Carbide in Austenitic Steel: *Paul Lambert*[1]; Daniel Bechetti[1]; Keith Knipling[2]; Maya Nath[1]; Matthew Draper[1]; Charles Fisher[1]; [1]Naval Surface Warfare Center - Carderock Division; [2]Naval Research Laboratory

Advances in Dielectric Materials and Electronic Devices — Dielectrics and Piezoelectrics: Session I Synthesis and Growth

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

Tuesday PM November 3, 2020

2:00 PM Invited
Structural Peculiarities of Epitaxial PMN-PT Thin Films: *Matjaž Spreitzer*[1]; Urška Gabor[1]; Jamal Belhadi[1]; Nina Daneu[1]; Danilo Suvorov[1]; [1]Jozef Stefan Institute

2:40 PM
Novel Dielectrics, through [Ga, Ta] Dipolar-pair Substituted $BaTiO_3$ Ceramics: *Kaijie Ning*[1]; Holly Shulman[1]; Steven Pilgrim[1]; Walter Schulze[1]; Steven Tidrow[1]; [1]Alfred University

3:00 PM
Plasma-assisted Epitaxy and Piezoelectric Behavior of AlN Films on c-Sapphire: *Morton Greenslit*[1]; Robert Lad[1]; Mauricio Pereira da Cunha[1]; [1]University of Maine

3:20 PM
Designing Electroceramics with Ferroelectric Grain Boundaries and Cold Sintering: *Javier Mena Garcia*[1]; Clive Randall[1]; Sinan Dursun[1]; Kosuke Tsuji[1]; Sun Hwi Bang[1]; [1]Pennsylvania State University

Advances in Synthesis and Integration Methods for Enhanced Properties, and Applications in Emerging Nanomaterials — Energy Materials I: Energy Storage Materials and Hybrid Perovskite Solar Cells

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jung-Kun Lee, University of Pittsburgh; Zubaer Hossain, University of Delaware

Tuesday PM November 3, 2020

2:00 PM Invited
Nanoscale Oxide Layers for Halide Perovskite Solar Cells: *Jung-Kun Lee*[1]; Seongha Lee[1]; Fen Qin[1]; Matthew Duff[1]; [1]University of Pittsburgh

2:30 PM Invited
Polymer Additives for Stable Hybrid Perovskite Solar Cells: *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory

Advances in Zinc-coated Sheet Steel Processing and Properties — Advances in Zinc-coated Sheet Steel Processing and Properties

Program Organizers: Frank Goodwin, ILZRO; Joseph McDermid, McMaster University

Tuesday PM November 3, 2020

2:00 PM Keynote
Role of Liquid Zn and a-Fe(Zn) on Liquid Metal Embrittlement Cracking of Resistance Spot Welded Medium Mn Steels: *Yeongdo Park*[1]; Siva Prasad Murugan[1]; Ji-Ung Kim[1]; Junsu Kim[1]; Ilguk Jo[1]; [1]Dong-Eui University

2:30 PM
Effect of Hot Press Forming on Electrochemical Properties of Galvanized Steel: *Jaime Jewer*[1]; Joseph McDermid[1]; Joseph Kish[1]; [1]McMaster University

3:00 PM
The Effect of Galvanizing Sheet Steel under SHS Conditions on the Development of Steel Microstructures: *Borys Sereda*[1]; Dmytro Sereda[1]; Irina Sereda[1]; [1]Dneprovsky State Technical University

3:30 PM
Reduction of the Internal and External Oxidation of the Charge during Galvanizing under SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda[1]; [1]Dneprovsky State Technical University

3:50 PM
Zinc Coating Control Using a New Integrated Indicator ECP-Zn: *Borys Sereda*[1]; Dmytro Sereda[1]; Irina Kruglyak[1]; [1]Dneprovsky State Technical University

Bulk and Sheet Thermal-Deformation Processing and Microstructure Development in Metals – Characterization, Experiments and Modeling — Session II

Program Organizers: Daniel Coughlin, Los Alamos National Laboratory; Kester Clarke, Colorado School of Mines; Piyush Upadhyay, Pacific Northwest National Laboratory

Tuesday PM November 3, 2020

2:00 PM
Probing Differences in Processing and Texture in FCC/BCC Nanolaminates Fabricated via Accumulative Roll Bonding: *John Carpenter*[1]; Thomas Nizolek[1]; Cody Miller[1]; Carl Osborne[1]; Rodney McCabe[1]; Daniel Coughlin[1]; [1]Los Alamos National Laboratory

2:30 PM
Continuum Dislocation Dynamics-based Modeling of the Strain Hardening Behavior of ECAPed Aluminum Alloy: Ali Kobaissy[1]; *Georges Ayoub*[2]; Mu'Tasem Shehadeh[1]; [1]American University of Beirut; [2]University of Michigan

2:50 PM
Austenite Stability and Strain Localization in Q&P Steels Deformed at Dynamic Strain Rates: *Christopher Finfrock*[1]; Trevor Ballard[1]; Gus Becker[1]; John Copley[1]; Benjamin Ellyson[1]; Melissa Thrun[1]; Jonah Klemm-Toole[1]; Amy Clarke[1]; Kester Clarke[1]; [1]Colorado School of Mines

Ceramics in the Nuclear Fuel Cycle — Ceramics in the Nuclear Materials

Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Kyle Brinkman, Clemson University; Philip Edmondson, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

Tuesday PM November 3, 2020

2:00 PM
Evaluation of the Corrosion of High Purity CVD SiC in Light Water Reactor Environments: *Peter Doyle*[1]; Stephen Raiman[2]; Steven Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

2:20 PM
First-principles Study on the Trapping and Recombination of Tritium in Lithium Vacancy of the \947-LiAlO$_2$ (100) Surface: *Ting Jia*[1]; David Senor[2]; Yuhua Duan[1]; [1]National Energy Technology Laboratory, United States Department of Energy; [2]Pacific Northwest National Laboratory

2:40 PM
Nb and Ti Alloying Effects on the Phase and Oxidation of U$_3$Si$_2$: *Geronimo Robles*[1]; Joshua White[2]; Elizabeth Sooby Wood[1]; [1]University of Texas at San Antonio; [2]Los Alamos National Laboratory

3:00 PM
Radiolytic Damage and Hydrogen Generation at Carbide – Water Interfaces: *Simon Pimblott*[1]; Jay LaVerne[2]; [1]Idaho National Laboratory; [2]University of Notre Dame

3:20 PM
Thermophysical Properties of Sintered Yttrium Dihydride: *Aditya Shivprasad*[1]; Vedant Mehta[1]; Joshua White[1]; Michael Cooper[1]; Tarik Saleh[1]; Joseph Wermer[1]; Erik Luther[1]; Holly Trellue[1]; D.V. Rao[1]; [1]Los Alamos National Laboratory

Coating and Thin Film Materials for Energy, Aerospace, Environment and Biological Applications — Advanced Coating and Thin Films

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Yeongil Jung, Changwon National University; Albert Feuerstein, Praxair Surface Technologies, Inc. (retired); Raymond Sinatra, Rolls-Royce Corporation (retired); Li Li, Rolls-Royce Corporation

Tuesday PM November 3, 2020

2:00 PM
Rapid, Selective, Ambient Growth and Optimization of Copper Benzene-1,3,5-Tricarboxylate (Cu-BTC) Metal-organic Framework Thin Films on a Conductive Metal Oxide for Sensing Applications: *Scott Crawford*[1]; Ki-Joong Kim[1]; Yang Yu[1]; Paul Ohodnicki[1]; [1]National Energy Technology Laboratory

2:20 PM
Forming Al Tab to Cu Busbar Joints Using Low Pressure Cold Spray Process: *Volf Leshchynsky*[1]; Roman Maev[1]; Thomas Brackett[2]; James Boileau[2]; Brian Robert[2]; Emil Strumban[1]; [1]IDIR; [2]Ford

2:40 PM
Molecular Dynamics Simulation of Mechanical and Tribological Properties of AlCoCrFe High Entropy Alloy Coatings on Aluminum Substrate: Xuehui Yang[1]; Jian Zhang[1]; Dan Koo[1]; Bong-Gu Kim[2]; Heesung Park[2]; Yeon-Gil Jung[2]; *Jing Zhang*[1]; [1]Indiana University - Purdue University Indianapolis; [2]Changwon National University

3:00 PM
Modeling Ceramic Coating Removal Process Using Smoothed Particle Hydrodynamics Method: Jian Zhang[1]; Sugrim Sagar[1]; Dan Koo[1]; Hyun-Hee Choi[2]; Yeon-Gil Jung[2]; Heesung Park[2]; *Jing Zhang*[1]; [1]Indiana University - Purdue University Indianapolis; [2]Changwon National University

3:20 PM
Aerosol Cold Spray and Sintering of Hydroxyapatite Coatings: *Volf Leshchynsky*[1]; Roman Maev[1]; Ahmed Elseddawy[1]; Emil Strumban[1]; Joanna Chojnacka[1]; Dariusz Garbiecz[1]; [1]IDIR

3:40 PM
Advanced Coatings for Passive Mitigation of Spacecraft Charging: *Danny Liu*[1]; Joshua Boman[2]; Matthew Lyle[2]; Dan Wang[1]; JR Dennison[2]; Timothy Hall[1]; Maria Inman[1]; [1]Faraday Technology Inc; [2]Utah State University

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Energy Applications of Nanostructures

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory ; Jian Shi, Rensselaer Polytechnic Institute; Kejie Zhao, Purdue University ; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne

Tuesday PM November 3, 2020

2:00 PM Invited
Panchromatic Light Absorption in CdSe/CdS Coated SnO2 Nanowires for Solar-fuel Conversion: Salim Caliskan[1]; *Jung-Kun Lee*[1]; [1]University of Pittsburgh

2:30 PM
Control Over Structure and Chemistry Across Multiple Lengthscales in Fe-Si-Ge-Based Thermoelectrics: Naiming Liu[1]; Mona Zebarjadi[1]; *Jerrold Floro*[1]; [1]University of Virginia

Environmentally Assisted Cracking: Theory and Practice — EAC of Aluminum Alloys

Program Organizers: Jenifer Locke, Ohio State University; Wenjun Cai, Virginia Polytechnic Institute and State University; Bai Cui, University of Nebraska-Lincoln; Srujan Rokkam, Advanced Cooling Technologies Inc; Kaila Bertsch, University of Wisconsin-Madison

Tuesday PM November 3, 2020

2:00 PM Invited
The Role of SCC in Corrosion Fatigue Kinetics of AA5456-H116: *David Schrock*[1]; Jenifer (Warner) Locke[1]; [1]The Ohio State University

2:40 PM
Microstructure and Beta Phase Distribution Effects on Environmental Fracture Susceptibility in Al-Mg Alloys: *Matthew McMahon*[1]; William Golumbfskie[1]; [1]Naval Surface Warfare Center, Carderock Division

3:00 PM
Directional Sensitization Responses in 5XXX Series Aluminum Alloy Microstructures: *Likun Sun*[1]; Matthew Steiner[1]; [1]University of Cincinnati

3:20 PM
Corrosion Fatigue Testing of AA7085-T7451 in Complex Atmospheric Environments of Varied Humidity with Surface Salt Loading: *Brandon Free*[1]; Austin Burns[2]; Jason Niebuhr[2]; Sarah Galyon Dorman[2]; Jenifer Locke[1]; [1]The Ohio State Uniersity; [2]SAFE Inc.

3:40 PM
Understanding Pitting Corrosion in a High-performance Aluminum Alloy by 4D X-ray Microtomography: *Daniel Sinclair*[1]; Sridhar Niverty[1]; Nikhilesh Chawla[1]; [1]Arizona State University

Glasses, Optical Materials, and their Functional Applications: Current Issues in Science & Technology — ACerS GOMD Alfred R. Cooper Award Session

Program Organizers: Jincheng Du, University of North Texas; S. K. Sundaram, Alfred University

Tuesday PM November 3, 2020

2:00 PM Invited
Cooper Distinguished Lecture: Exploring the Amorphous State of Matter by Roaming About the Network Building Blocks: *John Kieffer*[1]; [1]University of Michigan

2:40 PM Invited
2020 Alfred R. Cooper Young Scholar Award Presentation: Beyond the Average: A Statistical Mechanical Exploration of Topological Fluctuations in Glass-Forming Systems: *Katelyn Kirchner*[1]; [1]Pennsylvania State University

3:20 PM Invited
Effect of Nanoscale Phase Separation on the Fracture Behavior of Glasses: Toward Tough, Yet Transparent Glasses: *Jared Rivera*[1]; [1]UCLA Department of Civil and Environmental Engineering

3:50 PM Invited
Decoding Structure-Dynamics Correlations in SiO2 Supercooled Liquid by Machine Learning: *Emily Li*[1]; [1]Materion Corporation

High Entropy Materials: Concentrated Solid Solution, Intermetallics, Ceramics, Functional Materials and Beyond — Theory and Fundamentals

Program Organizers: Xingbo Liu, West Virginia University; Michael Gao, National Energy Technology Laboratory; Peter Liaw, University of Tennessee; Jian Luo, University of California, San Diego; Yiquan Wu, Alfred University; Yu Zhong, Worcester Polytechnic Institute

Tuesday PM November 3, 2020

2:00 PM Invited
Lattice-distortion-enhanced-yield Strength in a Refractory High-entropy Alloy: Chanho Lee[1]; Yi Chou[2]; George Kim[3]; Michael C. Gao[4]; Ke An[5]; Chuan Zhang[6]; Wei Chen[3]; Jonathan D. Poplawsky[5]; Gian Song[7]; Yi-Chia Chou[2]; *Peter Liaw*; [1]University of Tennessee; [2]National Chiao Tung University; [3]Illinois Institute of Technology; [4]National Energy Technology Laboratory; [5]Oak Ridge National Laboratory; [6]Computherm, LLC; [7]Kongju National University

2:20 PM Invited
Atomistic Modeling Predictions of the Structures and Properties of High Entropy Alloy Nanoparticles from Carbothermal Shock Synthesis: *Guofeng Wang*[1]; Zhenyu Liu[1]; [1]University of Pittsburgh

2:40 PM Invited
Phase Stability of CoCrFeMnNi High Entropy Alloy at Elevated Temperature and Pressure: Sitaram Aryal[1]; *Lizhi Ouyang*[1]; Michael Gao[2]; [1]Tennessee State University; [2]NETL

3:00 PM
Rapid Production of Accurate Multicomponent Embedded-Atom Method Potentials for Metal Alloys: *Elan Weiss*[1]; Cosmin Safta[2]; Habib Najm[2]; David Riegner[1]; Logan Ward[1]; Wolfgang Windl[1]; [1]The Ohio State University; [2]Sandia National Laboratories

3:20 PM
Bond-order Bond Energy Model for Concentrated Solid Solutions: Szu-Chia Chien[1]; Christian Oberdorfer[1]; *Wolfgang Windl*[1]; [1]Ohio State University

3:40 PM
Atomistic Simulations Evince the Sluggish Diffusion in Refractory HEAs: *Ankit Roy*[1]; Joydeep Munshi[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

4:00 PM Invited
High Entropy and Sluggish Diiffusion Effects in Co-Cr-Fe-Ni Based High Entropy Alloys: *Abhishek Mehta*[1]; Yongho Sohn[1]; [1]University of Central Florida

4:20 PM
Effect of Grain Size and Strain Rate on the Deformation Mechanism of Nanocrystalline HEAs Using Molecular Dynamics Simulations: *Ankit Roy*[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

High Temperature Corrosion and Degradation of Structural Materials — Refractory Metal Alloys/ Modeling and Theory

Program Organizers: Kinga Unocic, Oak Ridge National Laboratory; Raul Rebak, GE Global Research; David Shifler, Office of Naval Research; Richard Oleksak, National Energy Technology Laboratory

Tuesday PM November 3, 2020

2:00 PM Invited
Environmental Resistance and Microstructure Design in Mo-Si-B Alloys: *John Perepezko*[1]; [1]University of Wisconsin-Madison

2:30 PM
Effect of Al Addition on Oxidation Behavior of a New Mo-Si-B Alloy: Longfei Liu[1]; *John Perepezko*[1]; [1]University of Wisconsin-Madison

2:50 PM
Elucidating Influence of Alloy Composition, Thermal Cycling and Environment on Oxidation Behavior of Engine Exhaust Valve Materials: *Rishi Pillai*[1]; Marie Romedenne[1]; Allen Haynes[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

3:10 PM
Machine Learning and Data Analytics for Accelerating High-temperature, Corrosion-resistant Materials Design: Xuesong Fan[1]; Baldur Steingrimsson[2]; Anand Kulkarni[3]; *Peter Liaw*; [1]University of Tennessee; [2]Imagars LLC; Portland State University; [3]Siemens Corporation

3:30 PM
Kinetic Modeling of High-temperature Oxidation of Pure Metals by Incorporating Wagner's Theory into the CALPHAD Approach: *Fangzhou Xing*[1]; Sa Ma[2]; Yu Zhong[1]; Lijun Zhang[2]; [1]Worcester Polytechnic Institute; [2]Central South University

Integration between Modeling and Experiments for Crystalline Metals: From Atomistic to Macroscopic Scales II — Session II

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Levente Balogh, Queen's University; Josh Kacher, Georgia Institute of Technology; Caizhi Zhou, University of South Carolina; Lei Cao, University of Nevada

Tuesday PM November 3, 2020

2:00 PM Invited
Twinning Nucleation in Hexagonal Close-packed Crystals: Yang He[1]; *Zhengwu Fang*[1]; Scott Mao[1]; [1]University of Pittsburgh

2:30 PM
Twin Transmission Across Grain Boundaries in HCP Metals: *Mariyappan Arul Kumar*[1]; Rodney McCabe[1]; Laurent Capolungo[1]; Carlos Tome[1]; [1]Los Alamos National Laboratory

2:50 PM
On the Characterization of Twin-twin Interactions in Mg and Its Alloys: *Yanqing Su*[1]; Irene Beyerlein[2]; [1]Utah State University; [2]University of California, Santa Barbara

3:10 PM
Directionally-anisotropic Mobility of Faceted Boundaries Explained through Interfacial Dislocation Mechanisms: *Megan McCarthy*[1]; Timothy Rupert[1]; [1]University of California, Irvine

Interfaces and Phase Transformations — Interfaces and Phase Transformation I

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Matthias Militzer, University of British Columbia; Matthew Steiner, University of Cincinnati; Mohsen Zaeem, Colorado School of Mines; Yufeng Zheng, University of Nevada, Reno

Tuesday PM November 3, 2020

2:00 PM Invited
Localized Phase Transformation at Interfaces – A New Alloy Design Strategy: Longsheng Feng[1]; Ashton Egan[1]; Qianglong Liang[1]; Yipeng Gao[2]; Michael Mills[1]; *Yunzhi Wang*[1]; [1]Ohio State University; [2]INL

2:40 PM
A Phase Field Dislocation Dynamics Model in Heterogeneous Crystalline Media: *Shuozhi Xu*[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara

Low Density Advanced Composite Materials — Low Density Advanced Composite Materials

Program Organizers: Ioannis Mastorakos, Clarkson University; Brian Wisner, Ohio University; David Bahr, Purdue University

Tuesday PM November 3, 2020

2:00 PM Invited
Effect of Battery Charge-discharge Cycles on the Mechanical Behavior of Porous Polyethylene Separators: Mustapha Makki[1]; *Georges Ayoub*[1]; Cheol Lee[1]; [1]University of Michigan

2:20 PM
Composite Graphitization by Directing Interfacial Nanostructure Using Graphene: *Randy Vander Wal*[1]; Madhu Singh[1]; [1]Penn State University

Manufacturing and Processing of Advanced Ceramic Materials — New Opportunities in Ceramic Processing I

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Mike Alexander, Allied Mineral Products, Inc.; Eric Faierson, Quad City Manufacturing Laboratory - Western Illinois University; James Hemrick, Reno Refractories Inc.; Keith DeCarlo, Blasch Precision Ceramics

Tuesday PM November 3, 2020

2:00 PM Invited
Identifying Multidisciplinary Research Opportunities in Ceramic Processing: *Michael Bakas*[1]; [1]Army Research Office

2:40 PM Invited
Fusion Welding of Structural Ceramics: *William Fahrenholtz*[1]; Greg Hilmas[1]; Jeremy Watts[1]; [1]Missouri University of Science and Technology

3:20 PM Invited
Indirect Additive Manufacturing of Ceramics: *David Bourell*[1]; [1]University of Texas

4:00 PM
Laser Shock Processing of Silicon Carbide Ceramics: Fei Wang[1]; Xueliang Yan[1]; Chenfei Zhang[1]; Leimin Deng[1]; Yongfeng Lu[1]; Michael Nastasi[1]; *Bai Cui*[1]; [1]University of Nebraska-Lincoln

Materials Design through AI Composition and Process Optimization — Session II

Program Organizers: Noah Paulson, Argonne National Laboratory; Tiberiu Stan, Northwestern University; Brandon Bocklund, Pennsylvania State University; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Tuesday PM November 3, 2020

2:00 PM Invited
High-fidelity Accelerated Design of High-performance Electrochemical Systems: *Rachel Kurchin*[1]; Alan Edelman[2]; Viral Shah[3]; Chris Rackauckas[3]; Bryce Meredig[4]; Venkat Viswanathan[1]; [1]Carnegie Mellon University; [2]Massachusetts Institute of Technology; [3]Julia Computing; [4]Citrine Informatics

2:25 PM Invited
Investigating Crystallographic Texture Control Using Laser Powder-bed Fusion Additive Manufacturing: *Joseph Pauza*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

2:50 PM Invited
Multi-information Source Batch Bayesian Optimization of Alloys: *Raymundo Arroyave*[1]; [1]Texas A&M University

3:15 PM
Accelerating the Discovery of New DP-steel Using Machine Learning-based Multiscale Materials Simulations: Abdallah Chehade[1]; Tarek Belgasam[2]; *Georges Ayoub*[1]; [1]University of Michigan; [2]University of Benghazi

3:35 PM
Using Machine Learning to Classify In Situ Monitored Melt Pool Surfaces in a Powder Bed Fusion Process: Wei Xing[1]; *Yu Zou*[1]; [1]University of Toronto

3:55 PM
Machine-learning Prediction of Melting Temperature of Binary Alloys: *Pinwen Guan*[1]; Venkat Viswanathan[1]; [1]Carnegie Mellon University

Materials Informatics and Modeling for 21st Century Ceramics Research — Machine Learning for Materials Microstructure and Property Predictions

Program Organizers: Ming Tang, Rice University; Jeffrey Rickman, Lehigh University; Turab Lookman, Los Alamos National Laboratory

Tuesday PM November 3, 2020

2:00 PM Invited
Coarse-grained Equation-free Time Evolution of Microstructures with Deep Learning: *Fei Zhou*[1]; Ming Tang[2]; [1]LLNL; [2]Rice University

2:30 PM Invited
Using Materials Informatics to Quantify Complex Correlations Linking Structure, Properties and Processing
: *Jeffrey Rickman*[1]; [1]Lehigh University

3:00 PM
Predicting Stress Hotspots in Polycrystalline Materials from Microstructural Features Using Deep Learning: *Ankit Shrivastava*[1]; Hae Young Noh[2]; Kaushik Dayal[1]; [1]Carnegie Mellon University; [2]Stanford University

Micro- and Nano-Mechanical Behavior of Materials — Micro/Nano-Mechanics III

Program Organizers: Sundeep Mukherjee, University of North Texas; Mahmoud Baniasadi, Georgia Southern University; Meysam Haghshenas, University of Toledo

Tuesday PM November 3, 2020

2:00 PM Invited
Effects of Testing Temperature and Sample-size on Tensile Deformation of Metallic Glass: *Golden Kumar*[1]; [1]The University of Texas at Dallas

2:20 PM Invited
Gradatim Ferociter: Exploring the Grain Size Stability of Heterogeneous Copper in Thermal, Mechanical and Radiation Environments
: *Suveen Mathaudhu*[1]; Heather Salvador[1]; Evander Ramos[1]; Sina Shahrezaei[2]; Khalid Hattar[3]; [1]University of California, Riverside; [2]Pacific Northwest National Laboratory; [3]Sandia National Laboratories

2:40 PM
In Situ Nanomechanical Testing of Piezoresistive Materials: *Steven Boles*[1]; [1]Hong Kong Polytechnic University

MS&T Student Events — Young Professional Session

Tuesday PM November 3, 2020

3:00 PM Panel Discussion - Panelists include: Charmayne Lonergan, Pacific Northwest National Lab; Scott McCormack, University of California, Davis; Abby Cisko, Engineer Research & Development Center (Army); Andrew Baker, Boeing; Liz Hunter, Nucor; and David Kober, IBA America

Multiscale Modeling of Microstructure Deformation in Material Processing — Multiscale Modeling of Microstructure Deformation in Material Processing

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Jaimie Tiley, AFRL/RXLMD; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

Tuesday PM November 3, 2020

2:00 PM
Modeling Mechanical Response of Microtextured Regions in Hexagonal Metals: *Joseph Tucker*[1]; Sushant Jha[2]; Sean Donegan[3]; James Larsen[3]; Adam Pilchak[3]; [1]Exponent; [2]University of Dayton Research Institute; [3]Air Force Research Laboratory

2:40 PM
Multiscale Approach to Model Deformation Behavior of Multilayered Sheets Produced by Explosive Cladding: *Krzysztof Muszka*[1]; Marcin Kwiecien[1]; Paulina Lisiecka-Graca[1]; Janusz Majta[1]; Konrad Perzynski[1]; Lukasz Madej[1]; [1]AGH University of Science and Technology

3:00 PM
The Research Thermoplastic Deformation Modes of Dual-phase Special Alloys for Obtaining Rational Intermetallic Structure: *Borys Sereda*[1]; Dmytro Sereda[1]; Yuriy Belokon[2]; [1]Dneprovsky State Technical University; [2]ZNU

Naval/Maritime Applications of Additively Manufactured Parts: Design and Experimental Approaches — Naval/Maritime Applications of Additively Manufactured Parts: Design and Experimental Approaches

Program Organizers: Cindy Waters, Carderock Division Naval Surface Warfare Center; Caroline Vail, Naval Surface Warfare Center, Carderock; Marc Zupan, University of Maryland

Tuesday PM November 3, 2020

2:00 PM
Introductory Comments: Naval/Maritime Applications of Additively Manufactured Parts: Design and Experimental Approaches: *Cindy Waters*[1]; [1]Carderock Division Naval Surface Warfare Center

2:05 PM
Repeatability and Performance Prediction of Additively Manufactured 17-4 Stainless Steel: *Julianna Posey*[1]; Michael Duffy[2]; Caroline Vail[3]; Marc Zupan[2]; [1]University of Maryland, Baltimore County ; [2]University of Maryland, Baltimore County; [3]University of Maryland, Baltimore County;Naval Surface Warfare Center, Carderock Division

2:25 PM
Additive Friction Stir Deposition for Naval/Maritime Applications: *Mackenzie Perry*[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute

2:45 PM
Additive Manufacturing of a Lifeboat Hook System with a Functionally Dynamic Mechanism: *Ulanbek Auyeskhan*[1]; Namhun Kim[2]; Van Loi Tran[1]; Eunhei Cho[1]; Dong-Hyun Kim[1]; [1]KITECH; [2]Ulsan National Institute of Science and Technology

3:05 PM
Direct Tension and Fatigue Characterization of AM Ti-6Al-4V Defects: A Microsample Approach: *Joao Santos*[1]; Michael Duffy[1]; Steven Storck[2]; Marc Zupan[1]; [1]University of Maryland, Baltimore County; [2]University of Maryland, Baltimore County; The Johns Hopkins Applied Physics Lab

Next Generation Biomaterials — Next Generation Biomaterials III

Program Organizers: Roger Narayan, University of North Carolina; David Dausch, RTI International; Sanjiv Lalwani, Lynntech, Inc.

Tuesday PM November 3, 2020

2:00 PM
Optimizing Bicontinuous Structure of Bijels-derived Polymer-hydrogel Hybrids for the Controlled Release of Different Cells: Haoran Sun[1]; *Min Wang*[1]; [1]University of Hong Kong

2:20 PM Invited
Decellularized Lucky Bamboo (Dracaena sanderiana) Scaffolds for Bone Tissue Engineering: *Ali Salifu*[1]; Joshua Gershlak[1]; John Obayemi[1]; Vanessa Uzonwanne[1]; Glenn Gaudette[1]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute

2:40 PM Invited
Diamond-like Carbon Thin Films for an Improved Surgical Field of View: *Anna Bull*[1]; Jackson Mayfield[1]; Adam Evans[1]; Russell Leonard[1]; Jacqueline Johnson[1]; [1]University of Tennessee Space Institute

3:00 PM
Mechanical Behavior of Resilin-mimicking Materials: *Annaliza Perez-Torres*[1]; Fuqian Yang[1]; [1]University of Kentucky

Probabilistic Life Prediction of Materials in Aging Systems — Probabilistic Life Prediction of Materials in Aging Systems

Program Organizers: Narasi Sridhar, OSU; Raul Rebak, GE Global Research

Tuesday PM November 3, 2020

2:00 PM Invited
Increasing Operation Life of Light Water Reactors by using Accident Tolerant Fuels: *Raul Rebak*[1]; [1]GE Global Research

2:30 PM
Mechanistic and Engineering-Scale Modeling of the Effect of High-altitude Environments on the Structural Integrity of Airframe Components: *James Burns*[1]; [1]University of Virginia

2:55 PM Invited
Probabilistic Life-cycle Decision Optimization with Bayesian Networks for Aging Fixed Equipment and Piping in the Energy Industries: *Aaron Stenta*[1]; Charles Panzarella[1]; [1]The Equity Engineering Group

3:15 PM
Probabilistic Prediction of Stress Corrosion Cracking of Oil & Gas Pipelines Using Bayesian Network: *Narasi Sridhar*[1]; Francois Ayello[2]; [1]OSU; [2]DNVGL

Synthesis, Characterization, Modeling and Applications of Functional Porous Materials — Functional Porous Materials III

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

Tuesday PM November 3, 2020

2:00 PM Invited
Crystallinity Effect on Mesoporous TiO2 Nanoparticle Negative Electrode Material for Metal Ion Batteries: *Hui Xiong*[1]; Changjian Deng[1]; Paige Skinner[1]; Yuzi Liu[2]; Wenqian Xu[2]; Hua Zhou[2]; Xianghui Zhang[3]; Di Wu[3]; Yadong Yin[4]; Yang Ren[2]; [1]Boise State University; [2]Argonne National Laboratory; [3]Washington State University; [4]University of California - Riverside

2:30 PM
Low/Intermediate Temperature Polysiloxane Derived Ceramics with Increased Carbon for Electrical Applications: *Michelle Greenough*[1]; Zeyu Zhao[1]; Jianhua Tong[1]; Luiz Jacobsohn[1]; Rajendra Bordia[1]; [1]Clemson University

2:50 PM
The Influence of Yttria Content and Synthetic Parameters on the Thermal Stability of Yttria-stabilized Zirconia Aerogels: *Nathaniel Olson*[1]; Frances Hurwitz[2]; Haiquan Guo[3]; Richard Rogers[2]; Jessica Krogstad[1]; [1]University of Illinois Urbana Champaign; [2]NASA Glenn Research Center; [3]Ohio Aerospace Institute

Thermodynamics of Materials in Extreme Environments — Thermodynamic Studies of Nuclear Materials

Program Organizers: Xiaofeng Guo, Washington State University; Kristina Lilova, Arizona State University; Kyle Brinkman, Clemson University; Alexandra Navrotsky, Arizona State University; Jake Amoroso, Savannah River National Laboratory; Xingbo Liu, West Virginia University; Gustavo Costa, NASA Glenn Research Center

Tuesday PM November 3, 2020

2:00 PM Invited
Thermochemical Modeling of Molten Salt Systems for Reactors and Simulations with the Molten Salt Thermodynamic Database: *Theodore Besmann*[1]; Kaitlin Johnson[1]; Johnathan Ard[1]; Jacob Yingling[1]; Matthew Christian[1]; Juliano Schorne Pinto[1]; Jacob McMurray[2]; Markus Piro[3]; [1]University of South Carolina; [2]Oak Ridge National Laboratory; [3]Ontario Tech

2:30 PM
Effect of Physically Determined Coordination-numbers for Modeling Molten Salt Fuels Using the Modified Quasi-chemical Model (MQM): *Matthew Christian*[1]; Juliano Pinto[1]; Theodore Besmann[1]; Timothy Lynch[2]; Wilson Chiu[3]; Nancy Birkner[4]; Kyle Brinkman[4]; [1]University of South Carolina; [2]University of Connecticut ; [3]University of Connecticut; [4]Clemson University

2:50 PM
The LiF–ZrF4 System Revisited - An Updated Thermodynamic Description Using New Information Data: *Juliano Schorne Pinto*[1]; Matthew Christian[1]; Timothy Lynch[2]; Wilson Chiu[2]; Theodore Besmann[1]; [1]University of South Carolina; [2]University of Connecticut

3:10 PM
Thermodynamic Modelling of Vacancies in Zirconium Carbide: *Theresa Davey*[1]; Ying Chen[1]; [1]Tohoku University

12th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Manufacturing from Metal and Ceramics based Precursor Materials

Program Organizers: Surojit Gupta, University of North Dakota; Rajiv Asthana, University of Wisconsin; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, AIST; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Tatami Junichi, Yokohama national university; Yiquan Wu, Alfred University; Allen Apblett, Oklahoma State University

Wednesday AM November 4, 2020

8:00 AM Invited
Amino Acid-based Single Source Precursors for Bimetallic Molybdates: *Allen Apblett*[1]; Fahad Alqahtani[1]; [1]Oklahoma State University

8:40 AM
Development of a Separation Process of NBR/HNBR Rubber from Metal Substrate: *Sarah Scardelatto*[1]; Mariana Nascimento[2]; [1]Zanaflex; [2]Fundação Santo André

9:00 AM Invited
Ceramics for the Circular Economy: *Monica Ferraris*[1]; Milena Salvo[1]; Elham Sharifikoloui[1]; [1]Politecnico di Torino – Italy

9:40 AM
Conditions for electrolytic reduction of titanium from binary mixed-oxide melt: *Catherine Bishop*[1]; Nic Weaver[1]; Samuel Martin-Treceno[1]; Aaron Marshall[1]; Matthew Watson[1]; [1]University of Canterbury

Additive Manufacturing Modeling and Simulation: AM Materials, Processes, and Mechanics — Additive Manufacturing Modeling and Simulation - Online Process Monitoring, Non-mechanical Property Characterization

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Brandon Mcwilliams, US Army Research Laboratory; Li Ma, Johns Hopkins University Applied Physics Laboratory; Yeongil Jung, Changwon National University

Wednesday AM November 4, 2020

8:00 AM
In-situ Monitoring of Powder Flow in Direct Energy Deposition Additive Manufacturing: *Baily Thomas*[1]; Abdalla Nassar[1]; Steve Brown[1]; Matthew Milanek[1]; Jason Scherer[1]; [1]Penn State University

8:20 AM
Property Measurements for Modeling the Process-structure-property Relationships in Additive Manufacturing: *Gwendolyn Bracker*[1]; Madeline Scott[1]; Elizabeth Hodges[1]; Michael SanSoucie[1]; Robert Hyers[1]; [1]University of Massachusetts

8:40 AM
Control of High-temperature Drop-on-demand Metal Jetting through Numerical Modelling and Experimentation: *Negar Gilani*[1]; Nesma Aboulkhair[1]; Marco Simonelli[1]; Ian Ashcroft[1]; Richard Hague[1]; [1]University of Nottingham

Additive Manufacturing of Ceramics and Ceramic Composites: Materials Properties, Processes, and Modeling — Additive Manufacturing of Ceramics and Ceramic Composites: Materials Properties, Processes, and Modeling

Program Organizers: Xiangyang Dong, Missouri University of Science and Technology; William Headrick, RHI Magnesita; James Hemrick, Reno Refractories Inc.; Eric Faierson, Quad City Manufacturing Laboratory; Keith DeCarlo, Blasch Precision Ceramics

Wednesday AM November 4, 2020

8:00 AM
Additive Manufacturing of Hybrid Silicon Carbide/Carbon Fiber Nano-composites: *Saja Al-ajrash*; Charles Browning[1]; [1]University of Dayton

8:20 AM
Additive Manufacturing of Miniaturized RFID Tag Using Electroceramic Materials for High Temperature Wireless Sensing Applications: *Kavin Sivaneri Varadharajan Id*[1]; Domenic Cipollone[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; Daryl Reynolds[1]; [1]West Virginia University

8:40 AM
Additive Manufacturing of Novel PZT Piezocomposite Structures: *Shawn Allan*[1]; Barry Robinson[2]; Alex Angilella[3]; Justin Tufariello[3]; Leslie Riesenhuber[3]; Brian Pazol[2]; [1]Lithoz America LLC; [2]MSI Transducers Corp; [3]The MITRE Corporation

9:00 AM
Effect of Carbon Concentration from Phenolic PIP on the Fabrication and Thermal- Mechanical Properties of SiC Composites by Additive Manufacturing and Reactive Silicon Melt Infiltration: *Corson Cramer*[1]; Edgar Lara-Curzio[1]; Amy Elliott[1]; Christina Padilla[1]; Alexis Flores-Betancourt[1]; Derek Siddel[1]; Kashif Nawaz[1]; [1]Oak Ridge National Laboratory

9:20 AM
Fundamental Studies of Tritium Diffusivity in Irradiation Defective LiAlO2 and Li2ZrO3: A Frist Principles Density Function Theory Study: Hari Paudel[1]; *Yuhua Duan*[1]; [1]National Energy Technology Laboratory

9:40 AM
Mechanical Characterization of SLA Printed Silica Lattice Structures: *Bhargavi Mummareddy*[1]; Jose Carrillo-Baeza[1]; Pedro Cortes[1]; [1]Youngstown State University

10:00 AM
Process Development for the Selective Laser Melting of Tungsten Carbide-Nickel Matrix Composites: *Edgar Mendoza*[1]; Baby Reeja-Jayan[1]; Jack Beuth[1]; [1]Carnegie Mellon Univ

Additive Manufacturing of Metals: Complex Microstructures and Architecture Design — Microstructure Evolution and Control

Program Organizers: Yu Zou, University of Toronto; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday AM November 4, 2020

8:00 AM Invited
Alloy and Process Modification for Microstructure Control in Additively Manufactured Alloys: *Christian Leinenbach*[1]; Seth Griffiths[1]; Anthony De Luca[1]; Ariyan Arabi-Hashemi[1]; [1]Empa, Swiss Federal Laboratories for Materials Science and Technology

8:30 AM Invited
Engineering the Plasticity of SLM Steel via Crystallographic Texture Control: Sudarshan Raman[1]; Karl Sofinowski[1]; *Matteo Seita*[1]; [1]Nanyang Technological University

9:00 AM
Small Scale Characterization of Additively Manufactured NiTi: *Minhazul Islam*[1]; Parisa Bayati[1]; M Nematollahi[1]; Mohammad Elahinia[1]; Meysam Haghshenas[1]; [1]University of Toledo

9:20 AM
Microstructure of Alloy 247LC Manufactured by Laser Powder Bed Fusion: *Olutayo Adegoke*[1]; Joel Andersson[1]; Robert Pederson[1]; Håkan Brodin[1]; [1]University West

9:40 AM
Evaluation of Microstructure in Multi Bead Ti-6Al-4V: *Amaranth Karra*[1]; Ali Guzel[1]; Hangman Chen[1]; Amit Kumar Verma[1]; Anthony D. Rollett[1]; [1]Carnegie Mellon University

Additive Manufacturing: Alloy Design to Develop New Feedstock Materials — Session I

Program Organizers: Joseph McKeown, Lawrence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Manyalibo Matthews, Lawrence Livermore National Laboratory; Christian Leinenbach, Empa, Swiss Federal Laboratories for Materials Science and Technology; Peter Hosemann, University of California

Wednesday AM November 4, 2020

8:00 AM Invited
High-Throughput Accelerated Alloy Development: Kenneth Vecchio[1]; *Olivia Dippo*[1]; [1]University of California, San Diego

8:30 AM Invited
Accidental Alloy Development: In-situ Evolution of AM Powder and Opportunities for New Material Synthesis Pathways: *Tim Horn*[1]; Chris Rock[1]; [1]North Carolina State University

9:00 AM
Characterization of Spatter with Organized Features in Laser Powder Bed Fusion: *Christopher Rock*[1]; Tim Horn[1]; [1]North Carolina State University

9:20 AM Invited
Optimization of Nitrogen-Atomized 17-4 Stainless Steel Feedstock for AM Processing: *Carelyn Campbell*[1]; James Zuback[1]; Mark Stoudt[1]; [1]National Institute of Standards and Technology

9:50 AM
Sensitivity Analysis and Composition Design for Metal Additive Manufacturing Using CALPHAD-based ICME Framework: *Xin Wang*[1]; Soumya Sridar[1]; Wei Xiong[1]; [1]University of Pittsburgh

10:10 AM Invited
Laser Additive Manufacturing of Nanocomposite Powders: *Bilal Gökce*[1]; Stephan Barcikowski[1]; [1]University of Duisburg-Essen

10:40 AM
Residual Stress Mitigation of Additive Manufactured Stainless Steel 316L Components through the Directed Energy Deposition Inclusion of TiC Nanoparticles: *Jakob Hamilton*[1]; Samantha Sorondo[1]; Andrew Greeley[1]; Denis Cormier[1]; Iris Rivero[1]; [1]Rochester Institute of Technology

Additive Manufacturing: Materials, Alloy Development, Microstructure and Properties — Additive Manufacturing of Al- and Ti-based Alloys

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University Of Technology; Zhi Wang, South China University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science; Filippo Berto, Norwegian University of Science and Technology

Wednesday AM November 4, 2020

8:00 AM Invited
Additive Manufacturing of Metallic Materials: Mechanical Properties: *Prashanth Konda Gokuldoss*[1]; [1]Tallinn University Of Technology

8:20 AM
Microstructural Evolution and Mechanical Properties of Cast and Additive Manufactured AlSi10Mg at Different Heat-treated Conditions: *Shawkat Imam*[1]; Ahmed Paridie[1]; Meysam Haghshenas[1]; [1]University of Toledo

8:40 AM
Microstructure and Mechanical Property of Additively Manufactured Zr-modified AA6061 Alloy: *Le Zhou*[1]; Abhishek Mehta[1]; Holden Hyer[1]; Thinh Huynh[1]; Sharon Park[1]; Devin Imholte[2]; Nicolas Woolstenhulme[2]; Daniel Wachs[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]Idaho National Laboratory

9:00 AM
Toward In-Situ Flaw Detection in Laser Powder Bed Fusion Additive Manufacturing: *Brett Diehl*[1]; Zackary Snow[1]; Abdalla Nassar[1]; Edward Reutzel[1]; [1]Applied Research Laboratory, Pennsylvania State University

9:20 AM
Mapping Relationships between Process Parameters, Microstructure, and Properties for Wire Feed – DED of Ti-6Al-4V: Ze Geng[1]; *Zhening Yang*[1]; Ali Guzel[1]; Amit Verma[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Materials — Titanium Alloy Microstructure and Properties

Program Organizers: Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Peeyush Nandwana, Oak Ridge National Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory; Yufeng Zheng, University of Nevada, Reno

Wednesday AM November 4, 2020

8:00 AM
Correlating Processing, Structure and Properties for Additively Manufactured Ti-6Al-4V: *Jayme Keist*[1]; Selda Nayir[1]; Todd Palmer[1]; [1]Pennsylvania State University

8:40 AM
Study of Effects from Post-processing on the Fatigue Performances of Laser Powder Bed Fusion Built Parts Using Hydride-dehydride Ti-6Al-4V Powders: *Ziheng Wu*[1]; Amir Mostafaei[2]; Nihal Sivakumar[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Illinois Institute of Technology

9:00 AM
Mechanical properties, fracture surface and microstructure of additively manufactured Ti6Al4V: *Asif Mahmud*[1]; Thinh Huynh[1]; Le Zhou[1]; Devin Imholte[2]; Nicolas Woolstenhulme[2]; Daniel Wachs[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]Idaho National Laboratory

9:20 AM
Environmental Degradation of AM-fabricated Ti6Al4V Alloy: *Guy Ben-Hamu*[1]; [1]Sami Shamoon College of Engineering

9:40 AM
Multiscale Mechanical Studies of Dual-phase Titanium Alloys Made by Additive Manufacturing: Zhiying Liu[1]; *Yu Zou*[1]; [1]University of Toronto

10:00 AM
Study the Effect of Thermal Gradients on the Microstructure and Mechanical Properties of Electron Beam Melting Ti-6Al-4V Builds: *Meiyue Shao*[1]; Sriram Vijayan[1]; Evan Hass[1]; Kayla Hepler[1]; Joerg Jinschek[1]; [1]The Ohio State University

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments — Radiation Effects & Materials Mechanics

Program Organizers: Samuel Briggs, Oregon State University; Christopher Barr, Sandia National Laboratories; Emily Aradi, University of Huddersfield; Michael Short, Massachusetts Institute of Technology; Janelle Wharry, Purdue University; Cheng Sun, Idaho National Laboratory; Dong Liu, University of Oxford; Khalid Hattar, Sandia National Laboratories

Wednesday AM November 4, 2020

8:00 AM
Benefits of Using High Energy Ions in Ion Irradiation Experiments to Evaluate Void Swelling: *Peter Doyle*[1]; Takaaki Koyanagi[2]; Steven Zinkle[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

8:20 AM
Swelling of Nuclear Reactor Steels: Modeling, Theory, and Accelerated Testing: *Michael Fluss*[1]; Edward Moses[2]; [1]Nuclear Materials Consultancy; [2]Longview Consulting, Inc.

8:40 AM
Response of an Additively Manufactured 316 Stainless Steel Subjected to High Temperature Heavy Ion Irradiations: *Zhongxia Shang*[1]; Cuncai Fan[2]; Jie Ding[1]; Sichuang Xue[1]; Adam Gabriel[3]; Thomas Voisin[4]; Jin Li[1]; Lin Shao[3]; Yinmin Wang[4]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Oak Ridge National Laboratory; [3]Texas A&M University; [4]Lawrence Livermore National Laboratory

9:00 AM
In situ Crack Loading and Measurement Techniques for Gen IV Reactor Coolant Media: *Peter Beck*[1]; Andrew Brittan[2]; Dustin Mangus[1]; Jake Quincy[1]; George Young[2]; Guillaume Mignot[1]; Samuel Briggs[1]; Julie Tucker[1]; [1]Oregon State University; [2]Kairos Power

9:20 AM
Characterization of Stress and Environment Dependent Fracture Mechanisms of SiC/SiC CMCs: *Morgan Price*[1]; Clifton Bumgardner[1]; Frederick Heim[1]; David Roache[1]; Xiaodong Li[1]; [1]University of Virginia

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

Program Organizers: Evelina Vogli, Lm Group Holdings Inc.; Fei Tang, DNV GL

Wednesday AM November 4, 2020

8:00 AM
Improved Coating Performance of REACH Compliant Trivalent Chromium Plating Process for Functional Applications: *Andrew Moran*[1]; Rajeswaran Radhakrishnan[1]; Kamyar Ahmadi[2]; Timothy Hall[1]; Stephen Snyder[1]; Tony Oriti[3]; Mark Feathers[4]; Michael Johnson[4]; George Bokisa[3]; Jennings Taylor[1]; Maria Inman[1]; Stanko Brankovic[2]; Jing Xu[1]; [1]Faraday Technology Inc; [2]University of Houston; [3]Coventya Inc; [4]U.S. Army Aviation and Missile Command

8:20 AM
The Surface Integrity of Hard Coatings and Surface Treatments on Alloy 17-4PH in Highly Soured Environments: *Manuel Marya*[1]; Dean Lauppe[1]; Virendra Singh[1]; [1]Schlumberger

8:40 AM
High Performance Amorphous Based Thermal Sprayed Coatings for Molten Salt Environment: *Evelina Vogli*[1]; John Kang[1]; Rick Salas[1]; [1]Lm Group Holdings Inc.

9:00 AM
Electrochemical Corrosion Behaviors of Nitrogen-enriched Stainless Steels and High Chromium White Irons: *Virendra Singh*[1]; Manuel Marya[1]; [1]Schlumberger

9:20 AM
Production of Chromium-aluminized Coatings to Protect Against Wear and Corrosion: *Borys Sereda*[1]; Dmytro Sereda[1]; Irina Kruglyak[1]; [1]Dneprovsky State Technical University

Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials — Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials I

Program Organizers: Mohammad Elahinia, University of Toledo; Haluk Karaca, University of Kentucky; Reginald Hamilton, Pennsylvania State University; Mohammad Mahtabi, University Of Tennessee - Chattanooga; Narges Shayesteh Moghaddam, University of Texas at Arlington; Reza Rizvi, University of Toledo; Markus Chmielus, University of Pittsburgh; Hamdy Ibrahim, University of Tennessee at Chattanooga; Mohammadreza Nematollahi, University of Toledo

Wednesday AM November 4, 2020

8:00 AM
3D Printed Shape Memory Polymers: Electronics and Morphing: *Trenton Cersoli*[1]; Pedro Cortes[1]; [1]Youngstown State University

8:20 AM
Establishing Fundamentals for Laser Metal Deposition of Functional Ni-Mn-Ga Alloys: Effect of Rapid Solidification on Microstructure and Phase Transformation Characteristics: *Emily Flitcraft*[1]; Carolin Fink[1]; Markus Chmielus[2]; Jakub Toman[2]; [1]Edison Joining Technology Center - OSU Welding Engineering; [2]University of Pittsburgh

8:40 AM
Microstructure and Property Differences in Sintered and Annealed Binder-Jet 3D Printed Ni-Mn-Ga Magnetic Shape Memory Alloys: *Aaron Acierno*[1]; Ville Laitinen[2]; Jakub Toman[1]; Katerina Kimes[1]; Mirko Boin[3]; Robert Wimpory[3]; Andrey Saren[2]; Kari Ullakko[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Lappeenranta-Lahti University of Technology; [3]Helmholtz-Zentrum Berlin

9:00 AM
Epitaxial Growth of a Magnetic Shape-memory Alloy via Laser Melting and Directed Energy Deposition: *Jakub Toman*[1]; Tyler Paplham[1]; Peter Müllner[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Boise State University

9:20 AM
Compressive Behavior of NiMnGa Parts Fabricated by Binder Jet Additive Manufacturing: Stephen Isacco[1]; Christopher Bansah[1]; Matthew Caputo[2]; *C. Virgil Solomon*[1]; [1]Youngstown State University; [2]Penn State University

Advanced Steel Metallurgy — Characterization

Program Organizers: Chirag Mahimkar, Big River Steel; Justin Raines, SSAB Americas; Kip Findley, Colorado School of Mines; Alla Sergueeva, NanoSteel Company Inc; Daniel Branagan, The NanoSteel Co

Wednesday AM November 4, 2020

8:00 AM
Microstructure Characterization and Post-heat Treatment Design for High-Strength Low-alloy Steels Strengthened with Fe_2SiTi-$L2_1$ Precipitates: *Rafael Rodriguez De Vecchis*[1]; Soumya Sridar[1]; Xin Wang[1]; Zhangwei Wang[2]; Wei Xiong[1]; [1]University of Pittsburgh; [2]Max-Planck-Institut für Eisenforschung GmbH

8:20 AM
Microstructure Property Relationships of Al- alloyed Medium Manganese Steels: *Alexandros Serafeim*[1]; Christian Haase[1]; Wolfgang Bleck[1]; [1]Steel Institute (IEHK)

8:40 AM
Relationship between Microstructure and Tensile Properties on High Strength Medium Carbon Mo-Nb-B Microalloyed Q/Q&T Steels: Irati Zurutuza[1]; Nerea Isasti[1]; Eric Detemple[2]; Volker Schwinn[2]; Hardy Mohrbacher[3]; *Pello Uranga*[1]; [1]CEIT and TECNUN (University of Navarra); [2]AG der Dillinger Hüttenwerke; [3]NiobelCon bvba

Advances in Dielectric Materials and Electronic Devices — Ferroics, Multiferroics, & Electronics

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

Wednesday AM November 4, 2020

10:20 AM
Multiferroism and Magneto-electric Coupling Effect of M-type Hexaferrites: *Gulong Tan*[1]; Xue Li[1]; HaoHao Sheng[1]; Wei[1]; Yao Huang[1]; [1]Wuhan University of Technology

10:40 AM
Chemical and Magnetic Phase Stability in $BiXO_3$ by Density-functional Theory: *Michael Walden*[1]; Cristian Ciobanu[1]; Geoff Brennecka[1]; [1]Colorado School of Mines

Advances in Synthesis and Integration Methods for Enhanced Properties, and Applications in Emerging Nanomaterials — Energy Materials II: Membranes and Catalysts

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jung-Kun Lee, University of Pittsburgh; Zubaer Hossain, University of Delaware

Wednesday AM November 4, 2020

8:00 AM Invited
Development of High-performance Ion Selective Membranes for Redox Flow Batteries: *Sangil Kim*[1]; Tongshuai Wang[1]; Natalie Fifield[2]; Chulsung Bae[2]; [1]University of Illinois at Chicago; [2]Rensselaer Polytechnic Institute

8:30 AM Invited
Influence of Surface Charge on the Photochemical Reactivity of $SrTiO_3$, $BaTiO_3$, and TiO_2/$BaTiO_3$ Heterostructured Catalysts: Wenjia Song[1]; Mingyi Zhang[1]; Paul Salvador[1]; *Gregory Rohrer*[1]; [1]Carnegie Mellon University

AI for Big Data Problems in Imaging, Modeling and Synthesis — AI-accelerated Materials Discovery and Synthesis

Program Organizers: Mathew Cherukara, Argonne National Laboratory; Badri Narayanan, University of Louisville; Subramanian Sankaranarayanan, University of Illinois (Chicago)

Wednesday AM November 4, 2020

8:00 AM
Enabling Data-driven Discovery of Chemistry-function Relationships via Automated Packing Motif Labeling: *Donald Loveland*[1]; Phan Nguyen[1]; Anna Hiszpanski[1]; T. Yong-Jin Han[1]; [1]Lawrence Livermore National Laboratory

8:20 AM Invited
Directing Matter In-situ via Deep Learning: *Bobby Sumpter*[1]; [1]Oak Ridge National Laboratory

9:00 AM
Inverse Design of Porous Structures by Deep Learning and TPU-based Computing: Yuhai Li[1]; Yuhan Liu[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

9:20 AM Invited
Polymer Informatics—Current Status and Critical Next Steps: *Lihua Chen*[1]; Rampi Ramprasad[1]; [1]Georgia Institute of Technology

Broadening Participation in the Materials Science and Engineering Profession — Session I

Wednesday AM November 4, 2020

11:00 AM
Presenters include: *Karl Reid, National Society of Black Engineers; Beth Dickey, Carnegie Mellon University; Keith Bowman, University of Maryland; Olivia Graeve, University of California San Diego; Ellen Cerreta, Los Alamos National Laboratory; and Marc Brooks, Nucor*

Ceramic and Crystal Materials for Optics and Photonics — Session I

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory; Xiang Hua Zhang, University of Rennes - and - Materials Science Department, University of Arizona; Michael Squillante, Radiation Monitoring Devices Inc; Long Zhang, Shanghai Institute of Optical and Fine Mechanics, Chinese Academy of Science; Takunori Taira, National Institutes of Natural Science

Wednesday AM November 4, 2020

8:00 AM Invited
Manipulating Properties via Grain Size Engineering in Transparent Ceramics: *James Wollmershauser*[1]; Boris Feigelson[1]; Lukasz Kuna[2]; John Mangeri[3]; Kevin Anderson[4]; Heonjune Ryou[1]; Eric Patterson[1]; Edward Gorzkowski[1]; Serge Nakhmanson[2]; [1]U.S. Naval Research Laboratory; [2]University of Connecticut; [3]Academy of Sciences of the Czech Republic; [4]National Research Council Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory

8:40 AM Invited
ZnS:Ag Scintillators: Synthesis, Microstructure, and Luminescence: *Luiz Jacobsohn*[1]; [1]Clemson University

9:00 AM Invited
Plate/Powder Form of Single Crystal Phosphors for High-brightness White Lighting: *Kiyoshi Shimamura*[1]; Encarnacion Garcia Villora[1]; Daisuke Inomata[2]; [1]National Institute for Materials Science; [2]Tamura Corporation

9:20 AM Invited
Nano-phosphor Materials Synthesized by Novel Soft Chemistry, Water-assisted Solid-state Reaction Method: *Kenji Toda*[1]; Dae-Ho Yoon[2]; [1]Niigata University; [2]Sungkyunkwan University

9:40 AM
Fabrication and Optical Properties of Yb-doped MgO Transparent Ceramics by Spark Plasma Sintering: *Xuan Chen*[1]; David Carloni[1]; Yiquan Wu[1]; [1]Alfred University

10:00 AM
Investigation Into Improving Scintillation Properties of Cesium Hafnium Chloride: *Cordell Delzer*[1]; Ketaki Joshi[1]; Luis Stand[1]; Nerine Cherepy[2]; Steve Payne[2]; Xianfei Wen[1]; Jason Hayward[1]; [1]University of Tennessee; [2]LLNL

10:20 AM
Containerless Processing and Characterization of Potential Host Crystals for Photorefractive Devices: *Elizabeth Hodges*[1]; Michael SanSoucie[2]; Robert Hyers[1]; [1]University of Massachusetts Amherst; [2]NASA

Ceramics in the Nuclear Fuel Cycle — Waste Form Development

Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Kyle Brinkman, Clemson University; Philip Edmondson, Oak Ridge National Laboratory; Djamel Kaoumi, North Carolina State University

Wednesday AM November 4, 2020

8:00 AM
A First-principles Database Approach to Predicting Trans-Uranic Waste Forms: *Matthew Christian*[1]; Vladislav Klepov[1]; Kristen Pace[1]; Gregory Morrison[1]; Theodore Besmann[1]; Hans-Conrad zur Loye[1]; [1]University of South Carolina

8:20 AM
Multi-scale Cs Sorbents Easily Transformable into Waste Confinement Matrices: Agnes Grandjean[1]; Micheal Maloney[1]; Clément Cabaud[1]; N. Massoni[1]; *Scott Misture*[2]; [1]CEA, DEN, Univ. Montpellier; [2]Alfred University

Coatings to Protect Materials from Extreme Environments — Environmental and Thermal Barrier Coatings I

Program Organizers: Kang Lee, NASA Glenn Research Center; Yutaka Kagawa, High Performance Materials; Daniel Mumm, University of California, Irvine; Rodney Trice, Purdue University; Emmanuel Boakye, UES Inc.; Valerie Wiesner, NASA Langley Research Center; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Jun Song, McGill University; Christian Moreau, Concordia University; Stephen Yue, McGill University

Wednesday AM November 4, 2020

8:00 AM
Cyclic Steam Oxidation of Single Layer Ytterbium Disilicate Environmental Barrier Coatings: *Kenneth Kane*[1]; Padraig Stack[2]; Eugenio Garcia[3]; Sanjay Sampath[3]; Bruce Pint[1]; [1]Oak Ridge National Laboratory; [2]University of Akron; [3]Center for Thermal Spray Research

8:30 AM
Anisotropic Wettability of CaO-MgO-Al_2O_3-SiO_2 Deposits on $YAlO_3$: Implications for Grain Boundary Engineering of Environmental Barrier Coatings for Gas Engine Applications: *Amanda Velazquez Plaza*[1]; Amanda Krause[1]; [1]University of Florida

8:50 AM Invited
Cathodic Arc Deposition of Silicon Aluminum Nitride Coating on SiC: *Emmanuel Boakye*[1]; Ming Ming Chen[1]; Keller[1]; Brian Sirn[1]; Rabi Bhattacharya[1]; A.K Rai[1]; [1]UES Inc.

9:20 AM
Real-time Observation of Impact Damage in Coated Silicon Carbide (SiC): *Nesredin Kedir*[1]; Wayne Chen[1]; Kamel Fezzaa[2]; [1]Purdue University; [2]ANL/APS

9:40 AM
Novel Multiscale Shear Adhesion Testing of Thermal Barrier Coatings: *John Daspit*[1]; [1]University of Virginia

Emergent Materials under Extremes and Decisive In Situ Characterizations — Pressure-induced dramatic changes in structures and properties

Program Organizers: Xiaofeng Guo, Washington State University; Xujie Lu, Center for High Pressure Science & Technology Advanced Research; Hua Zhou, Argonne National Laboratory; Judith Driscoll, University of Cambridge; Hongwu Xu, Los Alamos National Laboratory

Wednesday AM November 4, 2020

8:00 AM
Evolution of Structure, Electrical, and Optical Properties in Ti-doped In_2O_3 Nanocrystals under Pressure: *Xuqiang Liu*[1]; Yandong Wang[2]; Wenge Yang[3]; [1]Northeastern University(China) and HPSTAR; [2]Northeastern University; [3]Center for High Pressure Science & Technology Advanced Research(HPSTAR)

8:20 AM Invited
Giant Pressure-induced Enhancements in Electronic Transport and Photoelectric Properties in 2D and 3D Structures: *Wenge Yang*[1]; [1]Center for High Pressure Science and Technology Advanced Research

8:50 AM
High Pressure & Temperature Investigation into Thorium Orthosilicates: *Andrew Strzelecki*[1]; Jason Baker[2]; Stella Chariton[3]; Vitali Prakapenka[3]; Hongwu Xu[2]; Mostafa Ahmadzadeh[1]; John McCloy[1]; Paul Estevenon[4]; Adel Mesbah[4]; Nicolas Dacheux[4]; Xiaofeng Guo[1]; [1]Washington State University; [2]Los Alamos National Laboratory; [3]Argonne National Laboratory; [4]ICSM

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Kinetic Processes and Interface Transitions

Program Organizers: Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of Illinois at Urbana-Champaign; Wolfgang Rheinheimer, Purdue University; Ming Tang, Rice University; Melissa Santala, Oregon State University

Wednesday AM November 4, 2020

8:00 AM
A Survey of Constrained Grain Boundary Migration Mechanisms: *Ian Chesser*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

8:20 AM
Equilibrium and Kinetic Shapes of Grains in Polycrystals: *Wolfgang Rheinheimer*[1]; John Blendell[2]; Carol Handwerker[2]; [1]TU Darmstadt; [2]Purdue University

8:40 AM
Electromigration-induced Defects' Evolution in Polycrystalline Interconnects: Insights from Phase-field Simulations: *William Farmer*[1]; Sree Vemulapalli[1]; Kumar Ankit[1]; [1]Arizona State University

9:00 AM
Relating Grain Size Distributions and Grain Boundary Excess Coverages to Complexion Transitions in Eu-doped MgAl2O4: *Christopher Marvel*[1]; Caroline Riedel[1]; Amanda Krause[2]; Martin Harmer[1]; [1]Lehigh University; [2]University of Florida

9:20 AM
Grain Boundary Engineering ZnAl2O4 via Rare Earth (RE) Doping with Varying Ionic Radii: *Luis Sotelo Martin*[1]; Ricardo Castro[1]; [1]University of California, Davis

9:40 AM Invited
Roughening and Screening Transitions in Grain Boundaries and the Implications on Grain-Boundary Properties: *Jian Han*[1]; Kongtao Chen[2]; David Srolovitz[1]; [1]City University of Hong Kong; [2]University of Pennsylvania

High Entropy Materials: Concentrated Solid Solution, Intermetallics, Ceramics, Functional Materials and Beyond — High Entropy Ceramics

Program Organizers: Xingbo Liu, West Virginia University; Michael Gao, National Energy Technology Laboratory; Peter Liaw, University of Tennessee; Jian Luo, University of California, San Diego; Yiquan Wu, Alfred University; Yu Zhong, Worcester Polytechnic Institute

Wednesday AM November 4, 2020

8:00 AM Invited
High-entropy Sesquioxide Transparent Ceramics with Up-conversion Functionality: *Guangran Zhang*[1]; Iva Milisavljevic[1]; Yiquan Wu[1]; [1]Alfred University

8:20 AM
Chemical Defect Reactivity of A-site High-Entropy $LaFeO_3$ and $LaMnO_3$ Based Perovskite Oxides: *Hector De Santiago Hernandez*[1]; Wei Li[1]; Wenyuan Li[1]; Xingbo Liu[1]; [1]West Virginia University

8:40 AM Invited
Tuning of Lattice Distortion in High-entropy Oxides by High Pressure: *Qiaoshi Zeng*[1]; [1]Hpstar

9:00 AM Invited
Controllable Phase Heterogeneity in High Entropy Oxides: *Alexander Dupuy*[1]; Julie Schoenung[1]; [1]University of California, Irvine

9:20 AM Invited
Magnetic Properties of High Entropy Oxides: *Abhishek Sarkar*[1]; Ralf Witte[2]; Robert Kruk[2]; Richard Brand[2]; Horst Hahn[1]; [1]Technische Universität Darmstadt; [2]Karlsruhe Institute of Technology (KIT)

9:40 AM Invited
Quantification of the Feasible High Entropy Alloy Space via Novel Alloy Search Schemes: *Raymundo Arroyave*[1]; [1]Texas A&M University

10:00 AM Invited
Phase Transformation and Kinetic Behavior of High Entropy Oxide Materials Characterized via Rapid In-situ Non-ambient X-ray Diffraction: *Brianna Musico*[1]; Cordell Delzer[1]; Claudia Rawn[1]; Veerle Keppens[1]; David Mandrus[1]; [1]University of Tennessee

Integration between Modeling and Experiments for Crystalline Metals: From Atomistic to Macroscopic Scales II — Session III

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Levente Balogh, Queen's University; Josh Kacher, Georgia Institute of Technology; Caizhi Zhou, University of South Carolina; Lei Cao, University of Nevada

Wednesday AM November 4, 2020

8:00 AM
Electron Backscatter Diffraction Pattern Simulation for Interaction Volume Containing Lattice Defects: *Chaoyi Zhu*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

8:20 AM
Strong strain hardening in ultrafast melt-quenched nanocrystalline Cu: the role of fivefold twins: *Amir Hassan Zahiri*[1]; Pranay Chakraborty[1]; Yan Wang[1]; Lei Cao[1]; [1]Universitiy Of Nevada Reno

8:40 AM Invited
Regulating Elastic and Plastic Deformations by Microstructure Design and Coupling between Deformation and Phase Transformation - An Integrated Modeling and Experimental Study: Qianglong Liang[1]; Yufeng Zheng[2]; Yipeng Gao[3]; Tianlong Zhang[4]; Dong Wang[4]; Michael Mills[1]; Hamish Fraser[1]; *Yunzhi Wang*[1]; [1]Ohio State University; [2]University of Nevada Reno; [3]INL; [4]Xi'an Jiao Tong University

9:10 AM
Novel Remapping Method for HR-EBSD Based on Computer Vision Algorithm: *Chaoyi Zhu*[1]; Kevin Kaufmann[2]; Kenneth Vecchio[2]; [1]Carnegie Mellon University; [2]University of California, San Diego

9:30 AM
Applications of Computational Polarized Light Microscopy for Large Area Orientation
Determination of alpha-Titanium: *Ke-Wei Jin*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

9:50 AM
Design of an Austenitic Steel Weldment System Using ICME: *Daniel Bechetti*[1]; Paul Lambert[1]; Jacob Steiner[1]; Matthew Sinfield[1]; Charles Fisher[1]; [1]NSWC Carderock Division

Interfaces and Phase Transformations — Interfaces and Phase Transformations II

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Matthias Militzer, University of British Columbia; Matthew Steiner, University of Cincinnati; Mohsen Zaeem, Colorado School of Mines; Yufeng Zheng, University of Nevada, Reno

Wednesday AM November 4, 2020

8:00 AM Invited
Study of Strain Rate and Temperature Dependent Behavior of Pseudomorphic bcc Mg within the Mg/Nb Nanocomposites: *Manish Jain*[1]; Rajaprakash Ramachandramoorthy[1]; Marko Knezevic[2]; Nenad Velisavaljevic[3]; Nathan Mara[4]; Irene Beyerlein[5]; Johann Michler[1]; Siddhartha Pathak[6]; [1]Empa-Swiss Federal Laboratories for Materials Science and Technology; [2]University of New Hampshire; [3]Argonne National Laboratory; [4]University of Minnesota; [5]University of California, Santa Barbara; [6]University of Nevada Reno

8:30 AM
Shear-mediated Interfacial Structure Evolution in Nanoscale FCC Gold: *Zhengwu Fang*[1]; Scott Mao[1]; [1]University of Pittsburgh

8:50 AM
Phase Transformations in High-Temperature Industrial Applications: An Experimental and Computational Study of Nitridation in Commercial Austenitic Stainless Steel: *Alice Young*[1]; Milo Kral[1]; Catherine Bishop[1]; [1]University of Canterbury

9:10 AM
Microstructure and Mechanical Properties of Pre-aged Thermo-Mechanically Processed NiTiHf Shape Memory Alloy: *Faith Gantz*[1]; Nathan Ley[1]; Jessica Rider[1]; Jordyn Ward[1]; Drew Forbes[2]; Marcus Young[1]; [1]University of North Texas; [2]Fort Wayne Metals Research Products Corp.

Journal of the American Ceramic Society Awards Symposium — Journal of the American Ceramic Society Awards Symposium Session I

Program Organizer: William Fahrenholtz, Missouri University of Science and Technology

Wednesday AM November 4, 2020

10:20 AM
Introductory Comments: Journal of the American Ceramic Society Awards Symposium: *William Fahrenholtz*[1]; [1]Missouri University of Science and Technology

10:25 AM
Direct-Writing of 3D Photonic Crystals with Tunable Terahertz Properties: *Qi Li*[1]; [1]Southwest Jiaotong University

10:55 AM
Improvements of Fergusonite-type Microwave Dielectric Ceramics by Ions Substitutions: *Di Zhou*[1]; [1]Xi'an Jiaotong University

11:25 AM
Phase Formation and Mechanical Properties of (Mg,Co,Ni,Cu,Zn)O High Entropy Ceramics by Field Assisted Sintering Technology: *Fei Chen*[1]; Weichen Hong[1]; Mingyong Jia[1]; Qiang Shen[1]; [1]Wuhan University of Technology

Manufacturing and Processing of Advanced Ceramic Materials — New Opportunities in Ceramic Processing II

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Mike Alexander, Allied Mineral Products, Inc.; Eric Faierson, Quad City Manufacturing Laboratory - Western Illinois University; James Hemrick, Reno Refractories Inc.; Keith DeCarlo, Blasch Precision Ceramics

Wednesday AM November 4, 2020

8:00 AM Invited
Developing Materials and Coating Technologies for Mitigation of Lunar Dust Adhesion and Abrasion: *Valerie Wiesner*[1]; Lopamudra Das[2]; Chris Wohl[1]; Glen King[1]; Keith Gordon[1]; Samuel Hocker[1]; Karen Taminger[1]; Sharon Miller[3]; [1]NASA Langley Research Center; [2]National Institute of Aerospace; [3]NASA Glenn Research Center

8:40 AM Invited
Neutrons Guide Materials Design and Synthesis of Functional Oxides: *Yan Chen*[1]; Ke An[1]; [1]Oak Ridge National Laboratory

9:20 AM Invited
Transparent Ceramics by Lithography-Based Additive Manufacturing: *Guangran Zhang*[1]; David Carloni[1]; Yiquan Wu[1]; [1]Alfred University

10:00 AM Invited
Processing and Properties of High Thermal Conductive Silicon Nitride Ceramics: *Kiyoshi Hirao*[1]; You Zhou[1]; Hideki Hyuga[1]; Tatsuki Ohji[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

10:40 AM Invited
A Rational Design of Ultra-uniform Nanocrystalline Materials: *Yanhao Dong*[1]; Hongbing Yang[2]; Jiangong Li[2]; I-Wei Chen[3]; Ju Li[1]; [1]Massachusetts Institute of Technology; [2]Lanzhou University; [3]University of Pennsylvania

Materials Informatics for Images and Multi-dimensional Datasets — Joint Session: "Materials Informatics for Images and Multi-dimensional Datasets" and "Materials Informatics and Modeling for 21st Century Ceramics Research"

Program Organizers: Amanda Krause, University of Florida; Kristen Brosnan, General Electric Research; Alp Sehirlioglu, Case Western Reserve University

Wednesday AM November 4, 2020

8:00 AM Invited
Computer Vision and Machine Learning for Microstructural Image Data: *Elizabeth Holm*[1]; [1]Carnegie Mellon University

8:30 AM Invited
Microstructure Representation for Physically Meaningful Descriptors: *Olga Wodo*; [1]

9:00 AM Invited
Incorporating Materials Physics into Imaging Algorithms for Microscope Image Interpretation: *Jeff Simmons*[1]; [1]U.S. Air Force Research Laboratory

9:30 AM Invited
Accelerate TEM and Tomography Imaging by Deep-learning Enabled Compressive Sensing and Information Inpainting in High-dimensional Manifold: *Huolin Xin*[1]; [1]University of California, Irvine

10:00 AM Invited
FAIR Digital Object Framework and High Throughput Experiment: *Zachary Trautt*[1]; Raymond Plante[1]; Gretchen Greene[1]; Jason Hattrick-Simpers[1]; Brian DeCost[1]; Aaron Kusne[1]; Andriy Zakutayev[2]; [1]National Institute of Standards and Technology; [2]National Renewable Energy Laboratory

Multi-material Additive Manufacturing: Processing and Heterogeneous Materials Design — Innovative AM Approaches for Multi-functions

Program Organizers: Hang Yu, Virginia Polytechnic Institute and State University; Steven Boles, Hong Kong Polytechnic University; Michael Gibson, Desktop Metal; Lonnie Love, Oak Ridge National Laboratory; Leon Prentice, CSIRO Metal Industries

Wednesday AM November 4, 2020

8:00 AM
Material Layering with Binder Jet 3D Printing to Improve Magnetocaloric Functionality: *Erica Stevens*[1]; Katerina Kimes[1]; Jeffrey Martin[1]; Emma Dickinson[1]; Markus Chmielus[1]; [1]University of Pittsburgh

8:20 AM Invited
Multimaterial, Multifunctional Design of Metallic Components: *Joseph Newkirk*[1]; Frank Liou[1]; [1]Missouri University of Science and Technology

9:00 AM Invited
Direct Digital Manufacturing (DDM): The Integration of Multimaterials, Additive and Subtractive Manufacturing: *Charles Newton*[1]; [1]nScrypt

Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry — Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session I

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

Wednesday AM November 4, 2020

8:00 AM
Introductory Comments: Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry: *Gary Pickrell*[1]; [1]Virginia Tech

8:05 AM Invited
Rational Design of MOFs-based Nanocomposites for Environmental Applications: *Weining Wang*[1]; [1]Virginia Commonwealth University

8:35 AM
Additively Manufactured In-pile Strain Sensors: *Timothy Phero*[1]; Kaelee Novich[1]; Bette Gougar[1]; Samuel Cutler[1]; Kiyo Fujimoto[1]; Richard Skifton[2]; David Estrada[1]; Brian Jaques[1]; [1]Boise State University; [2]Idaho National Laboratory

8:55 AM
Energy and Nanomaterials: Synergy at the Interface: *Randy Vander Wal*[1]; [1]Penn State University

9:15 AM
Pioneering Sensing Applications of Nanoporous Gold by Leveraging Unique Properties at the Nanoscale: Timothy Wong[1]; *Roger Newman*[1]; [1]University of Toronto

Next Generation Biomaterials — Next Generation Biomaterials IV

Program Organizers: Roger Narayan, University of North Carolina; David Dausch, RTI International; Sanjiv Lalwani, Lynntech, Inc.

Wednesday AM November 4, 2020

8:00 AM Invited
Next Generation Multi-principal and Amorphous Metallic Biomaterials: Jibril Shittu[1]; Maryam Sadeghilaridjani[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

8:20 AM Invited
Novel Hierarchical Carbon Nantotube-coated Materials as Bioscaffolds for Keratinocyte Cell Growth: *Soham Parikh*[1]; Courtney Sulentic[1]; Sharmila Mukhopadhyay[2]; [1]Wright State University; [2]The University of Maine

8:40 AM
Chemical, Thermal and Radiological Stability of Bio-ceramics: *Akshay Patel*[1]; Margaret LaCourse[1]; Brett Setera[1]; Ian Emge[1]; Charmain Su[1]; Joshua Wilhide[1]; Brian Cullum[1]; Bradley Arnold[1]; Fow-Sen Choa[1]; Narsingh Singh[1]; [1]University of Maryland, Baltimore County

9:00 AM
Ultra-soft Hydrogel Mechanical Property Testing Device and Methodology: *Kazue Orikasa*[1]; Nicole Bacca[1]; Arvind Agarwal[1]; [1]Florida International University

9:20 AM
Silk Fibroin Scaffold Degradation Induced by Focused Therapeutic Ultrasound: *Megan DeBari*[1]; Xiaodan Niu[1]; Mallory Griffin[1]; Sean Pereira[1]; Bin He[1]; Rosalyn Abbott[1]; [1]Carnegie Mellon University

Surface Treatments and Properties of Titanium and Titanium Alloys: A Forum on New Strategies and Processes for Biomedical and Industrial Advanced Applications — Surface Treatments and Properties of Titanium and Titanium Alloys

Program Organizers: Silvia Spriano, Politecnico Di Torino; Sara Ferraris, Politecnico di Torino; Paulo Tambasco de Oliveira, Universidade de São Paulo,; Antonio Nanci, Université de Montréal

Wednesday AM November 4, 2020

8:00 AM
Introductory Comments: Surface Treatments and Properties of Titanium and Titanium Alloys:: *Silvia Spriano*[1]; [1]Politecnico De Torino

8:05 AM
Controlled Surface Topography of Titanium-based Implants via Use of Gas/Solid Reactions: *Naotaka Ogura*[1]; Pavan Srivas[1]; Kenneth Sandhage[1]; [1]Purdue University

8:25 AM
Sustainable Antibacterial Activity of Iodine-loaded Bioactive Titanium Metal by Chemical and Heat Treatment: *Seiji Yamaguchi*[1]; Morihiro Ito[1]; Seine Shintani[1]; Takashi Nakamura[1]; Hiroaki Takadama[1]; [1]Chubu University

8:45 AM
A Comparative Study of Protein Adsorption on Different Bio-surfaces for Osteointegration: *Jacopo Barberi*[1]; Sara Ferraris[1]; Luisa Mandrile[2]; Erik Piatti[1]; Andrea Mario Rossi[2]; Seiji Yamaguchi[3]; Silvia Spriano[1]; [1]Politecnico di Torino; [2]National Institute of Metrological Research; [3]Chubu University

Synthesis, Characterization and Application of 3D Graphene — Session I

Program Organizers: Yun Hu, Michigan Technological University; Siyuan Fang, Michigan Technological University

Wednesday AM November 4, 2020

8:00 AM Invited
Development of Highly Efficient TCR with Free-standing Multilayer Graphene: *Minhee Yun*[1]; [1]University of Pittsburgh

8:30 AM Invited
Synthesis and Application of 3D Surface-microporous Graphene: *Yun Hu*[1]; [1]Michigan Technological University

9:10 AM Invited
Graphene-enabled Nanocomposites: *Xiaodong Li*[1]; [1]University of Virginia

9:40 AM
3D Graphene as an Efficient Electrode for Capacitive Deionization: *Siyuan Fang*[1]; Liang Chang[1]; Yun Hang Hu[1]; [1]Michigan Technological University

Thermodynamics of Materials in Extreme Environments — Thermodynamics, Stability, and Reactivity of Materials under Extreme Conditions

Program Organizers: Xiaofeng Guo, Washington State University; Kristina Lilova, Arizona State University; Kyle Brinkman, Clemson University; Alexandra Navrotsky, Arizona State University; Jake Amoroso, Savannah River National Laboratory; Xingbo Liu, West Virginia University; Gustavo Costa, NASA Glenn Research Center

Wednesday AM November 4, 2020

8:00 AM Invited
Thermodynamics of An-Cl Complexes at High Temperature and Pressure: *Ping Yang*[1]; Xiaobin Zhang[1]; Morgan Kelley[1]; Enrique Batista[1]; Jason Baker[1]; Hakim Boukhalfa[1]; Artaches Migdissov[1]; Hongwu Xu[1]; [1]Los Alamos National Laboratory

8:30 AM Invited
Improved CMAS Resistance of Environmental Barrier Coatings via Tailoring Phase and Composition of Mixed Rare Earth Silicates: *Elizabeth Opila*[1]; Rebekah Webster[1]; Cameron Miller[1]; Clark Luckhardt[1]; [1]University of Virginia

9:00 AM
Exploring Extreme Environments via In-situ Electron Microscopy: *Khalid Hattar*[1]; [1]Sandia National Laboratories

Additive Manufacturing of Metals: Complex Microstructures and Architecture Design — Microstructure Evolution in Structural Metals

Program Organizers: Yu Zou, University of Toronto; Hang Yu, Virginia Polytechnic Institute and State University

Wednesday PM November 4, 2020

2:00 PM Invited
Laser Powder Bed Fusion of Single-crystalline-like Stainless Steel 316L; From Samples to Parts: Xianglong Wang[1]; Jose Alberto Muniz Lerma[1]; Oscar Sanchez Mata[1]; Mohammad Attarian Shandiz[1]; *Mathieu Brochu*[1]; [1]McGill University

2:30 PM
Additive Manufacturing of Pure Magnesium: *Bandar AlMangour*; [1]

2:50 PM
Fabrication of High Temperature High Strength Austenitic Steels by Laser Powder-bed Fusion: *Sebastien Dryepondt*[1]; Peeyush Nandwana[1]; Kinga Unocic[1]; Patxi Fernandez-Zelaia[1]; Ying Yang[1]; Yousub Lee[1]; Fred List[1]; [1]Oak Ridge National Laboratory

3:10 PM
The Structure of Cellular Features in Additively Manufactured 316L: *Richard Fonda*[1]; Joseph Aroh[2]; Jerry Feng[1]; David Rowenhorst[1]; [1]Naval Research Laboratory; [2]Carnegie Mellon University

3:30 PM
Secondary Orientation Preference of Ni-based Superalloy Single Crystals Produced via Electron Beam Melting: *Patxi Fernandez-Zelai*[1]; Michael Kirka[1]; Yousub Lee[1]; Andres Marquez Rossy[1]; Sebastien Dryepondt[1]; [1]Oak Ridge National Laboratory

Additive Manufacturing: Alloy Design to Develop New Feedstock Materials — Session II

Program Organizers: Joseph McKeown, Lawrence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Manyalibo Matthews, Lawrence Livermore National Laboratory; Christian Leinenbach, Empa, Swiss Federal Laboratories for Materials Science and Technology; Peter Hosemann, University of California

Wednesday PM November 4, 2020

2:00 PM
3D Characterization of Cracks Formed in "Weldable" AA6061 and Implications for Alloy Design: *Giuseppe Del Guercio*[1]; Graham McCartney[1]; Nesma Aboulkhair[1]; Chris Tuck[1]; Marco Simonelli[1]; [1]University of Nottingham

2:20 PM
Mechanical Alloying of Feedstock Powder for Additive Manufacturing by Selective Laser Melting: Aluminum Alloy Matrix Composites: *Ethan Parsons*[1]; [1]MIT Lincoln Laboratory

2:40 PM Invited
An Interdisciplinary Approach for Alloy Design for Additive Manufacturing: *Raymundo Arroyave*[1]; [1]Texas A&M University

3:10 PM
CALPHAD Informed Design of Rare-earth Containing Alloys for Additive Manufacturing: *Emily Moore*[1]; [1]Lawrence Livermore National Laboratory

3:30 PM
Development of Oxidation Resistant Multi-Principle Element Alloys Applied with Additive Manufacturing: *Jose Loli*[1]; Yining He[1]; Amish Chovatiya[1]; Zachary Ulissi[1]; Bryan Webler[1]; Jack Beuth[1]; Maarten De Boer[1]; [1]Carnegie Mellon University

Additive Manufacturing: Materials, Alloy Development, Microstructure and Properties — Additive Manufacturing of Fe-based Alloys

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University Of Technology; Zhi Wang, South China University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science; Filippo Berto, Norwegian University of Science and Technology

Wednesday PM November 4, 2020

2:00 PM Invited
Structural Characterization of Wire and Arc Additive Manufactured (WAAM) Austenitic Stainless Steel: *Sudhakar Vadiraja*[1]; Ryan Foley[1]; [1]Montana Technological University

2:20 PM
Investigating the Mechanical, Microstructural, Corrosion and Impact Performances of a New Steel Composition, Produced by Tandem WAAM Mixing of Steel Wires: *Osahon Ehigiator*[1]; Supriyo Ganguly[1]; [1]Cranfield University

2:40 PM
3D Characterization of Intrinsic Defects in Water- and Gas- Atomized 17-4 PH Stainless Steel Powder Precursors for Additive Manufacturing: *Veeraraghavan Sundar*[1]; Rachel Reed[1]; [1]UES Inc.

3:00 PM
Effect of Atomization and Processing Gas on Microstructures in Additively Manufactured 17-4PH Stainless Steel: *Alexis Ernst*[1]; Rainer Hebert[1]; Mark Aindow[1]; [1]University of Connecticut

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Materials — Modeling and Properties

Program Organizers: Ulf Ackelid, Freemelt AB; Ola Harrysson, North Carolina State University; Peeyush Nandwana, Oak Ridge National Laboratory; Rongpei Shi, Lawrence Livermore National Laboratory; Yufeng Zheng, University of Nevada, Reno

Wednesday PM November 4, 2020

2:00 PM Invited
Predicting Properties in Additively Manufactured Titanium Alloys: Sunil Dhapola[1]; Andrew Temple[1]; Thomas Ales[1]; *Peter Collins*[1]; [1]Iowa State University

2:30 PM
Microstructural Modeling of ß to a Transformation Morphologies in Multi-layered Laser Wire Additively Manufactured Ti-6Al-4V Parts: *Andrew (Drew) Huck*[1]; Amit Verma[1]; Anthony Rollett[1]; Brandon Abranovich[1]; Elizabeth Chang-Davidson[1]; Ali Guzel[1]; Jack Beuth[1]; Zhening Yang[1]; Ze Geng[1]; Lonnie Smith[1]; Amaranth Karra[1]; [1]Carnegie Mellon University

2:50 PM
Dynamic Transformations In AM Ti6Al4V Alloy: *Sabina Kumar*[1]; Rakesh Kamath[2]; Yan Chen[3]; Peeyush Nandwana[3]; Suresh Babu[1]; [1]University of Tennessee; [2]University Of Tennessee; [3]Oak Ridge National Laboratory

3:10 PM
Fracture of additively manufactured Ti-6Al-4V under multiaxial loading: experiments and modeling: *Alexander Wilson-Heid*[1]; Allison Beese[1]; [1]Pennsylvania State University

3:30 PM
Influence of Different Post-printing Treatments on the In Vitro Biocompatibility of 3D Generated Titanium Plates: Jakob Schneider[1]; *Elena Lopez*[1]; Frank Brueckner[1]; Christoph Leyens[1]; Ute Botzenhart[1]; Bernhard Weiland[1]; Kiriaki Katerina Papadopoulos[1]; Andreas Schroeder[1]; [1]Fraunhofer IWS

3:50 PM
Measuring texture at large scales using spatially resolved acoustic spectroscopy: Thomas Ales[1]; *Peter Collins*[1]; [1]Iowa State University

4:10 PM
Understanding Microstructure and Mechanical Property Variations in Lase-based Powder Bed Fusion of Ti-6Al-4V and their Heat Treatment Design: *Ebrahim Asadi*[1]; Behzad Fotovvati[1]; Seyed Alireza Etesami[1]; [1]University of Memphis

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments — Materials Mechanics & Environmental Degradation

Program Organizers: Samuel Briggs, Oregon State University; Christopher Barr, Sandia National Laboratories; Emily Aradi, University of Huddersfield; Michael Short, Massachusetts Institute of Technology; Janelle Wharry, Purdue University; Cheng Sun, Idaho National Laboratory; Dong Liu, University of Oxford; Khalid Hattar, Sandia National Laboratories

Wednesday PM November 4, 2020

2:00 PM Invited
Explaining the Corrosion Morphology of Structural Materials in Molten Fluoride Salts With/Without Radiation: *Weiyue Zhou*[1]; Yang Yang[2]; Miaomiao Jin[3]; Lingfeng He[3]; Andrew Minor[2]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Lawrence Berkeley National Laboratory; [3]Idaho National Laboratory

2:40 PM
Enabling In-situ Crack Growth Testing and Monitoring in VTR Cartridge Loop Environments: *Samuel Briggs*[1]; Peter Beck[1]; Dustin Mangus[1]; Jake Quincey[1]; Andrew Brittan[1]; George Young[2]; Guillaume Mignot[1]; Julie Tucker[1]; [1]Oregon State University; [2]Kairos Power

3:00 PM
Unveiling High Temperature Damage Mechanisms via In-situ Digital Image Correlation of Chromium-coated Zirconium-based Fuel Claddings: *David Roache*[1]; Alex Jarama[1]; Clifton Bumgardner[1]; Frederick Heim[1]; Morgan Price[1]; Xiaodong Li[1]; [1]University of Virginia

3:20 PM
Development of an In-Situ Mechanical Test System for Advanced Reactor Coolants: *Jake Quincey*[1]; Peter Beck[1]; Josef Parrington[2]; Lars Parrington[2]; Christopher Lamb[2]; Henry Korellis[3]; Pit Schulze[3]; Alan Kruizenga[3]; Micah Hackett[3]; George Young[3]; Julie Tucker[1]; Samuel Briggs[1]; [1]Oregon State University; [2]Parrington Instruments; [3]Kairos Power

3:40 PM
Corrosion Control of Austenitic Stainless Steel and Nickel-Based Alloys in Molten Chloride Salt Environments: *Kasey Hanson*[1]; Krishna Moorthi Sankar[1]; Remi Dingreville[2]; Joshua Sugar[2]; Chaitanya Deo[1]; Preet Singh[1]; [1]Georgia Institute of Technology; [2]Sandia National Laboratories

4:00 PM
Design of a Hot Hydrogen Test Loop for Testing of Nuclear Thermal Rocket Elements: *William Searight*[1]; Alex Somers[1]; Leigh Winfrey[1]; [1]The Pennsylvania State University

4:20 PM
Development of a Combined Thermal Hydraulic and Materials Corrosion Liquid-Sodium Experimental Facility: *Dustin Mangus*[1]; Juwan Johnson[1]; Brett Leitherer[1]; Peter Beck[1]; Seth Walton[1]; Guillaume Mignot[1]; Wade Marcum[1]; Julie Tucker[1]; Samuel Briggs[1]; [1]Oregon State University

Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials — Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials II

Program Organizers: Mohammad Elahinia, University of Toledo; Haluk Karaca, University of Kentucky; Reginald Hamilton, Pennsylvania State University; Mohammad Mahtabi, University Of Tennessee - Chattanooga; Narges Shayesteh Moghaddam, University of Texas at Arlington; Reza Rizvi, University of Toledo; Markus Chmielus, University of Pittsburgh; Hamdy Ibrahim, University of Tennessee at Chattanooga; Mohammadreza Nematollahi, University of Toledo

Wednesday PM November 4, 2020

2:00 PM
Characterization of n-type Bismuth Telluride Processed via Selective Laser Melting: *Ryan Welch*[1]; Haidong Zhang[1]; Saniya LeBlanc[1]; [1]George Washington University

2:20 PM
Strand Casting and Thermal Properties of Submillimeter Metallic Glass Wires: *Ayodele Olofinjana*[1]; James Kern[2]; [1]University of the Sunshine Coast; [2]The Welding Institute

2:40 PM
Defect Recognition on Coating Layer Using PinPoint Nanomechanical Mode in Atomic Force Microscopy: *Gil Min*[1]; Gabriela Mendoza[1]; Cathy Lee[1]; Moses Lee[1]; Jake Kim[1]; Keibock Lee[1]; [1]Park Systems

Advanced Steel Metallurgy — Miscellaneous

Program Organizers: Chirag Mahimkar, Big River Steel; Justin Raines, SSAB Americas; Kip Findley, Colorado School of Mines; Alla Sergueeva, NanoSteel Company Inc; Daniel Branagan, The NanoSteel Co

Wednesday PM November 4, 2020

2:00 PM
Digital Innovative Design (DID) for Reliable Casting Performance of Steel Castings: *Maria Diana David*[1]; David Poweleit[1]; Raymond Monroe[1]; [1]Steel Founders' Society of America

2:20 PM
Strain Aging Embrittlement of Structural Steel: *Morimichi Kimura*[1]; Kazutoshi Ichikawa[1]; Tomohiko Omura[1]; Masaki Mizoguchi[2]; [1]Tohoku University; [2]Nippon Steel Corporation

2:40 PM
Double-Twist Torsion Testing to Assess Partial Recrystallization in Microalloyed Steels: *Trevor Ballard*[1]; John Speer[1]; Kip Findley[1]; Emmanuel De Moor[1]; [1]Advanced Steel Processing and Products Research Center, Colorado School of Mines

3:00 PM
Effect of Coiling and Annealing Temperature on Nb precipitation, Microstructure and Mechanical Properties of HSLA: *Lei Cui*[1]; Wenjun Wang[2]; Deshun Chen[1]; Yonggang Liu[1]; [1]Ma Steel; [2]Citic Metal Co., Ltd

3:20 PM
Silicide Strengthened Ferritic Alloy - A New Method of Wear Protection in Nuclear Environments: *Rahul Unnikrishnan*[1]; David Bowden[2]; Michael Preuss[1]; [1]The University of Manchester; [2]UK Atomic Energy Authority

3:40 PM
Triple Nano-precipitate Strengthened Austenitic Steel: *Colin Stewart*[1]; Richard Fonda[2]; Keith Knipling[2]; [1]National Research Council Associate at the U.S. Naval Research Laboratory; [2]U.S. Naval Research Laboratory

Advances in Dielectric Materials and Electronic Devices — Dielectrics and Piezoelectrics: Session II Modeling and Applications

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

Wednesday PM November 4, 2020

2:00 PM Invited
Integrating Material Fabrication, Characterization and Modeling to Maximize ROI: *Steven Tidrow*[1]; [1]Alfred University

2:40 PM
Dielectric Capacitance for Chemical and Biological Sensing: *Ian Emge*[1]; Charmain Su[1]; Fow-Sen Choa[1]; Bradley Arnold[1]; Lisa Kelly[1]; Manish Verma[1]; Kamdeo Mandal[1]; Himagowri Prasad[1]; Narsingh Singh[1]; [1]University of Maryland, Baltimore County

3:00 PM
Identifying Dielectric Breakdown Micromechanisms in Solid Oxides with In Situ TEM: *Xinchun Tian*[1]; Xiaoli Tan[1]; Geoff Brennecka[2]; Gabriel Caruntu[3]; [1]Iowa State University; [2]Colorado School of Mines; [3]Central Michigan University

3:20 PM Invited
Correlative Models of Some Structural Aspects of Perovskites: Evan Smith[1]; Kevin Tolman[2]; Sreco Škapin[3]; *Rick Ubic*[1]; [1]Boise State University; [2]Idaho National Laboratory; [3]Jožef Stefan Institute

4:00 PM Invited
Investigation of Intergranular Dielectric Properties within the Relation between Fractal, Graph and Neural Networks Theories: *Vojislav Mitic*[1]; Goran Lazovic[2]; Chun-An Lu[3]; Ivana Radovic[4]; Vesna Paunovic[5]; Aleksandar Stajcic[2]; Branislav Randjelovic[6]; Srdjan Ribar[2]; Branislav Vlahovic[7]; [1]University of Nis; University of Belgrade; [2]University of Belgrade; [3]Industrial Technology Research Institute; [4]University of Belgrade; VINCA" Institute of Nuclear Sciences - National Institute of the Republic of Serbia; [5]University of Nis; [6]University of Nis; University of K. Mitrovica; [7]North Carolina Central University

4:40 PM
Determining Complex Dielectric Properties from Coaxial Transmission Line Data Using a Machine Learning Approach: *Robert Tempke*[1]; Liam Thomas[1]; Christina Wildfire[2]; Dushyant Shekhawat[2]; Terence Musho[1]; [1]West Virginia University; [2]National Energy Technology Laboratory - US Department of Energy

Advances in Surface Engineering — Session I

Program Organizers: Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology Inc; Michael Roach, University of Mississippi Medical Center; Tushar Borkar, Cleveland State University; Sandip Harimkar, Oklahoma State University; Rajeev Gupta, North Carolina State University

Wednesday PM November 4, 2020

2:00 PM
Effect of Surface Finish on the Corrosion Properties of Additively Manufactured Stainless Steel: *Jamie Stull*[1]; Courtney Clark[1]; Timothy Gorey[1]; Don Johnson[1]; Randy Edwards[1]; Enkeleda Dervishi[1]; Daniel hooks[1]; [1]Los Alamos National Laboratory

2:20 PM
Performance Analysis of Biomimetic Ionic Polymer-metal Composite (IPMC) Thin-Film Actuators: *Allison Arnold*[1]; Kavin Sivaneri Varadharajan Idhaiam[1]; Lisa Hilgar[1]; Edward Sabolsky[1]; Ji Su[2]; [1]West Virginia University; [2]NASA Langley Research Center

2:40 PM
Nucleation, Growth, and Grain Structure Control of Electrodeposited Graded Density Alloys: *Michael McBride*[1]; Donald Johnson[1]; Jamie Stull[1]; Enkeleda Dervishi[1]; Randall Edwards[1]; Daniel Hooks[1]; [1]Los Alamos National Laboratory

3:10 PM
Reversible Electrochemical Mirror Devices Using Space Compliant Ionic Liquid Electrolytes: *Holly Garich*[1]; Danny Liu[1]; James Davis[2]; Morgan Tench[3]; Thomas Peng[4]; Jennings Taylor[1]; Timothy Hall[1]; Maria Inman[1]; [1]Faraday Technology Inc; [2]University of South Alabama; [3]Tench Technology; [4]AFRL

3:30 PM
Electroplating Powder for Cold Spray Applications: *Gwendolyn Bracker*[1]; Elizabeth Hodges[1]; Madeline Scott[1]; Victor Champagne[2]; Robert Hyers[1]; [1]University of Massachusetts; [2]Cold Spray Innovations International

3:50 PM
Non-Linear Through-Hole Fabrication by Electrochemical Machining: Danny Liu[1]; *Brian Skinn*[1]; Andrew Moran[1]; Stephen Snyder[1]; Mike Horonzy[2]; Timothy Hall[1]; [1]Faraday Technology, Inc.; [2]Republic Anode Fabricators

4:10 PM
Application of Artificial Neural Network and Statistical Modeling to Study Water Contact Angle of Ductile Iron: Iron-graphite Composite: *Amir Kordijazi*[1]; Hathibelagal Roshan[1]; Pradeep Rohatgi[1]; [1]University of Wisconsin Milwaukee

Advances in Synthesis and Integration Methods for Enhanced Properties, and Applications in Emerging Nanomaterials — Functional Materials and Nanocomposites

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jung-Kun Lee, University of Pittsburgh; Zubaer Hossain, University of Delaware

Wednesday PM November 4, 2020

2:00 PM Invited
Laser Processing of Soft Magnetic Amorphous and Nanocrystalline Alloys: *Paul Ohodnicki*[1]; Ahmed Talaat[1]; Jorg Wiezorek[1]; [1]University of Pittsburgh

2:30 PM Invited
Multi-functional Surfaces: *Paul Leu*[1]; Sajad Haghanifar[1]; Anthony Galante[1]; [1]University of Pittsburgh

3:00 PM
Low-reflectivity Carbon Nanotube Coatings for Space Applications: *Dan Wang*[1]; Peter Fuqua[2]; Amber Hennessy[2]; Alan Hopkins[2]; Timothy Hall[1]; Stephen Snyder[1]; Maria Inman[1]; Jennings Taylor[1]; [1]Faraday Technology Inc; [2]The Aerospace Corporation

3:20 PM
Investigating the Micro-structure and Transport Mechanisms in Graphene Copper Composites: *Raju Ghimire*[1]; Mehran Tehrani[1]; [1]The University of Texas at Austin; University of New Mexico

3:40 PM
Electrical Properties of Transition Metal Chloride Intercalated Carbon-based Materials: *Pouria Khanbolouki*[1]; Mehran Tehrani[1]; [1]The University of Texas at Austin

AI for Big Data Problems in Imaging, Modeling and Synthesis — AI-enabled Materials Characterization

Program Organizers: Mathew Cherukara, Argonne National Laboratory; Badri Narayanan, University of Louisville; Subramanian Sankaranarayanan, University of Illinois (Chicago)

Wednesday PM November 4, 2020

2:00 PM
Image Characterization of Self-assembled Photonic Crystals and Glasses Using Machine Learning: *Bo Lei*[1]; Yen Häntsch[2]; Gerold Schneider[2]; Kaline Furlan[2]; Elizabeth Holm[1]; [1]Carnegie Mellon University; [2]Hamburg University of Technology

2:20 PM
A Hybrid EBSD Indexing Method Powered by Convolutional Neural Network (CNN) and Dictionary Indexing (DI): *Zihao Ding*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

2:40 PM
The Composition-microstructure-property Relationship by Machine Learning: *Zongrui Pei*[1]; Michael Gao[1]; Kyle Rozman[1]; Tao Liu[1]; David Alman[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

3:00 PM
Instance Segmentation for Autonomous Detection of Individual Powder Particles and Satellites in an Additive Manufacturing Feedstock Powder: *Ryan Cohn*[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

Art and Cultural Heritage: Discoveries and Education — Art and Cultural Heritage: Discoveries and Education

Program Organizers: Glenn Gates, Walters Art Museum; Marie Jackson, University of Utah

Wednesday PM November 4, 2020

2:00 PM
Introductory Comments: Art and Cultural Heritage: *Glenn Gates*[1]; [1]Walters Art Museum

2:05 PM Invited
ACerS-AACS Shepard Award: Small Steps, Occasional Leaps, Significant Backslides: Ceramic Compositional Analysis in an Americanist Archaeological Perspective: *Ronald Bishop*[1]; [1]Smithsonian Institution; NIST National Center for Neutron Research

2:45 PM
Adsorption on Kaolinite Surfaces: A Density Functional Theory (DFT) Approach to Quantifying Interactions Between a Clay Mineral and Small Molecules: *Jessica Heimann*[1]; Joseph Bennett[1]; Zeev Rosenzweig[1]; [1]University of Maryland, Baltimore County

3:25 PM
An Unusual Green Pigment in a Korean Temple Banner: *Christina Bisulca*[1]; Christopher Foster[1]; Katherine Kasdorf[1]; Zhongrui (Jerry) Li[2]; [1]Detroit Institute of Arts; [2]University of Michigan

4:05 PM
Naturally Altered Glass: Methods and Challenges of Modeling Long-term Glass Alteration Environments: *Jamie Weaver*[1]; [1]National Institute of Standards and Technology

4:45 PM
Compositional and Structural Analysis of Early Chinese Currencies: Michael Wall[1]; Joseph McCool[1]; Caroline White[1]; Yuheng Wang[1]; *Marcus Young*[1]; [1]University of North Texas

5:25 PM
Cementitious Systems in Roman Reactive Glass Marine Concretes: *Marie Jackson*[1]; Cory Trivelpiece[2]; Nanfei Cheng[1]; Barbara Nash[1]; Nobumichi Tamura[3]; [1]University of Utah; [2]Savannah River National Laboratory; [3]Advanced Light Source

Ceramic and Crystal Materials for Optics and Photonics — Session II

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory; Xiang Hua Zhang, University of Rennes - and - Materials Science Department, University of Arizona; Michael Squillante, Radiation Monitoring Devices Inc; Long Zhang, Shanghai Institute of Optical and Fine Mechanics, Chinese Academy of Science; Takunori Taira, National Institutes of Natural Science

Wednesday PM November 4, 2020

2:00 PM Invited
Giant Micro-photonics toward Table-top XFEL: *Takunori Taira*[1]; [1]RIKEN SPring-8 / IMS

2:40 PM Invited
Microstructural Evolution and Cantilever Bending of AlON Transparent Ceramics: *Ying Shi*[1]; [1]Shanghai University

Coatings to Protect Materials from Extreme Environments — Environmental and Thermal Barrier Coatings II/Aerosol Deposition

Program Organizers: Kang Lee, NASA Glenn Research Center; Yutaka Kagawa, High Performance Materials; Daniel Mumm, University of California, Irvine; Rodney Trice, Purdue University; Emmanuel Boakye, UES Inc.; Valerie Wiesner, NASA Langley Research Center; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Jun Song, McGill University; Christian Moreau, Concordia University; Stephen Yue, McGill University

Wednesday PM November 4, 2020

2:00 PM
Growth Behaviour of TGO Alumina and Silica in Thermal Barrier and Environmental Barrier Coatings: *Kuiying Chen*[1]; [1]NRC

2:20 PM
Integrated Fluid and Materials Modeling of Environmental Barrier Coatings: *David Newsome*[1]; Rae Waxman[1]; Andreas Hoffie[1]; Ashok Raman[1]; Debasis Sengupta[1]; Stewart Silling[2]; [1]CFD Research Corporation; [2]Sandia National Laboratory

2:40 PM
Aerosol Deposition and Characterization of Sodium Niobate: *Eric Patterson*[1]; Scooter Johnson[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory

3:00 PM
Aerosol Deposition Method: Influence of Particle Agglomeration on SiC Film Density: *Derek Davies*[1]; Michael Gammage[2]; Michael Becker[1]; John Keto[1]; Desiderio Kovar[1]; [1]University of Texas at Austin; [2]CCDC DEVCOM Army Research Laboratory

3:20 PM
Dry Aerosol Deposition of SiO_x Coatings for Protection of Polymers in Low Earth Orbit: *Robert Calvo*[1]; Paul Fuierer[1]; [1]Department of Materials Engineering, New Mexico Institute of Mining and Technology

Emergent Materials under Extremes and Decisive In Situ Characterizations — Decisive In-situ Characterizations

Program Organizers: Xiaofeng Guo, Washington State University; Xujie Lu, Center for High Pressure Science & Technology Advanced Research; Hua Zhou, Argonne National Laboratory; Judith Driscoll, University of Cambridge; Hongwu Xu, Los Alamos National Laboratory

Wednesday PM November 4, 2020

2:00 PM Invited
Technology Development of In-situ Corrosion Kinetics and Salt Property Measurements: *Li Liu*[1]; Jinghua Feng[1]; Kemal Ramic[1]; [1]Rensselaer Poletechnic Institute

2:30 PM Invited
Characterizing Disordered Crystalline Materials with Pauling's Rules: *Eric O'Quinn*[1]; Kurt Sickafus[1]; Rodney Ewing[2]; Gianguido Baldinozzi[3]; Joerg Neuefeind[4]; Matthew Tucker[4]; Antonio Fuentes[5]; Devon Drey[1]; Maik Lang[1]; [1]University of Tennessee; [2]Stanford University; [3]Université Paris-Saclay; [4]Oak Ridge National Laboratory; [5]Cinvestav Unidad Saltillo

3:00 PM Invited
Investigations of Materials under Extreme Hydrothermal Conditions Using Synchrotron and Complementary Techniques: *Robert Mayanovic*[1]; Diwash Dhakal[1]; Nadib Akram[1]; Jason Baker[2]; Xiaofeng Guo[3]; Hakim Boukhalfa[2]; Artas Migdissov[2]; Cheng-Jun Sun[4]; Hongwu Xu[2]; [1]Missouri State University; [2]Los Alamos National Laboratory; [3]Washington State University; [4]Argonne National Laboratory

3:30 PM
High-speed X-ray Phase Contrast Imaging Analysis of Microscale Shock Response of a Mock Additively Manufactured Energetic Material: *Karla Wagner*[1]; Amirreza Keyhani[1]; Andrew Boddorff[1]; Gregory Kennedy[1]; Didier Montaigne[2]; Matthew Beason[3]; Brian Jensen[3]; Min Zhou[1]; Naresh Thadhani[1]; [1]Georgia Institute of Technology; [2]Eglin Air Force Research Lab; [3]Los Alamos National Lab

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Interface Anisotropy and Interfaces in Ferroelectric/Functional Oxides

Program Organizers: Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of Illinois at Urbana-Champaign; Wolfgang Rheinheimer, Purdue University; Ming Tang, Rice University; Melissa Santala, Oregon State University

Wednesday PM November 4, 2020

2:00 PM
Anisotropy at Interfaces in Rare-earth Pyrosilicates for High-temperature Coatings: *Hadas Sternlicht*[1]; Nitin Padture[1]; [1]Brown University

2:20 PM Invited
Implications of Ferroelectricity in Perovskite Solar Cells: *Holger Roehm*[1]; Tobias Leonhard[1]; Michael Hoffmann[1]; Alexander Colsmann[1]; [1]Karlsruhe Institute of Technology

2:50 PM
Effect of Electrode Composition and Potential on Moisture Incorporation and Degradation in Dielectrics and Piezoelectrics: *John McGarrahan*[1]; Elizabeth Dickey[1]; [1]North Carolina State University

3:10 PM Invited
Advanced TEM of Interfaces and Defects in Functional Ceramics: *Joachim Mayer*[1]; [1]RWTH Aachen University

3:40 PM
Phase Stability of $Sr_{1-x}Ba_xMnO_3$ (0 \8804 x \8804 0.5) Films Using Combinatorial Substrate Epitaxy: *Catherine Zhou*[1]; Paul Salvador[1]; Gregory Rohrer[1]; Marc De Graef[1]; [1]Carnegie Mellon University

High Entropy Materials: Concentrated Solid Solution, Intermetallics, Ceramics, Functional Materials and Beyond — Processing and Properties

Program Organizers: Xingbo Liu, West Virginia University; Michael Gao, National Energy Technology Laboratory; Peter Liaw, University of Tennessee; Jian Luo, University of California, San Diego; Yiquan Wu, Alfred University; Yu Zhong, Worcester Polytechnic Institute

Wednesday PM November 4, 2020

2:00 PM Invited
Highly Tunable Mechanical and Magnetic Properties in an Al0.3CoFeNi Complex Concentrated Alloy: *Sriswaroop Dasari*[1]; Varun Chaudhary[2]; Bharat Gwalani[1]; Abhinav Jagetia[1]; Vishal Soni[1]; Stephane Gorsse[3]; Raju Ramanujan[2]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]Nanyang Technological University, Singapore; [3]University of Bordeaux, France

2:20 PM
Corrosion Resistant Property Improvement of CoCrFeNiMoTi-based High Entropy Alloy by Optimizing Composition: *Tatsuya Kimura*[1]; Hiroshi Shiratori[1]; Kazuya Shinagawa[1]; Kosuke Kuwabara[2]; Yuzo Daigo[2]; [1]HITACHI; [2]Hitachi Metals

2:40 PM Invited
Effect of Interstitial Nitrogen on the Phase Stability, Strengthening, Mechanical Behavior in TRIP-assisted High-entropy Alloys: *Kenta Yamanaka*[1]; Manami Mori[2]; Yusuke Onuki[3]; Shigeo Sato[3]; Akihiko Chiba[1]; [1]Tohoku University; [2]National Institute of Technology, Sendai College; [3]Ibaraki University

3:00 PM
Effect of Milling Parameters on Microstructure and Mechanical Properties of Mechanically Alloyed, Refractory High Entropy Alloy: *Joshua Smeltzer*[1]; Christopher Marvel[1]; B. Hornbuckle[2]; Anit Giri[2]; Kristopher Darling[2]; Martin Harmer[1]; [1]Lehigh University; [2]U.S. Army Research Laboratory

3:20 PM Invited
Thermal Stability of Refractory High Entropy Alloys at Intermediate Temperatures: *Ke Jin*[1]; Nannan Jia[1]; Yunfei Xue[1]; [1]Beijing Institute of Technology

3:40 PM
ζ-Factor Microanalysis, a Quantitative Chemical Analysis Technique for the Characterization of High Entropy Alloys: Christopher Marvel[1]; *Joshua Smeltzer*[1]; Anit Giri[2]; B. Hornbuckle[2]; Kristopher Darling[2]; Martin Harmer[1]; [1]Lehigh University; [2]U.S. Army Research Lab

Journal of the American Ceramic Society Awards Symposium — Session II

Program Organizer: William Fahrenholtz, Missouri University of Science and Technology

Wednesday PM November 4, 2020

2:00 PM
Thermochemical Investigation of Lithium Borate Glasses and Crystals: *Alexandra Navrotsky*[1]; Lili Wu[2]; Anastasia Koryttseva[2]; Christoph Grob[3]; [1]Arisona State University; [2]University of California, Davis; [3]Schott AG

2:30 PM
Effect of CaF_2, B_2O_3 and the CaO/SiO_2 Mass Ratio on the Viscosity and Structure of B_2O_3–Containing Calcium–silicate–based Melts: Gihyun Kim[1]; *Il Sohn*[2]; [1]The University of Tokyo; [2]Yonsei University

3:00 PM
Glass-ceramics as Potential Waste Forms for Actinide Immobilization: *Yingjie Zhang*[1]; Tao Wei[1]; Zhaoming Zhang[1]; Linggen Kong[1]; Pranesh Dayal[1]; Daniel Gregg[1]; [1]ANSTO

3:30 PM
Substitutional Effect of Na_2O with K_2O on the Viscosity and Structure of CaO-SiO_2-CaF_2-based Mold Flux Systems: *MinSeok Seo*[1]; Il Shon[1]; [1]Yonsei University

4:00 PM
Advances in Polymer-assisted Sol-gel Synthesis of Aluminosilicate Precursors for Modern Cementitious Materials: *Juan Pablo Gevaudan*[1]; Jaqueline Wallat[2]; Bimala Lama[2]; Wil V. Srubar[2]; [1]Pennsylvania State University; [2]University of Colorado at Boulder

Manufacturing and Processing of Advanced Ceramic Materials — Processing of Oxide Ceramics

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Mike Alexander, Allied Mineral Products, Inc.; Eric Faierson, Quad City Manufacturing Laboratory - Western Illinois University; James Hemrick, Reno Refractories Inc.; Keith DeCarlo, Blasch Precision Ceramics

Wednesday PM November 4, 2020

2:00 PM Invited
Investigating the Dependence of Microstructure Evolution in Alumina on the Liquid Phase Chemistry in the CaO-Al_2O_3-SiO_2 System: Densification, Grain Growth and Secondary Phase Formation: *Sarah Whipkey*[1]; William Carty[1]; [1]Alfred University

2:40 PM Invited
Opportunities for Tailored Grain Boundary Networks in Thermomagnetically Processed Alumina Ceramics: *Amanda Krause*[1]; Bryan Conry[1]; Michael Kesler[2]; [1]University of Florida; [2]Oak Ridge National Laboratory

3:20 PM
Self-bonded Refractories for Investment Casting Mold Manufacture: *David Price*[1]; [1]IC Ceramic Consulting, LLC

3:40 PM Invited
Fabricating alumina with heterogeneous microstructure using integrated additive/subtractive manufacturing (IASM): Xiao Geng[1]; Jincheng Lei[1]; Shenglong Mu[1]; Hai Xiao[1]; Jianhua Tong[1]; Rajendra Bordia[1]; *Fei Peng*[1]; [1]Clemson University

4:20 PM
Optimized Etching of Porcelain and Polycrystalline Alumina with a Glass Phase: *Sarah Whipkey*[1]; Max Modugno[1]; Hyojin Lee[1]; William Carty[1]; [1]Alfred University

Metallurgy and Magnetism — Metallurgy and Magnetism I

Program Organizers: Nicholas Jones, Naval Surface Warfare Center, Carderock Division; Paul Lambert, Naval Surface Warfare Center, Carderock Division

Wednesday PM November 4, 2020

2:00 PM
Introductory Comments: Metallurgy and Magnetism: *Nicholas Jones*[1]; [1]Naval Surface Warfare Center, Carderock Division

2:05 PM
Processing of Fe-Co Alloys: Past and Present: *Zafer Turgut*[1]; Alex Leary[2]; John Horwath[1]; Gregory Kozlowski[3]; [1]AFRL/RQQM; [2]NASA Glenn Research Center; [3]Wright State University

2:25 PM
The Effect of Deformation of Low Alloy Steels Used in Metallurgy on Their Magnetic Characteristics: *Borys Sereda*[1]; Dmytro Sereda[1]; Vitalyy Volokh[1]; Vladimir Sukhomlyn[1]; [1]Dneprovsky State Technical University

2:45 PM
Microstructural Development and Mechanical Property Changes Due to Temper Embrittlement in HY-80 Submarine Steel: *Charles D'Ambra*[1]; Jason Schibler[1]; Michele Manuel[1]; Thomas Krause[2]; Aroba Saleem[1]; [1]University of Florida, Department of Materials Science and Engineering; [2]Royal Military College of Canada

3:05 PM
Effects of Steel Sensitization on Magnetic Properties Measured through MOKE Magnetometry: *Nicholas Jones*[1]; Olaf van 't Erve[2]; Emily Guzas[3]; Matthew Roberts[1]; [1]Naval Surface Warfare Center, Carderock Division; [2]Naval Research Laboratory; [3]Naval Undersea Warfare Center, Division Newport

3:25 PM
Modeling the Magnetostructural Interactions in Austenitic Steels at the Quantum Mechanical Level: Michelle Johannes[1]; Noam Bernstein[1]; *Edwin Antillon*[1]; [1]Naval Research Laboratory

3:45 PM
Processing of Vitreous Fe-based Wires into Nanostructured Soft Magnetic Material: *Ayodele Olofinjana*[1]; James Kern[2]; Nyok Voo[3]; [1]University of the Sunshine Coast; [2]The Welding Institute; [3]Universiti Brunei Darussalam

4:05 PM
Rapid Thermal Processing of Amorphous and Nanocrystalline Soft Magnetic Alloys: *Paul Ohodnicki*[1]; Ahmed Talaat[1]; David Greve[2]; [1]University of Pittsburgh; [2]DWGreve Consulting

MS&T Student Events — MA Speaking Contest Semi-finals

Wednesday PM November 4, 2020

1:00 PM
The Failure Behind the Chaos: *Gladys Duran*[1]; Monserrat Lopez-Cornejo[1]; [1]Instituto Tecnologico de Morelia

1:10 PM
Tiny Scale, Remarkable Effect: *Shuyi Liu*[1]; Fei Chen[1]; [1]Wuhan University of Technology

1:20 PM
Dissipative Assembly of Nanoparticles for Reconfigurable Optical Materials and Sensing Systems: *Justin Hughes*[1]; Isabel Lloyd[1]; [1]University of Maryland, College Park

1:30 PM
Thermal Atomic Layer Deposition for Future Application in Transition Metal Dichalcogenides: *Raivat Singhania*[1]; Laura Moyer[1]; [1]Lehigh University

1:40 PM
Improving Materials for Pulp Capping Using Sodium Metasilicate Glass: *Jerry Howard*[1]; Krista Carlson[1]; [1]University of Utah

1:50 PM
The Incorporation and Adhesion of Bioactives in Layer-by-Layer (LbL) Films: *Ashleigh Abbott*[1]; Greg Hilmas[1]; [1]Missouri University of Science and Technology

Multi-material Additive Manufacturing: Processing and Heterogeneous Materials Design — AM of Functionally Graded & Dissimilar Materials

Program Organizers: Hang Yu, Virginia Polytechnic Institute and State University; Steven Boles, Hong Kong Polytechnic University; Michael Gibson, Desktop Metal; Lonnie Love, Oak Ridge National Laboratory; Leon Prentice, CSIRO Metal Industries

Wednesday PM November 4, 2020

2:00 PM
Experimental-computational Approach for The Design of Functionally Graded Materials by Additive Manufacturing: *Allison Beese*[1]; Zi-Kui Liu[1]; Brandon Bocklund[1]; Lourdes Bobbio[1]; [1]Pennsylvania State University

2:30 PM
Gradient Microstructure and Local Mechanical Properties of a γ-TiAl/[Ti]_2AlNb Dual Alloy Produced by Laser Direct Metal Deposition: Haoxiu Chen[1]; *Yu Zou*[1]; [1]University of Toronto

2:50 PM
Additive Manufacturing Design of Functionally Graded Materials: *Noah Sargent*[1]; Xin Wang[1]; Kun Li[1]; Wei Xiong[1]; [1]University of Pittsburgh

3:10 PM
Precision Forming of FGMs via Directed Energy Deposition and Alloy Development Feeder: *Kevin Luo*[1]; [1]FormAlloy

3:30 PM
Wire-arc Additive Manufacturing of Inconel 740H Superalloy – P91 Steel Bimetallic Structures: Microstructure Characterization and Post-Heat Treatment Design: *Soumya Sridar*[1]; Xin Wang[1]; Michael Klecka[2]; Wei Xiong[1]; [1]University of Pittsburgh; [2]United Technologies Research Center

Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry — Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session II

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

Wednesday PM November 4, 2020

2:00 PM Invited
Effect of CuO/MgO Ratio on the Gene Expression, Cytocompatibilty, and Antibacterial/Analgesic/ Anticancerous Drug Loading Kinetics for the Mesoporous Bioactive Glasses: *Gurbinder Kaur*[1]; [1]Simon Fraser University

2:30 PM
Multifunctional Exfoliated 2-D Oxides for Charge Storage: *Madeleine Flint*[1]; Peter Metz[1]; Robert Koch[1]; Peng Gao[1]; Alec Ladonis[1]; Scott Misture[1]; [1]Alfred University

2:50 PM
Electrochemical Reactivity of 2D Confined Metallocenes: *Michael Spencer*[1]; [1]North Carolina State University

Solid State Processing of Metals and Composites — Session I

Program Organizers: Ajay Kumar P., Indian Institute of Technology Tirupati; Pradeep Menezes, University of Nevada, Reno; Satish Kailas, Indian Institute of Science (IISc), Bangalore; N Venkaiah, Indian Institute of Technology Tirupati; Venkata Kiran Degala, Indian Institute of Technology Tirupati

Wednesday PM November 4, 2020

2:00 PM
Surface Modification of Supersonic Particle Deposited 316L Stainless Steel through Friction-Stir Processing: *Alessandro Ralls*[1]; Pradeep Menezes[1]; Prasad Kalvala[1]; Ashish Kasar[1]; Pankaj Kumar[1]; Manoranjan Misra[1]; Mohammadreza Daroonparvar[1]; [1]University of Nevada, Reno

2:20 PM
7075 Aluminum Graphene Composites Made by Shear Assisted Processing and Extrusion: *Xiao Li*[1]; Xiaolong Ma[1]; Dalong Zhang[1]; Timothy Roosendaal[1]; Angel Ortiz[1]; [1]Pacific Northwest National Laboratory

2:40 PM
Development of Spare Parts and Components for Aerospace Engineering out of Heavily Deformed Steels: Valeriy Mishchenko[1]; Anna Ben[2]; *Anton Matiukhin*[2]; Vitalii Shyrokobokov[2]; Sergey Sheyko[1]; Elena Kulabneva[2]; [1]Zaporizhzhia National University; [2]National University "Zaporizhzhia polytechnic"

3:00 PM
Evaluation of Factors of Cold Plastic Deformation Influence on the Increase of Mechanical Properties of the Shaving Steel for a Milling Cutting Tool: Valeriy Mishchenko[1]; *Anton Matiukhin*[2]; Anna Ben[2]; Vitalii Shyrokobokov[2]; Sergey Sheyko[1]; Elena Kulabneva[2]; [1]Zaporizhzhia National University; [2]"Zaporizhzhia Polytechnic" National University

3:20 PM
Solid State Joining of Dissimilar Ni-based Superalloys via Field Assisted Sintering Technology for Turbine Applications: Charis Lin[1]; *Namiko Yamamoto*[1]; Derek King[2]; Jogender Singh[1]; [1]The Pennsylvania State University; [2]UES, Inc.

Thermodynamics of Materials in Extreme Environments — Thermodynamics and Stability of Mateirals for Fuel Cells and Other Energy Applications

Program Organizers: Xiaofeng Guo, Washington State University; Kristina Lilova, Arizona State University; Kyle Brinkman, Clemson University; Alexandra Navrotsky, Arizona State University; Jake Amoroso, Savannah River National Laboratory; Xingbo Liu, West Virginia University; Gustavo Costa, NASA Glenn Research Center

Wednesday PM November 4, 2020

2:00 PM Invited
Helium Irradiation of Gd2Zr2O7 Defect-fluorite Ceramics: Interfacial Phenomena and Radiation Resistance: Zhangyi Huang[1]; Jianqi Qi[1]; Xiaofeng Guo[2]; Tiecheng Lu[1]; *Di Wu*[2]; [1]Sichuan University; [2]Washington State University

2:30 PM
Density Functional Theory Modeling on the Positive Effect of H_2O in Hydrogen Oxidation Reaction on Perovskite Anode for Solid-oxide Fuel Cells: *Yueh-Lin Lee*[1]; Qi He[2]; Tao Yang[1]; Wenyuan Li[2]; Wei Li[2]; Liang Ma[2]; Shanshan Hu[2]; Yuhua Duan[3]; Xingbo Liu[2]; Gregory Hackett[3]; [1]Leidos Research Support Team at National Energy Technology Laboratory; [2]West Virginia University; [3]National Energy Technology Laboratory

2:50 PM
Molecular Modeling of Surface Exchange Mechanisms in Solid Oxide Fuel Cell Cathodes: *Dane Morgan*[1]; Yipeng Cao[1]; [1]University of Wisconsin-Madison

3:10 PM
Ellingham Diagram to Assess Synthesis Conditions and Chemical Stability of Ceramic Membranes under Operational Conditions: *Armin Feldhoff*[1]; [1]Leibniz University Hannover

3:30 PM
Thermodynamics and Elastic Properties of Cerium Doped Yttrium Aluminum Garnets: *Vitaliy Goncharov*[1]; Nian Wei[2]; Miu Lau[3]; Albert Migliori[4]; Hongwu Xu[4]; Min Long[3]; Xiaofeng Guo[1]; [1]Washington State University; [2]Sichuan University; [3]Boise State University; [4]Los Alamos National Laboratory

Additive Manufacturing of Metals: Complex Microstructures and Architecture Design — Microstructure Characterization and Novel Materials

Program Organizers: Yu Zou, University of Toronto; Hang Yu, Virginia Polytechnic Institute and State University

Thursday AM November 5, 2020

8:00 AM Invited
Synchrotron X-ray Studies on Additive Manufacturing and Materials: *Tao Sun*[1]; [1]University of Virginia

8:30 AM
Application of Photodiode Sensor for Contour Extraction of Part Features in the Laser Powder Bed Fusion Process: *Yuri Plotnikov*[1]; Mark White[1]; Kyle Snyder[1]; Marcus Thoreson[1]; John Sions[1]; [1]CCAM

8:50 AM
Control of Nanoscale Lamellae in Bulk Al-Cu Eutectic Samples Through Laser Powder Bed Fusion: *Jonathan Skelton*[1]; James Fitz-Gerald[1]; Jerrold Floro[1]; [1]University Of Virginia

9:10 AM
Mitigating Stray Grain Nucleation during the Laser Powder Bed Fusion of Single Crystal CMSX-4: *Joseph Aroh*[1]; Amir Mostafaei[2]; Joseph Pauza[1]; Runbo Jiang[1]; Jerard Gordon[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Illinois Institute of Technology

9:30 AM
Microstructural Features and Mechanical Properties of a Newly Designed Steel Fabricated by Laser Powder Bed Fusion: Yuan Tian[1]; *Robert Palad*[2]; Clodualdo Jr. Aranas[2]; [1]Voestalpine Additive Manufacturing Ltd.; [2]University of New Brunswick

Additive Manufacturing: Alloy Design to Develop New Feedstock Materials — Session III

Program Organizers: Joseph McKeown, Lawrence Livermore National Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory; Manyalibo Matthews, Lawrence Livermore National Laboratory; Christian Leinenbach, Empa, Swiss Federal Laboratories for Materials Science and Technology; Peter Hosemann, University of California

Thursday AM November 5, 2020

8:00 AM Invited
Opportunities to Improve the Mechanical Properties of Titanium Alloys Produced by Laser Powder Bed Fusion: *Marco Simonelli*[1]; Graham McCartney[1]; Nesma Aboulkhair[1]; Yau Yau Tse[2]; Adam Clare[1]; Richard Hague[1]; [1]University of Nottingham; [2]Loughborough University

8:30 AM Invited
Microstructure and Property Variability in DED Inconel 718 as a Function of Build Rate: Bernard Gaskey[1]; Ekta Jain[1]; Yong Chen Yeoh[1]; Guido Macchi[2]; Antonio Mattia Grande[2]; *Matteo Seita*[1]; [1]Nanyang Technological University; [2]Politecnico di Milano

9:00 AM
Micro-crack Mitigation by Alloy Modification in the Additively Manufactured Ni-base Superalloy CM247LC: *Christian Leinenbach*[1]; Seth Griffiths[1]; Hossein Tabasi[2]; Toni Ivas[2]; Xavier Maeder[1]; Anthony De Luca[1]; Kai Zweiacker[1]; Rafal Wrobel[1]; Jamasp Jhabvala[2]; Roland Logé[2]; [1]Empa, Swiss Federal Laboratories for Materials Science and Technology; [2]Ecole Polytechnique Fédérale de Lausanne (EPFL)

9:20 AM
Processing of Y2O3-modified Nickel Superalloy by Selective Laser Melting.: *Anthony De Luca*[1]; Christoph Kenel[2]; David Dunand[2]; Christian Leinenbach[1]; [1]EMPA; [2]Northwestern University

9:40 AM
Development And Application of Thermodynamic Tools for AM Alloy Design: *Aurelien Perron*[1]; Bey Vrancken[1]; Nicholas Calta[1]; Tien Roehling[1]; John Roehling[1]; Thejaswi Tumkur Umanath[1]; Joel Berry[1]; Joseph McKeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

10:00 AM
Application of Taguchi, Response Surface, and Artificial Neural Networks for Rapid Optimization of Direct Metal Laser Sintering Process: *Ebrahim Asadi*[1]; Behzad Fotovvati[1]; Faridreza Attarzadeh[1]; [1]University of Memphis

Additive Manufacturing: Materials, Alloy Development, Microstructure and Properties — Additive Manufacturing of Other Miscellaneous Materials

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University Of Technology; Zhi Wang, South China University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science; Filippo Berto, Norwegian University of Science and Technology

Thursday AM November 5, 2020

8:00 AM Invited
Microstructure and Property of Additively Manufactured Nickel-based Superalloy: *Guofeng Wang*[1]; Brian Gleeson[1]; [1]University of Pittsburgh

8:20 AM
Influence of the Surface Condition on the Fatigue Performance of Alloy UNS N07718 Produced via Selective Laser Melting: *Madison Wooldridge*[1]; Helmuth Sarmiento Klapper[1]; Christoph Wangenheim[1]; [1]Baker Hughes

8:40 AM
Effect of Heat Treatment on Additively Manufactured Ni-based Superalloys: *Colleen Hilla*[1]; Michael Mills[1]; Wei Zhang[1]; Alfred Okello[2]; Alber Sadek[3]; Hyeyun Song[4]; [1]The Ohio State University; [2]GE Additive; [3]Edison Welding Institute ; [4]Edison Welding Institute

Coatings to Protect Materials from Extreme Environments — Coatings for Harsh Environments

Program Organizers: Kang Lee, NASA Glenn Research Center; Yutaka Kagawa, High Performance Materials; Daniel Mumm, University of California, Irvine; Rodney Trice, Purdue University; Emmanuel Boakye, UES Inc.; Valerie Wiesner, NASA Langley Research Center; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Jun Song, McGill University; Christian Moreau, Concordia University; Stephen Yue, McGill University

Thursday AM November 5, 2020

8:00 AM
Direct-writing by Micro Cold Spray of Yttria (Y2O3) Films for Reactive Metal Casting: *Aidan Moyers*[1]; Desiderio Kovar[1]; Michael Becker[1]; John Keto[1]; [1]University of Texas at Austin

8:20 AM
Electrodeposited NiMo Coatings for Improved Molten Salt Reactor Performance: *Rajeswaran Radhakrishnan*[1]; Kamyar Ahmadi[2]; Timothy Hall[1]; Stephen Snyder[1]; Stephen Raiman[3]; [1]Faraday Technology Inc; [2]University of Houston; [3]Oak Ridge National Laboratory

8:40 AM
Obtaining Surface Coatings Providing Protection Against High Temperatures in the Production of Coke: *Borys Sereda*[1]; Dmytro Sereda[1]; Aleksandr Gaydaenko[1]; [1]Dneprovsky State Technical University

9:00 AM
Obtaining Wear-resistant Titanium Coatings in SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda[1]; Irina Palehova[1]; [1]Dneprovsky State Technical University

Integration between Modeling and Experiments for Crystalline Metals: From Atomistic to Macroscopic Scales II — Session IV

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Levente Balogh, Queen's University; Josh Kacher, Georgia Institute of Technology; Caizhi Zhou, University of South Carolina; Lei Cao, University of Nevada

Thursday AM November 5, 2020

8:00 AM Invited
Synchrotron X-ray Tools for Multiscale Studies of Microstructure Evolution: Matthew Wilkin[1]; Yueheng Zhang[1]; Yufeng Shen[1]; He Liu[1]; Anthony Rollett[1]; *Robert Suter*[1]; [1]Carnegie Mellon University

8:30 AM Invited
Experimental Capabilities at High Pressure Collaborative Access Team (HPCAT) for In-situ and In-operando Characterization of Pressure/Stress Induced Microstructural Changes in Materials: *Dmitry Popov*[1]; Nenad Velisavljevic[2]; [1]HPCAT, X-ray Science Division, Argonne National Laboratory; [2]Physics Division-Physical & Life Sciences Directorate, Lawrence Livermore National Laboratory

9:00 AM
Characterization of 3-D Slip Fields in Deforming Polycrystals: *Darren Pagan*[1]; Kelly Nygren[2]; Matthew Miller[3]; [1]Pennsylvania State University; [2]Cornell High Energy Synchrotron Source; [3]Cornell University

9:20 AM
Diffraction Elastic Constants from Electron Backscatter Diffraction Data and Finite Element Models: *Adam Creuziger*[1]; Thomas Gnaupel-Herold[1]; Alex Bien[1]; Stephen Langer[1]; Andrew Reid[1]; [1]National Institute of Standards and Technology

9:40 AM Invited
Combining Multi-scale Modeling and Three-Dimensional Diffraction to Investigate Chemical and Displacement Ordering in Metallic Alloys: *Yu Wang*[1]; Yongmei Jin[1]; Yang Ren[2]; Xiaoxu Guo[1]; Liwei Geng[1]; [1]Michigan Technological University; [2]Argonne National Laboratory

10:10 AM
Investigating the Microstructural Origins of Hydrogen Effects on Deformation and Fracture: *Coleman Alleman*[1]; Christopher San Marchi[1]; Brian Kagay[1]; [1]Sandia National Laboratories

Manufacturing and Processing of Advanced Ceramic Materials — Processing of Carbides, Borides, and Chlorides

Program Organizers: Bai Cui, University of Nebraska-Lincoln; Mike Alexander, Allied Mineral Products, Inc.; Eric Faierson, Quad City Manufacturing Laboratory - Western Illinois University; James Hemrick, Reno Refractories Inc.; Keith DeCarlo, Blasch Precision Ceramics

Thursday AM November 5, 2020

8:00 AM Invited
A Progress Report on the Synthesis and Characterization of MAX and MAB Phases: *Surojit Gupta*[1]; [1]University of North Dakota

8:40 AM Invited
Design, Synthesis and Processing of Novel Ionic Conductors for All-solid-state Batteries: *Hailong Chen*[1]; [1]Georgia Institute of Technology

9:20 AM Invited
Synthesis and Flash Sintering of (Hf1-xZrx)B2 Solid Solution Fine Powders: Jose Belisario[1]; Santanu Mondal[1]; Iman Khakpour[1]; Alexander Franco[1]; Andriy Durygin[1]; *Zhe Cheng*[1]; [1]Florida International University

10:00 AM
Thermal Stability and Mechanical Properties of High-entropy Carbide Ceramics with Submicron Grain Size Fabricated by Spark Plasma Sintering: *Fei Wang*[1]; Xiang Zhang[1]; Xueliang Yan[1]; Yongfeng Lu[1]; Michael Nastasi[1]; Yan Chen[2]; Bai Cui[1]; [1]University of Nebraska Lincoln; [2]Oak Ridge National Laboratory

Metallurgy and Magnetism — Metallurgy and Magnetism II

Program Organizers: Nicholas Jones, Naval Surface Warfare Center, Carderock Division; Paul Lambert, Naval Surface Warfare Center, Carderock Division

Thursday AM November 5, 2020

8:00 AM
Comparative Studies on the Structure and Magnetic Properties of Mechanically Alloyed Fe40Co30Ni30 Medium-entropy Alloy in Argon and Ambient Atmospheres: Alex Paul[1]; Anuj Rathi[1]; *Tanjore Jayaraman*[1]; [1]University of Michigan-Dearborn

8:20 AM
Improvement of the Magnetic Characteristics of Materials Due to the Formation of Unidirectional Boundaries of Ferrite during Processing in SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda[1]; Vitalyy Volokh[1]; [1]Dneprovsky State Technical University

8:40 AM
Development of FeCo/MnZn Ferrite Composite by Field Assisted Sintering Technique: *Bowen Dong*[1]; Gabriel Santillan[2]; Matthew Willard[1]; [1]Case Western Reserve University; [2]Powdermet Inc.

9:00 AM
Exchange Coupled Ferromagnetism in Nanochessboards Obtained By Eutectoid Decomposition in the Co-Pt and Fe-Pt Systems: *Adrian Savovici*[1]; Eric Vetter[2]; William Soffa[1]; Jerrold Floro[1]; [1]University of Virginia; [2]NCSU

9:20 AM
Magnetic Performance of Gas-atomized Maraging Steel Powders: Ganesh Varma Thotakura[1]; Ramasis Goswami[2]; *Tanjore Jayaraman*[1]; [1]University of Michigan-Dearborn; [2]Naval Research Laboratory

9:40 AM
The Influence of the Microstructure Obtained After Processing in SHS Conditions on the Magnetic Characteristics of Steels: *Borys Sereda*[1]; Dmytro Sereda[1]; Vitalyy Volokh[1]; Vladimir Sukhomlyn[1]; Irina Kruglyak[1]; [1]Dneprovsky State Technical University

MS&T20 Plenary Session — TMS/ASM Distinguished Lectureship in Materials and Society

Thursday AM November 5, 2020

11:00 AM
Introductory Comments: MS&T20 Plenary Session: *Thomas Battle*[1]; [1]2020 TMS President

11:05 AM Plenary
Integrating Materials and Manufacturing: *Charles Ward*[1]; [1]Air Force Research Laboratory

11:45 AM
Concluding Comments & Award Presentation: MS&T20 Plenary Session: *Thomas Battle*[1]; [1]2020 TMS President

Multi-material Additive Manufacturing: Processing and Heterogeneous Materials Design — Recent Progress in Multi-Material AM

Program Organizers: Hang Yu, Virginia Polytechnic Institute and State University; Steven Boles, Hong Kong Polytechnic University; Michael Gibson, Desktop Metal; Lonnie Love, Oak Ridge National Laboratory; Leon Prentice, CSIRO Metal Industries

Thursday AM November 5, 2020

8:00 AM
Microstructural Characterization of a Metal Matrix Composite Manufactured via Hybrid Approach of Jetting and Selective Laser Melting: Milad Ghayoor[1]; Bryce Cox[1]; Brian Paul[1]; Joshua Gess[1]; *Somayeh Pasebani*[1]; [1]Oregon State University

8:30 AM
Aluminum Powders for Additive Manufacturing: *Yoshiki Hashizume*[1]; [1]TOYO Alunimium K.K.

Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry — Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session III

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

Thursday AM November 5, 2020

8:00 AM
Designing Non-precious Transition Metal/Nitrogen Doped Carbon Nanocatalysts for CO2 Reduction: *Guofeng Wang*[1]; Boyang Li[1]; [1]University of Pittsburgh

8:20 AM
Removal of 4,6-dinitro-o-cresol Pesticide from Aqueous Solutions via Magnetic Filtration Using Octanoate and Stearate Capped Magnetite and Nickel Ferrite Nanoparticles: *Allen Apblett*[1]; Tarek Trad[2]; [1]Oklahoma State University; [2]Sam Houston State University

Thermodynamics of Materials in Extreme Environments — Thermodynamics at the Nanoscale and Interfaces

Program Organizers: Xiaofeng Guo, Washington State University; Kristina Lilova, Arizona State University; Kyle Brinkman, Clemson University; Alexandra Navrotsky, Arizona State University; Jake Amoroso, Savannah River National Laboratory; Xingbo Liu, West Virginia University; Gustavo Costa, NASA Glenn Research Center

Thursday AM November 5, 2020

8:00 AM Invited
Ab-initio Studies of Point Defects in Alumina under Electrochemical Conditions: Aditya Sundar[1]; *Liang Qi*[1]; [1]University of Michigan

8:30 AM
Nanomaterials from Geopolymer, a Low-temperature Ceramics: *Dong-Kyun Seo*[1]; [1]Arizona State University

8:50 AM
Pressure-induced Anomalous Phase Transition Behavior in Layered Tellurene: *Arunima Singh*[1]; Han Li[1]; Kedi Wu[1]; Sijie Yang[1]; Tara Boland[1]; Bin Chen[1]; Sefaattin Tongay[1]; [1]Arizona State University

9:10 AM
Stabilities and Ultrafast Dynamics of Sub-nanometer Metal Oxide Clusters: *Scott Sayres*[1]; [1]Arizona State University

MS&T Student Events — MA Speaking Contest Finals

Thursday PM November 5, 2020

To be Announced

The Materials Genome Initiative and Materials R&D in the 2020s

Program Organizer: James Warren, National Institute of Standards and Technology

Friday AM November 6, 2020

10:30 AM
Presentations and Panel Discussion: *James Warren*[1]; [1]National Institute of Standards and Technology

Advanced Coatings for Wear and Corrosion Protection — Poster Session

Program Organizers: Evelina Vogli, Lm Group Holdings Inc.; Fei Tang, DNV GL

Tuesday AM November 3, 2020

High-performance Boron-based Coatings Alloyed with Chrome to Protect Against Wear and Corrosion: *Borys Sereda*[1]; Dmytro Sereda[1]; [1]Dneprovsky State Technical University

Advanced Steel Metallurgy — Poster Session

Program Organizers: Chirag Mahimkar, Big River Steel; Justin Raines, SSAB Americas; Kip Findley, Colorado School of Mines; Alla Sergueeva, NanoSteel Company Inc; Daniel Branagan, The NanoSteel Co

Tuesday AM November 3, 2020

Advanced Characterization of Wear Resistant Steel: *Anastasia July*[1]; Luis Simoes[1]; C. Garcia[1]; [1]University of Pittsburgh

Advances in Dielectric Materials and Electronic Devices — Poster Session

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

Tuesday AM November 3, 2020

Concentration Dependent Dielectric Behavior of [In, Ta] Dipole Pair Substituted $BaTiO_3$ Ceramics: Ian Chedzoy[1]; Evan Merkey[1]; Natalia Betancur-Granados[2]; *Kaijie Ning*[1]; Jorge Tobón[3]; Oscar Restrepo[3]; Holly Shulman[1]; Steven Pilgrim[1]; Walter Schulze[1]; Steven Tidrow[1]; [1]Alfred University; [2]Alfred University/ Colombia National University Medillin; [3]Colombia National University Medillin

Investigation of Relaxor-like Ferroelectrics in [Sc, Ta] Dipole-pair Substituted $BaTiO_3$ Ceramics: Benjamin Conley[1]; *Victoria Pellegrino*[1]; Wesley Senn[1]; William Hogan[1]; Kaijie Ning[1]; Holly Shulman[1]; Steven Pilgrim[1]; Walter Schulze[1]; Steven Tidrow[1]; [1]Alfred University

Relaxor-like Behavior in Dipole-Pair [Y, Ta] Substituted $BaTiO_3$ Ceramics: *Victoria Pellegrino*[1]; Benjamin Conley[1]; Kaijie Ning[1]; Holly Shulman[1]; Steven Pilgrim[1]; Walter Schulze[1]; Steven Tidrow[1]; [1]Alfred University

The Synthetic Diamonds Electrical Conductivity with Fractal Correction: *Vojislav Mitic*[1]; Goran Lazovic[2]; Vesna Paunovic[3]; Ivana Radovic[4]; Aleksandar Stajcic[2]; Markus Mohr[5]; Hans Fecht[5]; [1]University of Belgrade; University of Nis; [2]University of Belgrade; [3]University of Nis; [4]University of Belgrade; VINCA" Institute of Nuclear Sciences - National Institute of the Republic of Serbia; [5]Ulm University

Ceramic and Crystal Materials for Optics and Photonics — Poster Session

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory; Xiang Hua Zhang, University of Rennes - and - Materials Science Department, University of Arizona; Michael Squillante, Radiation Monitoring Devices Inc; Long Zhang, Shanghai Institute of Optical and Fine Mechanics, Chinese Academy of Science; Takunori Taira, National Institutes of Natural Science

Tuesday AM November 3, 2020

Self Activated $Ca_3Si_2O_7$ + Ca_2SiO_4:Dy^{3+} Phosphors Derived from Agro-food Wastes: *Manmeet Kaur*[1]; Kulvir Singh[1]; [1]Thapar Institute of Engineering and Technology

Ceramics and Glasses Simulations and Machine Learning — Poster Session

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Tuesday AM November 3, 2020

Defect Formation and Self-diffusion in Alumina: Computational Approaches: *Andy Chen*[1]; Michael Finnis[2]; Arthur Heuer[1]; [1]Case Western Reserve University; [2]Imperial College London

Verification of Mn Local Structure in Manganese Lithium Borate-based Glass by Computer Simulations and X-ray Absorption Spectroscopy: *Pattarapong Nijapai*[1]; [1]School of Physics, Suranaree University of Technology

Coating and Thin Film Materials for Energy, Aerospace, Environment and Biological Applications — Poster Session

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Yeongil Jung, Changwon National University; Albert Feuerstein, Praxair Surface Technologies, Inc. (retired); Raymond Sinatra, Rolls-Royce Corporation (retired); Li Li, Rolls-Royce Corporation

Tuesday AM November 3, 2020

Germanium Monochalcogenide Nanosheets as Anode in Metal-ion Batteries: *Shakir Bin Mujib*[1]; Maren Ellis[1]; Sophie Justus[1]; Porter Herold[1]; Gurpreet Singh[1]; [1]Kansas State University

Infiltration Behavior of Calcium Magnesium Alumina-Silicate (CMAS) in Thermal Barrier Materials of YSZ, LZ, and LZ–YSZ Composite: *Guanlin Lyu*[1]; Dowon Song[2]; Junseong Kim[1]; Janghyeok Pyeon[1]; SeungCheol Yang[1]; Yeon-Gil Jung[1]; [1]Changwon National University; [2]Hanyang University

Numerical Simulation of Temperature Swing Effect in Silica Reinforced Porous Anodized Aluminum Coatings: Abhilash Gulhane[1]; Jian Zhang[1]; Zhe Lu[2]; Bong-Gu Kim[3]; Yeon-Gil Jung[3]; *Jing Zhang*[1]; [1]Indiana University – Purdue University Indianapolis, Indiana; [2]University of Science and Technology Liaoning; [3]Changwon National University

Coatings to Protect Materials from Extreme Environments — Poster Session

Program Organizers: Kang Lee, NASA Glenn Research Center; Yutaka Kagawa, High Performance Materials; Daniel Mumm, University of California, Irvine; Rodney Trice, Purdue University; Emmanuel Boakye, UES Inc.; Valerie Wiesner, NASA Langley Research Center; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Jun Song, McGill University; Christian Moreau, Concordia University; Stephen Yue, McGill University

Tuesday AM November 3, 2020

Aerosol Deposition of Hexagonal and Cubic Boron Nitride: *Eric Patterson*[1]; Heonjune Ryou[1]; Scooter Johnson[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory

Computation Assisted Materials Development for Improved Corrosion Resistance — Poster Session

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Christopher Taylor, Dnv Gl

Tuesday AM November 3, 2020

Applying Machine Learning to Determine the Corrosion Resistance of Alloys: *Szu-Chia Chien*[1]; Wolfgang Windl[1]; Gerald Frankel[1]; [1]The Ohio State University

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Poster Session

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, Virginia Tech; Edward Gorzkowski, Naval Research Laboratory ; Jian Shi, Rensselaer Polytechnic Institute; Kejie Zhao, Purdue University ; Michael Naguib , Tulane University; Sanjay Mathur, University of Cologne

Tuesday AM November 3, 2020

Rheological Dynamics of Liquid Crystal-coupled Nanocomposites under Influence of Thermal Gradients: *Albree Weisen*[1]; Harini Sridharan[1]; Joshua Seylar[1]; Ruel McKenzie[1]; [1]The University of Akron - Department of Polymer Engineering

Functional Defects in Electroceramic Materials — Poster Session

Program Organizers: Hui Xiong, Boise State University; Hua Zhou, Argonne National Laboratory; Yanhao Dong, Massachusetts Institute of Technology

Tuesday AM November 3, 2020

Energetic Landscape of Functionally Modified 2D Nano-ceramics for Energy Storage: *Cody Cockreham*[1]; Xianghui Zhang[1]; Gengnan Li[1]; Hongwu Xu[2]; Di Wu[1]; [1]Washington State University; [2]Los Alamos National Laboratory

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Poster Session

Program Organizers: Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of Illinois at Urbana-Champaign; Wolfgang Rheinheimer, Purdue University; Ming Tang, Rice University; Melissa Santala, Oregon State University

Tuesday AM November 3, 2020

The Impact of Metastable Grain Boundary States on Mobility in FCC Metal: *Yutong Bi*[1]; Ian Chesser[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

Thermal Property of Diamond Thin Film on Si (100) Substrate: *Chunyan Zhang*[1]; Joseph P. Feser[1]; Chaoying Ni[1]; [1]University of Delaware

Vacancy-enhanced Grain Boundary Migration: *Shuozhi Xu*[1]; Dengke Chen[2]; Yashashree Kulkarni[3]; [1]University of California, Santa Barbara; [2]Georgia Institute of Technology; [3]University of Houston

High Entropy Materials: Concentrated Solid Solution, Intermetallics, Ceramics, Functional Materials and Beyond — Poster Session

Program Organizers: Xingbo Liu, West Virginia University; Michael Gao, National Energy Technology Laboratory; Peter Liaw, University of Tennessee; Jian Luo, University of California, San Diego; Yiquan Wu, Alfred University; Yu Zhong, Worcester Polytechnic Institute

Tuesday AM November 3, 2020

Full "Ab-initio" Simulation of Field Evaporation of High Entropy Alloys: *Jiayuwen Qi*[1]; Christian Oberdorfer[1]; Emmanuelle Marquis[2]; Wolfgang Windl[1]; [1]The Ohio State University, Department of Materials Science and Engineering; [2]University of Michigan, Department of Materials Science and Engineering

Integration between Modeling and Experiments for Crystalline Metals: From Atomistic to Macroscopic Scales II — Poster Session

Program Organizers: Mariyappan Arul Kumar, Los Alamos National Laboratory; Irene Beyerlein, University of California, Santa Barbara; Levente Balogh, Queen's University; Josh Kacher, Georgia Institute of Technology; Caizhi Zhou, University of South Carolina; Lei Cao, University of Nevada

Tuesday AM November 3, 2020

Development of a Reactive Forcefield to Model Cu-Ni Alloy Oxidation and Surface Segregation in Thermal Conditions: *Richard Garza*[1]; Matthew Curnan[1]; Meng Li[1]; Wissam Saidi[1]; [1]University of Pittsburgh

Interfaces and Phase Transformations — Poster Session

Program Organizers: Arun Devaraj, Pacific Northwest National Laboratory; Matthias Militzer, University of British Columbia; Matthew Steiner, University of Cincinnati; Mohsen Zaeem, Colorado School of Mines; Yufeng Zheng, University of Nevada, Reno

Tuesday AM November 3, 2020

Computing the Free Energy and Mobility of Cylindrical Interfaces: *Anqi Qiu*[1]; Ian Chesser[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

Refining Alpha Microstructure via Dual-phase Interface and Twin Boundary in Beta Titanium Alloys: *Dian Li*[1]; Xing Zhang[2]; Yiliang Liao[2]; Stoichko Antonov[3]; Yufeng Zheng[1]; [1]University of Nevada, Reno; [2]Iowa State University; [3]Max Planck Insitut fur Eisenforschung GmbH

Late News Poster Session — Biomaterials

Tuesday AM November 3, 2020

A Novel Prototype of Bioactive Ceramic Scaffold for Bone Regeneration: *Yrina Viatela*[1]; Erika Lopez[1]; Miguel Prado[1]; Vanesa Biolatti[1]; Carolina Bagnato[2]; [1]National Atomic Energy Commission; [2]National Council of Scientific and Technological Research

Late News Poster Session — Ceramic and Glass Materials

Tuesday AM November 3, 2020

Effect of SiC and CNT on thermal stability of HfB2–ZrB2 Based Ultra High Temperature Composites: *Shruti Dubey*[1]; Kantesh Balani[1]; Ambreen Nisar[2]; [1]Indian Institute of Technology; [2]Florida International University

Single and Multi-dopant Diffusion in YAG Ceramics for Lasers: *Thomas Rudzik*[1]; Zachary Seeley[1]; Nerine Cherepy[1]; Stephen Payne[1]; [1]Lawrence Livermore National Lab

Late News Poster Session — Fundamentals and Characterization

Tuesday AM November 3, 2020

Microstructural Evolution and Mechanical Properties of a Cu-2.7at.%Zr Alloy Processed by High-Pressure Torsion: *Kenta Miyamoto*[1]; Takahiro Kunimine[1]; [1]Kanazawa University

Materials Design through AI Composition and Process Optimization — Poster Session

Program Organizers: Noah Paulson, Argonne National Laboratory; Tiberiu Stan, Northwestern University; Brandon Bocklund, Pennsylvania State University; Arun Kumar Mannodi Kanakkithodi, Argonne National Laboratory

Tuesday AM November 3, 2020

A Physics-informed AI Assistant for Atomic Layer Deposition: *Noah Paulson*[1]; Angel Yanguas-Gil[1]; Steven Letourneau[2]; Jeffery Elam[1]; [1]Argonne National Laboratory; [2]ASM

AI-driven Discovery of Novel High Entropy Semiconductor Alloys: *Arun Kumar Mannodi Kanakkithodi*[1]; Xueying Li[2]; David Fenning[2]; Maria Chan[1]; [1]Argonne National Laboratory; [2]University of California San Diego

Enabling Process Optimization Using High-throughput Machine Learning-based Image Analysis: *Tiberiu Stan*[1]; Peter Voorhees[1]; [1]Northwestern University

Materials Informatics for Images and Multi-dimensional Datasets — Poster Session

Program Organizers: Amanda Krause, University of Florida; Kristen Brosnan, General Electric Research; Alp Sehirlioglu, Case Western Reserve University

Tuesday AM November 3, 2020

Identifying Crack Initiation Sites with CNNs: *Katelyn Jones*[1]; Elizabeth Holm[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

Keyhole Porosity Threshold in Laser Melting Revealed by High-Speed X-ray Imaging: *Runbo Jiang*[1]; Benjamin Gould[2]; Andy Ramlatchan[3]; Joseph Aroh[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Argonne National Laboratory; [3]NASA Langley Research Center

Micro- and Nano-Mechanical Behavior of Materials — Poster Session

Program Organizers: Sundeep Mukherjee, University of North Texas; Mahmoud Baniasadi, Georgia Southern University; Meysam Haghshenas, University of Toledo

Tuesday AM November 3, 2020

Atomistic Simulations of Collisions between SiC Nanoparticles: *Kevin Kayang*[1]; Alexey Volkov[1]; [1]University of Alabama

Characterization of Fatigue Damage Behavior in Unidirectional Carbon Fiber Reinforced Plastic Laminates: *Akihiro Kudou*[1]; Satoshi Kobayashi[1]; Toshiko Osada[1]; [1]Tokyo Metropolitan University

Cyclo[18]carbon as an Ultra-flexible Material: *Siyuan Fang*[1]; Yun Hang Hu[1]; [1]Michigan Technological University

Diffusion Induced Abnormal Softening Behaviors in Nanocrystals: *Sixue Zheng*[1]; Xiang Wang[1]; Scott Mao[1]; [1]University of Pittsburgh

Mechanical Behavior of Resilin-mimicking Materials: *Annaliza Perez-Torres*[1]; Fuqian Yang[1]; [1]University of Kentucky

Mechanical Properties of Hybrid Core-shell Ceramic Nanoparticles: *Kevin Kayang*[1]; Alexey Volkov[1]; [1]University of Alabama

Processing, Characterization, and Modeling of Nano-twinned Alloys: Understanding the Role that Controlling and Tuning of Microstructure has in Dislocation-twin Interactions: *Francisco Andrade Chávez*[1]; Orcun Koray Celebi[1]; Huseyin Sehitoglu[1]; Jessica Krogstad[1]; [1]University of Illinois at Urbana-Champaign

Small-Scale Mechanical Behavior of Ion-irradiated Amorphous Metals versus Multi-Principal Alloys: Maryam Sadeghilaridjani[1]; Vahid Hasannaeimi[1]; Shristy Jha[1]; *Sundeep Mukherjee*[1]; [1]University of North Texas

Twinning and Detwinning in Small-sized Crystals: *Xiang Wang*[1]; Scott Mao[1]; [1]University of Pittsburgh

Multiscale Modeling of Microstructure Deformation in Material Processing — Poster Session

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Jaimie Tiley, AFRL/RXLMD; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

Tuesday AM November 3, 2020

Development of the Coupled Cellular Automata/Finite Difference Model of Phase Transformation during Continuous Cooling: Mateusz Sitko[1]; Maciej Pietrzyk[1]; Danuta Szeliga[1]; *Lukasz Madej*[1]; [1]AGH University of Science and Technology

Next Generation Biomaterials — Poster Session

Program Organizers: Roger Narayan, University of North Carolina; David Dausch, RTI International; Sanjiv Lalwani, Lynntech, Inc.

Tuesday AM November 3, 2020

3D Printed Porous Tissue Engineering Scaffolds with the Self-folding Ability and Controlled Release of Growth Factor: Jiahui Lai[1]; Junzhi Li[1]; *Min Wang*[1]; [1]University of Hong Kong

3D Printed Strontium-doped Alginate-collagen Scaffolds for Bone Tissue Engineering: *Shams Khondkar*[1]; Naomi Edwards[1]; Azhar Ilyas[1]; [1]New York Institute of Technology

Biocompatible Ceramics Based on Hydrated Calcium Phosphates: Tatiana Safronova[1]; *Gilyana Kazakova*[1]; Otabek Toshev[1]; Andrey Kiselev[1]; Tatyana Shatalova[1]; Irina Selezneva[2]; Vladimir Zaitsev[3]; [1]Lomonosov Moscow State University; [2]Institute of theoretical and experimental biophysics of RAS; [3]Priorov National Medical Research Center of Traumatology and Orthopedics

Powder Mixtures of Calcium Hydroxyapatite and Potassium Hydrosulfate for Producing Biocompatble Ceramics: Tatiana Safronova[1]; *Gilyana Kazakova*[1]; Marat Akhmedov[2]; Tatyana Shatalova[1]; Snezhana Tikhonova[1]; [1]Lomonosov Moscow State University; [2]A.N. Kosygin State University of Russia (Technology. Design. Art)

Thermodynamic Properties, Structure and Phase Stabilities of Special Alloys — Poster Session

Program Organizers: Erwin Povoden-Karadeniz, TU Wien CDL-IPE; Ernst Kozeschnik, Vienna University of Technology

Tuesday AM November 3, 2020

Funding support provided by: MatCalc Engineering GmbH, Vienna

Depiction of Electro-optical Characteristics in CdSexTe1-x by Curbing Content And Short-Range Pattern: *Bishal Dumre*[1]; Nathan Szymanski[2]; Vijaya Adhikari[1]; Indiras Khatri[1]; Daniel Gall[3]; Sanjay Khare[1]; [1]The University of Toledo; [2]University of California, Berkeley; [3]Rensselaer Polytechnic Institute

Determination of the Activation Energy of the Formation of Intermetallic Compounds in the Ni-Al and Ti-Al System Upon Receipt of Special Alloys: *Borys Sereda*[1]; Dmytro Sereda[1]; Yuriy Belokon[2]; Ivan Babko[1]; [1]Dneprovsky State Technical University; [2]ZNU

Sodium Pnictogen Chalcogenides for Thermoelectric and Photovoltaic Applications: *Ishan Khare*[1]; Nathan Szymanski[2]; Daniel Gall[3]; Richard Irving[1]; [1]Department of Physics and Astronomy, University of Toledo; [2]Department of Materials Science and Engineering, University of California, Berkeley; [3]Department of Materials Science and Engineering, Rensselaer Polytechnic Institute

12th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Poster Session

Program Organizers: Surojit Gupta, University of North Dakota; Rajiv Asthana, University of Wisconsin; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, AIST; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Tatami Junichi, Yokohama national university; Yiquan Wu, Alfred University; Allen Apblett, Oklahoma State University

Tuesday PM November 3, 2020

An Alternative Optimization Route for the Recovery of Stainless Steel Alloying Elements: *Diego Santa Rosa Coradini*[1]; Ana Rabelo de Lima[2]; Rüdiger Deike[2]; Victor Bridi Telles[3]; Helmut Antrekowitsch[1]; José Roberto de Oliveira[3]; [1]Montauniversty Leoben; [2]University of Duisburg-Essen; [3]Instituto Federal do Espirito Santo

2020 Undergraduate Student Poster Contest — 2020 Undergraduate Student Poster Contest

Tuesday PM November 3, 2020

Additive Manufacturing of Titanium-based Functionally Graded Materials: Experiment Characterization and FEA Modeling: *Yang Liu*[1]; [1]WHUT

Alloying MnGeTe2 Enables High Thermoelectric Performance: *Grace Rome*[1]; [1]Colorado School of Mines

Analysis of High Entropy Ceramics Prepared via Steric Entrapment and Solid-state Sintering Methods: Crystal Structure: *Madeline Loveday*[1]; Matheus Pianassola[1]; Merry Koschan[1]; Charles Melcher[1]; Mariya Zhuravleva[1]; [1]University of Tennessee, Knoxville

Comparative Study of Transport propeties of Bismuth Sulfide with Different Dopants: *Farheen Anjum*[1]; [1]IIT Kanpur

Crack Driving Force Expressions Using Compliance Approach in Clamped Beam Bending Geometry: *Tejas Chaudhari*[1]; Ashwini Mishra[1]; Hrushikesh Sahasrabuddhe[1]; Nagamani Jaya Balila[1]; [1]IIT Bombay

Crystal Structure and Lithium Ionic Transport Behavior of Li Site Doped Li7La3Zr2O12: *Qianshun Cui*[1]; [1]Wuhan University of Technology

Developing Materials and Coating Technologies for Mitigation of Lunar Dust Adhesion and Abrasion: *Dylan Lew*[1]; Nicolas Fransen[2]; Valerie Wiesner[3]; Christopher Wohl[3]; Lopamudra Das[4]; [1]Carnegie Mellon University; [2]Purdue University; [3]NASA Langley Research Center; [4]National Institute of Aerospace

Development of a Blast Furnace Simulator: *Adam Binder*[1]; Nicholas Rheinheimer[1]; [1]Purdue University Northwest

Effect of Aspect Ratio on Stress Intensity Factor Solutions for Single Edge Notch Wire Fracture Test Specimen under Tensile and Clamped Bend Loading Conditions: *Hrushikesh Sahasrabuddhe*[1]; Ashwini Mishra[1]; Nagamani Jaya Balila[1]; [1]India Institute of Technology Bombay

Efficient and Stable Perovskite Solar Cells via Surface Passivation of an Ultrathin Hydrophobic Organic Molecular Layer: *Xiaofeng Gao*[1]; [1]Wuhan University of Technology

Innovative Preparation Methods of High Performance Magnetically Responsive Photonic Crystals: *Linxin Huang*[1]; [1]Wuhan University of Technology

Maximizing Magnetostriction in Fe-Ga-Zr Nanocrystalline Alloys: *Ria Nandwana*[1]; Matthew Willard[1]; Yumi Ijiri[2]; [1]Case Western Reserve University; [2]Oberlin College

Nanocrystalline Magnetic Metallic Microwave Absorbents Working at Elevated Temperature: *Shuaiwei Guo*[1]; [1]Wuhan University of Technology

Origin of the Phase Transition in Lithium Garnets: *Lu Xinqi*[1]; [1]Functionally Graded Materials

Quantitatively Accounting for the Effects of Surface Topography on the Oxidation Kinetics of Additive Manufactured Hastelloy X Processed by Electron Beam Melting: *Matthew Kuner*[1]; Marie Romedenne[2]; Patxi Fernandez-Zelaia[2]; Sebastien Dryepondt[2]; [1]Georgia Institute of Technology; [2]Oak Ridge National Laboratory

Supercritical Synthesis of VO_2 Nanoparticles For Smart Window Films: *Robert Spurling*[1]; Elizabeth Rasmussen[1]; Mai Tran[1]; Jie Li[1]; [1]Argonne National Laboratory

Unique S-scheme Heterojunctions in Self-assembled TiO_2/$CsPbBr_3$ Hybrids for CO_2 Photoreduction: *Kai Meng*[1]; [1]Wuhan University of Technology

Additive Manufacturing Modeling and Simulation: AM Materials, Processes, and Mechanics — Poster Session

Program Organizers: Jing Zhang, Indiana University – Purdue University Indianapolis; Brandon Mcwilliams, US Army Research Laboratory; Li Ma, Johns Hopkins University Applied Physics Laboratory; Yeongil Jung, Changwon National University

Tuesday PM November 3, 2020

Creep Modeling of 3D Printed 718 Nickel Alloys: Harshal Dhamade[1]; Abhilash Gulhane[1]; Jian Zhang[1]; Bong-Gu Kim[2]; Yeon-Gil Jung[2]; *Jing Zhang*[1]; [1]Indiana University - Purdue University Indianapolis; [2]Changwon National University

Fabrication of Ceramic Core for Single Crystal Casting of Gas Turbine Blade: *Hye-Yeong Park*[1]; Eun-Hee Kim[1]; SeungCheol Yang[1]; Hyun-Hee Choi[1]; Jing Zhang[2]; Yeon-Gil Jung[1]; [1]Changwon National University; [2]Indiana University – Purdue University Indianapolis

Mechanical and Surface Properties of Inconel 718 Alloy Fabricated by Additive Manufacturing: *Junseong Kim*[1]; Dowon Song[2]; Yun kon Joo[3]; Guanlin Lyu[3]; SeungCheol Yang[3]; Jing Zhang[1]; Yeon-Gil[3]; [1]Indiana University - Purdue University Indianapolis; [2]Hanyang University; [3]Changwon National University

Experimental and Modeling Study of Gas Adsorption in Metal-organic Framework Coated on 3D Printed Plastics: Tejesh Dube[1]; Jian Zhang[1]; Bong-Gu Kim[2]; Yeongil Jung[2]; *Jing Zhang*[1]; [1]Indiana University – Purdue University Indianapolis; [2]Changwon National University

Modeling of Electron Beam Physical Vapor Deposition Process for Fabricating Thermal Barrier Coatings: Anvesh Dhulipalla[1]; Yafeng Li[2]; Jian Zhang[1]; Hye-Yeong Park[3]; Yeon-Gil Jung[3]; *Jing Zhang*[1]; [1]Indiana University - Purdue University Indianapolis; [2]Tianjin Polytechnic University; [3]Changwon National University

Modeling of Impact Property of 3D Printed 718 Nickel Alloys: Sugrim Sagar[1]; Jian Zhang[1]; Junseong Kim[2]; Yeon-Gil Jung[2]; *Jing Zhang*[1]; [1]Indiana University - Purdue University Indianapolis; [2]Changwon National University

Strength Improvement of The Ceramic Core by Applying Dual Polymers In 3D Printing Process: *Hyun-Hee Choi*[1]; Bong-Gu Kim[1]; Hye-Yeong Park[1]; Junseong Kim[1]; SeungCheol Yang[1]; Yeon-Gil Jung[1]; Jing Zhang[2]; [1]Changwon National Univerisity/ Department of Materials Science and Engineering; [2]Indiana University-Purdue University Indianapolis

Probabilistic Process Design of Laser Powder Bed Fusion Using Coupled Monte Carlo and Inverse First Order Reliability Method: Lingbin Meng[1]; Xuehui Yang[1]; Xiaoping Du[1]; Brandon McWilliams[2]; *Jing Zhang*[1]; [1]Indiana University - Purdue University Indianapolis; [2]CCDC Army Research Laboratory

Virtual Reality Module for Additive Manufacturing Education: *Jing Zhang*[1]; Glorio Singui[1]; Shambhuraj Wadghule[1]; Xuehui Yang[1]; Jian Zhang[1]; Chauncey Frend[1]; [1]Indiana University - Purdue University Indianapolis

Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications — Poster Session

Program Organizers: Lei Chen, University of Michigan-Dearborn; Xuan Song, University of Iowa; Nahum Travitzky, University of Erlangen-Nuremberg; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, Pennsylvania State University

Tuesday PM November 3, 2020

Effects of Printing Parameters on Density And Mechanical Properties of Binder Jet 3D Printed WC-Co: Katerina Kimes[1]; Pierangeli Rodriguiz[1]; *Danielle Brunetta*[1]; Drew Elhassid[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]General Carbide

Hybrid Additive Manufacturing Technology Applied to Si3N4 Freeform Components Fabrication: *Anna De Marzi*[1]; Johanna Schmidt[2]; Sarah Diener[3]; Giorgia Franchin[1]; Paolo Colombo[1]; [1]Department of Industrial Engineering, Università degli Studi di Padova; [2]Schunk GmbH; [3]Kyocera Fineceramics Precision GmbH

Temporary Coating for Binder Jet 3D Printed Tungsten Carbide-Cobalt Parts: *Pierangeli Rodriguez De Vecchis*[1]; Katerina Kimes[1]; Drew Elhassid[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]General Carbide

Additive Manufacturing: Qualification and Certification — Poster Session

Program Organizers: Faramarz Zarandi, Raytheon Technologies; Jacob Hochhalter, University of Utah; Douglas Wells, NASA / Marshall Space Flight Center; Richard Russell, NASA Kennedy Space Center; Mohsen Seifi, ASTM International/Case Western Reserve University; Eric Ott, GE Additive; Mark Benedict, Air Force Research Laboratory; Craig Brice, Colorado School Of Mines; J Hector Sandoval, Lockheed Martin

Tuesday PM November 3, 2020

Influence of Printing Parameters within the Binder-powder Interaction: Trenton Colton[1]; *Nathan Crane*[1]; [1]Brigham Young University

Post-build Heat Treatment of Wire-arc Additive Manufactured 410 SS for Hardness Tuning: *Girish Padhy*[1]; Winston Kam[1]; Matthew Willard[1]; James McGuffin-Cawley[1]; Michael Kottman[2]; Bradley Barnhart[2]; Badri Narayanan[2]; [1]Case Western Reserve University; [2]Lincoln Electric. Inc

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments — Poster Session

Program Organizers: Samuel Briggs, Oregon State University; Christopher Barr, Sandia National Laboratories; Emily Aradi, University of Huddersfield; Michael Short, Massachusetts Institute of Technology; Janelle Wharry, Purdue University; Cheng Sun, Idaho National Laboratory; Dong Liu, University of Oxford; Khalid Hattar, Sandia National Laboratories

Tuesday PM November 3, 2020

Effects of Post-Processing Variability on Radiation Response of Additively-Manufactured HT9: *Pengyuan Xiu*[1]; Niyanth Sridharan[2]; Kevin Field[1]; [1]University Of Michigan; [2]Lincoln Electric

Investigation of Uranium Silicide Fuel Form Additions through Rietveld Refinement and Internal Standard P-XRD: *Zachary Acosta*[1]; Cole Moczygemba[1]; Elizabeth Sooby Wood[1]; [1]The University of Texas at San Antonio

Late News Poster Session — Energy

Tuesday PM November 3, 2020

Silicon Carbon Nitride (SiCN) and Silicon Oxycarbide (SiOC) Functionalization of Molybdenum Disulfide (MoS2) as Stable Battery Electrodes: *Davi Marcelo Soares*[1]; Gurpreet Singh[1]; [1]Kansas State University, Alan Levin Department of Mechanical and Nuclear Eng.

Sintering and Related Powder Processing Science and Technologies — Poster Session

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

Tuesday PM November 3, 2020

On the Bending of High-aspect Ratio Freestanding Aerosol Jet Printed Micropillar Arrays during Thermal Sintering: *Sandra Ritchie*[1]; Mohammad Saleh[1]; Rahul Panat[1]; [1]Carnegie Mellon University

The Effect of Texturing by Applied Magnetic Field on Grain Growth of Alumina: *Bryan Conry*[1]; Michael Kesler[2]; Amanda Krause[1]; [1]University of Florida; [2]Oak Ridge National Laboratory

Synthesis, Characterization, Modeling 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 November 3, 2020

Development of Nanostructured Vycor Glass Microspheres for Doxorubicin Administration: *Bryan Escalante Castro*[1]; Yanina Martinez[1]; Guillermo Zampieri[1]; Yrina Viatela[1]; [1]Natinal Atomic Energy Comission

INDEX

C

INDEX

D

E

F

INDEX

G

H

I

J

INDEX

K

L

INDEX

M

N

O

INDEX

R

S

INDEX

T

INDEX

U

V

W

X

Y

Z

INDEX