Technical Meeting and Exhibition

MS&T24

MATERIALS SCIENCE & TECHNOLOGY

October 6-9, 2024 | Pittsburgh, Pennsylvania

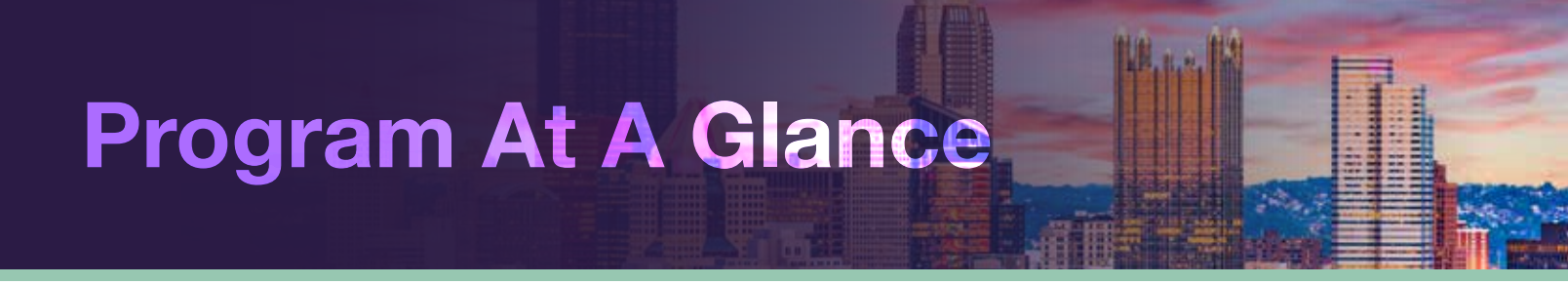
FINAL

TECHNICAL PROGRAM

The content in this final technical program was generated on September 24, 2024. Please refer to the online session sheets for the most up-to-date information.

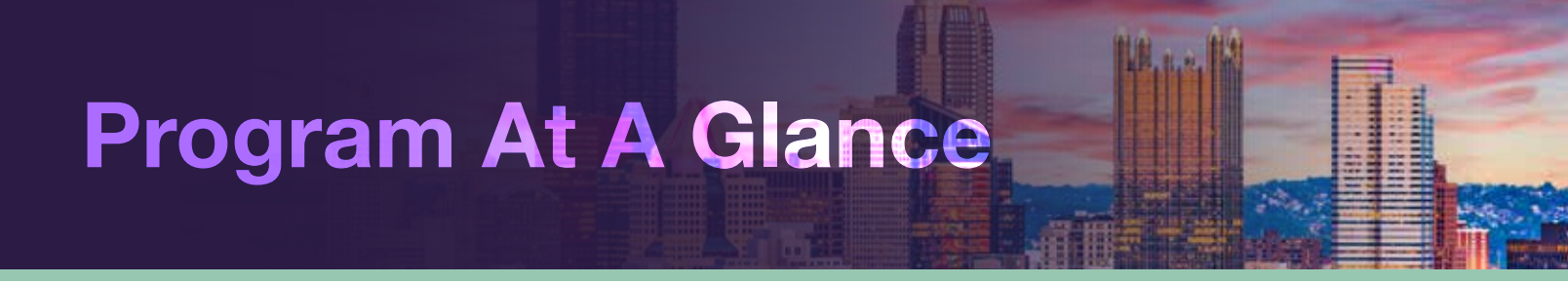
Organizing Societies: The American Ceramic Society www.ceramics.org | AIST Association for Iron & Steel Technology | TMS The Minerals, Metals & Materials Society

Co-Sponsoring Society: Society For Biomaterials



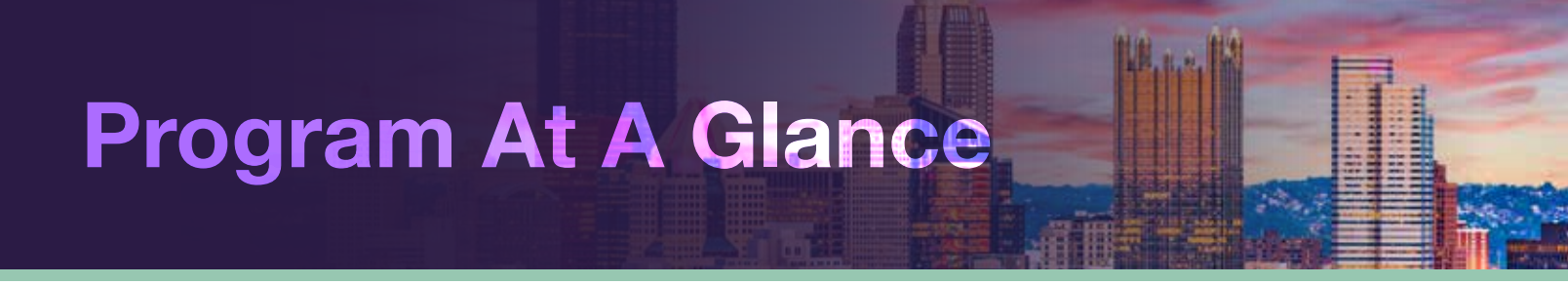
Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring				
Session I: Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring	MON	AM	303	12
Session II: Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring	MON	PM	303	33
Session III: Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring	TUE	AM	306	50
Poster Session	TUE	PM	Hall A	129
Additive Manufacturing: Interactions between Energy and Materials				
Additive Manufacturing: Energy-Matter Interactions	MON	AM	305	12
Additive Manufacturing: Microstructure, Defects, and Properties				
Phase Stability in Extreme Environments	MON	AM	306	13
AM of Steels	TUE	AM	304	50
AM of Ni-based Alloys	TUE	PM	304	70
Poster Session	TUE	PM	Hall A	130
Modeling and Characterization	WED	AM	304	91
AM of Other Metallic Systems	WED	PM	304	111
Advanced Manufacturing of High Temperature Ceramics and Composites: Processing, Characterization and Testing				
Additive Manufacturing of Ceramic Monoliths	TUE	AM	303	52
AM of CMCs / Traditional Ceramic and CMC Manufacturing	TUE	PM	303	71
Poster Session	TUE	PM	Hall A	131
Opportunities and Applications of Solid-State Additive Manufacturing Processes				
Additive Friction Stir Deposition and Cold Spray	WED	AM	305	105
Ultrasonic AM, Binder Jetting, and Hybrid Manufacturing	WED	PM	305	120
Standards for Data Science in Additive Manufacturing				
Standards for Data Science in Additive Manufacturing	MON	AM	301	27
Artificial Intelligence				
Frontiers of Machine Learning on Materials Discovery				
Frontiers of Machine Learning Session I	TUE	PM	311	80
Frontiers of Machine Learning Session II	WED	AM	311	100
Frontiers of Machine Learning Session III	WED	PM	311	116
Integrated Computational Materials Engineering for Physics-Based Machine Learning Models				
Poster Session	TUE	PM	Hall A	136
Integrated Computational Materials Engineering for Physics-Based Machine Learning Models	WED	AM	310	103
Machine Learning and Simulations				
Machine Learning and Simulations I	MON	AM	310	22
Machine Learning and Simulations II	MON	PM	310	43
Poster Session	TUE	PM	Hall A	136
Materials Informatics for Images and Multi-dimensional Datasets				
Session I	TUE	AM	310	62
Session II	TUE	PM	310	83
Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics				
Materials Design and Innovation / Physical Property Exploration	MON	AM	311	23
Poster Session	TUE	PM	Hall A	137
Biomaterials				
3D Printing of Biomaterials and Devices				
Poster Session	TUE	PM	Hall A	128
3D Printing of Biomaterials and Devices I	WED	AM	319	88
3D Printing of Biomaterials and Devices II	WED	PM	319	109



Program At A Glance

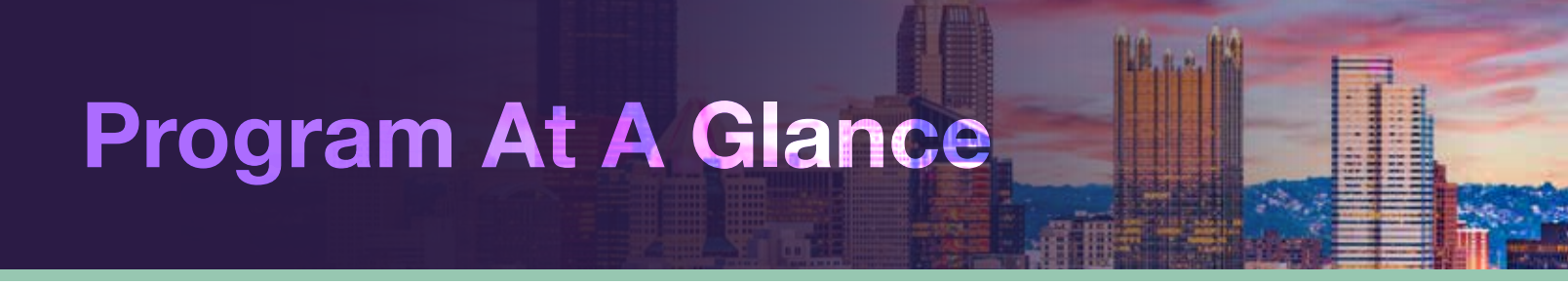
Topic Area/Symposium	Date	Time	Room	Page
Mesoscale Phenomena in Functional Polycrystals and Their Nanostructures				
Session I: Optical Properties, Grains and Domains	MON	AM	410	24
Session II: Tribology, Thermal Properties, Carbon and Nanostructures	MON	PM	410	43
Poster Session	TUE	PM	Hall A	137
Phase Transformations in Ceramics: Science and Applications				
Session I	WED	AM	412	105
Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics				
Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics I	MON	AM	411	25
Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics II	MON	PM	411	45
Solid-state Optical Materials and Luminescence Properties				
Solid-state Optical Materials and Luminescence Properties I	WED	AM	408	107
Solid-state Optical Materials and Luminescence Properties II	WED	PM	408	120
The American Ceramic Society Journal Awards Symposium				
Session I	TUE	AM	408	66
Session II	TUE	PM	408	86
Fundamentals and Characterization				
Computational Materials for Qualification and Certification				
Overview and "State of Practice" Assessment	MON	AM	323	16
Defects and Heat Transfer	MON	PM	323	38
Materials Properties and Performance	TUE	AM	323	57
Fatigue and Fracture	TUE	PM	323	77
Thermal Simulations and Phase Transformations	WED	AM	333	97
Panel Discussion and Regulatory Considerations	WED	PM	333	114
Emergent Materials under Extremes and Decisive In Situ Characterizations				
In Situ Characterization Under Extreme Conditions	TUE	PM	326	79
Next-Generation X-Ray and Neutron Capabilities and High-Pressure Research	WED	AM	326	98
Fracture in Metals: Insights from Experiments and Modeling Across Length and Time Scales				
Modeling and Simulations	MON	AM	326	19
Experimental Insights	MON	PM	326	40
Experiments, Modeling, and Machine Learning	TUE	AM	326	59
Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships				
Grain Growth	MON	AM	325	20
Segregation	MON	PM	325	41
Grain Boundary & Interface Stability and Transitions	TUE	AM	325	60
Boundaries in Functional Ceramics	TUE	PM	325	81
Poster Session	TUE	PM	Hall A	135
Mechanical Properties & Mechanics	WED	AM	325	100
Computational Modeling & Data Analytics (Sintering & Grain Boundaries in Metals)	WED	PM	325	116
High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V				
Session I	MON	AM	324	20
Session II	MON	PM	324	42
Session III	TUE	AM	324	61
Session IV	TUE	PM	324	81
Session V	TUE	PM	328	82
Poster Session	TUE	PM	Hall A	135
Session VI	WED	AM	323	101
Session VII	WED	AM	324	102
Session VIII	WED	PM	323	117



Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Light Metal Technology				
Light Metal Technology	WED	AM	403	103
Materials-Environment Interactions				
Advanced Coatings for Wear and Corrosion Protection				
Advanced Coatings for Wear and Corrosion Protection I	MON	PM	335	33
Poster Session	TUE	PM	Hall A	130
Advanced Materials for Harsh Environments				
Session I	MON	PM	330	35
Session II	TUE	AM	333	52
Session III	TUE	PM	333	72
Poster Session	TUE	PM	Hall A	131
Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson				
Fundamentals of Oxidation and Materials Degradation	MON	AM	334	14
Alloy Development and High-Temperature Oxidation I	MON	PM	334	36
Alloy Development and High-Temperature Oxidation II	TUE	AM	334	54
Materials Design and Deposition-Induced Degradation and Complex Environment	TUE	PM	334	74
Poster Session	TUE	PM	Hall A	132
Interface, Coating, and Properties for High-Temperature Performance	WED	AM	334	93
Corrosion and Environmental Degradation: Theory and Practice				
Session I	TUE	AM	335	58
Session II	TUE	PM	335	78
Session III	WED	AM	335	97
Thermodynamics of Materials in Extreme Environments				
Frontiers of Thermodynamics	MON	AM	333	28
Thermodynamics of Ceramic and Intermetallic Systems	MON	PM	333	47
Thermodynamics of Molten Salt Systems	TUE	AM	413	67
Poster Session	TUE	PM	Hall A	140
Modeling				
Advances in Multiphysics Modeling and Multi-modal Imaging of Functional Materials				
Multimodal Imaging of Functional Materials	MON	PM	414	37
Advanced Mathematical Algorithms, AI, and Reduced-Order Model for Materials Modeling	TUE	AM	414	55
Multiphysics Modeling of Materials and Devices I	TUE	PM	414	75
Poster Session	TUE	PM	Hall A	132
Multiphysics Modeling of Materials and Devices II	WED	PM	414	113
Computation Assisted Materials Development for Improved Corrosion Resistance				
Computation Assisted Materials Development for Improved Corrosion Resistance	WED	AM	414	96
Nanomaterials				
Advances in Emerging Electronic Nanomaterials: Towards Next-Generation Microelectronics				
Neuromorphic Devices and 2D Materials	TUE	PM	318	73
Functional Materials and Devices I	WED	AM	318	92
Functional Materials and Devices II	WED	PM	318	112
Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials				
Nanoparticles	MON	AM	319	17
2D Materials	MON	PM	319	39
Energy & Plasmonic Applications	TUE	AM	319	58
Mechanical & Other Applications	TUE	PM	319	77
Poster Session	TUE	PM	Hall A	134

Program At A Glance



Topic Area/Symposium	Date	Time	Room	Page
Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing				
Joint Session: Steels for Sustainable Development & Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing	MON	AM	405	15
Poster Session	TUE	PM	Hall A	133
Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing	WED	AM	317	94
Ceramics for Clean Hydrogen				
Ceramics for Clean Hydrogen I	TUE	AM	312	57
Ceramics for Clean Hydrogen II	TUE	PM	312	76
Energy Materials for Sustainable Development				
Thermoelectrics I	MON	AM	315	18
Thermoelectrics II	MON	PM	315	40
Emerging Energy Materials	MON	PM	318	39
Thermoelectrics III	TUE	AM	315	59
Energy Harvesting I	TUE	PM	315	79
Poster Session	TUE	PM	Hall A	134
Energy Harvesting II	WED	AM	315	99
Batteries and Storages I	WED	AM	312	99
Batteries and Storages II	WED	PM	312	115
Fuel Cells and Electrolyzers	WED	PM	315	115
Enhancing Recycling and Reuse of Secondary Materials to Support a Circular Economy				
Enhancing Recycling and Reuse of Secondary Materials to Support a CircularEconomy	MON	AM	316	19
Poster Session	TUE	PM	Hall A	135
Manufacturing Changes and Challenges Associated with Electric Vehicles				
Manufacturing Changes and Challenges Associated with Electric Vehicles	TUE	AM	318	62
Materials for CO2 Sequestration				
Materials for CO2 Sequestration	WED	PM	317	119
Porous Materials for Energy and Environment Applications				
Porous Materials I	MON	PM	311	44
Porous Materials II	TUE	AM	311	63
Poster Session	TUE	PM	Hall A	138
Sustainable Horizons: A Symposium on Collective Action for a Resilient Future				
Sustainable Horizons	MON	PM	316	46
Special Topics				
2024 Graduate Student Poster Contest				
2024 Graduate Student Poster Contest	TUE	PM	Hall A	123
2024 Undergraduate Student Poster Contest				
2024 Undergraduate Student Poster Contest	TUE	PM	Hall A	126
Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday				
Introductory Session	MON	AM	412	21
Progress in Mxenes I	MON	PM	412	42
Nanomaterials II / Progress in MAX Phases I	TUE	AM	412	61
Progress in MAX Phases II	TUE	PM	412	82
Poster Session	TUE	PM	Hall A	135
Progress in MAX Phases III	WED	AM	401	102
IGNITE MSE: Thinking Outside the Lab				
Poster Session	TUE	PM	Hall A	136
Scientific Methods in Art, Archeology, and Art Conservation Science				
Scientific Methods in Art, Archeology, and Art Conservation Science	WED	AM	413	106

SPECIAL TOPICS

Plenary Sessions — AIST Plenary Session

Monday AM | October 7, 2024
Spirit of Pittsburgh Ballroom B | David L. Lawrence Convention Center

8:00 AM Introductory Comments

8:05 AM Plenary
AIST Adolf Martens Memorial Steel Lecture: Thin-Slab Continuous Strip Processing Technology — Changing the Landscape of How We Make Greener and Leaner Advanced High-Strength Steels: *Amar De*[1]; [1]Big River Steel

8:45 AM Award Presentation

8:50 AM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

16th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Technologies I

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mrityunjay Singh, NASA; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technology; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Wu, Wuhan University of Technology

Monday AM | October 7, 2024
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Session Chairs: Lan Li, Boise State University; Lalit Kumar Sharma, Mahamana Ceramic Development O; Mathieu Bauchy, University of California, Los Angeles

8:00 AM Invited
Decarbonizing Concrete with Artificial Intelligence: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

8:30 AM Invited
Leverage DNA Nanotechnology to Build Energy- and Time-Saving Quantum Computers: Maia Ketteridge[1]; *Lan Li*[1]; [1]Boise State University

9:00 AM
Combustion of Plastic Particles in a Blast Furnace Raceway – CFD Analysis: *Sowjanya Yelluripati*[1]; Samuel Nielson[1]; Tyamo Okosun[1]; Joe Maiolo[2]; Victor Hernandez[2]; Kosta Leontaras[3]; Jason Entwistle[3]; Chenn Zhou[1]; [1]Purdue University Northwest; [2]Linde; [3]U.S. Steel

9:20 AM Invited
Development of Ceramic Components for Energy Efficient Combustion Technology for Gas Burner Applications: *Lalit Kumar Sharma*[1]; Rekha T[1]; Hari Rao[1]; [1]Mahamana Ceramic Development O

9:50 AM
Continuous Extrusion of Coal-Derived Carbon Foam: Expanding Utilization in Industry Applications.: *Caleb Gula*[1]; Yahya Al-Majali[1]; [1]Institute for Sustainable Energy and the Environment

10:10 AM Break

10:30 AM
High Throughput Desktop Electrospinning System: *Tessa Gilmore*[1]; Pelagia-Irene Gouma[1]; [1]The Ohio State University

10:50 AM Invited
In-Situ Investigation on Crack-Initiation and Deformation of Alumina Green Bodies during Dewaxing Process by Combined OCT-TG-FTIR and TMA: *Junichi Tatami*[1]; Mariko Minami[1]; Motoyuki Iijima[1]; Takuma Takahashi[2]; Tatsuki Ohji[3]; [1]Yokohama National University; [2]Kanagawa Institute of Industrial Science and Technology; [3]National Institute of Advanced Industrial Science and Technology

11:20 AM
Highly Water-Stable 2D Metal-Organic Framework-Based Membrane for Molecular Separation: *Haftu Alemayehu*[1]; [1]Arba Minch University

CERAMIC AND GLASS MATERIALS

ACerS-ECerS Joint Symposium: Emerging Leaders in Glass and Ceramics — Session I

Sponsored by: The American Ceramic Society , The European Ceramic Society

Program Organizers: Rajendra Bordia, Clemson University; Thomas Graule, Empa; Francis Cambier, Belgian Ceramic Research Ctr; Sanjay Mathur, University of Cologne

Monday AM | October 7, 2024
408 | David L. Lawrence Convention Center

Session Chairs: Thomas Graule, Empa; Rajendra Bordia, Clemson University

8:00 AM Invited
Laser Induced Forward Transfer on the Printing of Multimaterial Devices for Energy Applications: *Maria Canillas*[1]; Carlos Bueno[2]; David Canteli[1]; Cristia Muñoz[1]; David Muñoz[1]; Miguel A Rodriguez[3]; Carlos Molpeceres[1]; Miguel Morales[1]; [1]Universidad Politécnica de Madrid; [2]Universidad Politécnica of Madrid; [3]Consejo Superior de Investigaciones Científicas

8:30 AM Invited
Novel Two-dimensional Ceramics for Energy Applications: *Michael Naguib*[1]; [1]Tulane University

9:00 AM Invited
Design of Piezoceramics Using Extended Defects: *Jurij Koruza*[1]; Fangping Zhuo[2]; Changhao Zhao[3]; Jürgen Rödel[2]; [1]Graz University of Technology; [2]TU Darmstadt; [3]Xi'an Jiaotong University

9:30 AM Invited
Development of Personalized and Affordable Multi-Substituted Calcium Phosphate-Based Biomimetic Scaffolds for Bone Regeneration Applications: *Antonia Ressler*[1]; Erkka Frankberg[1]; Setareh Zakeri[1]; Martin Schwentenwein[2]; Susanna Miettinen[1]; Erkki Levänen[1]; [1]Tampere University; [2]Lithoz GmbH

10:00 AM Break

10:20 AM Invited
Ceramic Interfaces: What Do We Still Need to Learn?: *Shen Dillon*[1]; [1]University of California, Irvine

10:50 AM Invited
The Role of Porous Additives on Carbonation of Cement-Based Composites: Melissa Mills[1]; Atolo Tuinukuafe[1]; Chven Mitchell[1]; *Jessica Rimsza*[1]; [1]Sandia National Laboratories

11:20 AM Invited
Integrated Data Science and Computational Materials Science for Understanding Complex Materials: *Dilpuneet Aidhy*[1]; [1]Clemson University

11:50 AM Invited
The Role of Anisotropic Grain Boundary Energy in Grain Growth of Textured Alumina: *Amanda Krause*[1]; Bryan Conry[2]; Lin Yang[3]; Michael Kesler[2]; Michael Tonks[3]; [1]Carnegie Mellon University; [2]Oak Ridge National Laboratory; [3]University of Florida

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SPECIAL TOPICS

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

Monday AM | October 7, 2024
407 | David L. Lawrence Convention Center

Session Chair: Helen Chan, Lehigh University

9:00 AM Invited
Materials for Extreme (and Space) Environments: Crystallography and Properties: *Olivia Graeve*[1]; [1]University of California, San Diego

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ADDITIVE MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Engineering Ceramics Division, ACerS Manufacturing Division

Program Organizers: Lei Chen, University of Michigan-Dearborn; Xuan Song, University of Iowa; Xiangyang Dong, Arizona State University; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, The Pennsylvania State University

Monday AM | October 7, 2024
304 | David L. Lawrence Convention Center

Session Chairs: Liyi Wang, University of Pittsburgh; Luis Ladinos Pizano, University of Pittsburgh

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8:00 AM Invited
Irradiative Ceramization of Chemically Bound Phosphate Ceramics (CBPCs) to Enable Direct Additive Manufacturing of Ceramic Composites: *Mark Losego*[1]; [1]Georgia Institute of Technology

8:40 AM
Dense Complex Shape Ceramic Components Fabricated By Digital Light Printing (DLP) and Liquid Silicon Infiltration (LSI): *Jiwen Wang*[1]; [1]Coherent

9:00 AM
Density Improvement of Binder Jet Printed MnZn Ferrite Cores via Pre-and Post- Sintering Improvement Strategies: *Bishal Bhandari*[1]; Dipika Mandal[1]; Christopher Bracken[1]; Chuyuan Zheng[1]; Suraj Mullurkara[1]; Paul Ohodnicki[1]; [1]University of Pittsburgh

9:20 AM
Densification and Microstructure Evolution of Alumina Structures via Direct Ink Writing: *Deeksha Kodangal*[1]; Rajendra Kumar Bordia[1]; [1]Clemson University

9:40 AM
Laser-Directed Energy Deposition Additive Manufacturing of Lunar Highlands Simulant (LHS-1) Lunar Regolith Simulant for In Situ Resource Utilization: *Sizhe Xu*[1]; Marwan Haddad[1]; Aslan Alamdari[1]; Sarah Wolff[1]; [1]Ohio State University

10:00 AM Break

10:20 AM
Fused Filament Fabrication of Ceramic Matrix Composite Preforms Via Thermo-Oxidative Stabilization of Polyetheretherketone: *Dustin Gilmer*; Samuel Pankratz[1]; Corson Cramer[2]; James Klett[2]; Greg Larsen[2]; Uday Vaidya[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

10:40 AM
Dispersion of PMN-PZT for Direct Ink Writing: *Chloe Fellabaum*[1]; Christopher Eadie[2]; Beecher Watson[2]; Jennifer Gray[3]; Mark Fanton[2]; Richard Meyer[2]; [1]Penn State University; [2]Penn State Applied Research Laboratory; [3]Penn State Materials Research Institute

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ADDITIVE MANUFACTURING

Additive Manufacturing of Polymeric-based Materials: Potentials and Challenges — Revolutionizing Applications and Unleashing the Potential of Polymer-based Additive Manufacturing

Sponsored by:

Program Organizers: Matthew Caputo, Pennsylvania State University - Shenango; Ola Rashwan, Pennsylvania State University-Harrisburg; Jason Walker, The Ohio State University; Daudi Waryoba, Pennsylvania State University

Monday AM | October 7, 2024
302 | David L. Lawrence Convention Center

Session Chairs: Matthew Caputo, Penn State Shenango; Ola Rashwan, Penn State Harrisburg

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8:00 AM Introductory Comments

8:05 AM
Advanced Surface Engineering for Improved Ice-Traction and Wear-Resistance: *Sabrina Islam*[1]; Z. Shaghayegh Bagheri[1]; [1]George Mason University

8:25 AM
Design and Additive Manufacturing of Polyethylene-Based Hierarchical Composites by Selective Laser Sintering: *Muxuan Yang*[1]; [1]University of Akron

8:45 AM
Recent Advances in Gas Atomization Processing of Polymer Powders for AM: *Abigail Stanlick*[1]; Jordan Tiarks[2]; Iver Anderson[1]; [1]Iowa State University; [2]Ames National Laboratory

9:15 AM
Investigation of Aging Behavior and Sensor Performance of Thiolene Based UV-Curable Elastomers Printed via Direct Ink Writing for Soft Robotic Applications: *Emrah Demirkal*[1]; Austin Hewitt[1]; Derrick Banerjee[1]; Rowan Barto[1]; Katarzyna Sabolsky[1]; Konstantinos Sierros[1]; Edward Sabolsky[1]; [1]West Virginia University

9:35 AM
Optimization of 4D Printing Parameters for Shape Memory Polymer Blends: A Comprehensive Characterization Study on TPU/PLA Blend: *Sibani Mahapatra*[1]; Shampa Aich[1]; [1]Indian Institute of Technology Kharagpur

9:55 AM Break

10:10 AM
Ultrasonic Welding with L and L&T Mode Transducers: *Celaletdin Ergun*[1]; [1]Istanbul Technical University

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ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Session I: Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Samantha Webster, Nist - Gaithersburg; Ola Harrysson, North Carolina State University; Ulf Ackelid, Freemelt AB

Monday AM | October 7, 2024
303 | David L. Lawrence Convention Center

Session Chairs: Joy Gockel, Colorado School of Mines; Ian Crawford, Freemelt Americas Inc.

8:00 AM Invited
Advancements in Microstructure Control in Additive Manufacturing through Operando X-Ray Studies: Adrita Dass[1]; Akane Wakai[1]; *Atieh Moridi*[1]; [1]Cornell University

8:40 AM Invited
Phase and Stress Manipulation via Operando Multispectral Infrared, Digital Image Correlation, and Neutron Diffraction: *James Haley*[1]; Chris Fancher[1]; Calen Kimmel[1]; John Potter[1]; Wei Tang[1]; Ke An[1]; Dunji Yu[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

9:20 AM Invited
Leveraging High-Throughput X-Ray Imaging for a Deeper Understanding of Powder Bed Fusion and in a Adaptive Laser Power Control Methodology: *Fred Carter*[1]; [1]DMG MORI

10:00 AM
A Low-Cost Laser Beam Profile Measurement Technique for High-Power Lasers Used in Metal Manufacturing Processes: *Aslan Bafahm Alamdari*[1]; Sizhe Xu[1]; Enam Chowdhury[1]; Sarah Wolff[1]; [1]Ohio State University

10:20 AM Break

10:40 AM
Melt Pool Thermal Imaging on Wire-Arc Additive Manufacturing Using the Two-Color Method with a Commercial Color Camera: *Gala Solis*[1]; Alexander Myers[1]; Guadalupe Quirarte[1]; Mikhail Khrenov[1]; Sneha Narra[1]; Jonathan Malen[1]; [1]Carnegie Mellon Univeristy

11:00 AM
Analysis of Thermal Profile in Continuous Casting Guide Rolls during Laser Cladding under Different Operating Conditions: *Dae-Geun Hong*[1]; Gibeom Kim[1]; Chang-Hee Yim[1]; Nam-Kyu Park[2]; Deok-Su Yun[2]; Tae-Gyu Lee[2]; Rae-Hyung Chung[2]; Changwoo Park[3]; [1]Pohang University of Science and Technology; [2]Sung-Wook Co., Ltd.; [3]Seoul National University

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ADDITIVE MANUFACTURING

Additive Manufacturing: Interactions between Energy and Materials — Additive Manufacturing: Energy-Matter Interactions

Sponsored by: ACerS Manufacturing Division

Program Organizers: Fuda Ning, Binghamton University; Wen Chen, University of Massachusetts-Amherst; Zhichao Liu, West Virginia University

Monday AM | October 7, 2024
305 | David L. Lawrence Convention Center

Session Chairs: Fuda Ning, Binghamton University; Zhichao Liu, West Virginia University

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8:00 AM
Three-Dimensionally (3D) Controlled Aerosol Deposition of SOFC Electrolytes and Electrodes with Quantitative Defect Characterization: *Davis Warmuth*[1]; Joshua Tenney[1]; Evan Helgeson[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; Harry Abernathy[2]; [1]West Virginia University; [2]US DOE-National Energy Technology Laboratory, Morgantown, WV

8:20 AM
Tribo-Mechanical Behavior of DED Processed Yttria Reinforced SS316L for Nuclear Energy Applications: *Manikanta Grandhi*[1]; Sudip Saha[2]; Changyu Ma[1]; Bruce Kang[1]; Sougata Roy[3]; Zhichao Liu[1]; [1]West Virginia University; [2]Auburn University; [3]Iowa State University

8:40 AM
Influence of Heat Treatment Duration on Microstructural Evolution and Mechanical Characteristics of 17-4 PH Stainless Steel/Inconel 625 Bimetallic Components Manufactured by Fused Filament Fabrication: *Yulin Liu*[1]; Fuda Ning[1]; [1]Binghamton University

9:00 AM
Generation of a Plasma during Flash and Its Migration Under Magnetic Fields, and It Application to Touch-Free Flash Sintering: *Rishi Raj*[1]; Zeynep Cetinkaya[1]; [1]University of Colorado

9:20 AM Question and Answer Period

9:40 AM
Mechanical Characterization of Additively Manufactured Ceramic Nanocomposites Reinforced by Boron Nitride Nanotubes: *Dingli Wang*[1]; Changhong Ke[1]; [1]SUNY-Binghamton

10:00 AM Break

10:20 AM
Numerical Simulation of the First Layer Printing in Electric Field-Assisted Fused Filament Fabrication for Robust Unconventionally Oriented Additive Manufacturing: *Shantanu Gopal Gaurkhede*[1]; Jia Deng[1]; [1]Binghamton University

10:40 AM
In-Situ Laser surface Remelting of Additive Build Ti6Al4V in Nitrogen Environment for Surface Nitriding: *Ankit Porwal*[1]; Cheruvu Kumar[1]; Santanu Dhara[1]; [1]IIT Kharagpur

11:00 AM
Insights into the Selective Laser Sintering of Light-Weight Structures Made from Nylon Materials: *Aime Rugerinyange*[1]; Yingbin Hu[1]; Jacob Gallaspie[1]; Bruce Hardman[1]; Lewis Rowan[1]; [1]Miami University

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructure, Defects, and Properties — Phase Stability in Extreme Environments

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee

Program Organizers: Nadia Kouraytem, Utah State University; Shenyang Hu, Pacific Northwest National Laboratory; Mohan Sai Kiran Nartu, Pacific Northwest National Laboratory (Pnnl); Srujan Rokkam, Advanced Cooling Technologies, Inc.; Mohsen Asle Zaeem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology; Donna Guillen, Idaho National Laboratory; Dan Young, Wright State; Iris Rivero, University of Florida; Jonathan Pegues, Castheon; Eric Payton, University of Cincinnati; Ming Chen, Northwestern University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati

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Session Chairs: Ashley Paz y Puente, University of Cincinnati; Haozhi Zhang, North Carolina State University

8:00 AM Invited
Towards More Consistent Microstructures in Laser Powder Bed Fusion 17-4 PH Stainless Steel: *Michael Haines*[1]; Ehsan Farabi[1]; Vitor Rielli[1]; Nima Haghdadi[1]; Sophie Primig[1]; [1]University of New South Wales

8:40 AM Invited
Phase Stability of Additively Manufactured Multi-Principal Element Alloys in Irradiation Environments: *Haiming Wen*[1]; Matthew Luebbe[1]; [1]Missouri University of Science and Technology

9:20 AM
Phase Stability of Dual-Phase CoCrFeNiTi High Entropy Alloys Synthesized via Laser-Directed Energy Deposition Under Heavy Ion Irradiation: *Shunyu Liu*[1]; Som Dixit[1]; Wei-Ying Chen[2]; Meimei Li[2]; [1]Clemson University; [2]Argonne National Laboratory

9:40 AM Invited
Limits of Dispersoid Size and Number Density in ODS Alloys Fabricated with Laser Powder Bed Fusion: Nathan Wassermann[1]; Yongchang Li[2]; Alexander Myers[1]; Christopher Kantzos[3]; Timothy Smith[3]; Jonathan Malen[1]; Jack Beuth[1]; Lin Shao[2]; Alan McGaughey[1]; *Sneha Narra*[1]; [1]Carnegie Mellon University; [2]Texas A&M University; [3]NASA Glenn Research Center

10:20 AM Break

10:40 AM Invited
Phase Stability of Laser Directed Energy Deposition Additive Manufactured Stainless Steels for Nuclear Applications: *Isabella Van Rooyen*[1]; Subhashish Meher[1]; Asif Mahmud[1]; Peter Renner[1]; John Snitzer[2]; Xiaoyuan Lou[2]; [1]Pacific Northwest National Laboratory; [2]Purdue University

11:20 AM
Efficient Improvement of High-Temperature Ductility in Selective Laser Melted Ni-Cr-Co Superalloy by Mg Microalloying and Optimized Heat Treatment: *Zexin Quan*[1]; Qiang Jia[1]; Yishu Wang[1]; Fu Guo[1]; Qiang Hu[2]; Wenqian Guo[2]; [1]Beijing University of Technology; [2]GRINM Additive Manufacturing Technology Co. Ltd.

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advanced Ceramics for Environmental Remediation — Session I

Program Organizers: Alberto Vomiero, Lulea University of Technology; Elisa Moretti, Ca' Foscari University of Venice; Tofik Shifa, Ca'Foscari University of Venice; Clara Santato, Polytechnique Montreal

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Session Chairs: Elisa Moretti, Ca'Foscari university of venice; Alberto Vomiero, Lulea University of Technology; Andrea Li Bassi, Politecnico di Milano

8:30 AM Introductory Comments Prof. Moretti/Prof. Alberto

8:40 AM Invited
2D Carbons and Nanocarbons for Environmental Remediation and Nanofiltration in Agriculture: *Giovanni Fanchini*[1]; [1]University of Western Ontario

9:10 AM Invited
Advances in Photon-Harvesting Technologies for Perovskite Absorbers and Water Splitting Reactions: *Sanjay Mathur*[1]; [1]University of Cologne

9:40 AM Invited
Luminescent Eu^{3+} and Ag Doped 13X Zeolites as Porous Materials for Environmental Remediation and Sensing: *Francesco Enrichi*[1]; Anna Safonova[1]; Alessia Sambugaro[1]; Michele Cassetta[1]; Gino Mariotto[1]; Nicola Daldosso[1]; Farid Akhtar[2]; Alberto Vomiero[2]; Warren Cairns[3]; [1]University of Verona; [2]Luleå University of Technology; [3]CNR-ISP Institute of Polar Sciences

10:10 AM Break

10:30 AM Invited
Machine Learning Assisted Discovery of Perovskite Oxides for Thermochemical CO2 Decomposition: Ximei Zhai[1]; Xiaoyan Han[1]; Zeyu Zhao[2]; Feng Luo[1]; *Jianhua Tong*[1]; [1]Clemson University; [2]Idaho National Laboratory

LIGHTWEIGHT ALLOYS

Advancements in Lightweight Composites, Materials & Alloys — High Temperature Applications

Sponsored by: TMS: Materials Characterization Committee

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Ramachandra Canumalla, Weldaloy Specialty Forgings; Aashish Rohatgi, Pacific Northwest National Laboratory

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Session Chair: T Jayaraman, United States Air Force Academy

8:00 AM
High Temperature Tensile Strength and Creep Behavior of an $L1_2$ Strengthened Al-Ce Alloy: *Opemipo Adetan*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

8:20 AM Invited
Novel Nanocomposite High-Temperature Thermoelectric Materials: *Kevin Anderson*[1]; Benjamin Greenberg[1]; Alan Jacobs[1]; James Wollmershauser[1]; Boris Feigelson[1]; [1]U.S. Naval Research Laboratory

8:50 AM Invited
Aluminum Metal Matrix Composites for Electric Vehicle Powertrain Applications: Xiao Li[1]; Hrishikesh Das[1]; Mayur Pole[1]; Shane Kastamo[2]; Adam Loukus[2]; Jung Choi[1]; Semanti Mukhopadhyay[1]; Matthew Olszta[1]; *Aashish Rohatgi*[1]; Arun Devaraj[1]; Glenn Grant[1]; Darrell Herling[1]; Mert Efe[1]; [1]Pacific Northwest National Laboratory; [2]Loukus Technologies, Inc.

9:20 AM Invited
Automated Image Segmentation for High-Throughput Microstructure Analysis to Aid Aluminum Alloy Development: *Michael Tershakovec*[1]; Jon-Erik Mogonye[1]; Taylor Cain[1]; [1]US Army DEVCOM Army Research Lab

9:50 AM Break

10:10 AM
Nitridation-Based Self Forming of Al6061/SiC Composites: *Hyunjoo Choi*[1]; Kon-Bae Lee[1]; [1]Kookmin University

10:30 AM
Gradient Alloying as a Combinatorial Approach for the Discovery of 100% Secondary Content Aluminum Alloys: *Tianhao Wang*[1]; Xiao Li[1]; Shivakant Shukla[1]; Akash Mukhopadhyay[1]; [1]Pacific Northwest National Laboratory

10:50 AM
Improvement of Ti-6Al-4V Wear Performance through Various Surface Modifications: *Beyza Öztürk*[1]; Emma White[1]; Daniel Dickes[2]; Uwe Glatzel[2]; Mathias Galetz[1]; [1]DECHEMA Research Institute; [2]University of Bayreuth

11:10 AM
Monotonic Tensile Behavior of CuCrZr at Room Temperature: *Robert Meyer*[1]; Nathan Fleming[1]; Ramachandra Canumalla[1]; [1]Weldaloy Specialty Forgings

MATERIALS-ENVIRONMENT INTERACTIONS

Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson — Fundamentals of Oxidation and Materials Degradation

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: High Temperature Alloys Committee, TMS: Alloy Phases Committee

Program Organizers: Kinga Unocic, North Carolina State University; Wei Xiong, University of Pittsburgh; Elizabeth Opila, University of Virginia; Richard Oleksak, National Energy Technology Laboratory; Rishi Pillai, Oak Ridge National Laboratory; Bruce Pint, Oak Ridge National Laboratory

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Session Chairs: Kinga Unocic, Oak Ridge National Laboratory; Wei Xiong, University of Pittsburgh

8:00 AM Invited
50+ Years of High-Temperature Corrosion at Pitt-MEMS: *Gerald Meier*[1]; [1]University of Pittsburgh

8:25 AM Keynote
High Temperature Corrosion in Mixed Gases: *David Young*[1]; [1]University of New South Wales

9:00 AM Invited
Effects of Chlorides and Sulphates on High-Temperature Corrosion of Chromia-Forming Fe-Based Alloys in Wet CO2 Gas: Xuteng Xi[1]; Yuchen Cai[1]; *Jianqiang Zhang*[1]; Brian Gleeson[2]; David Young[1]; [1]UNSW Australia; [2]University of Pittsburgh

9:25 AM Invited
Si Bond Coat Oxidation in SiC-Composite $Yb_2Si_2O_7$ Systems: Rachel Guarriello[1]; Dominic Pinnisi[2]; *Elizabeth Opila*[3]; [1]Physical Sciences, Inc.; [2]Northrup Grumman; [3]University of Virginia

9:50 AM Invited
Experimental Considerations Required for the Lab-Scale Replication of Corrosion Experienced by Nickel Superalloy Components in Aviation Gas-Turbine Engines: *Patrick Brennan*[1]; [1]GE Aerospace Research

10:15 AM Break

10:35 AM Invited
Steam Degradation Mechanisms in Sustainably Fueled Gas-Turbine Engines: *Wes Jackson*[1]; [1]RTX Technology Research Center

11:00 AM Invited
High-Temperature Oxidation Behavior of Dissimilar Metal Weld Joins for Steam Power Applications: *Grace de Leon*[1]; Mallikarjun Karadge[1]; Voramon Dheeradhada[1]; Marissa Brennan[2]; Sreekar Karnati[1]; Tim Stotler[3]; [1]GE Vernova- Advanced Research Center; [2]GE Aerospace - Advanced Research Center; [3]EWI

11:25 AM
Thermochemical Stability of Yb2Si2O7-Yb2SiO5 Mixtures in High-Temperature Water Vapor Environments: *Chathuranga Sandamal Witharamage*[1]; Wesley Jackson[2]; Elizabeth Opila[1]; [1]University of Virginia; [2]Raytheon Technologies Research Center

11:45 AM
Factors Affecting Na_2SO_4 -Deposit-Induced Corrosion of Ni-Based Superalloys at High Temperatures: *Preston Nguyen*[1]; Douglas Konitzer[1]; Brian Gleeson[1]; [1]University of Pittsburgh

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing — Joint Session: Steels for Sustainable Development & Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing

Sponsored by: TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Andrew Iams, National Institute of Standards and Technology; Samantha Webster, Nist - Gaithersburg; Sarah Wolff, The Ohio State University; Carelyn Campbell, National Institute of Standards and Technology; Wei Xiong, University of Pittsburgh

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Session Chair: Andrew Iams, National Institute of Standards and Technology

9:40 AM Invited
Green Ironmaking via Ammonia-Based Direct Reduction of Iron Ores: *Yan Ma*[1]; [1]Max-Planck-Institut Fuer Eisenforschung Gmbh

10:10 AM Break

10:30 AM Invited
Pathways for Decarbonizing Steel: *Sridhar Seetharaman*[1]; [1]Arizona State University

11:00 AM Invited
Quantifying Pyrometallurgy Process Options with Low-Dimensional Models: *Petrus Pistorius*[1]; [1]Carnegie Mellon University

11:30 AM Invited
The Road to Sustainable Steelmaking Technologies: Linking Fundamental and Applied Research Activities: *Susanne Michelic*[1]; Julian Cejka[2]; Alexander Halwax[3]; Johannes Schenk[1]; [1]Montanuniversitaet Leoben; [2]Christian Doppler Laboratory for Inclusion Metallurgy in Advanced Steelmaking; [3]K1-MET GmbH

IRON AND STEEL (FERROUS ALLOYS)

Austenite Formation and Decomposition V: A Symposium in Memory of Prof. Mats Hillert — Microstructure I

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee, TMS: Steels Committee, TMS: Phase Transformations Committee

Program Organizers: Annika Borgenstam, KTH Royal Institute of Technology; John Agren, Royal Institute of Technology; Amy Clarke, Los Alamos National Laboratory; Hatem Zurob, McMaster University; Matthias Militzer, University of British Columbia; Kester Clarke, Los Alamos National Laboratory; Igor Vieira, Nucor Steel; Daniel Baker, LIFT

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Session Chair: Annika Borgenstam, KTH Royal Institute of Technology

9:00 AM Keynote
Mats Hillert's View on the State of Migrating Phase Interfaces: *John Agren*[1]; [1]Royal Institute of Technology

9:40 AM
Carbon Solute Drag Effect on the Growth of Carbon Supersaturated Bainitic Ferrite: *Zongbiao Dai*[1]; Junjie Sun[1]; Hao Chen[2]; Sybrand van der Zwaag[3]; Jun Sun[1]; [1]State-Key Laboratory for Mechanical Behavior of Materials; [2]Tsinghua University; [3]Technical University Delft

10:00 AM Invited
Nanoscale Investigation of Austenite To Ferrite Transformation Interfaces in Fe-Mn-C Steel: *Olha Nakonechna*[1]; Frederic Danoix[2]; Helena Zapolsky[2]; Mohamed Gouné[3]; [1]Institute Jean Lamour - Université de Lorraine; [2]Groupe de Physique des Matériaux (GPM) - University of Rouen Normandy; [3]ICMCB - University of Bordeaux

10:30 AM Break

10:50 AM Keynote
Austenite at Its Finest: Understanding Interlath Austenite and Its Effects: *C. Tasan*[1]; [1]Massachusetts Institute of Technology

11:30 AM
Rapid Heating for Enhanced Austenite Reversion and Tensile Properties Toward a Green Cold-Rolled Low-Density Steel: *Tomas Scuseria*[1]; Dean Pierce[2]; Kelcey Garza[3]; Amy Clarke[4]; Kester Clarke[4]; [1]Colorado School of Mines; [2]Oak Ridge National Laboratory; [3]Cleveland-Cliffs, Inc.; [4]Colorado School of Mines; Los Alamos National Laboratory

11:50 AM
Optimization of Duplex Medium Manganese Steel Microstructures by High-Throughput Characterization Methods: *Olha Nakonechna*[1]; Guillaume Geandier[1]; Imed-Eddine Benrabah[1]; Benoit Denand[1]; Lionel Germain[2]; Hugo Van Landeghem[3]; Alexis Deschamps[3]; Sébastien Allain[1]; [1]Institut Jean Lamour, CNRS - Université de Lorraine; [2]LEM3, CNRS - Université de Lorraine; [3]SIMaP, University of Grenoble Alpes, CNRS, Grenoble INP

12:10 PM
Bainite Formation Observed by In Situ Transmission Electron Microscopy: *Daniel dos Santos Avila*[1]; John Nutter[2]; W. Mark Rainforth[2]; S. Erik Offerman[1]; Maria J. Santofimia[1]; [1]Delft University of Technology; [2]University of Sheffield

12:30 PM Invited
Optimizing Steel Microstructure for Mechanical Properties: Insights from Comparative Characterization Methods: Sergio Fernandez-Sanchez[1]; Nerea Isasti[1]; Denis Jorge-Badiola[1]; Claudio Aguilar[2]; *Pello Uranga*[1]; [1]CEIT and TECNUN (University of Navarra); [2]Universidad Técnica Federico Santa María

NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy Systems — Ceramic and Glass Waste Forms

Sponsored by: ACerS Energy Materials and Systems Division, TMS: Nuclear Materials Committee

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Theodore Besmann, University of South Carolina; Charmayne Lonergan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Kaustubh Bawane, Idaho National Laboratory; Joshua White, Los Alamos National Laboratory; Christian Deck, General Atomics; Gordon Thorogood, Australian Nuclear Science and Technology Organization

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Session Chairs: Charmayne Lonergan, Missouri University of Science and Technology; Maik Lang, University of Tennessee

8:00 AM Invited
Corrosion Behavior of Nuclear Waste Glasses and Glass-Ceramics in Geological Repository Systems: *James Neeway*[1]; [1]Pacific Northwest National Laboratory

8:30 AM Invited
Determining Waste Glass Corrosion via the EPA Method 1313, the Stirred Reactor Coupon Analysis, and Vapor Hydration Testing: *Lucas Greiner*[1]; Jesse Westman[2]; James Neeway[2]; Charmayne Lonergan[1]; [1]Missouri Science and Technology; [2]Pacific Northwest National Lab

8:50 AM
Analysis of Crucible-Scale Corrosion Testing of Monofrax® K-3 Refractory in Contact with Glass Melts: *Matthew Page*[1]; Nicodemus Rod[1]; Jake Amoroso[1]; [1]Savannah River National Laboratory

9:10 AM
Progress on Modeling Refractory Corrosion of Waste Glass Melters: *Donna Guillen*[1]; Tongan Jin[2]; Jaroslav Klouzek[3]; Richard Pokorny[3]; Jake Amoroso[4]; Mark Hall[2]; John Acierno[1]; Daniel Yankura[1]; Albert Kruger[5]; [1]Idaho National Laboratory; [2]Pacific Northwest National Laboratory; [3]UCT Prague; [4]Savannah River National Laboratory; [5]U.S. Department of Energy

9:30 AM
Time-Temperature-Transformation Diagram Development for a Coupled-Operation Glass Composition with SWPF: *Matthew Page*[1]; Nicodemus Rod[1]; Madison Hsieh[1]; Fabienne Johnson[1]; [1]Savannah River National Laboratory

9:50 AM Break

10:10 AM Invited
Iron Phosphate Glasses for Waste Immobilization: *Richard Brow*[1]; CW Kim[2]; [1]Missouri University of Science and Technology; [2]Mo-Sci, LLC

10:40 AM
Composition and Properties of Iron Phosphate Waste Forms for Radioactive Salt Waste Immobilization: *Harmony Werth*[1]; Paige Murray[1]; Jade Beland[1]; Charmayne Lonergan[2]; Brian Riley[3]; Michael Simpson[4]; Krista Carlson[1]; [1]University of Nevada Reno; [2]Missouri University of Science and Technology; [3]Pacific Northwest National Lab; [4]The University of Utah

11:00 AM
Phosphate-Based Dechlorination of Electrorefiner Salt Waste Using a Phosphoric Acid Precursor: *Paige Murray*[1]; Harmony Werth[1]; Sean Sullivan[1]; Brian Riley[2]; Michael Simpson[3]; Charmayne Lonergan[4]; Krista Carlson[1]; [1]University of Nevada, Reno; [2]Pacific Northwest National Laboratory; [3]University of Utah; [4]Missouri University Science and Technology

11:20 AM
Investigation of Technetium Management through Chalcogenides and Bimetallic Nanoparticles: *Logan Breton*[1]; Jake Amoroso[1]; [1]SRNL

11:40 AM
Predicting the Durability of Nuclear Waste Immobilization Glasses Using Nonparametric Machine Learning: Yu Song[1]; Xiaonan Lu[2]; Joseph Ryan[2]; Morten Smedskjaer[3]; John Vienna[2]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles; [2]PNNL; [3]Aalborg University

FUNDAMENTALS AND CHARACTERIZATION

Computational Materials for Qualification and Certification — Overview and "State of Practice" Assessment

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Corbett Battaile, Sandia National Laboratories; Anthony Rollett, Carnegie Mellon University; Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration

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Session Chairs: Michael Gorelik, Federal Aviation Administration; Edward Glaessgen, NASA Langley Research Center

8:00 AM Invited
Computational Materials for Qualification and Certification Steering Group and Community Vision Roadmap: *Edward Glaessgen*[1]; Michael Gorelik[2]; [1]NASA Langley Research Center; [2]Federal Aviation Administration

8:30 AM Invited
Industry's Vision for the Use of Computational Materials Tools in Qualification and Certification: *Derrick Lamm*[1]; [1]Lockheed Martin Corporate, Emerging Operations Technology Portfolio Lead, Additive Manufacturing Technology.

9:00 AM Invited
Transitioning from Basic Research to Industrial Applications for Metal AM Components: *Lyle Levine*[1]; Harry Millwater[2]; Corbett Battaile[3]; Edward Glaessgen[4]; Michael Kane[5]; Sankaran Mahadevan[6]; Caglar Oskay[6]; Carl Popelar[7]; Tony Rollett[8]; Edwin Schwalbach[9]; Paul Toivonen[10]; Derrick Lamm[11]; Narendran Raghavan[12]; [1]National Institute of Standards and Technology; [2]University of Texas San Antonio; [3]Sandia National Laboratory; [4]NASA Langley Research Center; [5]U.S Army DEVCOM AvMC; [6]Vanderbilt University; [7]Southwest Research Institute; [8]Carnegie Mellon University; [9]U.S. Air Force Research Laboratory; [10]Spirit AeroSystems; [11]Lockheed Martin; [12]Boeing

9:30 AM Invited
America Makes Efforts in Advanced Qualification Methods for AM: *Brandon Ribic*[1]; [1]America Makes

10:00 AM Break

10:20 AM Invited
A Framework for Assessing Simulation Maturity: *Edwin Schwalbach*[1]; Lyle Levine[2]; Harry Millwater[3]; Corbett Battaile[4]; Edward Glaessgen[5]; Carl Popelar[6]; Anthony Rollett[7]; Paul Toivonen[8]; Michael Kane[9]; [1]Air Force Research Labroatory; [2]National Institute of Standards and Technology; [3]University of Texas at San Antonio; [4]Sandia National Laboratory; [5]NASA Langley Research Center; [6]Southwest Research Institute; [7]Carnegie Mellon University; [8]Spirit AeroSystems; [9]US Army

10:50 AM Invited
Computational Tools for Advancing Materials Maturity in Additive Manufacturing: *Anthony Rollett*[1]; [1]Carnegie Mellon University

11:20 AM Invited
QUASAR – Assessment of the State of the Art and Gaps for AM of Fracture Critical Components: Matthew Crill[1]; Kevin Slattery[1]; *Rick Russell*[1]; [1]The Barnes Global Advisors

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Nanoparticles

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division, ACerS Energy Materials and Systems Division, ACerS Engineering Ceramics Division

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Purdue University

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Session Chairs: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Sanjay Mathur, University of Cologne

8:00 AM Keynote
Atomically Precise Metal Nanoclusters: *Rongchao Jin*[1]; [1]Carnegie Mellon University

8:40 AM Invited
Adhesion and Stability of Nanoparticles: Direct Measurements Using In Situ TEM: *Tevis Jacobs*[1]; Andrew Baker[1]; Sai Vishnubhotla[1]; Sanjana Karpe[1]; Yahui Yang[1]; Götz Veser[1]; [1]University of Pittsburgh

9:10 AM Invited
Tribochemical Activation of Intergranular Sites Inside Nanoparticle Powder Compacts: *Oliver Diwald*[1]; Korbinian Aicher[1]; Thomas Schwab[1]; Thomas Berger[1]; Milan Oncak[2]; Keith McKenna[3]; [1]Paris Lodron Universitaet Salzburg; [2]University of Innsbruck; [3]University of York

9:40 AM
Electrophoretic Deposition of Iron Oxide Nanoparticles in Various Planar Geometries for On-Chip Component Fabrication: *Sara Mills*[1]; Connor Smith[2]; [1]US Naval Research Laboratory; [2]United States Naval Academy

10:00 AM Break

10:20 AM Invited
Synthesis of Metal and Oxide Inclusion-In-Oxide Composite Materials: *Gunnar Westin*[1]; [1]Uppsala University

10:50 AM Invited
Nanomaterials by Design: Tailored Morphology for Environmental Challenges: *Elisa Moretti*[1]; [1]Ca' Foscari University of Venice

11:20 AM
Tailoring Morphology of Nanostructured Materials in Dry Printing Enabled by Bottom-up Strategies: *V. Vinay K. Doddapaneni*[1]; Chuankai Song[1]; Ningmo Cheng[1]; Isaac Camp[1]; Jeffrey Dhas[1]; Changqing Pan[1]; Alvin Chang[1]; Zhenxing Feng[1]; Konstantinos Sierros[2]; Somayeh Pasebani[1]; Brian Paul[1]; Chih-hung Chang[1]; [1]Oregon State University; [2]West Virginia University

11:40 AM
Controlled Growth of Tellurium Micro- and Nanostructures for Photodetection Applications: *Ahmed Abdelazeez*[1]; Tom Schmedake[1]; Yong Zhang[1]; Haitao Zhang[1]; [1]University of North Carolina at Charlotte

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics I

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

8:00 AM Invited
Magneto-Thermoelectric Properties in FeRh Thin Films during Antiferromagnetic-Ferromagnetic Phase Transition: *Mona Zebarjadi*[1]; Sabbir Akhanda[1]; Sourav Das[1]; Steven Bennett[2]; Sang-Kwon Lee[3]; [1]University of Virginia; [2]NRL; [3]Chung-Ang University

8:30 AM Invited
Enhancing Thermoelectric Materials with Magnetism and Topology: *Sarah Watzman*[1]; [1]University Of Cincinnati

9:00 AM Invited
Half-Heusler Thermoelectrics: Advances from Materials Fundamental to Device Engineering: *Wenjie Li*[1]; Subrata Ghosh[1]; Na Liu[1]; Bed Poudel[1]; [1]The Pennsylvania State University

9:30 AM Invited
High Thermoelectric Figure-of-Merit in Half-Heusler Compounds: *Joseph Poon*[1]; [1]University of Virginia

10:00 AM Break

10:20 AM Invited
Lone Pair Induced 1D Effect and Lattice Vibrations: Two Ingredients for Low Thermal Conductivity in Thermoelectric Sulfides: *Emmanuel Guilmeau*[1]; [1]CRISMAT/CNRS

10:50 AM
High Entropy Engineered Half-Heusler Thermoelectric: *Subrata Ghosh*[1]; Rabeya Smriti[1]; Wenjie Li[1]; Shashank Priya[1]; Bed Poudel[1]; [1]Pennsylvania State University

11:10 AM
Improved Thermoelectric Properties of SiC with Optimized In-Situ Formed Transitional Boride/Carbide Network Microstructures: Salih Ozer[1]; Melis Isik[1]; *Servet Turan*[1]; [1]Eskisehir Technical University

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Engineering Ceramics: Microstructure-Property-Performance Relations and Applications I

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Junichi Tatami, Yokohama National University; Young-Wook Kim, University of Seoul; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

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Session Chairs: Junichi Tatami, Yokohama National University; Jie Zhang, Institute of Metal Research, Chinese Academy of Sciences; Yuki Nakashima, Yokohama National University

8:00 AM Invited
Microscale Mechanical Properties of Silicon Nitride: *Tatsuki Ohji*[1]; Motoyuki Iijima[2]; Takuma Takahashi[3]; Junichi Tatami[2]; [1]National Institute of Advanced Industrial Science and Technology; [2]Yokohama National University; [3]Kanagawa Institute of Industrial Science and Technology

8:20 AM
Effects of Grain Boundary Characteristics on Fracture Toughness and Dielectric Breakdown Strength of Silicon Nitride Ceramics: *Yuki Nakashima*[1]; Ryoichi Furushima[1]; You Zhou[1]; Kiyoshi Hirao[1]; Tatsuki Ohji[1]; Manabu Fukushima[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

8:40 AM
Influence of Various Operating Conditions on Co-Annular Silicon Nitride-Based Glow Plug Degradation: *Prapassorn Numkiatsakul*[1]; Cory Philippe[1]; Eri Amezcua Cuellar[2]; David Rothamer[2]; Tonghun Lee[1]; Kenneth Kim[3]; Chol-Bum Kweon[3]; Waltraud Kriven[1]; [1]University of Illinois Urbana Champaign; [2]University of Wisconsin; [3]Combat Capabilities Development Command Army Research Laboratory

9:00 AM
Spray Freeze Granulation Drying of Nonaqueous Slurry to Fabricate High Strength Silicon Nitride Ceramics: *Junichi Tatami*[1]; Riko Yamazaki[1]; Motoyuki Iijima[1]; Shinya Kawaguchi[2]; Naoki Kondo[3]; [1]Yokohama National University; [2]Preci Co., Ltd.; [3]National Institute of Advanced Industrial Science and Technology

9:20 AM
Tribological Behavior of Spark Plasma Sintered Ti3SiC2 MAX Phase Composites: *Shipra Bajpai*[1]; Maria Cinta Lorenzo Martin[1]; Oyelayo Ajayi[1]; Dileep Singh[1]; [1]Argonne National Laboratory

9:40 AM
Mechanical Testing of Carbon Fiber-Reinforced Silicon Carbide Composites (C/C-SiC): Size effect of bending and tensile strength: Stefan Flauder[1]; Nico Langhof[1]; *Stefan Schafföner*[1]; [1]University of Bayreuth

10:00 AM Break

10:20 AM
In-Situ Microscale Evaluation of Damage Progression in SiC/BN/SiC Ceramic Matrix Composites: *Hunter Gross*[1]; Michelle Harr[2]; Alicia Rossi[3]; Nathan Klingbeil[4]; Kaitlin Detwiler[5]; [1]Strategic Ohio Council for Higher Education / Air Force Reseach Laboratory / Wright State University; [2]MRL Materials Resources, LLC / Air Force Research Laboratory; [3]University of Dayton Research Institute / Air Force Research Laboratory ; [4]Wright State University; [5]Air Force Research Laboratory

10:40 AM
Densification, Mechanical and Thermal Properties Study of Zirconium Diboride with Carbon Additions: *Yue Zhou*[1]; William Fahrenholtz[1]; Gregory Hilmas[1]; [1]Missouri University of Science and Technology

11:00 AM
Combinatorial and High-Throughput Approaches of Advanced Ceramics for High-Temperature Applications: *Jie Zhang*[1]; Xirui Lv[1]; Jingyang Wang[1]; [1]Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

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SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Enhancing Recycling and Reuse of Secondary Materials to Support a Circular Economy — Enhancing Recycling and Reuse of Secondary Materials to Support a Circular Economy

Program Organizers: Christopher Sinton, Integral Consulting Inc.; Gabrielle Gaustad, Alfred University

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Session Chairs: Christopher Sinton, Integral Consulting Inc.; Gabrielle Gaustad, Alfred University

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8:00 AM Introductory Comments

8:10 AM
We Love the "Circular Economy" – But We Must Challenge Our Assumptions: *Jeff Zeman*[1]; Theresa Millard[1]; [1]TrueNorthCollective

8:30 AM
Recycling at Point of Disposal for a Distributed Supply Network: Martin Thuo[1]; Dhanush Jamadgni[1]; *Andrew Martin*[1]; Alana Pauls[1]; Benjamin Kwasa[2]; [1]North Carolina State University; [2]Kent State University

8:50 AM
Waste Coal Utilization for the Production of Mesophase Pitch-Based High Modulus Carbon Fiber: *Christina Thompson*[1]; George Frank[1]; Michela Martinelli[1]; Vivian Edwards[1]; Ashley Morris[1]; Asmund Vego[1]; John Craddock[1]; Mark Meier[2]; Matthew Weisenberger[1]; [1]University of Kentucky Center for Applied Energy Research; [2]University of Kentucky

9:10 AM
Refining Tantalum and Manganese from E-Waste: *Ansan Pokharel*[1]; Shavinka Jayasekera[1]; Edward Sabolsky[1]; Terence Musho[1]; [1]West Virginia University

9:30 AM
Advancements in Dental Material Sustainability: Recycling Cobalt Alloy Residues Using Laser Directed Energy Deposition: *Oscar Barro*[1]; Felipe Arias-González[1]; Daniel Wallerstein[1]; Erik Calvo[1]; Fernando Lusquinos[1]; Rafael Comesana[1]; Juan Pou[1]; [1]University of Vigo

9:50 AM Break

10:10 AM
EVERGLASS. The Development of Laser-Based Technology for Recycling Glass: Rafael Comesana[1]; *Oscar Barro*[1]; Mónica Fernández-Arias[1]; Jesús del Val[2]; Antonio Riveiro[1]; Mohamed Boutinguiza[1]; Fernando Lusquinos[1]; Juan Pou[1]; [1]University of Vigo; [2]Defense University Center, Spanish Naval Academy

10:30 AM
Glass Foams Produced from Soda-Lime Glass Waste and Metallic Hydroxides as Foaming Agents: *Evaldo Kubaski*[1]; Robson da Silva[1]; Maria Fernanda Rosa[1]; Giulia Antero[1]; [1]State University of Ponta Grossa

10:50 AM
Development of 3D Hierarchical Porous Structure Using Brown Mud and Waste Glass, Designed to Maximize Porosity and Mechanical Strength: *Akansha Mehta*[1]; Jozef Kraxner[1]; Abhijeet Lale[2]; Martin Schwentenwein[3]; Dusan Galusek[1]; [1]FunGlass, Alexander Dubcek University; [2]Lithoz GmbH Mollardgasse 85A/2/64–69, Vienna ; [3]Lithoz GmbH Mollardgasse 85A/2/64–69, Vienna

11:10 AM
Reuse of Solid Mining Waste: Resources from the Interstate Technology Regulatory Council: *Christopher Sinton*[1]; Cherri Baysinger[2]; David Cates[3]; Mark Rudolph[4]; [1]Integral Consulting Inc.; [2]Interstate Technology Regulatory Council; [3]Oklahoma Department of Environmental Quality ; [4]Colorado Department of Public Health and Environment

11:30 AM
Evaluation of the Effect on the Mechanical Performance and Workability of Mortars in the Presence of Recycled Fine Aggregates: *A. Bohorquez-Maldonado*[1]; Kevin Stiven Castaño[1]; Camilo Diaz-García[1]; Erick Torres[1]; Juan Camilo Rodríguez-Reyes[1]; Jorge I. Tobón[1]; Ary A. Hoyos-Montilla[1]; Alvaro Castro[1]; [1]Universidad Nacional de Colombia

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FUNDAMENTALS AND CHARACTERIZATION

Fracture in Metals: Insights from Experiments and Modeling Across Length and Time Scales — Modeling and Simulations

Program Organizers: Abigail Hunter, Los Alamos National Laboratory; Nithin Mathew, Los Alamos National Laboratory; Janel Chua, Los Alamos National Lab

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Session Chairs: Janel Chua, Los Alamos National Lab; Balaji Shridar, Carnegie Mellon University

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8:00 AM Invited
A Phase-Field Fracture Model for Compressive Loading: *Kaushik Dayal*[1]; [1]Carnegie Mellon University

8:30 AM
Phase-Field Thermomechanics of Dynamic Fracture: *Balaji Sridhar*[1]; Kiana Naghibzadeh[2]; Janel Chua[3]; Abigail Hunter[3]; George Gazonas[4]; Noel Walkington[1]; Kaushik Dayal[1]; [1]Carnegie Mellon University; [2]Massachusetts Institute of Technology; [3]Los Alamos National Laboratory; [4]Army Research Laboratory

8:50 AM
The Role of Non-Singular Stresses on the Brittle-to-Ductile Transition: *Hunter Brumblay*[1]; Gregory Thompson[2]; Christopher Weinberger[1]; [1]Colorado State University; [2]University of Alabama

9:10 AM
Fracture in Functionally Graded Materials: A Mixed Experimental and Computational Approach: *Katherine Piper*[1]; [1]California Institute of Technology

9:30 AM Invited
Polycrystalline Scale Study of H-Defect Interactions to Investigate H-Enhanced Localized Plasticity: *S. Mohadeseh Taheri-Mousavi*[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM
Thermally Activated Dislocation Motion and the Brittle-to-Ductile Transition Temperature: Hunter Brumblay[1]; Gregory Thompson[2]; *Christopher Weinberger*[1]; [1]Colorado State University; [2]University of Alabama

10:40 AM
Ductility and Brittle Fracture of Tungsten: The Role of Twin Boundaries and Pre-Existing Dislocations: Omar Hussein[1]; Nicolas Bertin[1]; Tomas Oppelstrup[1]; Fadi Abdeljawad[2]; *Timofey Frolov*[1]; [1]Lawrence Livermore National Laboratory; [2]Lehigh University

11:00 AM
Atomistic Studies of Hydrogen Effects on Cross-slip in Ni and Fe70Ni10Cr20: *Xiaowang Zhou*[1]; Fernando León-Cázares[1]; Christopher San Marchi[1]; [1]Sandia National Laboratories

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Grain Growth

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chairs: Melissa Santala, Oregon State University; Dylan Jennings, Forschungszentrum Jülich

9:00 AM Invited
An Orientation-Field Phase Field Model of Grain Growth: *Phil Staublin*[1]; James Warren[2]; Peter Voorhees[1]; [1]Northwestern University; [2]National Institute of Standards and Technology

9:30 AM
Observation of Abnormal Grain Growth in 4D of Pure Ni: *Yi Wang*[1]; Zipeng Xu[1]; Vivekanand Muralikrishnan[1]; Hao Zhu[1]; Gregory Rohrer[1]; Amanda Krause[1]; [1]Carnegie Mellon University

9:50 AM
On the Aleatoric Uncertainty and Uncertainty Propagation in Molecular Dynamics Simulation of Grain Growth: *Meizhong Lyu*[1]; Zipeng Xu[2]; Gregory Rohrer[2]; Elizabeth Holm[1]; [1]University of Michigan; [2]Carnegie Mellon University

10:10 AM Break

10:30 AM
Direct Observation of Anisotropic Growth of Nickel Oxide Nanostructure by the Terrace-Ledge-Kink Mechanism: Boyi Qu[1]; *Klaus van Benthem*[1]; [1]University of California, Davis

10:50 AM
A Correlative Microscopy Framework for In Situ Grain Growth Studies in Thin Films: *Matthew Patrick*[1]; Jeffrey Rickman[2]; Katayun Barmak[1]; [1]Columbia University; [2]Lehigh University

11:10 AM
Abnormal Grain Growth in Metallic Thin Films Under High Cyclic Loading: Yichen Yang[1]; Qiushi Li[1]; Alejandro Barrios[2]; Yazhuo Liu[1]; Manish Jain[3]; Brad Boyce[3]; Ting Zhu[1]; *Olivier Pierron*[1]; [1]Georgia Institute of Technology; [2]Colorado School of Mines; [3]Sandia National Laboratories

11:30 AM
Grain Boundary Migration in the Presence of a Liquid Phase: *Zipeng Xu*[1]; Jun Sun[2]; Jette Oddershede[2]; Jules Dake[3]; Carl Krill III[3]; Gregory Rohrer[1]; [1]Carnegie Mellon University; [2]Xnovo Technology; [3]Ulm University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session I

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Michael Gao, National Energy Technology Laboratory

8:00 AM Invited
Autonomous Research and Development of High-Entropy and Complex, Concentrated Alloys: *Daniel Miracle*[1]; [1]Air Force Research Laboratory

8:20 AM Invited
Can Short Range Order be Used as a 'Design Knob' for High Entropy Alloys?: *Raymundo Arroyave*[1]; [1]Texas A&M University

8:40 AM Invited
Data Driving Design of High-Entropy Alloys for Lightweight and Dynamic Applications: *Yong Zhang*[1]; [1]University of Science and Technology Beijing

9:00 AM Invited
Advancements in Interatomic Potential Development for High Entropy Materials: *Ridwan Sakidja*[1]; Matthew Bruenning[1]; Gaige Riggs[1]; Anika Tabassum[1]; Jonathan Kliewer[1]; [1]Missouri State University

9:20 AM
Chemical Disorder in Fe2VAl1-xSix and Its Effect on the Thermoelectric Properties: *Fuxiang Zhang*[1]; [1]Songshan Lake Materials Laboratory

9:40 AM
Fabrication of Powdered Ti-V-Zr-Nb-Mo-Hf-Ta-W Refractory High-Entropy Alloys by Plasma-Assisted Centrifugal Atomization: *Marina Ciurans-Oset*[1]; Johanne Mouzon[1]; Farid Akhtar[1]; [1]Lulea University of Technology

10:00 AM Break

10:20 AM Invited
Applications of Nanoindentation in High-/Medium-Entropy Alloys R&D: *Jae-il Jang*[1]; Zhe Gao[1]; [1]Hanyang University

10:40 AM Invited
Additive Manufacturing Feasibility of Refractory High Entropy Alloys: *Abdulquadri Oriola*[1]; Anh Nguyen[1]; Ugochukwu Ochieze[1]; Sravya Josyula[1]; Hung Do[1]; Josh Maile[1]; Aaron Mcmillen[1]; William Voellmecke[1]; Eric Payton[1]; [1]University of Cincinnati

11:00 AM Invited
Anisotropic Co-Deformation Behavior of Nanolamellar Structures in Additively Manufactured Eutectic High Entropy Alloys: *Yu Zou*[1]; [1]University of Toronto

11:20 AM
A Phase-field Study of CuO Precipitate Morphology in Epitaxial High-Entropy Oxide Films: *Yueze Tan*[1]; Jacob Sivak[1]; Saeed Almishal[1]; Susan Sinnott[1]; Jon-Paul Maria[1]; Yanzhou Ji[1]; Long-Qing Chen[1]; [1]Pennsylvania State University

11:40 AM
Comparative Studies on Thermo-Mechanical Simulations of Ni25Al25Co14Fe15Ti8Mn8Cr5 High Entropy Alloy Using Thermo-Calc®: *Emmanuel Olorundaisi*[1]; Bukola Babalola[1]; Linda Teffo[2]; Peter Olubambi[1]; [1]University of Johannesburg; [2]Tshwane University of Technology

SPECIAL TOPICS

Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday — Introductory Session

Sponsored by: ACerS Basic Science Division, ACerS Engineering Science Division

Program Organizers: Surojit Gupta, University of North Dakota; Miladin Radovic, Texas A&M University; Michael Naguib, Tulane University

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Session Chairs: Miladin Radovic, Texas A&M University; Surojit Gupta, University of North Dakota

8:00 AM Invited
Honoring Prof. Michel Barsoum: Pioneering Contributions to Ceramic Sciences and Engineering: *Miladin Radovic*[1]; Surojit Gupta[2]; Michael Naguib[3]; [1]Texas A&M University; [2]University of North Dakota; [3]Tulane University

8:20 AM Invited
Michael Barsoum – Pre-MAX Days at MIT: *Harry Tuller*[1]; [1]MIT

8:50 AM Keynote
1D Lepidocrocite Titania-Based Nanomaterials, Their Diverse Morphologies and Exceptional Properties: *Michel Barsoum*[1]; [1]Drexel University

9:30 AM Invited
Atomic and Electronic Structures of One-Dimensional Titania Lepidocrocite: *Yong-Jie Hu*[1]; David Bugallo Ferron[1]; Francisco Lagunas[2]; Robert Klie[3]; Michel Barsoum[1]; [1]Drexel University; [2]Argonne National Laboratory; [3]University of Illinois Chicago

10:00 AM Break

10:20 AM Invited
Tuning the 1D to 2D Transition in Lepidocrocite Titanium Oxide via Polymer Wrapping: *Christopher Li*[1]; [1]Drexel University

10:50 AM Invited
Applications of 1D Titania and Other Low Dimensional Oxides for National Defense: *Joshua Uzarski*[1]; [1]US Army DEVCOM Soldier Center

11:20 AM Invited
Characterization and Synthesis of Novel One-Dimensional Lepidocrocite Titanium-Oxide Nanofilaments: *Mohamed Ibrahim*[1]; Gregory Schwenk[1]; Hussein Badr[1]; Michel Barsoum[1]; [1]Drexel University

11:50 AM Invited
Electronic and Photocatalytic Properties of Colloidal One-Dimensional Titanium Oxide Lepidocrocite Nanofilaments: *Adam Walter*[1]; Gregory Schwenk[1]; Jacob Cope[1]; Michel Barsoum[1]; [1]Drexel Universiy

LIGHTWEIGHT ALLOYS

Light Alloys, Advanced Forming Processes and Characterization — Light Alloys, Advanced Forming Processes and Characterization

Sponsored by: TMS: Aluminum Committee, TMS: Recycling and Environmental Technologies Committee, TMS: Shaping and Forming Committee

Program Organizers: Scott Taylor, WMG, University of Warwick; Ishwar Kapoor, University of Warwick; Hiren Kotadia, Liverpool John Moores University

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Session Chair: Hyokyung Sung, Kookmin University

8:00 AM
Advanced Averaging Transverse Strain Measurement Technology for Automotive Sheet Metal: *Dean Lovewell*[1]; [1]Instron Corporation

8:20 AM
Developing Multifunctional Al-Based Alloys by Solid Stir Processing: *Bharat Gwalani*[1]; Farhan Ishrak[1]; Kumar Kandasamy[2]; Mert Efe[3]; Aniruddha Malakar[1]; Ravi Haridas[4]; Michael Lastovich[1]; Md Jasim Uddin[1]; Rajiv Mishra[4]; [1]North Carolina State University; [2]Enabled Engineering ; [3]Pacific Northwest National Laboratory; [4]University of North Texas

8:40 AM
High Speed Extrusion of ZK60 Mg Alloy by Friction Extrusion Process: *Swapnil Sawalkar*[1]; Benjamin Schuessler[2]; Jens Darsell[2]; Dalong Zhang[2]; Brandon Taysom[2]; Md Reza-E-Rabby[2]; Darrell Herling[2]; David Field[1]; Vineet Joshi[2]; [1]Washington State University; [2]Pacific Northwest National Lab

9:00 AM
Microstructure Modification and Mechanical Properties Improvement of Lightweight Ti-Rich Medium-Entropy Alloys through Minor Boron Addition: *Po-Sung Chen*[1]; Bao-Teng Kuo[1]; Yu-Chin Liao[1]; Pei-Hua Tsai[1]; Li-In Wang[1]; Jason Shian-Ching Jang[1]; Chih-Yen Chen[2]; [1]National Central University; [2]National Yang Ming Chiao Tung University

9:20 AM
Precipitate Evolution and Properties of 7xxx Aluminum Alloy Under the Influence Magnetic Field Annealing: *Damilola Alewi*[1]; Kirk Lemmen[1]; Clé Sanchez[1]; Heather Murdoch[2]; Daniel Magagnosc[2]; Haluk Karaca[1]; Paul Rottmann[1]; [1]University of Kentucky; [2]DEVCOM Army Research Lab

9:40 AM
Solute Clustering Effects on the Microscopic Deformation Behavior of Al-Zn-Mg-Cu Alloys: *Hyokyung Sung*[1]; Saif Kayani[2]; Won-Seok Ko[3]; Hyunjoo Choi[1]; Jae Bok Seol[4]; Jung Gi Kim[4]; [1]Kookmin University; [2]Korea Institute of Materials Science; [3]Inha University; [4]Gyeongsang National University

10:00 AM
Microstructure and Mechanical Analysis of a High Pressure Die Cast Recycled AlSi10MnMg(Fe) Alloy: *Biswajit Dalai*[1]; Simon Jonsson[1]; Manel da Silva[2]; Liang Yu[1]; Jörgen Kajberg[1]; [1]Luleå University of Technology; [2]Eurecat

ARTIFICIAL INTELLIGENCE

Machine Learning and Simulations — Machine Learning and Simulations I

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Anoop Krishnan, IIT Delhi

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Session Chairs: Mathieu Bauchy, UCLA; Peter Kroll, The University of Texas at Arlington; Anoop Krishnan, IIT Delhi

8:00 AM
New Machine–Learning Interatomic Potentials (MLIPs) for Si-C-O-H Compounds Enabling Atomistic Simulations of Complex Chemical Transformations: *Mitchell Falgoust*[1]; Shariq Haseen[1]; Peter Kroll[1]; [1]University of Texas at Arlington

8:20 AM
EBSD Geometry Calibration Through SE(3) Lie Group Optimization: *Zachary Varley*[1]; Marc De Graef[1]; Gregory Rohrer[1]; [1]Carnegie Mellon University

8:40 AM
Generation of Machine Learning Interatomic Potentials for Boron Carbide with Comparison to the Analytic Angular Dependent Potential: *Prakash Khanal*[1]; Paul Rulis[1]; [1]University of Missouri Kansas City

9:00 AM
Predicting the Dynamics of Atoms in Liquids by a Surrogate Machine-Learned Simulator: *Mathieu Bauchy*[1]; Han Liu[1]; [1]University of California, Los Angeles

9:20 AM Invited
Decoding the Structural Genome of Silicate Glasses: *Qi Zhou*[1]; [1]University of California, Los Angeles

10:00 AM Break

10:20 AM
A Machine Learning Approach to Predict Solute Segregation Energy in Ni Grain Boundaries: *Roshan Jha*[1]; Ranjeet Kumar[1]; Sumantra Mandal[1]; [1]Indian Institute of Technology, Kharagpur

10:40 AM
Estimation of Thermal Hysteresis in Zirconia Using Machine Learning Molecular Dynamics and Transition State Modelling: *Owen Rettenmaier*[1]; Srikanth Patala[1]; Christopher Schuh[1]; [1]Northwestern University

11:00 AM
A Machine Learning Based Computational Method for Accurate Prediction of Equilibrium Cation Distribution in Complex Spinel Oxides: *Guofeng Wang*[1]; Ying Fang[1]; [1]University of Pittsburgh

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — New Frontiers in Advanced Manufacturing of Ceramic Materials

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

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Session Chairs: Andrew Brown, Army Research Office; Amanda Krause, Carnegie Mellon University

8:00 AM Invited
Electrification of Ceramics Manufacturing: *Rishi Raj*[1]; [1]University of Colorado

8:30 AM Invited
Controlling Abnormal Grain Growth in Ceramics: *Amanda Krause*[1]; [1]Carnegie Mellon University

9:00 AM Invited
A Critique of Additive Manufacturing of Ceramics: *William Carty*[1]; [1]Alfred University

9:30 AM
Microstructure Development of Novel Composite Heating Elements for Steel Decarbonization: *Michael Mulholland*[1]; Jorgen Rufner[1]; [1]Idaho National Laboratory

9:50 AM Break

10:10 AM Invited
Basic Materials Research Opportunities from the Army Research Laboratory: *Andrew Brown*[1]; [1]DEVCOM Army Research Laboratory (ARL) Army Research Office's (ARO)

10:40 AM Invited
A Strategic Roadmap for Energy-Relevant Harsh Environment Material Research and Development Investments: *John Lalena*[1]; [1]U.S. Department of Energy

11:10 AM Invited
Lithium Storage Performance of Anti-Site Defects Influenced Nanostructured LiFePO4 for High-Power Applications: Markas Law[1]; Hwang Sheng Lee[1]; Viswanathan Ramar[1]; *Palani Balaya*[1]; [1]National University of Singapore

11:40 AM
Flash Joining of Metal-Ceramic Multi-Layered Sandwich Structure: Raghav Mudra[1]; Pulkin Gupta[1]; *Shikhar Krishn Jha*[1]; [1]IIT Kanpur

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Materials Design and Innovation / Physical Property Exploration

Sponsored by: ACerS Basic Science Division

Program Organizers: Fei Peng, Clemson University; Kathy Lu, University of Alabama Birmingham; Pinar Acar, Virginia Tech; Yi Je Cho, Sunchon National University

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Session Chair: Fei Peng, Clemson University

8:00 AM Invited
Digital Twins for Accelerated Materials Innovation: *Surya Kalidindi*[1]; [1]Georgia Institute of Technology

8:30 AM Invited
Denoising Diffusion Probabilistic Model for Data Augmentation and Inverse Design of Structural Materials: *Yoon Suk Choi*[1]; Libin Zhang[1]; Taejoo Lee[1]; Sujeong Kim[1]; [1]Pusan National University

8:50 AM
Multi-Layer Graded Thermal Barrier Coating Design via Deep Reinforcement Learning: *Ningxuan Wen*[1]; Hai Xiao[1]; Dongsheng Li[1]; Fei Peng[1]; [1]Clemson University

9:10 AM Invited
Design of Microstructure in Zn-Al-Mg Alloys Using Integrated Finite Element Analysis and Deep Learning Techniques: Khushahal Thool[1]; Preetham Alluri[1]; Ki-Seong Park[1]; Wi-Geol Seo[1]; *Shi Hoon Choi*[1]; [1]Sunchon National University

9:30 AM Invited
Image Processing of Charge Density from DFT to Predict Properties in Complex Materials: Hossein Mirzaee[1]; Ramin Soltanmohammadi[1]; Nathan Linton[2]; Jacob Fischer[2]; Serveh Kamrava[1]; Pejman Tahmasebi[1]; *Dilpuneet Aidhy*[2]; [1]Colorado School of Mines; [2]Clemson University

9:50 AM Break

10:10 AM Invited
Exploring the Properties of Grain Boundaries and Compositionally Complex Ceramics in High Dimensions: *Jian Luo*[1]; [1]University of California, San Diego

10:40 AM Invited
High-throughput, Ultra-fast Laser Sintering of Ceramics and Machine-learning-Based Prediction on Processing-Microstructure-Property Relationships: Xiao Geng[1]; Jianan Tang[1]; Ningxuan Wen[1]; Siddhartha Sarkar[1]; Rajendra Bordia[1]; Jianhua Tong[1]; Dongsheng Li[2]; Hai Xiao[1]; *Fei Peng*[1]; [1]Clemson University; [2]Advanced Manufacturing LLC

11:00 AM Invited
Online Mechanical Properties Prediction for Hot Rolled Steel Coils Using Machine Learning Model: *JaeHyun Choi*[1]; Junho Park[1]; TaeKyo Han[1]; [1]POSCO

11:20 AM
Fast and Accurate Prediction of Temperature Evolution in Additive Friction Stir Deposition Through In-Situ Calibration and Exploration of Unknown Physics: *Xiaofeng Wu*[1]; Nikhil Gotawala[1]; David Higdon[1]; Yunhui Zhu[1]; Hang Yu[1]; [1]Virginia Tech

11:40 AM Invited
Navigating the Microscopic World with AEcroscopy: Autonomous Measurements Powered by Machine Learning: *Yongtao Liu*[1]; Rama Vasudevan[1]; [1]Oak Ridge National Laboratory

CERAMIC AND GLASS MATERIALS

Mesoscale Phenomena in Functional Polycrystals and Nanostructures — Session I: Optical Properties, Grains and Domains

Sponsored by: ACerS Electronics Division

Program Organizers: Serge Nakhmanson, University of Connecticut; Edward Gorzkowski, Naval Research Laboratory; James Wollmershauser, U.S. Naval Research Laboratory; Seungbum Hong, KAIST; Javier Garay, University of California, San Diego; Pierre-Eymeric Janolin, CentraleSupélec; Ilya Sochnikov, University of Connecticut

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Session Chairs: Serge Nakhmanson, University of Connecticut; Sarshad Rommel, University of Connecticut

8:00 AM Invited
Exploring Barium Titanate: Theoretical Insights and Topological Phenomena: *Florian Mayer*[1]; Mauro A. P. Goncalves[2]; Marek Pasciak[2]; Jiri Hlinka[2]; [1]Materials Center Leoben; [2]Czech Academy of Sciences

8:30 AM Keynote
Ferroelectrics for Emergent Silicon-Integrated Optical Computing: *Alex Demkov*[1]; [1]The University of Texas

9:10 AM
High-Throughput Approach for Predicting Optical Properties of Crystals: *M. Fatin Ishtiyaq*[1]; Serzat Safaltin[1]; Sanjeev Nayak[1]; S. Pamir Alpay[1]; Serge Nakhmanson[1]; [1]University of Connecticut

9:30 AM Invited
Electro-Optics in Ferroelectrics: Ab-Initio Insights: *Charles Paillard*[1]; [1]University of Arkansas

10:00 AM Break

10:20 AM
Predicting Failure via Grain Boundary Rupture Using a Stochastic FEM-based Approach: *Naji Mashrafi*[1]; Adnan Taqi[1]; Matthew Beck[1]; [1]University of Kentucky

10:40 AM
A Phase Field Analysis of Temperature-Dependent Grain Growth in Polycrystalline Alloys Embedded with Secondary Particles: *M Nabil Bhuiyan*[1]; Lesley D. Frame[1]; Serge M. Nakhmanson[1]; [1]University of Connecticut

11:00 AM Invited
Grain Boundary Chemistry and Electrical Potentials in Electronic Oxides: *Elizabeth Dickey*[1]; [1]Carnegie Mellon University

11:30 AM Invited
Permissible Domain Walls in Monoclinic Ferroelectric Phases: *Semën Gorfman*[1]; [1]Tel Aviv University

NANOMATERIALS

Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry — Session I

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

Monday AM | October 7, 2024
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Session Chairs: Avik Dutt, University of Maryland, College Park; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

8:00 AM Invited
Spectral-Domain Quantum Nanophotonics in Low-Loss Silicon Nitride: *Avik Dutt*[1]; [1]University of Maryland, College Park

8:30 AM
Biogenic Nanoparticles from Mango (Mangifera indica) Leaves: An Eco-Friendly Approach to Synthesis and Antimicrobial Potential of Calcium Oxide Nanoparticles: *Esther Ikhuoria*[1]; Oghenefejiro Odu Paulson[1]; Ikhazuagbe Ifijen[2]; [1]University of Benin; [2]Rubber research institute of Nigeria

8:50 AM
Design and Development of Compact ZnO/SnO2 Nanocomposite, ZnO and In2O3 Thin Film Metal Oxide Sensors for Methane Detection.: *Lalitha Dabilpuram*[1]; Shweta Meshram[1]; Aroba Saleem[1]; [1]University of Florida

9:10 AM
Enhanced Thermal Management with Two-Dimensional Nanomaterials: *Saketh Merugu*[1]; Anju Gupta[1]; Babak Anasori; Anupma Thakur[2]; [1]University of Toledo; [2]Purdue University

9:30 AM
Investigating the Antibacterial Efficacy of Ternary Oxide Nanoparticles Derived from Blended Plant Extracts with Iron, Silver, and Vanadium: *Esther Ikhuoria*[1]; Ita Uwidia[1]; Rachel Okojie[1]; Ikhazuagbe Ifijen[2]; Ikechukwu Chikaodili[1]; [1]University of Benin; [2]Rubber Research Institute of Nigeria

9:50 AM Break

10:10 AM Invited
Additive Manufacturing of Immiscible Bimetallic Composites for Biodegradable Implants: Sai Pratyush Akula[1]; *Atieh Moridi*[1]; [1]Cornell University

10:40 AM
One-Dimensional Titanium Oxide Lepidocrocite Nanofilaments: Electronic Properties and Applications in Energy: *Adam Walter*[1]; Michel Barsoum[1]; Gregory Schwenk[1]; [1]Drexel Universiy

11:00 AM
Multi-Scale Characterization of Riboflavin Supplements Using X-Ray Microscopy, SEM, and Automated Phase Analyses: *Andy Holwell*[1]; Ria Mitchell[1]; Darragh Murnane[2]; [1]Carl Zeiss Microscopy LLC; [2]University of Hertfordshire

11:20 AM
Fabrication of Carbon Based Non-Enzymatic Glucose Biosensor from Biogenic Raw Materials: *Soma Das*[1]; [1]IMS Engineering College

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials I

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

Monday AM | October 7, 2024
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Session Chairs: Hideyuki Kanematsu, National Institute of Technology (KOSEN), Suzuka College; Carlos Elias, Military Institute of Engineering; Eva Hemmer, University of Ottawa

8:00 AM Invited
4th Generation of Magnetic Bioactive Glass-Ceramics: A New Nanocomposite With Improved Magnetic and Bioactivity Properties Aiming Magnetic Hyperthermia Application: Roger Borges[1]; Francesco Baino[2]; *Juliana Marchi*[3]; [1]Hospital Israelita Albert Eintein; [2]Politecnico di Torino; [3]Universidade Federal do ABC

8:20 AM Invited
Bioactive Composite Nanocoatings Fabricated by Advanced Laser Processing to Target Resistant Superbugs: *Rodica Cristescu*[1]; Anita Ioana Visan[1]; Consuela Elena Matei[1]; Dan Eduard Mihaiescu[2]; Mariana Carmen Chifiriuc[3]; Roger J. Narayan[4]; Douglas B. Chrisey[5]; [1]National Institute for Lasers, Plasma and Radiation Physics; [2]University "Politehnica" Bucharest; [3]Research Institute of the University of Bucharest–ICUB, University of Bucharest; [4]University of North Carolina and North Carolina State University; [5]Tulane University

8:40 AM Invited
Synthesis and Applications of Organotrialkoxysilane Derived Nanomaterials: *Prem Pandey*[1]; [1]Indian Institute of Technology, BHU

9:00 AM Invited
3D Printing of Biomimetic Hierarchical Scaffolds for Osteochondral Tissue Regeneration: Xiaodie Chen[1]; Yiuleung Poon[1]; *Min Wang*[1]; [1]University of Hong Kong Pokfulam Road

9:20 AM Invited
The Dawn of the Next Generation of Biomaterials: Scalable and Sustainable Fibrous Product Manufacture Using Inverted Pressure Spinning: Mohan Edirisinghe[1]; *Yanqi Dai*[1]; [1]University College London

9:40 AM Invited
Nitric Oxide Releasing Materials (NORMs) For Biomedical Applications: *Tanveer Tabish*[1]; [1]University of Oxford

10:00 AM Break

10:20 AM Invited
Nanomaterials-Based Soft Bioelectronics and Its Application to Cardiovascular Disease: *Dae-Hyeong Kim*[1]; [1]Seoul National University

10:40 AM Invited
Synthesis and Applications of Vancomycin Functionalized Gold Nanoparticles: Prem Pandey[1]; *Atul Tiwari*[1]; [1]Indian Institute of Technology, BHU

11:00 AM Invited
Synthesis and Biomedical Applications of Polyethylenimine Functionalized Noble Metal Nanoparticles with Specific Attention to Neonatal: *Govind Pandey*[1]; [1]Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow

11:20 AM
Multifunctional Graphene-Based Nanofibers for Biomedical Applications: *Seda Gungordu Er*[1]; Tanveer Tabish[2]; Ishara Dharmasena[3]; Mohan Edirisinghe[1]; [1]University College London; [2]University of Oxford; [3]Loughborough University

11:40 AM Invited
Innovative 3D-Printed GelMA-KerMA Composite Patches for Tissue Engineering of Tympanic Membrane Perforations: *Oguzhan Gunduz*[1]; [1]Marmara University

CERAMIC AND GLASS MATERIALS

Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics — Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics I

Sponsored by: ACerS Engineering Ceramics Division, ACerS Basic Science Division

Program Organizers: Matthew Dickerson, Air Force Research Laboratory; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama at Birmingham

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Session Chair: Matthew Dickerson, AFRL

8:00 AM Introductory Comments

8:05 AM Invited
Phase and Microstructure Study of Boron-Doped Allylvinylhydridocarbosilane Derived Bulk SiBC Ceramic: *Kathy Lu*[1]; Rahul Anand[2]; Vempuluru Madhavi[2]; [1]University of Alabama Birmingham; [2]Virginia Tech

8:35 AM Invited
GNPs, NIMs, and UHTC AFPCs: Progress Toward Higher Volume Yielding Preceramics: *Jared Delcamp*[1]; Matthew Dickerson[1]; Timothy Pruyn[1]; Kara Martin[1]; Christina Thompson[2]; Nicholas Posey[3]; Brandon Ackley[4]; Abigail Advincula[3]; Sophia Angelopoulos[3]; [1]AFRL; [2]University of Kentucky; [3]AFRL/Blue Halo; [4]Arctos

9:05 AM
Preceramic Polymer Grafted Nanoparticle Systems: *Gary Germanton*[1]; Kara Martin[2]; Nicholas Posey[2]; James Ponder[2]; Md Alamgir Hossain[1]; Pitchaimari Gnanasekar[1]; Lutz Wiegart[3]; Matthew Dickerson[2]; Subramanian Ramakrishnan[1]; [1]FAMU-FSU College of Engineering; [2]Air Force Research Laboratory; [3]Brookhaven National Laboratory

9:25 AM Invited
Ceramic Yields of Preceramic Polymer Grafted Nanoparticles using Conventional and Photothermal Heating: *Robert Hickey*[1]; Benjamin Stoval[1]; Jensen Sevening[1]; Kavindi Sabaratne[1]; Anthony Katona[1]; Yuki Fan[1]; Benjamin Lear[1]; [1]The Pennsylvania State University

9:55 AM
Improving Mechanical Properties of Polymer-Derived Dense SiC Ceramics with the Integration of 2D MXene: *Wei Li*[1]; Mubina Shaik[1]; Kathy Lu[1]; [1]University of Alabama Birmingham

10:15 AM Break

10:35 AM Invited
Development of Processable Polymer Derived Ultra-High Temperature Ceramics and Composites: *Timothy Pruyn*[1]; Jared Delcamp[1]; Abigail Advincula[2]; Sophia Angelopoulos[2]; Matthew Dickerson[1]; [1]Materials and Manufacturing Directorate; [2]UES/Blue Halo

11:05 AM Invited
Refractory Ceramics Using High Char Polymers: *James Sitter*[1]; Matthew Laskoski[1]; [1]US Naval Research Laboratory

IRON AND STEEL (FERROUS ALLOYS)

Segregation in Steels — Segregation in Steels

Sponsored by: TMS: Steels Committee, AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - Industeel; Colin Stewart, US Naval Research Laboratory; Joshua Mueller, Michigan Technological University; Lijia Zhao, Northeastern University; Krista Limmer, Devcom Army Research Laboratory; Alexandra Glover, Michigan Technological University

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Session Chair: Ian Zuazo, ArcelorMittal Global R&D - Industeel

10:20 AM Invited
Characterization and Modeling of Solute Segregation at Grain and Interphase Boundaries in Steel: *Goro Miyamoto*[1]; Yongjie Zhang[1]; Bohao Zheng[1]; Tadashi Furuhara[1]; [1]Tohoku University

10:50 AM
Impact of Steel Composition on Macro-Segregation of Carbon in Continuous Casting: *Sai Bhuvanesh Nandipati*[1]; Armin Silaen[1]; Yufeng Wang[2]; Sunday Abraham[2]; Chenn Zhou[1]; [1]Purdue University Northwest; [2]SSAB

11:10 AM
Measurement of Microsegregation of Mn, Cr and Nb Through the Thickness of an As-Cast X70 Microalloyed Steel Slab Using EMPA: Rishav Raj[1]; J. B. Wiskel[1]; Michael Gaudet[2]; Bikram Konar[2]; Julien Zollinger[3]; Pusong Wang[1]; *Hani Henein*[1]; [1]University of Alberta; [2]EVRAZ; [3]Institut Jean Lamour

11:30 AM
Influence of Boron Segregation on Sigma Phase Formation in Duplex Steels: *Roman Schuster*[1]; Andreas Keplinger[2]; Laszlo Solyom[3]; Anna Krejci[3]; Nicolas Garcia Arango[1]; Franz Kiraly[4]; Aurelie Jacob[1]; Emad Maawad[5]; Erwin Povoden-Karadeniz[1]; [1]Christian Doppler Laboratory for Interfaces and Precipitation Engineering CDL-IPE, Institute of Materials Science and Technology, TU Wien; [2]voestalpine BÖHLER Edelstahl GmbH & Co KG; [3]Institute of Materials Science and Technology, TU Wien; [4]University of Vienna; [5]Institute of Materials Physics, Helmholtz-Zentrum Hereon

11:50 AM
Correlating Retained Austenite Characteristics and Mechanical Properties in Duplex-Type Steels Microstructures: *Caleb Minasian*[1]; Matthew Johnson[1]; Joshua Mueller[1]; [1]Michigan Techonological University

BIOMATERIALS

Society for Biomaterials: Biomaterial Applications in Today's Industry: Development, Translation & Commercialization — Session I

Sponsored by: Society for Biomaterials

Program Organizers: Jan Stegemann, University of Michigan; Guigen Zhang, University of Kentucky

Monday AM | October 7, 2024
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Session Chair: Yadong Wang, Cornell University

8:00 AM Invited
Biomaterial-Focused Anticoagulation to Enable Permanent Respiratory Support: *Keith Cook*[1]; [1]Carnegie Mellon University

8:30 AM Invited
Design and Development of Elastomeric Biomaterials and Scaffolds for Clinical Translation: *William Wagner*[1]; [1]University of Pittsburgh

9:00 AM
Design, Fabrication, and Application of Biodegradable Zinc Alloy Implants in China: *Lu-Ning Wang*[1]; [1]University of Science and Technology Beijing

9:20 AM
Formulation of Biodegradable Polysaccharide Blend as Replacement of Single-Use Plastics: Selma Gmati[1]; *Abby Whittington*[1]; Meredith Steele[2]; [1]Virginia Tech Materials Science and Engineering; [2]Virginia Tech School of Plant and Environmental Sciences

9:40 AM
Transarterial Radioembolization with Eye90 Microspheres®: Biological Evaluation of Novel Microsphere Container-Closure and Delivery Device Intended for Investigational Clinical Study in Patients with Hepatocellular Carcinoma: Kathleen O'Connell[1]; Yasmin Omar[1]; Declan Hussey[1]; Ivan Toponarksi[1]; Brandi Woods[1]; Catherine A. Whitman[1]; *Sharon Kehoe*[1]; [1]ABK Biomedical

10:00 AM Break

10:20 AM
Regulatory Tools for Assessing Medical Device Leachables: CHemical RISk Calculators (CHRIS): *David Saylor*[1]; [1]US FDA

10:40 AM Invited
Engineering Futuristic and Next Generation Nanoplatforms for Predictable and Precise Genetic Nanomedicines: *Beata Chertok*[1]; [1]AstraZeneca

11:00 AM
Direct Ink Write Printing of Novel Bioinspired Ceramics: *Donna Guillen*[1]; Konner Cutts[1]; Kiyo Fujimoto[1]; Bradley Huddleston[1]; Zherui Guo[1]; Dennis Tucker[2]; Jack Grimm[3]; Cameron Renteria[3]; Carli Marsico[3]; Dwayne Arola[3]; Viktor Nikitin[4]; Dula Parkinson[5]; [1]Idaho National Laboratory; [2]Rocky Mountain Scientific; [3]University of Washington; [4]Argonne National Laboratory/Advanced Photon Source; [5]Lawrence Berkeley National Laboratory/Advanced Light Source

11:20 AM
Next-Generation Machining and Sintering Technologies for Ceramic Dental Restorations: *Yu Zhang*[1]; Marwa Bawazir[1]; Abdulaziz Alshahrani[1]; [1]University of Pennsylvania

11:40 AM
Copper-Containing Hydroxyapatite as an Antibacterial Bioceramic: *Sierra Kucko*[1]; [1]MO SCI

FUNDAMENTALS AND CHARACTERIZATION

Solid-State Transformations Under Complex Thermal Conditions — Characterization

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Adriana Eres-Castellanos, Colorado School of Mines; Sriram Vijayan, Michigan Technological University; Eric Payton, University of Cincinnati; Sophie Primig, University of New South Wales

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Session Chair: Sophie Primig, University of New South Wales

9:00 AM Invited
In-Situ Heating in Transmission Electron Microscopy to Characterize Nuclear Fuel: *Fidelma Di Lemma*[1]; Daniele Salvato[1]; Kourtney Wright[1]; Laura Hawkins[1]; Kaustubh Bawane[1]; Tiankai Yao[1]; Luca Capriotti[1]; Sriram Vijayan[2]; [1]Idaho National Laboratory; [2]Michigan Technology University

9:30 AM
Design and Function of a Nanocalorimetry Sensor for In-Situ TEM Imaging: *Lakshmi Ravi Narayan*[1]; William Osborn[1]; Feng Yi[1]; [1]National Institute of Standards and Technology

9:50 AM
Effect of Partial Transformation Cycling on Transformation Behaviour of a Binary Nickel-Based Alloy: *Sampath Vedamanickam*[1]; Swaminathan Ganesan[2]; [1]Indian Institute of Technology Madras; [2]PSG Institute of Technology and Applied Research

10:10 AM Break

10:30 AM
Multi-Stimuli Integration in Alloy Design: A Shear-Assisted Processing Approach for High-Performance Nano-Composite Materials: *Bharat Gwalani*[1]; Md Jasim Uddin[1]; Aniruddha Malakar[1]; Farhan Ishrak[1]; Dongsheng li[2]; Arun Devaraj[3]; Elizabeth Kautz[1]; Michael Lastovich[1]; Tim Horn[1]; Christopher Rock[1]; Fu-Yun Tsai[1]; [1]North Carolina State University; [2]Advanced Manufacturing LLC ; [3]Pacific Northwest National Laboratory

10:50 AM Invited
Thermal Fatigue of Sn-Based Solders in Heterogenous Integration in Packaging (HIP) by Time-Resolved X-Ray Microscopy: *Nikhilesh Chawla*[1]; Eshan Ganju[1]; Yaw Obeng[2]; [1]Purdue University; [2]National Institute of Standards and Technology

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ADDITIVE MANUFACTURING

Standards for Data Science in Additive Manufacturing — Standards for Data Science in Additive Manufacturing

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Shengyen Li, National Institute of Standards and Technology; Donna Guillen, Idaho National Laboratory; Mark Stoudt, National Institute of Standards and Technology; John Carpenter, Los Alamos National Laboratory; Tyler Lebrun, Sandia National Laboratories; Mahdi Jamshid, ASTM International; Soumya Nag, Oak Ridge National Laboratory; Bo Shen, New Jersey Institute of Technology

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Session Chairs: Shengyen Li, National Institute of Standards and Technology; Mark Stoudt, National Institute of Standards and Technology

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8:00 AM Invited
How Much Data is Enough Data in the Qualification of AM Parts?: *John Barnes*[1]; Kirk Rogers[1]; Matt Crill[1]; Wayne King[1]; Kevin Slattery[1]; Rick Russell[1]; Eric Versluys[1]; [1]The Barnes Global Advisors

8:30 AM
Transferability of Workflow in Direct Ink Write Printing and Analysis: *Hein Htet Aung*[1]; Balashanmuga Priyan Rajamohan[1]; Quynh Tran[1]; Jayvic Cristian Jimenez[2]; Brian Au[2]; Robert Cerda[2]; Pigeon Caviness[2]; Brian Giera[2]; Roger French[1]; Laura Bruckman[1]; [1]Case Western Reserve University; [2]Lawrence Livermore National Lab

8:50 AM
Addressing Limitations in the Historical Reporting of Fatigue Meta-Data for Additively Manufactured Titanium Alloys: *Ian Wietecha-Reiman*[1]; Todd Palmer[1]; [1]The Pennsylvania State University

9:10 AM Invited
Motivation and Application of Data Science for Additive Manufacturing Process Pre-Qualification: Anil Chaudhary[1]; *Logan Martin*[1]; [1]Applied Optimization, Inc.

9:40 AM
Scientific Data FAIRification and Dynamic Knowledge Infrastructure to Drive AI: *Balashanmuga Priyan Rajamohan*[1]; Alexander Bradley[1]; Thomas Ciardi[1]; Arafath Nihar[1]; Laura Bruckman[1]; Yinghui Wu[1]; Erika Barcelos[1]; Roger French[1]; [1]Case Western Reserve University/SDLE

10:00 AM Break

10:20 AM Invited
Challenges in Producing, Curating, and Sharing Large Multimodal, Multi-Institutional Data Sets for Additive Manufacturing: *Lyle Levine*[1]; Brandon Lane[1]; Gerard Lemson[2]; Jai Won Kim[2]; Shengyen Li[1]; Gretchen Greene[1]; [1]National Institute of Standards and Technology; [2]Johns Hopkins University

10:50 AM
Data Management and Digital Twins for Advanced Manufacturing: *Shengyen Li*[1]; Yan Lu[1]; [1]National Institute of Standards and Technology

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NUCLEAR ENERGY

Tackling Metallic Structural Materials Challenges for Advanced Nuclear Reactors — Defects and Microstructural Features

Sponsored by: TMS: Nuclear Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Miaomiao Jin, Pennsylvania State University; Xing Wang, Pennsylvania State University; Karim Ahmed, Texas A&M University; Jeremy Bischoff, Framatome; Adrien Couet, University of Wisconsin-Madison; Kevin Field, University of Michigan; Lingfeng He, North Carolina State University; Raul Rebak, GE Global Research

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Session Chairs: Kun Wang, Alfred University; Boopathy Kombaiah, Idaho National Laboratoy

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8:00 AM
Atomistic Modeling of Irradiation-Induced Defects and Clusters in Additively-Manufactured Austenitic Stainless Steel: *Mathew Swisher*[1]; [1]Idaho National Lab

8:20 AM
Density Functional Theory Study of Helium diffusion in Ni-M Alloys (M= Cr, Mo): *Ximeng Wang*[1]; Yachun Wang[2]; Yongfeng Zhang[1]; [1]University of Wisconsin-Madison; [2]Idaho National Laboratory

8:40 AM Invited
Characterization of In Situ and Ex Situ Ion Irradiated AM316L and AM316H Stainless Steels: *Wei-Ying Chen*[1]; Stephen Taller[2]; Andrea Jokissari[3]; Yiren Chen[1]; Rongjie Song[3]; [1]Argonne National Laboratory; [2]Oak Ridge National Laboratory; [3]Idaho National Laboratory

9:10 AM
Emulation of Neutron Irradiation Induced Dislocation Loops, Elemental Segregation, and Precipitation Evolution at High Dose in 800H Using Dual Ion Beam: *Xingyu Liu*[1]; Xing Wang[1]; Arthur Motta[1]; [1]Pennsylvania State University

9:30 AM Invited
In-Situ Microstructural Evolution Under Extreme Environments: *Khalid Hattar*[1]; [1]University of Tennessee Knoxville

10:00 AM Break

10:20 AM
Performance Comparison of U-Net Based Machine Learning Architectures for Automated Analysis of TEM Images of Nuclear Materials: *Aiden Ochoa*[1]; Xing Wang[1]; Xinyuan Xu[1]; [1]Penn State University

10:40 AM Invited
Radiation Performance of Doped High Entropy Alloys NiCoFeCr-3X (X=Pd/Al/Cu): *Boopathy Kombaiah*[1]; Sriswaroop Dasari[1]; Robby Renfrow[2]; Hangyu Li[2]; Jonathan Poplawsky[3]; Dilpuneet Aidhy[4]; Mukesh Bachhav[1]; Philip Edmondson[5]; Kevin Field[2]; Yanwen Zhang[1]; [1]Idaho National Laboratoy; [2]University of Michigan; [3]Oak Ridge National Laboratory; [4]Clemson University; [5]The University of Manchester

11:10 AM
The Effect of Infinitesimal Potassium Doping on Incipient Plasticity and Ductile-to-Brittle Transition Temperature of Tungsten: *Jeongseok Kim*[1]; Guensik Min[1]; Phu Nguyen[2]; Sungmin Lee[1]; Yeonju Oh[1]; Hwangsun Kim[1]; Hyoung Chan Kim[3]; Ill Ryu[1]; Heung Nam Han[1]; [1]Seoul National University; [2]The University of Texas at Dallas; [3]Korea Institute of Fusion Energy

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MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Frontiers of Thermodynamics

Sponsored by: ACerS Basic Science Division, ACerS Energy Materials and Systems Division, TMS: Chemistry and Physics of Materials Committee

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

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Session Chair: Xiaofeng Guo, Washington State University

8:00 AM Introductory Comments

8:10 AM Invited
Defect Thermodynamics and Its Role in the Irradiation Response of Nuclear Fuels: *David Andersson*[1]; Michael Cooper[1]; Benjamin Liu[1]; Conor Galvin[1]; Anton Schneider[1]; William Neilson[1]; Christopher Matthews[1]; [1]Los Alamos National Laboratory

8:40 AM Invited
Dissipative Kinetic Models: Do we Require Deeper Understanding of Local Thermodynamics?: *Shen Dillon*[1]; [1]University of California, Irvine

9:10 AM Invited
A Generalized Approach for Rapid Entropy Calculation of Liquids and Solids: *Qijun Hong*[1]; [1]Arizona State University

9:40 AM
Hase-Field Model of Solid Stoichiometric Compounds and Solution Phases: Yanzhou Ji[1]; *Long-Qing Chen*[1]; [1]Pennsylvania State University

10:00 AM Break

10:20 AM Invited
Computationally Guided Synthesis of MXenes by Dry Selective Extraction: *Yong-Jie Hu*[1]; Ervin Rems[1]; Mark Anayee[2]; Yury Gogotsi[1]; [1]Drexel University; [2]ARFL

10:50 AM
Expanding Metastability Beyond Glasses and Undercooled States in Metals: Martin Thuo[1]; *Andrew Martin*[1]; Alana Pauls[1]; [1]North Carolina State University

11:10 AM
A Thermodynamic Equation of Motion for Coupled Transport in Magnetite: *Deepak Dhariwal*[1]; Michael von Spakovsky[1]; William T. Reynolds[1]; [1]Virginia Tech

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SPECIAL TOPICS

Plenary Sessions — TMS Plenary Session

Monday PM | October 7, 2024
Spirit of Pittsburgh Ballroom B | David L. Lawrence Convention Center

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2:00 PM Introductory Comments

2:05 PM Plenary
TMS/ASM Distinguished Lectureship in Materials and Society: Saving the Planet through Sustainability-Informed Selection, Design and Discovery of Materials: *Julie Schoenung*[1]; [1]Texas A&M University

2:45 PM Award Presentation

2:50 PM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

16th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Technologies II

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mrityunjay Singh, NASA; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technology; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Wu, Wuhan University of Technology

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Session Chairs: Manoj Mahapatra, University of Alabama-Birmingham; Michael Bonner, Saint Clair Systems, Inc.; Rosette Gault, New Century Arts, Inc (paperclaylab)

2:00 PM Invited
Carbon Products from Coal and Coal Refuses for Clean Energy Technologies – A Review: *Manoj Mahapatra*[1]; [1]University of Alabama-Birmingham

2:25 PM
Eco-friendly Paper Clay: Research Questions: *Rosette Gault*[1]; [1]New Century Arts, Inc (paperclaylab)

2:45 PM
Investigating Hydrogen-Natural Gas Blending in a Reheating Furnace for Decarbonizing Steel Production: *Abhishek Kolakotla*[1]; Nicholas Walla[1]; Armin Silaen[1]; Kurt Johnson[2]; Chenn Zhou[1]; [1]Purdue University Northwest; [2]Cleveland-Cliffs Burns Harbor

3:05 PM
Investigating Material Flow and Mixing During SolidStir Extrusion Using Markers: *Devin Davis*[1]; Pankaj Kulkarni[1]; Anurag Gumaste[2]; Ravisankar Haridas[2]; Rajiv Mishra[2]; Kumar Kandasamy[1]; [1]Enabled Engineering; [2]Innovative Materials & Processes Lab (IMAP) at University of North Texas

3:25 PM Break

3:40 PM
Is UV/EB the Sustainable Answer to the EV Question? (It's All About Energy!): *Michael Bonner*[1]; [1]Saint Clair Systems, Inc.

4:00 PM Invited
Low-Temperature Sintering for Ceramics with Finer and Uniform Microstructure: *Ruoshi Zhao*[1]; Yanhao Dong[1]; [1]Tsinghua University

4:25 PM
Development of Grinding Media in JSW Steel Salem Works: *Deepan N*[1]; Manjini Sambandam[1]; [1]JSW Steel Ltd, Salem Works

4:45 PM
Deposition Rates and Annealing Effects on the Growth of Nb Thin Film on Cu Substrate: Molecular Dynamic Simulation: *Lablali Mohammed*[1]; Mes-Adi Hassan[2]; Mazroui M'Hammed[1]; [1]FSBM; [2]Ensa Khouribga

5:05 PM Invited
Fatigue Performance of Laser Welded TWIP1000 Steel: *Mei Zhang*[1]; Wenhao LI[1]; Weikun Wang[1]; [1]Shanghai University

5:30 PM Invited
Synthesis of -MoO3 Nanosized Powder By Thermal Evaporation: *Hisayuki Suematsu*[1]; Ying Yang[1]; Taiga Kitagawa[1]; Ngo Minh Chu[1]; Thi Mai Dung Do[1]; Tadachika Nakayama[1]; Koichi Niihara[1]; [1]Nagaoka University of Technology

CERAMIC AND GLASS MATERIALS

ACerS-ECerS Joint Symposium: Emerging Leaders in Glass and Ceramics — Session II

Sponsored by: The American Ceramic Society , The European Ceramic Society

Program Organizers: Rajendra Bordia, Clemson University; Thomas Graule, Empa; Francis Cambier, Belgian Ceramic Research Ctr; Sanjay Mathur, University of Cologne

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Session Chairs: Thomas Graule, Empa; Sanjay Mathur, University of Cologne

2:00 PM Invited
Additive Manufacturing of Zirconia Ceramics: Challenges and Opportunities: *Fei Zhang*[1]; Jef Vleugels[1]; Bart Van Meerbeek[1]; [1]KU Leuven

2:30 PM Invited
Processing of Next-Generation Aerospace Ceramics and Composites: *Lisa Rueschhoff*[1]; Jonathan Kaufman[1]; Connor Wyckoff[1]; Zlatomir Apostolov[1]; Michael Cinibulk[1]; [1]Air Force Research Laboratory

3:00 PM Invited
Additive Manufacturing of Ceramics from Water-Based Feedstocks with Low Binder Content: *Andrea Zocca*[1]; Thomas Mühler[2]; Jens Günster[1]; [1]Bundesanstalt für Materialforschung und -prüfung (BAM); [2]QEP3D GmbH

3:30 PM Break

3:50 PM Invited
Transparent Ceramic Composites: Materials Design and Structuring for Lasers, Scintillators and IR Windows: *Jan Hostaša*[1]; Francesco Picelli[1]; Soa Hříbalová[2]; Valentina Biasini[1]; Laura Esposito[1]; Andreana Piancastelli[1]; Dariia Chernomorets[3]; Francesca Cova[4]; Anna Vedda[4]; Roberto Lorenzi[4]; [1]CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics; [2]University of Chemistry and Technology, Prague (UCT Prague); [3]CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics, Italy / Institute for Single Crystals, NAS, Ukraine; [4]University of Milano – Bicocca

4:20 PM Invited
Phase Stability and Cation Partitioning in Multi-Rare Earth Aluminates and Zirconates: Yueh-Cheng Yu[1]; *David Poerschke*[1]; [1]University of Minnesota

SPECIAL TOPICS

ACerS Richard M. Fulrath Award Session — ACerS Richard M. Fulrath Award Session

Sponsored by: ACerS

Monday PM | October 7, 2024
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Session Chair: Gregory Morscher, University of Akron

2:20 PM Invited
Developments of New Lead-Free Piezoelectric Ceramics and Transparent Piezoelectric Ceramics: *Ichiro Fujii*[1]; [1]University of Yamanashi

3:00 PM Invited
Fundamentals of Mechanism Research and Its Industrial Applications with Cold Sintering: *Shuichi Funahashi*[1]; [1]Murata Mfg. Co. Ltd.

3:20 PM Break

3:40 PM Invited
Dust-Proofing the Future: Materials Challenges for Lunar Exploration: *Valerie Wiesner*[1]; [1]NASA Langley Research Center

4:00 PM Invited
Direct Observation of Local Conductive Path in Degraded Multi-Layered Ceramic Capacitor: *Kazuyoshi Izawa*[1]; [1]Kyocera Corporation

4:20 PM Invited
A Ceramicist's Love Story: Lithium, Speed & Interfaces - Designing Next Solid Battery Materials Real Fast with High Control of Chemistry: *Jennifer Rupp*[1]; [1]Massachusetts Institute of Technology; Technical University of Munich & TUM International Energy

ADDITIVE MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Engineering Ceramics Division, ACerS Manufacturing Division

Program Organizers: Lei Chen, University of Michigan-Dearborn; Xuan Song, University of Iowa; Xiangyang Dong, Arizona State University; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, The Pennsylvania State University

Monday PM | October 7, 2024
304 | David L. Lawrence Convention Center

Session Chair: Yanzhou Ji, Ohio State University

2:00 PM
Towards Direct Additive Manufacturing of Bulk Ceramics Using Selective Laser Flash Sintering: *Desiderio Kovar*[1]; [1]University of Texas

2:40 PM
Multi Ceramic Additive Manufacturing Based on Novel Digital Light Processing Technology: *Hui-suk Yun*[1]; [1]Korea Institute of Material Science

3:00 PM
Interface Stability of Iron-Carbide Materials Fabricated via Laser-Direct Energy Deposition: *Som Dixit*[1]; Shunyu Liu[1]; Fei Peng[1]; Hai Xiao[1]; [1]Clemson University

3:20 PM
Direct Ink Writing of SiOC Structure from Preceramic Polymer Containing Inactive Fillers: *Victoria Bishop*[1]; Wei Wei[1]; [1]Wichita State University

3:40 PM Break

4:00 PM
Rapid Volumetric Microwave Curing of Silicon Nitride Ceramic Binder Mixtures: *Saptarshi Mukherjee*[1]; Ethan Rosenberg[1]; Johanna Vandenbrande[1]; Johanna Schwartz[1]; Maxim Shusteff[1]; Joseph Tringe[1]; James Kelly[1]; [1]Lawrence Livermore National Laboratory

4:20 PM
Stabilization of Alumina Dispersed Slurry by Controlling pH: Pulkin Gupta[1]; Raghav Mudra[1]; *Shikhar Krishn Jha*[1]; [1]IIT Kanpur

4:40 PM
Use of 2D Ti_3C_2 MXene as an Additive in SiC and Their High-Temperature Phase Behavior: *Nithin Chandran Balachandran Sajitha*[1]; Srinivasa Kartik Nemani[1]; Anupma Thakur[1]; Ravi Kumar N V[2]; Babak Anasori[1]; [1]Purdue University; [2]IIT Madras

5:00 PM
Using Laser Ultrasonics to Correlate Young's Modulus to Particle Neck Size in Early-Stage Sintering: *Christina Nissen*[1]; Arturo Hernandez-Barreto[1]; Michael Haberman[1]; Joseph Beaman[1]; Desiderio Kovar[1]; [1]University of Texas at Austin

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ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Al-Based Alloys

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science

Monday PM | October 7, 2024
301 | David L. Lawrence Convention Center

Session Chair: Prashanth Konda Gokuldoss, Tallinn University of Technology

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2:00 PM
Rapid Experimental Validation of Printable High-Temperature Al-Alloys Using Laser-Scanning Strategies: *Benjamin Glaser*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

2:20 PM
Microstructure, Electrical Conductivity, and Mechanical Properties of an Additively Manufactured Al-Zr-Ce-Cu-Sn Alloy: *Jovid Rakhmonov*[1]; Sumit Bahl[1]; Jonathan Poplawsky[1]; Lawrence Allard[1]; Alice Perrin[1]; Alex Plotkowski[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

2:40 PM
Grain Refinement and 3D Printability of High Strength Aluminum Alloys via In Situ Alloying of 2024 for LPBF Applications by Mechanical Mixing of Commercially Available Powders: *John O'Connell*[1]; Timothy Nice[1]; Nathaniel Badgett[1]; Bhaskar Majumdar[1]; [1]New Mexico Institute of Mining and Technology

3:00 PM
Influence of the Arc Current Type on the Chemical Composition and Dilution of the 5356 Aluminum Alloy Deposited by WAAM Additive Manufacturing: *Anderson Pukasiewicz*[1]; Roger Verastegui[1]; Gabriel Valerio[1]; Jose de Campos[1]; Gabriel Borri[1]; [1]Federal University of Technology - Paraná

3:20 PM Break

3:40 PM
The Importance of Trace Elements Analysis in 3D Printing Materials Physical and Mechanical Properties: *Kayvon Savadkouei*[1]; Fran Adar[1]; Brian Chung[1]; Ali Ghasemi[2]; [1]HORIBA; [2]National University of Singapore

4:00 PM
Effect of High Fe Content on the Microstructure and Mechanical Properties of an Additively Manufactured Al-Si-Cu-Mg Alloy: *Jovid Rakhmonov*[1]; Sumit Bahl[1]; Jonathan Poplawsky[1]; Lawrence Allard[1]; Alice Perrin[1]; Alex Plotkowski[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

4:20 PM
Additive Manufacturing of Aluminum Metal Matrix Composite by SMART Processed Powder: *Hyeongseob Kim*[1]; Wonjong Jung[1]; Ho Jin Ryu[1]; Seong Jin Kim[2]; [1]Korea Advanced Institute of Science and Technology (KAIST); [2]Hyundai Motor Company

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ADDITIVE MANUFACTURING

Additive Manufacturing of Polymer-involved Ceramic and Metal Composites — Additive Manufacturing of Polymer-involved Ceramic and Metal Composites

Sponsored by: TMS: Composite Materials Committee

Program Organizers: Kenan Song, University of Georgia; Xiangyang Dong, Arizona State University; Kun Fu, University of Delaware; Erina Baynojir Joyee, University of North Carolina at Charlotte; Yifei Jin, University of Nevada Reno

Monday PM | October 7, 2024
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Session Chairs: Erina Joyee, UNCC; Yifei Jin, University of Nevada, Reno; Kenan Song, UGA

3:00 PM
Development of Magnetoactive Bioink for 3D Printing of Stimuli-Responsive Composite Materials: Sumama Nuthana Kalva[1]; *Muammer Koç*[1]; [1]HBKU

3:30 PM Break

3:50 PM
Two-Color Thermal Imaging and Modeling of WC-Ni Cermet Melt Pools in Laser Powder Bed Fusion: *Guadalupe Quirarte*; Alexander Myers[1]; Alex Gourley[1]; B. Jayan[1]; Jack Beuth[1]; Jonathan Malen[1]; [1]Carnegie Mellon University

4:20 PM
Advanced Humidity Sensor Development Using Direct Ink Writing and Polymer Nanocomposites: *Anasheh Khecho*[1]; Erina Joyee[1]; [1]University Of North Carolina At Charlotte

4:40 PM
Fabrication of Hollow Microneedle with Ceramic-Polymer Composite for Dermal Interstitial Fluid Extraction.: *Md Rahatuzzaman*[1]; Erina Joyee[1]; [1]University of North Carolina at Charlotte

5:00 PM
Integration of Low-Melting-Point Alloy and Thermoplastic Elastomers for 3D Printing of Multifunctional Composites: *Jinyu Bu*[1]; Naifu Shen[1]; Zhao Qin[2]; Weinan Xu[1]; [1]University of Akron; [2]Syracuse University

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ADDITIVE MANUFACTURING

Additive Manufacturing of Polymeric-based Materials: Potentials and Challenges — Exploring the Additive Manufacturing Frontier of Polymeric Composites

Sponsored by:

Program Organizers: Matthew Caputo, Pennsylvania State University - Shenango; Ola Rashwan, Pennsylvania State University-Harrisburg; Jason Walker, The Ohio State University; Daudi Waryoba, Pennsylvania State University

Monday PM | October 7, 2024
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Session Chairs: Ola Rashwan, Penn State Harrisburg; Matthew Caputo, Penn State Shenango

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3:00 PM Introductory Comments

3:05 PM
Design and Manufacturing of Multifunctional Piezoelectric Composites: *Huan Zhao*[1]; Yan Li[1]; [1]Dartmouth College

3:25 PM
Antimicrobial Coating of 3D Printed Polyetheretherketone(PEEK) Spinal Cages: *Caden Kurzenknabe*[1]; Ola Rashwan[1]; [1]Pennsylvania State University- Harrisburg

3:45 PM Break

4:00 PM
Anisotropy and Porosity in 3D Printed Carbon Fiber-PLA Composites Measured Using Ultrasonic Testing: Dillon Shen[1]; Zebadiah Miles[1]; Daniel Santos Gualoto Condor[1]; Carl Boehlert[1]; *Sunil Chakrapani*[1]; [1]Michigan State University

4:30 PM
Investigating Property Changes of Reprocessed Fiber Reinforced Polymers for Additive Manufacturing: *Pete Schupska*[1]; Thomas Harris[1]; Connor Sims[1]; Ryan Hahnlen[2]; Jason Walker[1]; [1]The Ohio State University - CDME; [2]Honda Development & Manufacturing of America, LLC

4:50 PM
Natural Carbon-Enhanced Polymer Composite Material for Sustainable Additive Manufacturing Applications: *Grace Baranack*[1]; Yahya Al-Majali[1]; [1]Ohio University/Institute for Sustainable Energy and the Environment

5:10 PM
Thermal Strategies for Producing Metallic Components from Metal-Polymer Feed-Stock via Material Extrusion: *Matthew Caputo*[1]; Grace Marhulik[2]; [1]Pennsylvania State University - Shenango; [2]Penn State University

5:30 PM
Molecular Engineering and Additive Manufacturing of Polyisobutylene-Based Elastomers and Composites: *Naifu Shen*[1]; Jinyu Bu[1]; Weinan Xu[1]; [1]The University of Akron

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ADDITIVE MANUFACTURING

Additive Manufacturing: Artificial Intelligence and Data Driven Approaches — AI and Data Driven Approaches

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Eric Clough, HRL Laboratories; Mohsen Asle Zaeem, Colorado School of Mines; Bo Shen, New Jersey Institute of Technology; Xiaopeng Li, University of New South Wales

Monday PM | October 7, 2024
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Session Chair: Eric Clough, HRL Laboratories

3:00 PM Introductory Comments

3:05 PM
Chemical Composition Based Machine Learning and Multi-Physics Model to Predict Defect Formation in Additive Manufacturing: *Ankit Roy*[1]; Stephanie Lawson[1]; Mohan Sai Kiran Kumar Yadav Nartu[1]; Nahal Ghanadi[2]; Somayeh Pasebani[1]; Isabella Van Rooyen[1]; [1]Pacific Northwest National Lab; [2]Oregon State University

3:25 PM Break

3:45 PM
Accelerating Engineering Design through Scientific AI and Adaptive Sampling: *Michael McKerns*[1]; [1]The UQ Foundation

4:05 PM
Prediction of Mechanical Properties of AlSi10Mg by Laser Powder Bed Fusion Using In Situ Processing Data with Image-Based Transfer Learning: *Qixiang Luo*[1]; Allison Beese[1]; [1]Pennsylvania State University

4:25 PM
AI-Powered Prediction of the Flash Onset in Oxides: *Rishi Raj*[1]; Roger French[2]; Pawan Tripathi[2]; [1]University of Colorado; [2]Case Western Reserve University

ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Session II: Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Samantha Webster, Nist - Gaithersburg; Ola Harrysson, North Carolina State University; Ulf Ackelid, Freemelt AB

Monday PM | October 7, 2024
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Session Chair: Sneha Prabha Narra, Carnegie Mellon University

3:00 PM Invited
High-Speed Spectral Sensing for Real-Time AM Process Monitoring and Control: *Steven Storck*[1]; Mike Brown[1]; Brandan Croom[1]; Mary Daffron[1]; Ari Lax[1]; Li Ma[1]; Robert Mueller[1]; Victor Leon[1]; Samuel Gonzalez[1]; Brad Bazow[1]; Jackson Pittman[1]; Vince Pagan[1]; Jade Traiger[1]; Ranjit LoboPrabhu[1]; Morgan Trexler[1]; Mark Foster[2]; Colin Goodman[2]; [1]Johns Hopkins Applied Physics Laboratory; [2]JHU

3:40 PM Break

4:00 PM Invited
Electron Optical Imaging: A Versatile Process Monitoring Tool in Electron Beam Powder Bed Fusion: *Jakob Renner*[1]; Matthias Markl[1]; Carolin Körner[1]; [1]Lehrstuhl für Werkstoffe und Technologie der Metalle, Friedrich-Alexander-Universität Erlangen-Nürnberg

4:40 PM
E-beam Spot Melt Process Mapping via High-Speed Two-Color Thermal Imaging: *Alexander Myers*[1]; William Frieden Templeton[1]; Jonathan Malen[1]; Sneha Narra[1]; Jack Beuth[1]; [1]Carnegie Mellon University

5:00 PM
Mechanistic Investigation of Powder Catchment Efficiency Through In-situ Monitoring in Laser Directed Energy Deposition: *Colin Ancalmo*[1]; Sneha Narra[1]; [1]Carnegie Mellon University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advanced Ceramics for Environmental Remediation — Session II

Program Organizers: Alberto Vomiero, Lulea University of Technology; Elisa Moretti, Ca' Foscari University of Venice; Tofik Shifa, Ca'Foscari University of Venice; Clara Santato, Polytechnique Montreal

Monday PM | October 7, 2024
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Session Chairs: Gunnar Westin, Uppsala University; Oomman Varghese, University of Houston

2:00 PM Invited
Microwave-Assisted Synthesis of Lanthanide-Based Nanoparticles – Progress and Challenges: *Eva Hemmer*[1]; [1]University of Ottawa

2:30 PM Invited
Ni-Hexacyanoferrate Nanocubes Enable Efficient Solar-Light-Driven Photodegradation of Metronidazole in Water: *Federico Polo*[1]; Edlind Lushaj[1]; Matteo Bordin[1]; Letizia Liccardo[1]; [1]Ca' Foscari University of Venice

3:00 PM Invited
Studies at the Metastable Eu-Ion Doping Levels in ZnO: *Gunnar Westin*[1]; [1]Uppsala University

3:30 PM Break

3:50 PM
Functional Principles and Applications of a Turbulent Flow Processor for Water Purification: *Hardy Mohrbacher*[1]; Mathias Woydt[2]; Walter Bauer[3]; [1]NiobelCon bvba; [2]Matrilub; [3]Bauer Energy Design Inc.

4:10 PM
Oxidative Photocatalytic Desulfurization with Chevrel Phase $Ni_2Mo_6S_8$: *Anthony Annerino*[1]; Milind Pawar[1]; Jacob Shell[1]; Pelagia-Irene Gouma[1]; [1]The Ohio State University

MATERIALS-ENVIRONMENT INTERACTIONS

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

Program Organizers: Evelina Vogli, Flame Spray Inc.; Virendra Singh, SLB

Monday PM | October 7, 2024
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Session Chairs: Evelina Vogli, Flame Spray Inc.; Virendra Singh, Schlumberger

2:00 PM
Polymer Derived SiON Coating for Alleviating Chloride Induced Stress Corrosion Cracking of 304 Stainless Steel: *Hyeon Joon Choi*[1]; Kathy Lu[2]; [1]Virginia Polytechnic Institute; [2]University of Alabama

2:20 PM
Temperature Dependent Morphological and Compositional Evolutions of the Water Vapor Induced Oxides in a Fe-Ni-Cr-Si-Mn-Nb Alloy: Sung-Il Baik[1]; *Farahnaz Haftlang*[1]; Shipeng Shu[1]; Maryam Kazemzadeh-Atoufi[1]; Mark B. Davis[2]; Deepak Kumar[2]; Robin Ziebarth[2]; Sandeep Dhingra[2]; Robert D. Morgan[2]; Peter W. Voorhees[1]; David N. Seidman[1]; [1]Northwestern University; [2]Dow Chemical Company

2:40 PM
Cr Diffusion Coatings for Improved Metal Dusting Resistance of Ni-Cu Alloys: *Emma White*[1]; Clara Schlereth[1]; Beyza Oeztuerk[1]; Till Koenig[1]; Jan-Phillip Roth[2]; Katrin Jahns[2]; Mathias Galetz[1]; [1]DECHEMA Forschungsinstitut; [2]Hochschule Osnabrueck

3:00 PM
Local Hot Corrosion of Aluminizing (NiAl) Coating Deposited by Vapor Phase Aluminizing (VPA) Process on 738LC, MAR 247 and CMSX4 Superalloys Substrates at 900 oC Under Na2SO4 Salt Deposit Films: Ece Karabastik[1]; Batuhan Başbozkurt[2]; Sercan Soyöz[2]; *Cevat Sarioglu*[2]; [1]TE (Turkish Engine Industry); [2]Marmara University

3:20 PM Break

3:40 PM
Anti-Scaling and Tribological Performance of Different Roughness DLC Coated and Uncoated Surfaces: *Virendra Singh*[1]; Alireza Zolfaghari[1]; Manuel Marya[1]; Vipul Shinde[1]; [1]SLB

4:00 PM Invited
Matrix Effects on Formation Dynamics and Properties of Thermal Sprayed Cemented Carbides: *Sanjay Sampath*[1]; [1]Stony Brook University

4:20 PM
Influence of Ethanol HVOF Process Parameters on the Residual Stress and Microstructure of the FeCrMoB Coating: *Anderson Pukasiewicz*[1]; Alexandre Eurich[2]; Irene Siqueira[2]; Igor Zanella[2]; Ramon Paredes[2]; Maicon Dudek[2]; [1]Federal University of Technology - Paraná; [2]Institute of Technology for Development Lactec

4:40 PM
Reverse Cladding – A Novel Approach to Fabricate Components with Integrated Surface Cladding: Tumula Tirumala[1]; *Ajay Kumar*[1]; [1]Indian Institute of Technology Tirupati

5:00 PM
Novel Epoxy Composite Polymers for Potential Use as Corrosion-Resistant Coatings on Copper in a 3% NaCl Solution: Combining Experimental and Computational methodologies: *Nisrine Benzbiria*[1]; Siham Echihi[2]; Mohammed Azzi[1]; Mustapha Zertoubi[1]; [1]Hassan II University; [2]University Moulay Ismail of Meknes, Errachidia

5:20 PM
A Review on Corrosion Inhibitors for Steel in Reinforced Concrete Structures: *Gundeep Singh*[1]; [1]Department of Water Resources Punjab

PROCESSING AND MANUFACTURING

Advanced Joining Technologies for Automotive Lightweight Structures — Experimental and Simulation Studies of Material Performance during Joining and Processing

Program Organizers: Yan Huang, Brunel University London; Yingchun Chen, Dura Automotive Systems

Monday PM | October 7, 2024
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Session Chair: Yan Huang, Brunel University London

2:00 PM
Numerical Simulation and Validation of Linear Friction Welding of Al F357 to SS304: *Anthony Koumpias*[1]; David Hicks[1]; John Keogh[1]; Amberlee Haselhuhn[1]; [1]Lift

2:20 PM
Simultaneous Joining and Forging of a Lightweight Structural Component by Electrically Assisted Pressure Joining: *Thanh Thuong Do*[1]; Van Cong Phan[1]; Hyun Bae Jang[2]; Moon-Jo Kim[2]; Sung Tae Hong[1]; [1]University of Ulsan; [2]Materials Supply Chain R&D Department, Korea Institute of Industrial Technology

2:40 PM
An Investigation of the Behaviour of Self-Piercing Riveting in Al-Mg-Si Aluminium Alloys: *Hanaa Ibtes*[1]; Nina Edmonds[2]; Carla Barbatti[3]; Chamini Mendis[1]; Yan Huang[1]; [1]Brunel University London; [2]Constellium University Technology Centre, Brunel University London; [3]Brunel University London, Constellium

3:00 PM
Microstructure and Mechanical Properties of Adjustable-Ring-Mode Laser Welded and Hot-Stamped Al–Si Coated Boron Steel Joints: *Hyun-Uk Jun*[1]; Jaehun Kim[1]; Jooyong Cheon[1]; Hong-kwang Kim[2]; Changwook Ji[1]; [1]Korea Institute of Industrial Technology; [2]Daesung Corporation

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Session I

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

Monday PM | October 7, 2024
330 | David L. Lawrence Convention Center

Session Chairs: Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

2:00 PM Invited
Pathways to Grain Boundary Engineering in Metal Additive Manufacturing: Brian Schuster[1]; *Marie Charpagne*[2]; [1]University of Texas at El Paso; [2]University of Illinois at Urbana-Champaign

2:30 PM Invited
One-Dimensional Wormhole Corrosion in Metals: *Yang Yang*[1]; Weiyue Zhou[2]; Sheng Yin[3]; Mark Asta[3]; Michael Short[2]; Andrew Minor[2]; [1]Pennsylvania State University; [2]Massachusetts Institute of Technology; [3]University of California, Berkeley

3:00 PM
Combating Biofouling: Field Testing of a Lubricant-Infused Antifouling Coating in Marine Environments: *Curtis Larimer*[1]; Shane Addleman[1]; George Bonheyo[1]; Thomas Lefevre[1]; Wilaiwan Chouyyok[1]; Joseph Daddona[1]; [1]Pacific Northwest National Laboratory

3:20 PM
Conformal Environmental Barrier Coatings On Additive Manufactured Robust Alloys for Mitigation of Oxidation, Erosion, and Corrosion: *Xueyan Song*[1]; Yun Chen[1]; Cesar-Octavio Romo-de-la-Cruz[1]; Richard Oleksak[1]; Casey Carney[1]; Omer Dogan[1]; [1]West Virginia University

3:40 PM Break

4:00 PM
Stabilization Optimization of High Temperature Irradiation Resistant Thermocouples: *Scott Riley*[1]; Brandon King[1]; Kyle Holloway[1]; Allyssa Bateman[1]; Richard Skifton[2]; Brian Jaques[1]; [1]Boise State University; [2]Idaho National Laboratory

4:20 PM
Hot Corrosion Characteristics of 8YSZ Doped with CSZ and YTiZ in Molten V2O5 for Potential Use in Thermal Barrier Coatings: *Nestor Ankah*[1]; Nasirudeen Ogunlakin[1]; Zuhair Gasem[1]; Morsi Mahmoud[1]; [1]King Fahd University of Petroleum and Minerals

4:40 PM
Development of Corrosion-Resistant High Entropy Alloy for Nuclear Application: *Priyanshi Agrawal*[1]; Michael Moorehead[1]; Arin Preston[1]; Qiufeng Yang[1]; Ruchi Gakhar[1]; Michael McMurtery[1]; [1]Idaho National Laboratory

5:00 PM
Development of High Operating Temperature Latent Thermal Energy Storage System: Material Challenges: *Sandeep Hatte*[1]; Calin Tarau[1]; Kuan-Lin Lee[1]; Srujan Rokkam[1]; [1]Advanced Cooling Technologies, Inc.

LIGHTWEIGHT ALLOYS

Advancements in Lightweight Composites, Materials & Alloys — Microstructure and Properties

Sponsored by: TMS: Materials Characterization Committee

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Ramachandra Canumalla, Weldaloy Specialty Forgings; Aashish Rohatgi, Pacific Northwest National Laboratory

Monday PM | October 7, 2024
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Session Chair: Ramasis Goswami, US Naval Research Laboratory

3:00 PM Invited
Influence of Solution Treatment Temperatures on the Grain Size of Wrought CuCrZr: *Robert Meyer*[1]; Conor McKinney[1]; Nathan Fleming[1]; Ramachandra Canumalla[1]; [1]Weldaloy Specialty Forgings

3:30 PM Break

3:50 PM Invited
Atomistic Modelling of Dislocation Behaviour in Stoichiometric and Off-Stoichiometric γ-TiAl: *Anne Marie Tan*[1]; Mark Jhon[1]; Siu Sin Quek[1]; Zhaoxuan Wu[2]; [1]Institute of High Performance Computing, A*STAR; [2]City University of Hong Kong

4:20 PM
Assessment and Selection of Mg-Based Alloys and Composites by Grey Relational Analysis for Fracturing Applications: Sneha Laxminarayan[1]; *Tanjore Jayaraman*[1]; [1]United States Air Force Academy

4:40 PM
In-Situ Synthesis of New Aluminium-Boride Composites by Laser Powder Bed Fusion Using a Ball-Milled Precursor Powders: *Baptiste Forget*[1]; Laurent Chaffron[1]; Mathieu Soulier[1]; Camille Flament[1]; Thierry Baffie[1]; Jérôme Andrieux[2]; Olivier Dezellus[2]; [1]CEA, France; [2]Université Claude Bernard Lyon 1, France

5:00 PM
Establishing the Influence of Indentation Size Effect of Industrially Relevant Ti Alloys: *Nathan Fleming*[1]; Ramachandra Canumalla[1]; Robert Meyer[1]; Conor McKinney[1]; [1]Weldaloy

5:20 PM
Friction Stir Welding and Parametric Optimization of AA6061-T6 and Ti6Al4V Alloys with Nickel Interlayer: *Saed Enam Mustafa*[1]; Rajiv Nandan Rai[1]; [1]Indian Institute of Technology Kharagpur

MATERIALS-ENVIRONMENT INTERACTIONS

Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson — Alloy Development and High-Temperature Oxidation I

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: High Temperature Alloys Committee, TMS: Alloy Phases Committee

Program Organizers: Kinga Unocic, North Carolina State University; Wei Xiong, University of Pittsburgh; Elizabeth Opila, University of Virginia; Richard Oleksak, National Energy Technology Laboratory; Rishi Pillai, Oak Ridge National Laboratory; Bruce Pint, Oak Ridge National Laboratory

Monday PM | October 7, 2024
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Session Chairs: Elizabeth Opila, University of Virginia; Wissam Saidi, National Energy Technology Laboratory

3:00 PM Invited
Alloy Development and Compositional Effects on High Temperature Corrosion: *Bingtao Li*[1]; Vinay Deodeshmukh[1]; Lee Pike[1]; [1]Haynes International Inc.

3:25 PM Break

3:45 PM Invited
Alloying Elements as Key Drivers in Hot Corrosion: *Mathias Galetz*[1]; Till König[1]; Katharina Beck[1]; Lukas Korell[1]; Ceyhun Oskay[1]; [1]DECHEMA-Forschungsinstitut

4:10 PM Invited
Environmental Compatibility Issues for Ni-Based Alloys in Direct-Fired Supercritical CO2 Power Cycles: *Richard Oleksak*[1]; Casey Carney[1]; Joseph Tylczak[1]; Xueyan Song[2]; Nicholas Lamprinakos[3]; Anthony Rollett[3]; Ömer Doğan[1]; [1]National Energy Technology Laboratory; [2]West Virginia University; [3]Carnegie Mellon University

4:35 PM Invited
Ocean of Data: AI-Driven High Throughput Predictive Modeling of Materials Properties: *Zi-Kui Liu*[1]; Adam Krajewski[1]; [1]Pennsylvania State University

5:00 PM
The Third Element Effect of FeCrAl Alloys in High Temperature Oxidation with Aqueous Corrosion Connections: *Catherine Lynch*[1]; Elizabeth Opila[1]; John Scully[1]; [1]University of Virginia

IRON AND STEEL (FERROUS ALLOYS)

Advances in Metallic Coated Advanced Steels — Advances in Metallic Coated Advanced Steels

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee

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

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Session Chair: Joseph McDermid, McMaster University

2:00 PM Invited
Liquid Metal Embrittlement in Zinc-Coated Advanced High-Strength Steels: *Lawrence Cho*[1]; Diptak Bhattacharya[2]; Kip Findley[1]; John Speer[1]; [1]Colorado School of Mines; [2]General Motors R&D

2:20 PM
Zn-Assisted Liquid Metal Embrittlement in Austenitic Microstructure: *Virginia Bertolo*[1]; Roumen Petrov[2]; Vera Popovich[1]; [1]Delft University Of Technology; [2]Ghent University

2:40 PM
Shortening the Pulse during Resistance Spot Welding of Advanced High Strength Steels: *Saeed Shiri*[1]; Benjamin Hilpert[2]; Holger Schubert[2]; Luke N. Brewer[1]; [1]University of Alabama; [2]Mercedes-Benz AG, Germany

3:00 PM
On the Effect of Chemical Composition on the Liquid Metal Embrittlement Susceptibility of Advanced High Strength Steels: *Fateme Abdiyan*[1]; Joseph McDermid[1]; Hatem Zurob[1]; Andrew Macwan[2]; Mirnaly Saenz de Miera[1]; Bita Pourbahari[1]; Brian Langelier[3]; [1]McMaster University; [2]ArcelorMittal Dofasco; [3]Canadian Center for Electron Microscopy

3:20 PM Break

3:40 PM
Grain-Boundary Precipitation as a Mechanism of Liquid-Metal Embrittlement in Advanced High-Strength Steels: Yuki Ikeda[1]; Anirban Chakraborty[2]; Reza Darvishi-Kamachali[1]; Hassan Ghassemi-Armaki[3]; Jim Zuo[4]; *Robert Maass*[1]; [1]Federal Institute of Materials Research and Testing (BAM); [2]ArcelorMittal Global Research and Development; [3]General Motors R&D; [4]University of Illinois at Urbana-Champaign

4:00 PM
A Review of Corrosion Properties for ZnAlMg Alloys: *Ana Paula Domingos Cardoso*[1]; [1]International Zinc Association

4:20 PM
In Situ and Ex Situ Effects of Phase Transformation on Radiative Properties of Galvanneal Coating: *Michiyo Kagaya*[1]; Fatima Suleiman[1]; Kyle Daun[1]; [1]University of Waterloo

4:40 PM
On Selective Oxidation and Continuous Hot-Dip Galvanizing of a Medium-Mn Third Generation Advanced High Strength Steel: Kazi Bhadhon[1]; Ana Cardoso[2]; Frank Goodwin[2]; *Joseph McDermid*[1]; [1]McMaster University; [2]International Zinc Association

5:00 PM
Corrosion Resistance of Zinc Coatings Obtained by Technology Using Complex Functionally Active Charges in Chemical Environments: Borys Sereda[1]; *Dmytro Sereda*[1]; Anton Prolomov[1]; [1]DSTU

MODELING

Advances in Multiphysics Modeling and Multi-modal Imaging of Functional Materials — Multimodal Imaging of Functional Materials

Sponsored by: ACerS Basic Science Division, TMS: Computational Materials Science and Engineering Committee, TMS: Magnetic Materials Committee

Program Organizers: Jiamian Hu, University of Wisconsin Madison; Massimo Ghidini, University of Parma, Italy; Diamond Light Sources, UK; Wenrui Hao, The Pennsylvania State University; Di Qi, Purdue University

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Session Chairs: Massimo Ghidini, Diamond Light Sources and University of Cambridge; Jiamian Hu, University of Wisconsin-Madison

3:00 PM Invited
X-Ray Ptychographic Tomography at the Diamond Light Source: *Darren Batey*[1]; [1]Diamond Light Source Ltd.

3:20 PM Invited
Ultrafast X-Ray Imaging and Dynamics in Functional Complex Oxides: Nanoscale Transformations and Dynamical Modes: *Paul Evans*[1]; [1]Univ of Wisconsin

3:40 PM Break

4:00 PM Invited
Automated Quantification and Quality of Piezo Force Microscopy Results Especially for Polycrystalline Piezoelectrics: Karla Del Cid-Ledezma[1]; K.M. Abu Hurayra Lizu[1]; Adanma Akoma[1]; Fei Wang[1]; *Bryan Huey*[1]; [1]University of Connecticut

4:20 PM Invited
Advances in THz Nano-Imaging: from Qubit Circuits to Topological Edge States: *Jigang Wang*[1]; Samuel Haeuser[2]; Richard Kim[2]; [1]Iowa State University and Ames National Laboratory ; [2]Iowa State University and Ames National Laboratory

4:40 PM Invited
Probing Short-Wavelength Magnonics Using IR-Band Stroboscope: *Wei Zhang*[1]; [1]UNC Chapel Hill

IRON AND STEEL (FERROUS ALLOYS)

Austenite Formation and Decomposition V: A Symposium in Memory of Prof. Mats Hillert — Microstructure II

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee, TMS: Steels Committee, TMS: Phase Transformations Committee

Program Organizers: Annika Borgenstam, KTH Royal Institute of Technology; John Agren, Royal Institute of Technology; Amy Clarke, Los Alamos National Laboratory; Hatem Zurob, McMaster University; Matthias Militzer, University of British Columbia; Kester Clarke, Los Alamos National Laboratory; Igor Vieira, Nucor Steel; Daniel Baker, LIFT

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Session Chair: Hatem Zurob, McMaster University

2:00 PM Keynote
Ferrite and Austenite Transformations in Fe-N Based Alloys: *Tadashi Furuhara*[1]; Mitsutaka Sato[1]; Goro Miyamoto[1]; [1]Institute for Materials Research, Tohoku University

2:40 PM
Microstructure and Hardness Evaluation of a Quenched and Partitioned Gray Cast Iron: *Edson Silva Junior*[1]; Selauco Junior[2]; Fabio Mariani[3]; Kahl Zilnyk[3]; Antonio Ramirez[1]; [1]The Ohio State University; [2]Universidade Estadual de Ponta Grossa; [3]Instituto Tecnológico de Aeronáutica

3:00 PM
Quantitative Evaluation of Ferrite Growth Behaviors during Decarburization of Fe-C and Fe-C-Mn Alloys: *Kanon Sato*[1]; Yongjie Zhang[1]; Hidenori Nako[2]; Goro Miyamoto[1]; Tadashi Furuhara[1]; [1]Tohoku University; [2]Kobe Steel, Ltd.

3:20 PM Invited
Effects of Mn Heterogeneity on Bainite and MA Microstructure in Low Carbon Steel: *Goro Miyamoto*[1]; Kaito Matsumoto[2]; Shunichi Nakayama[3]; Masao Yuga[3]; Tadashi Furuhara[1]; [1]Tohoku University; [2]Tohoku University, JFE steel; [3]JFE steel

3:50 PM Break

4:10 PM Invited
Austenite Nucleation from Ferrite and Cementite in Steels Alloyed with Mn and Si: *Erik Offerman*[1]; Monika Krugla[2]; Dave Hanlon[2]; Jilt Sietsma[1]; [1]Delft University of Technology; [2]Tata Steel Europe R&D

4:40 PM
Texture Correction Factors for Austenite Phase Fraction Measurement via Diffraction: *Michael Cox*[1]; Adam Creuziger[2]; Kip Findley[3]; Thomas Gnäupel-Herold[2]; Whitney Poling[4]; Richard Thiessen[5]; [1]Colorado School of Mines & NIST; [2]National Institute of Standards and Technology; [3]Colorado School of Mines; [4]General Motors; [5]Thyssenkrupp Steel

5:00 PM
Novel Hierarchical γ90-εtwin-α' Triple Phase Structure at - Martensite Intersection: *Digvijay Singh*[1]; Fumiyoshi Yoshinaka[1]; Susumu Takamori[1]; Satoshi Emura[1]; Takahiro Sawaguchi[1]; [1]National Institute for Materials Science, Japan

5:20 PM
The Austenite Grain Growth of X80 Steel at Different Temperatures and Its Influence on Decomposition Kinetics and Mechanical Properties at a Cooling Rate of 50°C/s.: *Daniel Olguin Ramirez*[1]; Omar Garcia Rincon[2]; John Nutter[1]; Juan Pablo Pedraza[2]; Eric Palmiere[1]; [1]The University of Sheffield; [2]Ternium Mexico

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NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy Systems — Ceramic Waste Forms & Molten Salts

Sponsored by: ACerS Energy Materials and Systems Division, TMS: Nuclear Materials Committee

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Theodore Besmann, University of South Carolina; Charmayne Lonergan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Kaustubh Bawane, Idaho National Laboratory; Joshua White, Los Alamos National Laboratory; Christian Deck, General Atomics; Gordon Thorogood, Australian Nuclear Science and Technology Organization

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Session Chairs: Jake Amoroso, Savannah River National Laboratory; Juliano Schorne Pinto, University of South Carolina

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3:00 PM Invited
Structural Manipulation of Ceramic Materials via Extreme Conditions: *Maik Lang*[1]; Eric O'Quinn[1]; Alexandre Solomon[1]; Casey Corbridge[1]; Cale Overstreet[1]; Christina Trautmann[2]; Antonio Fuentes[3]; [1]University of Tennessee; [2]GSI Helmholtz Center ; [3]Cinvestav Unidad Saltillo

3:30 PM Break

3:50 PM
Atomic Scale Order in Swift Heavy Ion Irradiated MgAl2O4 Spinel Oxide: *John Hirtz*[1]; Eric O'Quinn[1]; Joerg Neuefeind[2]; Matt Tucker[2]; Arianna Minelli[2]; Maik Lang[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

4:10 PM
Structural Analysis of Swift Heavy Ion Irradiated -$Sc_2Hf_7O_{17}$ and -$Sc_2Hf_5O_{13}$: *Yugo Noguchi*[1]; Masanari Iwasaki[1]; Manabu Ishimaru[1]; Maulik Patel[2]; Gianguido Baldinozzi[3]; [1]Kyushu Institute of Technology; [2]University of Liverpool; [3]CNRS

4:30 PM
Chemical Durability of Cermet Waste Forms for Advanced Reactor Wastes: *Jake Amoroso*[1]; Matthew Page[1]; Nico Rod[1]; [1]Savannah River National Laboratory

4:50 PM Invited
Challenge of Making Accurate Heat Capacity Measurements for Fluoride Salts: *Juliano Schorne Pinto*[1]; Padinhare Manissery Aiswarya[1]; Jack Wilson[1]; Theodore Besmann[1]; [1]University of South Carolina

5:20 PM
Chemical Thermodynamic Database Development and Applications for Molten Salt Reactors: *Theodore Besmann*[1]; Juliano Schorne-Pinto[1]; Jorge Paz Soldan Palma[1]; Amir Mofrad[1]; Clara Dixon[1]; Ronald Booth[1]; Jack Wilson[1]; Aiswarya Padinhare Manissery[1]; [1]University of South Carolina

5:40 PM
Thermodynamic Modeling of the LiF-NaF-(La,Ce,Pu)F_3 Systems for Molten Salt Reactor Applications: *Jorge Paz Soldan*[1]; Amir Mofrad[1]; Juliano Schorne-Pinto[1]; Aiswarya Padinhare Manissery[1]; Theodore Besmann[1]; [1]University of South Carolina

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FUNDAMENTALS AND CHARACTERIZATION

Computational Materials for Qualification and Certification — Defects and Heat Transfer

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Corbett Battaile, Sandia National Laboratories; Anthony Rollett, Carnegie Mellon University; Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration

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Session Chairs: Gregory Wagner, Northwestern University; Edwin Schwalbach, Air Force Research Labroatory

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3:00 PM Invited
Lessons Learned Calibration and Validation of Process Models for Laser Powder Bed Fusion Additive Manufacturing: *Albert To*[1]; [1]University of Pittsburgh

3:30 PM
Data-Driven Process Uncertainty Analysis of Stochastic Lack-of-Fusion in Laser Powder Bed Fusion: *Vamsi Subraveti*[1]; Caglar Oskay[1]; [1]Vanderbilt University

3:50 PM Break

4:10 PM Invited
Additive Manufacturing Porosity Estimation Using Multiple Nondestructive Evaluation Techniques: *Peter Spaeth*[1]; Joseph Zalameda[1]; Erik Frankforter[1]; [1]NASA

4:40 PM Invited
Correlations of Additive Manufacturing Model-Based Process Metrics With Spatter-Induced Porosity in the Powder Bed Fusion-Laser Beam/Metallic Process: *Samuel Hocker*[1]; Andrew Kitahara[2]; Brodan Richter[1]; Sang-Hyon Chu[1]; Brandon Widener[2]; Peter Spaeth[1]; Joseph Zalameda[1]; Edward Glaessgen[1]; [1]Nasa; [2]Analytical Mechanics Associates

5:10 PM
Computational Investigation on the Combined Effect of Pore Attributes on Strain Concentrators in Metal Additively Manufactured Materials: *Erick Ramirez*[1]; Saikumar Yeratapally[2]; George Weber[3]; Kenji Shimada[1]; [1]Carnegie Mellon University; [2]Science and Technology Corporation; [3]NASA Langley Research Center

5:30 PM
Quantifying Microstructure Evolution of LPBF Ni-Alloy Under High Temperatures Exposure Through Computer Vision: *Yu-Tsen Yi*[1]; Junwon Seo[1]; Nicholas Lamprinakos[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — 2D Materials

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division, ACerS Energy Materials and Systems Division, ACerS Engineering Ceramics Division

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Purdue University

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Session Chairs: Wonmo Kang, Arizona State University; Babak Anasori, Purdue Univerity; Michael Naguib, Tulane University

2:00 PM Invited
Electromagnetic Irradiation Enabled Direct Activation for Efficient Graphene Etching and Doping: *Qiong Nian*[1]; [1]Arizona State University

2:30 PM Invited
Sol Gel-Based Syntheses Towards Functional Carbides: *Christina Birkel*[1]; [1]Arizona State University

3:00 PM
Bi-Continuous Graphene-Nickel Composite Fibers with Combined Strength-Ductility: Won June Choi[1]; Uschuas Dipta Das[1]; Chunghwan Kim[1]; *Wonmo Kang*[1]; [1]Arizona State University

3:20 PM
Graphene Infused Copper: *Rishi Raj*[1]; Seohyeon Jo[1]; [1]University of Colorado

3:40 PM Break

4:00 PM
Phase Formation and High Temperature Electrical Conductivity in Polymer-Derived Silicon Oxycarbide – Ti3C2Tx 'MXene' Nanocomposites: *Advaith Rau*[1]; Kathy Lu[2]; [1]Virginia Polytechnic Institute; [2]University of Alabama Birmingham

4:20 PM
Two-Dimensional Transition Metal Carbo-Chalcogenide for Electrocatalysis: *Elham Loni*[1]; Ahmad Majed[1]; Hari Thangavelu[2]; Per Persson[2]; Chaochao Dun[3]; Jeffrey Urban[3]; Shengjie Zhang[1]; Matthew Montemore[1]; Anika Tabassum[1]; Karamullah Eisawi[1]; Michael Naguib[1]; [1]Tulane University; [2]Linköping University; [3]Lawrence Berkeley National Laboratory

4:40 PM
Role of Cations on High-Temperature Phase Evolution and Grain Growth of 2D Carbide MXenes and Their Electrocatalytic Properties: *Kartik Nemani*[1]; Bibash Sapkota[2]; Austin Vohrees[1]; Brian Wyatt[1]; Anupma Thakur[1]; Nithin Chandran[1]; Zachary Hood[3]; Robert Klie[2]; Babak Anasori[1]; [1]Purdue University; [2]University of Illinois Chicago; [3]Argonne National Laboratory

5:00 PM
Fabrication of Patterned Heaters Using Laser Induced Graphene Electrodes on Flexible Polyimide Substrates: *Mirza Sahaluddin*[1]; Soumalya Ghosh[1]; Moataz Abdulhafez[1]; Jacek Ryl[2]; Mostafa Bedewy[1]; [1]University of Pittsburgh; [2]Gdask University of Technology

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Emerging Energy Materials

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Yang Bai, University of Oulu; Jianhua Tong, Clemson University

2:00 PM Invited
Microwave-Assisted Hydrothermal Technique for the Preparation of Lanthanide Doped Alkaline-Earth Fluoride Nanoparticles: Emil Milan[1]; Francesca Loschi[1]; Martina Dalboni[1]; Eros Radicchi[1]; Miriam Herrera-Collado[2]; *Adolfo Speghini*[1]; [1]University of Verona; [2]University of Cadiz

2:30 PM
Synthesis of Novel Activated Carbons Derived from Pig Fur Biowaste for Cadmium Adsorption in Wastewater: A Comparative Study of In-Situ and Ex-Situ Activation Routes: *Jeremiah Chukwuneke*[1]; Jude Sinebe[2]; Henry Orugba[2]; [1]Nnamdi Azikiwe University, Awka; [2]Delta State University

2:50 PM
Emerging Solution to an Indigenous Power Sector Using Boltwoodite Ore for Nuclear Fuel Cycle Application: *Alafara Baba*[1]; Mustapha RAJI[1]; Jude Majasan[2]; Abdul Ganiyu Alabi[3]; Folahan Adekola[3]; Rasheed Agava[4]; [1]University of Ilorin; [2]University College London; [3]Kwara State University, Malete; [4]National Agency for Science and Engineering Infrastructure (NASENI)

3:10 PM Break

3:30 PM
Electret Behavior of Single Carbon Fiber: Satya Nagalla[1]; *Deborah Chung*[1]; [1]University at Buffalo, The State University of New York

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics II

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab

2:00 PM Invited
Exploring Additive Manufacturing of Thermoelectric Materials to Overcome Technology Transition Barriers: *Saniya Leblanc*[1]; [1]George Washington University

2:30 PM Invited
Progress in the Development of Distributed Transport Property (DTP) Thermoelectric Devices: *Doug Crane*[1]; Lon Bell[1]; [1]DTP Thermoelectrics

3:00 PM Invited
Realizing High-Performance and High-Temperature Compatible Thermoelectric Devices: *Bed Poudel*[1]; Wenjie Li[1]; Rabeya Smriti[1]; Subrata Ghosh[1]; Amin Nozariasbmarz[1]; Shashank Priya[2]; [1]Pennsylvania State University; [2]University of Minnesota

3:20 PM Break

3:40 PM Invited
Dynamics of Entropy, Charge and Energy: The Carnot Principle Applied to Thermoelectric Materials: *Armin Feldhoff*[1]; [1]Leibniz University Hannover

4:00 PM Invited
Low Apparent Thermal Conductivity of a Single Nanopillar Mediated by Surface Phonon Polaritons: *Sunmi Shin*[1]; [1]National University of Singapore

FUNDAMENTALS AND CHARACTERIZATION

Fracture in Metals: Insights from Experiments and Modeling Across Length and Time Scales — Experimental Insights

Program Organizers: Abigail Hunter, Los Alamos National Laboratory; Nithin Mathew, Los Alamos National Laboratory; Janel Chua, Los Alamos National Lab

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Session Chairs: Jasdeep Singh, Texas A&M University; Pania Newell, University of Utah

3:00 PM Invited
Thermo-Mechanical Insights into Titanium Content in TiAlTa Alloys: *Pania Newell*[1]; Yanbo Wang[1]; [1]University of Utah

3:30 PM
Tensile Deformation Characteristic and SASH Modeling of Superni 625 Alloy: Synergistic Effects of Coarse-Grain Size, Phase Transformation and Deformation Micromechanisms: *Sonika* -[1]; Suhrit Mula[1]; [1]Indian Institute of Technology Roorkee

3:50 PM Break

4:10 PM
Microcantilever Testing for Brittle-To-Ductile Transition Temperatures: *Gregory Thompson*[1]; Md Tariqul Islam[1]; Hunter Brumblay[2]; Christopher Weinberger[3]; [1]University of Alabama; [2]Colorado State University ; [3]Colorado State University

4:30 PM
Experimental Determination of Monotonic and Reversed Plastic-Zone Ahead of Crack-Tip in Fatigue Using High-Resolution Digital Image Correlation: *Suraj Kumar*[1]; Sanjeev Yadav[1]; Vikram Jayaram[1]; Praveen Kumar[1]; [1]Indian Institute of Science

4:50 PM
Novel Analysis of High Temperature Corrosion Products and Porosity on Uncoated Single Crystal RenéN5 Superalloy: *Roger Maddalena*[1]; Alice Scarpellini[1]; Marc Liu[1]; Stoichko Antonov[2]; Jonathan Cormier[3]; [1]Thermo Fisher Scientific; [2]National Energy Technology Laboratory; [3]ENSMA

5:10 PM Invited
Dynamic Testing of Nanoporous Gold Adhesive Strength Using a Shock Tube: *Jasdeep Singh*[1]; Hooman Rahmani[1]; Sean Cooper[1]; Eric Petersen[1]; Ankit Srivastava[1]; Michael Demkowicz[1]; [1]Texas A&M University

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Current Issues and Functional Applications — Glasses and Optical Materials: Current Issues and Functional Applications

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Qiang Fu, Corning Inc; Walter Kob, University of Montpellier

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Session Chair: Qiang Fu, Corning Inc

2:00 PM Invited
Laser Processing of Glass: Rafael Comesana[1]; Oscar Barro[1]; Mónica Fernández-Arias[1]; Félix Quintero[1]; Pablo Pou-Álvarez[1]; Raul Barciela[1]; Ramón Soto[1]; Ana Vilas[1]; *Juan Pou*[1]; [1]University of Vigo

2:30 PM
Investigation of the Alkali and Alkali-Earth Effect on Crystallization of SnO2 in LAW Glasses for WTP: *Arumala Lere-Adams*[1]; John McCloy[1]; [1]Washington State University

2:50 PM
Pores Plague Glass-Ceramic: *Oscar Peitl*[1]; Edgar Zanotto[1]; Klaus Heide[2]; [1]Federal University of Sao Carlos; [2]Friedrich-Schiller-Universität

3:10 PM
Structural Relaxation of a Medieval Cathedral Glass: *Ricardo Felipe Lancelotti*[1]; Marcelo Kurtovic[1]; Oscar Peitl[1]; Edgar Zanotto[1]; [1]Federal University of Sao Carlos

3:30 PM Break

3:50 PM
Studying Enthalpy Relaxation of Sodium Aluminosilicate Glasses Using Modulated Differential Scanning Calorimetry: *Brittney Hauke*[1]; John Mauro[1]; [1]Penn State University

4:10 PM
Structure-Property Correlation in the Bi_2O_3-ZnO-B_2O_3 Pyroborate Glass System: *Lenorah Haight-Stott*[1]; Sophia Carretto[1]; Elizabeth Tsekrekas[1]; Doris Möncke[1]; [1]Alfred University

4:30 PM
Structure and Dynamics of Silica Glass Surfaces Treated with HF and HCl Acids: *Drew Antony*[1]; Gabe Agnello[1]; Jejoon Yeon[1]; Nicholas Smith[1]; Wanda Walczak[1]; Joy Banerjee[1]; [1]Corning

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Segregation

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chairs: Fadi Abdelijawad, Lehigh University; John Blendell, Purdue University

3:00 PM Invited
Grain Boundary Segregation and Solute Drag in Multicomponent Alloys: *Fadi Abdeljawad*[1]; [1]Lehigh University

3:30 PM
Grain Boundary Phase Transformations in Segregated Metallic Alloys: *Timofey Frolov*[1]; Vivek Devulapalli[2]; Enze Chen[3]; Tobias Brink[2]; Christian Liebscher[4]; [1]Lawrence Livermore National Laboratory; [2]MPIE; [3]Stanford university; [4]Ruhr University Bochum

3:50 PM Break

4:10 PM Invited
Local Cationic Ordering in Iron-Substituted Strontium Titanate: *Dylan Jennings*[1]; M. Pascal Zahler[2]; Moritz Kindelmann[1]; Franziska Winterhalder[1]; Di Wang[3]; Olivier Guillon[1]; Joachim Mayer[1]; Wolfgang Rheinheimer[2]; [1]Forschungszentrum Jülich; [2]University of Stuttgart; [3]Karlsruhe Institute of Technology

4:40 PM
Quantitative Analysis of Ca and Y Segregation Behaviors in Magnesium Aluminate Spinel: *Alexander Campos-Quiros*[1]; Animesh Kundu[1]; Masashi Watanabe[1]; [1]Lehigh University

5:00 PM
Grain Boundary Segregation Behavior in Ni and Fe Based Alloys During Diffusional Creep: *Boopathy Kombaiah*[1]; Sriswaroop Dasari[1]; Chaitanya Bhave[1]; Shehab Shousha[2]; Advika Chesetti[3]; Ninad Mohale[1]; Benjamin Beeler[2]; Sourabh Kadambi[2]; [1]Idaho National Laboratoy; [2]North Carolina State University; [3]University of North Texas

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session II

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Peter Liaw, University of Tennessee

3:00 PM Invited
Capturing Physics-Driven Differences in Optimized High Entropy Alloys via Informatics: *Scott Broderick*[1]; [1]University at Buffalo

3:20 PM Invited
Composition Design of Refractory High-Entropy Alloys with Machine Learning Models: *Haixuan Xu*[1]; Tao Liang[1]; [1]University of Tennessee

3:40 PM Break

4:00 PM Invited
Compositionally Complex Lightweight Refractory Alloys Designed to Exhibit Ductility: *Joseph Poon*[1]; Diego Ibarra[1]; Peter Connors[1]; Jie Qi[1]; Samuel Inman[1]; Xuesong Fan[1]; Jishnu Bhattacharyya[1]; Debashish Sur[1]; Michael Widom[2]; Sean Agnew[1]; John Scully[1]; Peter Liaw[1]; [1]University of Virginia; [2]Carnegie-Mellon University

4:20 PM
Controlling Factors of Vacancy Formation Energies in FCC Concentrated Alloys from DFT Calculations: *Nathan Linton*[1]; Dilpuneet Aidhy[1]; [1]Clemson University

4:40 PM
Controlling the Deformation Behavior of AlCoCrFeNi High-Entropy Alloy Additively Manufactured via Binder Jetting: *Olujide Oyerinde*[1]; Ioannis Mastorakos[1]; Ajit Achuthan[1]; Philip Yuya[1]; [1]Clarkson University

5:00 PM
Coupling Self-Stabilization and Solute Grain Boundary Segregation Effects for Ultra-Stable Nanocrystalline High Entropy Alloy Design: *Moses Adaan-Nyiak*[1]; Ahmed Tiamiyu[1]; [1]University of Calgary

SPECIAL TOPICS

Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday — Progress in Mxenes I

Sponsored by: ACerS Basic Science Division, ACerS Engineering Science Division

Program Organizers: Surojit Gupta, University of North Dakota; Miladin Radovic, Texas A&M University; Michael Naguib, Tulane University

Monday PM | October 7, 2024
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Session Chairs: Babak Anasori, Purdue University; ZhengMing Sun, Southeast University; Michael Naguib, Tulane University

2:00 PM Invited
From MAX Phases to Carbon Nanomaterials and MXenes: *Yury Gogotsi*[1]; [1]Drexel University

2:30 PM Invited
Two-Dimensional MXenes: from Discovery to Recent Developments: *Michael Naguib*[1]; [1]Tulane University

3:00 PM Invited
MAX Phases and MXenes as Additive Materials in Composites: *Babak Anasori*[1]; [1]Purdue University

3:30 PM Break

3:50 PM Invited
Challenges and Opportunities in Integrating MXene into Ceramic Nanocomposites: *Maxim Sokol*[1]; [1]Tel-Aviv University

4:20 PM Invited
Effect of Cationic Exchange on the Hydration and Swelling Behavior of MXenes: *Louisiane Verger*[1]; Cooper Voigt[2]; Varun Natu[2]; Michael Ghidiu[2]; Michel Barsoum[2]; [1]Rennes Institute of Chemical Sciences; [2]Drexel University

4:50 PM Invited
MXene Composites and Derivatives for Energy Storage: *ZhengMing Sun*[1]; [1]Southeast University

5:20 PM Invited
Scalable, Inexpensive, One-Pot, Facile Synthesis of Crystalline, Two-Dimensional, Birnessite Flakes with Quaternary Ammonium Hydroxides: *Mary Qin Hassig*[1]; Takayuki Kono[2]; Michael Carey[3]; Kaustubh Sudhakar[1]; Hussein Badr[1]; Gregory Schwenk[1]; Michel Barsoum[1]; [1]Drexel University; [2]Murata Manufacturing Co; [3]Riverside Research, Air Force Research Laboratory

LIGHTWEIGHT ALLOYS

Impurity-Tolerant Alloy Design, Development, and Production — Impurity-Tolerant Alloy Design, Development, and Production

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Alice Perrin, Oak Ridge National Laboratory; Ying Yang, Oak Ridge National Laboratory

Monday PM | October 7, 2024
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Session Chair: Alice Perrin, Oak Ridge National Laboratory

3:00 PM Invited
Impact of Feedstock Purity on a Ta-Containing Steel During Melt Processing Using Vacuum Induction Melting and Electroslag Remelting: *Martin Detrois*[1]; Paul Jablonski[1]; [1]National Energy Technology Laboratory

3:30 PM Break

3:50 PM
Generative-AI for Impurity-Tolerant Robust Alloy Design: *Patxi Fernandez-Zelai*[1]; Saket Thapliyal[1]; Rangasayee Kannan[1]; Peeyush Nandwana[1]; Yukinori Yamamoto[1]; Andrzej Nycz[1]; Vincent Paquit[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

ARTIFICIAL INTELLIGENCE

Machine Learning and Simulations — Machine Learning and Simulations II

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Anoop Krishnan, IIT Delhi

Monday PM | October 7, 2024
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Session Chairs: Mathieu Bauchy, UCLA; Peter Kroll, The University of Texas at Arlington; Anoop Krishnan, IIT Delhi

2:00 PM Invited
Machine Learning in Nuclear Waste Glass Formulation and Property Model Development: *Xiaonan Lu*[1]; John Vienna[1]; [1]Pacific Northwest National Laboratory

2:40 PM
Assessing GPR Models for Steel Hardness Prediction in Production Environments: *Qasim Khan*[1]; Viraj Ashok Athavale[2]; [1]Nucor Steel Memphis, Inc.; [2]Nucor Steel Memphis Inc

3:00 PM
Multi-Fidelity Gaussian Process Models for Time-Series Outputs: *Aditya Venkatraman*[1]; Ryan Katona[1]; David Montes de Oca Zapiain[1]; Philip Noell[1]; [1]Sandia National Laboratories

3:20 PM Break

3:40 PM
Forward Prediction and Inverse Design of Additively Manufacturable Alloys via Autoregressive Language Models: *Bo Ni*[1]; Benjamin Glaser[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

4:00 PM
Understanding Grain-Boundary Structure Using Strain Functional Descriptors and Unsupervised Machine Learning: *Nithin Mathew*[1]; [1]Los Alamos National Laboratory

4:20 PM
End-To-End Differentiability and Tensor Processing Unit (TPU) Computing to Accelerate Materials' Inverse Design: *Mathieu Bauchy*[1]; Han Liu[1]; [1]University of California, Los Angeles

4:40 PM
Graph Neural Networks for Rapid Continuum Damage Modeling of Semi-Crystalline Polymers: *Ali Kassab*[1]; Georges Ayoub[1]; [1]University of Michigan-Dearborn

CERAMIC AND GLASS MATERIALS

Mesoscale Phenomena in Functional Polycrystals and Nanostructures — Session II: Tribology, Thermal Properties, Carbon and Nanostructures

Sponsored by: ACerS Electronics Division

Program Organizers: Serge Nakhmanson, University of Connecticut; Edward Gorzkowski, Naval Research Laboratory; James Wollmershauser, U.S. Naval Research Laboratory; Seungbum Hong, KAIST; Javier Garay, University of California, San Diego; Pierre-Eymeric Janolin, CentraleSupélec; Ilya Sochnikov, University of Connecticut

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Session Chairs: Elizabeth Dickey, Carnegie Mellon University; Charles Paillard, University of Arkansas; Semën Gorfman, Tel Aviv University; Florian Mayer, Materials Center Leoben Forschung GmbH

2:00 PM Invited
Nanoscale Flexoelectric Control of Tribology in Ferroelectrics: *Seongwoo Cho*[1]; Iaroslav Gaponenko[1]; Céline Lichtensteiger[1]; Jordi Barceló-Mercader[2]; Irene Arias[2]; Seungbum Hong[3]; Patrycja Paruch[1]; [1]University of Geneva; [2]Universitat Politècnica de Catalunya; [3]KAIST

2:30 PM
Microstructural Characterization of Artificial Interfacial Solids for High ZT Thermoelectrics: *Sarshad Rommel*[1]; Ovijit Das[1]; Benjamin Greenberg[2]; Kevin Anderson[2]; James Wollmershauser[2]; Boris Feigelson[2]; David Drabold[3]; Serge Nakhmanson[1]; Mark Aindow[1]; [1]University of Connecticut; [2]U.S. Naval Research Laboratory; [3]Ohio University

2:50 PM
Exploring the Spatial Projection of Thermal Conductivity and Heat Transport in Materials: *Aashish Gautam*[1]; Chinonso Ugwumadu[1]; Kishor Nepal[1]; David Drabold[1]; [1]Ohio University

3:10 PM
Carbon, Coal and Graphite: A Simulation Approach: *Chinonso Ugwumadu*[1]; David Drabold[1]; [1]Ohio University

3:30 PM Break

3:50 PM
Metal-Graphene Interactions for Enhanced Electronic Conductivity in FCC Metals.: *Kishor Nepal*[1]; Chinonso Ugwumadu[1]; Keerti Kappagantula[2]; David Drabold[1]; [1]Ohio University; [2]Pacific Northwest National Laboratory

4:10 PM
Vapor Phase Grown Metal Oxide Nanoparticles in Aqueous Environments: Structure Formation, Transformation Behaviour, and Reactivity: *Oliver Diwald*[1]; Daniel Thomele[1]; Hasan Razouq[1]; Kerstin Neuhauser[1]; Thomas Berger[1]; Gilles Bourret[1]; [1]Paris Lodron Universitaet Salzburg

4:30 PM
Intergranular Chemistry and Sintering of Metal Oxide Particle Powders: Korbinian Aicher[1]; Hasan Razouq[1]; Thomas Schwab[1]; Gregor Zickler[1]; *Oliver Diwald*[1]; [1]Paris Lodron Universitaet Salzburg

4:50 PM
Berry Phase Polarization Calculation of Carbon Nanotubes: Toward Non-Destructive Testing and Monitoring: *Ala Alotaibi*[1]; [1]University of Missouri - Kansas City

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials II

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

Monday PM | October 7, 2024
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Session Chairs: Juliana Marchi, Universidade Federal do ABC; Min Wang, University of Hong Kong

3:00 PM Invited
Exploring Anti-Biofilm Properties of Silver-Loaded Zeolite in UV-Cured Resins: A Study Using VAT Polymerization on Glass Substrates: *Hideyuki Kanematsu*[1]; Dana Barry[2]; Tsunemasa Saiki[3]; Hidekazu Miura[4]; Akihiro Hirayama[3]; Akira Otsu[3]; Koichiro Ogata[5]; Akiko Ogawa[1]; Takeshi Kogo[1]; Nobumitsu Hirai[1]; Takayoshi Nakano[6]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Clarkson University; [3]Hyogo Prefectural Institute of Technology; [4]Suzuka University of Medical Science; [5]National Institute of Technology (KOSEN), Oita College; [6]Osaka University

3:20 PM Break

3:40 PM Invited
Exploring the Anti-Biofilm Properties of Austenitic Stainless Steel: A Study on Material Surface Characteristics and Biofilm Resistance via Selective Laser Sintering: *Hideyuki Kanematsu*[1]; Dana Barry[2]; Tsunemasa Saiki[3]; Akihiro Hirayama[3]; Akira Otsu[3]; Koichiro Ogata[4]; Akiko Ogawa[1]; Takeshi Kogo[1]; Hirokazu Konishi[1]; Nobumitsu Hirai[1]; Hidekazu Miura[5]; Takayoshi Nakano[6]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Clarkson University; [3]Hyogo Prefectural Institute of Technology; [4]Natoinal Institute of Technology, Oita College; [5]Suzuka University of Medical Science; [6]Osaka University

4:00 PM Invited
Influence of Surface Finishing on Fatigue Life of NiTi Wire and Endodontic Instruments: *Carlos Elias*[1]; Ivi dos Santos[1]; Julianna Garcia[1]; Victor Vieira Leal[1]; [1]Military Institute of Engineering

4:20 PM Invited
New Generation of Bioceramics With Complex Structure and Chemical Composition Based on Glaserite-Like Phases for Personalized Bone Tissue: *Pavel Evdokimov*[1]; N. Leontyev[1]; V. Bitanova[1]; D. Larionov[1]; A. Murashko[1]; D. Golubchikov[1]; E. Klimashina[1]; Ya Filippov[2]; A. Garshev[1]; I. Scherbakov[1]; V. Dubrov[1]; A. Efimenko[1]; G. Shipunov[1]; O. Kapitanova[1]; I. Veselova[1]; V. Putlayev[1]; [1]Lomonosov Moscow State University; [2]1Lomonosov Moscow State University

4:40 PM Invited
Processing of Drugs with Poor Water Solubility for Microneedle Drug Delivery: Andrew Sachan[1]; *Roger Narayan*[2]; [1]University of North Carolina at Chapel Hill; [2]University of North Carolina

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Porous Materials for Energy and Environment Applications — Porous Materials I

Program Organizers: Lan Li, Boise State University; Winnie Wong-Ng; Kevin Huang, University of South Carolina; Di Wu, Washington State University

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Session Chairs: Lan Li, Boise State University; Winnie Wong-Ng, National Institute of Standards and Technology (NIST)

2:00 PM Introductory Comments

2:05 PM Invited
Ammonium ZSM-5 Zeolite: Characterization and Sorption Reference Data in Recent Years: *Huong Giang Nguyen*[1]; [1]National Institute of Standards

2:25 PM Invited
Structural Phase Transition in the Flexible Coordination Polymer Ni-DBM-Bpy from X-Ray Diffraction Measurements and DFT Calculations: *Eric Cockayne*[1]; Andrew Allen[1]; Wei Zhou[1]; Winnie Wong-Ng[1]; [1]National Institute of Standards and Technology

2:45 PM Invited
Impact of Microstructural Details in Porous Materials on Thermal and Mechanical Properties: *Matthew Beck*[1]; [1]University of Kentucky

3:05 PM Invited
Graded Porous Matrices Made by Phase Inversion Method: *Kevin Huang*[1]; [1]University of South Carolina

3:25 PM Break

3:45 PM Invited
Hierarchical Nanoporosity Through Hybrid Processing of Alloys: *Mark Atwater*[1]; [1]Liberty University

4:05 PM Invited
On the Design of Novel Porous Materials from Biomass: *Surojit Gupta*[1]; [1]University of North Dakota

4:25 PM
Anisotropic Cellulose Aerogels for Developing Mesoporous Ceramics: *Hannah Blaha*[1]; E. Johan Foster[2]; Carolina Tallon[1]; [1]Virginia Tech; [2]The University of British Columbia

4:45 PM
Mesoporous Polymetallic from Bentonite Clay: Characterization and Application Studies: *Abdullah Ibrahim*[1]; Khadijat Abdulsalam[1]; Daud Olaoluwa[2]; Sadisu Girigisu[3]; Alafara Baba[4]; [1]Federal Polytechnic Ayede; [2]Federal Polytechnic Ede; [3]Federal Polytechnic Offa; [4]University of Ilorin

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CERAMIC AND GLASS MATERIALS

Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics — Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics II

Sponsored by: ACerS Engineering Ceramics Division, ACerS Basic Science Division

Program Organizers: Matthew Dickerson, Air Force Research Laboratory; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama at Birmingham

Monday PM | October 7, 2024
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Session Chair: Kathy Lu, University of Alabama at Birmingham

2:00 PM Invited
Developing Ceramic Materials via Preceramic Polymer Chemistry and an Enhanced Understanding of Structure-Property Relationships: *Nicholas Bedford*[1]; [1]University of New South Wales

2:30 PM
Insights into MXene-SiOC Composite Formation and Properties via Experimental and DFT Studies: *Mubina Shaik*[1]; Kathy Lu[1]; [1]University of Alabama at Birmingham

2:50 PM Invited
Formulation of Preceramic Polymers for Photocuring and 3D Printing of Polymer-Derived Ceramic Lattices: *Michael Jakubinek*[1]; Thomas Lacelle[2]; Hamidreza Yazdani Sarvestani[2]; Ahmad Sohrabi[2]; Apoorv Kulkarni[2]; Hanie Kazari[2]; Yadienka Martinez-Rubi[1]; Hugo Lavoie[3]; Amelie Robitaille[3]; Behnam Ashrafi[2]; [1]Division of Emerging Technologies, National Research Council Canada; [2]Aerospace Research Centre, National Research Council Canada; [3]Defence Research & Development Canada

3:20 PM Break

3:40 PM Invited
Thermo-Mechanical Effects during the Conversion of Pre-Ceramic Polymers: *Mark O'Masta*[1]; Erin Wernick[1]; Alex Yu[1]; Kayleigh Porter[1]; Phuong Bui[1]; Tobias Schaedler[1]; [1]HRL Laboratories Llc

4:10 PM Invited
Size Effects in Additively Manufactured Polymer-Derived Ceramic Composites: *Brett Compton*[1]; [1]University of Tennessee, Knoxville

4:40 PM
Polymer Derived Ceramics: An Evolutionary Algorithm Driven Classical Molecular Dynamics: *Mohammed Belhadj Larbi*[1]; [1]University of Missouri Kansas City

5:00 PM Concluding Comments

FUNDAMENTALS AND CHARACTERIZATION

Solid-State Transformations Under Complex Thermal Conditions — Microstructural Evolution Prediction

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Adriana Eres-Castellanos, Colorado School of Mines; Sriram Vijayan, Michigan Technological University; Eric Payton, University of Cincinnati; Sophie Primig, University of New South Wales

Monday PM | October 7, 2024
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Session Chair: Eric Payton, University of Cincinnati

3:40 PM Invited
Towards Predictive Microstructural Design of Additively Manufactured Metals: Janith Wanni[1]; Subodh Subedi[1]; Krishnan Suresh[1]; *Dan Thoma*[1]; [1]University of Wisconsin-Madison

4:10 PM
A New Crystal Plasticity Modeling Framework Enabling Fully Implicit Time Integration of Coupled Phase Transformation and Plastic Deformation in Shape Memory Alloys: *Rupesh Kumar Mahendran*[1]; Surya Kalidindi[1]; Aaron Stebner[1]; [1]Georgia Institute of Technology

4:30 PM
Predicting Emergence of Nanoscale Order in Surfaces Oxides Through Preferential Interactivity Parameter: *Andrew Martin*[1]; Martin Thuo[1]; [1]North Carolina State University

4:50 PM
Using the SEAQT Framework to Predict the Kinetics of Irradiating an FeCr Alloy: *Christopher Garza*[1]; Michael von Spakovsky[1]; William Reynolds[1]; [1]Virginia Polytechnic Institute

5:10 PM
Additive Manufacturing of Beta Titanium Alloys: Influence of Thermo-Kinetics on Solid State Precipitation (Invited): M.S.K.K.Y Nartu[1]; Tirthesh Ingale[1]; Srinivas Aditya Mantri[1]; Sriswaroop Dasari[1]; Abhishek Sharma[1]; Fan Sun[2]; Frederic Prima[2]; Narendra Dahotre[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]Chimie ParisTech, Institut de Recherche de Chimie Paris

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Sustainable Horizons: A Symposium on Collective Action for a Resilient Future — Sustainable Horizons

Sponsored by: ACerS Education and Professional Development Council, ACerS Electronics Division, ACerS President's Council of Student Advisors

Program Organizers: Alp Sehirlioglu, Case Western Reserve University; Jurgen Rodel, Technical University of Darmstadt; Rishabh Kundu, Technical University of Darmstadt

Monday PM | October 7, 2024
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Session Chair: Alp Sehirlioglu, Case Western Reserve University

2:00 PM Invited
The Electrification of Everything: *David Ginley*[1]; [1]NREL

2:30 PM
Key Factors for Communicating the Climate Reality in an Era of Information Overload: *Rishabh Kundu*[1]; Marc Widenmeyer[2]; Anke Weidenkaff[3]; [1]Technical University of Darmstadt; [2]RTechnical University of Darmstadt; [3]Technical University of Darmstadt / Fraunhofer Research Institution for Material Recycling and Resource Strategies IWKS

2:50 PM Invited
Catalysts of Change: Functional Ceramic Materials Steering Green Hydrogen Production: *Sanjay Mathur*[1]; [1]University of Cologne

3:20 PM Break

3:40 PM Invited
Sustainable Development of Advanced Materials Through Responsible Innovation: *Khara Grieger*[1]; Jacob Jones[1]; [1]North Carolina State University

4:10 PM Invited
Building a Sustainable Culture in Day-to-Day Laboratory Research: Jon-Paul Maria[1]; *Kristin Dreyer*[1]; Saeed Almishal[1]; Krista Bailey[1]; Jack Rumery[1]; [1]Penn State University

4:40 PM
University Chemical Inventory Emission Analytics Dashboard: A Path to Sustainable R&D Through Smart Procurement: *Hector Gomez Jimenez*[1]; Alp Sehirlioglu[1]; [1]Case Western Reserve University

5:00 PM
Insights from Laboratory Efficiency Assessment Framework (LEAF) Certification in University Research Labs: *Rishabh Kundu*[1]; Ann-Katrin Emmerich[1]; Margarida Barroso[1]; Marc Widenmeyer[1]; Anke Weidenkaff[1]; [1]Technical University of Darmstadt

NUCLEAR ENERGY

Tackling Metallic Structural Materials Challenges for Advanced Nuclear Reactors — Structural Materials in Corrosive Environments

Sponsored by: TMS: Nuclear Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Miaomiao Jin, Pennsylvania State University; Xing Wang, Pennsylvania State University; Karim Ahmed, Texas A&M University; Jeremy Bischoff, Framatome; Adrien Couet, University of Wisconsin-Madison; Kevin Field, University of Michigan; Lingfeng He, North Carolina State University; Raul Rebak, GE Global Research

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Session Chairs: Miaomiao Jin, Pennsylvania State University; Xing Wang, Pennsylvania State University

3:00 PM
Effect of Molten Halide Salts on Structural Alloy Creep at 650°-750°C: *Bruce Pint*[1]; Rishi Pillai[1]; [1]Oak Ridge National Laboratory

3:20 PM Break

3:40 PM Invited
Degradational Effects of Single Crystal Deformation Mode and Corrosion Resistance due to Long-Range Order in Ni-Based Alloys for Nuclear Applications: *Fei Teng*[1]; Julie Tucker[2]; Trishelle Copeland-Johnson[1]; Guoping Cao[1]; Hi Tin Vo[3]; Nicholas Aerne[2]; [1]Idaho National Laboratory; [2]Oregon State University; [3]Los Alamos National Laboratory

4:10 PM
Embrittlement of Ni and Fe Based Alloys in Te- Containing Fluoride Salts: *Mohammad Umar Farooq Khan*[1]; Stephen Raiman[1]; Lesley Frame[2]; [1]University of Michigan; [2]University of Connecticut

4:30 PM
Atomistic Insights into the Corrosion Behavior of NiCr Alloys in Molten FLiNaK Salt Using Reactive Force Field Molecular Dynamics: *Hamdy Arkoub*[1]; Miaomiao Jin[1]; [1]Penn State University

4:50 PM Invited
Understanding Corrosion Behavior of AA6061 Cladding Material Exposed to Nuclear Reactor Cooling Water Environments: *Jenifer Locke*[1]; Koushik Kosanam[1]; Xiaolei Guo[1]; Saba Esmaeely[1]; Gabby Montiel[1]; Jason Schulthess[2]; Jan-Fong Jue[2]; Jeffery Giglio[2]; [1]Ohio State University; [2]Idaho National Laboratory

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Thermodynamics of Ceramic and Intermetallic Systems

Sponsored by: ACerS Basic Science Division, ACerS Energy Materials and Systems Division, TMS: Chemistry and Physics of Materials Committee

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

Monday PM | October 7, 2024
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Session Chair: Xiaofeng Guo, Washington State University

3:00 PM Invited
Thermochemistry of RE2O3-P2O5 Systems: *Elizabeth Opila*[1]; B.-C. Zhou[1]; P.E. Hopkins[1]; C.S. Witharamage[1]; R. Zaman[1]; H. Schonfeld[1]; W. Riffe[1]; J. Wu[2]; L. Nahar[2]; S Ushakov[2]; H. Xu[2]; Q. Hong[2]; A. Navrotsky[2]; [1]University of Virginia; [2]Arizona State University

3:30 PM Break

3:50 PM Invited
Non-Ideal Mixing in Entropy Stabilized Oxides: William Rosenberg[1]; Stuart Ness[1]; Bhoopesha Mishra[2]; Carlo Segre[2]; *Scott Mccormack*[1]; [1]University of California, Davis; [2]Illinois Institute of Technology

4:20 PM
An Investigation of the Structure-Property Relations of Tunnel Structured Oxides: *Nakeshma Cassell*[1]; Nancy Birkner[1]; Abhaya Mishra[1]; Kyle Brinkman[1]; [1]Clemson University

4:40 PM Invited
Atomic-Scale Structural Analysis of Metastable Zirconia: *Maik Lang*[1]; Alexandre Solomon[1]; Eric O'Quinn[1]; Gianguido Baldinozzi[2]; Juejing Liu[3]; Xiaofeng Guo[3]; Joerg Neuefeind[4]; Christina Trautmann[5]; Rodney Ewing[6]; [1]University of Tennessee; [2]SPMS, CNRS CentraleSupélec, Université Paris-Saclay; [3]Washington State University; [4]Oak Ridge National Laboratory; [5]GSI Helmholtz Center; [6]Stanford University

5:10 PM
Magnetic Properties of Non-Crystalline Ho2Ti2O7 Pyrochlore Prepared by Far-From-Equilibrium Processing: *Cale Overstreet*[1]; Eric O'Quinn[1]; Yishu Wang[1]; Maik Lang[1]; [1]University of Tennessee Knoxville

5:30 PM
Quantifying the Athermal Effect of Electric Current on Solid-Solid Phase Transformation of Titanium: *Howook Choi*[1]; Siwhan Lee[1]; Yijae Kim[1]; In-ho Jung[1]; Wan Chuck Woo[2]; Hobyung Chae[2]; Heung Nam Han[1]; [1]Seoul National University; [2]Korea Atomic Energy Research Institute

SPECIAL TOPICS

Plenary Sessions — ACerS Plenary Session

Tuesday AM | October 8, 2024
Spirit of Pittsburgh Ballroom B | David L. Lawrence Convention Center

8:00 AM Introductory Comments

8:05 AM Plenary
ACerS Edward Orton, Jr. Memorial Lecture: Silicon Carbide: The Versatile Ceramic Alloy: *Young-Wook Kim*[1]; [1]Worldex Industry & Trading Co., Ltd.; University of Seoul

8:45 AM Award Presentation

8:50 AM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

16th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Technologies III

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mrityunjay Singh, NASA; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technology; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Wu, Wuhan University of Technology

Tuesday AM | October 8, 2024
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Session Chairs: Junichi Tatami, Yokohama National University; Surojit Gupta, University of North Dakota; Andy Holwell, Carl Zeiss Microscopy LLC; Xinghang Zhang, Purdue University

9:00 AM Invited
Mechanical Behavior of Additively Manufactured Alloys with Medium Entropy Precipitates: Anyu Shang[1]; Benjamin Stegman[1]; Kenyi Choy Hernandez[2]; Pascal Bellon[2]; Haiyan Wang[1]; *Xinghang Zhang*[1]; [1]Purdue University; [2]University of Illinois, Urbana Champaign

9:30 AM Invited
Electrification of Ceramics Manufacturing (ECM): *Rishi Raj*[1]; Devinder Yadav[2]; Ravi Kumar NV[3]; Imteyaz Ahmad[4]; Saravana Kumar G[3]; [1]University of Colorado; [2]IIT-Patna; [3]IIT-Madras/Chennai; [4]IIT-BHU

10:00 AM Break

10:20 AM
Non-Destructive Materials Phase Characterization of Black Mass in Battery Recycling Using 3D Automated Quantitative Mineralogy in the X-ray Microscope: *Andy Holwell*[1]; Ria Mitchell[1]; Eddy Hill[1]; Richard Taylor[1]; [1]Carl Zeiss Microscopy LLC

10:40 AM Invited
Toward Greener Aviation Through Sustainable Manufacturing of Aircraft: *Meelad Ranaiefar*[1]; Christopher Wohl[2]; Sang-Hyon Chu[2]; Matthew Webster[2]; Glen King[2]; Erik Frankforter[2]; Sam Johnson[2]; Devin Burns[2]; Sandi Miller[1]; Stephanie Vivod[1]; Sadeq Malakooti[1]; Tiffany Williams[1]; David Rinehart[1]; Andrew Santos[3]; Lauren Abbott[3]; [1]NASA Glenn Research Center; [2]NASA Langley Research Center; [3]NASA Ames Research Center

11:10 AM
Synthesis of ZnO Nanoparticles Utilizing Microwave-Metal Discharge Phenomenon in Atmospheric Air: Pranjal Gupta[1]; *Apurbba Sharma*[1]; Inderdeep Singh[1]; [1]Indian Institute of Technology Roorkee

11:30 AM
Studies on Photocatalytic Properties of Bi4Ti3O12 Ceramic Synthesized by Wet Route: Anup Kumar[1]; *Dhanesh Tiwary*[1]; [1]Indian Institute of Technology (Banaras Hindu University)

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Integrated Computational Materials Engineering (ICME) / Mechanical Properties I

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Jing Zhang, Purdue University in Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Brandon McWilliams, US Army Research Laboratory; Yeon-Gil Jung, Korea Institute of Ceramic Engineering & Technology; Charles Fisher, Naval Surface Warfare Center - Carderock

Tuesday AM | October 8, 2024
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Session Chairs: Jing Zhang, Purdue University in Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Charles Fisher, NSWC Carderock Division ; Brandon McWilliams, CCDC Army Research Laboratory; Yeon-Gil Jung, Changwon National University

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8:00 AM
Accelerated Post-Heat Treatment Design for Additive Manufacturing: A Case Study on Medium-High Entropy Alloy Using Commercial Alloy Powder Mixture: *Daozheng Li*[1]; Wei Xiong[1]; [1]University of Pittsburgh

8:20 AM
Accelerating Materials Development via ICME Automation: A Laser Beam Powder Bed Fusion Case Study: *David Hicks*[1]; Reese Eichhorn[1]; Amberlee Haselhuhn[1]; [1]LIFT

8:40 AM
CAD to Part Methodology for Process Structure and Performance (PSPP): *Ross Gregoriev*[1]; Kyle Rosenow[1]; [1]Lockheed Martin

9:00 AM
CALPHAD-Based ICME Design for Joining Dissimilar Alloys: Which Thermodynamic Database to Choose?: *Marcia Myung Hye Ahn*[1]; Soumya Sridar[1]; Wei Xiong[1]; [1]University of Pittsburgh

9:20 AM
Simulation and Validation of Laser Powder Bed Fusion Melt Pool Physics through Multiphase Modeling: *Craig Weeks*[1]; Jonathan Malen[1]; Satbir Singh[1]; [1]Carnegie Mellon University

9:40 AM
Minimizing Layer-Level Thermal Variance in Electron Beam Powder Bed Fusion via Numerical Optimal Control: *Mikhail Khrenov*[1]; William Frieden Templeton[1]; Sneha Narra[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM Invited
Integrating Phase Field Modeling and Machine Learning to Develop Process-Microstructure Relationships in Laser Powder Bed Fusion of IN718: *Li Ma*[1]; Hudson Liu[2]; Maureen Williams[3]; Lyle Levine[3]; Ali Ramazani[4]; [1]Johns Hopkins University Applied Physics Laboratory; [2]Gilman School; [3]National Institute of Standards and Technology; [4]Massachusetts Institute of Technology

10:40 AM
A Thermo-Mechanical Finite Element Model to Predict Thermal Cycles and Residual Stresses in Directed Energy Deposition Technology: *Edison Bonifaz*[1]; [1]Universidad San Francisco de Quito

11:00 AM
Microstructure-Sensitive Fatigue Models from Micromechanical Fatigue Experiments: *Peter Gumbsch*[1]; Ali Durmaz[2]; Akhil Thomas[2]; Thomas Straub[2]; Chris Eberl[2]; [1]Karlsruhe Inst of Technology KIT; [2]Fraunhofer IWM

11:20 AM
Modeling of Additively Manufactured Large-Components for Optimizing Powder Metallurgy Hot Isostatic Pressing Applications: *Yousub Lee*[1]; Wen Dong[1]; Chris Masuo[1]; William Carter[1]; Michel Sebok[1]; Canhai Lai[1]; Andrzej Nycz[1]; Jason Mayeur[1]; Soumya Nag[1]; Srdjan Simunovic[1]; [1]Oak Ridge National Laboratory

11:40 AM
Process-Structure-Property Modeling for Fatigue in Additive Manufacturing: *Gary Whelan*[1]; [1]Questek Innovations Llc

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ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing - Fe-Based Alloys

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science

Tuesday AM | October 8, 2024
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Session Chair: Hyoung Seop Kim, Pohang University of Science and Technology

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8:00 AM
Challenges in the Heat Treatment of Additively Manufactured Precipitation Hardened Martensitic Stainless Steels: *Todd Palmer*[1]; James Zuback[2]; [1]Pennsylvania State University; [2]National Institute of Standards and Technology

8:20 AM
Role of Manganese Composition on the Strain-Controlled Fatigue Life in Additively Manufactured 316L Austenitic Stainless Steel: *Ian Wietecha-Reiman*[1]; Todd Palmer[1]; [1]The Pennsylvania State University

8:40 AM
Effects of Forging Parameters on Microstructural and Mechanical Anisotropy in Wire Arc Additively Manufactured (WAAM) AISI 316LSi.: *Vishnu Ramasamy*[1]; Brett Ley[1]; Glenn Daehn[1]; Jan Dzugan[2]; Zhigang Xu[3]; Bradley Jared[4]; Tony Schmitz[4]; Jian Cao[5]; Jennifer Carter[1]; John Lewandowski[1]; [1]Case Western Reserve University; [2]COMTES FHT a.s.; [3]North Carolina Agricultural and Technical State University; [4]University of Tennessee; [5]Northwestern University

9:00 AM
Development of Fe-Si Steel Powders for Additive Manufacturing: *Lorena Perez*[1]; Nilesh Kumar[1]; [1]University of Alabama

9:20 AM
Influence of Annealing on Enhancing Soft Magnetic Properties in Laser Powder Bed Fusion Processed Hiperco (Fe-49Co-2V): *SaiSree Varahabhatla*[1]; [1]University of North Texas

9:40 AM
On the Structural Integrity of Fe-36Ni Invar Alloy Processed by Different Additive Manufacturing Techniques: *Thomas Wegener*[1]; Thomas Niendorf[1]; Johannes Günther[2]; [1]University of Kassel, Institute of Materials Engineering - Metallic Materials; [2]Günter-Köhler Institute for Joining and Materials Testing

10:00 AM Break

10:20 AM
Microstructural and Mechanical Properties of Steel Alloys Produced through the Bound-Metal FFF Additive Manufacturing Process: *Eric Faierson*[1]; Benjamin Nelson[1]; [1]Iowa State University

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ADDITIVE MANUFACTURING

Additive Manufacturing of Titanium-based Materials: Processing, Microstructure and Material Properties — Laser Powder Bed Fusion

Sponsored by: TMS: Additive Manufacturing Committee

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

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Session Chair: Ola Harrysson, North Carolina State University

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8:00 AM
Additive Manufacturing of Titanium Loop Heat Pipe for Thermal Management of Spaceflight: *Parth Agrawal*[1]; Ashley Puente[1]; Dinc Erdeniz[1]; Ying Sun[1]; Sandeep Hatte[2]; Calin Tarau[2]; Han Hu[3]; [1]University of Cincinnati; [2]Advanced Cooling Technologies, Inc.; [3]University of Arkansas

8:20 AM
Atomic Layer Deposition (ALD) for Improved Ti64 Feedstocks for Laser Powder Bed Fusion Processes: *Chris Gump*[1]; Joseph Gauspohl[1]; Brandon Castro[1]; Anthony Manerbino[2]; Jeremy Iten[2]; [1]Forge Nano; [2]Elementum 3D

8:40 AM
Effect of Heat Treatment on Laser Powder Bed Fusion Ti-6Al-4V: *Katie O'Donnell*[1]; Anthony Rollett[1]; Evan Adcock[1]; John Lewandowski[2]; Brett Ley[2]; [1]Carnegie Mellon University; [2]Case Western Reserve University

9:00 AM
Effects of Thermal Conditions and Post-Processing Heat Treatments on Microstructure-Property Relationships of Ti-6Al-4V Fabricated via Laser Powder Bed Fusion: *Nancy Huang*[1]; Timothy Simpson[1]; Allison Beese[1]; [1]Penn State University

9:20 AM
Refining the Fatigue-Based Process Window for LPBF Ti64 and Exploring Defect Distributions: *Brett Ley*[1]; Austin Ngo[1]; Oluwatumininu Adeeko[1]; Anthony Rollett[2]; Christian Gobert[2]; Jack Beuth[2]; John Lewandowski[1]; [1]Case Western Reserve University; [2]Carnegie Mellon University

9:40 AM
Revealing Solidification Conditions during Laser Powder Bed Fusion of Ti-6Al-4V from EBSD: *Lu Yang*[1]; Wajira Mirihanage[1]; Saranarayanan Ramachandran[2]; Axieh Bagasol[3]; Qiyu Guan[1]; Weiguang Wang[1]; David Browne[3]; Denis Dowling[3]; [1]The University of Manchester; [2]University Of Strathclyde; [3]University College Dublin

10:00 AM Break

10:20 AM
Ti-6Al-4V Microstructure Outcomes and Effects in PBF-LB Fatigue Samples Across Varied Laser Power and Velocity: *Evan Adcock*[1]; Austin Ngo[2]; Brett Ley[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Case Western Reserve University

10:40 AM
Variations Across Length Scales in Additively Manufactured Ti-6Al-4V Parts: Challenges to Repeatability and Reproducibility: *Utkarsh Thakre*[1]; Venkatavardhan Sunderarajan[1]; Suman Das[1]; [1]Georgia Institute of Technology

11:00 AM
Effect of Nitrogen Environment In-Situ Laser Remelting Over the Corrosion and Wear Behaviour of Additive Manufactured Ti6Al4V: *Ankit Porwal*[1]; Cheruvu Kumar[1]; Santanu Dhara[1]; [1]IIT Kharagpur

ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Session III: Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Samantha Webster, Nist - Gaithersburg; Ola Harrysson, North Carolina State University; Ulf Ackelid, Freemelt AB

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Session Chair: Samantha Webster, NIST

8:00 AM Invited
Process Informed Surface Topography Measurements for Thermal-Based Over Melting Prediction: *Jesse Redford*[1]; Jason Fox[1]; Chris Evans[1]; [1]National Institute of Standards and Technology

8:40 AM
Fringe Projection In Situ Monitoring of L-PBF Process for Evaluating Part Health: *Aaron McMillen*[1]; Sean Dobson[1]; Niall O'Dowd[2]; Ashley Paz y Puente[1]; [1]University of Cincinnati; [2]Phase3D

9:00 AM
Semantic Segmentation and Spreading Anomaly Identification of Binder Jet In-Situ Images: *Alexander Gourley*[1]; Jonathan Kaufman[2]; Bashu Aman[1]; Edwin Schwalbach[3]; Jack Beuth[1]; Lisa Rueschhoff[3]; Reeja Jayan[1]; [1]Carnegie Mellon University; [2]UES Inc; [3]Air Force Research Laboratory

9:20 AM
Effect of In-Situ Heating and Post-Processing on the Microstructure and Mechanical Properties of IN718 Produced by LPBF: *Ala Qattawi*[1]; [1]University of Toledo

9:40 AM
Using Photothermal Radiometry and Lock-In Thermography to Rapidly Screening Thermal Property and Characterizing Microstructure of Advanced and Additive Manufacturing Components: *Zilong Hua*[1]; Patrick Merighe[2]; Jorgen Rufner[1]; Arin Preston[1]; Amey Khanolkar[1]; Caleb Picklesimer[1]; Asa Monson[1]; Michael McMurtrey[1]; David Hurley[1]; [1]Idaho National Laboratory; [2]Utah State University

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructure, Defects, and Properties — AM of Steels

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee

Program Organizers: Nadia Kouraytem, Utah State University; Shenyang Hu, Pacific Northwest National Laboratory; Mohan Sai Kiran Nartu, Pacific Northwest National Laboratory (Pnnl); Srujan Rokkam, Advanced Cooling Technologies, Inc.; Mohsen Asle Zaeem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology; Donna Guillen, Idaho National Laboratory; Dan Young, Wright State; Iris Rivero, University of Florida; Jonathan Pegues, Castheon; Eric Payton, University of Cincinnati; Ming Chen, Northwestern University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati

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Session Chairs: Nadia Kouraytem, Utah State University; Srujan Rokkam, Advanced Cooling Technologies, Inc.

8:00 AM
Effects of Process Parameters on the Mechanical Behavior of Wire Arc Additively Manufactured (WAAM) AISI 316LSi.: *Vishnu Ramasamy*[1]; Brett Ley[1]; John Lewandowski[1]; [1]Case Western Reserve University

8:20 AM
Exploring the Interplay between Surface Roughness, Porosity, and Processing Parameters for Additively Manufactured 316L Stainless Steel in Laser Powder Bed Fusion: *Tianyu Zhang*[1]; Lang Yuan[1]; Posadas Dalton[1]; [1]University of South Carolina

8:40 AM
Influence of Printing Parameters on the High Strain Rate Characteristics of Hybrid-Manufactured Components for Tooling Application: *Coleman Buchanan*[1]; Pedro Cortes[1]; Bharat Yelamanchi[1]; Andrew Prokop[1]; John Carballo[1]; Constantin Solomon[1]; [1]Youngstown State University

9:00 AM
The Effect of Scan Rotation Angle and Build Orientation-Induced Mechanical Anisotropy in Additive Manufacturing 316L Stainless Steel: *Som Dixit*[1]; Shunyu Liu[1]; Pauline Smith[2]; Sai Pradeep[3]; [1]Clemson University; [2]DEVCOM Army Research Laboratory; [3]University of Delaware

9:20 AM
Additively Manufactured M300 Maraging Steel – Process Monitoring, Microstructure, and Performance Evaluation: *Puskar Pathak*[1]; Aniqa Ibnat Lim[1]; Mohan Sai Kiran Kumar Yadav Nartu[2]; Francisco Carlos Robles Hernandez[1]; Venkat Selvamanickam[1]; [1]University of Houston; [2]Pacific Northwest National Laboratory (PNNL)

9:40 AM
Influence of Lack of Fusion Defects on Tensile Properties of Gas Metal Arc Directed Energy Deposition 316L and 316LSi: *Dominic Piccone*[1]; Luc Hagen[1]; Stephan Tate[2]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines; [2]Electric Power Research Institute

10:00 AM Break

10:20 AM
Investigating the Impact of Hot Isostatic Pressing Treatment on Microstructure Evolution and Mechanical Properties of Binder Jet-Processed AISI M2 Tool Steel: *Amit Choudhari*[1]; Manoj Mugale[1]; Sanoj Karki[1]; Satyavan Digole[1]; Tushar Borkar[1]; [1]Cleveland State University

10:40 AM
Investigation of Microstructure Changes of Wire Arc Additively Manufactured 316LSi In the As-deposited and Forged Conditions Using Double Cone Samples: *Brett Ley*[1]; Vishnu Ramasamy[1]; Glenn Daehn[2]; Bradley Jared[3]; Zhigang Xu[4]; Kornel Ehmann[5]; Jennifer Carter[1]; John Lewandowski[1]; [1]Case Western Reserve University; [2]The Ohio State University; [3]The University of Tennessee, Knoxville; [4]North Carolina Agricultural and Technical State University; [5]Northwestern University

11:00 AM
Plastic Deformation Variation Along the Building Direction During Directed Energy Deposition of 316L Stainless Steel: *Zhe Cai*[1]; Da Guo[2]; Kun Yan[1]; Mark Callaghan[3]; Dominik Daisenberger[4]; Mark Chatterton[5]; Jiadong Chen[1]; Andrew Wisbey[3]; Wajira Mirihanage[1]; [1]University of Manchester; [2]University College London; [3]High Temperature Materials, Jacobs; [4]Diamond Light Source; [5]Corrosion and Materials Science, Jacobs

11:20 AM
Study of Microstructure and Mechanical Properties According to Cooling Effect of Wire Arc Additive Manufacturing Using Steel Wire: *Young Keun Park*[1]; Jae-Deuk Kim[1]; Changwook Ji[1]; [1]Korea Institute of Industrial Technology (KITECH)

11:40 AM
Probing the Balling Boundary in Laser Powder Bed Fusion: Are Single Bead Experiments Enough?: *Junwon Seo*[1]; Sarah Birchall[1]; Bryan Webler[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

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NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments V — Session I

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Keyou Mao, Florida State University; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

Tuesday AM | October 8, 2024
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Session Chairs: Cheng Sun, Clemson University; Khalid Hattar, University of Tennessee Knoxville

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8:00 AM Invited
Formation and Recover of Dislocations Under Deformation and/or Irradiation of Elemental Tantalum, a Step Toward Understanding Complex BCC Alloys.: *Donald Brown*[1]; Laurent Capolungo[1]; Bjorn Clausen[1]; Kohnert Aaron[1]; Reeju Pokharel[1]; Dan Savage[1]; [1]Los Alamos National Laboratory

8:30 AM Invited
Deciphering and Visualizing Helium Accumulation and Dynamics in Materials via In-Situ Characterization: *Eric Lang*[1]; [1]University of New Mexico

9:00 AM
Real-time Neutron Diffraction to Support Interpretation of DSC Results on Zr-2.5Nb for Reactor Pressure Tubes: *Sven Vogel*[1]; Amy Fluke[2]; Daniel Savage[1]; Toshiro Tomida[3]; [1]Los Alamos National Laboratory; [2]Canadian Nuclear Laboratories; [3]Frontier Research Center for Applied Atomic Sciences, Ibaraki University

9:20 AM
Nanoscale Redistribution of Lithium in Neutron Irradiated LiAlO2: *Edgar Buck*[1]; Shalini Tripathi[1]; Gary Sevigny[1]; [1]Pacific Northwest National Laboratory

9:40 AM
Synthesis and Irradiation of Uranium Carbide and Nitride for TRISO Development: *Jacob Minnette*[1]; Cale Overstreet[1]; Evan Williams[1]; Matthew Kurley[2]; William Cureton[2]; Igor Ivanov[3]; Changyong Park[4]; Elizabeth Sooby[5]; Eric O'Quinn[1]; Maik Lang[1]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratory; [3]Institute of Nuclear Physics; [4]Argonne National Laboratory; [5]University of Texas, San Antonio

10:00 AM Break

10:20 AM Invited
Advanced Characterization Capabilities of Nuclear Materials via NSUF: *Rongjie Song*[1]; Brenden Heidrich[1]; [1]Idaho National Laboratory

10:50 AM
Advanced In-Situ Strain Mapping for Zr Oxidation by 4D-SPED: *Yongwen Sun*[1]; Ying Han[1]; Hugo Garza[2]; Alejandro Gomez-Perez[3]; Athanassios S. Galanis[3]; Starvos Nicolopoulos[3]; Dan Zhou[2]; Yang Yang[1]; [1]Penn State University; [2]DENSsolutions; [3]NanoMEGAS SPRL

11:10 AM
Quantitative Phase Characterization of Nuclear Cements and Concretes Using Non-Destructive 3D Automated Mineralogy and Enhanced Deep-Learning Reconstruction via X-ray Microscopy: *Andy Holwell*[1]; Ria Mitchell[1]; Stephen Kelly[1]; John Provis[2]; Giacomo Torelli[3]; Kajanan Selvaranjan[3]; [1]Carl Zeiss Microscopy LLC; [2]Paul Scherrer Institut; [3]University of Sheffield

11:30 AM
Thermophysical Characterisation of Zirconium-Based Nuclear Materials: *Phylis Makurunje*[1]; Jack Callaghan[1]; Abdullah Mamun[1]; Michael Rushton[1]; Simon Middleburgh[1]; [1]Nuclear Futures Institute

ADDITIVE MANUFACTURING

Advanced Manufacturing of High Temperature Ceramics and Composites: Processing, Characterization and Testing — Additive Manufacturing of Ceramic Monoliths

Sponsored by: ACerS Basic Science Division, ACerS Engineering Ceramics Division

Program Organizers: Corson Cramer, Oak Ridge National Laboratory; Greg Hilmas, Missouri University of Science and Technology; Lisa Rueschhoff, Air Force Research Laboratory; David Mitchell, University of Central Florida

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Session Chair: Lisa Rueschhoff, AFRL

9:20 AM Invited
Additively Manufactured Reaction Bonded Porous Silicon Nitride: *Trevor Aguirre*[1]; Corson Cramer[1]; David Mitchell[1]; Vlastimil Kunc[1]; James Klett[1]; [1]Oak Ridge National Laboratory

9:50 AM
Advanced Silicon Carbide Fabrication Using Laser Induced Slip Casting: *Corson Cramer*[1]; Beth Armstrong[1]; David Mitchell[1]; Jacob Feldbauer[1]; Martin Schwentenwein[2]; Mehdi Mohammadi[2]; Shawn Allan[3]; [1]Oak Ridge National Laboratory; [2]Lithoz GmbH; [3]Lithoz America, LLC

10:10 AM Break

10:30 AM
Optimizing Solids Loading for Aqueous Robocasting of Monolithic Silicon Carbide: *Jacob Feldbauer*[1]; Corson Gilmer[2]; Dustin Gilmer[1]; [1]UT/OakRidge Innovation Institute; [2]OakRidge National Lab

10:50 AM
Robocasting SiC Using Sub-mm Nozzle Sizes: Josh Robinson[1]; Cooper Howard[1]; Yuxuan Sun[1]; *Scott Misture*[1]; [1]Alfred University

11:10 AM
Synthesis and Characterization of Next-Generation Multiphase Silicon Nitride-Based Structural Ceramics: *Katherine Brizzolara*[1]; Stephen DiPietro[2]; Mark Opeka[3]; Curtis Martin[4]; Kevin Hemker[1]; [1]Johns Hopkins University; [2]Exothermics, Inc.; [3]Kratos SRE; [4]Naval Surface Warfare Center, Carderock Division

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Session II

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

Tuesday AM | October 8, 2024
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Session Chairs: Brian Schuster, University of Texas at El Paso; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

9:00 AM Invited
How Large Language Models can Discover and Design New Materials?: *Amir Barati Farimani*[1]; [1]Carnegie Mellon University

9:20 AM
Development of Nuclear Reactor Structural Materials with Low Critical Mineral Concentrations: Chinthaka Silva[1]; Ankit Roy[1]; Carolyne Burns[1]; Ben Lund[1]; Steven Livers[1]; Thomas Hartman[1]; Mohan Nartu[1]; Subhashish Meher[1]; *Isabella Van Rooyen*[1]; [1]Pacific Northwest National Laboratory

9:40 AM
Effect of TiO2 Addition on the Hot Corrosion Behavior of Yttria-Stabilized Zirconia in the Presence of V2O5 for Thermal Barrier Coatings Application: *Nasirudeen Ogunlakin*[1]; Nestor Ankah[1]; Ihsan Ulhaq Toor[1]; [1]King Fahd University of Petroleum and Minerals

10:00 AM Break

10:20 AM
Embedded High-Temperature Sensors: Enhancing Thermoelectrical Performance with Refractory Composites Gradient Layers: *Javier Mena*[1]; Rowan Barto[1]; Katarzyna Sabolsky[1]; Konstantinos Sierros[1]; Edward Sabolsky[1]; [1]West Virginia University

10:40 AM
Enhancing Sustainability in Tool Repair: Refurbishing H13 Hot Forging Tools Using Laser Directed Energy Deposition: *Felipe Arias-González*[1]; Oscar Barro[1]; Daniel Wallerstein[1]; Erik Calvo[1]; Fernando Lusquinos[1]; Rafael Comesana[1]; Juan Pou[1]; [1]University of Vigo

11:00 AM
Hot Corrosion of Mo-Si-B and Its Derivates with Ti or Cr between the 500°C - 900°C Range: *Lukas Korell*[1]; Katharina Beck[1]; Till König[1]; Ceyhun Oskay[1]; Frauke Hinrichs[2]; Martin Heilmaier[3]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut; [2]Karlsruhe Institute of Technology ; [3]Karlsruhe Institute of Technology

11:20 AM
Far-Field Passive Ceramic Sensors for High-Temperature Environments: *Kevin Tennant*[1]; William Bullock[1]; Jay Wilhelm[2]; Edward Sabolsky[1]; [1]West Virginia University; [2]Ohio University

11:40 AM
Refractory Ceramics for Use in Molten Oxide Electrolysis: *Mitchell Lensing*[1]; Geoff Brennecka[1]; [1]Colorado School of Mines

LIGHTWEIGHT ALLOYS

Advancements in Lightweight Composites, Materials & Alloys — Machine Learning and Microstructure of Composites

Sponsored by: TMS: Materials Characterization Committee

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Ramachandra Canumalla, Weldaloy Specialty Forgings; Aashish Rohatgi, Pacific Northwest National Laboratory

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Session Chair: Ramchandra Canumala, Weldaloy Specialty Forgings

8:00 AM Invited
Q-Analysis of Lightweight Magnetic High Entropy Alloys for Applications in Aerospace: Marissa Picione[1]; *Tanjore Jayaraman*[1]; [1]United States Air Force Academy

8:30 AM Invited
Powder Fabrication and Laser Powder Bed Fusion of Highly-Reinforced, High-Strength Aluminum Alloys: *Ethan Parsons*[1]; [1]MIT Lincoln Laboratory

9:00 AM
Reinforcing Characteristics, Electrical, and Thermo-Mechanical Properties of Ultrafine-Grained Irvingia Wombolu/CNTs Hybrid Reinforced Al-7Si-2Cu-0.5Ni Eco-Composite Inoculated by Al-Nb-V-Zr Master Alloy: *Kingsley Nnakwo*[1]; [1]Nnamdi Azikiwe University Awka Nigeria

9:20 AM
Utilization of Agricultural Waste for Reinforce Epoxy Resin Composite: *Chukwulozie Okolie*[1]; Chidume Nwambu[1]; [1]Nnamdi Azikiwe University Awka

9:40 AM
Microstructural Evolution and Mechanical Properties of (SiC+TiC) Dispersed AlSi10Mg Based Surface Composite Developed by Laser Composite Surfacing: *Bidipta Dam*[1]; Jyotsna Dutta Majumdar[1]; Indranil Manna[1]; [1]Indian Institute of Technology Kharagpur

10:00 AM Break

10:20 AM
Effect of Dispersion Technique and Applied Load on the Dry Sliding Wear Behavior of Combined Stir-Squeeze-Cast AA6061-0.5 wt. % CNT Composite at Both Room Temperature and Elevated Temperature: *Sukanta Sarkar*[1]; Bidipta Dam[1]; Ujjal Dey[1]; Cheruvu Kumar[1]; Indranil Manna[1]; Siddhartha Roy[1]; [1]Indian Institute of Technology, Kharagpur

IRON AND STEEL (FERROUS ALLOYS)

Advancements in Steel Structural Refinement — Advancements in Steel Structural Refinement

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Charles Enloe, Steel Dynamics; Emmanuel De Moor, Colorado School of Mines

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Session Chairs: Matt Enloe, Steel Dynamics; Emmanuel De Moor, Colorado School of Mines

8:00 AM
On the Limits of Strength and Performance in Automotive Sheet Steels: *Hardy Mohrbacher*[1]; [1]NiobelCon bvba

8:20 AM
Stress Measurements of Multiaxially Deformed AHSSs via X-Ray Diffraction: *Michael Cox*[1]; Kip Findley[2]; Adam Creuziger[3]; Richard Thiessen[4]; Thomas Gnaupel-Herold[3]; Mark Iadicola[3]; Jumari Robinson[3]; Evan Rust[3]; [1]Colorado School of Mines & NIST; [2]Colorado School of Mines; [3]National Institute of Standards and Technology (NIST); [4]thyssenkrupp steel

8:40 AM
Influence of Microalloyed Steel Slab Reheating Conditions on the Evolution of Austenite Structure: *Andrei Chastukhin*[1]; [1]Mississippi State University

9:00 AM
Favorable Mechanical Performance by Controlled Characteristics of Local Brittle Zone in Nb Bearing HSLA Steel for Ultra-High Heat Input Welding: *Seonhoon Yoo*[1]; Namhyun Kang[1]; [1]Pusan National University

9:20 AM
Optimizing Mechanical Properties of Q&T Steels by Tailoring the Evolution and Transformation of Nano-Scale Cu-Precipitates: *Kapil Sharma*[1]; Anish Karmakar[1]; [1]Indian Institute of Technology, Roorkee

9:40 AM
Microalloy Addition Strategies for Increased Yield Strength of Bearing Steels: *Mario Buchely*[1]; Justin Singleton[1]; Viraj Athavale[2]; Ashton Ventura[1]; [1]Missouri S&T; [2]Nucor Corp.

10:00 AM Break

10:20 AM
Microstructure and Processing of Heavy-Gauge S700MC Hot Rolled Steel: *Rekha M Y*[1]; Brian K. Lin[1]; Dimitri M Sidorenko[1]; Srinivas R Atreya[1]; [1]ArcelorMittal Global R&D

10:40 AM
Strengthening Effects of Fine MX Precipitates and Solute Clustering on Seismic/Fire Simulated Fatigue Test in Bainitic H-Section Steel: *Jae-Yeon Han*[1]; Cheol-Hyeok Yang[1]; Bong-Ho Lee[2]; Chang-Hoon Lee[3]; Jun-Ho Chung[4]; Hyun-Uk Hong[1]; [1]Changwon National University; [2]Daegu Gyeongbuk Institute of Science & Technology; [3]Korea Institute of Materials Science; [4]Hyundai Steel Company

11:00 AM
Initiation and Propagation of Intermediate Cracks and Surface Cracks of Continuous Casting Steel during Solidification End Reduction Process: *Ji Cheng*[1]; Zhida Zhang[1]; Miaoyong Zhu[1]; [1]Northeastern University

11:20 AM
ICME Development of a Novel, High-Strength Austenitic Steel: Paul Lambert[1]; *Nicholas Jones*[2]; Colin Stewart[3]; Keith Knipling[3]; Eric Dau[2]; Richard Gins[2]; Matthew Draper[2]; Charles Fisher[2]; [1]Johns Hopkins University Applied Physics Laboratory; [2]Naval Surface Warfare Center, Carderock Diivision; [3]Naval Research Laboratory

11:40 AM
Effects of Ferrite/Austenite Ratio in Heterogeneous Nano-Structured Duplex Stainless Steels on Microstructure and Mechanical Properties: *Hiromi Miura*[1]; Yojiro Oba[1]; Koji Koyama[1]; Masakazu Kobayashi[1]; Chihiro Watanabe[2]; [1]Toyohashi University of Technology; [2]Kanazawa University

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Novel Processing of Functional Ceramics

Sponsored by: ACerS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Ubic, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

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Session Chairs: Rick Ubic, Boise State University; Rattikorn Yimnirun, Vidyasirimedhi Institute of Science and Technology

9:00 AM
Droplet Spread Analysis of Functional Inks Using A Computational Micro-Fluidics Simulation: *Carlos Acosta*[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]University of Texas at San Antonio

9:20 AM
Printable Ink Formulation of Piezoelectric Ceramic on Glass Substrates for Haptic Feedback: *Abhinay Sreeram*[1]; Milan Shrestha[1]; Syed Ismail[1]; Edwin H. T. Teo[1]; Maharaja Sankaralingam[2]; Michael Renaud[2]; Leonardus Depari[2]; [1]Nanyang Technological University; [2]Continental Automotive Singapore Pte. Ltd

9:40 AM
Soft and Stretchable Conductive Polymer Nanocomposites and Their Additive Manufacturing: *Xun Liu*[1]; Naifu Shen[1]; Jinyu Bu[1]; Weinan Xu[1]; [1]The University of Akron

10:00 AM Break

10:20 AM Invited
Enhanced Photocatalytic Activity of Flash-Sintered Co-Doped Materials: Anupam Raj[1]; *Shikhar Krishn Jha*[1]; [1]IIT Kanpur

10:40 AM
Advancing Ferrite Materials For Dynamic Wireless Charging Systems For Electric Vehicles: *Kristyn Ardrey*[1]; Rebecca McAullife[2]; Madeline Kidder[3]; Raphael Herman[1]; Benjamin Lamm[1]; Beth Armstrong[1]; [1]Oak Ridge National Laboratory; [2]Materion Advanced Materials; [3]Tennessee Tech University

11:00 AM Invited
Room Temperature Fabrication of Ceramic Composites for Electronic Applications: *Matjaž Spreitzer*[1]; Nina Kuzmi[1]; Mikko Nelo[2]; Sreo Škapin[1]; Heli Jantunen[2]; [1]Jožef Stefan Institute; [2]University of Oulu

11:20 AM
Study of Laser-Assisted Machining on Single-Crystal Piezoelectric Material for Advanced Electronic Devices: *Dong-Hyun Seo*[1]; Eun-Ji Gwak[2]; Tae-Jin Je[2]; Doo-Sun Choi[2]; Jun Sae Han[1]; [1]Korea Institute of Machinery & Materials / University of Science and Technology (UST); [2]Korea Institute of Machinery & Materials

11:40 AM
Analysis of Inkjet Printed Barium Titanate and Barium Titanate:Cobalt Ferrite Core Shell Nanocomposites for Tunable Electronic Devices: *William Flynn*[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]University of Texas at San Antonio

MATERIALS-ENVIRONMENT INTERACTIONS

Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson — Alloy Development and High-Temperature Oxidation II

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: High Temperature Alloys Committee, TMS: Alloy Phases Committee

Program Organizers: Kinga Unocic, North Carolina State University; Wei Xiong, University of Pittsburgh; Elizabeth Opila, University of Virginia; Richard Oleksak, National Energy Technology Laboratory; Rishi Pillai, Oak Ridge National Laboratory; Bruce Pint, Oak Ridge National Laboratory

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Session Chairs: Bingtao Li, Haynes International Inc.; Bryan Webler, Carnegie Mellon University

8:00 AM Keynote
Aspects of HT Chlorine Corrosion as Part of the Development of Technical Plants for Hydrogen and Synfuel Production from Biomass: *Michael Schütze*[1]; [1]MSSC

8:35 AM Invited
Effect of Nb on the Growth Behavior of Al_2O_3 Scale Formed on Ferritic Stainless Steels: Cong Li[1]; *Shigenari Hayashi*[1]; Muhammad Febry[2]; [1]Hokkaido University; [2]JFE Steel Corporation

9:00 AM Invited
Effects of Alloy and TGO Composition on the Mixed Deposit-Induced Degradation of Advanced Alloys: Atharva Chikhalikar[1]; *David Poerschke*[1]; [1]University of Minnesota

9:25 AM Invited
High Temperature Corrosion Induced Degradation: Can We Ever Bridge the Gap between Practically Relevant Continuum and Fundamentally Interesting Atomistic Models?: *Rishi Pillai*[1]; Marie Romedenne[1]; Rafael Rodriguez De Vecchis[2]; Brian Gleeson[2]; Bruce Pint[1]; [1]Oak Ridge National Laboratory; [2]University of Pittsburgh

9:50 AM Break

10:10 AM Invited
High Temperature Oxidation and Environmental Degradation in Industrial Gas Turbine: *Voramon Dheeradhada*[1]; [1]GE Vernova Advanced Research

10:35 AM Invited
High Temperature Oxidation Resistance of Commercial Ni- and Co-Base Alloys in Harsh Environments: *Vinay Deodeshmukh*[1]; Lee Pike[1]; Bingtao Li[1]; [1]Haynes International Inc.

11:00 AM Invited
The Importance of Selective Oxidation in the Decarbonization of Steel Production: *Bryan Webler*[1]; [1]Carnegie Mellon University

11:25 AM Invited
Strategies for Improving the High Temperature Oxidation Behavior of Multi-Principal Element Alloys: *Mark Weaver*[1]; Michael Pavel[1]; [1]University of Alabama

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SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Hydrogen Production, Separation, and Storage

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division, TMS: Refractory Metals & Materials Committee

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory

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Session Chairs: Stefan Reinartz, Utility Global, Inc. ; Steven Hammond, National Renewable Energy Laboratory; Michael Kass, Oak Ridge National Laboratory

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9:00 AM Invited
Overview of U.S. DOE's Reversible Solid Oxide Fuel Cell (R-SOFC) Program: *Patcharin Burke*[1]; [1]Department of Energy

9:20 AM Invited
Advanced Electrochemical Systems for Hydrogen Economy: Technology Status and Development Needs: *Prabhakar Singh*[1]; Mysore Santosh[2]; Pawan Dubey[1]; [1]University of Connecticut; [2]CSIR-Central Institute of Mining & Fuel Research,

9:40 AM Invited
Material Discovery and Design Principles of Perovskite Oxides for Reversible Solid Oxide Cells: *Jian Liu*[1]; Ryan Jacobs[2]; Bo Guan[3]; Tao Yang[3]; Richard Pineault[1]; Gregory Hackett[1]; Harry Abernathy[1]; Dane Morgan[2]; [1]National Energy Technology Laboratory; [2]University of Wisconsin- Madison; [3]DOE National Energy Technology Laboratory/ NETL Support Contractor

10:00 AM Break

10:20 AM
Efficient Hydrogen Production from Recycled Aluminum and Seawater: *Aly Kombargi*[1]; Douglas Hart[1]; [1]Massachusetts Institute of Technology

10:40 AM Invited
Zero-Electricity Electrolytic Reactor Produces Hydrogen and Syngas for Onsite Energy, Fuel, and Feedstocks: *Bryan Blackburn*[1]; Eric Flynn[1]; [1]Utility Global

11:00 AM Invited
Insights into Hydrogen Separation from Simulations: *De-en Jiang*[1]; [1]Vanderbilt University

11:20 AM Invited
Multiscale Simulations of Materials Degradation for Hydrogen Production and Storage: *Brandon Wood*[1]; [1]Lawrence Livermore National Laboratory

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MODELING

Advances in Multiphysics Modeling and Multi-modal Imaging of Functional Materials — Advanced Mathematical Algorithms, AI, and Reduced-Order Model for Materials Modeling

Sponsored by: ACerS Basic Science Division, TMS: Computational Materials Science and Engineering Committee, TMS: Magnetic Materials Committee

Program Organizers: Jiamian Hu, University of Wisconsin Madison; Massimo Ghidini, University of Parma, Italy; Diamond Light Sources, UK; Wenrui Hao, The Pennsylvania State University; Di Qi, Purdue University

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Session Chairs: Wenrui Hao, The Pennsylvania State University; Di Qi, Purdue University

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9:00 AM Invited
A Thermodynamically Consistent Model for Yield Stress Fluids: *Qi Wang*[1]; [1]University of South Carolina

9:20 AM Invited
Construction of Coarse-Grained Molecular Dynamics with Many-Body Non-Markovian Memory: *Huan Lei*[1]; [1]Michigan State University

9:40 AM Invited
The Cheap Stochastic Surrogate Model for the Precipitation Quasi-Geostrophic Equations: *Changhong Mou*[1]; [1]University of Wisconsin-Madison

10:00 AM Break

10:20 AM Invited
Deep Operator Learning for Battery Characterization: From Materials to Systems: Wei Li[1]; Ruqing Fang[1]; Junning Jiao[1]; Georgios Vassilakis[1]; *Juner Zhu*[1]; [1]Northeastern University

10:40 AM Invited
Determining Heterogeneous Elastic Properties of Soft Materials Using Physics-Informed Neural Networks: *Wensi Wu*[1]; Lu Lu[2]; [1]Children's Hospital of Philadelphia; [2]Yale University

IRON AND STEEL (FERROUS ALLOYS)

Austenite Formation and Decomposition V: A Symposium in Memory of Prof. Mats Hillert — Processing

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee, TMS: Steels Committee, TMS: Phase Transformations Committee

Program Organizers: Annika Borgenstam, KTH Royal Institute of Technology; John Agren, Royal Institute of Technology; Amy Clarke, Los Alamos National Laboratory; Hatem Zurob, McMaster University; Matthias Militzer, University of British Columbia; Kester Clarke, Los Alamos National Laboratory; Igor Vieira, Nucor Steel; Daniel Baker, LIFT

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Session Chair: Amy Clarke, Los Alamos National Laboratory

8:00 AM Keynote
The Bainite Transformation in Steel – Mats Hillert's Perspective: *Annika Borgenstam*[1]; [1]KTH Royal Institute of Technology

8:40 AM
Properties and Processing of Medium-Mn Steel Plate: Understanding Composition and Heat-Treatment Effects: Daniel Field[1]; Daniel Magagnosc[1]; Jeffrey Lloyd[1]; *Krista Limmer*[2]; [1]DEVCOM Army Research Laboratory; [2]DEVCOM Army Research Laboratory

9:00 AM
The Influence of Rapid Tempering on Retained Austenite Decomposition in 4340 Steel: *Virginia Euser*[1]; Don Williamson[2]; Amy Clarke[1]; John Speer[2]; [1]Los Alamos National Laboratory; [2]Colorado School of Mines

9:20 AM Invited
Delta-Ferrite to Austenite Phase Transformation Pathways in 2205 Duplex Stainless Steels Manufactured via Laser Powder Bed Fusion: Cindy He[1]; Nima Haghdadi[2]; *Sophie Primig*[1]; [1]University of New South Wales; [2]Imperial College London

9:50 AM Break

10:10 AM Keynote
Phase Transformations in Additive Manufacturing of Tool Steels: Ana Santana[1]; Adriana Eres-Castellanos[2]; Rosalia Rementeria[3]; Jonathan Poplawsky[4]; Carlos Capdevila[1]; *Francisca Caballero*[1]; [1]National Centre for Metallurgical Research (CENIM-CSIC); [2]Colorado School of Mines; [3]ArcelorMittal Global R&D; [4]Oak Ridge National Laboratory

10:50 AM
Austenite Decomposition during Hot Strip Rolling of a X70 Line Pipe Steel: *Smit Patel*[1]; Sabyasachi Roy[1]; Matthias Militzer[1]; Warren Poole[1]; [1]The University of British Columbia

11:10 AM
In-Situ Monitoring of Austenite Decomposition with Laser Ultrasonics: *Minghui Lin*[1]; Sabyasachi Roy[1]; Matthias Militzer[1]; [1]The University of British Columbia

11:30 AM Invited
Extremely Low Cooling Rate Austenite Decomposition in FeNi Iron Meteorites: *Frederic Danoix*[1]; Raphaële Danoix[1]; Jérome Gattacceca[2]; Clara Maurel[2]; Mathieu Roskosz[3]; Matthieu Gounelle[3]; Mohamed Gouné[4]; [1]Groupe de Physique des Matériaux - CNRS Univ. Rouen Normandy; [2]CEREGE; [3]Museum National d'Histoire Naturelle; [4]ICMCB - CNRS - Université de Bordeaux

NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy Systems — Ceramic Fuels

Sponsored by: ACerS Energy Materials and Systems Division, TMS: Nuclear Materials Committee

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Theodore Besmann, University of South Carolina; Charmayne Lonergan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Kaustubh Bawane, Idaho National Laboratory; Joshua White, Los Alamos National Laboratory; Christian Deck, General Atomics; Gordon Thorogood, Australian Nuclear Science and Technology Organization

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Session Chairs: Joshua White, Los Alamos National Laboratory; Sudipta Biswas, Idaho National Laboratory

9:00 AM Invited
Assessing High Uranium Density Ceramic Fuels for Implementation in Water Cooled Reactors: *Elizabeth Sooby*[1]; [1]University of Texas at San Antonio

9:30 AM Invited
High Temperature Ceramic Nuclear Fuels for Cross-Cutting Applications: *Erofili Kardoulaki*[1]; Maria Kosmidou[1]; Joe Schaeperkoetter[1]; Scarlett Widgeon Paisner[1]; Josh White[1]; Ken McClellan[1]; [1]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
Phase Equilibria and Thermodynamics of Uranium Mononitride Fuel Undergoing Burn-Up in a Lead-Cooled Reactor: *Ronald Booth*[1]; Eric McManus[1]; Juliano Schorne-Pinto[1]; Jorge Paz Soldan Palma[1]; Antoinne Claisse[2]; Theodore Besmann[1]; [1]University of South Carolina; [2]Westinghouse

10:40 AM Invited
Post-irradiation Examination of Irradiated Fuels with Pulsed Neutrons at LANSCE: *Sven Vogel*[1]; Thilo Balke[1]; Charles Bouman[2]; Luca Capriotti[3]; Aaron Craft[3]; Jason Harp[4]; Alex Long[1]; Kenneth McClellan[1]; Josef Svoboda[1]; Brendt Wohlberg[1]; Michael Benson[3]; [1]Los Alamos National Laboratory; [2]Purdue University; [3]Idaho National Laboratory; [4]Oak Ridge National Laboratory

11:10 AM Invited
High-Burnup Structure Formation and Associated Fission Product Diffusion in UO2: *Sudipta Biswas*[1]; Dewen Yushu[1]; Veerappan Prithivirajan[1]; Linu Malakkal[1]; Cameron Howard[1]; Lingfeng He[2]; [1]Idaho National Laboratory; [2]NCSU

11:40 AM
Statistical Fracture Behavior of Doped UO2 Using a Ball-On-Ring Test Method: *Adrianna Lupercio*[1]; Brian Jaques[1]; Andrew Nelson[1]; [1]Boise State University

12:00 PM
Microstructural Characterization and Thermal Oxidation of Zr Doped UO2: *Sam Karcher*[1]; John McCloy[1]; [1]Washington State University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Ceramics for Clean Hydrogen — Ceramics for Clean Hydrogen I

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Jianhua Tong, Clemson University; John Pietras, Saint-Gobain Ceramic Materials; Sandrine Ricote, Colorado School of Mines

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Session Chairs: Sandrine Ricote, Colorado School of Mines; Jianhua Tong, Clemson University

9:00 AM Invited
An Analytical Tool to Evaluate Defect Thermodynamics of (La,Ba) $Fe_{1-x}M_xO_{3-}$ Perovskites for Solid-Oxide Cell Applications: *Yueh-Lin Lee*[1]; Yuhua Duan[1]; Dan Sorescu[1]; Wissam Saidi[1]; Dane Morgan[2]; Thomas Kalapos[1]; William Epting[1]; Gregory Hackett[1]; Harry Abernathy[1]; [1]National Energy Technology Laboratory; [2]University of Wisconsin-Madison

9:20 AM
High Temperature Tensile Strength of Ultrathin 3YSZ Ceramic Tapes Applied for SOEC: Ilaria Bombarda[1]; Nico Langhof[1]; *Stefan Schaffoener*[1]; [1]University of Bayreuth

9:40 AM Invited
Advancing Intermediate-Temperature Proton-Conducting Solid Oxide Electrolysis Cells: Mechanistic Insights and Material Optimization: *Wenyuan Li*[1]; Xuemei Li[1]; Bo Guan[1]; Xingbo Liu[1]; [1]West Virginia University

10:00 AM Break

10:20 AM
Inter- & Intra-Granular Nanostructure Degradation of YSZ in Electrolyte Under SOEC Operation: Yun Chen[1]; Harry Abernathy[1]; Yueying Fan[1]; Jian Liu[1]; Yinkai Lei[1]; *Xueyan Song*[1]; [1]National Energy Technology Lab

10:40 AM
Wet Impregnation of Ternary and High-Entropy Nano-Coatings of a $La_2NiO_{4+\delta}$ SOEC to Improve Performance and Stability: *Cole Klemstine*[1]; Yu Zhong[2]; Wenyuan Li[1]; Xingbo Liu[1]; Edward Sabolsky[1]; [1]West Virginia University; [2]Worcester Polytechnic Institute

11:00 AM
Laser 3D Printing of Protonic Ceramic Electrochemical Cells: *Jianhua Tong*[1]; [1]Clemson University

11:20 AM
Interface Engineering by Digital Laser Machining for Protonic Ceramic Electrochemical Cells: *Tianyi Zhou*[1]; Hua Huang[1]; Yuqing Meng[1]; Jianhua Tong[1]; [1]Clemson University

FUNDAMENTALS AND CHARACTERIZATION

Computational Materials for Qualification and Certification — Materials Properties and Performance

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Corbett Battaile, Sandia National Laboratories; Anthony Rollett, Carnegie Mellon University; Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration

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Session Chairs: Anthony Rollett, Carnegie Mellon University; Lyle Levine, National Institute of Standards and Technology

8:00 AM Invited
Scientific AI for Automated Validation and Certification: *Michael McKerns*[1]; [1]the UQ Foundation

8:30 AM Invited
Review of Past and Future Impacts of the Additive Manufacturing Benchmark Test Series (AM Bench): *Brandon Lane*[1]; Lyle Levine[1]; [1]National Institute of Standards and Technology

9:00 AM Invited
Materials Data for Validation and Verification of Mechanical Performance: Outcomes and Future Perspectives from the AM Benchmark Series: *Orion Kafka*[1]; Jake Benzing[1]; Newell Moser[1]; Nicholas Derimow[1]; Alec Saville[1]; Li-Anne Liew[1]; Jordan Weaver[1]; Ross Rentz[1]; Nik Hrabe[1]; [1]National Institute of Standards and Technology

9:30 AM Invited
Fast, Cheap & In Control: Application of Surrogate Models to Explore Microstructure-Properties Relationships for AM-Based Materials: *Vanessa Oklejas*[1]; Ross Gregoriev[1]; Kyle Rosenow[1]; Scott Cochran[1]; [1]Lockheed Martin

10:00 AM Break

10:20 AM Invited
Uncertainty Quantification and Sensitivity Analysis in Process-Structure-Property Simulations for Laser Powder Bed Fusion Additive Manufacturing: *Joshua Pribe*[1]; Patrick Leser[2]; Brodan Richter[2]; George Weber[2]; Edward Glaessgen[2]; [1]Analytical Mechanics Associates; [2]NASA Langley Research Center

10:50 AM Invited
Towards a Digital Twin for Qualification and Certification of Metals Additive Manufacturing: *Anthony Rollett*[1]; Somnath Ghosh[2]; [1]Carnegie Mellon University; [2]Johns Hopkins Univ.

11:20 AM Invited
Enabling Rapid Aerospace Component Qualification and Certification: Integrated Model-Based Material Definitions in Additive Manufacturing: *Masoud Anahid*[1]; Sergei Burlatsky[2]; Manish Kamal[3]; David Furrer[3]; [1]RTX Technology Research Center ; [2]RTX Technology Research Center; [3]Pratt & Whitney

NANOMATERIALS

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division, ACerS Energy Materials and Systems Division, ACerS Engineering Ceramics Division

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Purdue University

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Session Chairs: Kathy Lu, University of Alabama at Birmingham; Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University

9:00 AM Invited
Functional Nanostructured Thermal Interface for Advanced Energy Applications: *Sheng Shen*[1]; [1]Carnegie Mellon University

9:30 AM
Immiscible Nanostructured Aluminum Alloys for Hydrogen Generation: *Billy Hornbuckle*[1]; Anthony Robertes[1]; Anit Giri[1]; Sean Fudger[1]; Tom Luckenbaugh[1]; Kris Darling[1]; [1]Devcom Us Army Research Laboratory

9:50 AM
Single-Source-Precursor Derived Novel HfBxCyN1-x-y Ultrahigh-Temperature Ceramics for Multifunctional Applications: Energy Conversion and Thermal Protection: *Wei Li*[1]; Jinxue Ding[1]; Kathy Lu[1]; [1]University of Alabama Birmingham

10:10 AM
Advancements in Synthesis and Characterization of High-Purity Mn_4C for Thermomagnetic Energy Devices: Baochao Zhang[1]; Tianhong Zhou[1]; Xing Zheng[1]; Youngwoon Song[1]; Pingzhan Si[2]; Oi Lun Li[3]; Chul-Jin Choi[1]; *Jihoon Park*[1]; [1]Korea Institute of Materials Science; [2]China Jiliang University; [3]Pusan National University

10:30 AM Break

10:50 AM Invited
Polymeric Supraparticles with Plasmonic Enhancement for Advance Diagnostic Performance: Gabriel Aguirre Cruz[1]; *Lia Stanciu*[2]; [1]Purdue University; [2]Perdue University

11:20 AM
Soft Nanomaterials as Plasmonic Systems: *Brigita Rozic*[1]; Jerome Fresnais[2]; Torsten Hegmann[3]; Emmanuelle Lacaze[4]; [1]Jozef Stefan Institute; [2]Laboratorie PECSA, UPMC; [3]Kent State University; [4]Institut des Nanosciences de Paris (INSP)

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion and Environmental Degradation: Theory and Practice — Session I

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Haozheng Qu, GE Global Research; Bai Cui, University of Nebraska Lincoln; Kaila Bertsch, Lawrence Livermore National Laboratory; Karthikeyan Hariharan, Friedrich Alexander University, Erlangen-Nuremberg

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Session Chairs: Haozheng Qu, GE Vernova Advanved Research; Jie Lian, RPI

8:00 AM Invited
CMAS Corrosion Resistance and Mechanisms of High Entropy Rare-Earth Phosphates as Potential Environmental Barrier Coatings: Keith Bryce[1]; Bishnu Pada Majee[1]; Liping Huang[1]; *Jie Lian*[1]; [1]Rensselaer Polytechnic Institute

8:30 AM
Thermal Properties and CMAS Corrosion Resistance of Rare Earth Phosphates as Environmental Barrier Coatings for SiC-based Ceramic-Matrix Composites: *Bishnu Majee*[1]; Keith Bryce[1]; Liping Huang[1]; Jie Lian[1]; [1]Rensselaer Polytechnic Institute

8:50 AM
Re-Coating Adhesion Following Laser Ablation Coating Removal of Coatings and Lead on Metal Surfaces: *William Moffat*[1]; Jim Fitz-Gerald[1]; Sean Agnew[1]; Jason Provines[2]; Stephen Sharp[2]; [1]University of Virginia; [2]VTRC

9:10 AM
Corrosion Resistance of Fe-Al Reactive Bond from Casted AlCeMg Alloy: *Jamieson Brechtl*[1]; Melanie Moses-DeBusk[1]; Yan-Ru Lin[1]; Ercan Cakmak[1]; Tracie Lowe[1]; James Keiser[1]; Michael Kesler[1]; David Weiss[2]; Kashif Nawaz[1]; [1]Oak Ridge National Laboratory; [2]Loukus Technologies, Inc.

9:30 AM
Diaminohexane and Diaminooctane Functionalized Graphene Oxide as Corrosion Inhibited for Carbon Steel in a Simulated Oilfield Acidizing Environment: A Weight Loss, Electrochemical, DFT and Machine Learning Study: *Kabiru Haruna*[1]; Tawfik Saleh[1]; [1]King Fahd University of Petroleum and Minerals

9:50 AM Break

10:10 AM
Micro-XRF Spectrometry: A New Generation of Image-Based Mineralogical Refractory Characterization: *Isabella Haas*[1]; Anna Fehleisen[1]; [1]RHI Magnesita

10:30 AM
High-Temperature Oxidation of Alitized Coatings Using Functionally Active Charges: *Borys Sereda*[1]; Dmytro Sereda[1]; Dmytro Kiforuk[1]; Kiril Gulyaev[1]; [1]DSTU

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics III

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Mona Zebarjadi, University of Virginia; Charmayne Lonergan, Missouri University of Science and Technology

9:00 AM Invited
Material Design of Thermoelectric Oxides with Low Thermal Conductivity: *Takayoshi Katase*[1]; [1]Tokyo Institute of Technology

9:20 AM Invited
Benchtop Room-Temperature Synthesis of High Performance Thermoelectrics: *Kirill Kovnir*[1]; [1]Iowa State University

9:40 AM Invited
ACerS EMSD Outstanding Student Researcher Award Lecture: Advancing Nontoxic, Antimony-Based 1–2–2-Type Thermoelectric Zintls: *Xin Shi*[1]; [1]University of Houston

10:00 AM Break

10:20 AM Invited
Thermoelectric Property Predictions via Machine Learning: *Holger Kleinke*[1]; [1]University of Waterloo

10:50 AM Invited
Exploration of Thermoelectric Conversion from the Diffusive to Ballistic Transport Regime: Qinxin Zhu[1]; *Jesse Maassen*[1]; [1]Dalhousie University

11:20 AM Invited
Quantum Analysis of Metal-Insulator Transitions in Some Ruthenate Pyrochlores: *Sepideh Akhbarifar*[1]; [1]Catholic University of America -Vitreous State Lab

FUNDAMENTALS AND CHARACTERIZATION

Fracture in Metals: Insights from Experiments and Modeling Across Length and Time Scales — Experiments, Modeling, and Machine Learning

Sponsored by:

Program Organizers: Abigail Hunter, Los Alamos National Laboratory; Nithin Mathew, Los Alamos National Laboratory; Janel Chua, Los Alamos National Lab

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Session Chairs: Nithin Mathew, Los Alamos National Laboratory; Samuel Hemery, Institute Pprime

8:00 AM Invited
In-situ Measurement of Damage Evolution in Shocked Magnesium as a Function of Microstructure: B. MacNider[1]; David Jones[2]; Jesse Callanan[2]; M. Beason[2]; D. M. Dattelbaum[2]; N. Boechler[3]; *Saryu Fensin*[2]; [1]Los Alamos National Laboratory; University of California, San Diego; [2]Los Alamos National Laboratory; [3]University of California, San Diego

8:30 AM
Assessment of the Transition Temperature Based on Multiscale Modeling of Mechanical Behavior: *Ghiath Monnet*[1]; [1]Edf

8:50 AM
3D Surrogate Model Training Using Active Learning with Elasto-Viscoplastic FFT Simulations of Pore Morphologies from Laser Powder Bed Fusion of Ti64: *Daniel Diaz*[1]; Xingyang Li[1]; Elizabeth Holm[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]University of Michigan

9:10 AM Invited
Is There a Quantitative Relationship Between Strain Localization and Ductility in Ti Alloys?: Tiphaine Giroud[1]; Patrick Villechaise[1]; Azdine Naït-Ali[1]; Francois Bourdin[2]; Damien Texier[3]; *Samuel Hemery*[4]; [1]ISAE-ENSMA; [2]Airbus; [3]ICA; [4]Ensma - Institute Pprime

9:40 AM
The Influence of Substantial Intragranular Orientation Gradients on the Micromechanical Response of Heavily-Worked Material: Karthik Shankar[1]; Meddelin Setiawan[2]; Katherine Shanks[3]; Matthew Krug[4]; *Matt Kasemer*[1]; Darren Pagan[2]; [1]The University of Alabama; [2]Pennsylvania State University; [3]Cornell High Energy Synchrotron Sources; [4]Air Force Research Laboratory

10:00 AM Break

10:20 AM Invited
The Large Structural Size Effect in Charpy Impact Fracture of Steels: Novel Net-Section Mechanics Approach to Quantify the Size Effect and Scaling Laws: *K. S. Ravi Chandran*[1]; [1]The University of Utah

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Current Issues and Functional Applications — ACerS Alfred R. Cooper Award Session

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Qiang Fu, Corning Inc; Walter Kob, University of Montpellier

Tuesday AM | October 8, 2024
409 | David L. Lawrence Convention Center

Session Chair: Michelle Korwin-Edson, Owens Corning

9:20 AM Invited
What is the Best Glass Material for Optical Fibres – Soft Glass or Silica? – It Depends: *Heike Ebendorff-Heidepriem*[1]; [1]The University of Adelaide

10:00 AM Break

10:20 AM Invited
Accelerated Relaxation of Chalcogenide Glasses via Thermo-Ultrasonication: *Patrick Lynch*[1]; Lam Tran[1]; Ecem Yamac[1]; Gil B. J. Sop Tagne[1]; Christian Cano[2]; Philip Marrero[2]; Arron Phillips[2]; Rashi Sharma[3]; Rebecca Welch[1]; Cosmin-Constantin Popescu[4]; Juejun Hu[4]; Kathleen Richardson[3]; Steve Feller[2]; William LaCourse[1]; Stuart Yaniger[1]; Collin Wilkinson[1]; Myungkoo Kang[1]; [1]Alfred University; [2]Coe College; [3]University of Central Florida; [4]Massachusetts Institute of Technology

10:40 AM Invited
Structure-Property Relations in the 60Li2S + 30SiS2 + xLiSbO3 + (10-x)LiPO3 Glass System: *William Fettkether*[1]; Cody Lyle[1]; Steve Martin[1]; [1]Iowa State University

11:00 AM Invited
LionGlass™: A Zinc Aluminosilicophosphate (ZASP) Glass That Reduces Carbon Emissions by 65%: *Julianne Chen*[1]; Nicholas Clark[1]; John Mauro[1]; [1]Pennsylvania State University

11:20 AM Invited
Solution Based Processing of Ge2Sb2Se4Te1 Phase Change Material for Optical Applications: *Daniel Wiedeman*[1]; Rashi Sharma[1]; Eric Bissel[1]; Parag Banerjee[1]; Brian Mills[2]; Juejun Hu[2]; Marie Sykes[3]; Jasper Stackawitz[3]; Jake Lucinec[3]; Casey Schwarz[3]; Kathleen Richardson[1]; [1]University of Central Florida; [2]Massachusetts Institute of Technology; [3]Ursinus College

11:40 AM Invited
Subsolidus Phase Diagrams of the In2O3-SnO2-ZnO System at 1400 and 1500 and New Ternary In2Sn2Zn2O9 Phase: *Kyungmin Yu*[1]; [1]Seoul National University

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Grain Boundary & Interface Stability and Transitions

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chairs: John Blendell, Purdue University; Klaus van Benthem, University of California, Davis

9:00 AM Invited
Stressing Grain Boundaries to Change Local Properties: William Hahn[1]; Andrew Lupini[2]; *Klaus van Benthem*[1]; [1]University of California, Davis; [2]Oak Ridge National Laboratory

9:30 AM
Grain Boundary Misorientation-Dependent Phase Transforming TiOx Polycrystals: *Alfredo Sanjuan*[1]; Edwin García[1]; Jarrod Lund[1]; Shang Zhongxia[1]; Noam Berstein[2]; Steve Hellberg[2]; Xinghang Zhang[1]; Haiyan Wang[1]; [1]Purdue University; [2]Naval Research Laboratory

9:50 AM
Surface Energy Measurements of Yttrium Oxide: *Kavan Joshi*[1]; Jeremy Mason[2]; Ricardo Castro[1]; [1]Lehigh University; [2]UC Davis

10:10 AM Break

10:30 AM Invited
Influences of Ternary Solutes on Nanocrystalline Stability: *Gregory Thompson*[1]; Thomas Koenig[2]; Ilias Bikmukhametov[1]; Ankit Gupta[3]; Garritt Tucker[4]; [1]University of Alabama; [2]Lehigh University; [3]Baylor University ; [4]Baylor University

11:00 AM
Identifying Subgrain Boundary Migration Behavior at Early Stage Recrystallization: *Zehua Liu*[1]; Marc DeGraef[1]; [1]Carnegie Mellon University

11:20 AM
Special Grain Boundaries in NiTi Shape Memory Alloys as Sites for Preferential Martensite Nucleation: *Gabriel Plummer*[1]; Mikhail Mendelev[1]; John Lawson[1]; [1]Nasa Ames Research Center

11:40 AM
The Influence of Zr on the Dewetting of Cu-Zr Alloy Thin Films: *Wen-Yu Chen*[1]; Md Shariful Islam[1]; Maarten de Boer[1]; Gregory Rohrer[1]; Elizabeth Dickey[1]; [1]Carnegie Mellon University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session III

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Raymundo Arroyave, Texas A&M University

9:00 AM Invited
Development of Intermetallic-Free Welding between Aluminum and Steel Using High Entropy Alloy Interlayers in Resistance Spot Welding: *Jianxun Hu*[1]; Peiyong Chen[2]; Xuesong Fan[2]; John Bohling[2]; Peter Liaw[2]; [1]Honda Development & Manufacturing of Americas; [2]University of Tennessee - Knoxville

9:20 AM Invited
Elastic and Plastic Behavior of Binary and Ternary Refractory Multi-Principal-Element Alloys: *Rui Feng*[1]; George Kim[2]; Dunji Yu[3]; Yan Chen[3]; Wei Chen[4]; Peter Liaw[5]; Ke An[3]; [1]National Energy Technology Laboratory; [2]Illinois Institute of Technology; [3]Oak Ridge National Laboratory; [4]University at Buffalo; [5]The University of Tennessee, Knoxville

9:40 AM Invited
Elastic Properties as a Function of Temperature of AlMoNbV, NbTaTiV, NbTaTiZr, AlNbTaTiV, HfNbTaTiZr, and MoNbTaVW RHEAs from First-Principles Calculations: Danielsen Moreno[1]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology

10:00 AM Break

10:20 AM Invited
Examining the Influence of Chemical Inhomogeneity in Modelling Plasticity and Fracture in Complex Concentrated Alloys: *Anne Marie Tan*[1]; Zhi Li[1]; Yakai Zhao[2]; Upadrasta Ramamurty[3]; Huajian Gao[4]; [1]Institute of High Performance Computing, A*STAR; [2]Institute of Materials Research and Engineering, A*STAR; [3]Nanyang Technological University; [4]Tsinghua University

10:40 AM Invited
Exploration and Characterization of Refractory Compositionally Complex Rare Earth Garnets: *Claudia Rawn*[1]; [1]University of Tennessee

11:00 AM Invited
Exploring the Potential of High Entropy Alloys for Superior Mechanical Properties: *Xin Wang*[1]; [1]University of Alabama

11:20 AM Invited
First-Principles Study of Oxygen Adsorption, Absorption and Diffusion in FeCrNi Medium Entropy Alloy: *Hao Zhang*[1]; Farhan Khalid[1]; Jing Liu[1]; [1]University of Alberta

11:40 AM Invited
From High-Entropy Ceramics (HECs) to Compositionally Complex Ceramics (CCCs): *Jian Luo*[1]; [1]University of California, San Diego

SPECIAL TOPICS

Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday — Nanomaterials II / Progress in MAX Phases I

Sponsored by: ACerS Basic Science Division, ACerS Engineering Science Division

Program Organizers: Surojit Gupta, University of North Dakota; Miladin Radovic, Texas A&M University; Michael Naguib, Tulane University

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Session Chairs: Konstantina Lambrinou, University of Huddersfield; Thierry Ouisse, Grenoble INP

9:00 AM Invited
Self-Assembly of Inorganic Gels and Networks From Unique 1-Dimensional Lepidocrocite Phase Titanium Oxide: *Gregory Schwenk*[1]; Adam Walter[1]; Matthew Mieles[1]; Haifeng Ji[1]; Michel Barsoum[1]; [1]Drexel University

9:30 AM Invited
MAX Phase Single Crystals and Their 2D Derivatives: *Thierry Ouisse*[1]; Hanna Pazniak[1]; Takahiro Ito[2]; Fabrice Wilhelm[3]; Aditya Sharma[1]; Andrei Rogalev[3]; Michel Barsoum[4]; [1]Grenoble INP; [2]Nagoya University; [3]European Synchrotron Radiation Facility; [4]Drexel university

10:00 AM Break

10:15 AM Invited
MAX Phases for Nuclear Applications: *Konstantina Lambrinou*[1]; [1]University of Huddersfield

10:45 AM Invited
Past, Present, and Future of MAX Phases: *Martin Dahlqvist*[1]; [1]Linköping University

11:15 AM Invited
Phase Formation and Thermal Stability of MAX and MAB Phase Thin Films: *Jochen Schneider*[1]; [1]Rwth Aachen University

11:45 AM Invited
Hydroxides-Derived Nanostructures: Scalable Synthesis, Characterization, Properties, and Potential Applications: *Hussein Badr*[1]; Michel Barsoum[1]; [1]Drexel University

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Advances in Ceramic Processing I: Sintering

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

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Session Chairs: Fei Peng, Clemson University; Jorgen Rufner, Idaho National Laboratory

9:00 AM Invited
From Understanding Flash Sintering Mechanisms to Realizing Ultrafast Sintering without Electric Fields and Controlling Microstructures with Electric Fields: *Jian Luo*[1]; [1]University of California, San Diego

9:30 AM Invited
Electric Field Assisted Sintering of Advanced Materials at Industrially Relevant Length Scales: *Jorgen Rufner*[1]; Arin Preston[1]; Xinchang Zhang[1]; Andrew Gorman[1]; Charles Aicher[1]; Robert Byrnes[1]; [1]Idaho National Laboratory

10:00 AM Break

10:20 AM
From Spark Plasma Sintering to Ultra-Fast Consolidation of Carbides: *Elisa Torresani*[1]; Eugene A. Olevsky[1]; Thomas Grippi[1]; Chris Haines[2]; Martin Darold[3]; Andrii Maximenko[1]; [1]San Diego State University; [2]US Army Research Laboratory; [3]US Army Armament Research, Development and Engineering Center

10:40 AM
Spark Plasma Sintering (SPS) of Polymer Derived Silicon Oxycarbide (SiOC): *Apurba Naskar*[1]; Manoj Mahapatra[1]; [1]University of Alabama at Birmingham

11:00 AM Invited
Ultra-Fast Laser Sintering of Ceramics and Machine-Learning-Based Prediction on Processing-Microstructure-Property Relationships: Xiao Geng[1]; Jianan Tang[1]; Siddhartha Sarkar[1]; Ningxuan Wen[1]; Jianhua Tong[1]; Rajendra Bordia[1]; Dongsheng Li[2]; Hai Xiao[1]; *Fei Peng*[1]; [1]Clemson University; [2]Advanced Manufacturing LLC

11:30 AM
Ultra-Fast CO2 Laser Sintering of Iron-Alumina Metal-Ceramic Materials: *Siddhartha Sarkar*[1]; Shunyu Liu[1]; Hai Xiao[1]; Fei Peng[1]; [1]Clemson University

11:50 AM
Grain Size Refinement of Additive Manufactured Ce-TZP Ceramics by Coupled Two-Step Pre-Sintering and HIP: *Ruoshi Zhao*[1]; Hongbing Yang[1]; Xintong Liu[1]; Hezhen Li[1]; Chang-An Wang[1]; Jing Ma[1]; Yanhao Dong[1]; [1]Tsinghua University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Manufacturing Changes and Challenges Associated with Electric Vehicles — Manufacturing Changes and Challenges Associated with Electric Vehicles

Sponsored by: TMS: Shaping and Forming Committee

Program Organizers: Judy Schneider, University of Alabama at Huntsville; Aashish Rohatgi, Pacific Northwest National Laboratory; Katherine Rader, Pacific Northwest National Laboratory; Mageshwari Komarasamy, Pacific Northwest National Laboratory; Matthew Steiner, University of Cincinnati; Danny Nikolai, Rotating Precision Mechanisms, Inc.

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Session Chairs: Judy Schneider, University of Alabama at Huntsville; Aashish Rohatgi, Pacific Northwest National Laboratory

9:00 AM Keynote
Application of Emerging Manufacturing Processes on the Electrical Vehicle Industry: *Tim Skszek*[1]; [1]Pacific Northwest National Labortory

9:40 AM
Development of a Continuous Lamination Manufacturing Process for Fabricating Long-Length Flexible Printed Circuit Boards for Electric Vehicles Battery Assembly Units: *Chan-Woo Lee*[1]; Eun-Ji Gwak[2]; Tae-Jin Je[2]; Doo-Sun Choi[2]; Jun Sae Han[1]; [1]Korea Institute of Machinery & Materials / Korea National University of Science and Technology; [2]Korea Institute of Machinery & Materials

ARTIFICIAL INTELLIGENCE

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division

Program Organizers: Amanda Krause, Carnegie Mellon University; Daniel Ruscitto, GE Research; Alp Sehirlioglu, Case Western Reserve University; Roger French, Case Western Reserve University; Erika Barcelos, Case Western Reserve University

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Session Chair: Amanda Krause, Carnegie Mellon University

9:00 AM Invited
Foundation Models for Multimodal Data Mining with Applications in Materials Science: *Aikaterini Vriza*[1]; Maria Chan[1]; Henry Chan[1]; Jie Xu[1]; [1]Argonne National Laboratory

9:30 AM Invited
Machine Learning Enhanced Data Analytics for Transmission Electron Microscopy: *Kai He*[1]; [1]University of California, Irvine

10:00 AM Break

10:20 AM
Categorization of Fracture Surfaces Using Deep Learning-Enabled 2D Image Analysis: *Nicholas Jones*[1]; Tianjie Zhang[2]; Jin-Hyeong Yoo[1]; Yang Lu[2]; [1]Naval Surface Warfare Center, Carderock Division; [2]Boise State University

10:40 AM
Extraction of Local Scalar 3D Microstructural Properties of SOFC Electrodes from 2D Micrographs Using Convolutional Neural Networks: *William Kent*[1]; Rochan Bajpai[1]; Rachel Kurchin[1]; William Epting[2]; Harry Abernathy[2]; Paul Salvador[2]; [1]Carnegie Mellon University; [2]National Energy Technology Laboratory

11:00 AM
Feature Extraction from SEM Images of Fatigue Fracture Surfaces: *Anthony Lino*[1]; Kristen Hernandez[1]; Austin Ngo[1]; Tu Pham[1]; Roger French[1]; Pawan Tripathi[1]; John Lewandowski[1]; Laura Bruckman[1]; [1]Case Western Reserve University

11:20 AM
Synthetic 3D Microstructure Generation of Solid Oxide Cell Electrodes Using Denoising Diffusion Models: *Rochan Bajpai*[1]; William Kent[1]; William Epting[1]; Harry Abernathy[1]; Paul Salvador[1]; Rachel Kurchin[1]; [1]US DOE National Energy Technology Laboratory

11:40 AM
Aligning Grains in Time-Series Laboratory Diffraction Contrast Tomography (LabDCT) Data for Machine Learning of Microstructure Evolution: *Woohyun Eum*[1]; Yi Wang[2]; Kang Yang[1]; Vishal Yadav[1]; Michael Tonks[1]; Amanda Krause[2]; Joel Harley[1]; [1]University of Florida; [2]Carnegie Mellon University

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials III

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

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Session Chairs: Kalpana Katti, North Dakota State University; Rahim Esfandyarpour, University of California, Irvine; Marisa Beppu, University of Campinas; Boris Khusid, New Jersey Institute of Technology

9:00 AM Invited
Tadashi Kokubo Award: Glass for Healthcare: From Research, Invention to Industrialization: *Qiang Fu*[1]; [1]Corning Inc.

9:20 AM Invited
Bioceramics Young Scholar: Additive Manufacturing of Bioceramics: From an Indirect Method to a Direct Route for the Production of Porous Parts with the Help of Phosphate Condensation and Photonic Irradiation: *Nicolas Somers*[1]; Alejandro Monton[1]; Eren Ozmen[1]; Florian Jean[2]; Marie Lasgorceix[2]; Fabrice Petit[3]; Anne Leriche[2]; Mark Losego[1]; [1]Georgia Institute of Technology; [2]Université Polytechnique Hauts-de-France; [3]Belgian Ceramic Research Center

9:40 AM Invited
Synthesis and Characterizations of Chitosan/Hydroxyapatite Hollow Fibers: *Akiyoshi Osaka*[1]; Song Chen[2]; [1]Okayama University; [2]Taiyuan University of Technology

10:00 AM Break

10:20 AM Invited
Test Methods for Bone Void Fillers in International Standards from Our Studies: *Masanori Kikuchi*[1]; [1]National Institute for Materials Science

10:40 AM Invited
Zirconia Paste Printing (ZP²) and Zirconia Binderjetting (ZBJ) for Bone Tissue Engineering Applications: *Srimanta Barui*[1]; Kunal Kate[1]; Bikramjit Basu[2]; [1]University of Louisville; [2]Materials Research Center, Indian Institute of Science Bangalore

11:00 AM Invited
Zn-Based Antimicrobial (Nano)Materials: Green Electrochemical Synthesis and Bionanocomposite Development: *Rosaria Anna Picca*[1]; [1]Università degli studi di Bari Aldo Moro

11:20 AM
Holmium-Doped Bioactive Glasses in Thermo-Responsive Drug Delivery Systems for Brachytherapy Allied with Bisphosphonates in Bone Cancer Treatment: *Roger Borges*[1]; Agatha Pelosini[2]; Juliana Marchi[2]; [1]Hospital Israelita Albert Einstein; [2]Universidade Federal do ABC

11:40 AM Invited
3D Microarchitectures of Metals, Ceramics, and Polymers, via Droplet-Based Nanoprinting for Next Generation Brain-Computer Interfaces and Robotic Skins: *Rahul Panat*[1]; [1]Carnegie Mellon University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Porous Materials for Energy and Environment Applications — Porous Materials II

Program Organizers: Lan Li, Boise State University; Winnie Wong-Ng; Kevin Huang, University of South Carolina; Di Wu, Washington State University

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Session Chairs: Winnie Wong-Ng, National Institute of Standards and Technology (NIST); Kevin Huang, University of South Carolina

8:00 AM Invited
Scalable Anti-Corrosion Coating Based on Porous Superhydrophobic Structure: *Fangming Xiang*[1]; David Hopkinson[1]; [1]National Energy Technology Laboratory

8:20 AM Invited
Tuning Hybrid Siliceous Functional Materials for the Selective Capture of Energy Critical Metals: *Dhruvi Patel*[1]; Aditi Chatterjee[1]; Prarabdh Jain[1]; Greeshma Gadikota[1]; [1]Cornell University

8:40 AM Invited
High Throughput, Ultra-fast Laser Sintering of Ceramics and Glass: Xiao Geng[1]; Jianan Tang[1]; Siddhartha Sarkar[1]; Rajendra Bordia[1]; Dongsheng Li[2]; Jianhua Tong[1]; Hai Xiao[1]; *Fei Peng*[1]; [1]Clemson University; [2]Advanced Manufacturing LLC

9:00 AM Invited
Microscopic 3D Graphene for High-Performance Supercapacitors with Ultra-High Areal Capacitance: *Viet Hung Pham*[1]; Congjun Wang[1]; Yuan Gao[1]; Jennifer Weidman[1]; Ki-Joong Kim[1]; Christopher Matranga[1]; [1]National Energy Technology Laboratory

9:20 AM
Additive Manufacturing Applications in Heterogeneous Catalysis: *Matthew Watson*[1]; [1]University of Canterbury

9:40 AM
Physicochemically Modified Biochars for Environmental Applications: *Jaeyun Moon*[1]; [1]University of Nevada - Las Vegas

10:00 AM Break

10:20 AM
Porous Catalytic Intermetallic Alloys Obtained by Synthesis of Complex Functionally Active Charges: Borys Sereda[1]; Yuriy Belokon[1]; *Irina Kruhliak*[1]; Dmytro Sereda[1]; [1]DSTU

10:40 AM
Second Phase and Solid Solution Strengthening in Metallic Nanofoams: *David Bahr*[1]; Alexandra Loiza[1]; [1]Purdue University

11:00 AM
Asymmetric Hybrid Capacitive Deionization Coupled with Organics Degradation in a Flow-Through Cell Architecture for Wastewater Treatment: *Paige Murray*[1]; Karthikeyan Baskaran[1]; Sage Hiibel[1]; Krista Carlson[1]; [1]University of Nevada, Reno

11:20 AM
C-Rate Dependent Degradation Regimes in LiFePO4-based Lithium-Ion Batteries: *Cole Hobby*[1]; Alfredo Sanjuan[1]; Edwin García[1]; [1]Purdue University

11:40 AM
Microstructural Evolution of CNC-PVA Porous Aerogels: *Madhavi Vempuluru*[1]; E Johan Foster[2]; Carolina Tallon[1]; [1]Virginia Tech; [2]The University of British Columbia

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Manufacturing Division

Program Organizers: Morsi Mahmoud, Abdullah Al Salem University (AASU); Dinesh Agrawal, Pennsylvania State University; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Christina Wildfire, National Energy Technology Laboratory; Guido Link, Karlsruhe Institute of Technology

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Session Chairs: Morsi Mahmoud, King Fahd University of Petroleum and Minerals; Hideyuki Kanematsu , Suzuka College NIT (KOSEN)

9:00 AM Invited
Corrosion Behavior of AlCrCoFeNi High Entropy Alloy Cladded on F-0008 by Spark Plasma Sintering: *Daudi Waryoba*[1]; Alex Davis[1]; Patrick Albert[1]; [1]Pennsylvania State University

9:20 AM
Characterization of AA7xxx Under Magnetic Field during Artificial Heat Treatment: *Kirk Lemmen*[1]; Damilola Alewi[1]; Clé Sanchez[1]; Keaton Looper[1]; Haluk Karaca[1]; Paul Rottmann[1]; Heather Murdoch[2]; Daniel Magagnosc[2]; [1]University of Kentucky; [2]US Army DEVCOM

9:40 AM
Evaluating the Effect of Reinforcement on the Specific Damping Capacity of Microwave Casted Nickel-Copper Alloy: *Ashok Kumar*[1]; Ashish Kumar[1]; Sumit Sharma[1]; [1]Dr B R Ambedkar National Institute of Technology Jalandhar Punjab

10:00 AM Break

10:20 AM
Effect of Processing Parameters on Microstructure of Acoustoplastically Deformed Copper: *Oktay Yigit*[1]; Yoganandh Madhuranthakam[1]; Upama Biswas Tonny[1]; Carl Boehlert[1]; Sunil Chakrapani[1]; [1]Michigan State University

10:40 AM
Evaluating the Modal Parameters of Nickel Specimens Processed Using In-Situ and Ex-Situ Microwave Casting: *Gaurav Sharma*[1]; Ashish Kumar[2]; Ashok Kumar Bagha[3]; Shashi Bahl[4]; [1]Mehr Chand Polytechnic College; [2]Dr. B R Ambedkar National Institute of Technology Jalandhar; [3]Dr. B R Ambedkar National Institute of Technology Jalandhar; [4]I.K. Gujral Punjab Technical University

11:00 AM
Hybrid Microwave Processing of 7-8 wt.% Yttria Stabilized Zirconia: *Morsi Mahmoud*[1]; Nestor Ankah[1]; Mohammed Arif[1]; Zuhair Gasem[1]; [1]King Fahd University Of Petroleum And Minerals

11:20 AM Invited
High-Intensity Electric Nano Pulsing: *Eugene A. Olevsky*[1]; Elisa Torresani[1]; Xu Wenwu[1]; Andrii Maximenko[1]; Runjian Jiang[1]; [1]San Diego State University

BIOMATERIALS

Society for Biomaterials: Biomaterial Applications — Podium Session

Sponsored by: Society for Biomaterials

Program Organizers: J. Zach Hilt, University of Kentucky; Yadong Wang, Cornell University

Tuesday AM | October 8, 2024
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Session Chair: Yadong Wang, Cornell University

8:00 AM Invited
Mimicking Tumors as a S.M.A.R.T.E.R. Way to Treat Transplant Rejection and Inflammatory Diseases: *Steven Little*[1]; [1]University of Pittsburgh

8:40 AM
Evaluating Impact of Particle Size and Loading on Echogenicity of Medical Devices: *Samuel Vibostok*[1]; Abby Whittington[1]; [1]Virginia Polytechnic Institute & State University

9:00 AM
A Coordination-Crosslinked Degradable Elastomer: *Cole Latvis*[1]; Nolan Shan[1]; Katelyn Ge[1]; Amanda Wang[1]; Alan Wells[2]; Hanshuang Shao[2]; Simon Van Herck[1]; Anthony D'Amato[1]; Yadong Wang[1]; [1]Cornell University; [2]University of Pittsburgh

9:20 AM
Novel Decellularized, Dehydrated Human Placental Extracellular Matrix (ECM) Mineral Composite for Bone Applications: *Rajarajeswari Sivalenka*[1]; Brandon Mirabile[1]; Robert Pouliot[1]; Maumita Bhattacharjee[1]; Joseph Gleason[1]; Nicolas Mann[1]; Lukasz Przek[1]; Desiree Long[1]; Adrian Kilcoyne[1]; Robert Hariri[1]; Stephen Brigido[1]; Anna Gosiewska[1]; [1]Celularity Inc

9:40 AM
Titania Nanorods for Posterior Dental Restoration Composites: *Isabel Lloyd*[1]; Rashmi Reddy Mallu[2]; [1]University of Maryland; [2]CSIR-IICT

10:00 AM Break

10:20 AM Invited
3D Bioprinting Human Tissues and the Path Towards Translation: *Adam Feinberg*[1]; [1]Carnegie Mellon University

11:00 AM
Scalable, Green Thiol-Norbornene Photopolymers for 3D Printing of Biomaterials: *Warrick Ma*[1]; Anthony D'Amato[1]; Yadong Wang[1]; [1]Cornell University

11:20 AM
Fine-Tuning Iron Nanoparticles Sizes Using Long Alkyl Chained Surfactants for Magnetic Particle Imaging Applications: *Aleia Williams*[1]; Lu Liu[1]; Charles Johnson[1]; Jacqueline Johnson[1]; [1]University of Tennessee Space Institute

11:40 AM
Thermally Responsive Microswimmers Biomanufactured by Genetically Engineered Probiotics for Antibiofilm Therapies: *Prakriti Dhungana*[1]; Jonathan Caguiat[1]; Byung-Wook Park[1]; [1]Youngstown State University

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development III — Design and Characterization

Sponsored by: TMS: Steels Committee, AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Adriana Eres-Castellanos, Colorado School of Mines; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, University of Navarra; Jeongho Han, Hanyang University; Ian Zuanzo Rodriguez, ArcelorMittal R&D; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Los Alamos National Laboratory

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Session Chair: Alexandra Glover, Los Alamos National Laboratory

8:00 AM Invited
Maximizing Scrap Recycling by Designing Cu Tolerant Steel Compositions: *Kester Clarke*[1]; David Landi[1]; Lionel Promel[1]; Henry Geerlings[1]; Matthew Stanley[1]; Shubhankar Upasani[2]; William Xi[2]; Erin Barrick[3]; Andrew Kustas[3]; Jason Spice[4]; Bhaskar Yalamanchili[5]; Paul Mason[6]; Xiaoli Zhang[1]; Emmanuel De Moor[1]; Jonah Klemm-Toole[1]; Sridhar Seetharaman[7]; Amy Clarke[1]; [1]Colorado School of Mines; [2]NREL; [3]Sandia National Laboratories; [4]Vallourec; [5]Gerdau; [6]Thermo-Calc Inc; [7]Arizona State University

8:30 AM
Advanced High Strength Steel for Automotive: Light Weighting and Sustainability: *Deepan N*[1]; Manjini Sambandam[1]; [1]JSW Steel Ltd, Salem Works

8:50 AM
Design of Novel Nanostructured Bainitic Steels for High Wear Service Conditions: *Rangasayee Kannan*[1]; Yiyu Wang[1]; Tomas Grejtak[1]; Bryan Lim[1]; Christopher Fancher[1]; Kinga Unocic[1]; Peeyush Nandwana[1]; [1]Oak Ridge National Laboratory

9:10 AM
Development of Fe-10Ni Based Steel for Liquid Hydrogen Storage: *Hyo Joo Han*[1]; Hyun Wook Lee[1]; Min-Ho Park[2]; Hyeong-Sub So[2]; Jeongho Han[1]; [1]Hanyang University; [2]Hyundai-Steel Co.

9:30 AM
Development of Invar Alloy/High Strength Steel Laminates for Satellite Applications: *Hyeju Shin*[1]; Hyun Wook Lee[1]; Hyogeon Kim[1]; Jeongho Han[1]; [1]Hanyang University

9:50 AM Break

10:10 AM
Enhancing Q&T Steels Toughness: Precision Crafting of Nano Scale Cu-Precipitates by Optimizing Heat Treatment Parameters: *Kapil Sharma*[1]; Anish Karmakar[1]; [1]Indian Institute of Technology, Roorkee

10:30 AM
Study on the Grain Boundary Precipitation and Intergranular Fracture Behaviors in an Austenitic Fe-Mn-Al-C Lightweight Steel: *Dongwon Lee*[1]; Gun-Young Yoon[2]; Seong-Jun Park[2]; Jae Sang Lee[1]; Yoon-Uk Heo[1]; [1]POSTECH/GIFT; [2]KIMS

10:50 AM
Quantification of Coarse TiN-Rich Precipitates in Hhigh Strength Microalloyed Steels: Tamara Kazoun[1]; Ry Karl[1]; J. Barry Wiskel[1]; Doug Ivey[1]; Chad Cathcart[2]; Tihe (Tom) Zhou[2]; *Hani Henein*[1]; [1]University of Alberta; [2]Stelco

11:10 AM
Isotopic Fingerprint – an Innovative Method to Determine the Origin of Non-Metallic Inclusions in Steel: *Kathrin Thiele*[1]; Stefan Wagner[2]; Johanna Irrgeher[2]; Thomas Prohaska[2]; Susanne Michelic[1]; [1]Christian Doppler Laboratory for Inclusion Metallurgy in Advanced Steelmaking; [2]Montanuniversität Leoben

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NUCLEAR ENERGY

Tackling Metallic Structural Materials Challenges for Advanced Nuclear Reactors — Advanced Nuclear Materials

Sponsored by: TMS: Nuclear Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Miaomiao Jin, Pennsylvania State University; Xing Wang, Pennsylvania State University; Karim Ahmed, Texas A&M University; Jeremy Bischoff, Framatome; Adrien Couet, University of Wisconsin-Madison; Kevin Field, University of Michigan; Lingfeng He, North Carolina State University; Raul Rebak, GE Global Research

Tuesday AM | October 8, 2024
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Session Chairs: Caleb Massey, Oak Ridge National Laboratory; Ericmoore Jossou, Massachusetts Institute of Technology

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8:00 AM
An Investigation of Post Heat-Treatment on the 316H Stainless Steel Fabricated by Laser Powder Bed Fusion: *Lin Gao*[1]; Srinivas Mantri[1]; Xuan Zhang[1]; [1]Argonne National Laboratory

8:20 AM Invited
What "Qualifies" as Nuclear-Grade Laser Powder Bed Fusion 316H Stainless Steel?: *Caleb Massey*[1]; Peeyush Nandwana[1]; Holden Hyer[1]; Amir Ziabari[1]; Xuan Zhang[2]; Mark Messner[2]; [1]Oak Ridge National Laboratory; [2]Argonne National Laboratory

8:50 AM
Stress Relief Optimization for Laser Powder Bed Fusion Printed 316H Stainless Steel: *Geeta Kumari*[1]; Amanda Musgrove[1]; Selda Nayir[1]; Tim Graening[1]; Peeyush Nandwana[1]; Caleb Massey[1]; [1]Oak Ridge National Laboratory

9:10 AM Invited
Thermomechanical Fatigue Investigation of SS316L Fabricated via Laser Wire-Directed Energy Deposition: Ritam Pal[1]; Ajay Kushwaha[1]; Kun-Hao Huang[1]; *Amrita Basak*[1]; [1]Pennsylvania State University

9:40 AM
An Investigation of the Stability and Thermomechanical Properties of Binary Refractory Alloys Through Atomistic Simulations: *Adib Samin*[1]; Lucas Heaton[1]; [1]Air Force Institute of Technology

10:00 AM Break

10:20 AM Invited
High-Throughput Exploration of Refractory High Entropy Alloys: *Ericmoore Jossou*[1]; Trevor Bormann[1]; [1]Massachusetts Institute of Technology

10:50 AM
Innovative Processing and Characterization of Novel High-Strength and Corrosion-Resistant Cr/HEA Gradients for Fuel Cladding: *Mohan Sai Kiran Nartu*[1]; Daniel Yoon[2]; Subhashish Meher[1]; Mageshwari Komarasamy[1]; Lei Li[1]; Ayoub Soulami[1]; Isabella Van Rooyen[1]; [1]Pacific Northwest National Laboratory (Pnnl); [2]Washington University at St. Louis

11:10 AM Invited
Development of Electron Beam Welding and PM-HIP Manufacturing of Advanced Reactor Pressure Vessels: *Janelle Wharry*[1]; Elliot Marrero Jackson[1]; Grayson Nemets[1]; Jasmyne Emerson[1]; Yu Lu[2]; Maria Okuniewski[1]; Benjamin Sutton[3]; David Gandy[3]; [1]Purdue University; [2]Boise State University; [3]Electric Power Research Institute

11:40 AM
Investigation of HIP Bonded AA6061 vs. AA6061 Cladding Interface as Functions of HIP Temperature and Cooling Rate: *Shayndel Pido*[1]; Jamie McIntyre[1]; Jason Schulthess[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]Idaho National Laboratory

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CERAMIC AND GLASS MATERIALS

The American Ceramic Society Journal Awards Symposium — Session I

Sponsored by: ACerS

Program Organizer: John Mauro, Pennsylvania State University

Tuesday AM | October 8, 2024
408 | David L. Lawrence Convention Center

Session Chair: John Mauro, The Pennsylvania State University

9:00 AM Invited
3D-Printed Alumina-Based Ceramics with Spatially Resolved Porosity: Serkan Nohut[1]; Josef Schlacher[2]; Irina Kraleva[2]; Martin Schwentenwein[1]; Raul Bermejo[2]; Shawn Allan[3]; *Ryan Fordham*[4]; [1]Lithoz GmbH; [2]Montanuniversitaet Leoben; [3]Lithoz America LLC; [4]Lithoz America

9:30 AM Invited
Holistic Comparison of Environmental Barrier Coating Material Candidates Through Design of a Figure of Merit: Mackenzie Ridley[1]; Dominic Pinnisi[2]; *Elizabeth Opila*[2]; [1]Oak Ridge National Laboratory; University of Virginia; [2]University of Virginia

10:00 AM Break

10:20 AM Invited
Modeling Oxidation Kinetics of Silicon Carbide-Containing Refractory Diborides: *Pavel Mogilevsky*[1]; Michael Cinibulk[2]; [1]Air Force Research Laboratory, Materials and Manufacturing Directorate; UES Inc.; [2]Air Force Research Laboratory, Materials and Manufacturing Directorate

10:50 AM
Radiation Heat Transfer During Hypersonic Flight: Fundamentals, Materials and Applications: *Rodney Trice*[1]; Abdullah Al Saad[1]; Carlos Martinez[1]; [1]Purdue University

11:20 AM
Atomistic Origin of Structural Relaxation in Lead Metasilicate and Lithium Disilicate Glasses: *Ricardo Felipe Lancelotti*[1]; Edgar Zanotto[1]; Sabyasachi Sen[2]; [1]Federal University Of Sao Carlos; [2]University of California, Davis

11:40 AM
Advanced Thermoelectric Performance of Textured Ceramic Composite: Encapsulation of Sodium Cobaltite Template Particles into a Triple-Phase Cobaltite Matrix: Katharina Kruppa[1]; Tobias Hennig[1]; Giamper Escobar Cano[1]; Jytte Möckelmann[1]; *Armin Feldhoff*[1]; [1]Leibniz University Hannover/ Institute of Physical Chemistry and Electrochemistry

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Thermodynamics of Molten Salt Systems

Sponsored by: ACerS Basic Science Division, ACerS Energy Materials and Systems Division, TMS: Chemistry and Physics of Materials Committee

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 AM | October 8, 2024
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Session Chair: Xiaofeng Guo, Washington State University

9:00 AM
Molten Salt Calorimetry for Molten Salt Nuclear Reactors: *Alexandra Navrotsky*[1]; Hongwu Xu[1]; Vitaliy Goncharov[1]; Jared Matteucci[1]; [1]Arizona State University

9:20 AM Invited
Thermodynamic Modeling of Molten Salt for Nuclear Applications: Challenges and Opportunities: *Wei Xiong*[1]; Soumya Sridar[1]; Liangyan Hao[2]; [1]University of Pittsburgh; [2]Thermo-Calc Software Company

9:50 AM Invited
Predictive Modeling of the Structure and Thermodynamics of Molten Salts: *Vyacheslav Bryantsev*[1]; Luke Gibson[1]; Rajni Chahal[1]; Santanu Roy[1]; [1]ORNL

10:20 AM Break

10:40 AM Invited
Exploring Actinide Molten Salts with Density Functional Theory: *Benjamin Beeler*[1]; Kai Duemmler[2]; David Andersson[2]; Cecilia Harrison[1]; Ethan Wilson[1]; [1]North Carolina State University; [2]Los Alamos National Laboratory

11:10 AM
Implementing Models for High-Throughput CALPHAD Modeling of Molten Salts with Uncertainty Quantification: *Rushi Gong*[1]; Shun-Li Shang[1]; Xiaofeng Guo[2]; Zi-Kui Liu[1]; [1]Pennsylvania State University; [2]Washington State University

11:30 AM
Electrochemical Determination of Thermodynamic Properties of Ni(II) in FLiNaK Molten Salt: *Nathan Smith*[1]; Stephen Lombardo[1]; Rushi Gong[1]; Jorge Soldan Palma[1]; Hojong Kim[1]; Zi-Kui Liu[1]; Shunli Shang[1]; [1]Pennsylvania State University

FUNDAMENTALS AND CHARACTERIZATION

Uncertainty Quantification Applications in Materials and Engineering — UQ Tools, Sensitivity Analysis, and Surrogate Models

Sponsored by: ACerS Engineering Ceramics Division, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Mark Andrews, SmartUQ (retired); Gavin Jones, SmartUQ

Tuesday AM | October 8, 2024
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Session Chairs: Mark Andrews, SmartUQ (retired); Gavin Jones, SmartUQ

9:00 AM Introductory Comments Mark Andrews

9:05 AM
Tasmanian Toolkit for Uncertainty Quantification: *Miroslav Stoyanov*[1]; [1]Oak Ridge National Laboratory

9:25 AM
Introduction to Verification, Validation, and Uncertainty Quantification for Engineering Simulation: *Gavin Jones*[1]; Mark Andrews[2]; [1]SmartUQ; [2]SmartUQ (Retired)

9:45 AM Invited
Automating Engineering Design with UQ-Aware Scientific Learning: *Michael McKerns*[1]; [1]The UQ Foundation

10:05 AM Break

10:25 AM
A Parametric Study of Optical Floating-Zone Crystal-Growth Furnace Through Modeling of Heat Transfer: Effect of Sample Properties and Environment Gas Pressure: *Eymana Maria*[1]; Jonathan Denney[2]; Peter Khalifah[2]; Katsuyo Thornton[1]; [1]University of Michigan; [2]Stony Brook University

10:45 AM Invited
Quantitative Analysis of Systematic Uncertainties in Empirical and Machine Learning Interatomic Potentials: *Amit Samanta*[1]; Collin Lewin[1]; Vincenzo Lordi[1]; [1]Lawrence Livermore National Laboratory

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

16th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Sustainable Technologies IV

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mrityunjay Singh, NASA; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technology; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Wu, Wuhan University of Technology

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Session Chairs: Meelad Ranaiefar, NASA Glenn Research Center; Quanxi Jia, University at Buffalo – The State University of New York; Bai Cui, University of Nebraska Lincoln

2:00 PM Invited
Thermodynamic Stability and Carbothermal Reduction in Polymer-Derived SiOC: *Kathy Lu*[1]; Rahul Anand[2]; [1]University of Alabama Birmingham; [2]Virginia Tech

2:30 PM Invited
Nanocomposite Approach for Desired Functionalities: Aiping Chen[1]; Haiyan Wang[2]; MacManus-Driscoll Judith[3]; *Quanxi Jia*[4]; [1]Los Alamos National Laboratory; [2]Purdue University; [3]University of Cambridge; [4]University at Buffalo – The State University of New York

3:00 PM
Enhancing Epoxy Resin Biocomposite Properties Using Bamboo Fibre and Mangifera Indica Particulate: *Chidume Nwambu*[1]; Paul Okolie[1]; [1]Nnamdi Azikiwe University, Awka

3:20 PM Break

3:40 PM Invited
Sustainable Manufacturing of Carbon Fibers from Corn Kernel Fibers: *Bai Cui*[1]; Lanh Trinh[1]; Ryan Wall[1]; Mark Wilkins[2]; [1]University of Nebraska Lincoln; [2]Kansas State University

4:10 PM
Dynamic Mechanical Performances of Arrowroot (Maranta Arundinacea L.) Fiber Reinforced Starch Biocomposite Film: *Tarique Jamal*[1]; Zayd Leseman[1]; [1]King Fahd University of Petroleum and Minerals

4:30 PM
Photo-induced, Metal-free Hydroacylation of Aromatic Alkynes for Green Synthesis of Chalcones via C(sp3)-H Functionalization: *Sundaram Singh*[1]; [1]IIT(BHU)

SPECIAL TOPICS

ACerS Frontiers of Science and Society: The Rustum Roy Lecture — ACerS Frontiers of Science and Society: The Rustum Roy Lecture

Sponsored by: ACerS

Tuesday PM | October 8, 2024
407 | David L. Lawrence Convention Center

Session Chair: Young-Wook Kim, University of Seoul and Worldex Industry & Trading Co., Ltd.

1:00 PM Invited
Proposal of Oxide Ceramic LSI Device for Putting the Brakes on Global Warming Accelerated by AI-Age Computers: *Shunpei Yamazaki*[1]; [1]Semiconductor Energy Laboratory Co., Ltd.

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Mechanical Properties II / Microstructures I

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Jing Zhang, Purdue University in Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Brandon McWilliams, US Army Research Laboratory; Yeon-Gil Jung, Korea Institute of Ceramic Engineering & Technology; Charles Fisher, Naval Surface Warfare Center - Carderock

Tuesday PM | October 8, 2024
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Session Chairs: Li Ma, Johns Hopkins University Applied Physics Laboratory; Charles Fisher, NSWC Carderock Division ; Jing Zhang, Purdue University in Indianapolis

2:00 PM Invited
On the Onset of Plasticity: *Alan Jankowski*[1]; [1]Sandia National Laboratories

2:20 PM
Residual Stress in LHW-DED Ti-6Al-4V Single Walls: *Rajib Halder*[1]; Jack Canaday[2]; Matthew Dantin[2]; David Guirguis[1]; Christopher Fancher[3]; Jack Beuth[1]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]NSWC Carderock Division; [3]Oak Ridge National Lab

2:40 PM
Tailoring Distortion and Residual Stresses Using Hybrid Additive and Subtractive Approach: *Wen Dong*[1]; Chris Masuo[1]; William Carter[1]; Blane Fillingim[1]; Bhagya Prabhune[1]; Thomas Feldhausen[1]; Andrzej Nycz[1]; Srdjan Simunovic[1]; Yousub Lee[1]; [1]Oak Ridge National Laboratory

3:00 PM
Bioinspired Fabrication and Mechanical Characterization of Concentric Cylindrical Structures: Integrating SLA Technology and Finite Element Analysis: *Niloofar Fani*[1]; Fariborz Tavangarian[1]; Armaghan Hashemi Monfared[1]; [1]The Pennsylvania State University

3:20 PM Break

3:40 PM
Physics-Based Modeling for Process Dynamics and Microstructure Evolution in Laser Powder Bed Fusion: *Fangzhou Li*[1]; Wenda Tan[1]; [1]The University of Michigan

4:00 PM
Sample Size Effect of Flaws on Fracture Behavior of Ti-6Al-4V by Laser Powder Bed Fusion: Experiments and Modeling: *Erik Furton*[1]; Allison Beese[1]; [1]Pennsylvania State University

4:20 PM
Process Design for Metal Additive Manufacturing Through High-Speed Imaging and Vision Transformers: *David Guirguis*[1]; Conrad Tucker[1]; Jack Beuth[1]; [1]Carnegie Mellon University

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ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing - Composites, Graded Materials, HEA, and Cermets

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science

Tuesday PM | October 8, 2024
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Session Chair: Ian Wietecha-Reiman, Pennsylvania State University

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2:00 PM
Exploring the Microstructural Features of Additively Manufactured Graphene-Reinforced Stainless Steel 316L Composites: *Abhradeep Das*[1]; N. Sathish[2]; Duyao Zhang[1]; Dong Qiu[1]; Raj Das[1]; [1]RMIT University; [2]CSIR-Advanced Materials and Processes Research Institute (AMPRI)

2:20 PM
Enhanced Mechanical Properties in TiC/B4C-CoCrFeMnNi High-Entropy Composites Fabricated by Direct Energy Deposition: *Hyoung Seop Kim*[1]; Soung Yeoul Ahn[1]; [1]Pohang University of Science and Technology

2:40 PM
Formation and Elimination of Micron-Scale Oxide Inclusions in Ni-20Cr + Y_2O_3 ODS Alloy Fabricated with Laser Powder Bed Fusion: *Nathan Wassermann*[1]; Alan McGaughey[1]; Sneha Narra[1]; [1]Carnegie Mellon University

3:00 PM
Superior Strengthening via Nanoscale Lamellae in Eutectic Multi-Principal Element Alloy Additively Manufactured by Laser Powder Bed Fusion: *Thinh Huynh*[1]; Kevin Graydon[1]; Tanner Olson[2]; Amberlee Haselhuhn[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]LIFT

3:20 PM Break

3:40 PM
Computational Design of Crack-Free Cu-Inconel Functionally Graded Bimetallic Interfaces for Additive Manufacturing: *Liyi Wang*[1]; Luis Ladinos Pizano[1]; Michael Klecka[2]; Wei Xiong[1]; [1]University of Pittsburgh; [2]RTX Technology Research Center

4:00 PM
Additive Manufacturing of Cermets by Laser Modulation: *Prashanth Konda Gokuldoss*[1]; [1]Tallinn University of Technology

4:20 PM
Functionally Graded Lightweight Steel Designed by Additive Manufacturing with High Strength and Corrosion Resistance: *Jeong-Hun Kim*[1]; Joonoh Moon[1]; Heung Nam Han[2]; Siwhan Lee[2]; Seong-Jun Park[3]; [1]Changwon National University; [2]Seoul National University; [3]Korea Institute of Materials

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ADDITIVE MANUFACTURING

Additive Manufacturing of Titanium-based Materials: Processing, Microstructure and Material Properties — DED and Other Technologies

Sponsored by: TMS: Additive Manufacturing Committee

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

Tuesday PM | October 8, 2024
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Session Chair: Ian Crawford, Freemelt AB

2:00 PM
Effect of Recycled Swarf and Spherical Ti-6Al-4V Feedstocks on Laser Directed Energy Deposition Additive Manufacturing: *Marwan Haddad*[1]; Jianyue Zhang[1]; Alan Luo[1]; Sarah Wolff[1]; [1]Ohio State University

2:20 PM
Nanostructures in the Direct Energy Deposited Ti-5Al-5Mo-5V-3Cr Alloy: Sydney Fields[1]; Deepak Pillai[1]; Yiliang Liao[2]; Rajarshi Banerjee[1]; *Yufeng Zheng*[1]; [1]University of North Texas; [2]Iowa State University

2:40 PM
A Novel Direct Reduction and Alloying (DRA) Process for Making Titanium and Titanium Alloy Powder: *MD Emran Hossain*[1]; Pei Sun[1]; Zhigang Zak Fang[1]; [1]University of Utah

3:00 PM
Influence of Building Direction on Microstructure Evolution and Mechanical Behaviour of Additive Manufactured Ti-6Al-4V alloy: *Jagadeesh Babu S M*[1]; Anil Vesangi[2]; [1]REVA University; [2]Vikram Sarabhai Space Center, ISRO

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Session I

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

Tuesday PM | October 8, 2024
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Session Chairs: Ryan Sochol, University of Maryland; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

2:00 PM Invited
Alternative Micro/Nanoscale Additive Manufacturing Strategies for Soft Robots: *Ryan Sochol*[1]; [1]University of Maryland

2:20 PM Invited
Exploring the Potential of Multiscale Metal Additive Manufacturing for Developing Functional Components: *Sougata Roy*[1]; Prayag Burad[1]; Vishal Mahey[1]; Andrzej Nycz[2]; Mark Noakes[2]; [1]Iowa State University; [2]Oak Ridge National Laboratory

2:40 PM Invited
Laser Powder-Blown Directed Energy Deposition - Influence of Feedstock: *Sarah Wolff*[1]; [1]The Ohio State University

3:00 PM
A Mechanical Test Artifact for Determining Relative As-Built Fracture Toughness in Laser Powder Bed Fusion: *Dinh Son Nguyen*[1]; Soumya Sridar[1]; Wei Xiong[1]; Albert To[1]; [1]University of Pittsburgh

3:20 PM
Accuracy Assessment of Laser Powder Bed Fusion Fabricated AlSi10Mg Plate-Lattice Structures Using Micro-Computer Tomography: *Joseph Berthel*[1]; Jack Beuth[1]; Rahul Panat[1]; [1]Carnegie Mellon University

3:40 PM Break

4:00 PM
Additive Manufacturing of a Novel Nickel-Based Superalloy for High Performance Extreme Environment Components: *Austin Mann*[1]; Matias Garcia-Avila[1]; Shane Williams[1]; [1]ATI Materials

4:20 PM
Characterization of Process-Induced Cracks and Their Closure by Hot Isostatic Pressing in Laser Powder Bed Fusion AA-7075: *Jacque Berkson*[1]; Edwin Schwalbach[2]; Andrew Cassese[3]; Chad Beamer[3]; Antonio Ramirez[1]; [1]The Ohio State University; [2]Air Force Research Laboratory; [3]Quintus Technologies

4:40 PM
Demonstration of a New Hot Cracking Criterion to Design a Compositional Path to Join 316L Stainless Steel and Monel400: *Zhening Yang*[1]; Alexander Richter[1]; Hui Sun[1]; Zi-Kui Liu[1]; Allison Beese[1]; [1]Penn State University

5:00 PM
Densification and Microstructural Evolution of Carbon-Infiltrated, Binder-Jet Printed 316L Stainless Steel: *James Oti*[1]; Ryan Wassel[1]; Jung-Kun Lee[1]; Nikhil Bajaj[1]; [1]University of Pittsburgh

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructure, Defects, and Properties — AM of Ni-based Alloys

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee

Program Organizers: Nadia Kouraytem, Utah State University; Shenyang Hu, Pacific Northwest National Laboratory; Mohan Sai Kiran Nartu, Pacific Northwest National Laboratory (Pnnl); Srujan Rokkam, Advanced Cooling Technologies, Inc.; Mohsen Asle Zaeem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology; Donna Guillen, Idaho National Laboratory; Dan Young, Wright State; Iris Rivero, University of Florida; Jonathan Pegues, Castheon; Eric Payton, University of Cincinnati; Ming Chen, Northwestern University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati

Tuesday PM | October 8, 2024
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Session Chair: Eric Payton, University of Cincinnati

2:00 PM
A Mechanistic Explanation for Shrinkage Porosity in Laser Powder Bed Fusion Alloy 718: *William Frieden Templeton*[1]; Shawn Hinnebusch[2]; Seth Strayer[2]; Albert To[2]; P. Chris Pistorius[1]; Sneha Narra[1]; [1]Carnegie Mellon University; [2]University of Pittsburgh

2:20 PM
A Novel Approach to Develop a Shorter Heat Treatment Under Hot Isostatic Pressure for Electron Beam Melted Alloy 718: *Ajinkya Ghorpade*[1]; Ujjwal Prakash[1]; Shrikant Joshi[2]; [1]Indian Institute of Technology Roorkee; [2]University West

2:40 PM
Addressing the Portevin-Le Chatelier Effect in IN 939 Additively Manufactured Nickel-Based Superalloy: *Daniel Moreno*[1]; Moshe Nahmany[2]; Yohanan Nahmana[2]; Matan Zakai[2]; Orel Yaakoby[2]; Ariel Cohen[2]; Moshe Shapira[2]; [1]BSEL-Ltd Bet-Shemesh Israel; [2]BSEL-Ltd Israel

3:00 PM
Effects of Soot on Additively Manufactured Inconel 718: *Allyssa Bateman*[1]; Kyle Holloway[1]; Noah Montrose[1]; Patrick Warren[2]; Ana Stevanovich[2]; Elizabeth Sooby[2]; Brian Jaques[1]; [1]Boise State University; [2]University of Texas at San Antonio

3:20 PM Break

3:40 PM
Influence of Post-Build Heat Treatment on Microstructure and Stress Corrosion Cracking (SCC) Performance of Additively Manufactured Cu-30Ni: *Debasis Rath*[1]; Markus Chmielus[1]; Zachary Daniel Harris[1]; [1]University of Pittsburgh

4:00 PM
Progress Towards Crack-Free Ni-Based Superalloys Processed with Laser Powder Bed Fusion: *Jonah Klemm-Toole*[1]; Dan McConville[1]; Amy Clarke[1]; Ben Rafferty[2]; Kevin Eckes[2]; Jeremy Iten[2]; [1]Colorado School of Mines; [2]Elementum 3D

4:20 PM
Influence of Interface Design on the Cyclic Oxidation Behavior of SS316L/IN718 Functionally Graded Materials: *Mustafa Kas*[1]; Oguzhan Yılmaz[2]; Wei Xiong[1]; [1]Pittsburgh University; [2]Gazi University

4:40 PM
Influence of Process Parameters on the Microstructure, Texture, and Mechanical Properties of LBPF Haynes 282: *Nicholas Lamprinakos*[1]; Junwon Seo[1]; Yu-Tsen Yi[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

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NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments V — Session II

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Keyou Mao, Florida State University; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

Tuesday PM | October 8, 2024
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Session Chairs: Rongjie Song, Idaho National Laboratory; Khalid Hattar, University of Tennessee Knoxville

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2:00 PM Invited
Atomic-Scale Hidden Point-Defect Complexes Induce Ultrahigh Irradiation Hardening in BCC Metals: *Weizhong Han*[1]; [1]Xi'an Jiaotong University

2:30 PM Invited
Understanding Irradiation Assisted Hydrogen Embrittlement Using In Situ Coherent X-Ray Imaging: *Ericmoore Jossou*[1]; Riley Hultquist[1]; David Simonne[1]; [1]Massachusetts Institute of Technology

3:00 PM
Thermophysical Properties of Irradiated Yttrium Hydride Moderator Material: *Scott Middlemas*[1]; Narayan Poudel[1]; Tsvetoslav Pavlov[1]; Ian Hobbs[1]; Joey Charboneau[1]; Chase Taylor[1]; Mahmut Cinbiz[2]; [1]Idaho National Laboratory; [2]Oakridge National Laboratory

3:20 PM Break

3:40 PM
Surface Microstructure Evolution and Associated High Temperature Anti-Oxidation Mechanisms of Copper with Vapor Deposited Graphene: *Jiamiao Ni*[1]; Yue Liu[1]; [1]Shanghai Jiao Tong University

4:00 PM
Influence of Defects Length-Scale on Nuclear Graphite Properties: *Gongyuan Liu*[1]; Melonie Thomas[2]; Jing Du[1]; Khalid Hattar[3]; William Windes[4]; Aman Haque[1]; [1]Penn State Univ; [2]Los Alamos National Lab; [3]University of Tennessee at Knoxville; [4]Idaho National Lab

4:20 PM
Superimposed Effects of Texture and Grain Shape Anisotropy on Biaxial Creep Behavior of Nb-Modified Zircaloy-4 Cladding: *Mahmoud Hawary*[1]; K.L. Murty[1]; [1]North Carolina State University

4:40 PM
Understanding the Surface and Near Surface via Nanomechanical Mapping: *Eric Hintsala*[1]; Kevin Schmalbach[1]; Douglas Stauffer[1]; [1]Bruker Nano Surfaces and Metrology

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ADDITIVE MANUFACTURING

Advanced Manufacturing of High Temperature Ceramics and Composites: Processing, Characterization and Testing — AM of CMCs / Traditional Ceramic and CMC Manufacturing

Sponsored by: ACerS Basic Science Division, ACerS Engineering Ceramics Division

Program Organizers: Corson Cramer, Oak Ridge National Laboratory; Greg Hilmas, Missouri University of Science and Technology; Lisa Rueschhoff, Air Force Research Laboratory; David Mitchell, University of Central Florida

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Session Chairs: Phylis Makurunje, Bangor University; Corson Cramer, Oak Ridge National Laboratory

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2:00 PM
Additive Manufacturing of Carbon Fiber Reinforced Ceramic Matrix Composites (C/C-SiC): Wolfgang Freudenberg[1]; Jalena Best[1]; Nico Langhof[1]; *Stefan Schafföner*[1]; [1]University of Bayreuth

2:20 PM
Advanced Manufacturing of PIP-Based SiC-SiC CMCs: *Jordan Wright*[1]; Corson Cramer[1]; John Stuecker[1]; Steve Bullock[1]; David Mitchell[1]; [1]Oak Ridge National Laboratory

2:40 PM
Optimization and Considerations for the Fabrication of Highly Loaded Chopped Carbon Fiber Reinforced SiC Matrix Composites Through Direct Ink Writing and Silicon Melt Infiltration Processes: *Lilly Balderson*[1]; Georg Puchas[2]; Stefan Schafföner[2]; Tao Sun[3]; Elizabeth Opila[1]; [1]University of Virginia; [2]University of Bayreuth; [3]Northwestern University

3:00 PM Invited
Reactive Melt Infiltration Approaches for Ultra-High Temperature Ceramic Composites: *Phylis Makurunje*[1]; Simon Middleburgh[1]; William Lee[1]; [1]Nuclear Futures Institute

3:30 PM Break

3:50 PM
Novel Joining of Ceramic Matrix Composites Using Embedded Wire Heating and Chemical Vapor Deposition (EWCVD): Joseph Pegna[1]; Shay Harrison[1]; *Jeff Vervlied*[1]; [1]Free Form Fibers LLC

4:10 PM
Thermal Properties of Oxidized and Non-Oxidized 2D Pitch-Based and 3D PAN-Based C/C Composites: *Sardar Iqbal*[1]; [1]Southern Illinois University

4:30 PM
Reactivity of Hf-Nb-Ti-Ta Melts into B4C Packed Bed at 2800 K: *Laura Sandoval*[1]; Arturo Bronson[1]; Sanjay Shantha-Kumar[1]; Omar Cedillos-Barraza[1]; [1]University of Texas at El Paso

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Session III

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

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Session Chairs: Brian Schuster, University of Texas at El Paso; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

2:00 PM Invited
Incipient Deformation and Fracture of Metals and Ceramics During Dynamic Loading and Ballistic Impact: Brian Schuster[1]; *Marie Charpagne*[2]; [1]University of Texas at El Paso; [2]University of Illinois at Urbana-Champaign

2:30 PM
Near-Field Passive Wireless Sensor for High-Temperature Metal Corrosion Monitoring: *Ouzhan Bilaç*[1]; Noah Strader[1]; Kevin Tennant[1]; William Bullock[1]; Jordyn Herter[1]; Brian Jordan[1]; Daryl Reynolds[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; [1]West Virginia University

2:50 PM
Increasing the Service Life of Materials Working in Harsh Conditions of Metallurgical Production: *Borys Sereda*[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

3:10 PM
Influence of Water Vapor on Hot Corrosion of Nickel-Based Superalloys: Till Koenig[1]; Ceyhun Oskay[1]; *Mathias Galetz*[1]; [1]Dechema Research Institute

3:30 PM Break

3:50 PM
Preparation of Alitized Coatings Using Functionally Active Charges Operating in Harsh Environments of Coke Production: Borys Sereda[1]; Irina Kruhliak[1]; *Dmytro Sereda*[1]; [1]DSTU

4:10 PM
High-Temperature Oxidation Behavior of Wrought and Additive Manufactured H282 in Direct-Fired Supercritical CO_2 Power Cycle Environments: *Casey Carney*[1]; Nicholas Lamprinakos[2]; Chang-Yu Hung[1]; Richard Oleksak[1]; Anthony Rollett[2]; Ömer Doan[1]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University

LIGHTWEIGHT ALLOYS

Advancements in Lightweight Composites, Materials & Alloys — Manufacturing Processes and Properties

Sponsored by: TMS: Materials Characterization Committee

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Ramachandra Canumalla, Weldaloy Specialty Forgings; Aashish Rohatgi, Pacific Northwest National Laboratory

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Session Chair: Ramchandra Canumala, Weldaloy Specialty Forgings

2:00 PM Invited
Strengthening In-Situ Fe-Aluminide Reinforced Aluminum Matrix Composites Through an Optimized Twostep Thermal Processing Method; Sintering and Uniaxial Forging: *Tapabrata Maity*[1]; [1]National Institute of Advanced Manufacturing Technology

2:30 PM
Enhancing the Strength of Aluminum-Boron Carbide Composites to a High Degree by Magnesium Addition for Use in Automotive Applications: *Ramasis Goswami*[1]; Alex Moser[1]; [1]Naval Research Laboratory

3:00 PM Invited
High-Throughput Mapping of Thermal-Mechanical Properties of Cast Alloy Microstructural and Thermal Process Variation via Hot Shear Punch Method: *Jon-Erik Mogonye*[1]; Taylor Cain[1]; Michael Tershakovec[1]; [1]US Army DEVCOM Army Research Laboratory

3:30 PM Break

3:50 PM
Core-Shell Dispersoids of Re-Aged Al-6Cu-0.5Mn-2Ni Alloy at 300°C: An Understanding of Their High-Temperature Stability: *Diya Mukherjee*[1]; Himadri Roy[2]; Manidipto Mukherjee[2]; Nilrudra Mandal[2]; Dong Qiu[1]; Mark A Easton[1]; [1]RMIT University; [2]CSIR-Central Mechanical Engineering Research Institute

4:10 PM
A Study on Fabrication of a Hybrid Composite Metal Foam Using Aluminum Alloy, Cermet Hollow Spheres and Titanium-Hydride Powder for Higher Energy Absorption Applications: *Fisseha Zewdie Weldemariam*[1]; [1]Indian Institute of Technology, Delhi

4:30 PM
Innovative Carbon Metal Composite Wires for Electric Motors: *Obieda Altarawneh*[1]; Yahya Al-majali[1]; Omar Movil-Cabrera[1]; Frank Kraft[1]; [1]Ohio University

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Semiconductors & Memory Devices; Conductors, Dielectrics, & Ferroelectrics

Sponsored by: ACerS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Ubic, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

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Session Chairs: Ruyan Guo, University of Texas at San Antonio; Shikhar Krishn Jha, IIT Kanpur

2:00 PM
Off-State Current Characteristics of Vertical-Channel FET Using single-crystal Indium Oxide: *Kazuma Furutani*[1]; Kazuki Tsuda[1]; Masashi Oota[1]; Takanori Matsuzaki[1]; Tatsuya Onuki[1]; Yuto Yakubo[1]; Ryosuke Motoyoshi[1]; Hiromi Sawai[1]; Fumito Isaka[1]; Shunpei Yamazaki[1]; [1]Semiconductor Energy Laboratory Co., Ltd.,

2:20 PM
Oxygen Permeability in Single-Crystal Indium Oxide Ceramics and Reliability Characteristics in Vertical Channel FETs: Jun Ishikawa[1]; *Ryosuke Motoyoshi*[1]; Etsuko Asano[1]; Toshikazu Ohno[1]; Yuji Egi[1]; Sachiaki Tezuka[1]; Hiromi Sawai[1]; Fumito Isaka[1]; Takanori Matsuzaki[1]; Tatsuya Onuki[1]; Shunpei Yamazaki[1]; [1]Semiconductor Energy Laboratory Co., Ltd.

2:40 PM
Hot Carrier Injection in 65nm n-LDMOS: *Emad Rezaei*[1]; Arash Elhami Khorasani[1]; Mark Griswold[1]; Guantong Zhou[1]; [1]Onsemi

3:00 PM
Study of Microstructure and Chemistry of Ge-Rich GST Materials Electrically Stressed by C – AFM for Phase Change Memories Applications: *Chaymaa Boujrouf*[1]; Marc Bocquet[1]; Loic Patout[1]; Alain Portavoce[1]; Yannick Le Friec[2]; Ahmed Charai[1]; [1]Aix-Marseille University, IM2NP Laboratory; [2]STMicroelectronics

3:20 PM Break

3:40 PM Invited
Effect of Processing in Eutectic Melt on the Morphology and Performance of Dielectric Materials; Directional Freezing in Eutectic Melt: *Sundaram Singh*[1]; Dhanesh Tiwary[1]; Kamdeo Mandal[1]; Raghaw Rai[1]; Narsingh Singh[1]; [1]University of Maryland Baltimore County

4:00 PM
Boron Fiber as an Electrically Conductive Polarizable Material: *Vibhuti Kushwaha*[1]; Deborah Chung[1]; [1]University at Buffalo, The State University of New York

4:20 PM Invited
Machine Learning Predictions of Structural and Ferroelectric Properties of Perovskites: *Luiz Cotica*[1]; Hugo Machado[1]; Gustavo Dias[1]; Valdirlei Freitas[2]; Ivair Santos[1]; Ruyan Guo[3]; Amar Bhalla[3]; [1]State University of Maringa; [2]State University of Midwest; [3]University of Texas at San Antonio

4:40 PM
Artificially Induced Morphotropic Phase Boundary by Nano-Clustering of Ferroelectric Ceramics via Aerosol Deposition: *Hyunseok Song*[1]; Nayeon Kang[1]; Minjung Kim[1]; Dae-Yong Jeong[2]; Jungho Ryu[1]; [1]Yeongnam University; [2]Inha University

5:00 PM Invited
Recent Advances in Copper-Based Thermoelectric Sulfides: *Emmanuel Guilmeau*[1]; [1]CRISMAT/CNRS

NANOMATERIALS

Advances in Emerging Electronic Nanomaterials: Towards Next-Generation Microelectronics — Neuromorphic Devices and 2D Materials

Sponsored by: TMS: Nanomaterials Committee

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jinkyoung Yoo, Los Alamos National Laboratory; Jung-Kun Lee, University of Pittsburgh

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Session Chairs: Jung-Kun Lee, University of Pittsburgh; Chang-Yong Nam, Brookhaven National Laboratory

2:00 PM Invited
Solution Processable Ordered Defect Compound Semiconductors for High-Performance Thin-Film Electronics: *Qing Cao*[1]; [1]University of Illinois at Urbana-Champaign

2:30 PM Invited
Phase-Change and Interface-Type Oxide Memristive Devices for Neuromorphic Computing: *Sundar Kunwar*[1]; Nicholas Cucciniello[1]; Di Zhang[1]; Pinku Roy[1]; Aiping Chen[1]; [1]Los Alamos National Laboratory

3:00 PM Invited
Controlling Switching Stochasticity in Hybrid Memristors by Vapor-Phase Infiltration: *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory

3:30 PM
Phase-Field Modeling of Insulator-Metal Transitions in Quantum Materials for Neuromorphic Microelectronics: *Yin Shi*[1]; Long-Qing Chen[1]; [1]The Pennsylvania State University

3:50 PM Break

4:10 PM Invited
Epitaxy of Group-IV Semiconductors on Two-Dimensional Materials Stack: *Jinkyoung Yoo*[1]; [1]Los Alamos National Laboratory

4:40 PM Invited
Mechanically Deformed 2D Materials for Advanced Functionalities: *Juyoung Leem*[1]; [1]University of Texas at Dallas

5:10 PM
One-Step Micropatterning of Laser-Induced Graphene Structures at Different Layers Simultaneously Towards 3D Microelectronics: *Soumalya Ghosh*[1]; Mirza Sahaluddin[1]; Mostafa Bedewy[1]; [1]University of Pittsburgh

MATERIALS-ENVIRONMENT INTERACTIONS

Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson — Materials Design and Deposition-Induced Degradation and Complex Environment

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: High Temperature Alloys Committee, TMS: Alloy Phases Committee

Program Organizers: Kinga Unocic, North Carolina State University; Wei Xiong, University of Pittsburgh; Elizabeth Opila, University of Virginia; Richard Oleksak, National Energy Technology Laboratory; Rishi Pillai, Oak Ridge National Laboratory; Bruce Pint, Oak Ridge National Laboratory

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Session Chairs: Bruce Pint, Oak Ridge National Laboratory; Vilupanur Ravi, California State Polytechnic University Pomona

2:00 PM Invited
Deposit-Induced Corrosion Under Calcium-Containing Films: *Vilupanur Ravi*[1]; [1]California State Polytechnic University Pomona

2:25 PM Invited
Moving from Empirical to Physics-Based Understanding of Deposit-induced Corrosion on Gas Turbine Airfoils: *Xuan Liu*[1]; [1]Pratt & Whitney

2:50 PM Invited
Revolutionizing Materials Design: The Intersection of Quantum Mechanics and Data Modeling: *Wissam Saidi*[1]; [1]National Energy Technology Lab

3:15 PM Break

3:35 PM Invited
The Impact of Tantalum Addition on Oxide Formation of a Novel Ni-Cr-Co-Mo Superalloy: *Matthew Bender*[1]; Rafael Rodriguez De Vecchis[2]; [1]ATI; [2]University of Pittsburgh

4:00 PM
Effects of Steam, Carbon Dioxide, and Oxygen Potential on the Alumina-Scale Establishment Process for Ni-Based Alloys: *Jonathan Locker*[1]; Brian Gleeson[1]; [1]University of Pittsburgh

4:20 PM Invited
Improving Environmental and Mechanical Durability of Diboride Thin Films Through Alloying with Aluminum: Samyukta Shrivastav[1]; Kinsey Canova[1]; Dana Yun[1]; Laurent Souqui[1]; John Abelson[1]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Hydrogen Utilization and Industrial Decarbonization

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division, TMS: Refractory Metals & Materials Committee

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory

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Session Chairs: Matthew Lambert, Allied Mineral Products, Inc; Jian Liu, National Energy Technology Laboratory; Brandon Wood, Lawrence Livermore National Laboratory; Prabhakar Singh, University of Connecticut

2:00 PM Invited
Modeling and Valuation of Hydrogen Toward Multiple Energy Pathways and Grid Applications: *Di Wu*[1]; [1]Pacific Northwest National Laboratory

2:20 PM Invited
Analysis of Integrated Wind-Hydrogen Systems for Industrial Decarbonization: Steve Hammond[1]; *Syed Saqline*[2]; [1]NREL; [2]Lawrence Berkeley National Laboratory

2:40 PM Invited
Investigations in Hydrogen Ironmaking: *Joseph Govro*[1]; Fabian Calderon[1]; Iurii Korobienicov[2]; Amogh Meshram[2]; Sridhar Seetharaman[2]; Ronald O'Malley[1]; [1]Missouri University of Science and Technology; [2]Arizona State University

3:00 PM Invited
Multi-Layer, Multi-Functional Thermal and Environmental Barrier Coatings for Heat Engines: *Sanjay Sampath*[1]; [1]Stony Brook University

3:20 PM Break

3:40 PM
Degradation of Spinel Refractories in Dry (Ar - 10% H2) and Humid Hydrogen (Ar - 10% H2-3% H2O) Environment: *Manoj Mahapatra*[1]; Jakia Mim[1]; Rajat Ramteke[1]; James Hemrick[2]; [1]University of Alabama-Birmingham; [2]Oak Ridge National Laboratory

4:00 PM Invited
Refractory Ceramic Interactions with Medium Temperature Hydrogen-Containing Atmospheres: *Matthew Lambert*[1]; Dana Goski[1]; Scott Campbell[1]; Dominic Loiacona[1]; [1]Allied Mineral Products Inc

4:20 PM
Computational Simulation of Hydrogen DRI (HDRI) Pellets Immersed in Molten Steel and Slag: *Fabian Calderon Hurtado*[1]; Joe Govro[1]; Arezoo Emdadi[1]; Ronald O'Malley[1]; Sridhar Seetharaman[2]; [1]Missouri University of Science and Technology; [2]Arizona State University

MODELING

Advances in Multiphysics Modeling and Multi-modal Imaging of Functional Materials — Multiphysics Modeling of Materials and Devices I

Sponsored by: ACerS Basic Science Division, TMS: Computational Materials Science and Engineering Committee, TMS: Magnetic Materials Committee

Program Organizers: Jiamian Hu, University of Wisconsin Madison; Massimo Ghidini, University of Parma, Italy; Diamond Light Sources, UK; Wenrui Hao, The Pennsylvania State University; Di Qi, Purdue University

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Session Chairs: Jiamian Hu, University of Wisconsin-Madison; Bo Wang, Lawrence Livermore National Laboratory

2:00 PM Invited
Equilibrium and Nonequilibrium Thermodynamics of Ferroics: *Long-Qing Chen*[1]; [1]Pennsylvania State University

2:20 PM Invited
Thermodynamics and Ultrafast Evolution of Nanoscale Polar Structures: *Tiannan Yang*[1]; Long-Qing Chen[2]; [1]Shanghai Jiao Tong University; [2]The Pennsylvania State University

2:40 PM Invited
Insight into Optical Control of Ferroelectrics Using Density Functional Theory: *Charles Paillard*[1]; [1]University of Arkansas

3:00 PM Invited
Fouriera: Automated Spectral Methods for Multiphysics Problems via Symbolic Computing: *Bo Wang*[1]; Kyle Pietrzyk[1]; Tae Wook Heo[1]; [1]Lawrence Livermore National Laboratory

3:20 PM Break

3:40 PM Invited
Atom-to-Architecture Co-Design of Next-Generation High-Efficiency Microelectronics through High-Fidelity Device Modeling: *Zhi Jackie Yao*[1]; Andy Nonaka[1]; Revathi Jambunathan[1]; Prabhar Kumar[1]; Saurabh Sawant[1]; [1]Lawrence Berkeley National Laboratory

4:00 PM Invited
Nanocomposite Electrical Generators: A Multiscale Approach: *Kasra Momeni*[1]; [1]University of Alabama

4:20 PM Invited
Identifying Internal Process Order Parameters in Nonstoichiometric Oxides Described by Sublattice Model: *Yanzhou Ji*[1]; Yueze Tan[2]; Long-Qing Chen[2]; [1]Ohio State University; [2]Penn State University

IRON AND STEEL (FERROUS ALLOYS)

Austenite Formation and Decomposition V: A Symposium in Memory of Prof. Mats Hillert — Theory and Modeling

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee, TMS: Steels Committee, TMS: Phase Transformations Committee

Program Organizers: Annika Borgenstam, KTH Royal Institute of Technology; John Agren, Royal Institute of Technology; Amy Clarke, Los Alamos National Laboratory; Hatem Zurob, McMaster University; Matthias Militzer, University of British Columbia; Kester Clarke, Los Alamos National Laboratory; Igor Vieira, Nucor Steel; Daniel Baker, LIFT

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Session Chair: Matthias Militzer, University of British Columbia

2:00 PM Invited
Revisiting the Concept of Local Equilibrium in Terms of Hillert Thermodynamics: *Zi-Kui Liu*[1]; [1]Pennsylvania State University

2:30 PM
Atomistically Informed Phase-Field Simulations of Phase Transformation: Ayush Suhane[1]; *Matthias Militzer*[1]; [1]The University of British Columbia

2:50 PM
Multiphase Field Simulation of Austenite Decomposition into Ferrite and Bainite: Ali Khajezade[1]; *Matthias Militzer*[1]; [1]University of British Columbia

3:10 PM Invited
Fundamental Understanding of Nucleation during Solid–Solid Phase Transitions Through Atomistic Simulations: Xiaoqin Ou[1]; Jilt Sietsma[2]; *Maria Jesus Santofimia*[2]; [1]Delft University of Technology; Central South University; [2]Delft University of Technology

3:40 PM Break

4:00 PM
The Effect of Deformation on the Bainite Transformation Kinetics: *Imed Eddine Benrabah*[1]; Arina Deboer[2]; Guillaume Geandier[1]; Hugo Van Landeghem[3]; Christopher Hutchinson[4]; Yves Brechet[4]; Hatem Zurob[2]; [1]Universite de Lorraine, CNRS, IJL; [2]McMaster University; [3]SIMaP, Universite Grenoble Alpes, CNRS; [4]Monash University

4:20 PM
Magneto-Elastic Synergism in Transformation in Fe-C Alloys: A Quantitative Phase-Field Modeling Approach: *Soumya Bandyopadhyay*[1]; Sourav Chatterjee[2]; Michael Tonks[1]; [1]University of Florida; [2]Lawrence Livermore National Laboratory

4:40 PM Invited
CALPHAD-Based Modeling of Pearlite Transformation in Multicomponent Steels: Jiayi Yan[1]; John Agren[2]; Johan Jeppsson[2]; *Paul Mason*[3]; [1]Tsinghua University; [2]Thermo-Calc Software AB; [3]Thermo-Calc Software Inc.

NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy Systems — TRISO Fuels and Oxides

Sponsored by: ACerS Energy Materials and Systems Division, TMS: Nuclear Materials Committee

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Theodore Besmann, University of South Carolina; Charmayne Lonergan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Kaustubh Bawane, Idaho National Laboratory; Joshua White, Los Alamos National Laboratory; Christian Deck, General Atomics; Gordon Thorogood, Australian Nuclear Science and Technology Organization

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Session Chairs: Simon Middleburgh, Bangor University; Yi Je Cho, Sunchon National University

2:00 PM Invited
Development of Kernel Fuels for High Temperature Gas Reactor and Space Systems: *Simon Middleburgh*[1]; Phylis Makurunje[1]; Ritesh Mohun[1]; Dave Goddard[2]; Gareth Stephens[1]; Jack Callaghan[1]; William Lee[1]; [1]Bangor University; [2]National Nuclear Laboratory UK

2:30 PM
Beyond TRISO: Development of New Coated Particle Fuels: *Eddie Lopez Honorato*[1]; Ryan Heldt[1]; Angel Diaz Abreu[1]; Flavio Dal Forno Chuahy[1]; Bryan Conry[1]; Tyler Gerczak[1]; [1]Oak Ridge National Laboratory

2:50 PM
Ion Irradiation of UC and UN and Their Surrogates: Rashed Almasri[1]; Wei-Ying Chen[2]; Adrian Wagner[3]; Jian Gan[3]; *Lingfeng He*[1]; [1]North Carolina State University; [2]Argonne National Laboratory; [3]Idaho National Laboratory

3:10 PM Break

3:30 PM Invited
Oxidation Behavior of the SiC Coating of TRISO Fuel Particles in Air or Water Vapor: *Haiming Wen*[1]; Visharad Jalan[1]; [1]Missouri University of Science and Technology

4:00 PM
Developments in Producing Pyrolytic Carbon Coatings for Advanced Particle Fuel Forms: *Bryan Conry*[1]; Eddie Lopez-Honorato[1]; Ryan Heldt[1]; Flavio Dal Forno Chuahy[1]; Oluwafemi Oyedeji[1]; Tyler Gerczak[1]; [1]Oak Ridge National Laboratory

4:20 PM Invited
Numerical Modeling of Graphite Oxidation In Water Vapor Ingress Accidental Conditions for High Temperature Gas-Cooled Reactors: *Yi Je Cho*[1]; Kathy Lu[2]; [1]Sunchon National University; [2]University of Alabama at Birmingham

4:50 PM Invited
Atomistic Investigation of Defects and Defect-Phonon Scattering in ThO2: *Miaomiao Jin*[1]; Beihan Chen[1]; Linu Malakkal[2]; Kaustubh Bawane[2]; Boopathy Kombaiah[2]; Marat Khafizov[3]; David Hurley[2]; [1]Pennsylvania State University; [2]Idaho National Laboratory; [3]Ohio State University

5:20 PM Invited
Cluster Dynamics Simulations of Tritium and Helium Diffusion in Lithium Ceramics: *Ankit Roy*[1]; Michel Sassi[1]; Krishna Pitike[1]; Mark Lanza[1]; Andrew Casella[1]; David Senor[1]; Christopher Matthews[1]; David Andersson[1]; Ram Devanathan[1]; [1]Pacific Northwest National Lab

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Ceramics for Clean Hydrogen — Ceramics for Clean Hydrogen II

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Jianhua Tong, Clemson University; John Pietras, Saint-Gobain Ceramic Materials; Sandrine Ricote, Colorado School of Mines

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Session Chairs: Jianhua Tong, Clemson University; Kevin Huang, University of South Carolina; John Pietras, Saint-Gobain

2:00 PM Invited
Compositionally Complex Ceramics: A Review with an Example of Compositionally Complex Perovskite Oxides for Solar Thermochemical Water Splitting: *Jian Luo*[1]; Xingbo Liu[2]; Yue Qi[3]; Wei Li[2]; Dawei Zhang[1]; Héctor De Santiago[2]; Boyuan Xu[3]; Cijie Liu[2]; Jiyun Park[3]; Joshua Sugar[4]; Eric Coker[4]; Anthony McDaniel[4]; Stephan Lany[5]; [1]University of California, San Diego; [2]West Virginia University; [3]Brown University; [4]Sandia National Laboratories; [5]National Renewable Energy Laboratory

2:20 PM Invited
Advancing Solar Hydrogen Production by Thermochemical Redox Cycling of Nonstoichiometric Alkaline-Earth Manganese Perovskites: *Xin Qian*[1]; Hohan Bae[2]; Danielle Veigel[2]; Alireza Shirazi-amin; John Pietras[3]; Sossina Haile[2]; [1]Saint-Gobain Research North America; Northwestern University; [2]Northwestern University; [3]Saint-Gobain Research North America

2:40 PM Invited
Phase-Field Modeling of Mechanical Damages in Ceramic Matrix Composites: Fei Xue[1]; Tianle Cheng[1]; Yinkai Lei[1]; *You-Hai Wen*[1]; [1]Us Doe - Netl

3:00 PM Invited
Solid Oxide Iron-Air Battery for Long Duration Energy Storage: *Kevin Huang*[1]; [1]University of South Carolina

3:20 PM Break

3:40 PM
Structure Sensitivity of Photochemical Reactions on $AgNbO_3$: *Sipei Li*[1]; Paul Salvador[1]; Gregory Rohrer[1]; [1]Carnegie Mellon University

FUNDAMENTALS AND CHARACTERIZATION

Computational Materials for Qualification and Certification — Fatigue and Fracture

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Corbett Battaile, Sandia National Laboratories; Anthony Rollett, Carnegie Mellon University; Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration

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Session Chairs: Corbett Battaile, Sandia National Laboratories; Caglar Oskay, Vanderbilt University

2:00 PM Invited
Quantification of Microstructure-Induced Uncertainty in Fatigue Nucleation in Polycrystalline Materials: *Caglar Oskay*[1]; Xiaoyu Zhang[1]; [1]Vanderbilt University

2:30 PM Invited
Development of Computational Materials Workflows for Additively Manufactured Metallic Materials to Enable Accelerated Prediction of Fatigue Performance: *George Weber*[1]; Saikumar Yeratapally[2]; Peter Spaeth[1]; Erik Frankforter[1]; Joshua Pribe[3]; Brodan Richter[1]; Edward Glaessgen[1]; [1]NASA Langley Research Center; [2]Science and Technology Corporation; [3]Analytical Mechanics and Associates

3:00 PM Invited
Machine Learning Enabled Parametrically Upscaled Constitutive Models for Fatigue Simulations: A Data-Driven Multiscale Modeling Approach: *Somnath Ghosh*[1]; [1]Johns Hopkins University

3:30 PM
Using Unsupervised Learning to Cluster Fatigue Life Based on Ti64 Fatigue Fracture Surface Characteristics: *Katelyn Jones*[1]; Paul Shade[2]; Reji John[2]; Patrick Golden[2]; Elizabeth Holm[3]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Air Force Research Laboratory; [3]University of Michigan

3:50 PM Break

4:10 PM Invited
Towards a Probabilitic Model for the Assessment of Gas Turbine Components: *Peter Gumbsch*[1]; Jan Radners[2]; Christoph Schweizer[2]; Michael Schlesinger[2]; Stefan Eckmann[2]; Malek Al-Ameri[3]; Christian Amann[3]; Kai Kadau[3]; [1]Karlsruhe Inst of Technology KIT; [2]Fraunhofer IWM; [3]Siemens Energy

4:40 PM Invited
Durability and Damage Tolerance of Powder-Bed Fusion Ti-6Al-4V: Current Results and Modeling Needs: *Matthew Krug*[1]; Patrick Golden[1]; Sushant Jha[2]; Reji John[1]; [1]Air Force Research Laboratory; [2]University of Dayton Research Institute

5:10 PM
Assessing the Impact of Melt Pool Geometry Variability on Lack-of-Fusion Porosity and Fatigue Life in Powder Bed Fusion - Laser Beam Ti-6Al-4V: *Justin Miner*[1]; Austin Ngo[2]; Tharun Reddy[1]; Christian Gobert[1]; Jack Beuth[1]; Anthony Rollett[1]; John Lewandowski[2]; Sneha Prabha Narra[1]; [1]Carnegie Mellon University; [2]Case Western Reserve University

5:30 PM
A Computational Multiscale Approach for Predicting Macroscale Elastic Properties and Failure Initiation in Phenolic Impregnated Carbon Ablator: *Adnan Taqi*[1]; Matthew Beck[1]; [1]University of Kentucky

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Mechanical & Other Applications

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division, ACerS Energy Materials and Systems Division, ACerS Engineering Ceramics Division

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Purdue University

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Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Wonmo Kang, Arizona State University; Haitao Zhang, University of North Carolina at Charlotte

2:00 PM Invited
Grain Size Dependent Mechanical Properties of Hard Ceramics: *Heonjune Ryou*[1]; James Wollmershauser[1]; Kevin Anderson[1]; Alex Moser[1]; Edward Gorzkowski[1]; Boris Feygelson[1]; [1]U.S. Naval Research Laboratory

2:30 PM Invited
Strengthening of Aluminum by Non-Metallic Elements: Juyeon Han[1]; Hyokyung Sung[1]; *Hyunjoo Choi*[1]; [1]Kookmin University

3:00 PM
Nanostructural Effects Beyond Hall-Petch: Towards Superhard Tungsten Carbide: *Kevin Anderson*[1]; James Wollmershauser[1]; Heonjune Ryou[1]; Ramasis Goswami[1]; Sarshad Rommel[2]; Mark Aindow[2]; Edward Gorzkowski[1]; Boris Feigelson[1]; [1]U.S. Naval Research Laboratory; [2]University of Connecticut

3:20 PM Break

3:40 PM
Atomistic Simulation Insights into the Structural and Thermodynamic Properties of CuZr Metallic Glass Nanoparticles: Xuezhen Ren[1]; Suyue Yuan[2]; Emily Gurniak[1]; *Paulo Branicio*[1]; [1]University of Southern California; [2]Lawrence Livermore National Laboratory

4:00 PM
Persistent Free Carbon in Entropy Stabilized Ceramics: *James Wollmershauser*[1]; Heonjune Ryou[1]; Kevin Anderson[1]; Eric Patterson[1]; Sara Mills[1]; Homa Keshmiri[1]; Lavina Backman[1]; Boris Feigelson[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory

4:20 PM
Highly Water Stable 2D Metal Organic Framework-Based Membrane for Molecular Separation: *Haftu Alemayehu*[1]; [1]Arba Minch University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion and Environmental Degradation: Theory and Practice — Session II

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Haozheng Qu, GE Global Research; Bai Cui, University of Nebraska Lincoln; Kaila Bertsch, Lawrence Livermore National Laboratory; Karthikeyan Hariharan, Friedrich Alexander University, Erlangen-Nuremberg

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Session Chairs: Stephen Raiman, University of Michigan Ann Arbor; Xiaolei Guo, Colorado School of Mines

2:00 PM Invited
Recent Progress on Corrosion in Molten Salts: In Search of What Matters and What Doesn't: *Stephen Raiman*[1]; [1]University Of Michigan

2:30 PM Invited
Corrosion of Silicon Carbide in Molten Salt Environment: Nicholas Dailey[1]; *Jianqi Xi*[1]; [1]University of Illinois Urbana-Champaign

3:00 PM
Corrosion Results of Amorphous Fe and Ni-Based Coatings Exposed to FLiNaK and NaCl-MgCl2 at 700 °C: *Jean Mozolic*[1]; [1]Liquidmetal Coatings

3:20 PM
Stress Corrosion Behavior of Stainless Steel 316 and High Entropy Alloy Al0.1CrCoFeNi in a Molten NaCl-Na2SO4 Salt: *Wylie Simpson*[1]; James Earthman[1]; [1]University of California Irvine

3:40 PM Break

4:00 PM Invited
Pitting Corrosion of Stainless Steel 304 in Concentrated MgCl2 Solution: *Xiaolei Guo*[1]; [1]Colorado School of Mines

4:30 PM
Pit Morphologies and Crack Propagation of Stainless Steel 304H Using Representative Canister Brine Chemistries: *Daria Bentley*[1]; Jenifer Locke[1]; [1]The Ohio State University

4:50 PM
Corrosion Behavior of As-Cast Al-Mg-Ce Alloys in 0.6 M NaCl: *Khaing Aye*[1]; Adam Thompson[1]; Swaroop Behera[2]; Kaustubh Rane[2]; William Musinski[2]; Zachary Harris[1]; [1]University of Pittsburgh; [2]University of Wisconsin-Milwaukee

IRON AND STEEL (FERROUS ALLOYS)

Electrification of Iron and Steel — Keynote Session

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Leora Dresselhaus-Marais, Stanford University; Kerry Rippy, National Renewable Energy Laboratory; Ronald O'Malley, Missouri University of Science and Technology; David Marshall, Performance improvement Inc; Madhu Ranade, Steel Dynamics, Flat Roll Group; Joseph Morey, Morey Industrial Consulting

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Session Chair: Kerry Rippy, National Renewable Energy Laboratory

2:00 PM Introductory Comments

2:10 PM Keynote
Electrification of Heavy Industry - Challenges and Opportunities: *Sridhar Seetharaman*[1]; [1]Arizona State University

2:50 PM Question and Answer Period

3:00 PM Keynote
An Overview of Department of Energy's RD&D Strategy for Decarbonizing Iron and Steel: Paul Majsztrik[1]; *Daniel Stewart*[1]; [1]US Dept of Energy: IEDO

3:40 PM Question and Answer Period

3:50 PM Break

4:10 PM Keynote
Electrification of Combustion Processes in Steel Manufacture – Applications and Technologies: *Ronald OMalley*[1]; [1]Missouri University of Science and Technology

4:50 PM Question and Answer Period

5:00 PM Keynote
Sustainable Steelmaking: A Case of NIST's Vision for Sustainable Manufacturing: *Fan Zhang*[1]; [1]National Institute of Standards and Technology

5:30 PM Question and Answer Period

FUNDAMENTALS AND CHARACTERIZATION

Emergent Materials under Extremes and Decisive In Situ Characterizations — In Situ Characterization Under Extreme Conditions

Sponsored by: ACerS Basic Science Division, TMS: Nuclear Materials Committee

Program Organizers: Xiaofeng Guo, Washington State University; Xujie Lü , Center for High Pressure Science & Technology Advanced Research; Hua Zhou, Argonne National Laboratory; Judith Driscoll, University of Cambridge; Andrew Strzelecki, Los Alamos National Laboratory

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Session Chair: Xiaofeng Guo, Washington State University

2:00 PM Introductory Comments

2:10 PM Invited
Novel Refractory High-Entropy Metal-Ceramic Composites with Superior Mechanical Properties: *Bai Cui*[1]; Xin Chen[1]; Fei Wang[1]; Xiang Zhang[1]; Shanshan Hu[2]; Xingbo Liu[2]; Samuel Humphry-Baker[3]; Michael Gao[4]; Lingfeng He[5]; Yongfeng Lu[1]; [1]University of Nebraska Lincoln; [2]West Virginia University; [3]Imperial College London; [4]National Energy Technology Laboratory; [5]North Carolina State University

2:40 PM Invited
Irradiation Effects on the Microstructure, Micro-Mechanical and Thermal Properties of HECC: *Linu Malakkal*[1]; Kaustubh Bawane[1]; Lanh Trinh[2]; Fei Teng[1]; Zilong Hua[1]; Samuel Ruiz[3]; Fei Wang[3]; Bai Cui[3]; Lingfeng He[4]; [1]Idaho National Laboratory; [2]University of Nebraska ; [3]University of Nebraska; [4]North Carolina State University

3:00 PM Invited
Multi-Scale Investigation of Heterogeneous Swift Heavy Ion Tracks in Pyrochlore Oxides: *Eric O'Quinn*[1]; Cameron Tracy[2]; William Cureton[3]; Ritesh Sachan[4]; Joerg Neuefeind[3]; Christina Trautmann[5]; Maik Lang[1]; [1]University of Tennessee; [2]Stanford University; [3]Oak Ridge National Laboratory; [4]Oklahoma State University; [5]GSI Helmholtzzentrum für Schwerionenforschung

3:20 PM Invited
A Universal Model for the Compressive Strength of Advanced Ceramics: *Arezoo Zare*[1]; Dimitrios Giovanis[2]; [1]Washington State University; [2]Johns Hopkins University

3:40 PM Break

4:00 PM Invited
Advanced Characterization of Molten Salt Corrosion in Metals: *Lingfeng He*[1]; [1]North Carolina State University

4:30 PM Invited
Effect of Nickel on the Oxidation Resistance of FeCrAl Alloy in Lower Temperature (400 °C) and Higher Temperature (1200 °C) Steam Environments: *Haozheng Qu*[1]; Rajnikant Umretiya[1]; Raul Rebak[1]; [1]GE Vernova Advanced Research

4:50 PM
Microstructure and Temperature Dependencies of Grain Boundary Plastic Deformation Localization in IN718 via Multi-modal Characterization: *Raghul Asok Kumar*[1]; Dhruv Anjaria[2]; Amlan Das[3]; Reilly Knox[1]; Jean-Charles Stinville[2]; Darren Pagan[1]; [1]Pennsylvania State University; [2]University of Illinois Urbana-Champaign; [3]Cornell High Energy Synchrotron Source

5:10 PM
Ultralow Temperature Mechanical Behavior of Additively Manufactured Pure Copper: *Young-Kyun Kim*[1]; Seong-June Youn[1]; Ka-Ram Lim[1]; Young-Sang Na[1]; [1]Korea Institute of Materials Science

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Energy Harvesting I

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Eva Hemmer, University of Ottawa; Francesco Enrichi, University of Verona

2:00 PM Invited
Composite Nano-Systems for Energy Harvesting: *Alberto Vomiero*[1]; [1]Lulea University of Technology

2:20 PM Invited
Method to Monitor Cough by Employing Piezoelectric Energy Harvesting and Energy-as-Data Concepts: *Yang Bai*[1]; [1]University of Oulu

2:40 PM
Piezoinductance as an Emerging Form of Energy Conversion: *Akshita Yadav*[1]; Deborah Chung[1]; [1]State University of New York Buffalo

3:00 PM
Affordable Interface Passivation for Sustainable Carbon Electrode-Based Perovskite Solar Cells: A Pathway to Commercialization: Woraprom Passatorntaschakorn[1]; Warunee Khampa[1]; Wongsathon Musikpan[1]; Chukwuebuka Usulor[1]; Pattanasak Tipparak[1]; Atcharawon Gardchareon[1]; Anusit Kaewprajak[2]; Pisist Kumnorkaew[2]; Akarin Intaniwet[3]; Pongsakorn Kanjanaboos[4]; Pipat Ruankham[1]; *Duangmanee Wongratanaphisan*[1]; [1]Chiang Mai University; [2]National Science and Technology Development Agency (NSTDA); [3]Maejo University; [4]Mahidol University

3:20 PM Break

3:40 PM
How Additive Manufacturing is Becoming a Game-Changer for the Production of Clean Hydrogen: *Rouslan Svintsitski*[1]; Richard Gaignon[1]; Stéphane Schweizer[1]; Charlie Clarck[1]; [1]SAS 3DCeram Sinto

4:00 PM
Enhanced Magnetostriction in Fe-Ga by Rapid Solidification and Ce Microalloying: *Mohammad Tauhidul Islam*[1]; Matthew Willard[1]; Yumi Ijiri[2]; Scott McCall[3]; [1]Case Western Reserve University; [2]Oberlin College; [3]Lawrence Livermore National Laboratory

4:20 PM
Effect of A-Site Substitution on the Photovoltaic Properties of Bismuth Ferrite: *Marcel Habrik*[1]; Simon Petrick[1]; Holger Röhm[1]; Alexander Colsmann[1]; [1]Karlsruhe Institute of Technology (KIT) Material Research Center for Energy Systems (MZE) Light Technology Institute (LTI)

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Engineering Ceramics: Microstructure-Property-Performance Relations and Applications II

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Junichi Tatami, Yokohama National University; Young-Wook Kim, University of Seoul; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

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Session Chairs: Takafumi Ogawa, Japan Fine Ceramics Center; Takuma Takahashi, Kanagawa Institute of Industrial Science and Technology

2:00 PM Invited
Multicomponent Rare-Earth Titanates as a New Thermal Barrier Coating Material: *Takafumi Ogawa*[1]; Makoto Tanaka[1]; Naoki Kawashima[1]; Taishi Ito[1]; Kei Nakayama[1]; Takeharu Kato[1]; Norio Yamaguchi[1]; Hiroaki Suzuki[2]; Haruo Shibata[2]; Akira Kawasaki[2]; Satoshi Kitaoka[1]; [1]Japan Fine Ceramics Center; [2]Japan AeroSpace Technology Foundation

2:20 PM Invited
Elucidation of the Mechanism of Initial Low-Temperature Degradation of 3 mol% Y2O3 Stabilized ZrO2 Ceramics by Bending Test Using Microcantilever Beam Specimens: *Takuma Takahashi*[1]; Kaito Niregi[1]; Tsukaho Yahagi[1]; Tatsuki Ohji[2]; Junichi Tatami[3]; [1]Kanagawa Institute of Industrial Science and Technology; [2]National Institute of Advanced Industrial Science and Technology; [3]Yokohama National University

2:40 PM
Dual Phase High Entropy Ultra High Temperature Ceramics from Commercial Powders: *Rubia Hassan*[1]; Willaim G. Fahrenholtz[1]; Kantesh Balani[2]; Gregory E. Hilmas[1]; [1]Missouri University of Science and Technology; [2]Indian Institute of Technology Kanpur

3:00 PM
Influence of Carbon Content on High-Temperature Thermal Stability and Mechanical Properties of SiOCN Coatings: *Hyeon Joon Choi*[1]; Kathy Lu[2]; [1]Virginia Polytechnic Institute; [2]University of Alabama

3:20 PM Break

3:40 PM
The Role of Thermal Expansion Mismatch in the Drying of Refractory Castables Comprising Polymeric Fibers: *Murilo Moreira*[1]; Sebastião Canevarolo[1]; Victor Pandolfelli[1]; [1]Federal University of São Carlos

4:00 PM
Polymer-Derived Silicon Oxycarbide – Exfoliated Montmorillonite Ceramic Nanocomposites for Porous Ceramics: *Advaith Rau*[1]; Kathy Lu[2]; [1]Virginia Polytechnic Institute; [2]University of Alabama Birmingham

ARTIFICIAL INTELLIGENCE

Frontiers of Machine Learning on Materials Discovery — Frontiers of Machine Learning Session I

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Rinkle Juneja, Oak Ridge National Laboratory; Mingda Li, Mit; Hiroyuki Hayashi, Kyoto University

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Session Chairs: Stephen Baek, University of Virginia; Rinkle Juneja, Oak Ridge National Laboratory

2:00 PM Keynote
Machine Learning in Chemistry: Reactive Force Fields and Beyond: *Sergei Tretiak*[1]; [1]LANL

2:40 PM Invited
Exploring New Frontiers in Inverse Materials Design through Graph Neural Networks and Large Language Models: *Kamal Choudhary*[1]; [1]National Institute of Standards and Technology

3:00 PM Invited
Physics-Aware Recurrent Convolutional Neural Networks for Modeling Hotspot Formation and Growth in Energetic Materials: *Stephen Baek*[1]; [1]University of Virginia

3:20 PM Break

3:40 PM Invited
Accelerating Electron Microscopy and Experimentation through Acceptance of ML/AI: *Matt Olszta*[1]; [1]Pacific Northwest National Laboratory

4:00 PM Invited
Using UNET Architecture for Microstructural Image Analysis in Hypoeutectoid Steel: *Shikhar Krishn Jha*[1]; Nikhil Chaurasia[1]; Sandeep Sangal[1]; [1]IIT Kanpur

4:20 PM
MAXIMA: A High-Throughput Instrument for XRD and XRF Characterization of Materials: *Michael Wall*[1]; Timothy Long[1]; Robert Drake[2]; Todd Hufnagel[1]; [1]Johns Hopkins Unviversity; [2]Proto Manufacturing

4:40 PM
Physics-Informed Machine Learning of Thermodynamic Properties: *Jarrod Lund*[1]; Haoyue Wang[1]; Soumya Sarangi[1]; R. Edwin García[1]; [1]Purdue University

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Boundaries in Functional Ceramics

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chairs: Melissa Santala, Oregon State Unviersity; Bryan Huey, University of Connecticut

2:00 PM Invited
Direct Nanovolumetric Investigation of Domain Walls and Grain Boundaries in Polycrystalline Functional Oxides: Karla Del Cid-Ledezma[1]; K.M. Abu Hurayra Lizu[2]; Adanma Akoma[1]; Jan Schultheiss[2]; Dennis Meier[2]; *Bryan Huey*[1]; [1]University of Connecticut; [2]Norwegian University of Science and Technology

2:30 PM
Charged Domains on the Surface of a Centrosymmetric Ferroelastic Crystal: Ajay Pisat[1]; Jackson Adler[1]; Paul Salvador[1]; *Gregory Rohrer*[1]; [1]Carnegie Mellon University

2:50 PM
Phase Field Data Analytics of Grain Boundary $LiFePO_4$ Kinetics: *Danny Hermawan*[1]; Jarrod Lund[1]; Edwin García[1]; [1]Purdue University

3:10 PM
Microstructural Effects on Percolating Ionic Ceramic Granular Structures: *David Estrella Herrera*[1]; Danny Hermawan[1]; R. Edwin García[1]; [1]Purdue University

3:30 PM Break

3:50 PM Invited
Inherent Chemical Disorder at Grain Boundaries in Complex Oxides: *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory

4:20 PM
Charged Dislocations and Charged Grain Boundaries in Ionic Ceramics: *Edwin Garcia*[1]; [1]Purdue University

4:40 PM
Influence of Initial Duplex Microstructure on Solid-State Pseudo-Single Crystal Growth of CoTi2O5: *Junyan Zhang*[1]; Connor McNamara[1]; Jeffrey Rickman[1]; Helen Chan[1]; [1]Lehigh University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session IV

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Xingbo Liu, West Virginia University

2:00 PM Invited
Heterostructured High Entropy Alloys: An Overview: *Yuntian Zhu*[1]; Peijian Shi[1]; [1]City University of Hong Kong

2:20 PM Invited
High Entropy Materials and NSF: *Jonathan Madison*[1]; [1]National Science Foundation

2:40 PM Invited
High Throughput Characterization of Multi-Principal Element Alloy Electrochemical Properties Using Thin Film Alloy Libraries: *Zachary Sims*[1]; Philip Rack[2]; Reece Emery[2]; Harsh Singh[2]; [1]University of Tennessee-ORII; [2]University of Tennessee Knoxville

3:00 PM Invited
Making Sense of the Noise: Differentiating Sources of Diffuse Electron Scattering Signals in Multi-Principal Element Alloys: Po-Cheng Kung[1]; Rui Feng[2]; Peter Liaw[3]; Jian-Min Zuo[1]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign; [2]National Energy Technology Laboratory; [3]University of Tennessee Knoxville

3:20 PM Break

3:40 PM Invited
Ab Initio Modeling on The Thermodynamic and Temperature-Dependent Elastic Properties of Subsystems of The FCC FeNiCoCr Medium Entropy Alloys (MEAs): *Songge Yang*[1]; Yi Wang[2]; Zi-kui Liu[2]; Brajendra Mishra[1]; Yu Zhong[1]; [1]Worcester Polytechnic Institute; [2]Pen State University

4:00 PM Invited
Large Language Model-assisted Intuitive Materials Design: Quanliang Liu[1]; Maciej Polak[1]; So Yeon Kim[2]; Md Al Amin Shuvo[1]; Hrishikesh Deodhar[1]; Jeongsoo Han[1]; Dane Morgan[1]; *Hyunseok Oh*[1]; [1]University Of Wisconsin - Madison; [2]Massachusetts Institute of Technology

4:20 PM Invited
Interaction between Dislocation and Grain Boundary in Nanoindentation of Polycrystalline Al0.3CoCrFeNi Alloy: *Yuhong Zhao*[1]; [1]North University of China

4:40 PM Invited
Microstructural Evolution of Refractory Alloys During Thermomechanical Processing: *Byron Mcarthur*[1]; Todd Butler[1]; Sam Kuhr[1]; Nathan Levkulich[1]; Oleg Senkov[2]; Sheldon Semiatin[2]; Daniel Miracle[1]; [1]Air Force Research Laboratory; [2]Materials Resources LLC

5:00 PM
Mechanical Properties and Structural Relaxation Upon Heating of Nanostructured High-Entropy Alloys: *Megumi Kawasaki*[1]; [1]Oregon State University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session V

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Mitra Taheri, Johns Hopkins University

2:00 PM
Microwave Plasma as a Means to Create High Entropy Materials: *Aaron Catledge*[1]; Bria Storr[1]; Luke Moore[1]; Cheng-Chien Chen[1]; [1]University of Alabama at Birmingham

2:20 PM
The Effect of Carbide Nanoprecipitation on the Yield Strength of FCC Multi-Principal Element Alloys: *Nicholas Jones*[1]; Suok-Min Na[1]; Paul Lambert[2]; Jin-Hyeong Yoo[1]; Soobum Lee[3]; [1]Naval Surface Warfare Center, Carderock Division; [2]Johns Hopkins University Applied Physics Laboratory; [3]University of Maryland, Baltimore County

2:40 PM
Effect of Nb on the Superconducting Properties of Mo-Ti-V-Based RCCAs: *Ravi Kumar*[1]; Katherine Schlaak[1]; Sarah Watzman[1]; Eric Payton[1]; [1]University of Cincinnati

3:00 PM
Evaluating Microstructure and Strength Properties of a Tungsten Based 4-Component Multi Principal Element Alloy Fabricated by Laser Based Directed Energy Deposition: *Amaranth Karra*[1]; Aditya Rohan Narra[1]; Jeremy Watts[2]; Bryan Webler[1]; [1]Carnegie Mellon University; [2]Missouri S&T

3:20 PM Break

3:40 PM
Exploring Microstructural Evolution from Mesocrystal to Cube-Plate Dual Morphologies: Impact of Lattice Misfit and Elastic Moduli Variation during Spinodal Decomposition in Refractory HEAs: *Shiddhartha Ramprakash*[1]; Shalini Roy Koneru[2]; Christopher Tandoc[3]; Yong-Jie Hu[3]; Hamish Fraser[1]; Yunzhi Wang[1]; [1]The Ohio State University; [2]TCS Research; [3]Drexel University

4:00 PM
Grain Boundary Dynamics in High Entropy Alloys: *Milad Taghizadeh*[1]; Fadi Abdeljawad[1]; [1]Lehigh University

4:20 PM
High Strength-Ductility Combination in Low-Density Dual Phase High Entropy Alloy: *Manoj Mugale*[1]; Mayank Garg[1]; Amit Chaudhari[1]; Sanoj Karki[1]; Satyavan Digole[1]; Ganesh Walunj[2]; Tushar Borkar[1]; [1]Cleveland State University; [2]Suny Buffalo State University

4:40 PM
Influence of Co, Cr, and Ni Alloying Elements on the Microstructural, Oxidation and Mechanical behavior of NbTi-Based Alloys: *Ugochukwu Ochieze*[1]; Likun Sun[1]; Nicholas Simpson[1]; Sravya Josyula[1]; Matthew Steiner[1]; Eric Payton[1]; [1]University of Cincinnati

5:00 PM
Flash Sintering Improves the Mechanical Strength of High Entropy Oxides: *Shikhar Krishn Jha*[1]; Parmanand Tyagi[1]; [1]IIT Kanpur

SPECIAL TOPICS

Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday — Progress in MAX Phases II

Sponsored by: ACerS Basic Science Division, ACerS Engineering Science Division

Program Organizers: Surojit Gupta, University of North Dakota; Miladin Radovic, Texas A&M University; Michael Naguib, Tulane University

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Session Chairs: Ankit Srivastava, Texas A&M University; Mihaela Florea, National Institute of Materials Physics

2:00 PM Invited
Progress of Unravelling the Magnetic Complexity of iMAX Phases: *El'ad Nisan Caspi*[1]; [1]NRCN

2:30 PM Invited
Anomalous Crack Growth Resistance in Atomically Layered Ternary Carbides: Milos Dujovic[1]; Sahin Celik[1]; Miladin Radovic[1]; *Ankit Srivastava*[1]; [1]Texas A&M University

3:00 PM Invited
New Ternary Nanolaminated Carbide: Ti2NbAlC1.82 and TiNbAlC0.91: *Sylvain Dubois*[1]; Thierry Cabioc'h[1]; Véronique Gauthier-Brunet[1]; Patrick Chartier[1]; [1]Institut PPRIME

3:30 PM Break

3:50 PM Invited
Surface Electronic Structure of the Zr3SnC2 MAX Phase: *Takahiro Ito*[1]; Thierry Ouisse[2]; Manaya Mita[1]; Kiyohisa Tanaka[3]; Lourent Jouffret[4]; Hanna Pazniak[2]; Serge Quessada[2]; [1]Naogya University; [2]Grenoble INP, LMGP; [3] Institute for Molecular Science; [4]Université Clermont Auvergne

4:20 PM Invited
Surface Modifications of MAX Phases and MXenes for Catalytic Applications: *Mihaela Florea*[1]; [1]National Institute of Materials Physics

4:50 PM Invited
Characterization of MAX Phases by Neutron Diffraction - Michel Barsoum's Time at LANSCE: *Sven Vogel*[1]; Nina Lane[2]; Michel Barsoum[3]; [1]Los Alamos National Laboratory; [2]Amazon; [3]Drexel University

5:20 PM Invited
Stability and Properties of MAX Phases with Compositionally Complex M-layers: *Milos Dujovic*[1]; Zeyi Tan[1]; Ankit Srivastava[1]; Miladin Radovic[1]; [1]Texas A&M University

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Special Session: Uncertainty Quantification in Manufacturing

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

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Session Chairs: Scott McCormack, University of California, Davis; Soumya Sridar, University of Pittsburgh

2:00 PM Introductory Comments

2:10 PM Invited
Bayesian Methods in Computational Thermodynamics with Applications in High-Temperature Ceramics: *Noah Paulson*[1]; [1]Argonne National Laboratory

2:40 PM Invited
Microstructure Classification and the Microstructure State Space: Dylan Miley[1]; Ethan Suwandi[2]; Benjamin Schweinhart[3]; *Jeremy Mason*[1]; [1]University of California, Davis; [2]Northwestern University; [3]George Mason University

3:10 PM Invited
Probabilistic Physics-Integrated Neural Differentiable Modeling for Isothermal Chemical Vapor Infiltration Process: *Tengfei Luo*[1]; Deepak Akhare[1]; Jianxun Wang[1]; Zeping Chen[1]; Richard Gulotty[2]; [1]University of Notre Dame; [2]Honeywell

3:40 PM Break

4:00 PM Invited
Uncertainty Analysis in CALPHAD-Informed ICME Frameworks: *Raymundo Arroyave*[1]; [1]Texas A&M University

4:30 PM Invited
Accelerating Experimental Determination of Multicomponent Transition Metal Carbide Phase Diagrams Using Uncertainty Quantification: *Theresa Davey*[1]; William Rosenberg[2]; Ying Chen[3]; Scott McCormack[2]; [1]Bangor University/Tohoku University; [2]University of California, Davis; [3]Tohoku University

5:00 PM
Understanding Influence of Porosity and Impurities on Thermal Conductivity of ZrB2-Based Ultra-High Temperature Ceramics Through Thermodynamic Modeling: *Soumya Sridar*[1]; Wei Xiong[1]; [1]University of Pittsburgh

5:20 PM
Sequential Design of Experiments for Opacified Fibrous Insulation in Hypersonic Applications: *Akshay Jacob Thomas*[1]; Sharmila Karumuri[2]; Ilias Bilionis[1]; [1]Purdue University; [2]Johns Hopkins University

5:40 PM Question and Answer Period Open Discussions

ARTIFICIAL INTELLIGENCE

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division

Program Organizers: Amanda Krause, Carnegie Mellon University; Daniel Ruscitto, GE Research; Alp Sehirlioglu, Case Western Reserve University; Roger French, Case Western Reserve University; Erika Barcelos, Case Western Reserve University

Tuesday PM | October 8, 2024
310 | David L. Lawrence Convention Center

Session Chair: Amanda Krause, Carnegie Mellon University

2:00 PM Invited
Autonomous Approaches for Determining Structure-Processing-Property Relationships in Materials: *Rama Vasudevan*[1]; Sumner Harris[1]; Yongtao Liu[1]; Arpan Biswas[2]; [1]Oak Ridge National Laboratory; [2]UT Oak Ridge Innovation Institute

2:30 PM Invited
Hierarchical Bayesian Models for Automating Structural Materials Characterization: *Brian DeCost*[1]; Howie Joress[1]; [1]National Institute of Standards and Technology

3:00 PM
Advancing AI-Driven Analysis of Synchrotron Data via FAIR Practices, Ontology and Knowledge Graphs: *Mohommad Redad Mehdi*[1]; Finley Holt[1]; Weiqi Yue[1]; Alexander Bradley[1]; Balashanmuga Priyan Rajamohan[1]; Erika Barcelos[1]; Daniel Savage[2]; Hemant Sharma[3]; Matthew Willard[1]; Frank Ernst[1]; Pawan Tripathi[1]; Roger French[1]; [1]Case Western Reserve University; [2]Los Alamos National Lab; [3]Argonne National Laboratory

3:20 PM
Deep Learning Accelerated Lab-Scale X-Ray Computed Tomography of Low-Melting-Point Solder Alloys Used in Heterogeneously Integrated Semiconductor Packages: *Eshan Ganju*[1]; Nikhilesh Chawla[1]; [1]Purdue University

3:40 PM Break

4:00 PM
Enhancing Rietveld Refinement Analyses with Machine Learning Techniques: *Finley Holt*[1]; Redad Mehdi[1]; Weiqi Yue[1]; PawanT Tripathi[1]; Daniel Savage[2]; Matthew Willard[1]; Frank Ernst[1]; Roger French[1]; [1]Case Western Reserve University; [2]Los Alamos National Lab

4:20 PM
Advancing Sustainable Agriculture Through Multiscale Spatiotemporal Data Integration and High-Performance Computing: *Olatunde Akanbi*[1]; Vibha Mandayam[1]; Ethan Tobey[1]; Adaezeogo Ezeogo-Enwo[1]; HyangMok Baek[1]; Atharva Gupta[1]; Laura Bruckman[1]; Yinghui Wu[1]; Erika Barcelos[1]; Jeffrey Yarus[1]; Roger French[1]; [1]Case Western Reserve University

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials IV

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

Tuesday PM | October 8, 2024
320 | David L. Lawrence Convention Center

Session Chairs: Srimanta Barui, University of Louisville; Roger Borges, Hospital Israelita Albert Einstein; Masanori Kikuchi, National Institute for Materials Science

2:00 PM Invited
Peptide and Peptide-Mimetics Targeting Biohybrid Interfaces for Oral Health: *Candan Tamerler*[1]; [1]University of Kansas

2:20 PM Invited
Novel Biomaterials Utilizing Non-covalent Interactions for Increased Efficacy of Controlled and Sustained Ophthalmic Drug Delivery: *Mark Byrne*[1]; [1]Rowan-Virtua School of Translational Biomedical Engineering & Sciences, Dept of Biomedical Engineering, Rowan University

2:40 PM Invited
Innovative 3D Printing of Nanomaterials for Multiplexed, Cost-Effective, and Flexible Wearable Bioelectronic Sensing Systems: *Rahim Esfandyarpour*[1]; [1]University of California, Irvine

3:00 PM Invited
Electrical Stimulation of Orthopedic Implants for Next Generation Infection Control: *Mark Ehrensberger*[1]; [1]Suny at Buffalo

3:20 PM Break

3:40 PM Invited
Understanding Fungi Biomechanics and their Potential as Next-Generation Biomaterials: *Steven Naleway*[1]; Jim Gallagher[1]; Ihsan Elnunu[1]; Atul Agrawal[1]; Debora Lyn Porter[2]; [1]University of Utah; [2]University of California, Merced

4:00 PM Invited
Surface Modification of Biomaterials: A Perspective of Topography and Chemistry Influencing Cell Adhesion: *Marisa Beppu*[1]; [1]University of Campinas

4:20 PM Invited
Colloids in Microgravity: *Boris Khusid*[1]; Qian Lei[1]; Andrew Hollingsworth[2]; Paul Chaikin[2]; William Meyer[3]; [1]New Jersey Institute of Technology; [2]New York University; [3]Universities Space Research Association

4:40 PM
Electrospun Chitosan-Gelatin Nanofibers Reinforced with Graphene Oxide for Endothelial Cell Culture: *Toribio Figueroa*[1]; Claudio Aguayo[1]; [1]Universidad de Concepción

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Manufacturing Division

Program Organizers: Morsi Mahmoud, Abdullah Al Salem University (AASU); Dinesh Agrawal, Pennsylvania State University; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Christina Wildfire, National Energy Technology Laboratory; Guido Link, Karlsruhe Institute of Technology

Tuesday PM | October 8, 2024
401 | David L. Lawrence Convention Center

Session Chair: Daudi Waryoba, Penn State University

2:00 PM Invited
Evaluating the Impact of Alternating Electromagnetic Fields on Biofilm Formation at Low Bacterial Concentrations: Hidekazu Miura[1]; *Hideyuki Kanematsu*[2]; Dana Barry[3]; Akiko Ogawa[2]; Takeshi Kogo[2]; Hirokazu Konishi[2]; Hirai Nobumitsu[2]; Takayoshi Nakano[4]; [1]Suzuka University of Medical Science; [2]National Institute of Technology (KOSEN), Suzuka College; [3]Clarkson University; [4]Graduate Shool of Engineering, Osaka University

2:20 PM Invited
Microwave-Assisted Synthesis of Nano-Hydroxyapatite from Decarbonized Eggshells: A Sustainable and Eco-Friendly Approach: *Morsi Mahmoud*[1]; [1]King Fahd University of Petroleum and Minerals

2:40 PM Invited
Reduced Interfacial Stresses in Laminated Ceramics during Flash Sintering Enabled by an Extremely Low Uniaxial Viscosity: *Weiwei Xiao*[1]; [1]Tsinghua University

3:00 PM
Calcination Behaviour of Malachite Ore in the Absence and Presence of End-of-Life Polyethylene Terephthalate and Sawdust: *Jessica Dankwah*[1]; Brilliant Haizel[2]; Wilfred Barnes[3]; James Dankwah[1]; [1]University of Mines and Technology; [2]Metso Ghana Limited; [3]Prestea Sankofa Gold Limited

3:20 PM Break

3:40 PM
Anomalous Hall Effect in n-Type Cr-Doped Sb_2Te_3 Magnetic Topological Insulator: *Ali Sarikhani*[1]; Mathew Pollard[1]; Jacob Cook[2]; Qiu Sheng[1]; Seng Lee[1]; Laleh Avazpour[1]; Jack Crewse[1]; William Fahrenholtz[1]; Guang Bian[2]; Yew San Hor[1]; [1]Missouri University of Science and Technology; [2]University of Missouri-Columbia

4:00 PM
Study of Corrosion Properties and Biocorrosion Kinetics of Microwave Sintered Biodegradable Nanocomposites: Shivani Gupta[1]; *Apurbba Sharma*[1]; Dinesh Agrawal[2]; Inderdeep Singh[3]; [1]Dr. Vishwanath Karad MIT World Peace University Pune; [2]Penn State University, State College, USA; [3]IIT Roorkee

4:20 PM
Multiphysics Study of Dry Reforming in Fixed Bed Microwave Reactors: *Ansan Pokharel*[1]; Pranjali Muley[2]; Christina Wildfire[2]; Terence Musho[1]; [1]West Virginia University; [2]National Energy Technology Laboratory

4:40 PM
Magnetic Field Tempering Characterization of HT9 Ferritic/Martensitic Steel: *Kirk Lemmen*[1]; XiaTong Yang[2]; Haluk Karaca[1]; Osman Anderoglu[2]; Stuart Maloy[3]; Nan Li[4]; Clé Sanchez[1]; Keaton Looper[1]; [1]University Of Kentucky; [2]University of New Mexico; [3]Pacific Northwest National Laboratory; [4]Los Alamos National Laboratory

5:00 PM
Defect and Microstructure Control of Materials Using the Electron Wind Force: *Md Hafijur Rahman*[1]; Aman Haque[1]; [1]The Pennsylvania State University

BIOMATERIALS

Society for Biomaterials: Student Poster Contest + Rapid Fire — Presentations

Sponsored by: Society for Biomaterials

Program Organizers: Christopher Siedlecki, Penn State College of Medicine; Nicholas Ziats, Case Western Reserve University

Tuesday PM | October 8, 2024
321 | David L. Lawrence Convention Center

Session Chair: Christopher Siedlecki, Penn State College of Medicine

2:00 PM Introductory Comments

2:05 PM Rapid Fire Poster Presentations

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development III — Processing

Sponsored by: TMS: Steels Committee, AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Adriana Eres-Castellanos, Colorado School of Mines; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, University of Navarra; Jeongho Han, Hanyang University; Ian Zuanzo Rodriguez, ArcelorMittal R&D; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Los Alamos National Laboratory

Tuesday PM | October 8, 2024
403 | David L. Lawrence Convention Center

Session Chair: Jeongho Han, Hanyang University

2:00 PM Invited
Induction Heating for Sustainable Steel Manufacturing: Opportunities and Challenges: *Lawrence Cho*[1]; Emmanuel De Moor[1]; Kip Findley[1]; John Speer[1]; [1]Colorado School of Mines

2:30 PM Invited
Opportunities for Plasma-Based Processes to Reduce Iron Ore: *Noemi Leick*[1]; Yuri Korobeinikov[2]; Hariswaran Sitaraman[1]; Laxminarayan Raja[3]; Sridhar Seetharaman[2]; [1]NREL; [2]Arizona State University; [3]UT Austin

3:00 PM
Modelling of Phase Transformations During Laminar Cooling of a TMCP Microalloyed X70 Steel: Ry Karl[1]; Jonas Valloton[1]; J. Barry Wiskel[1]; Chad Cathcart[2]; *Tihe (Tom) Zhou*[2]; Fateh Fazeli[3]; Hani Henein[1]; [1]University of Alberta; [2]Stelco; [3]CanmetMATERIALS

3:20 PM Break

3:40 PM
Microstructure and Mechanical Properties in TIG Welded Joints of Advanced Reduced-Activation Alloy for Fusion Reactor: *KyoungHwan Kim*[1]; Joonoh Moon[1]; Yi-Hyun Park[2]; [1]Changwon National University; [2]Korea Institute of Fusion Energy (KFE)

4:00 PM
Microstructure Evolution and its Effects on Mechanical Properties Depending on Cooling Patterns in Austenitic Fe-Mn-Al-C Alloys: *Min-Ji Kwon*[1]; Joonoh Moon[1]; Seong-Jun Park[2]; [1]Changwon National University; [2]Korea Institute of Materials Science

CERAMIC AND GLASS MATERIALS

The American Ceramic Society Journal Awards Symposium — Session II

Sponsored by: ACerS

Program Organizer: John Mauro, Pennsylvania State University

Tuesday PM | October 8, 2024
408 | David L. Lawrence Convention Center

Session Chair: John Mauro, Pennsylvania State University

2:00 PM
Degradation of Yttria-Stabilized Zirconia in Molten Regolith Electrolysis Applications: *Kevin Yu*[1]; Jamesa Stokes[2]; Bryan Harder[2]; Lorlyn Reidy[3]; Jesus Dominguez[3]; Katherine Faber[1]; [1]California Institute of Technology; [2]NASA Glenn Research Center; [3]NASA Marshall Space Flight Center

2:20 PM
Correlative Characterization of Plasma Etching Resistance of Various Aluminum Garnets: *Christian Stern*[1]; Christian Schwab[1]; Moritz Kindelmann[2]; Mark Stamminger[3]; Inhee Park[4]; Florian Hausen[4]; Martin Finsterbusch[1]; Martin Bram[1]; Olivier Guillon[1]; [1]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research (IEK-1); [2]Forschungszentrum Jülich GmbH, Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons (ER-C); [3]Heraeus Noblelight GmbH; [4]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research (IEK-9)

2:40 PM
Neutron Tomography Analysis of Permeability-Enhancing Additives in Refractory Castables: *Murilo Moreira*[1]; Stefano Dal pont[2]; Alessandro Tengattini[3]; Victor Pandolfelli[1]; [1]Federal University of São Carlos; [2]Université Grenoble Alpes; [3]Institut Laue-Langevin

3:00 PM
Significantly Enhancement of Piezoelectric Properties and Electrical Resistivity in Bismuth Titanate-Ferrite: *Qian Wang*[1]; Chun-Ming Wang[1]; [1]Shandong University

FUNDAMENTALS AND CHARACTERIZATION

Uncertainty Quantification Applications in Materials and Engineering — Surrogate Models, Calibration Methods, and Examples

Sponsored by: ACerS Engineering Ceramics Division, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Mark Andrews, SmartUQ (retired); Gavin Jones, SmartUQ

Tuesday PM | October 8, 2024
327 | David L. Lawrence Convention Center

Session Chairs: Mark Andrews, SmartUQ; Gavin Jones, SmartUQ

2:00 PM Introductory Comments Mark Andrews

2:05 PM
Uncertainty Quantification of Material Properties in Data-Poor Regimes Using Transfer Learning and Gaussian Process Regression: *Sara Akhavan Abdollahian*[1]; Soumya Sridar[1]; Wei Xiong[1]; Hessam Babaee[1]; [1]University of Pittsburgh

2:25 PM
Uncertainty Quantification in Machine Learning Models with High-Dimensional Features and Large Sample Size: *Ayorinde Olatunde*[1]; Weiqi Yue[1]; Roger French[1]; Pawan Tripathi[1]; Anirban Mondal[1]; [1]Materials Data Science for Stockpile Stewardship: Center of Excellence, Case Western Reserve University

2:45 PM Invited
Unraveling Correlation between Interface Structure and Magnetic Properties of La1-xSrxCoO3/La1-xSrxMnO3 Bilayers Using Neural Architecture Search and Deep Ensembles: *Amit Samanta*[1]; Hong Sun[1]; Vincenzo Lordi[1]; Yayoi Takamura[2]; [1]Lawrence Livermore National Laboratory; [2]University of California Davis

3:05 PM
Bayesian Calibration of Cladding Creep Model Coefficients in the PAD5 Fuel Performance Code Using the Dakota Toolkit: *Aiden Ochoa*[1]; Cole Horan[1]; Yun Long[2]; Wenzhong Zhou[2]; Martin Nieto-Perez[1]; [1]Penn State University; [2]Westinghouse Electric Company

3:25 PM Break

3:45 PM
Bayesian Protocols for High-Throughput Optimization of Kinematic Hardening Models Using Cyclic Microindentation Experiments: *Aditya Venkatraman*[1]; David McDowell[2]; Surya Kalidindi[2]; [1]Sandia National Laboratories; [2]Georgia Institute of Technology

4:05 PM
Quantification of Uncertainty in Microstructure Segmentation of Solid Oxide Cell Electrodes Using an Improved Watershed Methodology: *William Kent*[1]; William Epting[2]; Harry Abernathy[2]; Paul Salvador[1]; [1]Carnegie Mellon University; [2]National Energy Technology Laboratory

FUNDAMENTALS AND CHARACTERIZATION

Understanding High Entropy Materials via Data Science and Computational Approaches — Session I

Sponsored by: TMS: Alloy Phases Committee

Program Organizers: Dilpuneet Aidhy, Clemson University; Raymundo Arroyave, Texas A&M University; Timothy Rupert, Johns Hopkins University; Liang Qi, University of Michigan; Wei Xiong, University of Pittsburgh; Prashant Singh, Ames National Labratory

Tuesday PM | October 8, 2024
413 | David L. Lawrence Convention Center

Session Chairs: Dilpuneet Aidhy, Clemson University; Michael Gao, NETL

2:00 PM Invited
Electronic Descriptors for Dislocation Deformation Behavior and Intrinsic Ductility in bcc High-Entropy Alloys: Pedro Borges[1]; Robert Ritchie[1]; *Mark Asta*[1]; [1]University of California, Berkeley

2:30 PM
Spinel-Structured Precipitate Morphology in High-Entropy Mg0.2Ni0.2Co0.2Cu0.2Zn0.2O Epitaxial Films: Thermodynamic and Phase-Field Investigations: *Yueze Tan*[1]; Jacob Sivak[1]; Saeed Almishal[1]; Susan Sinnott[1]; Jon-Paul Maria[1]; Yanzhou Ji[1]; Long-Qing Chen[1]; [1]Pennsylvania State University

2:50 PM Invited
ULTERA: A Data Ecosystem for High Entropy Materials (HEMs): *Zi-Kui Liu*[1]; Adam Krajewski[1]; [1]Pennsylvania State University

3:20 PM Break

3:40 PM Invited
Predicting Intrinsic Ductility of Refractory High Entropy Alloys: *Michael Gao*[1]; Saro San[1]; David Alman[1]; Vishnu Raghuraman[2]; Mike Widom[2]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University

4:10 PM
Screening High-Entropy Oxide Compositions Using Machine Learned Interatomic Potential: *Jacob Sivak*[1]; Saeed Almishal[1]; Yueze Tan[1]; Mary Kate Caucci[1]; Matthew Furst[1]; Dhiya Srikanth[1]; Long-Quin Chen[1]; Christina Rost[2]; Jon-Paul Maria[1]; Susan Sinnott[1]; [1]Pennsylvania State University; [2]Virginia Polytechnic Institute and State University

BIOMATERIALS

3D Printing of Biomaterials and Devices — 3D Printing of Biomaterials and Devices I

Program Organizers: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University

Wednesday AM | October 9, 2024
319 | David L. Lawrence Convention Center

Session Chairs: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University

8:00 AM Invited
Addressing Unmet Needs with 3D Printed Electronics: *Yong Lin Kong*[1]; [1]Rice University

8:20 AM
A Novel Horizontal Flow Bioreactor for Studying Cancer Progression: *Dinesh Katti*[1]; Kalpana Katti[1]; Sharad Jaswandkar[1]; Preetham Ravi[1]; [1]North Dakota State University

8:40 AM
Additively Manufactured Biodegradable ZnMg Alloy for Cortical-Bone Mimicking Load-Bearing Applications: *Yageng Li*[1]; Yuzhe Zheng[1]; Luning Wang[1]; [1]University of Science and Technology Beijing

9:00 AM
Phenolic-Loaded Scaffolds for Breast and Prostate Cancer Bone Metastasis Therapeutics: *Kalpana Katti*[1]; Preetham Ravi[1]; Kalidas Shetty[1]; Dinesh Katti[1]; [1]North Dakota State University

9:20 AM
Methodology for Ceramic 3D Printing: Slurry Optimization: Antrakrate Gupta[1]; Ratan Sahu[1]; Kantesh Balani[1]; *Shikhar Krishn Jha*[1]; [1]IIT Kanpur

9:40 AM
Development and Design of Porous 4D Bio Multi-Materials for Enhancing Functionality: *Zahra Bahranifard*[1]; Immanuel Cutler[1]; Abby Whittington[1]; [1]Virginia Tech

10:00 AM Break

10:20 AM
Degradation Customization of Degradable Metallic Biomaterials: Satyabrata Sahoo[1]; Santanu Mandal[2]; Samit Nandi[3]; *Mangal Roy*[1]; [1]Indian Institute of Technology - Kharagpur (IIT-Kgp); [2]Indian Institute of Technology Bhubaneswar; [3]West Bengal University of Animal & Fishery Sciences

10:40 AM
Hybrid Peptides for Multi-Functional Heterogeneous Interfaces: *Candan Tamerler*[1]; [1]University of Kansas

SPECIAL TOPICS

ACerS Robert B. Sosman Award Symposium: The Role of Computational Modeling of Complex Materials — Robert B. Sosman Award Symposium. The Role of Computational Modeling in Complex Materials

Sponsored by: ACerS Basic Science Division

Program Organizer: Winnie Wong-Ng

Wednesday AM | October 9, 2024
407 | David L. Lawrence Convention Center

Session Chairs: Winnie Wong-Ng, NIST; Eric Cockayne, NIST

8:00 AM Invited
Density Functional Theory Calculations of Biomolecules: *Puja Adhikari*[1]; [1]University of Missouri-Kansas City

8:40 AM Invited
Contribution of Density Functional Theory to Microporous Materials for Carbon Capture: *Eric Cockayne*[1]; [1]National Institute of Standards and Technology

9:20 AM Invited
Partial Optical Properties of Multi-Component Complex Materials: *Paul Rulis*[1]; Alysse Weigand[1]; [1]UMKC Dept. Physics and Astronomy

10:00 AM Break

10:20 AM Invited
A Systematic Approach to Search for Lead-Free Piezoelectric Materials: *Lizhi Ouyang*[1]; Sitaram Aryal[1]; [1]Tennessee State University

11:00 AM Invited
Machine Learning-Driven Multiscale Modeling of Dyes and DNA-Templated Dye Aggregates: Maia Ketteridge[1]; *Lan Li*[1]; [1]Boise State University

11:30 AM Invited
Role of Ripplocations in the Bending and Uniaxial Deformation of Graphite: *Kaustubh Sudhakar*[1]; [1]Drexel University

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - ML/AI / Directed Energy Deposition (DED)

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Jing Zhang, Purdue University in Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Brandon McWilliams, US Army Research Laboratory; Yeon-Gil Jung, Korea Institute of Ceramic Engineering & Technology; Charles Fisher, Naval Surface Warfare Center - Carderock

Wednesday AM | October 9, 2024
302 | David L. Lawrence Convention Center

Session Chairs: Charles Fisher, NSWC Carderock Division ; Li Ma, , Johns Hopkins University Applied Physics Laboratory; Jing Zhang, Purdue University in Indianapolis

8:00 AM
Heat Treatment Design for Laser-Melted Medium Entropy Alloys via Machine Learning and Gradient-Temperature Experiments: *Luis Ladinos Pizano*[1]; Daozheng Li[1]; Wei Zhang[1]; Wei Xiong[1]; [1]University of Pittsburgh

8:20 AM
Self-Supervised Feature Distillation and Design of Experiments for Efficient Training of Micromechanical Deep Learning Surrogates: *Patxi Fernandez-Zelai*[1]; Jiahao Cheng[1]; Jason Mayeur[1]; Yousub Lee[1]; Kevin Knipe[2]; Kai Kadau[2]; [1]Oak Ridge National Laboratory; [2]Siemens Energy Inc

8:40 AM
An Efficient Machine Learning Enhanced Image-Based Framework for Micromechanical Analysis of Additively Manufactured Ti-6Al-4V: *Lucas Ferreira*[1]; Nolan Strauss[1]; Brayan Murgas[1]; Steven Storck[2]; Somnath Ghosh[1]; [1]Johns Hopkins University; [2]Johns Hopkins University Applied Physics Laboratory

9:00 AM
Combining Multi-Physics Simulations with Machine Learning to Elucidate Spatter Mechanisms and Establish Process Map in Laser Powder Bed Fusion: *Olabode Ajenifujah*[1]; Odinakachukwu Ogoke[1]; Florian Wirth[2]; Jack Beuth[1]; Amir Barati-farimani[1]; [1]Carnegie Mellon University; [2]Exentis Group AG

9:20 AM
Machine Learning Informed Inverse Design of an Additively Manufacturable Al Alloy Strengthened by Both Eutectic and Nanoprecipitates: *Zhaoxuan Ge*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

9:40 AM
Machine Learning Surrogate Model of Spatter Transport in a Laser Powder Bed Fusion Machine: *Nicholas Obrien*[1]; Satbir Singh[1]; Jack Beuth[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM Keynote
Computational and Experimental Phase Validation of Thermal Spray and Laser-Clad High-Entropy Alloy Coatings: Ecio Bosi[1]; Ashok Meghwal[1]; Surinder Singh[1]; Hank Lloyd[1]; Rasim Eris[2]; Soumya Sridar[3]; Wei Xiong[3]; Paul Munroe[2]; *Christopher C. Berndt*[1]; Andrew Ang[1]; [1]Swinburne University of Technology; [2]University of New South Wales; [3]University of Pittsburgh

10:40 AM Invited
Study on Thermal Cracks in Steel Slab Using Neural Networks Model to Predict Impact Absorption Energy: *Kyung-Chul Cho*[1]; Gi-beom Kim[2]; Sang-Hum Kwon[1]; Chang-Hee Yim[2]; Dae-Geun Hong[2]; [1]POSCO Technical Research Laboratories; [2]Graduate Institute of Ferrous & Eco Materials Technology, POSTECH

11:00 AM
A Computational Approach to Optimize Phase Behavior in Compositionally Graded Structures: *Bernard Gaskey*[1]; Cheryl Hawk[1]; John Carpenter[1]; [1]Los Alamos National Laboratory

11:20 AM
MALAMUTE Directed Energy Deposition Process Modeling and Experimental Validation through Investigation of Laser and Powder Efficiency: *Luis Nuñez*[1]; Wen Jiang[2]; Dewen Yushu[1]; Isabella van Rooyen[3]; Michael Maughan[4]; [1]Idaho National Laboratory; [2]North Carolina State University; [3]Pacific Northwest National Laboratory; [4]University of Idaho

11:40 AM
Micro Cold Spray of Partially Sintered Zinc Oxide Nanoparticle Agglomerates: *Scott Burlison*[1]; Michael Becker[1]; Desiderio Kovar[1]; [1]University Of Texas At Austin

ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing - Non-Ferrous Materials

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science

Wednesday AM | October 9, 2024
301 | David L. Lawrence Convention Center

Session Chair: Eric Faierson, Iowa State University

8:00 AM
Cyclic Deformation Behavior of Wire Arc Additively Manufactured Inconel 625 under Strain-Controlled Low Cycle Fatigue: *Yoshit Tiwari*[1]; Diya Mukherjee[2]; Shivam Kumar[2]; Shenglu Lu[1]; Kaustav Barat[3]; Manidipto Mukherjee[2]; Himadri Roy[2]; Ma Qian[1]; Xiaobo Chen[1]; [1]RMIT University; [2]CSIR-Central Mechanical Engineering Research Institute; [3]CSIR-National Aerospace Laboratories

8:20 AM
Contributing Factors to High-Quality Ni-Mo-Al Single Crystal Repairs by Laser Melting: A Multimodal Approach: *Adriana Eres-Castellanos*[1]; Ruben Ochoa[1]; James Lamb[2]; Christopher Hareland[3]; Gus Becker[4]; Bryan Lim[5]; Kamel Fezzaa[6]; Simon Ringer[7]; Sophie Primig[8]; Xiaozhou Liao[7]; Tresa Pollock[2]; Peter Voorhees[3]; Amy Clarke[9]; [1]Colorado School of Mines; [2]University of California Santa Barbara; [3]Northwestern University; [4]University of Colorado Boulder; [5]Oak Ridge National Laboratory; [6]Argonne National Laboratory; [7]The University of Sydney; [8]UNSW Sydney; [9]Los Alamos National Laboratory

8:40 AM
Alloy Design for Additive Manufacturing of High-Fraction Ni-Based Superalloys: *Chan-Hee Lee*[1]; Hyun-Uk Hong[1]; Byung-Soo Lee[2]; Hae-Jin Lee[2]; [1]Changwon National University; [2]Korea Institute of Industrial Technology

9:00 AM
Maximizing High-Temperature Mechanical Property Through Optimization of ' Microstructure by Heat Treatment of Crack-Free SLM-Fabricated CM247LC Superalloy: *Suyalatu Suyalatu*[1]; Kazuto Arakawa[1]; Hideki Wakabayashi[1]; Yugo Higashida[1]; Norio Higuchi[1]; Hitoshi Sakai[1]; [1]NTT DATA XAM Technologies Corporation

9:20 AM
Microstructure and Mechanical Properties Correlation of Additively Manufactured IN939 Superalloy: *Md Shahwaz*[1]; Merve Nur Dogu[2]; Hengfeng Gu[3]; Dermot Brabazon[2]; Indrani Sen[1]; [1]Indian Institute of Technology Kharagpur; [2]Dublin City University, Dublin, Ireland; [3]Ansys Inc

9:40 AM
Laser Powder Bed Fusion of Highly Dense Tantalum: *Raden Gustinvil*[1]; Guru Dinda[1]; [1]Savannah River National Laboratory

10:00 AM Break

10:20 AM
Laser Processing of Ce-Based Permanent Magnets to Support the Domestic Magnet Supply Chain: *Alfred Amon*[1]; Eunjeong Kim[1]; Alexander Wilson-Heid[1]; Alexander Baker[1]; [1]Lawrence Livermore National Laboratory

10:40 AM
Refractory Metal Mixing in Directed Energy Deposition - Experiments and Analysis: *Anthony Stair*[1]; Alexander Myers[1]; Jonathan Malen[1]; Bryan Webler[1]; Jack Beuth[1]; Maarten de Boer[1]; [1]Carnegie Mellon University

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Session II

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

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Session Chairs: Lianyi Chen, University of Wisconsin-Madison; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

8:30 AM Invited
Dynamics and Mechanisms of Defect Formation in Metal Additive Manufacturing Processes: *Lianyi Chen*[1]; [1]University of Wisconsin-Madison

9:00 AM
Effect of Material Thickness on Laser Powder Bed Fusion Alloy 625 Mechanical Properties: *Mary Story*[1]; Emily Kistler[1]; Daniel Drazkowski[1]; [1]Naval Nuclear Laboratory

9:20 AM
Manufacturing Challenges of Ordered and Disordered Networks Using Powder Bed Fusion: *Christopher Rock*[1]; Karen Daniels[1]; Katherine Newhall[2]; Ryan Hurley[3]; Mason Porter[4]; Katherine Moody[1]; Sourabh Saptarshi[1]; [1]North Carolina State University; [2]The University of North Carolina at Chapel Hill; [3]John Hopkins University; [4]UCLA

9:40 AM
Multi-scale Characterization and Development of SIMP Topology Optimized SS316L Lattice Structured Architectures for Lightweighting Applications: *Calvin Downey*[1]; Max Nezdyur[1]; Lynn Munday[1]; Swapnil Morankar[1]; Cameron Howard[1]; Jakub Toman[1]; Carolyn Seepersad[2]; Geoffrey Beausoleil[1]; [1]Idaho National Laboratory; [2]Georgia Institute of Technology

10:00 AM Break

10:20 AM
Photo-activated Growth and Metastable Phase Transition in Metallic Solid Solutions: *Andrew Martin*[1]; Alana Pauls[1]; Boyce Chang[2]; Eva Boyce[1]; Martin Thuo[1]; [1]NC State University; [2]Iowa State University

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructure, Defects, and Properties — Modeling and Characterization

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee

Program Organizers: Nadia Kouraytem, Utah State University; Shenyang Hu, Pacific Northwest National Laboratory; Mohan Sai Kiran Nartu, Pacific Northwest National Laboratory (Pnnl); Srujan Rokkam, Advanced Cooling Technologies, Inc.; Mohsen Asle Zaeem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology; Donna Guillen, Idaho National Laboratory; Dan Young, Wright State; Iris Rivero, University of Florida; Jonathan Pegues, Castheon; Eric Payton, University of Cincinnati; Ming Chen, Northwestern University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati

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Session Chairs: Moshen Zaheem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology

8:00 AM
Accounting for Material Heterogeneity and Anisotropy in Optical Profilometry-based Micro-Indentation Testing via Uncertainty Quantification: Christian Puentes[1]; Astrid Rodriguez Negron[1]; *Aaron Tallman*[1]; [1]Florida International University

8:20 AM
Application of a Single Objective Optimization Algorithm on Residual Strain Extraction from Electron Backscatter Diffraction Patterns: *Crestienne DeChaine*[1]; Marc De Graef[1]; [1]Carnegie Mellon University

8:40 AM
Characterizing Flowability of Water Atomized Powders for Laser Powder Bed Fusion Additive Manufacturing: *Sarah Birchall*[1]; Srujana Yarasi[2]; Junwon Seo[1]; Anthony Rollett[1]; Bryan Webler[1]; [1]Carnegie Mellon University; [2]General Electric Aerospace Research

9:00 AM
Extraction Replication of Inert Particles in Powder Feedstocks for Additive Manufacturing: *Qiushi Jin*[1]; Manuel Sanchez-Poncela[2]; Rainer Hebert[1]; Maria Florencia Gatti[2]; Mark Aindow[1]; [1]University of Connecticut; [2]ArcelorMittal Global R&D Spain

9:20 AM
Phase-Field Modeling of Sintering for Metal Additive Manufacturing: *Rui Dong*[1]; Wenda Tan[1]; [1]The University of Michigan

9:40 AM
Phase Field Microelasticity Theory and Modeling of Dislocation Dynamics in an Elastically and Structurally Inhomogeneous Solid: *Janel Chua*[1]; Brayan Murgas Portilla[1]; Abigail Hunter[1]; Nithin Mathew[1]; [1]Los Alamos National laboratory

10:00 AM Break

10:20 AM
Non-Destructive 3D Structure Studies of Additive Manufactured Materials Using X-Ray Computed Tomography: *Tai-Jan Huang*[1]; Angela Criswell[1]; [1]Rigaku Americas Corporation

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments V — Session III

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Keyou Mao, Florida State University; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

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Session Chairs: Eric Lang, University of New Mexico; Cheng Sun, Clemson University

8:00 AM Invited
Dynamics of Radiation Defect Accumulation in Non-Metallic Materials: *Sergei Kucheyev*[1]; [1]Lawrence Livermore National Laboratory

8:30 AM
Machine Learning and Molecular Dynamics-Coupled X-Ray Absorption Spectroscopy for Disordered Multicomponent Systems: *Stephen Lam*[1]; Nicholas Marcella[2]; Omar Oraby[1]; Rajni Chahal[3]; Santanu Roy[3]; Vyacheslav Bryantsev[3]; Anatoly Frenkel[4]; [1]University of Massachusetts-Lowell; [2]University of Illinois Urbana-Champaign; [3]Oak Ridge National Laboratory; [4]Stony Brook University

8:50 AM Invited
Microstructural and Chemical Evolution Studies of U-10Zr Metallic Fuel and HT9 Cladding from Fast Flux Test Facility: *Mukesh Bachhav*[1]; Daniele Salvato[1]; Sohail Shah[1]; Tiankai Yao[1]; Luca Capriotti[1]; Cameron Howard[1]; [1]Idaho National Laboratory

9:20 AM
Deployment and Testing of a Fiber-Based Instrument for In-Reactor Thermal Property Measurements at MIT Research Reactor: *Zilong Hua*[1]; Caleb Picklesimer[1]; Austin Fleming[1]; Weiyue Zhou[2]; Michael Short[2]; David Carpenter[2]; David Hurley[1]; [1]Idaho National Laboratory; [2]MIT

9:40 AM
Characterization of Aluminum Under Shock: Defects, Grain Orientation, and Phase Stability: *Benjamin Helman*[1]; Adib Samin[1]; [1]Air Force Institute of Technology

10:00 AM Break

10:20 AM Invited
Strong Dependence of 2D Material Radiation Tolerance on the Composition of the 2D Material and Its Surrounding Environment: *Christopher Smyth*[1]; Kory Burns[2]; Catalin Spataru[1]; Taisuke Ohta[1]; [1]Sandia National Laboratories; [2]University of Virginia

10:50 AM
Neutron-Induced Reversible Nanostructuring of GeSe2: *Spoogmay Khan*[1]; Gang Chen[1]; [1]Ohio University

11:10 AM
An In-Situ Transmission Electron Microscopy Study on the Synergistic Effects of Heating and Biasing of AlGaN/GaN High Electron Mobility Transistors: *Nahid Sultan Al-Mamun*[1]; Aman Haque[1]; [1]The Pennsylvania State University

11:30 AM
Microstructural Evolution in 316L Stainless Steel Under Lead-Bismuth Eutectic Corrosion: *Zhiyu Zhang*[1]; Sarah. Wang[2]; Peter Hosemann[2]; Yang Yang[1]; Andrew Minor[2]; [1]Pennsylvania State University; [2]University of California at Berkeley

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Materials for Energy Storage/Conversion and Antibacterial Applications; Thermoelectrics & Magnetoelectrics

Sponsored by: ACerS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Ubic, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

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Session Chairs: Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

8:00 AM Break

8:40 AM Invited
Local Structure, Phase Formation, Electrical Properties, and Energy Storage Efficiency of (1-x)BaTiO3(x)BiYO3 Ceramics: *Rattikorn Yimnirun*[1]; [1]Vidyasirimedhi Institute of Science and Technology

9:00 AM
Effect of Distorted Perovskites on the Performance of Dielectric Energy Storage Material: *Daniel Gower*[1]; Anna Darden[1]; Aria Tauraso[1]; Ching Hua Su[1]; Lauren Gower[1]; Narasimha Prasad[1]; Bradley Arnold[1]; Fow-Sen Choa[1]; Brian Cullum[1]; Narsingh Singh[1]; [1]University of Maryland Baltimore County

9:20 AM
Structure-Property Relationships: A-Site Cations Redistribution in Polar Perovskite Oxides: *Neamul Hayet Khansur*[1]; Gina Eyoum[2]; Kyle Webber[2]; [1]Case Western Reserve University; Friedrich-Alexander-Universität Erlangen-Nürnberg; [2]Friedrich-Alexander-Universität Erlangen-Nürnberg

9:40 AM
Photoinduced Enhanced Raman Spectroscopy and Antibacterial Property of Titanium Oxide Hollow Nanosphere: *Shubhadip Atta*[1]; Shashank Das[1]; Arti Sharma[1]; Shubham Sharma[1]; Soumik Siddhanta[1]; Prashant Mishra[1]; Soutik Betal[1]; [1]Indian Institute of Technology

10:00 AM Break

10:20 AM Invited
High Entropy Oxides with Ultra-Low Thermal Conductivity: Emerging Class of High Temperature Thermoelectrics: *Tanmoy Maiti*[1]; [1]IIT Kanpur

10:40 AM Invited
Mechanical Properties and Application of High Temperature-Resistant Thermoelectric Modules: *Ryoji Funahashi*[1]; [1]National Institute of Advanced Industrial Science & Technology

11:00 AM Invited
Magnetoelectric Nanorobots for Magnetically Assisted Cell Targeting, Electroporation and On-Demand Drug Delivery: *Soutik Betal*[1]; Nandan Murali[1]; Amar Bhalla[2]; Ruyan Guo[2]; [1]IIT Delhi; [2]University of Texas- San Antonio

11:20 AM
Advanced Magnetoelectric nanostructure for Enhanced Water Purification: *Nandan Murali*[1]; Hemlata Rai[1]; Shashank Das[1]; Arti Sharma[1]; Aishwarya Thodikayil[1]; Shilpi Minocha[1]; Soumik Siddhanta[1]; Sampa Saha[1]; Soutik Betal[1]; [1]Indian Institute of Technology Delhi

NANOMATERIALS

Advances in Emerging Electronic Nanomaterials: Towards Next-Generation Microelectronics — Functional Materials and Devices I

Sponsored by: TMS: Nanomaterials Committee

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jinkyoung Yoo, Los Alamos National Laboratory; Jung-Kun Lee, University of Pittsburgh

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Session Chairs: Jinkyoung Yoo, Los Alamos National Laboratory; Chang-Yong Nam, Brookhaven National Laboratory

8:00 AM Invited
2D Amorphous Carbon Dielectric Prepared from Solution Precursor for Nanoelectronics: Viet Hung Pham[1]; Christopher Matranga[1]; *Congjun Wang*[1]; [1]National Energy Technology Laboratory

8:30 AM Invited
Enhanced Light Harvesting of Solar Cells by Nanoscale Engineering: *Jung-Kun Lee*[1]; [1]University of Pittsburgh

9:00 AM Invited
Creation and Control of Novel Magnetism at Magnetic Insulator Interfaces: *Jinwoo Hwang*[1]; [1]Ohio State University

9:30 AM Invited
Low-Dimensional Electronic Systems on a Silicon Platform: *Tzu-Ming Lu*[1]; [1]Sandia National Laboratories

10:00 AM Break

10:20 AM Invited
Laser-Induced Graphene: from Fundamental Science to Applications: *Mostafa Bedewy*[1]; [1]University of Pittsburgh

10:50 AM
Enhanced Near Infrared Emission of SiGe Nanocrystals by Heterostructuring with Hybrid Perovskite: *Yeonjoo Lee*[1]; Doyun Kim[2]; Mircea Cotlet[3]; John Watt[1]; Winson Kuo[1]; Wanyi Nie[1]; Uwe Kortshagen[4]; Jinkyoung Yoo[1]; [1]Los Alamos National Laboratory; [2]Texas A&M university; [3]Brookhaven National Laboratory; [4]University of Minnesota

11:10 AM
Light Management and Lifetime of Perovskite Solar Cells: *Youngsoo Jung*[1]; Seongha Lee[1]; Vishal Pal[1]; Kyoung Jin Choi[2]; Jung-Kun Lee[1]; [1]University of Pittsburgh; [2]Ulsan National Institute of Science and Technology (UNIST)

11:30 AM Panel Discussion Electronic Materials Funding Landscapes

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MATERIALS-ENVIRONMENT INTERACTIONS

Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson — Interface, Coating, and Properties for High-Temperature Performance

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: High Temperature Alloys Committee, TMS: Alloy Phases Committee

Program Organizers: Kinga Unocic, North Carolina State University; Wei Xiong, University of Pittsburgh; Elizabeth Opila, University of Virginia; Richard Oleksak, National Energy Technology Laboratory; Rishi Pillai, Oak Ridge National Laboratory; Bruce Pint, Oak Ridge National Laboratory

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Session Chairs: Grace de Leon, GE Global Research Center; Judith Yang, Brookhaven National Laboratory

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8:00 AM Invited
Advanced Metal Alloys and Coatings for Extreme Environments: *Todd Butler*[1]; Oleg Senkov[1]; Nathan Levkulich[1]; Samuel Kuhr[1]; Byron McArthur[1]; Daniel Miracle[1]; [1]Air Force Research Laboratory

8:25 AM Invited
Stress Assisted Corrosion of Single Crystal Alloys; In the Type II Sulphidation Regime: *Grant Gibson*[1]; Jonathan Leggett[1]; [1]Rolls-Royce Plc.

8:50 AM Invited
Atomic Scale Understanding of Cu and Cu Alloy Oxidation Using In Situ Environmental TEM: *Judith Yang*[1]; Meng Li[1]; Stephen House[2]; Matthew Curnan[3]; Linna Qiao[4]; Xiaobo Chen[5]; Dmitri Zakharov[1]; Wissam Saidi[6]; Guangwen Zhou[5]; [1]Brookhaven National Laboratory; [2]Sandia National Laboratory; [3]Korea Institute of Energy Technology; [4]Binghatom University; [5]Binghamton University; [6]National Energy Technology Laboratory

9:15 AM
Isothermal Oxidation of Ni-Mn-Ga Magnetic Shape Memory Alloys Under Different Atmospheres: *Pierangeli Rodriguez De Vecchis*[1]; Markus Chmielus[1]; [1]University of Pittsburgh

9:35 AM
Intermediate Temperature Oxidation of SiC/BN/SiC CMCs: *Sarah Beth Holles*[1]; Elizabeth Opila[1]; [1]University of Virginia

9:55 AM Break

10:15 AM Invited
On the Formation of Adherent Alumina Scales: *Bruce Pint*[1]; Yi-Feng Su[1]; Michael Lance[1]; [1]Oak Ridge National Laboratory

10:40 AM Invited
Gleeson and the Process Metallurgists- Oxidation of Liquid Aluminium: *Gabriella Tranell*[1]; [1]The Norwegian University of Science and Technology

11:05 AM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Hydrogen Transportation and Storage Issues; Hydrogen Embrittlement

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division, TMS: Refractory Metals & Materials Committee

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory

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Session Chairs: Wenbin Kuang, Pacific Northwest National Laboratory; Wendy Gu, Stanford University; T. Venkatesh, Stony Brook University

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8:00 AM Invited
Compatibility of Existing Natural Gas Pipeline Materials with Hydrogen: *Michael Kass*[1]; James Keiser[1]; Yan Liu[1]; Amy Moore[1]; Yarom Polsky[1]; [1]Oak Ridge National Laboratory

8:20 AM Invited
Modeling and Experimental Studies of Hydrogen Effects on the Materials Used for Storage and Transport: Ting Yang[1]; Guang Cheng[2]; Wurong Jian[3]; Yamini Mann[4]; Toshio Nakamura[4]; Wei Cai[3]; Ming Dao[1]; *T. Venkatesh*[4]; [1]MIT; [2]Beijing University of Chemical Technology; [3]Stanford University; [4]Stony Brook University

8:40 AM Invited
Fatigue and Fracture of Structural Steels in Gaseous Hydrogen Environments: *Chris San Marchi*[1]; Milan Agnani[1]; Robert Wheeler[1]; Fernando Leon-Cazares[1]; Brendan Davis[1]; Joeseph Ronevich[1]; [1]Sandia National Laboratories

9:00 AM
Adsorption and Dissociation of Hydrogen on Iron and Iron Oxide Surfaces Under Supercritical Conditions: *Hao Zhang*[1]; Meifeng Li[1]; Jing Liu[1]; [1]University of Alberta

9:20 AM
Effects of Oxygen Impurities on Long-Term Gaseous Hydrogen Embrittlement of Structural Steels: *Robert Wheeler*[1]; Chris San Marchi[1]; Joseph Ronevich[1]; Norman Bartelt[1]; Farid El Gabaly[1]; Milan Agnani[1]; Fernando Leon-Cazares[1]; [1]Sandia National Laboratories

9:40 AM
Effect of Chemically Heterogeneous Microstructure on Hydrogen Embrittlement in Martensitic Steel: *Ho Hyeong Lee*[1]; Ki-Taek Jung[2]; Dong-Woo Suh[1]; [1]POSTECH; [2]POSCO

10:00 AM Break

10:20 AM
Application of Local Strain Theory for Predicting Notch Fatigue Testing in Hydrogen-Charged Austenitic Stainless Steel: *Debjit Misra*[1]; Kevin Nibur[2]; Brian Somerday[3]; Zachary Harris[1]; [1]University of Pittsburgh; [2]Hy-Performance Materials Testing LLC, Bend, OR; [3]Somerday Consulting LLC, Wayne, PA

10:40 AM
Hydrogen Embrittlement in Micro-Alloyed Ultra High Strength Press Hardening Steel (PHS): *Seokhwan Ju*[1]; Ho Hyeong Lee[1]; Seawoong Lee[2]; Dong-Woo Suh[1]; [1]POSTECH; [2]POSCO

11:00 AM Invited
Insights into Hydrogen Embrittlement of AA7075 Aluminum Alloy Fabricated by Additive Friction Stir Deposition: *Ebenezer Acquah*[1]; Munsu Kim[1]; Gregory Kubacki[1]; Nilesh Kumar[1]; [1]University of Alabama, Tuscaloosa

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing — Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing

Sponsored by: TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Andrew Iams, National Institute of Standards and Technology; Samantha Webster, Nist - Gaithersburg; Sarah Wolff, The Ohio State University; Carelyn Campbell, National Institute of Standards and Technology; Wei Xiong, University of Pittsburgh

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Session Chairs: Samantha Webster, NIST; Sarah Wolff, Ohio State University

8:00 AM Introductory Comments

8:05 AM Invited
Application of ICME Methods in Aerospace Applications: *Vasisht Venkatesh*[1]; David Furrer[1]; Sergei Burlatsky[2]; Masoud Anahid[2]; Manish Kamal[1]; Max Kaplan[1]; [1]Pratt & Whitney; [2]RTX Research Center

8:35 AM Invited
ICME Approaches Towards Sustainable Metal Additive Manufacturing: *Danielle Cote*[1]; Kyle Tsaknopoulos[1]; Kiran Judd[1]; Ashton Lyon[1]; [1]Worcester Polytechnic Institute

9:05 AM Invited
Application of CALPHAD-Based Tools to Develop More Sustainable Alloys and Processing Methods: *Paul Mason*[1]; Anders Engstrom[2]; [1]Thermo-Calc Software Inc.; [2]Thermo-Calc Software AB

9:35 AM Invited
CALPHAD Simulations to Assist Sustainable Metal Processing: *Kamalnath Kadirvel*[1]; Weisheng Cao[1]; Chuan Zhang[1]; Songmao Liang[1]; Shuanglin Chen[1]; Fan Zhang[1]; [1]Computherm LLC

10:05 AM Break

10:25 AM
A Thermodynamic Analysis of Red Mud Usage for Sustainable Iron and Steel Production: *Rangasayee Kannan*[1]; Adam Stevens[1]; Peeyush Nandwana[1]; [1]Oak Ridge National Laboratory

10:45 AM
Scheil-Gulliver Constituent Diagrams for Designing Recycled Al-Alloys: *Sunyong Kwon*[1]; Gerald Knapp[1]; Ying Yang[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

IRON AND STEEL (FERROUS ALLOYS)

Austenite Formation and Decomposition V: A Symposium in Memory of Prof. Mats Hillert — Alloying

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee, TMS: Steels Committee, TMS: Phase Transformations Committee

Program Organizers: Annika Borgenstam, KTH Royal Institute of Technology; John Agren, Royal Institute of Technology; Amy Clarke, Los Alamos National Laboratory; Hatem Zurob, McMaster University; Matthias Militzer, University of British Columbia; Kester Clarke, Los Alamos National Laboratory; Igor Vieira, Nucor Steel; Daniel Baker, LIFT

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Session Chair: Kester Clarke, Los Alamos National Laboratory

8:00 AM Keynote
Chemically Patterned Steels: Xiaohan Weng[1]; Yuxiang Wu[1]; *Christopher Hutchinson*[1]; [1]Monash University

8:40 AM
Decomposition of Retained Austenite during Tempering of High-Strength Tool Steels: Effect of Silicon and Tempering Parameters: *Myriam Dumont*[1]; Marine Lachal[2]; David Quidort[2]; Denis Delagnes[3]; Moukrane Dehmas[4]; [1]ENSAM - MSMP; [2]Industeel; [3]ICA - IMT Albi; [4]CIRIMAT

9:00 AM
Effects of Manganese on Austenite Stabilization in Dissimilar Steel Welds: Implications for Ferrite Prediction: *Md Sojib Hossain*[1]; Stephen Sharp[2]; Jason Provines[3]; Sean Agnew[1]; James Fitz-Gerald[1]; [1]University of Virginia; [2]Virginia Transportation Research Council; [3]Virginia Transportation Research

9:20 AM Invited
Design of an Alumina Forming Martensitic Steel: *Carlos Capdevila-Montes*[1]; Cesar Fernandez-Jimenez[1]; Isaac Toda-Caraballo[1]; David San Martin-Fernandez[1]; Christopher Petersson[2]; Peter Szakalos[2]; [1]CENIM-CSIC; [2]KTH Royal Institute of Technology

9:50 AM Break

10:10 AM Invited
Effect of Vanadium Alloying on Pearlite Transformation: *Emmanuel De Moor*[1]; Addison Wong[1]; Lawrence Cho[1]; [1]Colorado School of Mines

10:40 AM
Solute Interactions with the Ferrite/Austenite Interface: Imed Benrabah[1]; *Hatem Zurob*[2]; Christopher Hutchinson[3]; [1]University of Lorraine; [2]McMaster University; [3]Monash University

11:00 AM
Pearlite Growth Kinetics in Fe-C-Mn Eutectoid Steels: Quantitative Evaluation of Energy Dissipation at Pearlite Growth Front via Experimental Approaches: *Yongjie Zhang*[1]; Takemasa Umeda[1]; Satoshi Morooka[2]; Stefanus Harjo[2]; Goro Miyamoto[1]; Tadashi Furuhara[1]; [1]Tohoku University; [2]Japan Atomic Energy Agency

11:20 AM
Partitioning and Non-Partitioning Growth of Austenite during Double-Soaking Treatments: *Joshua Mueller*[1]; Alexandra Glover[1]; John Speer[2]; Emmanuel De Moor[2]; [1]Michigan Technological University; [2]Colorado School of Mines

11:40 AM
Quenching and Austenite Reversion-Treated Medium Mn Steel Containing Various Precipitates: *Jinkyung Kim*[1]; Yong-Su Lim[1]; [1]Hanyang University

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NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy Systems — Ceramics for Structure, Coating, Shielding & Fusion

Sponsored by: ACerS Energy Materials and Systems Division, TMS: Nuclear Materials Committee

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Theodore Besmann, University of South Carolina; Charmayne Lonergan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Kaustubh Bawane, Idaho National Laboratory; Joshua White, Los Alamos National Laboratory; Christian Deck, General Atomics; Gordon Thorogood, Australian Nuclear Science and Technology Organization

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Session Chairs: Jian Gan, Idaho National Laboratory; Lingfeng He, North Carolina State University

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8:00 AM Invited
Compositionally Complex Carbide Ceramics: A Perspective on Irradiation Damage: *Bai Cui*[1]; Lanh Trinh[1]; Fei Wang[1]; Kaustubh Bawane[2]; Khalid Hatter[3]; Zilong Hua[2]; Linu Malakkal[2]; Lingfeng He[4]; Luke Wadle[1]; Yongfeng Lu[1]; [1]University of Nebraska Lincoln; [2]Idaho National Laboratory; [3]University of Tennessee, Knoxville; [4]North Carolina State University

8:30 AM
Irradiation Study of TiN Inner-Wall Coating for Advanced Cladding to Suppress FCCI: *Jian Gan*[1]; Yizhi Zhang[2]; Yifan Zhang[2]; Jiawei Song[2]; Haiyan Wang[2]; Yinbin Miao[3]; Peter Mouche[3]; Kun Mo[3]; Bei Ye[3]; Abdellatif Yacout[3]; Brandon Miller[1]; Laura Hawkins[1]; [1]Idaho National Laboratory; [2]Purdue University; [3]Argonne National Laboratory

8:50 AM
Advanced FCCI Barrier Coatings: Enhancing Fuel Cladding Performance Against Metallic Fuels at High Temperatures: *Sumit Bhattacharya*[1]; Shipeng Shu[1]; Abdellatif Yacout[1]; [1]Argonne National Laboratory

9:10 AM
Room Temperature Micro-Cold Spray of Ceramic Thick Films: *Desiderio Kovar*[1]; [1]University of Texas

9:30 AM Invited
Advanced Moderator Module (AMM) Manufacturing: *Sumit Bhattacharya*[1]; Yinbin Miao[1]; Holly Trellue[2]; Erik Luther[2]; Abdellatif Yacout[1]; [1]Argonne National Laboratory; [2]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
Indirect Powder Bed Fusion of Ceramics for Neutron Radiation Shielding: *Arturo Hernandez-Barreto*[1]; Julian Gawel[1]; Desiderio Kovar[1]; Sheldon Landsberger[1]; Jason Benkoski[2]; [1]The University Of Texas At Austin; [2]Los Alamos National Laboratory

10:40 AM
Performance of CrAl/Al2O3 Multilayer H2 Permeation Barrier Designed for High Temperature Metal Hydride-Based Neutron Moderators: *Sumit Bhattacharya*[1]; Chase Taylor[2]; Thomas Fuerst[3]; Nathan Gehmlich[3]; Yinbin Miao[1]; Shipeng Shu[1]; Holly Trellue[4]; Abdellatif Yacout[1]; [1]Argonne National Laboratory; [2]Idaho National Laboratory ; [3]Idaho National Laboratory; [4]Los Alamos National Laboratory

11:00 AM Invited
Mechanisms Controlling Defect Evolution in Irradiated CeO2 Using In-Situ TEM Annealing: *Anshul Kamboj*[1]; Kaustubh Bawane[1]; Boopathy Kombaiah[1]; Matthew Mann[2]; Cody Dennett[1]; Mukesh Bachhav[1]; Zhijie Jiao[3]; Amey Khanolkar[1]; Marat Khafizov[4]; David Hurley[1]; [1]Idaho National Laboratory; [2]Air Force Research Laboratory; [3]University of Michigan; [4]Ohio State University

11:30 AM
Molecular Dynamics Simulations of Displacement Cascades in LiAlO2 and LiAl5O8 Ceramics: *Ankit Roy*[1]; Andrew Casella[1]; David Senor[1]; Weilin Jiang[1]; Ram Devanathan[1]; [1]Pacific Northwest National Lab

LIGHTWEIGHT ALLOYS

Composition–Processing–Microstructure-Property Relationships of Titanium Alloys — Deformation Behavior/3D Printing

Sponsored by: TMS: Titanium Committee

Program Organizers: Carl Boehlert, Michigan State University; Adam Pilchak, Pratt & Whitney; Dipankar Banerjee, Indian Institute of Science; Philip Eisenlohr, Michigan State University

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Session Chair: Dipankar Banerjee, Indian Institute of Science

8:00 AM Invited
Deformation and Fracture at Basal Twist Grain Boundaries In Ti-6Al-4V: Thomas Yvinec[1]; Valery Valle[2]; Florence Hamon[1]; Djafar Iabadden[3]; Julien Guénolé[3]; *Samuel Hemery*[4]; [1]ISAE-ENSMA; [2]University of Poitiers; [3]LEM3; [4]Ensma - Institute Pprime

8:30 AM Invited
Cross-Slips in a Near- Titanium Alloy Made by Additive Manufacturing: *Yu Zou*[1]; [1]University of Toronto

9:00 AM
ATI Titan 27® : Exploiting c+a Slip to Improve Performance for Aerospace: *Bhuvi Nirudhoddi*[1]; Ming Li[1]; David Shaner[1]; John Foltz[1]; Andrew Temple[1]; Erik Rogoff[1]; [1]ATI Materials

9:20 AM Invited
Investigating Cold Dwell Fatigue Failure in Dual-Phase Ti Alloys: The Perspective of Hard-Soft Grain Interactions: *Baris Yavas*[1]; Nadib Akram[1]; Asa Frye[2]; Vasisht Venkatesh[2]; Adam Pilchak[2]; David Furrer[2]; Iuliana Cernatescu[2]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney

9:50 AM Invited
Metastable and Stress-Induced Transformations in Additively Processed Ti-10V-2Fe-3Al: M.S.K.K.Y Nartu[1]; Tirthesh Ingale[1]; Srinivas Aditya Mantri[1]; Sriswaroop Dasari[1]; Abhishek Sharma[1]; Fan Sun[2]; Frederic Prima[2]; Narendra Dahotre[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]Chimie ParisTech, Institut de Recherche de Chimie Paris

10:20 AM Break

10:40 AM
Tailoring Strength and Toughness of a New Titanium Alloy, ATI Titan 23™: *John Mantione*[1]; Matias Garcia-Avila[1]; David Brice[1]; [1]ATI

11:00 AM
An AM Defect Model for Fast-Acting Probabilistic Prediction of Defects in Laser Powder Bed Fusion and Its Application to Ti-6Al-4V: *Masoud Anahid*[1]; Sergei Burlatsky[2]; Manish Kamal[3]; David Furrer[3]; [1]RTX Technology Research Center ; [2]RTX Technology Research Center; [3]Pratt & Whitney

11:20 AM
Microstructure, Mechanical, and Electrochemical Properties of Additively Manufactured Ti-5Al-5V-5Mo-3Cr (wt.%): *Zia Uddin Mahmud*[1]; Taylor Kmetz[2]; Luke Rice[2]; Jonathan H. Dwyer[2]; Carl J. Boehlert[1]; Greg Swain[1]; [1]Michigan State University; [2]Honeywell Federal Manufacturing and Technologies

11:40 AM
Influence of Zr and O on the Evolution of Microstructural Features in High γ-Phase Ti-Al-Zr Alloys: *Michal Kuriš*[1]; Mária Tsoutsouva[1]; Marc Thomas[1]; Agnés Locq[1]; Zhao Huvelin[2]; Thomas Vaubois[3]; Pierre Sallot[3]; [1]ONERA - The French Aerospace Lab; [2]Cetim - Centre technique des industries mécaniques; [3]Safran Tech

MODELING

Computation Assisted Materials Development for Improved Corrosion Resistance — Computation Assisted Materials Development for Improved Corrosion Resistance

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Brian Gleeson, University of Pittsburgh; Mathias Galetz, DECHEMA-Forschungsinstitut; Tianle Cheng, National Energy Technology Laboratory

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Session Chairs: Rishi Pillai, Oak Ridge National Laboratory; Brian Gleeson, University of Pittsburgh; Mathias Galetz, DECHEMA-Forschungsinstitut; Tianle Cheng, National Energy Technology Laboratory

8:00 AM Invited
Atomic Origins of CO2-Promoted Oxidation of Chromia-Forming Alloys: *Guangwen Zhou*[1]; [1]State University of New York at Binghamton

8:30 AM Invited
New Approaches Towards Computational Modeling of Metal Dusting: *Clara Schlereth*[1]; Emma White[1]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut

9:00 AM
Impact of Water Vapor Content and Oxygen Partial Pressure on Oxidation Behavior of NiCr Alloys at 950 °C: *Marie Romedenne*[1]; Yi-Feng Su[1]; Jonathan Poplawsky[1]; Rishi Pillai[1]; [1]Oak Ridge National Laboratory

9:20 AM Invited
Re-Thinking Chemical Lifetime of Chromia-Forming Ferritic Stainless Steels: *Anton Chyrkin*[1]; [1]Chalmers University of Technology

9:50 AM
Assessment of the Role of Minor Refractory Alloying Additions in Affecting Alumina-Scale Formation During High-Temperature Oxidation of Ni-based model alloys: *Rafael Rodriguez De Vecchis*[1]; Rishi Pillai[2]; Kim Kisslinger[3]; Meng Li[3]; Judith Yang[3]; Brian Gleeson[1]; [1]University of Pittsburgh; [2]Oak Ridge National Laboratory; [3]Brookhaven National Laboratory

10:10 AM Break

10:30 AM Invited
Quantifying the Impact of Microstructure on the Corrosion of Structural Alloys by Molten Salt Using Mesoscale Modeling with the MOOSE Framework: *Michael Tonks*[1]; Chaitanya Bhave[2]; Thompson Igunma[1]; Soumya Bandyopadhyay[1]; Cole Evered[3]; Adrien Couet[3]; Kumar Sridharan[3]; [1]University of Florida; [2]Idaho National Laboratory; [3]University of Wisconsin-Madison

11:00 AM
Phase-Field Modeling of Thermally Grown Oxide and Induced Damage and Cracking in Environmental Barrier Coatings: *Tianle Cheng*[1]; Fei Xue[1]; Yinkai Lei[1]; Richard Oleksak[2]; Omer Dogan[2]; Youhai Wen[2]; [1]National Energy Technology Laboratory / NETL Support Contractor; [2]National Energy Technology Laboratory

11:20 AM
Phase Field Numerical Model for Simulating the Activation and Diffusion Controlled Stress Corrosion Cracking Phenomena in Anisotropic Material: *Christian Mathew*[1]; Yao Fu[1]; [1]Virginia Polytechnic Institute and State University

11:40 AM
Predicting Oxidation Behavior of Ni-Based Superalloys with Physics-Informed Machine Learning: *William Trehern*[1]; Aditya Sundar[2]; Leebyn Chong[2]; Richard Oleksak[1]; Madison Wenzlick[1]; Kyle Rozman[1]; Martin Detrois[1]; Paul Jablonski[1]; Michael Gao[1]; [1]National Energy Technology Laboratory; [2]NETL Support Contractor

FUNDAMENTALS AND CHARACTERIZATION

Computational Materials for Qualification and Certification — Thermal Simulations and Phase Transformations

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Corbett Battaile, Sandia National Laboratories; Anthony Rollett, Carnegie Mellon University; Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration

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Session Chairs: Scott Cochran, Lockheed Martin Space; Harry Millwater, University of Texas at San Antonio

8:00 AM Invited
Efficient Sensitivity and Uncertainty Analysis of a Laser Powder Bed Fusion Thermal Model Built Using HYPAD-FEM: *Harry Millwater*[1]; Juan-Sebastian Rincon-Tabares[1]; Samuel Roberts[1]; Matthew Balcer[1]; Mauricio Aristizabal[1]; Arturo Montoya[1]; David Restrepo[1]; [1]University of Texas at San Antonio

8:30 AM Invited
GO-MELT: GPU-Optimized Multilevel Execution of LPBF Thermal Simulations: Joseph Leonor[1]; Seyed Mohammad Elahi[1]; Andrew Potts[1]; Zhongsheng Sang[1]; *Gregory Wagner*[1]; [1]Northwestern University

9:00 AM Invited
Convolution-Based Numerical Solutions of Transient Temperature Fields during Powder Bed Fusion Additive Manufacturing: Theory, Accuracy, and Computational Cost: Brodan Richter[1]; *Joshua Pribe*[2]; George Weber[1]; Peter Spaeth[1]; Edward Glaessgen[1]; [1]NASA Langley Research Center; [2]Analytical Mechanics Associates

9:30 AM Invited
Computational Framework for Spatially-Dependent Melt Pool and Microstructure Simulations of Additively Manufactured Material: *Gerry Knapp*[1]; John Coleman[1]; Matthew Rolchigo[1]; Selda Nayir[1]; Sam Reeve[1]; Alex Plotkowski[1]; [1]Oak Ridge National Laboratory

10:00 AM Break

10:20 AM
Physics-Based Modeling of Ti-6Al-4V Phase Transformations for PBF-LB Temperature Histories: *Evan Adcock*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

10:40 AM
Process Sensitivity of Laser Powder Bed Fusion of IN718 to Composition Variation: *Li Ma*[1]; Pranav Karve[2]; Hasan James[3]; Sankaran Mahadevan[2]; S. Mohadeseh Taheri-Mousavi[3]; Steven Storck[1]; Morgan Trexler[1]; Somnath Ghosh[4]; Anthony Rollett[3]; Brendan Croom[1]; [1]Johns Hopkins University Applied Physics Laboratory; [2]Vanderbilt University; [3]Carnegie Mellon University; [4]Johns Hopkins University

11:00 AM
Uncertainty Quantification in Process-Structure-Property Dynamics of IN718: *Hasan Al Jame*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion and Environmental Degradation: Theory and Practice — Session III

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Haozheng Qu, GE Global Research; Bai Cui, University of Nebraska Lincoln; Kaila Bertsch, Lawrence Livermore National Laboratory; Karthikeyan Hariharan, Friedrich Alexander University, Erlangen-Nuremberg

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Session Chairs: Haozheng Qu, GE Vernova Advanved Research; Mengying Liu, Washington and Lee University

8:00 AM Invited
In Situ Investigation of Hydrogen-Assisted Crack Initiation in Nickel-Based Alloy 725: *Mengying Liu*[1]; [1]Washington and Lee University

8:30 AM
Revisiting Mechanisms for Hydrogen-Assisted Fracturing of Ni-Fe-Cr Alloys: *Kaori Kawano*[1]; [1]Nippon Steel Corporation

8:50 AM
Dislocation Nano-Hydrides In Nickel: Energetics and Effects on the Plastic Deformation: *Fernando Leon-Cazares*[1]; Xiaowang Zhou[1]; Chris San Marchi[1]; [1]Sandia National Laboratories

9:10 AM
Effect of Hydrogen Concentration on the Monotonic Deformation Behavior of Pure Nickel: *Mohammad Imroz Alam*[1]; Zachary Harris[1]; [1]University of Pittsburgh

9:30 AM
Effect of Welding Condition on Hydrogen Embrittlement in Weld Joint of 316L Stainless Steel: *Jimin Nam*[1]; Jaeseok Yoo[2]; Changwook Ji[3]; Seung-gun Lee[4]; Namhyun Kang[1]; [1]Pusan National University; [2]Hanwha Ocean; [3]Korea Institute of Industrial Technology; [4]Korea Institute of Materials Science

9:50 AM
Evaluation of Environmentally Assisted Cracking on Wire Arc Additively Manufactured (WAAM) AISI 316LSi.: *Vishnu Ramasamy*[1]; Brett Ley[1]; John Lewandowski[1]; [1]Case Western Reserve University

IRON AND STEEL (FERROUS ALLOYS)

Electrification of Iron and Steel — Green Ironmaking, Ore Beneficiation, & Cross-Pollination

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Leora Dresselhaus-Marais, Stanford University; Kerry Rippy, National Renewable Energy Laboratory; Ronald O'Malley, Missouri University of Science and Technology; David Marshall, Performance improvement Inc; Madhu Ranade, Steel Dynamics, Flat Roll Group; Joseph Morey, Morey Industrial Consulting

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Session Chair: Joseph Morey, Morey Industrial Consulting

8:00 AM
Impact of Varied Oxygen Injection on Refining Process in an Industry-Scale EAF Through CFD Model: *Sathvika Kottapalli*[1]; Orlando Ugarte[1]; Bikram Konar[2]; Tyamo Okosun[1]; Chenn Zhou[1]; [1]Purdue University Northwest; [2]EVRAZ North America

8:20 AM Invited
The Helios Cycle - A Novel Method to Reduce Iron Ore: *Ronen Weingarten*[1]; Udi Galati[1]; [1]Helios

8:50 AM Question and Answer Period

9:00 AM
A Volume Expansion Decarburization Kinetics of a Fe-1wt%.C Liquid Steel by Varying Ar-CO2 Ratio Used for Electric Arc Furnace: *Yongsug Chung*[1]; Joonho Lee[1]; [1]Tech University of Korea

9:20 AM
Electrified CSP® Nexus Solution: Chad Donovan[1]; *Cosimo Cecere*[1]; [1]SMS group

9:40 AM
Simulation of Steel Slab Induction Heating with an Adaptive Soaking Process: Misbahuddin Husaini Syed[1]; *Abhishek Kolakotla*[1]; Nicholas Walla[1]; Armin Silaen[1]; Chenn Zhou[1]; [1]Purdue University Northwest

10:00 AM Break

10:20 AM Invited
Decarbonizing EAF Steelmaking by Using CO2-Sourced Graphite Electrodes in EAF Steelmaking: *Randall Smith*[1]; [1]Seerstone Development LLC

10:50 AM Question and Answer Period

11:00 AM
Application and Prospect of Biomass Carbonization Process in the Field of Ironmaking: *Hui Sun*[1]; [1]China ENFI Engineering Corporation

11:20 AM Invited
Electrochemical Co-Recovery of Energy Critical Metals, Silica, and Calcium and Magnesium Hydroxides from Slags: *Prince Ochonma*[1]; Greeshma Gadikota[1]; [1]Cornell University

11:50 AM Question and Answer Period

FUNDAMENTALS AND CHARACTERIZATION

Emergent Materials under Extremes and Decisive In Situ Characterizations — Next-Generation X-Ray and Neutron Capabilities and High-Pressure Research

Sponsored by: ACerS Basic Science Division, TMS: Nuclear Materials Committee

Program Organizers: Xiaofeng Guo, Washington State University; Xujie Lü , Center for High Pressure Science & Technology Advanced Research; Hua Zhou, Argonne National Laboratory; Judith Driscoll, University of Cambridge; Andrew Strzelecki, Los Alamos National Laboratory

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Session Chair: Xiaofeng Guo, Washington State University

8:00 AM Invited
High Spatiotemporal Characterization of Light-Matter Interactions by UEM: *Haihua Liu*[1]; Thomas E. Gage[1]; Ilke Arslan[1]; [1]Argonne National Laboratory

8:30 AM Invited
Multiple Timescale X-Ray Spectroscopy and Scattering for Emerging Energy Materials: *Xiaoyi Zhang*[1]; [1]Argonne National Laboratory

9:00 AM
Quantifying High-Pressure Fe Recrystallization Kinetics Using In Situ Synchrotron X-Ray Multi-Anvil Compression: *Darren Pagan*[1]; Lukas Kissel[1]; Matthew Whitaker[2]; [1]Pennsylvania State University; [2]SUNY Stonybrook

9:20 AM Invited
Interplay of Charge Ordering and Superconductivity in TMD Materials under High Pressure: *Wenge Yang*[1]; [1]Center for High Pressure Science and Technology Advanced Research

9:50 AM Break

10:10 AM Invited
Investigation on Retention of Pressure-Induced/-Enhanced Superconductivity at Ambient Pressure: *Liangzi Deng*[1]; [1]Texas Center for Superconductivity at UH

10:40 AM
Origin of the Near-Room Temperature Resistance Transition in Lutetium with H2/N2 Gas Mixture under High Pressure: *Qiaoshi Zeng*[1]; [1]Hpstar

11:00 AM
HP-XAFS and the Local Structure of GeO2 Glass at High Pressure: *Xinguo Hong*[1]; Matt Newville[2]; [1]Center for High Pressure Science and Technology Advanced Research; [2]Center for Advanced Radiation Sources, University of Chicago

11:20 AM
In Situ Characterization on Thermal Evolution of Severe Plastic Deformation Processed Materials, by Advanced Synchrotron and Neutron Methods: *Klaus-Dieter Liss*[1]; Megumi Kawasaki[2]; [1]University of Tennessee, Knoxville; [2]Oregon State University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Batteries and Storages I

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Dong Hou, Clemson University; Kai He, University of California, Irvine

8:00 AM Invited
Advanced Transmission Electron Microscopy for Energy Materials: *Kai He*[1]; [1]University of California, Irvine

8:30 AM
Investigation of Oxygen Vacancies in MgO- based Oxides with Cations: *Ting Shen*[1]; Oriyomi Opetubo[1]; Dilpuneet Aidhy[1]; Rajendra Bordia[1]; [1]Clemson University

8:50 AM
Low-Temperature Production of Battery Grade Graphite from Coal with Recovery and Reuse of the Catalyst: *Ki-Joong Kim*[1]; Viet Hung Pham[1]; Ngoc Tien Huynh[1]; Yuan Gao[1]; YunYang Lee[1]; Congjun Wang[1]; Christopher Matranga[1]; [1]National Energy Technology Laboratory

9:10 AM
A 2-D Carbonaceous Silicon Oxycarbide (SiOC) Composite Anode with High Electrochemical Performance for Li-Ion Batteries: *Dillip Panda*[1]; Gangadhar Jella[2]; Nawraj Sapkota[1]; Apparao Rao[1]; Ravindran Sujith[2]; Rajendra Bordia[1]; [1]Clemson University; [2]Birla Institute of Technology and Science Pilani-Hyderabad Campus, Hyderabad,

9:30 AM
Peeling Back the Layers of Battery Materials with Correlative Microscopy: Novel Techniques for Characterizing Batteries and Materials in 2D and 3D at High Resolution: *Andy Holwell*[1]; Ria Mitchell[1]; Stephen Kelly[1]; [1]Carl Zeiss Microscopy LLC

9:50 AM Break

10:10 AM
Synthesizing Highly Crystalline Graphite Powder from Bulk Polyethylene Waste for Lithium-Ion Battery Anodes: *Ngoc Tien Huynh*[1]; Yuan Gao[1]; YunYang Lee[1]; Ki-Joong Kim[1]; Viet Hung Nguyen[1]; Congjun Wang[1]; Christopher Matranga[1]; [1]NETL/ DOE

10:30 AM
Development and Understanding of TiS2 for Use as Diffusion-Dependent Cathodes Active Materials on All-Solid-State Li-Ion Batteries: *Maelle Marchand-Nowak*[1]; Laurent Calvez[1]; Pierre-Etienne Cabelguen[2]; Enora Lavanant[2]; Louisiane Verger[1]; Hanane El Marsi[1]; Antoine Gautier[1]; David Le Coq[1]; [1]Rennes Institut of Chemical Sciences; [2]Umicore

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Energy Harvesting II

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Charmayne Lonergan, Missouri University of Science and Technology; Yang Bai, University of Oulu

8:00 AM Invited
Ag Nanoaggregates as Broadband Boosters for RE $^{3+}$-Ions Towards Efficient and Sustainable Energy Conversion and Lighting: *Francesco Enrichi*[1]; [1]University of Verona

8:30 AM Invited
Complex Nano-Structured Oxide, Composite and Metal Sponges for Sensing and Energy-Applications: *Gunnar Westin*[1]; [1]Uppsala University

9:00 AM
Rudorffites: Lead-free Perovskite-Inspired Copper Pnictohalides For Next-Generation Photovoltaics: *Rupam Datta*[1]; Alexander Colsmann[1]; Holger Röhm[1]; [1]Karlsruhe Institute of Technology

9:20 AM
Designed Polymer Ligands for Perovskite Quantum Dots and their Block Copolymer Nanocomposites: *Naifu Shen*[1]; Chenghan Tsai[1]; Weinan Xu[1]; [1]The University of Akron

9:40 AM
Photoresponsive Piezoelectric Ceramics for Multisource Energy Harvesting and Sensing: *Yang Bai*[1]; [1]University of Oulu

10:10 AM Break

10:30 AM Invited
Engineered Nanomaterials for Energy and Environment: From Synthesis to Applications: *Elisa Moretti*[1]; [1]Ca' Foscari University of Venice

11:00 AM
Ceramics Nanocomposite Materials for Green Energy and Heat Management: Zouhair Hanani[1]; Brigita Rozic[1]; Daoud Mezzane[2]; Mimoun El Marssi[3]; Anna Morozovska[4]; Serhii Ivanchenko[5]; Hana Ursic[1]; Matjaz Spreitzer[1]; *Zdravko Kutnjak*[1]; [1]Jozef Stefan Institute; [2]Cadi Ayyad University; [3]Univerity of Picardie Jules Verne; [4]Institute of Physics, National Academy of Sciences of Ukraine; [5]Institute for Problems of Materials Science, National Academy of Sciences of Ukraine

11:20 AM
Carbon Fiber Structural Composites as Flat Inductors, with Relevance to Induction-Based Energy Devices: *Sruthi Krishnaswamy Narayanan*[1]; Deborah Chung[1]; [1]University at Buffalo, The State University of New York

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Engineering Ceramics: Microstructure-Property-Performance Relations and Applications III

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Junichi Tatami, Yokohama National University; Young-Wook Kim, University of Seoul; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

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Session Chairs: Cesar Octavio Romo de la Cruz, West Virginia University; Anumeet Kaur, Global Group of Institutes

8:00 AM
Thermoelectric Oxide Ceramics Outperforming Single Crystals and with Synergistic Integration of Intergranular Segregation and Intragranular Nano-Inclusions: *Cesar Octavio Romo de la Cruz*[1]; Geoffroy Gauneau[1]; Yun Chen[1]; Xueyan Song[1]; [1]West Virginia University

8:20 AM
Enhanced Spontaneous Ferroelectric Polarization in Sm-Doped $BaFe_{0.2}Ti_{0.8}O_3$ Ceramics: *Anumeet Kaur*[1]; Arkaprava Das[2]; [1]Global Group of Institutes; [2]University of Tübingen, Tubingen, Germany. 72074

8:40 AM
Impact of Mixed Valence Dopants and Related Grain Boundary Segregation on the Seebeck Coefficient of $Ca_3Co_4O_9$ Ceramics: *Geoffroy Gauneau*[1]; Cesar-Octavio Romo-de-la-Cruz[1]; Fuming Jiang[1]; Yun Chen[1]; Xueyan Song[1]; [1]West Virginia University

9:00 AM
Additive Manufacturing of Misfit Layered Thermoelectric $BiCaCoO_6$ Ceramics: *Ellena Gemmen*[1]; Cesar-Octavio Romo-de-la-Cruz[1]; Yun Chen[1]; Xueyan Song[1]; [1]West Virginia University

ARTIFICIAL INTELLIGENCE

Frontiers of Machine Learning on Materials Discovery — Frontiers of Machine Learning Session II

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Rinkle Juneja, Oak Ridge National Laboratory; Mingda Li, Mit; Hiroyuki Hayashi, Kyoto University

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Session Chairs: Ying Wai Li, Los Alamos National Laboratory; Mingda Li, Massachusetts Institute of Technology

8:00 AM Keynote
Reinforcement Learning for Materials Science: Algorithms, Challenges and Applications to Improve Understanding of System Dynamics: *Rama Vasudevan*[1]; [1]Oak Ridge National Laboratory

8:40 AM
Variable Selection for Small-Scale Chemical Experimental Data Based on Bayesian Inference: *Yasuhiko Igarashi*[1]; Yuki Namiuchi[1]; Koki Obinata[2]; Kan Hatakeyama[3]; Yuya Oaki[4]; Masato Okada[2]; [1]University of Tsukuba; [2]The University of Tokyo; [3]Tokyo Institute of Technology; [4]Keio University

9:00 AM Invited
Accelerating Defect Predictions in Semiconductors Using Crystal Graphs: Arun Kumar Mannodi Kanakkithodi[1]; *Md Habibur Rahman*[1]; [1]Purdue University

9:20 AM Invited
Inverse Design of Quantum Materials by High-Throughput Calculations and Optimization Techniques: *Ying Wai Li*[1]; Christopher Lane[1]; Jianxin Zhu[1]; [1]Los Alamos National Laboratory

9:40 AM
abICS Framework for ab initio Statistical Thermodynamics of Complex Oxides Accelerated by Machine Learning: *Shusuke Kasamatsu*[1]; [1]Yamagata University

10:00 AM Break

10:20 AM Invited
Data-Driven Accelerated Discovery of Novel Battery Materials: *Ritesh Kumar*[1]; Minh Vu[1]; Peiyuan Ma[1]; Chibueze Amanchukwu[1]; [1]University of Chicago

10:40 AM Invited
Accelerating Glass Discovery through Artificial Intelligence and Machine Learning: *N M Anoop Krishnan*[1]; [1]Indian Institute of Technology Delhi

11:00 AM Invited
A Hierarchical Machine Learning Scheme to Identify Promising New Scintillators: Anjana Talapatrra[1]; Ghanshyam Pilania[2]; Christopher Stanek[1]; *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory; [2]GE

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Mechanical Properties & Mechanics

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chairs: Melissa Santala, Oregon State Unviersity; Amanda Krause, Carnegie Mellon University

8:00 AM Invited
STEM Dynamic Observations of Grain Boundary Fracture, Diffusion and Phase Transformation in Oxides: *Yuichi Ikuhara*[1]; [1]University of Tokyo

8:30 AM
In Situ TEM Strain Rate Dependence of Activation Volume in Au Ultrafine Grained Thin Films: *Yichen Yang*[1]; Kunqing Ding[1]; Ting Zhu[1]; Josh Kacher[1]; Olivier Pierron[1]; [1]Georgia Institute of Technology

8:50 AM
Multi-Scale Analysis of Lath Boundary Sliding during Plastic Deformation of Lath Martensite In Low-Carbon-Steel: *Shuang Gong*[1]; Junya Inoue[1]; [1]University of Tokyo

9:10 AM
Influence of Alloying in and (In+Ni) on Nanoindentation Creep and Diffusion-Controlled Growth in Sn(0.7 wt.% Cu)/Cu Interface: *Ayushi Thakur*[1]; Jayant Jain[1]; Sangeeta Santra[1]; [1]Indian Institute of Technology Delhi

9:30 AM
Billion-Cycle Fatigue Endurance Enabled via Grain Boundary Stabilization: *Manish Jain*[1]; Daniel Vizoso[1]; Alejandro Hinojos[1]; Alejandro Barrios[2]; Kyle Dorman[1]; David Adams[1]; Douglas Medlin[1]; Remi Dingreville[1]; Olivier Pierron[3]; Brad Boyce[1]; [1]Sandia National Laboratories; [2]Colorado School of Mines; [3]Georgia Institute of Technology

9:50 AM
The Role of Grain Boundary Dislocations in the Deformation of Polycrystalline Materials: *Yan Huang*[1]; [1]Brunel University London

10:10 AM Break

10:30 AM
Role of Ripplocations and Ripplocation Boundaries on the Deformation of Graphite: *Kaustubh Sudhakar*[1]; [1]Drexel University

10:50 AM
A Model for Grain Boundary Strengthening: *Roberto Figueiredo*[1]; [1]Universidade Federal De Minas Gerais

11:10 AM
Thicker Amorphous Grain Boundary Complexions Lead to Increased Plasticity in Nanocrystalline Cu Alloys: *Esther Hessong*[1]; Tongjun Niu[2]; Nicolo Maria della Ventura[3]; Brad Boyce[4]; Saryu Fensin[2]; Timothy Rupert[1]; [1]University of California, Irvine; [2]Los Alamos National Laboratory; [3]University of California, Santa Barbara; [4]Sandia National Laboratories

11:30 AM
Stabilized Grain Boundaries in CuTa Alloys and Their Resulting Properties: *Kris Darling*[1]; Billy Hornbuckle[1]; Anthony Roberts[1]; Anit Giri[1]; Sean Fudger[1]; Tom Luckenbaugh[1]; Phil Jannotti[1]; Steven Dean[1]; Dan Casem[1]; Scott Turnage[1]; Cyril Williams[1]; [1]Devcom Us Army Research Laboratory

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session VI

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Amy Clarke, Los Alamos National Laboratory

8:00 AM Invited
ML-Based Identification, Synthesis and Characterization Refractory High Entropy Alloy with Trade-Off Mechanical Properties: *Debasis Sengupta*[1]; Stephen Giles[1]; Hugh Shortt[2]; Peter Liaw[2]; [1]CFD Research Corp; [2]University of Tennessee, Knoxville

8:20 AM Invited
MPEA Filler Design Enabling New Opportunities for Similar and Dissimilar Joining: *Zhenzhen Yu*[1]; Benjamin Schneiderman[2]; Aric Adamson[1]; Warren Miglietti[3]; Alexander Hansen[1]; Aaron Wells[1]; [1]Colorado School of Mines; [2]HYSA Fillers; [3]Prince and Izant

8:40 AM Invited
New Insight into the Disordering Mechanism in Fluorite-Related Ceramics: *Maik Lang*[1]; [1]University of Tennessee

9:00 AM Invited
On the Mesoscale-Complexity of Macroscopically-Smooth Plastic Flow in an Al-Containing High-Entropy Alloy: *Jamieson Brechtl*[1]; Rui Feng[2]; Peter Liaw[3]; Benoît Beausir[4]; Hafsa Jaber[4]; Tatiana Lebedkina[4]; Mikhail Lebyodkin[4]; [1]Oak Ridge National Laboratory; [2]National Energy Technology Laboratory; [3]University of Tennessee-Knoxville; [4]Université de Lorraine

9:20 AM
Oxygen Vacancy Formation Energetics in MgO-Based High Entropy Oxides from DFT and Experimental Validation: *Oriyomi Opetubo*[1]; Ting Shen[1]; Rajendra Bordia[1]; Dilpuneet Aidhy[1]; [1]Clemson University

9:40 AM Invited
Phase Transformation and Deformation Behavior in a B2-Base High-Entropy Alloy: Rui Feng[1]; You Rao[2]; Chuan Zhang[3]; Maryam Ghazisaeidi[2]; *Peter Liaw*[4]; Ke An[5]; [1]National Energy Technology Laboratory; [2]The Ohio State University; [3]CompuTherm LLC; [4]The University of Tennessee, Knoxville; [5]Oak Ridge National Laboratory

10:00 AM Break

10:20 AM Invited
Predicting Coefficient of Thermal Expansion and Temperature-Dependent Elastic Properties of High Entropy Alloys: Yi Wang[1]; Saro San[1]; *Michael Gao*[1]; [1]National Energy Technology Laboratory

10:40 AM Invited
Predicting Yield Strength of Multi-Principal Element Alloys from Density Functional Theory Calculations: Siming Zhang[1]; *Guofeng Wang*[1]; [1]University of Pittsburgh

11:00 AM Invited
Probing Phase Stability in CrMoNbV Using Atomistic Simulations, CALPHAD Calculations and Experiments: *Amit Samanta*[1]; Siya Zhu[2]; Jibril Shittu[1]; Aurelien Perron[1]; Chiraag Nataraj[3]; Joel Berry[1]; Joseph McKeown[1]; Axel Walle[2]; [1]Lawrence Livermore National Laboratory; [2]Brown University; [3]Sandia National Laboratory

11:20 AM
Investigation on Superplastic Behavior of L21 Precipitate-Strengthened Al-Cr-Fe-Ni-Ti High Entropy Alloy: *Kanghyun Park*[1]; Kangjin Lee[1]; Sang Hun Shim[2]; Ka Ram Lim[2]; Chanho Lee[3]; Gian Song[1]; [1]Kongju National University; [2]Korea Institute of Materials Science (KIMS); [3]Auburn University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session VII

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Yu Zhong, Worcester Polytechnic Institute

8:00 AM Invited
Mining Lattice Distortion, Strength, and Intrinsic Ductility of Refractory High-Entropy Alloys Using Physics-Informed Statistical Learning: *Yong-Jie Hu*[1]; Christopher Tandoc[1]; [1]Drexel University

8:20 AM Invited
Processing of Refractory and Refractory Multi-Principal Element Alloys: *Amy Clarke*[1]; [1]Los Alamos National Laboratory

8:40 AM Invited
Short- and Long-Range Chemical Order in AlCrTiV: *Michael Widom*[1]; [1]Carnegie Mellon University

9:00 AM
Laser Directed Energy Deposition of NiCoCr Medium Entropy Alloy: *Thaer Syam*[1]; Vasanth Shunmugasamy[2]; Ibrahim Karaman[1]; Bilal Mansoor[1]; [1]Texas A&M University; [2]Texas A&M University at Qatar

9:20 AM
Mediating Plasticity in High-Entropy Alloys with High Stacking -Fault Energy via Nanotwins/9R under Extreme Conditions: *Aomin Huang*[1]; Enrique Lavernia[1]; Marc Meyers[2]; Carlos Ruestes[3]; Mingjie Xu[3]; [1]Texas A&M University; [2]University of California San Diego; [3]University of California, Irvine

9:40 AM Invited
Selective Laser Sintering and Spark Plasma Sintering of Compositionally Complex Carbide Ceramics: *Bai Cui*[1]; Lanh Trinh[1]; Zilong Hua[2]; Kaustubh Bawane[2]; Lingfeng He[3]; Linu Malakkal[2]; Xin Chen[1]; Luke Wadle[1]; Yongfeng Lu[1]; [1]University of Nebraska Lincoln; [2]Idaho National Laboratory; [3]North Carolina State University

10:00 AM Break

10:20 AM Invited
Thermodynamics and Plastic Deformation in BCC Refractory CCAs: *Eric Lass*[1]; [1]University of Tennessee-Knoxville

10:40 AM Invited
Ubiquitous Short-Range Order in Multi-Principal Element Alloys: *Yang Yang*[1]; [1]Pennsylvania State University

11:00 AM Invited
Ultra Low Density High Entropy Metamaterials: Dustin Gilbert[1]; *Cameron Jorgensen*[1]; [1]University of Tennessee

11:20 AM Invited
Unlocking Uniformity: Investigating the Influence of Reactive Element Additions and Al-Zr Intermetallics on Al2O3 Formation in RHEAs: *Elaf Anber*[1]; David Beaudry[1]; Charlie Brandenburg[2]; Sebastian Lech[1]; Elizabeth Opila[2]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]University of Virginia

11:40 AM
Study of Ductility and Plasticity of HfTiZrNbTa High-Entropy Alloys Using In-Situ Neutron Diffraction: *Lia Amalia*[1]; John Whitlow[1]; Xuesong Fan[1]; Nathan Grain[1]; Melanie Moczadlo[1]; Eric Lass[1]; Yanfei Gao[1]; Ke An[2]; Yan Chen[2]; Dunji Yu[2]; Peter Liaw[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

SPECIAL TOPICS

Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday — Progress in MAX Phases III

Sponsored by: ACerS Basic Science Division, ACerS Engineering Science Division

Program Organizers: Surojit Gupta, University of North Dakota; Miladin Radovic, Texas A&M University; Michael Naguib, Tulane University

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Session Chairs: Ankit Gupta, Baylor University; Joshua Snyder, Drexel University; Varun Natu, National Chemical Laboratory; Qing Huang, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Science

8:00 AM Invited
Synthesis Science of MAX Phases: A Chemist's Journey to New Functional Ceramics: *Christina Birkel*[1]; [1]Arizona State University/ Technische Universitaet Darmstadt

8:30 AM Invited
Unraveling Mechanistic Origins of Plasticity in MAX Phases: Dislocations, Kinking, and Delamination: Gabriel Plummer[1]; Ankit Gupta[2]; *Garritt Tucker*[2]; [1]NASA Ames Research Center; [2]Baylor University

9:00 AM Invited
On the Design and Characterization of Novel Ceramics for High Performance Applications: *Surojit Gupta*

9:30 AM Invited
Surface Chemistry and Counter Cation Control of Carrier Dynamics in One-Dimensional Lepidocrocite TiO_2: Julia Martin[1]; Erika Colin-Ulloa[2]; Tianqi Jin[2]; Adam Walter[3]; Hussein Badr[3]; Joshua Uzarski[4]; Michel Barsoum[3]; Lyubov Titova[2]; *Ronald Grimm*[2]; [1]National Renewable Energy Laboratory; [2]Worcester Polytechnic Institute; [3]Drexel University; [4]U.S. Army Natick Soldier Systems Center (NSSC)

10:00 AM Break

10:20 AM Invited
Enhancing the Oxidation Resistance of MXenes by Selective Edge Functionalization: *Varun Natu*[1]; [1]National Chemical Laboratory

ARTIFICIAL INTELLIGENCE

Integrated Computational Materials Engineering for Physics-Based Machine Learning Models — Integrated Computational Materials Engineering for Physics-Based Machine Learning Models

Sponsored by: TMS: Integrated Computational Materials Engineering Committee

Program Organizers: William Frazier, Pacific Northwest National Laboratory; Lei Li, Pacific Northwest National Laboratory; Yucheng Fu, Pacific Northwest National Laboratory; Philip Goins, US Army Research Laboratory; Zhengtao Gan, The University of Texas at El Paso

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Session Chair: William Frazier, Pacific Northwest National Laboratory

8:00 AM
A Multiscale Simulation Investigation of Cavity Evolution in a Ni TPBAR Coating: *William Frazier*[1]; Giridhar Nandipati[1]; Danny Edwards[1]; Andrew Casella[1]; David Senor[1]; [1]Pacific Northwest National Laboratory

8:20 AM
PRISMS-MultiPhysics: An Open-Source Coupled Phase Field-Crystal Plasticity Framework and its Application to Simulate Twinning in Magnesium Alloys: *David Montiel*[1]; Chaitali Patil[1]; Mohammadreza Yaghoobi[1]; Brian Puchala[1]; Anton Van der Ven[2]; Katsuyo Thornton[1]; Veera Sundararaghavan[1]; John Allison[1]; [1]University of Michigan; [2]University of California, Santa Barbara

8:40 AM
Phase-Field Modeling of Grain Evolution and Recrystallization in Friction Stir Processing: *Zhengtao Gan*[1]; [1]University of Texas at El Paso

9:00 AM
Advanced Coupling of an FFT-Based Mesoscale Modeling Method to a Macroscale Finite Element Method: *Evan Lieberman*[1]; Miroslav Zecevic[1]; Caleb Yenusah[2]; Nathaniel Morgan[1]; Ricardo Lebensohn[1]; [1]Los Alamos National Laboratory; [2]SLB

9:20 AM
Developing Data-Driven Strength Models Incorporating Temperature and Strain-Rate Dependence: *Nicole Aragon*[1]; David Montes de Oca Zapiain[1]; Corbett Battaile[1]; Hojun Lim[1]; [1]Sandia National Laboratories

9:40 AM
Hybrid Machine Learning Informed Design Guidelines for Structural Gradient Alloys with Enhanced Performances: *Jixuan Dong*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM
Deep Generative Model for Reproducing Microstructure of Low-Carbon Steel During Continuous Cooling: *Junya Inoue*[1]; Satoshi Noguchi[2]; [1]The University of Tokyo; [2]JAMSTEC

10:40 AM
Deep Learning for Early Detection and Localization of Damage in Metal Plates: *Christopher Rudolf*[1]; [1]US Naval Research Laboratory

11:00 AM
Thermodynamic Integration for Dynamically Unstable Systems Using Interatomic Force Constants without Molecular Dynamics: *Junsoo Park*[1]; Zhigang Wu[1]; John Lawson[1]; [1]NASA Ames Research Center

11:20 AM
Utilizing Convex Neural Networks to Predict the Yield Surfaces of Polycrystalline Samples with Complex Crystallographic Textures: *Matt Kasemer*[1]; Lloyd van Wees[1]; Mark Obstalecki[2]; Paul Shade[2]; [1]University of Alabama; [2]Air Force Research Laboratory

LIGHTWEIGHT ALLOYS

Light Metal Technology — Light Metal Technology

Sponsored by: TMS: Composite Materials Committee

Program Organizers: Xiaoming Wang, Purdue University; Tao Wang, PSW Group; Caizhi Zhou, University of South Carolina; Meysam Haghshenas, University of Toledo

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Session Chair: Yuyang Wang, Iowa state university

8:00 AM
A Novel Microstructural Engineering Based Strategy to Develop High-Performance Magnesium Alloy Sheets with Excellent Strength-Ductility Synergy: *Rakesh Kumar*[1]; Sushanta Kumar Panigrahi[1]; [1]Indian Institute of Technology Madras

8:20 AM
Coupled {10-12}+{11-21} Twinning in Magnesium: *Yuyang Wang*[1]; Bin li[1]; [1]Iowa State University

8:40 AM
Deep Learning Assisted Characterization of Microstructure in Cast Mg Alloy: Fine Feature Detection in 3D Using X-ray Microscopy: *Kaushik Yanamandra*[1]; Noushin Moharrami[1]; Feng Lin Ng[1]; [1]Carl Zeiss Microscopy

9:00 AM
Mechanistic Study on the Influence of Lime Activity on Bauxite Dissolution Properties: An Liu[1]; *Yanjun Zhang*[1]; [1]Central South University

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Advances in Ceramic Processing II: Applications

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

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Session Chairs: Jie Lian, Rensselaer Polytechnic Institute; Keith DeCarlo , Blasch Precision Ceramics

8:00 AM Invited
Advanced Fuels by Field Assisted Sintering Technology – Fuel Properties and Accident Tolerance: *Jie Lian*[1]; [1]Rensselaer Polytechnic Institute

8:30 AM Invited
Pitch-Perfect Nanoceramics: Swinging for the Fences in Processing and Manufacturing for Energy and Environmental Nexus: *Mangalaraja Ramalinga Viswanathan*[1]; [1]Adolfo Ibanez University

9:00 AM
Novel Cermet Waste Forms for Nuclear Applications: *Nathaniel Marrero*[1]; Nathan Sponenberg[1]; Alyssa Piechota[1]; Samuel Gross[1]; S.K. Sundaram[1]; [1]Alfred University

9:20 AM
Effect of Suspension Solid Concentration on Physical Properties of Diverse Different Geometry UHTCs: *Hui-Chun(June) Yu*[1]; Carolina Tallon[1]; [1]Virginia Tech

9:40 AM
Rheological Factors and Compact Microstructures of Pressure Cast Technical Ceramics: *Emelia Enke*[1]; Hyojin Lee[1]; Stephen DiPietro[2]; William Carty[1]; [1]New York State College of Ceramics at Alfred University; [2]Exothermics, Inc

10:00 AM Break

10:20 AM Invited
Rheology of Colloids in Non-Aqueous Suspensions and Determination of the Stability Mechanism: *Keith DeCarlo*[1]; [1]Blasch Precision Ceramics

10:50 AM
Fabrication of Continuous Polycrystalline Silicon Nitride (Si3N4) Fibers via Powder Processing Route: *Hyunjun Kim*[1]; Michael Cinibulk[2]; Lisa Rueschhoff[2]; Randall Hay[2]; William Costakis[2]; Connor Wyckoff[1]; Seamus McGarvey[1]; Randall Corns[1]; Kathryn Rutherford[1]; Brian Sirn[3]; [1]AFRL/BlueHalo; [2]AFRL; [3]BlueHalo

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials V

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

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Session Chairs: Prafulla Mallik, Indira Gandhi Institute of Technology Sarang; Jayachandran Kizhakkedathu, University of British Columbia; Erdem Sahin, Mugla University; Tanveer Tabish, University of Oxford

8:00 AM Invited
Advanced Harmonization Techniques For Accurate Establishment of In Vitro-In Vivo Drug Permeation Relationships from Dissolvable Microneedle Arrays and Other Complex Dermal Dosage Forms: *Audra Stinchcomb*[1]; Bianca Reginauld[1]; Dana Hammell[1]; [1]University of Maryland

8:20 AM Invited
Chitin/Chitosan as Bio-Based Functional Material Candidates for Biomedical Applications: *Jun-ichi Kadokawa*[1]; [1]Kagoshima University

8:40 AM Invited
Electrospun Fibrous Hybrid or Nanocomposite Structures for Medical Applications: *Min Wang*[1]; [1]University of Hong Kong Pokfulam Road

9:00 AM Invited
Lanthanide-Doped Nanomaterials for Biomedical Applications: *Eva Hemmer*[1]; [1]University of Ottawa

9:20 AM Invited
Nanocarriers for Stimuli-Responsive Drug Delivery and Tumor Specific Localization: Shaista Ilyas[1]; Annika Szymura[1]; Sumiya Iqbal[1]; Felix Mottaghy[2]; *Sanjay Mathur*[1]; [1]University of Cologne; [2]University Hospital, RWTH Aachen University

9:40 AM Invited
Chemical Modification of Polymers Using Gamma-Ray Irradiation for the Substrate of Stem Cell Culture: Hideki Mori[1]; *Masayuki Hara*[1]; [1]Osaka Metropolitan University

10:00 AM Break

10:20 AM Invited
Microstructure and Corrosion of Ti-47Nb Alloy for Biomedical Applications: *Carlos Elias*[1]; Bruno de Souza[1]; [1]Military Institute of Engineering

10:40 AM Invited
Degradable Printed Electronic pH Sensors for Personalized Healthcare: *Christian Fayomi*[1]; George K. Knopf[2]; [1]Universite du Quebec A Montreal; [2]The University of Western Ontario

11:00 AM Invited
Investigation of Compost Effluent from Biomaterials as Bio-Based Agents for Therapeutic Applications in Agriculture: *Ita Uwidia*[1]; Esther Ikhuoria[1]; Etinosa Oshodin[1]; Powel Perefagha[1]; Sarah Emmanuel[1]; [1]University of Benin

ADDITIVE MANUFACTURING

Opportunities and Applications of Solid-State Additive Manufacturing Processes — Additive Friction Stir Deposition and Cold Spray

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Hang Yu, Virginia Polytechnic Institute And State University; Isabella Van Rooyen, Pacific Northwest National Laboratory; Priyanshi Agrawal, Oak Ridge National Laboratory; Bharat Gwalani, North Carolina State University; Bin Li, Iowa State University; Leon Liao, Iowa State University; Judy Schneider, University of Alabama at Huntsville; Iris Rivero, University of Florida; Paul Prichard, Kennametal Inc.

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Session Chair: Hang Yu, Virginia Polytechnic Institute and State University

8:00 AM Invited
Part Production by Additive Friction Stir Deposition: Opportunities and Challenges: *Tony Schmitz*[1]; [1]University of Tennessee, Knoxville

8:30 AM
Repair of Aerospace Aluminum Through-Holes Utilizing Additive Friction Stir Deposition: *Mark Pandol*[1]; Greg Hahn[1]; Kendall Knight[1]; Hang Yu[1]; [1]Virginia Tech

8:50 AM
Dissimilar Material Multilayer Deposition Using Additive Friction Stir Deposition: *Nikhil Gotawala*[1]; Greg D Hahn[1]; Hang Z Yu[1]; [1]Virginia Tech

9:10 AM
Microstructural Effects of AFSD Repair on High Strength AA7050 Components: *Luke Hagedorn*[1]; Greg Hahn[1]; Kendall Knight[1]; Hang Yu[1]; [1]Virginia Tech

9:30 AM
Machine Design for Small Scale Additive Friction Stir Deposition: *Max Peter Remmert*[1]; Ryan Gottwald[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute and State University

9:50 AM Break

10:10 AM Invited
Cold Spray Additive Manufacturing of Copper Alloys and High-Entropy Alloys: *Yu Zou*[1]; [1]University of Toronto

10:40 AM
Optimization of Feedstock Powder Heat Treatment for Cold Spray Additive Manufacturing: *Kyle Tsaknopoulos*[1]; Caroline Dowling[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

CERAMIC AND GLASS MATERIALS

Phase Transformations in Ceramics: Science and Applications — Session I

Sponsored by: ACerS Basic Science Division

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay V. Khare, University of Toledo; Scott Mccormack, University of California, Davis; Theresa Davey, Bangor University

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Session Chairs: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University

8:00 AM Invited
In-Situ, in Air, High Temperature, Crystallographic, Synchrotron Studies of Ceramics: *Waltraud Kriven*[1]; [1]University of Illinois at Urbana-Champaign

8:30 AM
Phase Stability and Thermal Expansion of Substituted Rare Earth Disilicate Compositions for Environmental Barrier Coatings: *Christine Brockman*[1]; Jamesa Stokes[2]; Richard Rogers[2]; Laura Wilson[2]; Amjad Almansour[2]; James Kiser[2]; Pankaj Sarin[1]; [1]Oklahoma State University; [2]NASA Glenn Research Center

8:50 AM
Evolution of Phase Composition and Elastic Properties in Kaolin-Based Silicate Ceramics with Mullite Addition: *Petra Simonova*[1]; Eva Gregorova[1]; Willi Pabst[1]; Petr Bezdička[2]; [1]University of Chemistry and Technology, Prague; [2]Institute of Inorganic Chemistry, Czech Academy of Sciences

9:10 AM
Effects of Mechanical Constraint on Martensitic Transformation in Shape Memory Ceramic-based Composites: *Donald Erb*[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute and State University

9:30 AM Invited
In Situ Microscopy Studies of Two-Dimensional Layered Graphene on Molten Gold: *Suneel Kodambaka*[1]; [1]Virginia Polytechnic Institute and State University

10:00 AM Break

10:20 AM Invited
Phase-Diagrams in Nanocrystalline Oxides: Impacts of Surfaces and Grain Boundary Properties: *Ricardo Castro*[1]; [1]Lehigh University

10:50 AM Invited
Modeling Anisotropic Phase Transformations with the Phase Field Method: *Jacob Bair*[1]; [1]Oklahoma State University

11:20 AM
Route to Pure Ferroelectric Tungsten Trioxide Phase at Room Temperature: Zanlin Qiu[1]; *Mohammad Mahafuzur Rahaman*[1]; Boyd Panton[1]; Joerg Jinschek[2]; Pelagia-Irene (Perena) Gouma[1]; [1]The Ohio State University; [2]Technical University of Denmark (DTU)

11:40 AM
Morphological Transition from Crystalline to Glassy Phase Bioactive Materials Processed in Organic Melt: *Loren Gower*[1]; Krishna Machuga[1]; Anna Darden[1]; Aria Tauraso[1]; Himagowri Prasad[1]; Sundaram Singh[1]; Dhanesh Tiwary[1]; Kamdeo Mandal[1]; Nitin Tangirala[1]; Narsingh Singh[1]; [1]University of Maryland Baltimore County

NUCLEAR ENERGY

Progressive Solutions to Improve the Corrosion Resistance of Nuclear Waste Storage Materials — Borosilicate Glass Nuclear Waste Forms and Stainless Steel Canisters for Radioactive Wastes

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: Energy Committee

Program Organizers: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech

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Session Chairs: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech

8:00 AM Introductory Comments

8:05 AM Invited
Structural Design of Borosilicate-Based Nuclear Waste Glasses: *Ashutosh Goel*[1]; [1]Rutgers, The State University of New Jersey

8:35 AM
Transition Metal Ions Induced Structural Rearrangements and Their Impact on Sulfur Solubility in Borosilicate-Based Model Nuclear Waste Glasses: *Rajan Saini*[1]; [1]Rutgers University

8:55 AM Invited
Physics-Informed Machine Learning for Glass Property Predictions: *N M Anoop Krishnan*[1]; [1]Indian Institute of Technology Delhi

9:25 AM Invited
Structural Origin of the Passivation Effect Nuclear Waste Immobilization Glasses: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

9:55 AM Break

10:15 AM
Quantitative Analysis of Hydrogen Interactions with UO2 Grain Boundaries Using Density Functional Theory: *Rajat Goel*[1]; Ambar Kulkarni[1]; Nir Goldman[2]; [1]University of California, Davis; [2]Lawrence Livermore National Laboratory

10:35 AM Invited
Neutron Diffraction Residual Stress Characterization of Stainless Steel Produced by Wire Arc Direct Energy Deposition: *Wei Tang*[1]; Ke An[1]; Dunji Yu[1]; Dominic Giuliano[1]; Oscar Martinez[1]; Andrzej Nycz[1]; Maxim Gussev[1]; Luke Meyer[1]; Derek Vaughan[1]; [1]Oak Ridge National Laboratory

11:05 AM Invited
Polymer-Derived Ceramic Coatings for Nuclear Waste Storage Canister Corrosion Prevention: *Kathy Lu*[1]; HyeonJoon Choi[2]; [1]University of Alabama Birmingham; [2]Virginia Tech

SPECIAL TOPICS

Scientific Methods in Art, Archeology, and Art Conservation Science — Scientific Methods in Art, Archeology, and Art Conservation Science

Sponsored by: ACerS Art, Archaeology, and Conservation Science Division

Program Organizers: Jamie Weaver, National Institute of Standards and Technology; Christina Bisulca, Detroit Institute of Arts

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Session Chair: Christina Bisulca, Detroit Institute of Arts

8:00 AM
Synthetic Basic Copper Chloride Pigments in Korean Buddhist Painting: *Christina Bisulca*[1]; Joseph Leach[1]; [1]Detroit Institute of Arts

8:20 AM
Microanalysis of the Composition of Warhol's Oxidation Paintings: *Christopher Hefferan*[1]; Rikke Foulke[2]; Ryan Booth[1]; William Koshut[1]; Michael Deible[1]; [1]RJ Lee Group; [2]The Andy Warhol Museum

8:40 AM
The Egyptian Blues, Part 1: Phase, Chemistry, and Micro/Nanostructure: *Travis Olds*[1]; Ed Vicenzi[2]; Julia Esakoff[3]; John Bussey[4]; M. C. Dixon Wilkins[4]; Lisa Haney[1]; Mostafa Sherif[1]; Thomas Lam[2]; Sam Karcher[4]; John McCloy[4]; [1]Carnegie Museum of Natural History; [2]Museum Conservation Institute, Smithsonian; [3]Montana State University; [4]Washington State University

9:00 AM
The Egyptian Blues, Part 2: Quantitative Color Measurements: Ed Vicenzi[1]; Thomas Lam[1]; Lisa Haney[2]; Julia Esakoff[3]; John Bussey[4]; M. C. Dixon Wilkins[4]; Sam Karcher[4]; Travis Olds[2]; Mostafa Sherif[2]; *John McCloy*[4]; [1]Museum Conservation Institute, Smithsonian; [2]Carnegie Museum of Natural History; [3]Montana State University; [4]Washington State University

9:20 AM
Analysis with Scanning Electron Microscopy of a Roman Era Shipwreck Glass: *Edgar Buck*[1]; Jamie Weaver[2]; Joesph Ryan[1]; Alberta Silvestri[3]; [1]Pacific Northwest National Laboratory; [2]National Institute of Standards and Technology; [3]Università di Padova

9:40 AM
Preserving and Replicating Historical Artifacts: *Arif Sirinterlikci*[1]; [1]Robert Morris Unversity

10:00 AM Break

10:20 AM Invited
ACerS AACS Anna Shepard Award Lecture: 1954 to 2024: Endurance and Innovation in Anna Shepard's Thin-Section Petrography Approach for Archaeological Ceramics Analysis: *Chandra Reedy*[1]; [1]University of Delaware

10:40 AM
Copper Red Glass from Unterhalb Dornsweg Near Glashütten, Germany: History and Preliminary Findings: *Annika Blake-Howland*[1]; Doris Möncke[1]; [1]Alfred University

11:00 AM
Cute Pink Crystals: Using Ceramic Engineering Methods and Instrumentation to Achieve an Artistic Goal: *Grace Dunham*[1]; Doris Möncke[1]; William Carty[1]; [1]Alfred University

11:20 AM
Recreating and Validating 13th Century Methods of Steel Tool Manufacture: *Alexandra Cronin*[1]; Dan Lewis[1]; Jay Thomas[2]; Connnor Foreman[1]; Nick Wilder[1]; [1]RPI; [2]Syracuse University

11:40 AM
Merging Engineering Science with Glass Art – Recycling of Glass Cullet in the Art Studio – Lessons Learned from an Interdisciplinary Undergraduate Project: Devin Agosto[1]; Lenorah Haight-Stott[1]; Angus Powers[1]; Doris Möncke[1]; *Amir Ashjari*[1]; [1]Alfred University

BIOMATERIALS

Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments — Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments

Sponsored by: Society for Biomaterials

Program Organizers: Claudia Loebel, University of Michigan; Nicholas Ziats, Case Western Reserve University

Wednesday AM | October 9, 2024
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Session Chair: Nicholas Ziats, Case Western Reserve University

8:00 AM Invited
Metabolite Based Biomaterials for Modulating Immune Responses: *Abhinav Acharya*[1]; [1]Case Western Reserve University

8:20 AM
Angiogenic Potential of Mesoporous Bioactive Glass in Medical Applications: *Martin Michalek*[1]; Martina Vitazkova[2]; Zulema Vargas[2]; Andrea Soltysova[3]; Dusan Galusek[4]; [1]FunGlass – Centre for Functional and Surface Functionalized Glass Alexander Dubcek University of Trencín; [2]FunGlass – Centre for Functional and Surface Functionalized Glass Alexander Dubcek University of Trencín; [3]Faculty of Natural Sciences, Comenius University in Bratislava; [4]Join Glass Centre of the IIC SAS, TnUAD, FChPT STU

8:40 AM
Biomimetic Materials for Tissue Engineering and Biomolecule Delivery: *Peter Ma*[1]; [1]University of Michigan

9:00 AM
Cell-Instructive Peptide-Graphene Oxide Conjugates for Improved Bone Regrowth and Vascularization: *Michelle Wolf*[1]; [1]Carnegie Mellon University

9:20 AM
Clinical Tests and Mechanical Properties of TiG2, TiG4, Ti G4 After ECAP and Ti-6Al-4V: *Carlos Elias*[1]; Késia Simões[1]; [1]Military Institute of Engineering

9:40 AM
Biomimetic Mineral Coatings for Controlled Delivery of Therapeutic Biologics: *Jae Sung Lee*[1]; Daniel Hellenbrand[2]; Gianluca Fontana[2]; Andrew Khalil[2]; William Murphy[2]; [1]University of Minnesota; [2]University of Wisconsin-Madison

10:00 AM Break

10:20 AM
Hydrophilic Polydopamine (hPDA) Fueled Hydrogel Bio-Adhesive for Meniscus Tear Healing: *Solaiman Tarafder*[1]; [1]South Dakota State University

10:40 AM
Design and Experimental Approach Toward the Development of a Sensorized Contact Lens Using Aerosol Jet Printing: *Janet Gbur*[1]; Kennidi Kreiser[1]; Tyler Vu[1]; Douglas Shire[2]; Marcelino Essien[3]; Paul Carpenter[3]; Stephen Barnes[3]; [1]Case Western Reserve University; [2]VA Northeast Ohio Healthcare System; [3]IDS, Inc.

11:00 AM Invited
Label-Free Measurement of Cell Viability in Hydrogel Scaffolds Using Optical Coherence Tomography: *Carl Simon*[1]; [1]National Institute of Standards & Technology

CERAMIC AND GLASS MATERIALS

Solid-state Optical Materials and Luminescence Properties — Solid-state Optical Materials and Luminescence Properties I

Sponsored by: ACerS Basic Science Division

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Mathieu Allix, Laboratoire CEMHTI; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Polish Academy of Sciences; Jan Hostaša, CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics

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Session Chairs: Jan Hostaša, CNR ISSMC; Woohong Kim, Naval Research Laboratory

9:00 AM Invited
IR Optical Materials and Applications: *Woohong (Rick) Kim*[1]; Shyam Bayya[1]; Jesse Frantz[1]; Brandon Shaw[1]; Colin Baker[1]; Vinh Nguyen[1]; Darryl Boyd[1]; Daniel Gibson[1]; Daniel Rhonehouse[1]; Adam Floyd[1]; Joshua Gild[1]; Lynda Busse[1]; Bryan Sadowski[2]; Frederic Kung[3]; Robert Nicol[3]; Geoff Chin[3]; Tony Zhou[3]; Jasbinder Sanghera[1]; [1]Naval Research Laboratory; [2]Jacobs; [3]URF

9:20 AM Invited
Fabrication of High Strength IR Transparent Composite Ceramics Using Current Assisted Sintering Technique: *Koji Morita*[1]; [1]National Institure for Materials Science (NIMS)

9:40 AM Invited
Microstructure Tuning of Transparent Y_2O_3 Ceramics via Zr Content and Sintering Under Vacuum or by SPS: Dariia Chernomorets[1]; Vojtch Neina[2]; Pietro Galizia[3]; Andreana Piancastelli[3]; Giacomo Zanetti[4]; Stefano Varas[4]; Alessandro Chiasera[4]; Laura Esposito[4]; Roman Yavetskiy[5]; *Jan Hostaša*[3]; [1]CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics / Institute for Single Crystals, NAS; [2]University of Chemistry and Technology, Prague (UCT Prague); [3]CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics; [4]CNR IFN - Institute for Photonics and Nanotechnologies, CSMFO Lab. and FBK Photonics Unit; [5]Institute for Single Crystals of NAS of Ukraine

10:00 AM
Fabrication of Polycrystalline YAG Cladding on Single Crystal YAG Fibers via Co-Extrusion: *Hyunjun Kim*[1]; Randall Hay[2]; Kent Averett[2]; Benjamin Gray[2]; Alan Martinez[2]; Brian Sirn[3]; Randall Corns[1]; Robert Turner[1]; Daniel Gibson[4]; Robert Nicol[4]; Shyam Bayya[4]; Jas Sanghera[4]; Rick Kim[4]; [1]Air Force Research Laboratory/BlueHalo; [2]Air Force Research Laboratory; [3]BlueHalo; [4]Naval Research Laboratory

10:20 AM Break

10:40 AM Invited
Anisotropic Alumina Ceramics with Lisotropic Optical Properties: *Akio Ikesue*[1]; [1]World-Lab. Co., Ltd

11:10 AM Invited
Progress Towards Layerless 3D Printed GRIN Lenses and Transparency-On-Demand Microbial Habitats: *Beck Walton*[1]; Dominique Porcincula[1]; Martin De Beer[1]; Rick Hynes[1]; Erika Fong[1]; Hazel Rose Galvan[1]; Luke Myers[2]; Alyssa Troksa[1]; Jeffery Motschman[1]; Drew Melchert[1]; Peter Weber[1]; Rebecca Dylla-Spears[1]; [1]Lawrence Livermore National Laboratory; [2]Penn State University

11:30 AM Invited
Fabrication of SrF2 Polycrystalline Transparent Ceramic with High Optical Quality for High-Energy Laser Gain Media: *Thomas Rudzik*[1]; Zachary Seeley[1]; Nerine Cherepy[1]; Stephen Payne[1]; [1]Lawrence Livermore National Laboratory

FUNDAMENTALS AND CHARACTERIZATION

Understanding High Entropy Materials via Data Science and Computational Approaches — Session II

Sponsored by: TMS: Alloy Phases Committee

Program Organizers: Dilpuneet Aidhy, Clemson University; Raymundo Arroyave, Texas A&M University; Timothy Rupert, Johns Hopkins University; Liang Qi, University of Michigan; Wei Xiong, University of Pittsburgh; Prashant Singh, Ames National Labratory

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Session Chairs: Jeffery Rickman, Lehigh University; Chelsey Hargather, NMT

8:00 AM Invited
Characterization of Thermal Sprayed Ultrahard Coatings for Stamping Die Surfaces from Refractory High Entropy Alloys Designed Using DFT Calculations: *Iver Anderson*[1]; Duane Johnson[1]; Prashant Singh[2]; Rameshwari Naorem[3]; Yun Bai[4]; Bill Lenling[5]; Kyle Quillin[5]; Irina Downs[5]; Jim Watts[5]; John Koppes[5]; Nicolas Argibay[1]; [1]Ames National Laboratory; [2]Ames National Labratory; [3]Ames Natioanl Laboratory; [4]Ford Motor Co.; [5]TST-Fisher Barton

8:30 AM Invited
Analyzing, Understanding, and Guided Design of Solid Disordering by the Density of Atomistic States (DOAS): *Yifei Mo*[1]; [1]University of Maryland, College Park

9:00 AM Invited
Using Materials Informatics to Quantify Complex Correlations Linking Structure, Properties and Processing in High-Entropy Alloys : *Jeffrey Rickman*[1]; [1]Lehigh University

9:30 AM Invited
Factors Affecting Calculated Properties of RHEAs Using Density Functional Theory: Christopher Lafferty[1]; Danielsen Moreno[1]; Gabriel Beltran[1]; Peter Liaw[2]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology; [2]University of Tennessee

10:00 AM Break

10:20 AM Invited
Modeling Distribution of Unstable Stacking Fault Energy in bcc Refractory High-Entropy Alloys and its Implication to Ductility Assessment: *Yong-Jie Hu*[1]; Christopher Tandoc[1]; [1]Drexel University

10:50 AM
Predictive Screening of Phase Stability in High-Entropy Borides: *Muhammad Waqas Qureshi*[1]; Shuguang Wei[1]; Jun Young Kim[1]; Dane Morgan[1]; Izabela Szlufarska[1]; [1]University of Wisconsin Madison

11:10 AM
Contributions to Diffusion in Complex Materials Quantified with Machine Learning: *Soham Chattopadhyay*[1]; Dallas Trinkle[2]; [1]Los Alamos National Laboratory; [2]University of Illinois Urbana-Champaign

11:30 AM Invited
Entropy for Energy: High-Entropy Materials for Energy Applications: *Corey Oses*[1]; [1]Johns Hopkins University

BIOMATERIALS

3D Printing of Biomaterials and Devices — 3D Printing of Biomaterials and Devices II

Program Organizers: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University

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Session Chairs: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University

2:00 PM
Impact of Murine Cell Seeding on Vat Photopolymerized 3D Printed Scaffolds: *Abby Whittington*[1]; Sera Choi[1]; Elizabeth Hunt[1]; Edward Shangin[1]; Zahra Bahranifard[1]; Emma Nguyen[1]; Caitlyn Collins[1]; [1]Virginia Tech

2:20 PM
Isotropic/ Anisotropic 3D Printing Approach with Bioactive Polymers for Biomedical Applications: *Md Sarker*[1]; [1]University of Maryland Eastern Shore

2:40 PM
Magnesium Alloy Textiles as Porous Biodegradable Implants: Beril Ulugun[1]; Ju Xue[1]; Amber Robinson[1]; Sarah Abduljabbar[1]; Adam Griebel[1]; James Guest[1]; Ryan Guilbault[1]; Christopher Shubert[1]; Greg Osgood[1]; Warren Grayson[1]; *Timothy Weihs*[1]; [1]Johns Hopkins University

3:00 PM
Advanced Bioactive 3D Scaffolds Based on Ca-Mg Silicate Glass Microspheres: *Jozef Kraxner*[1]; Mokhtar Mahmoud[1]; Si Chen[1]; Monika Michalkova[2]; Martin Michalek[1]; Enrico Bernardo[3]; Dusan Galusek[4]; [1]FunGlass- Centre for Functional and Surface Functionalized Glass, Alexander Dubcek University of Trencin; [2]Joint Glass Centre of the IIC SAS, TnUAD and FChFT STU; [3]Universita Degli Studi di Padova; [4]FunGlass- Centre for Functional and Surface Functionalized Glass, Alexander Dubcek University of Trencin; Joint Glass Centre of the IIC SAS, TnUAD and FChFT STU

3:20 PM Break

3:40 PM
Phase Analysis and Processing Window of a Ti-13%Nb-13%Zr Alloy Produced by Additive Manufacturing Using Spherical and HDH Powders: *Jamil Guimaraes Junior*[1]; Fernando Landgraf[1]; [1]University of São Paulo - USP

4:00 PM
Preserving Data Integrity in Biomedical Device Design: *Paul Witherell*[1]; [1]NIST

4:20 PM
SolidStir® Composite 3D Printing: A Novel Solid-State Fabrication Approach to Tailored Biodegradable Materials: *Pankaj Pramod Kulkarni*[1]; Devin Davis[1]; Md Jasim Uddin[2]; Bharat Gwalani[2]; Kumar Kandasamy[1]; [1]Enabled Engineering; [2]North Carolina State University

4:40 PM
Synthesis and Robocasting of Tricalcium Phosphate, Hydroxyapatite and Wollastonite Based Composites: *Gowtham Rajan*[1]; Manisha Vidyavathy[1]; [1]Anna University

5:00 PM
Towards Bone-Like Scaffolds: Optimizing the Design and Manufacturing of Porous Bioactive Ceramics and Glasses: *Francesco Baino*[1]; Roberta Gabrieli[1]; Alessandro Schiavi[2]; Mehdi Mohammadi[3]; Martin Schwentenwein[3]; Luca D'Andrea[4]; Pasquale Vena[4]; Enrica Verné[1]; [1]Politecnico di Torino; [2]National Institute of Metrological Research (INRiM) ; [3]Lithoz GmbH; [4]Politecnico di Milano

SPECIAL TOPICS

ACerS Robert B. Sosman Award Symposium: The Role of Computational Modeling of Complex Materials — Robert B Sosman Award Presentation

Sponsored by: ACerS Basic Science Division

Program Organizer: Winnie Wong-Ng

Wednesday PM | October 9, 2024
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Session Chair: R. Edwin Garcia, Purdue University

1:00 PM Keynote
The Role of Computational Modeling in Complex Materials: *Wai-Yim Ching*[1]; [1]University of Missouri-Kansas City

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Microstructures II

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Jing Zhang, Purdue University in Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Brandon McWilliams, US Army Research Laboratory; Yeon-Gil Jung, Korea Institute of Ceramic Engineering & Technology; Charles Fisher, Naval Surface Warfare Center - Carderock

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Session Chairs: Li Ma, Johns Hopkins University Applied Physics Laboratory; Charles Fisher, NSWC Carderock Division ; Jing Zhang, Purdue University in Indianapolis

2:00 PM
Generative Property Optimization of Stochastic Microstructures: Patxi Fernandez-Zelai[1]; Jiahao Cheng[1]; *Jason Mayeur*[1]; Amir Ziabari[1]; Guannan Zhang[1]; Neil Zhang[1]; [1]Oak Ridge National Laboratory

2:20 PM
Efficient Microstructure Prediction in Additive Manufacturing Using a Novel Dimension Reduction Method: *Arulmurugan Senthilnathan*[1]; Paromita nath[2]; Sankaran Mahadevan[1]; [1]Vanderbilt University; [2]Rowan University

2:40 PM
Modeling of Shape Transition from Conduction to Keyholing for AA6061 in the Laser Power Bed Fusion Additive Manufacturing: *Tianyu Zhang*[1]; Lang Yuan[1]; Karna Sivaji[1]; Al-Aridi Rimah[1]; Can Sun[1]; Baldauff Justin[1]; Gross Andrew[1]; Christian Rossmann[2]; Timothy Krentz[3]; Dale Hitchcock[3]; [1]University of South Carolina; [2]Additive-Lab BVBA; [3]Savannah River National Laboratory

3:00 PM
Modeling of the Impact of Defects on Mechanical Properties of 3D Printed Natural Carbon-Enhanced Polymer Composites: *William Downs*[1]; Grace Baranack[1]; Yahya Al-Majali[1]; [1]Ohio University

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ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing - Miscellaneous

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science

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Session Chair: To Be Announced

2:00 PM
High Velocity Microparticle Impacts of Heat-Treated Al 6061: *Hyein Na*[1]; Christopher Schuh[2]; [1]MIT; [2]Northwestern University

2:20 PM
Computational Studies of Solidification Kinetics in Multicomponent Alloys: *Yitao Wang*[1]; Fadi Abdeljawad[1]; [1]Lehigh University

2:40 PM
High Throughput Generation of Alloy Microstructure Selection Maps: *James Hanagan*[1]; Peter Morcos[1]; Brent Vela[1]; Xueqin Huang[2]; Raymundo Arróyave[1]; [1]Texas A&M University; [2]Meta

3:00 PM
Rapid Data Acquisition and Machine Learning-Assisted Composition Design of Functionally Graded Alloys via Wire-Feed Additive Manufacturing: Xin Wang[1]; *Soumya Sridar*[1]; Wei Xiong[1]; [1]University of Pittsburgh

3:20 PM Break

3:40 PM
Recycling of Toasted 431 Stainless Steel Powders in Extreme High Speed Laser Cladding (EHLA) – Characterization of Heat Affected Powders, Deposition Efficiency, and Coating Microstructures: *Hank Lloyd*[1]; Hannah King[1]; Samuel Pinches[1]; Christopher Berndt[1]; Andrew Ang[1]; [1]Swinburne University of Technology, ARC Training Centre on Surface Engineering of Advanced Materials (SEAM)

4:00 PM
The Response of 3D Printed 17-4 PH to Heat Treatment: *Ipfi Mathoho*[1]; [1]CSIR Pretoria

4:20 PM
Anisotropy in Local Microstructure – Does It Affect the Tensile Properties of the SLM Samples?: *Tapabrata Maity*[1]; [1]National Institute of Advanced Manufacturing Technology

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ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Session III

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

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Session Chairs: Lianyi Chen, University of Wisconsin-Madison; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

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2:00 PM Invited
Data-Driven Design of Refractory High-Entropy Alloys for Additive Manufacturing: *Wesley Reinhart*[1]; [1]Pennsylvania State University

2:30 PM
Development of Design for Additive Manufacturing (DfAM) Knowledgebase: *Arif Sirinterlikci*[1]; Ergin Erdem[1]; [1]Robert Morris University

2:50 PM
Scaling Processes for Manufacturing in Binder Jetting of WC-Co: *Matt Bonidie*[1]; Niknam Momenzadeh[1]; Zhuqing Wang[1]; Paul Prichard[1]; [1]Kennametal

3:10 PM
The Utility of Computer Controlled Scanning Electron Microscopy (CCSEM) for Quality Characterization of Metallic Powders at Neighborhood 91: *Christopher Hefferan*[1]; John Barnes[2]; Michael Schmitt[3]; Steven Schlaegle[1]; Ryan Booth[3]; [1]RJ Lee Group; [2]Metal Powder Works; [3]HAMR Industries LLC

3:30 PM Break

3:50 PM
Size Effect and Influence of Process Parameters on the Porosity of Thin Struts Fabricated via Laser Powder-Bed Fusion: *Nismath Vadakkan Habeeb*[1]; Kevin Chou[1]; [1]University of Louisville

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructure, Defects, and Properties — AM of Other Metallic Systems

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee

Program Organizers: Nadia Kouraytem, Utah State University; Shenyang Hu, Pacific Northwest National Laboratory; Mohan Sai Kiran Nartu, Pacific Northwest National Laboratory (Pnnl); Srujan Rokkam, Advanced Cooling Technologies, Inc.; Mohsen Asle Zaeem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology; Donna Guillen, Idaho National Laboratory; Dan Young, Wright State; Iris Rivero, University of Florida; Jonathan Pegues, Castheon; Eric Payton, University of Cincinnati; Ming Chen, Northwestern University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati

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Session Chairs: Matthew Steiner, University of Cincinnati; Iris Rivero, University of Florida

2:00 PM
A Novel Approach to Combinatorial Studies Using an Orthogonal Ti-Cr Gradient: *Matthew Dolde*[1]; Fatih Sikan[1]; Maria Quintana[1]; Brian Martin[1]; Peter Collins[1]; Wenqi Li[2]; Matt Clark[2]; Rikesh Patel[2]; Richard Smith[2]; [1]Iowa State University; [2]University of Nottingham

2:20 PM
Dense and Crack-Free Pure Tungsten Manufactured by Electron Beam Powder Bed Fusion Using a Unique Spot Melting Strategy: Arun Ramanathan Balachandramurthi[1]; Gloria Graf[2]; Ulf Ackelid[1]; Ulric Ljungblad[1]; Greta Lindwall[2]; *Ian Crawford*[1]; [1]Freemelt AB; [2]KTH Royal Institute of Technology

2:40 PM
EB-PBF of Pure Tungsten Components for High-Temperature Application: From Fabrication to Evaluation: *Haozhi Zhang*[1]; Paul Carriere[2]; Matthew Baldwin[3]; Tim Horn[1]; [1]North Carolina State Univeristy; [2]RadiaBeam Technology; [3]University of California at San Diego

3:00 PM
Tailoring of Thermal Expansion in an Aluminum Alloy Through the Addition of Ti-6Al-4V via Additive Manufacturing: *Beril Tonyali*[1]; Hui Sun[1]; Jayme Keist[1]; Zi-Kui Liu[1]; Allison Beese[1]; [1]Pennsylvania State University

3:20 PM
Microstructural and Wear Behaviour Studies of Laser Surface Cladding of Rockit®401 Powder on Al 1100 Substrate: *Bidipta Dam*[1]; Jyotsna Dutta Majumdar[1]; Indranil Manna[1]; [1]Indian Institute of Technology Kharagpur

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments V — Session IV

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Keyou Mao, Florida State University; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

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Session Chairs: Mukesh Bachhav, Idaho National Laboratory; Rongjie Song, Idaho National Laboratory

2:00 PM Invited
Tungsten-Based WTaVCr Refractory High Entropy Alloys for Fusion Energy Applications: *Bai Cui*[1]; Yongchul Yoo[1]; Xiang Zhang[1]; Fei Wang[1]; Xin Chen[1]; Xing-Zhong Li[1]; Michael Nastasi[2]; [1]University of Nebraska Lincoln; [2]Texas A&M University

2:30 PM
Interactions Between Radiation-Induced Defects and Shock in Al 1100: *Calvin Lear*[1]; David Jones[1]; Daniel Martinez[1]; Matthew Chancey[1]; Yongqiang Wang[1]; Nan Li[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

2:50 PM
Understanding the Mechanism of Fission Gas Re-Solution and Blistering in UMo Fuel via Atomistic Modelling: *Linu Malakkal*[1]; ATM Jahid Hasan[2]; Mathew Swisher[1]; Benjamin Beeler[3]; [1]Idaho National Laboratory; [2]North Carolina State University ; [3]North Carolina State University

3:10 PM
Determination of Molten Salt Thermal Conductivity Using Laser Flash Technique: *Heng Wang*[1]; Florian Linseis[1]; [1]Linseis Inc.

3:30 PM Break

3:50 PM
Localized Crystallization of Zr Following Heavy Ion Irradiation of HfNbTaZr MPEA: *Abhishek KC*[1]; Sal Rodriquez[2]; Khalid Hattar[3]; Eric Lang[1]; [1]University of New Mexico; [2]Sandia National Laboratory; [3]University of Tennessee Knoxville

4:10 PM
Investigation of Helium Bubble Formation at Tungsten-Dispersoid Interfaces in Dispersion-Strengthened Tungsten Alloys: *Ashrakat Saefan*[1]; Levko Higgins[1]; Yongqiang Wang[2]; Jonathan Poplawsky[3]; Xing Wang[1]; [1]Pennsylvania State University; [2]Los Alamos National Laboratory; [3]Oak Ridge National Laboratory

4:30 PM
Structural Characterization of Ultra-High Temperature Ceramics in Three Dimensions for Statistical and Physics-Based Modeling: *Randi Swanson*[1]; Michael Chapman[2]; Sara Akhavan[3]; Ata Mesgarnejad[4]; Hessam Babaee[3]; Ashley Hilmas[2]; Michael Uchic[2]; William Fahrenholtz[5]; Scott McCormack[1]; [1]University of California Davis; [2]Air Force Research Laboratory; [3]University of Pittsburgh; [4]Northeastern University; [5]Missouri Science and Technology

4:50 PM
Impact of Amorphous Pockets on Displacement Damage Evolution in Crystalline Silicon: *Henry Little*[1]; Christopher Matthews[2]; Blas Uberuaga[2]; Christopher Lenyk[1]; [1]Air Force Institute of Technology; [2]Los Alamos National Laboratory

5:10 PM
Characterization of Radiation Damage in Nanocrystalline Ni- and Fe-Based Oxide Dispersion-Strengthened Alloys: *Zachary Stenstrom*[1]; Shengze Yin[1]; Ondrej Muransky[2]; Levente Balogh[1]; [1]Queens University; [2]Australian Nuclear Science and Technology Organization

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Scintillators and EMI Shielding

Sponsored by: ACerS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Ubic, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

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Session Chairs: Soutik Betal, IIT Delhi; Rick Ubic, Boise State University

2:00 PM Invited
How Can Efficiency of Glass Scintillator Be Enhanced?: *Jakrapong Kaewkhao*[1]; [1]Nakhon Pathom Rajabhat University

2:20 PM Invited
Microwave Behavior of Cement-Based Materials: *Deborah Chung*[1]; [1]University at Buffalo, The State University of New York

2:40 PM
Elucidation of the Electromagnetic Shielding Behavior of Metals: *Deborah Chung*[1]; [1]University at Buffalo, The State University of New York

2:40 PM Invited
Microwave Behavior of Cement-Based Materials: *Deborah Chung*[1]; [1]University at Buffalo, The State University of New York

NANOMATERIALS

Advances in Emerging Electronic Nanomaterials: Towards Next-Generation Microelectronics — Functional Materials and Devices II

Sponsored by: TMS: Nanomaterials Committee

Program Organizers: Chang-Yong Nam, Brookhaven National Laboratory; Jinkyoung Yoo, Los Alamos National Laboratory; Jung-Kun Lee, University of Pittsburgh

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Session Chairs: Chang-Yong Nam, Brookhaven National Laboratory; Jung-Kun Lee, University of Pittsburgh; Jinkyoung Yoo, Los Alamos National Laboratory

2:00 PM
Nanomolecularly-Induced Kinetic, Chemical, and Morphological Effects during Synthesis of Hybrid Inorganic/Organic Nanolaminates for Emergent Properties: *Collin Rowe*[1]; Ankit Kashyap[2]; Mahima Sasikumar[1]; Geetu Sharma[1]; Johan Alauzun[3]; Ajay Soni[2]; Per Eklund[4]; Henrik Pedersen[4]; Ganpati Ramanath[1]; [1]Rensselaer Polytechnic Institute; [2]Indian Institute of Technology Mandi; [3]University of Montpellier; [4]Linköping University

2:20 PM
Bias Modulated Nano Optical Sensor for Dual Color Detection by MoS2/ZnO Van der Waals Heterostructure: *Kishan Kumawat*[1]; Pius Augustine[2]; Deependra Kumar Singh[2]; Karuna Kar Nanda[2]; Saluru Baba Krupanidhi[2]; [1]Indian Institute of Science, Bangalore; Institut National de la Recherche Scientifique (INRS); [2]Indian Institute of Science, Bangalore

2:40 PM
Structural Analysis of P Ion Implanted Pt Thin Films: *Taichi Hombo*[1]; Horibe Yoichi[1]; Manabu Ishimaru[1]; Koki Imai[1]; Yusei Ono[1]; Yasuhiro Fukuma[1]; [1]Kyushu Institute of Technology

3:00 PM
Exploring Topological Soliton in Peierls Semimetal Sb: *Anton Smirnov*[1]; Sergey Chekmazov[1]; Andrei Ksenz[1]; Andrey Mazilkin[1]; Elena Pershina[1]; Andrei Ionov[1]; Sergey Bozhko[1]; [1]Institute of Solid State Physics RAS

3:20 PM Break

3:40 PM
Realizing Room-Temperature Ferromagnetism in a Semiconductor Single Crystal: *Limin Cao*[1]; Min Feng[1]; [1]Wuhan University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — High Temperature Materials Degradation in Hydrogen Environment; Advances in Characterization Techniques

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division, TMS: Refractory Metals & Materials Committee

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory

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Session Chairs: Chris Marchi, Sandia National Library; Joseph Govro, Missouri University of Science and Technology; Vincent Holohan, US DOT - PHMSA - Office of Pipeline Safety; De-en Jiang, Vanderbilt University

2:00 PM
The Less Discussed Impact of High Temperature (> 500 °C) Hydrogen Induced Degradation of Austenitic Ni- and Fe-Based Alloys: *Rishi Pillai*[1]; Marie Romedenne[1]; QQ Ren[1]; Yukinori Yamamoto[1]; J.A. Haynes[1]; [1]Oak Ridge National Laboratory

2:20 PM
Ferritic Interconnect Materials in SOEC – Challenges and Degradation from Ambient Temperature to 900°C: *David Kniep*[1]; Mario Rudolphi[1]; Mathias Galetz[1]; [1]DECHEMA-Forschungsinstitut

2:40 PM
Understanding the Creep Properties of 347H Austenitic Stainless Steels under Hydrogen-Containing Environments: *Qing-Qiang Ren*[1]; Rishi Pillai[1]; Yukinori Yamamoto[1]; Yajie Zhao[1]; Jonathan Poplawsky[1]; [1]Oak Ridge National Laboratory

3:00 PM
Advances in Hydrogen Barrier Coatings – An Overview.: *Apurba Naskar*[1]; Manoj Mahapatra[1]; [1]University of Alabama at Birmingham

3:20 PM Break

3:40 PM
Effect of Additives on Hydrogen Equilibrium Pressure and Absorption Rates in Yttrium Hydride: *Moiz Butt*[1]; Christopher Matthews[1]; Thomas Nizolek[1]; Sean McDeavitt[2]; Erik Luther[1]; [1]Los Alamos National Laboratory; [2]Texas A&M University

4:00 PM Invited
Dynamic Nano and Microscale Processes in Hydrogen Charged Metals and Alloys: *Wendy Gu*[1]; Andrew Lee[1]; Adam Barsotti[1]; Jiyun Kang[1]; [1]Stanford University

4:20 PM
Fundamental Atomistic Study of H-Defect Interactions to Predict H Segregation Energy Spectra: *Matthew Melfi*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

4:40 PM
Imaging the Nanoscale Hydrogen Distribution in an Austenitic Stainless Steel (347H) Using Atom Probe Tomography: *Jonathan Poplawsky*[1]; Yajie Zhao[1]; Qing-Qiang Ren[1]; Tanzilur Rahman[2]; Geeta Kuari[1]; Yukinori Yamamoto[1]; [1]Oak Ridge National Laboratory; [2]Michigan State University

5:00 PM Invited
Unraveling the Influence of Hydrogen and Blended Gas on Polymer Performance in Infrastructure Systems: *Wenbin Kuang*[1]; Kevin Simmons[1]; [1]Pacific Northwest National Laboratory

MODELING

Advances in Multiphysics Modeling and Multi-modal Imaging of Functional Materials — Multiphysics Modeling of Materials and Devices II

Sponsored by: ACerS Basic Science Division, TMS: Computational Materials Science and Engineering Committee, TMS: Magnetic Materials Committee

Program Organizers: Jiamian Hu, University of Wisconsin Madison; Massimo Ghidini, University of Parma, Italy; Diamond Light Sources, UK; Wenrui Hao, The Pennsylvania State University; Di Qi, Purdue University

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Session Chair: Ruyue Fang, The Pennsylvania State University

2:00 PM Invited
Analytical Model and Dynamical Phase-Field simulations of Terahertz Susceptibility in Ferroelectrics: *Yujie Zhu*[1]; Taorui Chen[1]; Aiden Ross[2]; Bo Wang[3]; Xiangwei Guo[1]; Venkatraman Gopalan[2]; Long-Qing Chen[2]; Jia-Mian Hu[1]; [1]University of Wisconsin–Madison; [2]The Pennsylvania State University; [3]Lawrence Livermore National Laboratory

2:20 PM
Molecular Dynamic Simulation of Pectin and Cellulose Nanocrystals Composites: *Xiawa Wu*[1]; [1]Penn State Behrend

2:40 PM
Chemo-Mechanical Origin of Accelerated Oxidation Near the Surface Flaws: *Ruyue Fang*[1]; Yang Yang[1]; Dingchuan Xue[1]; Yanzhou Ji[1]; Long-qing Chen[1]; Sulin Zhang[1]; [1]Penn State University

3:00 PM
Explicit Separation of Edge and Screw Dislocation Mobility and Density Evolution Law in BCC Single Crystal Plasticity Model: *Cathy Bing*[1]; Philip Eisenlohr[1]; [1]Michigan State University

LIGHTWEIGHT ALLOYS

Composition–Processing–Microstructure-Property Relationships of Titanium Alloys — Microstructural Characterization/Alloy Development

Sponsored by: TMS: Titanium Committee

Program Organizers: Carl Boehlert, Michigan State University; Adam Pilchak, Pratt & Whitney; Dipankar Banerjee, Indian Institute of Science; Philip Eisenlohr, Michigan State University

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Session Chairs: Jide Oyerinde, Clarkson University; Philip Eisenlohr, Michigan State University

2:00 PM Invited
Tuning Alpha Microstructures in Beta Titanium Alloys: Sydney Fields[1]; Deepak Pillai[1]; Dian Li[1]; *Yufeng Zheng*[1]; [1]University of North Texas

2:30 PM
Laser Shock Processing of Titanium Alloys: Microstructure Evolution and Enhanced Engineering Performance: *Bo Mao*[1]; Shuangjie Chu[1]; Qian Liu[1]; Qifei Zhang[1]; [1]Shanghai Jiao Tong University

2:50 PM
Surface Engineering Ti Alloys and Stress Impacts on Recrystallization: *David Brice*[1]; David Bahr[2]; [1]ATI Specialty Materials; [2]Purdue University

3:10 PM
ATI High Temperature Titanium Alloy Development for Aerospace Applications: *Zachary Schlittenhart*[1]; David Brice[1]; John Mantione[1]; Matias Garcia-Avila[1]; Matthew Bender[1]; [1]ATI

3:30 PM Break

3:50 PM
Novel Ti-Ta-Zr-Mo Alloys Utilizing Martensite-Driven TRIP/TWIP Mechanisms for Cardiovascular Stent Applications: *Sucharita Banerjee*[1]; Junhui Tang[2]; Rajarshi Banerjee[3]; Fan Sun[4]; [1]University of Texas at Austin; [2]PSL Research University, Chimie ParisTech, Institut de Recherche de Chimie Paris, CNRS; [3]University of North Texas; [4]PSL Research University, Chimie ParisTech, Institut de Recherche de Chimie Paris, CNRS

4:10 PM
Titanium Boron Nitride Nanotubes (Ti-BNNT) Metal Matrix Composite Processed by SPS: Microstructure, Mechanical and Tribological Characteristics: *Satyavan Digole*[1]; Sanoj Karki[1]; Jay Desai[1]; Manoj Mugale[1]; Amit Choudhari[1]; Tushar Borkar[1]; [1]Cleveland State University

4:30 PM
A Study on High-Temperature Deformation Behavior, Mechanism and Microstructure Evolution of Ti-900 Alloy for Gas Turbine Blade Application: *Dipayan Chakraborty*[1]; Ajay Kumar[1]; [1]Indian Institute of Technology Tirupati

FUNDAMENTALS AND CHARACTERIZATION

Computational Materials for Qualification and Certification — Panel Discussion and Regulatory Considerations

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Corbett Battaile, Sandia National Laboratories; Anthony Rollett, Carnegie Mellon University; Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration

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Session Chairs: Edward Glaessgen, NASA Langley; Michael Gorelik, Federal Aviation Administration

2:00 PM Introductory Comments (Edward Glaessgen, NASA Langley Research Center; Michael Gorelik, Federal Aviation Administration)

2:30 PM Panel Discussion (Computational Materials for Qualification and Certification of Advanced Materials: Challenges and Enablers)

4:00 PM Break

4:20 PM Question and Answer Period

5:00 PM Concluding Comments

IRON AND STEEL (FERROUS ALLOYS)

Electrification of Iron and Steel — Green Steelmaking

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Leora Dresselhaus-Marais, Stanford University; Kerry Rippy, National Renewable Energy Laboratory; Ronald O'Malley, Missouri University of Science and Technology; David Marshall, Performance improvement Inc; Madhu Ranade, Steel Dynamics, Flat Roll Group; Joseph Morey, Morey Industrial Consulting

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Session Chair: Madhu Ranade, Steel Dynamics, Flat Roll Group

2:00 PM Invited
Challenges and Opportunities for Electrification of the Ironmaking Process: *Brett Spigarelli*[1]; Matt Mlinar[1]; [1]University of Minnesota Duluth - Natural Resources Research Institute

2:30 PM Question and Answer Period

2:40 PM
BioIron™ – The Development of a Low CO_2 Emissions Ironmaking Process Utilising Raw Biomass as a Reductant and Microwaves as an Energy Source: David Leigh[1]; *Michael Buckley*[1]; [1]Rio Tinto

3:00 PM
Modeling Iron Ore Reduction on Pilot Scale and Industrial Scale to Determine Economic Penalty of Pure H2 Operation: *Amogh Meshram*[1]; William Xi[1]; Yuri Korobeinikov[2]; Joe Govro[3]; Ronald O'Malley[3]; Seetharaman Sridhar[2]; [1]National Renewable Energy Laboratory; [2]Arizona State University; [3]Missouri University of Science and Technology

3:20 PM Break

3:40 PM
Advances in Hydrogen Plasma Reduction of Iron Oxide Through Solid-State Generated Microwave Power: Daniel Ellis[1]; Jazline Rebollar[1]; Brian Jurcyzk[1]; R. Mohan Sankaran[1]; *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign

4:00 PM
High-Efficient Production of High-Purity Iron from Oxide Ores by Acidic Electrowinning in Anion-Rich Electrolytes: *Tao Gao*[1]; Jing Liu[1]; [1]University of Utah

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SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Batteries and Storages II

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Kai He, University of California, Irvine; Dong Hou, Clemson University

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2:00 PM
Using Mechanochemistry to Explore New Sodium Ion Conducting Glasses and Glass-Ceramics: *Louisiane Verger*[1]; Jiajie Zhang[1]; David Le Coq[1]; Laurent Calvez[1]; François Cheviré[1]; Virginie Nazabal[1]; Julien Trébosc[2]; Olivier Lafon[2]; Olivier Hernandez[3]; Steve Martin[4]; [1]Rennes Institute of Chemical Sciences; [2]University of Lille, France; [3]Institut des Matériaux Jean Rouxel, Nantes; [4]Iowa State University, Ames

2:20 PM
Predicting the Evolution of Solid Electrolyte Interphases in Li-Metal Batteries Using Atomically Informed Phase-Field Modeling: *Kena Zhang*[1]; Yanzhou Ji[1]; Qisheng Wu[2]; Seyed Nabavizadeh[1]; Yue Qi[2]; Long-Qing Chen[1]; [1]The Pennsylvania State University; [2]Brown University

2:40 PM Invited
Thermal Degradation Characterization of Layered Oxide Cathodes for High Energy Density and Long Cycle Life Li-Ion Batteries: *Dong Hou*[1]; [1]Clemson University

3:10 PM
Single Carbon Fiber as Inductor and Capacitor: Satya Nagalla[1]; *Deborah Chung*[1]; [1]University at Buffalo, The State University of New York

3:30 PM Break

3:50 PM
Upcycling Linear Low Density Polyethylene Waste into Graphene for High Mass Loading Supercapacitors: *Yuan Gao*[1]; Ngoc Tien Huynh[1]; Ki-Joong Kim[1]; Congjun Wang[1]; Christopher Matranga[1]; Viet Hung Pham[1]; [1]National Energy Technology Laboratory

4:10 PM
High Energy Sodium Ion Battery Materials for Low Temperature Applications: *Tyler Roy*[1]; Sharon Gray[1]; Lee Leonard[1]; Jacqueline Johnson[1]; Carol Putman[2]; [1]University of Tennessee Space Institute; [2]NASA

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Fuel Cells and Electrolyzers

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Jianhua Tong, Clemson University; Talia Sebastian, Ground Vehicle Systems Center (GVSC)

2:00 PM Invited
Oxygen Evolution Reaction Made Economically Affordable by Prussian Blue Analogues Integrated with Trigonal Selenium: *Federico Polo*[1]; Edlind Lushaj[1]; Tofik Shifa[1]; Elisa Moretti[1]; Alberto Vomiero[2]; [1]Ca' Foscari University of Venice; [2]Luleå University of Technology

2:20 PM Invited
Impact of Sulfur Contamination on La0.7Sr0.3V (LSV) Oxide Conductivity Modulation Over Time: *Talia Sebastian*[1]; Theodore Burye[2]; [1]Ground Vehicle Systems Center (GVSC), Force Projection Technology (FPT), Fuels and Lubricants Branch; [2]Ground Vehicle Systems Center (GVSC), Ground Vehicle Power & Mobility (GVPM), Fuel Cell Technologies, Detroit Arsenal

3:00 PM
Exploring Cobalt Substituted Dugganite for Efficient Oxygen Evolution Reaction in Alkaline Medium: Synthesis, Structures, and Material Properties.: *Shanmugapriya I G*[1]; Natarajan Srinivasan[1]; [1]Indian Institute of Science, Bengaluru

3:20 PM Break

3:40 PM
Machine Learning Assisted Discovery of Perovskite Oxides for Protonic Ceramic Electrochemical Cell Electrolytes: Ximei Zhai[1]; Xiayan Han[1]; Feng Luo[1]; *Jianhua Tong*[1]; [1]Clemson University

4:00 PM
Characterizing Coarsening of Single- and Multi-Component Metal Composite Nano-Catalysts for Solid Oxide Fuel Cell Operation: *Saad Waseem*[1]; Edward Sabolsky[1]; Katarzyna Sabolsky[1]; Richard Hart[2]; Seunghyuck Hong[3]; Mingfei Liu[3]; [1]West Virginia University; [2]GE Vernova; [3]GE Aerospace

4:20 PM
Microextrusion-Based Additive Manufacturing of Protonic Ceramics for Energy Conversion and Storage: *Tianyi Zhou*[1]; Hua Huang[1]; Minda Zou[1]; Jacob Conrad[1]; Jianhua Tong[1]; [1]Clemson University

ARTIFICIAL INTELLIGENCE

Frontiers of Machine Learning on Materials Discovery — Frontiers of Machine Learning Session III

Sponsored by: TMS: Thin Films and Interfaces Committee

Program Organizers: Rinkle Juneja, Oak Ridge National Laboratory; Mingda Li, Mit; Hiroyuki Hayashi, Kyoto University

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Session Chairs: Ritesh Kumar, University of Chicago; Hiroyuki Hayashi, Kyoto University

2:00 PM Invited
Physics-Infused Causal and Hypothesis-Driven AI for Advanced Functional Materials: *Ayana Ghosh*[1]; [1]Oak Ridge National Laboratory

2:20 PM Invited
Autonomous Materials Synthesis System for Inorganic Thin Films Utilizing AI and Robotics: *Ryota Shimizu*[1]; [1]The University of Tokyo

2:40 PM
Towards Automatic Alloy Design via Large Language Model Powered Multi-Agent Collaborations: *Bo Ni*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

3:00 PM Invited
Unveiling the Potential of CGMD Simulations: Informing Accuracy with Optimized Coarse-Grained Topologies: *Pranoy Ray*[1]; Adam Generale[1]; Nikhith Vankireddy[2]; Yuichiro Asoma[3]; Masataka Nakauchi[3]; Haein Lee[3]; Katsuhisa Yoshida[3]; Yoshishige Okuno[3]; Surya Kalidindi[1]; [1]Georgia Institute of Technology; [2]Purdue University; [3]Resonac Corporation

3:20 PM Break

3:40 PM
The Space of Phase Diagrams: Visualization Strategies for Advanced Materials: *Jarrod Lund*[1]; Xavier Tricoche[1]; R. Edwin García[1]; [1]Purdue University

4:00 PM Invited
Role of Domain Knowledge Injection in Data-Driven Methods Towards Accelerating Material Discovery: *Arpan Biswas*[1]; [1]University of Tennessee-Oak Ridge Innovation Institute

4:20 PM Invited
Delocalized, Asynchronous, Closed-Loop Discovery of Organic Laser Emitters: *Han Hao*[1]; Felix Strieth-Kalthoff[1]; Alan Aspuru-Guzik[1]; [1]University of Toronto

4:40 PM Invited
Machine Learning Materials Properties with Accurate Predictions, Uncertainty Estimates, Domain Guidance, and Persistent Online Accessibility: *Ryan Jacobs*[1]; Lane Schultz[1]; Paul Voyles[1]; Dane Morgan[1]; [1]University of Wisconsin Madison

5:00 PM
Machine-Learning-Aided Discovery of Metal-Organic Frameworks for Water Harvesting: *Li-Chiang Lin*[1]; Zhi-Xun Xu[1]; Shiue-Min Shih[1]; Yi-Ming Wang[1]; I-Ting Sung[1]; [1]National Taiwan University

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Computational Modeling & Data Analytics (Sintering & Grain Boundaries in Metals)

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chairs: John Blendell, Purdue University; Klaus van Benthem, University of California, Davis

2:00 PM
Multiscale Data Analytics Strategy for Sintering: *Danny Hermawan*[1]; Alfredo Sanjuan[1]; Stephanie Pitts[2]; Larry Aagesen[2]; Edwin García[1]; [1]Purdue University; [2]Idaho National Lab

2:20 PM
Machine Learning-Aided Optimization of the Flash Sintering Process: *Alfredo Sanjuan*[1]; Edwin García[1]; Shiyu Zhou[1]; Chao Shen[1]; Bo Yang[1]; Xinghang Zhang[1]; Haiyan Wang[1]; [1]Purdue University

2:40 PM
Data Analytics for Sintering Regimes Identification: *Jarrod Lund*[1]; Alfredo Sanjuan Sanjuan[1]; R. Edwin García[1]; [1]Purdue University

3:00 PM
An Atomistic Study of the Radiation Response of Grain Boundaries in High Entropy Alloys: *Sarah Paguaga*[1]; Ian Chesser[2]; Enrique Martinez Saez[1]; Saryu Fensin[2]; [1]Clemson University; [2]Los Alamos National Laboratory

3:20 PM Break

3:40 PM
Predicting the Structure and Transitions of Grain Boundaries in BCC Metals: *Daniel Moore*[1]; Enze Chen[2]; Rob Rudd[3]; Mark Asta[4]; Fadi Abdeljawad[1]; Timofey Frolov[3]; [1]Lehigh University; [2]Stanford University; [3]Lawrence Livermore National Laboratory; [4]University of California, Berkeley

4:00 PM
Atomic Simulations Investigate the Substructure Boundary Sliding in Lath Martensite Steel by Using an Accurate Artificial Neural Networks Assistant Potential: *Meng Zhang*[1]; Shuang Gong[1]; Junya Inoue[1]; [1]The University of Tokyo

4:20 PM
In Situ Observation of Austenite Grain Growth for the Determination of Nb(C,N) Zener Pinning Forces in Fe-Nb-C-N Alloys by HT-LSCM: *Maximilian Kern*[1]; Michael Bernhard[1]; Christian Bernhard[1]; [1]Montanuniversität Leoben

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FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session IX

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Jian Luo, University of California, San Diego

2:00 PM Invited
Scanning Tunneling Microscopy for High Entropy Materials: *TeYu Chien*[1]; [1]Unviersity of Wyoming

2:20 PM Invited
Theoretical and Numerical Study to Model the Effect of Dynamic Strain Aging in the HfNbTaTiZr Refractory High-Entropy Alloy: *Yooseob Song*[1]; Shuying Chen[2]; Weidong Li[3]; Ko-Kai Tseng[4]; Jien-Wei Yeh[4]; Peter Liaw[3]; [1]University of Alabama in Huntsville; [2]Yantai University; [3]The University of Tennessee, Knoxville; [4]National Tsing Hua University

2:40 PM
The Role of Enthalpy, Configurational Entropy, and Vibrational Entropy in Mixing Ultrahigh Temperature Ceramics: Xiaochuan Tang[1]; Gregory Thompson[2]; *Christopher Weinberger*[1]; [1]Colorado State University; [2]University of Alabama

3:00 PM
Vanadium Carbide Precipitation Hardening in Equiatomic FeNiCrMn and FeCoNiCr High Entropy Alloys: *Suok-Min Na*[1]; Nicholas Jones[1]; Jin-Hyeong Yoo[1]; [1]Naval Surface Warfare Center Carderock Division

3:20 PM Break

3:40 PM
Swift Heavy Ion-Induced Radiation Titanate Pyrochlore Oxides and Influence of Material Complexity: *George Adamson*[1]; Cale Overstreet[1]; Eric O'Quinn[1]; Tao Liang[1]; Haixuan Xu[1]; Pascal Simon[2]; Changyong Park[3]; Veerle Keppens[1]; Katherine Page[1]; Maik Lang[1]; [1]University of Tennessee Knoxville; [2]GSI Helmholtz Center; [3]HPCAT, X-ray Science Division, Argonne National Laboratory, Lemont, IL 60439

4:00 PM
Temperature-Dependent Deformation Mechanisms in the FeCrNi Alloy Containing BCC Particles: Dislocation Cells and Deformation Twins: *Jin-Seob Kim*[1]; Jin-Kyung Kim[1]; [1]Hanyang University

4:20 PM
The Role of Hafnium in the Oxidation of Hf-Nb-Ta-Ti-Zr-Al Refractory Multi-Principle Element Alloys: *Charlie Brandenburg*[1]; David Beaudry[2]; Ben Redemann[2]; Elaf Anber[2]; Tyrel McQueen[2]; Mitra Taheri[2]; Elizabeth Opila[1]; [1]University of Virginia; [2]Johns Hopkins University

4:40 PM
Thermal Stability and Electronic Properties of Rare-Earth High-Entropy Oxides: A First-Principles Approach: *Mary Kate Caucci*[1]; Billy Yang[1]; Gerald Bejger[2]; Sai Venkata Gayathri Ayyagari[1]; Saeed Almishal[1]; Jacob Sivak[1]; Jon-Paul Maria[1]; Nasim Alem[1]; Ismaila Dabo[1]; Christina Rost[2]; Susan Sinnott[1]; [1]The Pennsylvania State University; [2]Virginia Polytechnic Institute and State University

5:00 PM
Unveiling of Strengthening Mechanisms by Cu-Added High-Entropy Alloy Fillers in Metastable Ferrous Medium-Entropy Alloy Welding: *Yoona Lee*[1]; Seonghoon Yoo[1]; Namhyun Kang[1]; [1]Pusan National University

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FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Session VIII

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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Session Chair: Hyoung Seop Kim, Pohang University of Science and Technology

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2:00 PM Invited
Strain Hardenable and Ultrastrong Maraging Medium-Entropy Alloy: *Hyoung Seop Kim*[1]; Hyeonseok Kwon[1]; [1]Pohang University of Science and Technology

2:20 PM Invited
Tensile Creep Mechanisms of FCC and BCC High Entropy Alloys: *Mingwei Zhang*[1]; [1]University of California, Davis

2:40 PM
Non-Equiatomic High-Entropy Refractory Alloys with High Ductility: Hafnium vs. Titanium in Nb-Ta-Based Solutions: *Carla Joyce Nocheseda*[1]; Peter Liaw[1]; Eric Lass[1]; [1]The University of Tennessee

3:00 PM
Optimization of Cold-Rolling and Annealing Process to Achieve Ductile Refractory High Entropy Alloys with High Strength: *Kangjin Lee*[1]; Kanghyun Park[1]; Junhee Han[2]; Chanho Lee[3]; Peter Liaw[4]; Gian Song[1]; [1]Kongju National University; [2]Korea Institute of Industrial Technology; [3]Auburn University; [4]The University of Tennessee

3:20 PM Break

3:40 PM
Optimizing Hardness of High-Entropy Boride Thin Films by Modulating the Bipolar HiPIMS Kick-Pulse: *Nathaniel McIlwaine*[1]; Nestor Marquez-Rios[1]; Jon-Paul Maria[1]; [1]Penn State University

4:00 PM
Process Optimization of Spark Plasma Sintered Ti20Al20Cr5Nb5Ni17Cu16Co17 High Entropy Alloy Using Response Surface Methodology: *Ufoma Anamu*[1]; Emmanuel Olorundaisi[1]; Peter Olubambi[1]; [1]University of Johannesburg

4:20 PM
Processing of Cantor Derived (Co-Fe-Ni-Mn) Multi-Principal Element Alloys by Solid State Reduction of Oxides: *Wookyung Jin*[1]; Prince Sharma[1]; Helen Chan[1]; Animesh Kundu[1]; Ganesh Balasubramanian[1]; [1]Lehigh University

4:40 PM
Revealing Dislocation Activity in Single-Phase (Co,Cu,Mg,Ni,Zn)O via Micropillar Compression and Post-Deformation Transmission Electron Microscopy: *Jacob Norman*[1]; Xin Wang[2]; Alexander Dupuy[3]; Julie Schoenung[1]; [1]Texas A&M; [2]University of Alabama, Tuscaloosa; [3]University of Connecticut

5:00 PM
Role of Temperature on Screw Dislocation Dynamics in Ta, Ta-W, and TaNbTi: *Pulkit Garg*[1]; Morgan Jones[1]; Amy Clarke[2]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Novel Processing of Ceramics I

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

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Session Chairs: Eric Faierson, Iowa State University; Surojit Gupta, University of North Dakota

2:00 PM Invited
Design and Manufacturing of Sustainable Materials: *Surojit Gupta*[1]; [1]University of North Dakota

2:20 PM
Inter-Lanthanide Ternary Oxide ABO_3 Synthesis by Polymeric Steric Entrapment: *Brooke Downing*[1]; Moiz Butt[1]; Brianna Musico[1]; Joshua Smith[1]; Cortney Kreller[1]; Blas Uberuaga[1]; [1]Los Alamos National Laboratory

2:40 PM
Enhanced Thermal Conductivity Using Segregated Thermal Pathway in Magnesia Composites: *Hyunae Cha*[1]; Young Kook Moon[1]; Jong-Jin Choi[1]; Byung-Dong Hahn[1]; Cheol-Woo Ahn[1]; [1]Korea Institute of Materials Science

3:00 PM
Fabrication and Characterization of Cs_2HfCl_6 Ceramics: *Anna Zachariou*[1]; Steven Lass[1]; Shariar Motakef[2]; Samyak Dhole[2]; Amlan Datta[2]; Federico Moretti[3]; Weronika Wolszczak[3]; Romain Gaume[1]; [1]University of Central Florida; [2]CapeSym, Inc.; [3]Lawrence Berkeley National Laboratory

3:20 PM
Effect of Rapid Sintering Techniques on Defect Formation and Electrochemical Characteristics of Solid-Oxide Electrolysis Cell (SOEC) Materials: *Tugrul Yumak*[1]; Javier A. Mena[1]; Ouzhan Bilaç[1]; Saad Waseem[1]; William Bullock[1]; Mason Cavalier[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; [1]West Virginia University

3:40 PM Break

4:00 PM Invited
Low Energy Sintering Processing Routes for Ceramic Materials: *Claire Dancer*[1]; Rezvan Yavari[1]; Dinesha Dabera[1]; Gareth Jones[1]; [1]University of Warwick

4:30 PM
Mullite Formation in Porcelain – A Problem with Rietveld Analysis: Francis Alicanti[1]; Hyojin Lee[1]; *William Carty*[1]; [1]Alfred University

4:50 PM
Correlation of Pore Size Distribution with Particle Size and Processing: Sarah Lutkins[1]; Hyojin Lee[1]; *William Carty*[1]; [1]Alfred University

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Novel Processing of Ceramics II

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

Wednesday PM | October 9, 2024
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Session Chair: Zhezhen Fu, Penn State Harrisburg

2:00 PM Invited
Design and Manufacturing High-Entropy Li-Garnet Ceramic Electrolyte for Batteries: *Zhezhen Fu*[1]; Chang Li[1]; [1]Pennsylvania State University - Harrisburg

2:30 PM
Sintering Behavior of Non-Shrinkage and Low Pyroplastic Deformation Porous Ceramics: *Nobuaki Kamochi*[1]; Shoutarou Kamura[1]; Sridhar Komarneni[2]; [1]Saga Ceramics Research Laboratory; [2]Pennsylvania State University

2:50 PM
Measurement of Glaze Thermal Expansion via Crazing: *Michael Carson*[1]; William Carty[1]; Hyojin Lee[1]; Grace Dunham[1]; [1]Alfred University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Materials for CO2 Sequestration — Materials for CO2 Sequestration

Sponsored by: ACerS Energy and Systems Division, ACerS Engineering Ceramics Division, ACerS Basic Science Division

Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Flavio de Souza, Brazilian Center for Research in Energy and Materials; Pozhhan Mokhtari, University of Illinois Urbana-Champaign; Ana Carolina Trindade, University of Sao Paulo

Wednesday PM | October 9, 2024
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Session Chair: Waltraud Kriven, University of Illinois at Urbana-Champaign

2:00 PM Invited
Enhanced CO2 Sequestration Efficiency Using Inorganic Polymer Composite Incorporating Zeolite: Pozhhan Mokhtari[1]; *Maja Wlodarczyk*[1]; Laura Klusendorf[1]; Prapassorn Numkiatsakul[1]; Waltraud Kriven[1]; [1]University of Illinois Urbana-Champaign

2:30 PM Invited
Innovations in Concrete: Developing Bio-Hybrid Geopolymer-Based Alternatives for Reduced and Net-Negative CO2 Emissions: *Nicholas Pavlopoulos*[1]; Collin McClain[1]; [1]Johns Hopkins University - Applied Physics Lab

3:00 PM
Carbon Dioxide Capture and Wildfire Prevention through Biochars Derived from Forestry Waste: *Emma Letourneau*[1]; Jaeyun Moon[1]; [1]University of Nevada - Las Vegas

3:20 PM Invited
Assessing Ground State Energy of Molecules and Energy Profile of the NH_3 Capturing CO_2 System Using the Quantum Computing Algorithms: *Yueh-Lin Lee*[1]; Manh Tien Nguyen[1]; Dominic Alfonso[1]; Qing Shao[2]; Benjamin Avramidis[3]; Hari Paudel[1]; Kenneth Jordan[3]; Yuhua Duan[1]; [1]National Energy Technology Laboratory; [2]University of Kentucky; [3]University of Pittsburgh

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials VI

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

Wednesday PM | October 9, 2024
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Session Chairs: Jun-ichi Kadokawa, Kagoshima University; Cem Bayram, Hacettepe University; Soshu Kirihara, Osaka University

2:00 PM Invited
Enhancing In Vitro Efficacy of Irinotecan in Colorectal Cancer Cells through Polymeric Chitosan Nanoparticle Delivery: *Dilip Gunturu*[1]; Amol Morrow[1]; Lauryn Duhart[1]; Temesgen Samuel[1]; [1]Tuskegee University, College of Veterinary Medicine

2:20 PM Invited
Infection Resistant Surfaces with Long-term Antibiofilm Activity for Indwelling Medical Devices: *Jayachandran Kizhakkedathu*[1]; [1]University of British Columbia

2:40 PM Invited
Novel Nano-Oxide Surfaces for Drug Resistant Pathogen Mitigation: Deepa Shah[1]; Craig Neal[1]; *Sudipta Seal*[1]; William Self[1]; [1]University of Central Florida

3:00 PM Invited
Nanomedicine: Redefining Pulmonary Arterial Hypertension Treatment: *Nura Mohamed*[1]; Haissam Abou-Saleh[1]; [1]Qatar University

3:20 PM Break

3:40 PM Invited
Innovative Medical Textile Materials and Their Applications: *Arif Sirinterlikci*[1]; Alyssa Bell[1]; [1]Robert Morris University

4:00 PM Invited
Studies on Compost and Its Effluent from Biomaterials for Applications in Agricultural Soil Management: *Ita Uwidia*[1]; Esther Ikhuoria[1]; Powel Perefagha[1]; Etinosa Oshodin[1]; Sarah Emmanuel[1]; Fausta Ogbuefi-Chima[1]; [1]University of Benin

4:20 PM
Polymeric Membranes Incorporated with Vitreous Humor and Extracellular Vesicles for Epithelial Regeneration: Wallady da Silva Barroso[1]; Erika Patricia Chagas Gomes Luz[1]; Lidyane Souto Maciel Marques[1]; Paulo Eduardo da Silva Cavalcante[1]; Fabia Karine Andrade[1]; André Luis Coelho da Silva[1]; *Rodrigo Vieira*[1]; [1]Federal University of Ceará (UFC)

ADDITIVE MANUFACTURING

Opportunities and Applications of Solid-State Additive Manufacturing Processes — Ultrasonic AM, Binder Jetting, and Hybrid Manufacturing

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Hang Yu, Virginia Polytechnic Institute And State University; Isabella Van Rooyen, Pacific Northwest National Laboratory; Priyanshi Agrawal, Oak Ridge National Laboratory; Bharat Gwalani, North Carolina State University; Bin Li, Iowa State University; Leon Liao, Iowa State University; Judy Schneider, University of Alabama at Huntsville; Iris Rivero, University of Florida; Paul Prichard, Kennametal Inc.

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Session Chair: Isabella Van Rooyen, Pacific Northwest National Laboratory

2:00 PM Invited
Pore Boundary Tessellation For Microstructural Analysis of Binder Jet Printed and Sintered Porous Metal Structures: Pierangeli Rodriguez de Vecchis[1]; *Markus Chmielus*[1]; [1]University of Pittsburgh

2:30 PM
CALPHAD-Based ICME Design of Cobalt-Free High Entropy Alloy Binder for Cemented Carbides: *Pocket Pizzutillo*[1]; Soumya Sridar[1]; Wei Xiong[1]; [1]University of Pittsburgh

2:50 PM Invited
A Revolution in Digital Manufacturing: Integrating Machines, Robotics, Artificial Intelligence, and Forming Technologies: *Glenn Daehn*[1]; George Spanos[2]; [1]The Ohio State University; [2]TMS

3:20 PM Break

3:40 PM
Surface Alloying in the Cu-Al System via Friction Stir Processing of Cold-Spray Deposited Coatings: An Additive Manufacturing Approach to Localized Surface Treatment for Improved Mechanical Properties: *Syed Rizvi*[1]; Aniruddha Malakar[1]; Md Jasim Uddin[1]; Aaliyah Zuniga[1]; Florian Laggner[1]; Bharat Gwalani[1]; Elizabeth Kautz[1]; [1]North Carolina State University

4:00 PM
Enhancing Microstructure and Mechanical Properties of 7075 Aluminum Walls Using a Hybrid Wire-Arc Directed Energy Deposition and Friction Stir Process: *Dinh Son Nguyen*[1]; Soumya Sridar[1]; Wei Xiong[1]; Albert To[1]; [1]University of Pittsburgh

CERAMIC AND GLASS MATERIALS

Solid-state Optical Materials and Luminescence Properties — Solid-state Optical Materials and Luminescence Properties II

Sponsored by: ACerS Basic Science Division

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Mathieu Allix, Laboratoire CEMHTI; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Polish Academy of Sciences; Jan Hostaša, CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics

Wednesday PM | October 9, 2024
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Session Chairs: Jan Hostaša, CNR ISSMC; Woohong Kim, Naval Research Laboratory

2:00 PM Invited
Ternary lanthanide Activated Fluoride Nanoparticles as Optical Probes for Thermometry in the Biological Windows: Francesca Loschi[1]; Emil Milan[1]; Martina Dalboni[1]; Veronica Zani[2]; Raffaella Signorini[2]; Patrizia Canton[3]; Eros Radicchi[1]; *Adolfo Speghini*[1]; [1]University of Verona; [2]University of Padova; [3]Ca' Foscari University Venice

2:20 PM Invited
Visible Light Emitting ZnO Nanoparticles Synthesized in Polymer Media: *Oksana Chukova*[1]; Ihor Fesych[2]; Luiz Jacobsohn[1]; [1]Clemson University; [2]Taras Shevchenko National University of Kyiv

2:40 PM
Color-Changing Single-Layer -WO_3 Devices: *Anthony Annerino*[1]; Mohammad Rahaman[1]; Jacob Shell[1]; Pelagia-Irene Gouma[1]; [1]The Ohio State University

3:00 PM Invited
$Mg_{x-1}Zn_xAl_2O_4$ Solid State Solutions: Microstructure and Luminescence: *Luiz Jacobsohn*[1]; Robin Conner[1]; [1]Clemson University

3:20 PM Break

3:40 PM
Effects of B2O3 Doping on the Growth, Structural, and Magneto-Optical Properties of Yttrium Iron Garnet (YIG) Single Crystal Fibers: *Jun Young Hong*[1]; Dolendra Karki[1]; Paul Ohodnicki[1]; [1]Univerisity of Pittsburgh

4:00 PM Invited
Scintillation Properties of Transparent Lu-α-SiAlON:Ce^{3+} Ceramics: *Junichi Tatami*[1]; Kohei Aminaka[1]; Motoyuki Iijima[1]; Akihiko Ito[1]; Shogen Matsumoto[1]; Takuma Takahashi[2]; Tatsuki Ohji[3]; [1]Yokohama National University; [2]Kanagawa Institute of Industrial Science and Technology; [3]National Institute of Advanced Industrial Science and Technology

FUNDAMENTALS AND CHARACTERIZATION

Understanding High Entropy Materials via Data Science and Computational Approaches — Session III

Sponsored by: TMS: Alloy Phases Committee

Program Organizers: Dilpuneet Aidhy, Clemson University; Raymundo Arroyave, Texas A&M University; Timothy Rupert, Johns Hopkins University; Liang Qi, University of Michigan; Wei Xiong, University of Pittsburgh; Prashant Singh, Ames National Labratory

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Session Chairs: Nicolas Argibay, AMES National Lab; Nathan Smith, Northwestern University

2:00 PM Invited
Electronic-Structure-Guided Tailoring of Refractory High-Entropy Alloys for Extreme Environment: *Nicolas Argibay*[1]; Hailong Huang[1]; Rameshwari Naorem[1]; Zongyang Lyu[1]; Ryan Ott[1]; Prashant Singh[1]; Duane Johnson[1]; [1]Ames National Laboratory

2:30 PM Invited
A First Principles High Throughput Screening Method for Corrosion Resistant High Entropy Materials: *Nathan Smith*[1]; Chris Wolverton[1]; [1]Northwestern University

3:00 PM
Design Metastability in High-Entropy Alloys by Tailoring Unstable Fault Energies: *Xin Wang*[1]; Chenyang Li[2]; Wei Chen[3]; Wei Xiong[4]; [1]Thermo-Calc Software; [2]Illinois Institute of Technology; [3]University at Buffalo; [4]University of Pittsburgh

3:20 PM Break

3:40 PM
Grain Boundary Segregation-Driven Elemental Patterning Amplifies Chemical Short-Range Order in NiCoCr: *Ian Geiger*[1]; Timothy Rupert[1]; [1]University of California Irvine

4:00 PM
Lattice Correspondence Analyses of Phase Transformations in a High Entropy Alloy: *Yuyang Wang*[1]; Bin li[1]; [1]Iowa State University

4:20 PM
Machine Learning Design of Additively Manufacturable Tungsten-Based Refractory Multi Principle Element Alloys with Enhanced Strength at Extreme Temperatures: *Zhiyang An*[1]; Bo Ni[1]; Benjamin Glaser[1]; Amaranth Karra[1]; Bryan Webler[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

4:40 PM
Utilizing Atomistic Calculations for Processing High-Value Magnetic Material Derived from FeNiMoW: *Sarah O'Brien*[1]; Matthew Beck[1]; [1]University of Kentucky

Technical Meeting and Exhibition

MS&T24

MATERIALS SCIENCE & TECHNOLOGY

October 6-9, 2024 | Pittsburgh, Pennsylvania

POSTER SESSION

with Presenters

Monday, October 7		
Poster Installation	2:00 p.m. – 4:00 p.m.	
Tuesday, October 8		
Poster Installation	8:00 a.m. – 9:00 a.m.	(If you cannot set-up your poster on Monday)
Poster Session Viewing	2:00 p.m. – 5:00 p.m.	
Poster Session Presentations	5:00 p.m. – 6:00 p.m.	(Please stand by your poster at this time to discuss your research with attendees)
Wednesday, October 9		
Poster Session Viewing	9:00 a.m. – 12:00 p.m.	
Poster Removal	12:00 p.m. – 1:00 p.m.	

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

16th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Poster Session

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mrityunjay Singh, NASA; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technology; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Wu, Wuhan University of Technology

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

N-2: Development of Sustainable Functionalized Biochars from Agro Forest Residue Waste Streams for Environmental Remediation: *Summaira Saghir*[1]; [1]University of Eastern Finland

N-3: Dielectric and Electrical Properties of Complex Perovskite Nano-Materials: *Kamdeo Mandal*[1]; Anup Kumar[1]; N.B. Singh[2]; [1]Indian Institute of Technology (Banaras Hindu University) Varanasi; [2]University of Maryland Baltimore County

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Additive Manufacturing

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-1: A Simple Model for Direct Energy Deposition Process Parameter Selection: *Yiyang Xu*[1]; Bryan Webler[1]; Maarten De Boer[1]; [1]Carnegie Mellon University

SPG-2: Additive Manufacturing of Functionally Graded Materials Challenges and Solutions in Bonding Inconel 718 and Stainless Steel 316L Using LPBF: *Sara Ranjbareslamloo*[1]; Md Muhiulislam Muhit[1]; Gabriel Awuku Dzukey[1]; Ala Qattawi[1]; [1]University of Toledo

SPG-3: Challenges to Repeatability and Reproducibility with Variations Across Length Scales in Laser-PBF: *Utkarsh Thakre*[1]; Suman Das[1]; Venkatavardhan Sunderarajan[1]; [1]Georgia Institute of Technology

SPG-4: Continuous Carbon Fiber-Reinforced Composites for Aerospace Applications Using Advanced Manufacturing Techniques: *Kevin Tennant*[1]; Austin Harper[1]; Noah Osborne[1]; Thorsten Wuest[1]; Konstantinos Sierros[1]; Edward Sabolsky[1]; [1]West Virginia University

SPG-5: High Solid Loading SiC-Polymer Composite Printing via Gradient Light Projection (GLP)-Based Additive Manufacturing: *Anasheh Khecho*[1]; Erina Joyee[1]; [1]University of North Carolina at Charlotte

SPG-6: Interface Microstructure and Nano-Mechanical Properties of Fe-SiC Composites Fabricated by Laser-Directed Energy Deposition: *Som Dixit*[1]; Shunyu Liu[1]; [1]Clemson University

SPG-7: Microwave Welding of Multicomponent Additively Manufactured Structures: *Jonathan Harwell*[1]; Igor Luzinov[1]; Jeffery Owens[2]; [1]Clemson University; [2]Air Force Civil Engineer Center

SPG-8: Multi-Modal and Multi-Material Metal Additive Manufacturing - A Review: *Ananth Balasubramanian*[1]; Ashley Paz y Puente[1]; Eric Payton[1]; [1]University of Cincinnati

SPG-9: Surface Color Relation to Alpha Case Formation in Ti-6Al-4V: *William Voellmecke*[1]; Michaela von Schaumburg[2]; Eric Payton[1]; [1]University of Cincinnati; [2]Air Force Life Cycle Management Center, Wright Patterson AFB

SPG-10: The Study of the Bonding of Tungsten-Stainless Steel Functional Graded Material Manufactured Using Laser Power Bed Fusion: *Gabriel Dzukey*[1]; Md. Muhiul Islam Muhit[1]; Ranjbareslamloo Sara[1]; Ala Qattawi[1]; [1]University of Toledo

SPG-11: Thermally Dynamic Ripening Induced Multi-Modal Precipitation Strengthened NiTi Shape Memory Alloys by Laser Metal Deposition: *Jiaqi Lu*[1]; Zhifeng Huang[1]; Yang Liu[1]; Chi Zhang[1]; [1]Wuhan University of Technology

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Artificial Intelligence

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-12: Defining Data Quality for Aggregated Historical and Crowdsourced Additively Manufactured Material Datasets: *Ian Wietecha-Reiman*[1]; Todd Palmer[1]; [1]The Pennsylvania State University

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Ceramic and Glass Materials

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-13: A Physical-Chemical Description of Frederick Carder's Aurene Glass: *Annika Blake-Howland*[1]; Doris Möncke[1]; [1]Alfred University

SPG-14: Biomimetic Color Development: An Anatomical Study of Limax Maximus: *C Hancock*[1]; Lenorah Haight-Stott[1]; Doris Möncke[1]; [1]NYSCC at Alfred University

SPG-15: Brittle to Ductile Transitions in Magnesium-Aluminum Silicate Glass: A Molecular Dynamic Simulation: *Jiayu Yue*[1]; [1]Wuhan University of Technology

SPG-16: Derivation and Verification of Multilevel Particle Packing Model for Ultra-High Performance Concrete (UHPC): Modelling and Experiments: *Tianyi Yin*[1]; [1]Wuhan University of Technology

SPG-17: Dielectric and Electrical Transport Properties of Alkaline Earth Vanadate Glasses: *Adam Shearer*[1]; [1]Penn State

SPG-18: Effect of Light on the Coarsening Characteristics of Yttria-Stabilized Zirconia Ceramics Synthesized by the Modified Pechini Process: *Mst Sharmin Mostari*[1]; Ricardo Castro[1]; [1]Lehigh University

SPG-19: Effect of Precursor Selection in Reactive Inkjet Printing of Zinc Oxide Films: Sean Garnsey[1]; *William Flynn*[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]University of Texas at San Antonio

SPG-20: Effect of Raw Material Composition on Bending Strength of Y-α′ SiAlON Composite Ceramics Measured Using Microcantilever Beam Specimens: *Yuto Masuda*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; Takuma Takahashi[2]; Tatsuki Ohji[3]; [1]Yokohama National University; [2]Kanagawa Institute of Industrial Science and Technology; [3]National Institute of Advanced Industrial Science and Technology

SPG-21: Effect of TiO2 and AlN Addition on the Mesoscale Mechanical Properties of Si3N4 Ceramics: *Takahiro Saito*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; Tatsuki Ohji[2]; Tsukaho Yahagi[3]; Takuma Takahashi[3]; Hiromi Nakano[4]; [1]Yokohama National University; [2]National Institute of Advanced Industrial Science and Technology; [3]Kanagawa Institute of Industrial Science and Technology; [4]Toyohashi University of Technology

SPG-22: Elucidation of Internal Structural Change of Alumina Slurry with Temperature Increase by OCT Equipped with a Rheometer: *Miu Nakamura*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; [1]Yokohama National University

SPG-23: Grain Boundary Strength of High Thermal Conductivity Si_3N_4 Ceramics Measured Using Microcantilever Beam Specimens: *Komaki Matsuura*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; Tatsuki Ohji[2]; Takuma Takahashi[3]; [1]Yokohama National University; [2]National Institute of Advanced Industrial Science and Technology; [3]Kanagawa Institute of Industrial Science and Technology

SPG-24: In Situ Observation of Dewaxing Behavior of Alumina Green Body by a Combined OCT-TG-FTIR-MS System: *Fumiya Kimura*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; Takuma Takahashi[1]; [1]Yokohama National University

SPG-25: Influence of Cation Bond Electronegativity on the Electrical and Structural Properties of Pyrochlore-Type $Gd_2Zr_{2-x}Sn_xO_7$ Materials.: *Efrain de la Rosa Garcia*[1]; Jose Diaz Guillen[2]; Antonio Fernandez Fuentes[1]; [1]Cinvestav Unidad Saltillo; [2]Instituto Tecnologico de Saltillo

SPG-26: Influence of Microstructure on the Degradation of Electrical Resistivity of AlN Ceramics: *Ken Kotsugai*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; Katsuhiro Itakura[2]; Ryohei Yagi[2]; Ryohei Fujimi[2]; [1]Yokohama National Univ.; [2]Sumitomo Electric Industries, Ltd.

SPG-27: Mechanical Properties of Single Crystals and Bicrystals of 8mol% Y_2O_3 stabilized ZrO_2 Measured Using Microcantilever Beam Specimens: *Mayuko Muramoto*[1]; Junichi Tatami[1]; Motoyuki Iijima[1]; Tatsuki Ohji[1]; Tsukaho Yahagi[2]; Takuma Takahashi[2]; Daichi Minami[2]; Hiromi Nakano[3]; [1]Yokohama National University; [2]Kanagawa Institute of Industrial Science and Technology; [3]Toyohashi University of Technology

SPG-28: Poly(methyl methacrylate) with SiO_2 Nanoparticle Composite Coatings to Enhance Mechanical Properties of Glass Containers: *Shaylee Becerra*[1]; [1]Penn State

SPG-29: Sintering Aid Migration in SiN-Based, Ceramic Glow Plugs: Impact of Temperature and Electric Fields: *Prapassorn Numkiatsakul*[1]; Cory Philippe[1]; Weihao Cheng[1]; Tonghun Lee[1]; Kenneth Kim[2]; Chol-Bum Kweon[2]; Waltraud Kriven[1]; [1]University of Illinois at Urbana-Champaign; [2]Combat Capabilities Development Command Army Research Laboratory

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Fundamentals and Characterization

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-30: Control of Magnon Thermal Conductivity in Spin-Ladder Cuprate for Advanced Thermal Management by Electrochemical Reaction With Water: *Taisei Katayama*[1]; Chitose Ishikawa[1]; Nobuaki Terakado[1]; Takayuki Kawamata[2]; Koki Naruse[2]; Yoshihiro Takahashi[1]; Takumi Fujiwara[1]; [1]Tohoku University; [2]Tokyo Denki University

SPG-31: Dilatometric Studies of Fe-Ni-P Ternary Alloys: *Ugochukwu Ochieze*[1]; Ayobami Oladipo[1]; Matthew Steiner[1]; [1]University of Cincinnati

SPG-32: High Throughput Development of Cu-Al-Mn-Ni Based Elastocaloric Materials: *Maria Lebedeva*[1]; [1]Iowa State University

SPG-33: Prospects of Refractory Ti-V-Zr-Nb-Mo-Hf-Ta-W High-Entropy Alloys in Hydrogen Energy Systems: *Marina Ciurans-Oset*[1]; Renata Latypova[2]; Sakari Pallaspuro[2]; Johanne Mouzon[1]; Farid Akhtar[1]; [1]Luleå University of Technology; [2]University of Oulu

SPG-34: Understanding and Effective Tuning of Red-to-Green Upconversion Emission in Ho-Based Halide Double Perovskite: *Zhihui Rao*[1]; [1]Wuhan University of Technology

SPG-35: Vacancy Migration and Kirkendall Pore Formation in the Ni-Cr-Al-Ti System: *Nicholas Simpson*[1]; Ugochukwu Ochieze[1]; Ashley Paz y Puente[1]; [1]University of Cincinnati

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Iron and Steel (Ferrous Alloys)

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-36: A Deep Dive into Evolution and Transformation of Nanoscale Copper Precipitates and Their Impact on Mechanical Properties: *Kapil Sharma*[1]; Anish Karmakar[1]; [1]Indian Institute of Technology, Roorkee

SPG-37: Bending Deformation of 3G AHSS's: *Vaytiere Iglesias*[1]; [1]McMaster University

SPG-38: CFD Prediction and Validation of Refining Stage of Industry-Scale EAF: *Sathvika Kottapalli*[1]; [1]Purdue Northwest University

SPG-39: Exploring the Recyclability of Electrical Steel: *Praise Robert*[1]; Eric Payton[1]; [1]University of Cincinati

SPG-40: Extending the Service Life of Stainless Steels- Insights Using SANS and Neutron Total Scattering: *Monika Rolinska*[1]; Lewis Owen[2]; Benjamin Jolly[2]; Joakim Odqvist[1]; Peter Hedström[1]; [1]KTH Royal Institute of Technology; [2]University of Sheffield

SPG-41: Flow Optimization in Kanbara Reactors: *Kiranchandru Lingeswaran*[1]; [1]Purdue University Northwest

SPG-43: Non-Metallic Inclusions in Sequence Vacuum Induction Melting: *Zhikai Liu*[1]; Bryan Webler[1]; [1]Carnegie Mellon University

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Lightweight Alloys

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-44: Effect of Crystallographic Texture on Residual Stresses Induced during Surface Modification of Ti6Al4V Rolled Plate: *Ayobami Oladipo*[1]; Likun Sun[1]; Priam Tyagi[1]; Meiyan Timberlake[1]; Adam Pilchak[2]; Matthew Steiner[1]; Eric Payton[1]; [1]University of Cincinnati; [2]Pratt & Whitney

SPG-45: Improved Constitutive Descriptions of the Flow Behavior of Aluminum Alloy 2618: *Okechukwu Obioha*[1]; Joseph Kolar[1]; Phillisity Neal[1]; Jesus Acosta[1]; Netsanet Thompson[1]; Matthew Steiner[1]; Christopher Calhoun[1]; Eric Payton[1]; [1]University of Cincinnati

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Materials-Environment Interactions

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-46: Evaluating Steam Stability of Xenotime -Inspired Rare Earth Phosphate Environmental Barrier Coatings: *Imoen Stack*[1]; Elizabeth Opila[1]; [1]University of Virginia

SPG-47: Interlaboratory Study on Creep-Fatigue Testing of Creep-Brittle Materials per ASTM E2760: *Isabelle Heintz*[1]; Adam Thompson[1]; Santosh Narasimhachary[2]; Zach Harris[1]; [1]University of Pittsburgh; [2]Siemens Technology

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Modeling

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-48: Damage Behavior of High Particle Volume Fraction Composites with Initial Damage by Cohesive Finite Element Meso-Modeling: *Xiaoshan Zhang*[1]; [1]Wuhan University of Technology

SPG-49: Phase Field Modeling of Complex Pit Morphology, Mechanical loading, and electrochemical process in Anisotropic Material: *Christian Mathew*[1]; Yao Fu[1]; [1]Virginia Polytechnic Institute

SPG-50: Phase Field Modelling of Microtube Formation in NiTi Shape Memory Alloys: *Vinay Oruganti*[1]; Sravya Josyula[1]; Ravi Kumar[1]; Ashley Paz y Puente[1]; Eric Payton[1]; [1]University of Cincinnati

SPG-51: Thermo-Kinetics of Impurities in Uranium Alloys: *Nicole O'Shea*[1]; Adrian Gonzales[2]; Jibril Shittu[2]; Joseph Boro[2]; Nicholas Ury[2]; Kyoung Kweon[2]; Bradley Childs[2]; Emily Moore[2]; [1]University of California - Davis; [2]Lawrence Livermore National Laboratory

SPG-52: Thermomechanical Properties of Rare Earth Phosphates as Environmental Barrier Coatings: *Jelili Kazeem*[1]; Liping Huang[1]; Bishnu Majee[1]; Jie Lian[1]; Keith Bryce[1]; [1]Rensselaer Polytechnic Institute

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Nanomaterials

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-53: 2D MoS_2, WS_2, and $MoWS_2$ Nano-Flakes for Sodium and Potassium Ion Battery: *Arijit Roy*[1]; Sonjoy Dey[1]; Gurpreet Singh[1]; [1]Kansas State University

SPG-54: Anisotropic Reinforcement in Polymer Nanocomposites Using Dielectric-Magnetic Difunctional Nanofibers: *Zhi Li*[1]; [1]Wuhan University of Technology

SPG-55: Intrinsically Large Effective Mass and Multi-Valley Band Characteristics of n-Type Bi2-Bi2Te3 Superlattice-Like Films: *Yujie Ouyang*[1]; [1]Wuhan University of Technology

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Nuclear Energy

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-56: Development of a Dechlorination Process for an Elecrorefiner Salt Waste Simulant: *Harmony Werth*[1]; Paige Murray[1]; Brian Riley[2]; Michael Simpson[3]; Charmayne Lonergan[4]; Krista Carlson[1]; [1]University of Nevada Reno; [2]Pacific Northwest National Laboratory; [3]University of Utah; [4]Missouri University of Science and Technology

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Processing and Manufacturing

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-57: Development of Textured Lead Zirconate Titanate (PZT) Ceramics for Passive Acoustic Sensing Applications: *Casey Zhang*[1]; Beecher Watson[2]; Mark Fanton[2]; Richard Meyer[2]; Susan Trolier-McKinstry[1]; [1]Pennsylvania State University; [2]Applied Research Laboratory

SPG-58: Hot Deformation Behavior and Microstructure Evolution in XH43 Superalloys: *Sagar Patil*[1]; S.V.S. Narayana Murty[2]; M.J.N.V. Prasad[1]; [1]Indian Institute of Technology Bombay; [2]Indian Space Research Organization, Trivandrum

SPECIAL TOPICS

2024 Graduate Student Poster Contest — Sustainability, Energy, and the Environment

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPG-61: Structurally Simplified Tin-Lead Mixed Perovskite Solar Cells for Efficient All-Perovskite Tandems: *Yutian Tian*[1]; [1]Wuhan University of Technology

SPG-62: Topological Electronic Transition Contributing to Improved Thermoelectric Performance in p-Type Mg3Sb2-xBix Solid Solutions: *Sen Xie*[1]; [1]Wuhan University of Technology

SPG-63: X-Ray Diffraction Analysis of the Effect of Hydrogen and Methane Partial Pressures on the Chemical Vapor Deposition Synthesis of Refractory Metal Carbides: Jesus Acosta[1]; Phillisity Neal[1]; *Sajjad Hasan*[1]; Eric Payton[1]; [1]University of Cincinnati

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Additive Manufacturing

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-1: 3D Printing of Fully Integrated Flexible Humidity Sensor for Long-Term Health Monitoring: *Dylan Burke*[1]; Erina B Joyee[1]; Anasheh Khecho[1]; [1]UNC Charlotte

SPU-2: Anomaly Detection via In Situ Monitored Additively Manufactured Tensile Bars: *Annika Bauman*[1]; Dan Bolintineanu[2]; Anthony Garland[2]; Michael Heiden[2]; [1]New Mexico Institute of Mining and Technology; Sandia National Laboratory; [2]Sandia National Laboratory

SPU-3: Comparison of Substrate and Sintering Condition Impacts on Aerosol Jet Printed Traces: *Anuvi Gupta*[1]; Janet Gbur[1]; Douglas Shire[2]; [1]Case Western Reserve University; [2]VA Northeast Ohio Health Care System

SPU-4: Conductive Ink Morphology Analysis for Aerosol Jet Printing: *Lexi Miskey*[1]; Sylvie Crowell[1]; Janet Gbur[1]; [1]Case Western Reserve University

SPU-5: Leveraging Bayesian Optimization for Fine-Tuning of Aerosol Jet Printing Processing Parameters: *Daniel Rakowsky*[1]; Janet Gbur[1]; [1]Case Western Reserve University

SPU-6: LignoCrete: Carbon Negative Mortars for 3D Printing: *Xavier Fross*[1]; [1]Colorado School of Mines

SPU-7: Stability of Aerosol Jet Printing for Flexible Electronics: *Aidan Selkirk*[1]; Daniel Rakowsky[1]; Caroline Kromalic[1]; Peter Burdick[1]; Janet Gbur[1]; [1]Case Western Reserve University

SPU-8: Tailoring Microstructure and Twin-Induced Work Hardening of a Laser Powder Bed Fusion Manufactured Haynes 188 Alloy: *Yang Liu*[1]; Chi Zhang[1]; Jiaqi Lu[1]; Aijun Huang[2]; Fei Chen[1]; [1]Wuhan University of Technology; [2]Monash University

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Artificial Intelligence

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-9: Exploration and Classification of Materials Using a Tactile Sensor and Artificial Intelligence: *YiTing Lin*[1]; [1]Carnegie Mellon University

SPU-10: Machine Learning Model Explainability for the Development of High-Entropy Alloys: *David Flores*[1]; Wesley Reinhart[1]; Arindam Debnath[1]; [1]Pennsylvania State University

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Ceramic and Glass Materials

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-11: Chromium as a Catalyst for Large Particle Silicon Nitride: *Hannah Scott*[1]; Trevor Aguirre[2]; [1]Missouri University of Science And Technology; [2]Oak Ridge National Lab

SPU-12: Glass-Refractory Interactions with Industrial Scaleup of LionGlass: *Elizabeth Aichele*[1]; John Mauro[1]; [1]Pennsylvania State University

SPU-13: Hands-On Instruction of First-Year College Engineering Students to Introduce Concepts of Ceramic Engineering: *Evelyn Dolphin*[1]; Harmony Werth[1]; Krista Carlson[1]; [1]University of Nevada Reno

SPU-14: High Throughput Texture Analysis of Quartz via Automated Polarized Reflective Light Microscopy: *Tekle Khmiadashvili*[1]; Katalyn Denby[1]; Mengying Liu[1]; [1]Washington and Lee University

SPU-15: Improving Density and Toughness of Ceria-Based Oxygen Ion Conductors: *Connor Davison*[1]; [1]Lehigh University; NIST

SPU-16: Photochemical Properties of WO3-TiO2 Eutectic Composites: *Katherine Eisenman*[1]; Elizabeth Dickey[1]; Gregory Rohrer[1]; [1]Carnegie Mellon University

SPU-17: Tailoring Cation Solubility in Rock Salt High Entropy Oxides: *Matthew Furst*[1]; Saeed Almishal[1]; Jacob Sivak[1]; Susan Sinnot[1]; Jon-Paul Maria[1]; [1]The Pennsylvania State University

SPU-18: The Egyptian Blues, Preview: Color-Phase Assemblage Relationships: *John Bussey*[1]; Ed Vicenzi[2]; M. C. Dixon Wilkins[1]; Julia Esakoff[1]; Thomas Lam[2]; Travis Olds[3]; Lisa Haney[3]; Mostafa Sherif[3]; Sam Karcher[1]; John McCloy[4]; [1]Washington State University; [2]Museum Conservation Institute, Smithsonian Institution; [3]Carnegie Museum of Natural History; [4] Washington State University

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Fundamentals and Characterization

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-19: Advancing Cu-Al-Mn-Ni Alloys for Cost-Effective Elastocaloric Cooling: *Casen Legreid*[1]; Masha Lebedeva[1]; Jun Cui[1]; [1]Iowa State University

SPU-20: Electrical Transport Properties in 3D-Printed Variably Uniform 2D-Networks: *Caitlyn Obrero*[1]; Carmen Lee[1]; Karen Daniels[1]; Christopher Rock[1]; Katie Newhall[2]; [1]North Carolina State University; [2]University of North Carolina at Chapel Hill

SPU-21: The Effects of Corrugated Groove Pressing on Heterogenous Microstructure and Mechanical Properties in Copper Plates: *Alex Brown*[1]; David Field[1]; [1]Washington State University

SPU-22: Design of Silicone Composites with Controlled Hardness: *Pia Piazzi*[1]; Ashoka Gedara[1]; Irina Molodetsky[1]; [1]New Jersey Institute of Technology

SPU-23: On the Sources of Discrepancies between EBSD, SEM, and Optical Grain Size Measurements: *Darrah Timberlake*[1]; Kayla Evans[2]; Priam Tyagi[1]; Victoria Miller[3]; Eric Payton[1]; [1]University of Cincinnati; [2]Wright State University; [3]University of Florida

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Iron and Steel (Ferrous Alloys)

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-24: Can Titanium in Stainless Steel Diminish Corrosion Resistance?: *Aryn Loew*[1]; Clinton Hawkins[1]; Ashley Galligan[2]; Terry Lowe[1]; [1]Colorado School of Mines; [2]Purdue University

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Materials-Environment Interactions

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-25: FAIRification of Highly Accelerated Lifetime Testing of Multi-Layer Ceramic Capacitors: *Ravi Lin*[1]; Alp Sehirlioglu[1]; [1]Case Western Reserve University

SPU-26: Lifetime Analysis of Unencapsulated Solar Cell Passivation Layers: *Jonah Gezelter*[1]; Marina Kamperai[1]; Gray Thomas[1]; Sophia Buffone[1]; Nqobile Tshuma[1]; Diego Zubieta Sempertegui[1]; Mirra Rasmussen[1]; Andrew Lininger[1]; Ina Martin[1]; Laura Bruckman[1]; [1]Case Western Reserve University

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Modeling

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-27: Modeling the Force-Extension Response of Binary Copolymers With Molecular Dynamics Simulations: *Hanyu Pan*[1]; Thomas O'Connor[1]; [1]Carnegie Mellon University

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Nanomaterials

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-28: Epitaxial Growth of Highly Conductive -Ga2O3 by Suboxide Molecular-Beam Epitaxy: *Julianne Chen*[1]; Jacob Steele[2]; Darrell Schlom[2]; [1]Penn State University; [2]Cornell University

SPU-29: Growth of Twisted Nanomaterials: Chiral Halide Perovskite and Zinc Oxide: *Arianna Thornton*[1]; Matthew Hautzinger[2]; Matthew Beard[2]; [1]Case Western Reserve University; [2]National Renewable Energy Laboratory

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Nuclear Energy

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-30: Investigating Thermophysical Properties of Uranium Nitride Nuclear Fuel: *Sarah Cole*[1]; Ryan Finkelstein[1]; Allyssa Bateman[1]; Elizabeth Sooby[2]; Brian Jaques[1]; [1]Boise State University; [2]University of Texas at San Antonio

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Processing and Manufacturing

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-31: Design and Development of an Integrated Metal Oxide Semiconductor (MOS) and Infrared (IR) Spectroscopy Sensor (GatorSense) for Lunar Volatile Detection: *Emma Muscato*[1]; Zachary DeFabrizio[1]; Aarnav Gautam[1]; Shannon Gerard[1]; Michael Gold[1]; Nhan Hoang[1]; Lalitha Dabilpuram[1]; Shweta Meshram[1]; Aroba Saleem[1]; [1]University of Florida

SPECIAL TOPICS

2024 Undergraduate Student Poster Contest — Sustainability, Energy, and the Environment

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

SPU-32: Cellulose and Ionic Liquid Solutions Properties and Rheology: *Noel Mcclellan*[1]; [1]Penn State University

SPU-33: Cs+ Intercalation in WO3 Photoelectrodes Inhibits Catalyst Deactivation for the Oxygen-Evolution Reaction: *Matias Moreno*[1]; [1]Penn State University

SPU-34: High-Permittivity PDMS Dielectrics Obtained through Polar Group Functionalization: *Hao Gu*[1]; [1]West Valley College

SPU-35: Solvent Effect of Solution-Processed Electron Transport Layer on Organic Photovoltaics Performance: Souk Yoon Kim[1]; *Pimmada Sawangwong*[1]; Nutifafa Doumon[1]; [1]Penn State University

SPU-36: Sustainable Geopolymer Concrete for Construction Applications: *Zineb Moujoud*[1]; Omar Tanane[1]; Abdeslam El Bouari[1]; [1]Faculty of Sciences Ben M'Sick, Hassan II University of Casablanca, Morocco

SPU-37: The Design of Alloys for the Circular Economy: *Ian Giblin*[1]; Eric Payton[1]; Josh Maile[1]; Yuval Noiman[2]; [1]University of Cincinnati; [2]California State University, Fullerton

BIOMATERIALS

3D Printing of Biomaterials and Devices — Poster Session

Program Organizers: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

C-1: Surface Treatment of Titanium for Bone Tissue Engineering and Drug Delivery Applications: *Farid Ahmadpour Esmaeilabadi*[1]; Prantik Chowdhury[1]; Paige Bothwell[1]; Sahar Vahabzadeh[1]; [1]Northern Illinois University

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Jing Zhang, Purdue University in Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Brandon McWilliams, US Army Research Laboratory; Yeon-Gil Jung, Korea Institute of Ceramic Engineering & Technology; Charles Fisher, Naval Surface Warfare Center - Carderock

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Hall A | David L. Lawrence Convention Center

Session Chair: Jing Zhang, Purdue University in Indianapolis

A-1: Development of A Customized Open-Source Inkjet 3D Printer: Andrew Gillespie[1]; Tyler Weber[1]; *Jing Zhang*[1]; [1]Purdue University in Indianapolis

A-2: Melt Pool Geometry Analysis of a Ti-W Gradient Material Using In-Situ Monitoring and FEA in a DED AM System: *Matthew Dolde*[1]; Fatih Sikan[1]; Maria Quintana[1]; Peter Collins[1]; [1]Iowa State University

Assessment of New Hot Crack Susceptibility Index Based on Interdendritic Pressure Drop Simulations: *Joshua Maile*[1]; Abdulquadri Oriola[1]; A Nguyen[1]; Eric Payton[1]; [1]University of Cincinnati

ADDITIVE MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Engineering Ceramics Division, ACerS Manufacturing Division

Program Organizers: Lei Chen, University of Michigan-Dearborn; Xuan Song, University of Iowa; Xiangyang Dong, Arizona State University; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, The Pennsylvania State University

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

Session Chair: Lei Chen, University of Michigan-Dearborn

A-3:Optimizing SiC Slurries for Robocasting High-Performance SiC.: *Cooper Howard*[1]; Josh Robinson[1]; Scott Misture[1]; [1]Alfred University

ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Poster Session

Program Organizers: Prashanth Konda Gokuldoss, Tallinn University of Technology; Jurgen Eckert, Erich Schmid Institute of Materials Science

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

Additive Manufacturing of Inconel 718 and SS316L Preforms for Forging Operations: *Showmik Ahsan*[1]; Vignesh Asam[1]; AKM Mian[1]; Daniel Young[1]; Raghavan Srinivasan[1]; [1]Wright State University-Main Campus

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Poster Session

Sponsored by: ACerS

Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

A-4: Enhancing Mechanical Resilience of SLA Printed Parts in Load-Bearing Applications: *Armaghan Hashemi Monfared*[1]; Fariborz Tavangarian[1]; Niloofar Fani[1]; [1]Penn State Harrisburg

A-5: From Traditional Methods to Additive Manufacturing: Production of Pure Copper Components through Powder Metallurgy: *Mahsa Beyk Khorasani*[1]; Eric Rhodes[2]; John Barnes[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Metal Powder Works

A-6: Investigating Crack Propagation in 3D Printed Spicule-Inspired Structures Using Computer Tomography (CT) Scanning: *Fariborz Tavangarian*[1]; Armaghan Hashemi Monfared[1]; Niloofar Fani[1]; [1]Penn State Harrisburg

A-7: Optimal Design of Additively Manufactured Forging Preforms Using Finite Element Method: *Vignesh Asam*[1]; Showmik Ahsan[1]; Srinivasan Raghu[1]; Daniel Young[1]; Mian Ahsan[1]; [1]Wright State University

A-8: Optimizing Structural Efficiency: Core Design Strategies for Biomimetic Nested Cylindrical Frameworks in Bending: *Niloofar Fani*[1]; Fariborz Tavangarian[1]; Armaghan Hashemi Monfared[1]; [1]Pennsylvania State University

ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Joy Gockel, Colorado School of Mines; Sneha Prabha Narra, Carnegie Mellon University; Samantha Webster, Nist - Gaithersburg; Ola Harrysson, North Carolina State University; Ulf Ackelid, Freemelt AB

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Hall A | David L. Lawrence Convention Center

A-9: Investigation of Gradient Alloy Composition Measurement with LIBS: Towards In Situ Composition Monitoring in Additive Manufacturing: *Jacob Spencer*[1]; Brian Squires[1]; Brandon McWilliams[2]; Kyu Cho[2]; Narendra Dahotre[1]; Andrey Voevodin[1]; [1]University of North Texas; [2]CCDC Army Research Laboratory

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructure, Defects, and Properties — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Phase Transformations Committee

Program Organizers: Nadia Kouraytem, Utah State University; Shenyang Hu, Pacific Northwest National Laboratory; Mohan Sai Kiran Nartu, Pacific Northwest National Laboratory (Pnnl); Srujan Rokkam, Advanced Cooling Technologies, Inc.; Mohsen Asle Zaeem, Colorado School of Mines; Arezoo Emdadi, Missouri University of Science and Technology; Donna Guillen, Idaho National Laboratory; Dan Young, Wright State; Iris Rivero, University of Florida; Jonathan Pegues, Castheon; Eric Payton, University of Cincinnati; Ming Chen, Northwestern University; Ashley Paz y Puente, University of Cincinnati; Matthew Steiner, University of Cincinnati

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

A-10: Effects of Scanning Speed on the Shape Memory Properties of Additively Manufactured Ni-rich NiTiHf: Guher Toker[1]; *Keaton Looper*[2]; Mohammadreza Nematollahi[3]; Saeedeh Vanaei[3]; Mohammad Elahina[3]; Haluk Karaca[2]; [1]Bayburt University ; [2]University of Kentucky; [3]University of Toledo

A-12: Structure-Property Correlation and Defect Evaluation of Graphene Reinforced Aluminium Composites Fabricated via Laser Powder Bed Fusion: *Vishal Yadav*[1]; N Sathish[2]; Ma Qian[1]; Xiaobo Chen[1]; Tingting Song[1]; [1]RMIT University; [2]CSIR-AMPRI

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advanced Ceramics for Environmental Remediation — Poster Session

Program Organizers: Alberto Vomiero, Lulea University of Technology; Elisa Moretti, Ca' Foscari University of Venice; Tofik Shifa, Ca'Foscari University of Venice; Clara Santato, Polytechnique Montreal

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N-4: Enhanced Congo Red Adsorption and Photo-Fenton Oxidation Over an Iron-Impeded Geopolymer from Ferruginous Kaolinite: Steric, Energetic, Oxidation, and Synergetic Studies: *Esraa R. Adly*; [1]

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments V — Poster Session

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Keyou Mao, Florida State University; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

L-1: Application of Laboratory-Based Photoelectron Spectroscopy with Hard and Soft X-Rays to Nuclear Forensics Characterization of Uranium Dioxide Fuel: *Stuart Dunn*[1]; Paul Roussel[2]; Aaron Wood[3]; Ben Spencer[3]; Robert Harrision[3]; Philip Kaye[2]; Matthew Higginson[2]; Wendy Flavell[3]; [1]Bangor University; AWE; [2]AWE; [3]University of Manchester

L-2: Effect of Swift Heavy Ion Irradiation on Silicon Carbide: *Jackson Cagle*[1]; Maik Lang[1]; Eric O'Quinn[1]; Jacob Minnette[1]; Evan Williams[1]; Cale Overstreet[1]; [1]University of Tennessee

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Coatings for Wear and Corrosion Protection — Poster Session

Program Organizers: Evelina Vogli, Flame Spray Inc.; Virendra Singh, SLB

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

Session Chair: Evelina Vogli, Flame Spray Inc.

H-1: Characterization of Microstructure and Thermal Cycle Stability of Tantalum/Steel Interfaces Manufactured by Explosive Welding: *Si Yeon Kim*[1]; Chi Won Kim[2]; Sung Jin Chang[3]; Dong Hun Kim[4]; Sung Ho Yang[4]; Hyun Uk Hong[1]; [1]Changwon National University; [2]Korea Institute of Materials Science; [3]National Nanofab Center; [4]Agency for Defense Development

H-2: Corrosion Behavior of Fe-Based Metallic Glass Coatings Synthesized by Atmospheric Plasma Spraying: Optimisation of Heat Input and Coating Thickness: *Md Akif Faridi*[1]; Tapas Laha[1]; [1]Indian Institute of Technology Kharagpur

H-3: Electrodeposition Process Optimization by Response Surface Methodologies to Obtain High-Corrosion Resistant Zn-Ni Coatings: *Juan David Matallana Guerrero*[1]; Bangmaya Satpathy[1]; P.Siva Prasad[1]; Siddhartha Das[1]; Karabi Das[1]; [1]Indian Institute of Technology Kharagpur

H-4: Experimental Observation of Corrosion Resistance on Mg-Alloys Using the Large Pulsed Electron Beam Irradiations: *Hyung Wook Park*[1]; [1]Unist

H-5: Insights into Structural Adhesive Corrosion Resistance Using DOE: *Ming-Siao Hsiao*[1]; Ryan McCall[1]; Thomas Dautaj[1]; Denis Hostetter[1]; Nicholas Huff[1]; [1]Sunstar Engineering Americas

H-6: Obtaining Wear-Resistant Chrome Coatings on Parts of Press Tooling Under Conditions of Self-Propagating High-Temperature Synthesis: *Borys Sereda*[1]; Andrey Udod[1]; [1]DSTU

H-7: Particle Size-Dependent Corrosion Behavior of Green Graphene for Use in Coatings for Carbon Steel Under the Principle of Safe Sequestration: *Anu Verma*[1]; Chandra Tiwary[1]; Jayanta Bhattacharya[1]; [1]Indian Institute of Technology, Kharagpur

H-8: Production of Wear-Resistant Chrome Coatings Using Composite Saturating Charges: Borys Sereda[1]; *Irina Kruhliak*[1]; Dmytro Sereda[1]; Dmytro Kruhliak[1]; Ruslan Krivko[1]; [1]DSTU

ADDITIVE MANUFACTURING

Advanced Manufacturing of High Temperature Ceramics and Composites: Processing, Characterization and Testing — Poster Session

Sponsored by: ACerS Basic Science Division, ACerS Engineering Ceramics Division

Program Organizers: Corson Cramer, Oak Ridge National Laboratory; Greg Hilmas, Missouri University of Science and Technology; Lisa Rueschhoff, Air Force Research Laboratory; David Mitchell, University of Central Florida

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

Session Chair: Corson Cramer, Oak Ridge National Laboratory

A-13: Comparing the Measured Permittivity with the Mixing Rules of Maxwell-Garnett, Bruggeman, and the Coherent Potential: *Sahar Forouzan*[1]; Markus Hainthaler[1]; Raimund Förg[1]; Guenther Ruhl[2]; [1]Technische Hochschule Deggendorf; [2]Deggendorfer Institute of Technology

A-14: Hyperdoping: Doping TiO2 Beyond Thermodynamic Limits Using Flash Sintering: Anupam Raj[1]; *Shikhar Krishn Jha*[1]; [1]IIT Kanpur

A-15: Optimization of Ball Milling and Spark Plasma Sintering Process Parameters for Graphene Nanoplatelets Reinforced IN718 Composites: *Sanoj Karki*[1]; Satyavan Digole[1]; Mayank Garg[1]; Amit Choudhari[1]; Manoj Mugale[1]; Tushar Borkar[1]; [1]Cleveland State University

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Poster Session

Sponsored by: ACerS
Program Organizers: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

Session Chairs: Gary Pickrell, Virginia Tech; Navin Manjooran, Solve

H-9: Exposure of Aerosol Jet Printed h-BN/Polyimide Nanocomposite Films to Gamma Radiation: *Lucas Clark*[1]; Fahima Ouchen[2]; Laura Davidson[2]; Oshadha Ranasingha[3]; Emily Heckman[4]; Carrie Bartsch[4]; Ahsan Mian[1]; [1]Wright State University; [2]KBR; [3]University of Massachusetts Lowell; [4]Air Force Research Laboratory

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Poster Session

Sponsored by: ACerS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Ubic, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

Tuesday PM | October 8, 2024
Hall A | David L. Lawrence Convention Center

D-1: Analysis of the Electrical Conduction Mechanisms of La-Doped AgNbO3 Ferroelectric Ceramics: *Tawan H. T. Rosa*[1]; Ruyan Guo[2]; Amar S. Bhalla[2]; José de los Santos Guerra[1]; [1]Federal University of Uberlândia; [2]The University of Texas at San Antonio

D-2: CoFe2O4/PZT Magnetoelectric Composites for Magnetic Field Sensing: Lilian Pereira[1]; Julio Pastoril[1]; Gustavo Dias[1]; Ivair Santos[1]; Ruyan Guo[2]; Amar Bhalla[2]; *Luiz Cotica*[1]; [1]State University of Maringa; [2]University of Texas at San Antonio

D-3: Effect of Mo Doping on Structural and Ferroelectric Properties of BaTiO3 Using Electron Microscopy: *Vishesh Sharma*[1]; Sumit Pokhriyal[1]; N. P. Lalla[2]; Shivani Sharma[3]; [1]Graphic Era Hill University; [2]UGC-DAE Consortium for Scientific Research; [3]Alfred University

D-4: Effects of Dispersion Through Ultrasonification Method on Electro-Magnetic Core-Shell Nanoparticles: *Maria Basurto*[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]UTSA

D-5: Investigation of the Dielectric Response of BNT–KBT Based Lead-Free Ceramics: *Marcos Aparecido dos Santos Mariano*[1]; Ruyan Guo[2]; Amar S. Bhalla[2]; José de los Santos Guerra[1]; [1]Instituto de Física, Universidade Federal de Uberlandia; [2]The University of Texas at San Antonio

D-6: Lead-Free Bismuth-based Halide Perovskite with Temperature-Driven Dual Dielectric Switching: *Shivam Aggarwal*[1]; Dhananjay Dey[1]; Tanmoy Maiti[1]; [1]IIT Kanpur

D-7: Nanocomposites of High Entropy Oxide Thermoelectrics for High-Grade Waste Heat Recovery: *Vivek Kumar*[1]; Tanmoy Maiti[1]; [1]Indian Institute of Technology Kanpur

D-8: Processing and Characterization of Conductive and Dielectric Inks for Inkjet Printing: *Arashdeep Singh*[1]; Ahsan Mian[1]; Henry Young[1]; [1]Wright State University

D-9: Spark Plasma Sintering of High-TC CaBi2Nb2O9 that Exhibits Superior Piezoelectric Performance: *Chun-Ming Wang*[1]; Qian Wang[1]; [1]Shandong University

MATERIALS-ENVIRONMENT INTERACTIONS

Advances in High-Temperature Oxidation and Degradation of Materials for Harsh Environments: A SMD and FMD Symposium Honoring Brian Gleeson — Poster Session

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: High Temperature Alloys Committee, TMS: Alloy Phases Committee

Program Organizers: Kinga Unocic, North Carolina State University; Wei Xiong, University of Pittsburgh; Elizabeth Opila, University of Virginia; Richard Oleksak, National Energy Technology Laboratory; Rishi Pillai, Oak Ridge National Laboratory; Bruce Pint, Oak Ridge National Laboratory

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H-10: Effect of Al Content of -NiAl on Initial Sulfate Deposit-Induced Corrosion: *Taisei Iwasaki*[1]; Shigenari Hayashi[1]; Suzue Yoneda[1]; Kotaro Mizushino[2]; Yasuo Matsunaga[2]; Atsushi Tsuru[2]; [1]Hokkaido University; [2]IHI Corporation

H-11: Effect of Microstructures on Spallation Resistance of Oxide Scale Formed on 2.25Cr-1Mo Steels in Water Vapor at 600°C: *Taisei Kurosawa*[1]; Shigenari Hayashi[1]; Yoneda Suzue[1]; Kyohei Nomura[2]; Yohei Sakakibara[2]; Yoshiki Shioda[2]; [1]Hokkaido University; [2]IHI Corporation

H-12: Effect of Simulated Ash Components on Breakdown of a Protective Chromia Scale Formed on Heat Resistant Steel: *Soichiro Sugiyama*[1]; Shigenari Hayashi[1]; Suzue Yoneda[1]; Takashi Furugaki[2]; [1]Hokkaido University; [2]TAKUMA Co.

H-13: Effect of Water Vapor on the Oxidation Behavior of a Novel Ni-Based Alloy at 1273 K: *Abdul Latif*[1]; Mitsutoshi Ueda[2]; Kenichi Kawamura[1]; Masao Takeyama[1]; [1]Tokyo Institute of Technology; [2]Hokkaido University

H-14: Internal Oxidation Behavior of Fe-3at%Si-X Alloys at 1000°C: *Koki Ishikura*[1]; Shigenari Hayashi[1]; Suzue Yoneda[1]; Hiroshi Tanei[2]; Takumi Nishimoto[2]; Aya Harashima[2]; [1]Hokkaido University; [2]Nippon Steel Corporation

H-15: Understanding the High Temperature Oxidation and Interdiffusion Behaviour of Tantalum Alloyed -Based Titanium Aluminide: *Shivansh Mehrotra*[1]; Kushal Samanta[1]; Dibyajyoti Ghosh[1]; Sangeeta Santra[1]; [1]Indian Institute of Technology Delhi

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Poster Session

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division, TMS: Refractory Metals & Materials Committee

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory

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N-6: Effect of Cyclic Hydrogen Charging on Shot-Peening Steel with Surface Compressive Residual Stresses: *Jia-Huei Tien*[1]; David Bahr[1]; Megan Reger[1]; David Johnson[1]; [1]Purdue University

MODELING

Advances in Multiphysics Modeling and Multi-modal Imaging of Functional Materials — Poster Session

Sponsored by: ACerS Basic Science Division, TMS: Computational Materials Science and Engineering Committee, TMS: Magnetic Materials Committee

Program Organizers: Jiamian Hu, University of Wisconsin Madison; Massimo Ghidini, University of Parma, Italy; Diamond Light Sources, UK; Wenrui Hao, The Pennsylvania State University; Di Qi, Purdue University

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J-1: Integration of Phase-Field Model and Fast Fourier Transform-Based Crystal Plasticity with Geometrically Necessary Dislocations to Model Simulate Microstructure Evolution of Gradient Grained Metals: *Hossein Abbasi*[1]; Lei Chen[1]; [1]University of Michigan Dearborn

J-2: Location Preference of Boron and Nitrogen Dopants at Graphene/Copper Interface: *Boan Zhong*[1]; Yue Liu[1]; [1]Shanghai Jiao Tong University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Application of ICME Methods to Advance Sustainable Metallurgy and Metals Processing — Poster Session

Sponsored by: TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Andrew Iams, National Institute of Standards and Technology; Samantha Webster, Nist - Gaithersburg; Sarah Wolff, The Ohio State University; Carelyn Campbell, National Institute of Standards and Technology; Wei Xiong, University of Pittsburgh

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N-7: Validation of the Coupled Random Cellular Automata Finite Element Model of Dynamic Recrystallization: Kacper Pawlikowski[1]; Mateusz Sitko[1]; Konrad Perzynski[1]; *Lukasz Madej*[1]; [1]AGH University of Science and Technology

IRON AND STEEL (FERROUS ALLOYS)

Austenite Formation and Decomposition V: A Symposium in Memory of Prof. Mats Hillert — Poster Session

Sponsored by: AIST Metallurgy—Processing, Products and Applications Technology Committee, TMS: Steels Committee, TMS: Phase Transformations Committee

Program Organizers: Annika Borgenstam, KTH Royal Institute of Technology; John Agren, Royal Institute of Technology; Amy Clarke, Los Alamos National Laboratory; Hatem Zurob, McMaster University; Matthias Militzer, University of British Columbia; Kester Clarke, Los Alamos National Laboratory; Igor Vieira, Nucor Steel; Daniel Baker, LIFT

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F-1: Role of Cerium on Transformation Kinetics and Mechanical Properties of Low Carbon Steels: *Chetan Kadgaye*[1]; [1]Metallurgical and Materials Engineering, IIT Roorkee

NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy Systems — Poster Session

Sponsored by: ACerS Energy Materials and Systems Division, TMS: Nuclear Materials Committee

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Theodore Besmann, University of South Carolina; Charmayne Lonergan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Kaustubh Bawane, Idaho National Laboratory; Joshua White, Los Alamos National Laboratory; Christian Deck, General Atomics; Gordon Thorogood, Australian Nuclear Science and Technology Organization

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L-3: Characterization and Thermal Stability of (Li,Na,K)2O-Fe2O3-P2O5 Glasses for Waste Immobilization.: *Iheanyichukwu Ajoku*[1]; Krista Carlson[2]; Charmayne Lonergan[1]; [1]Missouri University of Science and Technology; [2]University of Nevada, Reno

L-4: MXene Hybrids as Promising Candidates for Iodine Gas Capture: *Karamullah Eisawi*[1]; Nancy Birkner[2]; Kyle Brinkman[2]; Brian Riley[3]; Michael Naguib[1]; [1]Tulane University; [2]Clemson University; [3]Pacific Northwest National Laboratory

L-5: Protecting Structural Components in Molten Salt Nuclear Reactors with Functional Coatings: *Sumit Bhattacharya*[1]; Yinbin Miao[1]; Abdellatif Yacout[1]; [1]Argonne National Laboratory

L-6: Thermal Diffusivity of UN Produced via Carbothermic Reduction Prior to Nitriding: *Ryan Finkelstein*[1]; Sarah Cole[1]; Elizabeth Sooby[2]; Brian Jaques[1]; [1]Boise State University; [2]University of Texas San Antonio

LIGHTWEIGHT ALLOYS

Composition–Processing–Microstructure-Property Relationships of Titanium Alloys — Poster Session

Sponsored by: TMS: Titanium Committee

Program Organizers: Carl Boehlert, Michigan State University; Adam Pilchak, Pratt & Whitney; Dipankar Banerjee, Indian Institute of Science; Philip Eisenlohr, Michigan State University

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G-1: Effects of Temperature on the Deformation Behavior and Microstructural Evolution during the Hot Compression Test of Ti-6Al-2V-1Fe-1Cr Alloy: *Arjun Mahato*[1]; Vivek Chandravanshi[2]; Shibayan Roy[1]; [1]Indian Institute of Technology, Kharagpur; [2]Defence Metallurgical Research Laboratory, Hyderabad

G-2: Experimental Investigations on Thermomechanical Fatigue Behavior in Near Alpha Titanium Alloy: *Ranjeet Kumar*[1]; Kartik Prasad[2]; Sumantra Mandal[1]; [1]Indian Institute of Technology Kharagpur; [2]Defence Metallurgical Research Laboratory

G-3: Heterogeneous Nano-Mechanical Response of Bimodal Ti-6Al-4V Alloy: *Saumya Gupta*[1]; Shibayan Roy[1]; [1]Materials Science Centre,Indian Institute of Technology, Kharagpur

G-4: Study of Microstructure of Titanium Alloys and Its Relation to Mechanical Properties of Alloys for Aerospace Industry: Borys Sereda[1]; Yaroslav Pylypchuk[1]; *Dmytro Kruhliak*[1]; [1]DSTU

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Poster Session

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division, ACerS Energy Materials and Systems Division, ACerS Engineering Ceramics Division

Program Organizers: Haitao Zhang, University of North Carolina at Charlotte; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Purdue University

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K-1: Effect of Annealing on Physical Properties in Nanostructure Electroformed Fe-Ni Alloy Sheets: *Junha Lee*[1]; Jin-Bum Kim[1]; In-Gyeong Kim[1]; Se-Eun Shin[1]; Yong-bum Park[1]; [1]Suncheon National University

K-2: Fine-Tuning SmFe10V2 Magnet Performance through Microstructure Control: *Tianhong Zhou*[1]; Jihoon Park[1]; Chul-Jin Choi[1]; Yong-Rae Cho[2]; [1]Korea Institute of Materials Science; [2]Pusan National University

K-3: Investigation of 2D-Material Based Devices with As-Grown Metal Contacts: *Norah Aldosari*[1]; [1]Ohio University

K-6: Self-Supporting Carbon Rich Silicon Oxycarbide Electrodes for Li-Ion Battery: *Arijit Roy*[1]; Gurpreet Singh[1]; [1]Kansas State University

K-7: Synthesis and Optical Properties of Titanium Aluminium Based Mxene Nanomaterial: *Romit Saha*[1]; [1]Presidency University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Poster Session

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Jianhua Tong, Clemson University; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Charmayne Lonergan, Missouri University of Science and Technology; Bed Poudel, Pennsylvania State University; Sepideh Akhbarifar, Catholic University of America -Vitreous State Lab; Armin Feldhoff, Leibniz University Hannover

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Session Chairs: Jianhua Tong, Clemson University; Yang Bai, University of Oulu

N-8: Alkaline Stable N-Bridged Triazine Framework Membranes for Rechargeable Anthrarufin Flow Batteries: *Jeet Sharma*[1]; Vaibhav Kulshrestha[2]; Richa Gupta[3]; Kothandaraman Ramanujam[3]; [1]Royal Melbourne Institute of Technology (RMIT) University; [2]Council of Scientific and Industrial Research-Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI); [3]Indian Institute of Technology, Madras

N-9: Designing 2D Janus Zr-based MXene for Anode Materials in Lithium-Ion Batteries Using Computational Approaches: *Szu-Chia Chien*[1]; Yu-Ting Lin[1]; [1]National Central University

N-10: Effect of Sintering and Microstructure on the Ionic Conductivity of Co-Doped Na3Zr2Si2PO12 Solid Electrolyte for All Solid-State Sodium Ion Batteries: *Basitti Hitesh*[1]; Anjan Sil[1]; [1]Indian Institute of Technology Roorkee

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Poster Session

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Junichi Tatami, Yokohama National University; Young-Wook Kim, University of Seoul; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

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D-10: Microstructure and Mechanical Properties of Ti(C, N)-SUS316L Stainless Steel Cermet: *Tatsuya Yoshida*[1]; Shinya Nariki[1]; [1]Tohoku University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Enhancing Recycling and Reuse of Secondary Materials to Support a Circular Economy — Poster Session

Program Organizers: Christopher Sinton, Integral Consulting Inc.; Gabrielle Gaustad, Alfred University

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N-11: Research on the Application of Vitrification Treatment Technology in the Hazardous Waste Industry: *Hui Sun*[1]; [1]China ENFI Engineering Corporation

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Poster Session

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; John Blendell, Purdue University; Shen Dillon, University of California, Irvine; Wayne Kaplan, Technion - Israel Institute of Technology; Wolfgang Rheinheimer, University of Stuttgart; Ming Tang, Rice University

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Session Chair: Melissa Santala, Oregon State Unviersity

E-1: Effects of Al, Bi, Ce, and Ti Additions on the Microstructure of Ni-Alloyed Ductile Iron: *August Rautmann*[1]; Adnan Ahamed[1]; Jingjing Qing[1]; Mingzhi Xu[1]; [1]Georgia Southern University

E-2: Grains Ain't Misbehaving or Going Wild? A Spontaneous Activation of Grain Boundaries Initiating Abnormal Grain Growth!: *Klaus-Dieter Liss*[1]; Pingguang Xu[2]; Ayumi Shiro[3]; Shuoyuan Zhang[4]; Eitaro Yukutake[5]; Takahisa Shobu[2]; Koichi Akita[6]; [1]University of Wollongong; [2]Japan Atomic Energy Agency; [3]National Institutes for Quantum Science and Technology; [4]Comprehensive Research Organization for Science and Society; [5]Industrial Technology Innovation Center of Ibaraki Prefecture; [6]Tokyo City University

E-3: Research of Special Boundaries in the Heat Treatment of Materials in the Two-Phase Region under Supercritical Temperature Effects: Borys Sereda[1]; Vitaliy Voloh[1]; *Irina Kruhliak*[1]; Dmytro Sereda[1]; [1]DSTU

E-4: Role of Cerium on Intricacies of Deformed State and Softening Kinetics of Low Carbon Steels: *Chetan Kadgaye*[1]; [1]Indian Institute of Technology Roorkee

E-5: Study on Interfacial Reaction and IMC Growth Kinetics in Sn-Based Lead-Free Solder Reinforced by Nickel-Coated Carbon Fiber: *Yihui Du*[1]; Fu Guo[1]; [1]Beijing University of Technology

E-6: UO2 Grain Boundaries Interactions with Hydrogen Using Large Scale Density Functional Theory: *Rajat Goel*[1]; Ambar Kulkarni[1]; Nir Goldman[2]; [1]University of California, Davis; [2]Lawrence Livermore National Laboratory

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond V — Poster Session

Sponsored by: TMS: Alloy Phases Committee, AcerS Basic Science Division

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

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E-7: A Superb Mechanical Behavior of Newly Developed Lightweight and Ductile Al0.5Ti2Nb1Zr1Wx Refractory High Entropy Alloy via Nanoprecipitates and Dislocations Induced-Deformation: *Muhammad Abubaker Khan*[1]; M. Hamza[2]; Mohamed Afifi[3]; Wei-Bing Liao[4]; [1]University of Science and Technology Beijing; Shenzhen University; [2]University of Punjab; [3]Nile University; [4]Shenzhen University

E-8: Effect of the Injection Mould Temperature on the Mechanical Properties of Recyclable PC-PS-PMMA-PET High-Entropy Polymer Blends: *Subhankar Sikder*[1]; Hemakesh Mohapatra[1]; [1]Indian Institute of Technology, Kharagpur

E-9: Exploring the Sintering of Ni-Pt-Pd HEA-Nanoparticles through In-Situ TEM: *Daniela Fonseca*[1]; Ricardo Castro[1]; Martin Harmer[1]; [1]Lehigh University

SPECIAL TOPICS

Honorary Symposium in Celebration of Prof. Michel Barsoum's 70th Birthday — Poster Session

Sponsored by: ACerS Basic Science Division, ACerS Engineering Science Division

Program Organizers: Surojit Gupta, University of North Dakota; Miladin Radovic, Texas A&M University; Michael Naguib, Tulane University

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O-1: Anisotropic Cracking and Lack Thereof in MAX Phases: *Milos Dujovic*[1]; Sahin Celik[1]; Thierry Ouisse[2]; Ankit Srivastava[1]; Miladin Radovic[1]; [1]Texas A&M University; [2]Université Grenoble Alpes

O-2: Kerosine-Fuelled High Velocity Oxy-Fuel (HVOF) Ti2AlC Coating on P91 Steel: *Milos Dujovic*[1]; Aleksandar Maslarevic[2]; Gordana Bakic[2]; Ankit Srivastava[1]; Miladin Radovic[1]; [1]Texas A&M University; [2]University of Belgrade

SPECIAL TOPICS

IGNITE MSE: Thinking Outside the Lab — Poster Session

Sponsored by: ACerS President's Council of Student Advisors, ACerS Ceramic and Glass Industry Foundation

Program Organizers: Pattiya Pibulchinda, Northwestern University; Kartik Nemani, Purdue University

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O-3: A Case Study for Outreach and Education Across Traditional Crafts and Materials Sciences: *Aaron Bossen*[1]; Brittney Hauke[1]; [1]Pennsylvania State University

O-4: ACerS President's Council of Student Advisors' Kit Outreach Initiatives: Hugh Smith[1]; Christine Brockman[2]; Shannon Rogers[3]; *Nathan McIlwaine*[4]; [1]Massachusetts Institute of Technology; [2]Oklahoma State University - Tulsa; [3]Colorado School of Mines; [4]Pennsylvania State University

ARTIFICIAL INTELLIGENCE

Integrated Computational Materials Engineering for Physics-Based Machine Learning Models — Poster Session

Sponsored by: TMS: Integrated Computational Materials Engineering Committee

Program Organizers: William Frazier, Pacific Northwest National Laboratory; Lei Li, Pacific Northwest National Laboratory; Yucheng Fu, Pacific Northwest National Laboratory; Philip Goins, US Army Research Laboratory; Zhengtao Gan, The University of Texas at El Paso

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B-1: Statistically Equivalent Virtual Microstructures for Modeling of Complex Polycrystalline Alloys Using a Generative Adversarial Network (GAN)-Enabled Computational Platform: *Joshua Stickel*[1]; Brayan Murgas[1]; Luke Brewer[2]; Somnath Ghosh[1]; [1]Johns Hopkins University; [2]University of Alabama

LIGHTWEIGHT ALLOYS

Light Alloys, Advanced Forming Processes and Characterization — Poster Session

Sponsored by: TMS: Aluminum Committee, TMS: Recycling and Environmental Technologies Committee, TMS: Shaping and Forming Committee

Program Organizers: Scott Taylor, WMG, University of Warwick; Ishwar Kapoor, University of Warwick; Hiren Kotadia, Liverpool John Moores University

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G-5: Effect of Rolling Temperature on Texture Development and Formability of Pure Ti Sheet: *Jong Woo Won*[1]; Yong Tack Hyun[1]; [1]Korea Institute of Materials Science

G-6: Effects of Trace Elements on Microstructure and Mechanical Properties of Dual-Phase Mg-Li Based Alloys: *Hyeon-Taek Son*[1]; Yong-Ho Kim[1]; Byong-Gwon Lee[1]; En-Chan Go[1]; [1]Korea Institute of Industrial Technology

G-7: Enhanced Mechanical Properties of the Lightweight Ti-Rich Medium-Entropy Alloys by Thermo-Mechanical Treatment: Po-Sung Chen[1]; Han-Lin Tsai[1]; Yu-Chin Liao[1]; Pei-Hua Tsai[1]; Li-In Wang[1]; *Jason Shian-Ching Jang*[1]; Chih-Yen Chen[2]; [1]National Central University; [2]National Yang Ming Chiao Tung University

ARTIFICIAL INTELLIGENCE

Machine Learning and Simulations — Poster Session

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Anoop Krishnan, IIT Delhi

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Session Chairs: Mathieu Bauchy, UCLA; Peter Kroll, The University of Texas at Arlington; Anoop Krishnan, IIT Delhi

B-2:Forecasting Nutrient Flows Using Terrain Elevation-Aware Spatial-Temporal Graph Neural Networks: *Jiaqi Li*[1]; Alexander H. Bradley[1]; Olatunde Akanbi[1]; Laura Bruckman[1]; Erika Barcelos[1]; Roger French[1]; Yinghui Wu[1]; [1]Case Western Reserve University

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Poster Session

Sponsored by: ACerS Manufacturing Division

Program Organizers: Bai Cui, University of Nebraska Lincoln; James Hemrick, Oak Ridge National Laboratory; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

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D-11: Near-Room-Temperature Fabrication for Oxides by Acid-Base Chemical Densification and High-Throughput Powder Experiment Using Various Automated Tools: *Yuki Yamaguchi*[1]; Rei Nakayama[1]; Yoshiyasu Nishiyama[1]; Hirofumi Sumi[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

D-12: The Effect of Particle Size on Sintering Characteristics of Non-Pyroplastic Deformation Porcelain: *Nobuaki Kamochi*[1]; Yuushi Nakamizo[1]; [1]Saga Ceramics Research Laboratory

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Poster Session

Sponsored by: ACerS Basic Science Division

Program Organizers: Fei Peng, Clemson University; Kathy Lu, University of Alabama Birmingham; Pinar Acar, Virginia Tech; Yi Je Cho, Sunchon National University

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B-3:Surface Properties Optimization of Co-Cr-Mo Alloy Through Artificial Neural Networks Applied to the Ball Burnishing Process: *Eric Noé Hernández Rodríguez*[1]; Diego Silva-Álvarez[2]; [1]University of Guanajuato; [2]CINVESTAV-Querétaro

CERAMIC AND GLASS MATERIALS

Mesoscale Phenomena in Functional Polycrystals and Nanostructures — Poster Session

Sponsored by: ACerS Electronics Division

Program Organizers: Serge Nakhmanson, University of Connecticut; Edward Gorzkowski, Naval Research Laboratory; James Wollmershauser, U.S. Naval Research Laboratory; Seungbum Hong, KAIST; Javier Garay, University of California, San Diego; Pierre-Eymeric Janolin, CentraleSupélec; Ilya Sochnikov, University of Connecticut

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D-13: Computer Simulation as a Tool to Optimize Electronic Conduction: *Chinonso Ugwumadu*[1]; Kiran Prasai[2]; David Drabold[1]; [1]Ohio University; [2]Stanford University

D-14: Modeling Domain Wall Dynamics in Polydomain Ferroelectric BaTiO3: *Ashok Gurung*[1]; M. Fatin Ishtiyaq[1]; John Mangeri[2]; S. Pamir Alpay[1]; Serge Nakhmanson[1]; [1]University of Connecticut; [2]Technical University of Denmark

D-15: Structural Optimization of Transport Properties in Artificial Interfacial Solids for High ZT Thermoelectrics: *Minhaz Morshed*[1]; Ovijit Das[1]; Aashish Gautam[2]; Chinonso Ugwumadu[2]; Kishor Nepal[2]; Dharma Basaula[1]; Benjamin Greenberg[3]; Kevin Anderson[3]; Sarshad Rommel[1]; David Drabold[2]; Mark Aindow[1]; James Wollmershauser[3]; Boris Feigelson[3]; Serge Nakhmanson[1]; [1]University of Connecticut; [2]Ohio University; [3]U.S. Naval Research Laboratory

D-16: Ultra-Conducting Copper Graphene Composites from Coal: *Kishor Nepal*[1]; Chinonso Ugwumadu[1]; Yahya Al-Majali[1]; David Drabold[1]; [1]Ohio University

BIOMATERIALS

Next Generation Biomaterials — Poster Session

Sponsored by: TMS: Biomaterials Committee, ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford

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Session Chair: Tanveer Tabish, University of Oxford

C-2: 3D Bioprinted Hepatocellular Carcinoma Model for Drug Screening: Zhenhua Cui[1]; Ruiqi Ji[2]; *Min Wang*[2]; [1] University of Hong Kong, Pokfulam Road; [2]University of Hong Kong, Pokfulam Road

C-3: Chitosan/Bioactive Glass Printed Scaffold for Peripheral Nerve Regeneration: *Larissa Lourenco*[1]; Roger Borges[2]; Mônica Mathor[3]; Carlos Silva[1]; Juliana Marchi[1]; [1]UFABC; [2]Albert Einstein Hospital; [3]IPEN

C-4: Computational Simulation of the Mechanical Behavior of Tissue Engineering Scaffolds Based on Cancellous Bone Structure: Yujie Zhang[1]; *Min Wang*[2]; [1]University of Hong Kong, Pokfulam Road; [2]University of Hong Kong

C-5: CP-Ti Lattice Infiltrated with Eggshell for Load Bearing Application: An Interpenetrating Phase Composite: *Riddhi Shukla*[1]; Mayank Yadav[1]; [1]Tallinn University of Technology

C-7: Enhancing Immunomodulation by Novel Glycoconjugate-Based Organ Engineering to Prevent Transplant Rejection: *Md Mohosin Rana*[1]; Peyman Malek Mohammadi Nouri[1]; Haiming D. Luo[1]; Lyann Sim[1]; Jiao-Jing Wang[2]; Zheng Zhang[2]; Stephen G. Withers[1]; Jayachandran N. Kizhakkedathu[1]; [1]University of British Columbia; [2]Northwestern University

C-8: Incorporation of Holmium into 58S Bioactive Glass for Brachytherapy Application: Roger Borges[1]; Giulia Piagentini Delpino[2]; Telma Zambanini[2]; *Juliana Marchi*[2]; [1]Hospital Israelita Albert Einstein; [2]Universidade Federal do ABC

C-10: New Generation of Bone Implants Inspired by Marin Sponges: *Fariborz Tavangarian*[1]; Niloofar Fani[1]; Armaghan Hashemi Monfared[1]; [1]Penn State Harrisburg

C-11: Performance Characteristics of Spark Plasma Synthesized Biomaterials for Clinical Implants Application: *Martha Phasani*[1]; John Abe[1]; Patricia Popoola[1]; Modupeola Dada[1]; [1]Tshwane University of Technology

C-12: Unveiling the Hidden World of Marine Sponge Spicules: Pioneering Insights for Advancing Biomimetic Bone Tissue Engineering: *Armaghan Hashemi Monfared*[1]; Fariborz Tavangarian[1]; Niloofar Fani[1]; [1]Penn State Harrisburg

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Porous Materials for Energy and Environment Applications — Poster Session

Program Organizers: Lan Li, Boise State University; Winnie Wong-Ng; Kevin Huang, University of South Carolina; Di Wu, Washington State University

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Session Chair: Lan Li, Boise State University

N-12: Comparison of the Permeability of Binder Jet Printed Metals Calculated by Different Methods: *Samuel Greulich*[1]; Pierangeli Rodriguez De Vecchis[1]; Markus Chmielus[1]; [1]University of Pittsburgh

N-13: Electronic, Energy and Environmental Properties of Thiophene-Based Organo-Dendrimetric Fluids. Role of Halogen Substitution and Nano-Metal Interactions: *Olayemi Fakayode*[1]; Nomvano Mketo[1]; Eno Ebenso[1]; Bakang Mothudi[1]; Bulelwa Ntsendwana[2]; [1]University of South Africa - Science Campus; [2]MINTEK

CERAMIC AND GLASS MATERIALS

Preceramic Polymers; Synthesis, Processing, Modeling, and Derived Ceramics — Poster Session

Sponsored by: ACerS Engineering Ceramics Division, ACerS Basic Science Division

Program Organizers: Matthew Dickerson, Air Force Research Laboratory; Gurpreet Singh, Kansas State University; Kathy Lu, University of Alabama at Birmingham

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D-17: Structure and Properties of Preceramic Polymer Grafted Nanoparticle Monolayers: *Pavan Polisetty*[1]; [1]FAMU-FSU College of Engineering

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Manufacturing Division

Program Organizers: Morsi Mahmoud, Abdullah Al Salem University (AASU); Dinesh Agrawal, Pennsylvania State University; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Christina Wildfire, National Energy Technology Laboratory; Guido Link, Karlsruhe Institute of Technology

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M-1: Laser Welding Process Technologies for Battery Manufacturing: *Heeshin Kang*[1]; Hyunjong Yoo[1]; Soojin Choi[1]; Jiwhan Noh[1]; Philgong Choi[1]; Ikgeun Jeon[1]; Myungjin Kim[1]; [1]Korea Institute of Machinery and Materials

IRON AND STEEL (FERROUS ALLOYS)

Segregation in Steels — Poster Session

Sponsored by: TMS: Steels Committee, AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - Industeel; Colin Stewart, US Naval Research Laboratory; Joshua Mueller, Michigan Technological University; Lijia Zhao, Northeastern University; Krista Limmer, Devcom Army Research Laboratory; Alexandra Glover, Michigan Technological University

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F-2: Study on Formation Mechanism and Control of Freckle in Electroslag Remelting Process of Low Alloy and High Strength Steel: *Yang Wang*[1]; Lang Shui[2]; Xianghua Luo[3]; Yi He[1]; Huasong Liu[1]; Kailun Zhang[1]; [1]Ansteel Beijing Research Institute Co. Ltd.; [2]Chengdu Institute of Advanced Metallic Material Technology and Industry Co. Ltd.; [3]Jiangyou Changcheng Special Steel Co. Ltd. of Pangang Group

F-3: Study on the Effect of Aluminum on Microsegregation of Elements in Steel: *Rudong Wang*[1]; Heng Cui[1]; Jinrui Liu[1]; [1]University of Science and Technology Beijing

BIOMATERIALS

Society for Biomaterials: Biomaterial Applications — Poster Session

Sponsored by: Society for Biomaterials

Program Organizers: J. Zach Hilt, University of Kentucky; Yadong Wang, Cornell University

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C-13: Mechanical Properties of 3D Printed Dental Resins in Different Orientations: *Bernardo Chichierchio*[1]; Bruno Martins de Souza[1]; Isabelle Santos Moura[1]; Carolina De Assis Pinto Ferreira[1]; Carlos Nelson Elias[1]; [1]Military Engineering Institute

C-14: Multifunctional Magnetite Superparamagnetic Nanoparticles: *Celaletdin Ergun*[1]; Ozkan Gokcekaya[2]; [1]Istanbul Technical University; [2]Osaka University

BIOMATERIALS

Society for Biomaterials: Student Poster Contest + Rapid Fire — Poster Session

Sponsored by: Society for Biomaterials

Program Organizers: Christopher Siedlecki, Penn State College of Medicine; Nicholas Ziats, Case Western Reserve University

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C-15: 3D Printing Physically Cross-Linked Materials for Biomedical Applications: *Hossein Libre*[1]; [1]Missouri University of Science and Technology

C-16: Development of Aerosol Jet Printing on PMMA for Sensorized Contact Lenses: *Tyler Vu*[1]; Kennidi Kresier[1]; Sylvie Crowell[1]; Doug Shire[1]; Janet Gbur[1]; [1]Case Western Reserve University

C-18: Effects of Genipin Crosslinking on Collagen I Thin Films: *Tracy Wan*[1]; Cecilia Padilla[1]; Keith Cook[1]; [1]Carnegie Mellon University

C-19: Experimental Design for Characterization of Cardiovascular Pacing Leads: *Justin Zimmerman*[1]; Robb Colbrunn[2]; Elizabeth Pace[2]; Janet Gbur[1]; John Rickard[2]; [1]Case Western Reserve University; [2]Cleveland Clinic Foundation

C-20: Zinc Alloys as Biodegradable Implants: *Jessica Salinas*[1]; Nafiseh Mollae[2]; Monica Echeverry-Rendón[2]; Carl Boehlert[1]; [1]Michigan State University; [2]Imdea Materials

C-22: Mechanical Evaluation of Neuromodulation Leads and Feedthrough Connections: *Jerry Yang*[1]; Wenfei Zhao[1]; Douglas Shire[2]; Janet Gbur[1]; [1]Case Western Reserve University; [2]Advanced Platform Technology Center, VA Northeast Ohio Healthcare System

C-23: Polyurethane Biomaterials Tethered with Small Molecule via Polyethylene Glycol (PEG) Enhance Anti-Biofilm Properties: *Jiale Liu*[1]; Chen Chen[2]; Harry Allcock[1]; Christopher Siedlecki[1]; Li-Chong Xu[1]; [1]Penn State College of Medicine; [2]Penn State University

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development III — Poster Session

Sponsored by: TMS: Steels Committee, AIST Metallurgy—Processing, Products and Applications Technology Committee

Program Organizers: Adriana Eres-Castellanos, Colorado School of Mines; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, University of Navarra; Jeongho Han, Hanyang University; Ian Zuanzo Rodriguez, ArcelorMittal R&D; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Los Alamos National Laboratory

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F-4: Influences of Retained Austenite on Fracture and Hydrogen Embrittlement Resistance of Ultra-High Strength Steel Sheets: *Wei Luo*[1]; [1]Baoshan Iron & Steel Co., Ltd.

NUCLEAR ENERGY

Tackling Metallic Structural Materials Challenges for Advanced Nuclear Reactors — Poster Session

Sponsored by: TMS: Nuclear Materials Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

Program Organizers: Miaomiao Jin, Pennsylvania State University; Xing Wang, Pennsylvania State University; Karim Ahmed, Texas A&M University; Jeremy Bischoff, Framatome; Adrien Couet, University of Wisconsin-Madison; Kevin Field, University of Michigan; Lingfeng He, North Carolina State University; Raul Rebak, GE Global Research

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L-7: Cold Spray and Friction Stir Processing Approach for Nuclear Applications: Manufacturing Mechanically and Thermally Stable Coatings: *Syed Rizvi*[1]; Md Jasim Uddin[1]; Aniruddha Malakar[1]; Robert McRobie[1]; Caleb Schenck[1]; Florian Laggner[1]; Bharat Gwalani[1]; Elizabeth Kautz[1]; [1]North Carolina State University

L-8: Designing Heat/Corrosion Resistant Al-Cr-Fe-Ni-Ti Ferritic Superalloys: *Ka-Ram Lim*[1]; Heoun-Jun Kwon[1]; Sang Hun Shim[1]; Young Kyun Kim[1]; Young Sang Na[1]; [1]Korea Institute of Materials Science

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Poster Session

Sponsored by: ACerS Basic Science Division, ACerS Energy Materials and Systems Division, TMS: Chemistry and Physics of Materials Committee

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

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Session Chair: Xiaofeng Guo, Washington State University

H-16: Thermodynamic Characteristics of Special Alloys of the Ti-Al system Formed During the Synthesis Process: Borys Sereda[1]; *Irina Kruhliak*[1]; Dmytro Sereda[1]; Oleg Snasevych[1]; Igor Bilozor[1]; [1]DSTU

H-17: Thermodynamic Modeling During Synthesis in Ni-Al and Ti-Al Systems: *Borys Sereda*[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

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