

Technical Meeting and Exhibition

MS&T25

MATERIALS SCIENCE & TECHNOLOGY

September 28–October 1, 2025 | Columbus, Ohio, USA

FINAL TECHNICAL PROGRAM



The content in this final technical program was generated on September 16, 2024.
Please refer to the online session sheets for the most up-to-date information.

Organizing
Societies:



Topic Area/Symposium	Date	Time	Room	Page
Program Highlights				
AIST Plenary Session	MON	AM	Short North Ballroom	12
TMS Plenary Session	MON	PM	Short North Ballroom	25
ACerS Plenary Session	TUE	AM	Short North Ballroom	39
MS&T25 Poster Session	TUE	PM	Exhibit Hall C/D	95
ACerS The Navrotsky Award for Experimental Thermodynamics of Solids	MON	AM	B142/143	24
ACerS Bioceramics Awardees	MON	AM	C171	23
ACerS Richard M. Fulrath Award Session	MON	PM	B131	26
ACerS GOMD Alfred R. Cooper Award Session	TUE	AM	B132	47
TMS Frontiers of Materials Award Lecture	TUE	AM	C162A	53
ACerS Frontiers of Science and Society - Rustum Roy Lecture	TUE	PM	B131	53
ACerS Basic Science Robert B. Sosman Award Lecture	WED	PM	B131	85
Additive Manufacturing				
Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process				
AM Modeling - Mechanical Properties	TUE	AM	C150	39
AM Modeling - Artificial Intelligence and Machine Learning (AI/ML)	TUE	PM	C150	54
Poster Session	TUE	PM	Exhibit Hall C/D	101
AM Modeling - Microstructures and Thermal Analyses I	WED	AM	C150	70
AM Modeling - Microstructures and Thermal Analyses II	WED	PM	C150	85
Additive Manufacturing of Ceramic-Based Materials: Process Development, Materials, Process Optimization and Applications				
Ceramic Vat Photopolymerization Processes	TUE	PM	C161A	54
Poster Session	TUE	PM	Exhibit Hall C/D	102
Ceramic Direct Ink Writing Processes	WED	AM	C161A	70
Ceramic Powder Bed Processes	WED	PM	C161A	85
Additive Manufacturing of Polymeric-Based Materials: Potentials and Challenges				
Revolutionizing Applications and Unleashing the Potential of Polymer-Based Additive Manufacturing	MON	AM	C160A	13
Exploring the Additive Manufacturing Frontier of Polymeric Composites	MON	PM	C160A	26
Additive Manufacturing of Thick Films Using Dry Aerosol Processes: Process Development, Materials, Process Optimization and Applications				
Solid Particle Aerosol Deposition	MON	PM	C150	26

Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
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Additive Manufacturing, Directed Energy Deposition of Metals: Processing – Microstructure – Mechanical Property Relationships

Stainless Steels	MON	AM	C160B	13
Nickel Alloys	MON	PM	C160B	27
Monitoring, Modeling, and Functionally Grading / Arc Based DED and Copper Alloys	TUE	AM	C160B	39
Steels / Titanium and High Entropy Alloys	TUE	PM	C160B	55
Poster Session	TUE	PM	Exhibit Hall C/D	102

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session I	MON	PM	C151	27
Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session II	TUE	AM	C151	40
Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session III	TUE	PM	C151	55
Poster Session	TUE	PM	Exhibit Hall C/D	103
Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session IV	WED	AM	C151	71
Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session V	WED	PM	C151	86

Additive Manufacturing: Development of Powders

Foundations and Advances in Atomization Refractory Powder Production	TUE	AM	C160A	40
Bridging Lab Scale Innovation and Industrial Powder Needs	TUE	PM	C160A	56
Powder Engineering, Functionalization & Simulation for AM	WED	AM	C160B	71

Additive Manufacturing: Enhancement and Synergy with Traditional Methods

Additive Manufacturing: Enhancement and Synergy with Traditional Methods I	MON	AM	C150	14
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Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring

In-Situ Monitoring Methods and Instrumentation	WED	AM	C160A	72
Multi-Modal Monitoring, Data Integration, and Post-Process Analysis	WED	PM	C160A	86

Artificial Intelligence

Autonomous Platforms for Designing and Understanding Materials

Autonomous Platforms for Designing and Understanding Materials	TUE	AM	D282	44
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Enhancing the Accessibility of Machine Learning-Enabled Experiments

Advancing Materials Research with Foundational Models	MON	AM	D283	19
Integrating AI, Automation, and Workflow for Intelligent Research Pipelines	MON	PM	D180	35

Topic Area/Symposium	Date	Time	Room	Page
Integrated Computational Materials Engineering for Physics-Based Machine Learning Models				
Integrated Computational Materials Engineering for Physics-Based Machine Learning Models	TUE	AM	D283	48
Poster Session	TUE	PM	Exhibit Hall C/D	107
Materials Informatics for Images and Multi-Dimensional Datasets				
Materials Informatics for Images and Multi-Dimensional Datasets I	MON	AM	D282	22
Materials Informatics for Images and Multi-Dimensional Datasets II	TUE	AM	B233	50
Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics				
Poster Session	TUE	PM	Exhibit Hall C/D	108
Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics I	WED	AM	D283	79
Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics II	WED	PM	D283	91
Biomaterials				
3D Printing of Biomaterials and Devices				
3D Printing of Biomaterials and Devices	MON	AM	C172	12
Poster Session	TUE	PM	Exhibit Hall C/D	101
Next Generation Biomaterials				
Next Generation Biomaterials I	MON	AM	C171	23
Next Generation Biomaterials II	MON	PM	C171	37
Next Generation Biomaterials III	TUE	AM	C171	52
Next Generation Biomaterials IV	TUE	PM	C171	65
Poster Session	TUE	PM	Exhibit Hall C/D	110
Next Generation Biomaterials V	WED	AM	C171	80
Next Generation Biomaterials VI	WED	PM	C171	92
Next Generation Biomaterials VII	WED	PM	C170	92
Ceramic and Glass Materials				
2D Materials: Synthesis, Properties, and Applications				
Poster Session	TUE	PM	Exhibit Hall C/D	101
2D Materials: Synthesis, Properties, and Applications	WED	AM	B130	69
Advances in Dielectric Materials and Electronic Devices				
Ferroelectrics	MON	PM	B142/143	29
Dielectrics for Catalysis, Energy Harvesting, and Other Applications	TUE	AM	B142/143	42
Additive Manufacturing and Perovskite Photovoltaics	TUE	PM	B142/143	57
Poster Session	TUE	PM	Exhibit Hall C/D	104
American Ceramic Society Journal Awards Symposium				
American Ceramic Society Journals Awards Symposium	TUE	PM	B130	59

Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Engineering Ceramics: Microstructure-Property-Performance Relations and Applications				
Poster Session	TUE	PM	Exhibit Hall C/D	106
Advanced Processing Technology / Corrosion Behavior of Ceramics / Modeling and Simulation	WED	AM	B240/241	76
Composites / Properties of Engineering Ceramics	WED	PM	B240/241	89
Glasses and Optical Materials: Challenges, Advances, and Applications				
Glass Formation and Manufacturing	MON	AM	B132	20
Non-Oxide Glasses, Optics, and Glassy Electrolytes	MON	PM	B132	35
GOMD Alfred R. Cooper Award Session	TUE	AM	B132	47
Structure and Properties of Oxide Glasses	TUE	PM	B132	62
Poster Session	TUE	PM	Exhibit Hall C/D	106
Manufacturing and Processing of Advanced Ceramic Materials				
New Frontiers in Advanced Manufacturing of Ceramic Materials	MON	PM	B240/241	37
Advances in Ceramic Processing I: Sintering	TUE	AM	B240/241	49
Poster Session	TUE	PM	Exhibit Hall C/D	108
Advances in Ceramic Processing II: Applications	WED	AM	B142/143	78
Phase Transformations in Ceramics: Science and Applications				
Phase Transformations in Ceramics I	WED	AM	B132	81
Phase Transformations in Ceramics II	WED	PM	B132	93
Solid-State Optical Materials and Luminescence Properties				
Solid-State Optical Materials and Luminescence Properties	MON	AM	B230	24
Poster Session	TUE	PM	Exhibit Hall C/D	111
Fundamentals and Characterization				
Applications of Uncertainty Quantification (UQ) in Science and Engineering				
UQ Applications in Materials and Engineering - Bayesian Calibration, Sparse Grid Surrogates, Meso-Scaling, Meta Analysis, Deep Kernel Learning	MON	PM	C162B	31
Emergent Materials Under Extremes and Decisive In Situ Characterizations				
In Situ Technologies Combined with Extreme Conditions	MON	AM	C162A	18
Advanced Characterization of Fuel and Ceramic Materials Under Extreme Conditions	MON	PM	C162A	33
Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships				
Sintering & Grain Growth and Modeling	MON	AM	C161A	20
Surfaces and Heterointerfaces	MON	PM	C161A	36
Electronic and Mechanical Properties	TUE	AM	C161A	47

Topic Area/Symposium	Date	Time	Room	Page
High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI				
Physics-Based Models	MON	AM	C170	21
Experiments: Non-Alloys	MON	PM	C170	36
Data-Driven, Data Analysis, and Design	TUE	AM	C170	47
Experiments: Alloy I	TUE	PM	C170	62
Poster Session	TUE	PM	Exhibit Hall C/D	107
Experiments: Alloy II	WED	AM	C170	76
Microstructural Control in Materials Processing: Role of Phase Transformation Pathways				
Poster Session	TUE	PM	Exhibit Hall C/D	109
Microstructural Control in Materials Processing: Role of Phase Transformation Pathways I	WED	AM	C162B	80
Microstructural Control in Materials Processing: Role of Phase Transformation Pathways II	WED	PM	C162B	91
Iron and Steel (Ferrous Alloys)				
Advances and Challenges in Decarbonization of the Steel Industry				
Advances and Challenges in Decarbonization of the Steel Industry	TUE	PM	D282	57
Advances in Ferrous Process Metallurgy				
Simulations & Modeling	MON	AM	D281	16
Processing & Characterization	MON	PM	D281	29
Poster Session	TUE	PM	Exhibit Hall C/D	104
Advances in Metallic Coated Advanced Steels				
Advances in Metallic Coated Advanced Steels	MON	PM	D283	30
Advances in Understanding of Martensite in Steels III				
Poster Session	TUE	PM	Exhibit Hall C/D	105
Martensite in Steels III	WED	AM	D281	74
Developments in Plate and Line Pipe Steels				
Developments in Plate and Line Pipe Steels	TUE	PM	D281	60
New Frontiers in Physical Metallurgy of Steels				
New Frontiers in Physical Metallurgy of Steels I	TUE	AM	D281	52
Poster Session	TUE	PM	Exhibit Hall C/D	109
Steels for Sustainable Development IV				
Development of Steels with Enhanced Mechanical Properties for Sustainable Applications	TUE	AM	D181	52
Student Poster Session	TUE	PM	Exhibit Hall C/D	112
Steel Development Supporting Sustainable Manufacturing and Energy Infrastructure	WED	AM	D282	83
Steel Development Supporting Circular Economics and Recyclability	WED	PM	D282	94

Program At A Glance

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Lightweight Alloys				
Advances in Titanium Technology				
Characterization of Phase Transformation Pathways	TUE	AM	C172	43
Alloy Design & Material Discovery	TUE	PM	C172	58
Poster Session	TUE	PM	Exhibit Hall C/D	105
Deformation Mechanisms and Mechanical Properties I	WED	AM	C172	73
Deformation Mechanisms and Mechanical Properties II	WED	PM	C172	87
Materials-Environment Interactions				
Advanced Coatings for Wear and Corrosion Protection				
Advanced Coatings for Wear and Corrosion Protection	MON	PM	D181	28
Poster Session	TUE	PM	Exhibit Hall C/D	103
Advanced Materials for Harsh Environments				
Poster Session	TUE	PM	Exhibit Hall C/D	103
Advanced Materials for Harsh Environments - Session I	WED	AM	D180	72
Advancement of Measurement Technologies for Harsh Environments				
Advancement of Measurement Technologies for Harsh Environments	MON	AM	D180	15
Poster Session	TUE	PM	Exhibit Hall C/D	104
Corrosion of Advanced Materials: Theory and Practice				
Corrosion of Advanced Materials: Theory and Practice I	TUE	AM	D180	45
Corrosion of Advanced Materials: Theory and Practice II	TUE	PM	D180	60
Corrosion, Protection and Damage Monitoring of Advanced Materials in Natural and Specific Environments				
Deepened Understandings of Corrosion And Protection Mechanisms with a Focus on Novel Materials, the Change of Corrosive Media and Coating	MON	PM	D182	33
Development and Applications of Advanced Instrumentation, Characterization Techniques and Methods for Degradation Study	TUE	AM	D182	45
Poster Session	TUE	PM	Exhibit Hall C/D	106
High-Temperature Corrosion and Degradation of Materials				
High-Temperature Corrosion and Degradation of Materials	MON	AM	D182	21
Materials Under Extreme Environment				
Poster Session	TUE	PM	Exhibit Hall C/D	108
Materials Under Extreme Environment I	WED	AM	D181	79
Materials Under Extreme Environment II	WED	PM	D181	91
Thermodynamics of Materials in Extreme Environments				
Thermodynamics of Materials in Extreme Environments	MON	AM	D181	25
Poster Session	TUE	PM	Exhibit Hall C/D	112

Topic Area/Symposium	Date	Time	Room	Page
Understanding and Mitigating High Temperature Corrosion Processes Through Synergistic Integration of Experimental, Computational and Manufacturing Techniques				
High Temperature Corrosion Challenges and Corrosion Resistant Coatings: An Industrial Perspective	TUE	PM	D181	68
Multiscale Modeling of Corrosion Induced Degradation of High Temperature Alloys	WED	AM	B242/243	84
Understanding Corrosion-Related Cracking				
Corrosion at Elevated Temperatures and Cracking	TUE	PM	D182	68
Poster Session	TUE	PM	Exhibit Hall C/D	112
Complex Corrosion Conditions and Cracking, Corrosion Fatigue and Beyond	WED	AM	D182	84
Modeling				
Advances in Multiphysics Modeling and Multi-Modal Imaging of Functional Materials				
Operator Learning / Phase-Field Modeling	MON	AM	B244/245	17
Poster Session	TUE	PM	Exhibit Hall C/D	105
Nanomaterials				
Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials				
2D Nanomaterials	MON	PM	B230	32
1D Nanostructures	TUE	AM	B230	44
Nanocomposites & Hybrid Materials	TUE	PM	B230	59
Poster Session	TUE	PM	Exhibit Hall C/D	105
Growth and Property Control of Nanomaterials I	WED	AM	B230	74
Growth and Property Control of Nanomaterials II	WED	PM	B230	88
Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry				
Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session I	MON	AM	B240/241	22
Poster Session	TUE	PM	Exhibit Hall C/D	109
Nuclear Energy				
Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments VI				
Advanced Characterization Session I	MON	AM	D280	14
Advanced Characterization Session II	MON	PM	D280	28
Poster Session	TUE	PM	Exhibit Hall C/D	103
Ceramic Materials for Nuclear Energy Systems				
Materials and Processes for Nuclear Energy Systems	MON	PM	D282	32
Metallic Nuclear Fuel Design, Fabrication and Characterization				
Metallic Nuclear Fuel Design, Fabrication and Characterization I	TUE	AM	D280	51
Metallic Nuclear Fuel Design, Fabrication and Characterization II	TUE	PM	D280	65
Poster Session	TUE	PM	Exhibit Hall C/D	109

Program At A Glance

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Progressive Solutions to Improve Corrosion Resistance of Nuclear Waste Storage Materials				
Iron Phosphate Glasses and Advanced Characterization Techniques for Nuclear Waste Forms	TUE	PM	D283	66
Poster Session	TUE	PM	Exhibit Hall C/D	111
Improving Processing of Nuclear Waste Glass, Mechanical Mechanisms of Crack Propagation and Measurement of Residual Stresses in Stainless Steel	WED	AM	D280	82
Processing and Manufacturing				
Advances in Refractory High Entropy Alloys and Ceramics				
High-Temperature Mechanical Properties	MON	PM	B232	31
Structures and Mechanical Properties	TUE	AM	B232	43
High Entropy Ceramics	TUE	PM	B232	58
Alloy Processing and Mechanical Behavior	WED	AM	B232	73
Alloy Design and Modeling	WED	PM	B232	87
Alloy Phase Transformations at Elevated Temperatures				
Ni-Based Superalloys	MON	AM	B232	17
Lightweight Composites, Materials & Alloys				
Microstructure and Processing	TUE	AM	B231	48
Microstructure and Properties	TUE	PM	B231	64
Poster Session	TUE	PM	Exhibit Hall C/D	108
Microstructure, Processing and Properties	WED	AM	B231	77
Processing and Mechanical Behavior	WED	PM	B231	90
Processing and Performance of Materials Using Microwaves, Electric and Magnetic Fields, Ultrasound, Lasers, and Mechanical Work – Rustum Roy Symposium				
Rustum Roy Symposium - Session I	MON	AM	B233	23
Rustum Roy Symposium - Session II	MON	PM	B233	38
Poster Session	TUE	PM	Exhibit Hall C/D	111
Sintering and Related Powder Processing Science and Technologies				
Flash and Ultra-Rapid Sintering: Mechanisms, Control, and Applications	TUE	PM	B233	67
Poster Session	TUE	PM	Exhibit Hall C/D	111
Field-Assisted Sintering and SPS: Mechanisms, Materials, and Applications	WED	AM	B233	82
Sintering Control: Linking Formulation, Simulation, and Material Properties	WED	PM	B233	93

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Sustainability, Energy, and the Environment

17th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing

Green and Sustainable Technologies for Manufacturing Materials I	MON	AM	B242/243	12
Green and Sustainable Technologies for Manufacturing Materials II	MON	PM	B242/243	25
Green and Sustainable Technologies for Manufacturing Materials III	TUE	PM	B240/241	53
Poster Session	TUE	PM	Exhibit Hall C/D	100

Advancements in Molten Salt/Metal Technology in Energy Applications: From Atoms to Plants

Molten Salt Fundamentals, Properties, and Simulation	TUE	AM	B242/243	41
Molten Salt Corrosion, Electrochemistry, Synthesis, and Separations	TUE	PM	B242/243	56

Advances in Materials and Systems for a Hydrogen Economy

Hydrogen Fuel in Aerospace Sectors, and Progress in Hydrogen Production by Electrochemical Method - Technical Advances and Obstacles	MON	AM	B246	16
Complex Interactions of Materials, Components, and Systems for Hydrogen Production, Separation, Storage, Transport, and Utilization	MON	PM	B246	30
Hydrogen Fuel for Industrial Decarbonization and Advances in Energy Technologies - Material Issues	TUE	AM	B246	42
Poster Session	TUE	PM	Exhibit Hall C/D	104

Energy Materials for Sustainable Development

Battery and Storage I	MON	AM	B234	18
Thermoelectrics I	MON	AM	B235	19
Battery and Storage II	MON	PM	B234	34
Thermoelectrics II	MON	PM	B235	34
Battery and Storage III	TUE	AM	B234	46
Thermoelectrics III	TUE	AM	B235	46
Battery and Storage IV	TUE	PM	B234	61
Thermoelectrics IV	TUE	PM	B235	61
Poster Session	TUE	PM	Exhibit Hall C/D	106
Battery and Storage V / Photovoltaics and Photocatalysis	WED	AM	B234	75
Thermoelectrics V/ Energy Harvesting, System and Application	WED	AM	B235	75
Energy Harvesting, System and Application	WED	PM	B234	88

Hybrid Organic-Inorganic Materials for Alternative Energy

Hybrid Organic-Inorganic Materials for AlternativeEnergy I	TUE	PM	B246	63
Poster Session	TUE	PM	Exhibit Hall C/D	107
2 D Materials and Computational Design of Hybrid Organic-Inorganic Materials for AlternativeEnergy	WED	AM	B246	77
Hybrid Organic-Inorganic Materials for AlternativeEnergy II	WED	PM	B246	89

Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Materials for CO2 Sequestration				
Materials for CO2 Sequestration	TUE	AM	B244/245	50
Phasing Out Carbon: Phase Transformation Challenges in Decarbonization Technologies				
Phasing Out Carbon: Phase Transformation Challenges in Decarbonization Technologies	MON	PM	B244/245	38
Poster Session	TUE	PM	Exhibit Hall C/D	110
Porous Materials for Energy and Environment Applications				
Porous Materials I	TUE	PM	B244/245	66
Poster Session	TUE	PM	Exhibit Hall C/D	110
Porous Materials II	WED	AM	B244/245	81
Special Topics				
2025 Graduate Student Poster Contest				
2025 Graduate Student Poster Contest	TUE	PM	Exhibit Hall C/D	96-98
2025 Undergraduate Student Poster Contest				
2025 Undergraduate Student Poster Contest	TUE	PM	Exhibit Hall C/D	98-100
ACerS Robert B. Sosman Award Symposium: Solid State Chemistry Meets Solid State Ionics				
ACerS Robert B. Sosman Award Symposium	WED	AM	B131	69
IGNITE MSE: Bridging Gaps in Innovation and Collaboration				
Poster Session	TUE	PM	Exhibit Hall C/D	107
Innovative Materials Solutions for a Rapidly Evolving Market				
Innovative Materials Solutions for a Rapidly Evolving Market	TUE	PM	C162B	63
Materials and Manufacturing in Low Earth Orbit (and Beyond)				
Manufacturing of Organics/Biomaterials in Low Earth Orbit	TUE	AM	C161B	49
Materials Testing & Modeling for Space Applications	TUE	PM	C161B	64
Welding in Low Earth Orbit- History and Planned Experiments	WED	AM	C161B	78
Building Space Infrastructure in Low Earth Orbit and Beyond	WED	PM	C161B	90
Navigating Career Pivots at the Mid-Career and Beyond				
Navigating Career Pivots at the Mid-Career and Beyond	TUE	AM	C162B	51
TMS Frontiers of Materials Award Symposium: Harnessing Charged and Chemical Defects for Exceptional Structural and Functional Properties				
TMS Frontiers of Materials Award Symposium I	TUE	AM	C162A	53
TMS Frontiers of Materials Award Symposium II	TUE	PM	C162A	67
TMS Frontiers of Materials Award Symposium III	WED	AM	C162A	83

SPECIAL TOPICS

Plenary Sessions — AIST Plenary Session

Monday AM | September 29, 2025
 Short North Ballroom B | Convention Center

8:00 AM Introductory Comments

8:05 AM Plenary

AIST Adolf Martens Memorial Steel Lecture: Microstructure Engineering for Advanced High-Strength Line Pipe Steels: *Dengqi Bai*¹; ¹SSAB Americas

8:45 AM Award Presentation

8:50 AM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

17th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Green and Sustainable Technologies for Manufacturing Materials 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; Wei Ji, Wuhan University of Technology

Monday AM | September 29, 2025
 B242/243 | Convention Center

Session Chairs: Enrico Bernardo, University of Padova; Bai Cui, University of Nebraska Lincoln; Yang Bai, University of Oulu; Kathy Lu, University of Alabama Birmingham

8:00 AM Invited

Weak Alkali Activation for New Sustainable Porous Components Based on Waste Glass: Francesco Carollo¹; Muhammad Jamshaid Zafar¹; *Enrico Bernardo*¹; ¹University of Padova

8:30 AM Invited

AI Data Centers Powered by Small Modular Reactors and Additive Manufacturing: *Bai Cu*¹; Lanh Trinh¹; ¹University of Nebraska Lincoln

9:00 AM

Advancing Pressure Spinning Polymeric Fibre Manufacture for Enhanced Performance and Sustainability: *Manul Amarakoon*¹; Shervanthi Homer-Vanniasinkam¹; Mohan Edirisinghe¹; ¹University College London

9:20 AM

Multi-Stimuli Integration in Alloy Design: A Shear-Assisted Processing Approach for High-Performance Nano-Composite Materials: *Bharat Gwalani*¹; ¹North Carolina State University

9:40 AM

Interfacial Microstructure and Diffusion Bonding Mechanisms in Aluminum-Copper Systems with Ultra-Thin Copper Sheet for Electric Motors: *Hossein Abbas*¹; Lei Chen¹; ¹University of Michigan Dearborn

10:00 AM Break

10:20 AM Invited

Novel Polymer-Derived MXene-SiOC Ceramic Nanocomposites: *Kathy Lu*¹; Advait Rau²; ¹University of Alabama Birmingham; ²Virginia Tech

10:50 AM

Interface Engineering for High-Performance All-Solid-State Batteries: *Taeseup Song*¹; Ungyu Paik¹; Seungcheol Myeong¹; Jiwoon Kim¹; Insung Hwang¹; Minsung Kim¹; Ganggyu Lee¹; Myeungwoo Ryu¹; Joonhyeok Park¹; Jooheon Sun¹; Seungmin Han¹; Geunsu Kim¹; Woojin Jeong¹; Sumin Hong¹; Giha Lee¹; Jinwoo Jeong¹; Yeseung Lee¹; Jun Lim¹; Sejin Park¹; Seoyun Jeong¹; Bogeum Choi¹; Se-On Sa¹; Yeongsung Yun¹; ¹Hanyang University

11:10 AM Invited

Recycling of Hazardous and Energy-Intensive Piezoelectric Ceramics Via the Upside-Down Compositing Method: *Yang Bai*¹; ¹University of Oulu

11:40 AM

Foam Glass Production from Flat Glass Waste: Technical Assessment of Sodium Hydroxide as a Foaming Agent: *Evaldo Kubaski*¹; Robson da Silva¹; Jamile Manoel¹; Gustavo Gabriel¹; ¹State University of Ponta Grossa

BIOMATERIALS

3D Printing of Biomaterials and Devices — 3D Printing of Biomaterials and Devices

Sponsored by: TMS: Biomaterials Committee

Program Organizers: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University; Amit Bandyopadhyay, Washington State University; Susmita Bose, Washington State University

Monday AM | September 29, 2025
 C172 | Convention Center

Session Chairs: Solaiman Tarafder, South Dakota State University; Sahar Vahabzadeh, Northern Illinois University

8:00 AM

Virtual Surgical Planning for the Design and Manufacturing of Stiffness-Matched Personalized Load-Bearing Implants: Transfemoral Percutaneous Implant Case: *Luis Olivas Alanis*¹; Jason Souza¹; David Dean¹; ¹The Ohio State University

8:20 AM

Biomechanical Tuning of Composites for Tissue Engineering: *Dinesh Katti*¹; Hanmant Gaikwad¹; Nanang Qosim²; Priyanka Kumari¹; Pooyan Pashaki¹; Mohan Edirisinghe²; Kalpana Katti¹; ¹North Dakota State University; ²University College London

8:40 AM

3D Printing of Active Medical Devices for Transdermal Drug Delivery and Biosensing: *Roger Narayan*¹; Gregory Sachan²; ¹University of North Carolina; ²Duke University

9:00 AM

A Collagen-Based Bioink for 3D Printing Biomimetic Tissue Graft for Rotator Cuff Repair: *Samiul Nibir¹; Solaiman Tarafder¹; ¹South Dakota State University*

9:20 AM

3D Printed Ceramics in Natural Medicine Delivery for Bone Regeneration: *Susmita Bose¹; ¹Washington State University*

9:40 AM

Bioglass Reinforced Ti6Al4V Composites for Load-Bearing Implants: *Amit Bandyopadhyay¹; Lochan Upadhyay¹; Susmita Bose¹; ¹Washington State University*

10:00 AM Break

10:20 AM

Engineering Location, External Shape, and Internal Pore Geometry, to Achieve Stiffness-Matched, 3D Printed, Nickel-Titanium Mandibular Graft Fixation Plates: *Luis Olivas Alanis¹; Agnieszka Chmielewska-Wysocka²; Ciro Rodriguez³; David Dean¹; ¹The Ohio State University; ²Cardinal Stefan Wyszyński University in Warsaw; ³Tecnologico de Monterrey*

10:40 AM

Fabrication of Personalized Resorbable Polymer Textile Scaffolds Using a Multi-Axis and Multi-Modality Biofabrication Platform: *Javier Vazquez-Armendariz²; Tanya Djemal¹; Jordan Peiffer¹; Evan Gilligan¹; Ciro Rodriguez¹; David Dean¹; ¹Ohio State University*

ADDITIVE MANUFACTURING

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

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

Monday AM | September 29, 2025
C160A | Convention Center

Session Chairs: Ola Rashwan, Penn State Harrisburg; Matt Caputo, Penn State Beaver

8:00 AM

3DP Polymers for Radiation Shielding for Portable Neuroimaging Devices: *Kate Fox¹; Azadeh Mirabedina¹; Chris McCrowe¹; Toh Yen Pang¹; ¹RMIT University*

8:20 AM

Fabrication of Soft Robotic Sensors and Actuators via Direct Ink Writing of Dual-Curable Elastomers: *Emrah Demirkal¹; Konstantinos Sierros¹; Derrick Banerjee¹; Jordyn Herter¹; Coen Wasielewski¹; Katarzyna Sabolsky¹; Edward Sabolsky¹; ¹West Virginia University*

8:40 AM

From Bottles to Builds: Development of a Recycled PET Filament: *Pete Schupska¹; Luke Debruin²; Ceylan Algan¹; Thomas Harris¹; Jacob Norris¹; Jason Walker¹; ¹The Ohio State University; ²IC3D, Inc*

9:00 AM

From Waste Stream to 3D Printing: Innovative Approaches to Sustainable Material Development: *Ramona Fayazfar¹; ¹Ontario Tech University*

9:20 AM

Polymer Gas Atomization: A Novel Approach to Powder Production for Additive Manufacturing: *Abigail Stanlick¹; Jordan Tiarks²; Boyce Chang¹; Iver Anderson²; ¹Iowa State University; ²Ames National Laboratory*

9:40 AM

Rapid Photocured Plastic Scintillators for Radiation Detection and Additive Manufacturing Applications: *Chandler Moore²; Juan Manfredi¹; Michael Febbraro¹; Daniel Rutstrom¹; Andrew Decker²; Ryan Kemnitz¹; Thomas Ruland³; Brennan Hackett³; Paul Hausladen³; ¹Air Force Institute of Technology; ²United States Military Academy, West Point; ³Oak Ridge National Laboratory*

10:00 AM

Thermoplastic Polyurethane (TPU) as a High-Loading Binder System for Magnesium (Mg) Alloy Extrusion: *Hyeonseok Kim¹; Eoin O'Cearbhaill¹; Mert Celikin¹; ¹University College Dublin*

ADDITIVE MANUFACTURING

Additive Manufacturing, Directed Energy Deposition of Metals: Processing – Microstructure – Mechanical Property Relationships — Stainless Steels

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Joy Gockel, Colorado School of Mines

Monday AM | September 29, 2025
C160B | Convention Center

Session Chair: Jonah Klemm-Toole, Colorado School of Mines

8:00 AM

Anisotropic Compression Behavior of 316L Stainless Steel at Room and Cryogenic Temperatures: The Influence of Twinning and Transformation Mechanisms: *Saurabh Pawar¹; K.U. Yazar²; Khushahal Thool¹; Wi-Geol Seo¹; Chang-Gon Jeong³; Yoon-Uk Heo³; Shi Hoon Choi¹; ¹Sunchon National University; ²Vellore Institute of Technology; ³POSTECH*

8:20 AM

Effects of Forging on Microstructural and Mechanical Properties of AISI 316LSi Fabricated via Wire Arc Additive Manufacturing (WAAM): *Vishnu Ramasamy¹; Brett Ley¹; Brian Thurston²; Glenn Daehn²; Bradley Jared³; John Lewandowski¹; Michael Bastuga¹; ¹Case Western Reserve University; ²Ohio State University; ³University of Tennessee*

8:40 AM

Enhanced Grain Refinement and Mechanical Properties in WAAM 316L by Integrated Hot Forging: *Henry Leon-Henao¹; Kaue C. Riffel¹; Antonio J. Ramirez¹; ¹The Ohio State University*

9:00 AM

New Insights into Microstructure Evolution and Deformation Mechanisms in Additively Manufactured 316L Stainless Steel: *Bassem Barkia*¹; Maxime Vallet²; Alexandre Tanguy³; Thierry Auger¹; Eva Hériré¹; ¹PIMM, Arts et Métiers; ²Université Paris-Saclay; ³Institut Polytechnique de Paris

9:20 AM

Wire Arc Additive Manufacturing of 17-4 PH Stainless Steel for Structural Components in Lock and Dam Infrastructure: Microstructural and Mechanical Performance Evaluation: *Md Naimur Rahman Antu*¹; Shawkat Imam Shakil¹; Meysam Haghshenas¹; Joseph Lawrence¹; ¹University of Toledo

9:40 AM

Creep Performance of Alloys Processed with Gas Metal Arc Directed Energy Deposition (GMA-DED): *Jonah Klemm-Toole*¹; Olivia DeNonno¹; Sophia Hill¹; Dominic Piccone¹; Robert Hamlin²; Stephen Tate³; ¹Colorado School of Mines; ²Naval Nuclear Laboratory; ³Electric Power Research Institute

10:00 AM Break

10:20 AM

Creep and Creep-Fatigue Behavior of Conventional and Additively Manufactured SS316L for Nuclear Applications: *Mahmoud Hawary*¹; K.L. Murty¹; Nadia Kouraytem²; ¹North Carolina State University; ²Utah State University

10:40 AM

Water-Atomized Powders for Powder-Feed Direct Energy Deposition: *Yiyang Xu*¹; Bryan Webler¹; ¹Carnegie Mellon University

11:00 AM

Directed Energy Deposition of Fe43.5Mn34Al15Ni7.5 Shape Memory Alloy: *Willow Knight*¹; Sameehan Joshi¹; Narendra Dahotre¹; Rob Mayer²; Marcus Young¹; ¹University of North Texas; ²Queen City Forging

ADDITIVE MANUFACTURING

Additive Manufacturing: Enhancement and Synergy with Traditional Methods — Additive Manufacturing: Enhancement and Synergy with Traditional Methods I

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Shaping and Forming Committee

Program Organizers: Henry Young, Wright State University; Tushar Borkar, Cleveland State University; Raghavan Srinivasan, Wright State University; Kester Clarke, Los Alamos National Laboratory

Monday AM | September 29, 2025
C150 | Convention Center

Session Chair: Kester Clarke, Los Alamos National Laboratory

8:00 AM

Mechanical Properties of Dissimilar Welds Between LPBFed and Wrought 17-4PH Stainless Steels: Role of LPBFed 17-4PH STS Precipitation Characteristics: *Ha Yeon Joo*¹; Ji Won Lee²; Yong Hyeok Choi²; Hyun Uk Hong¹; ¹Changwon National University; ²Doosan Enerbility

8:20 AM

Additive Manufacturing Evaporative Casting (AMEC) for Tooling and Nickel Alloys: *Sarah Jordan*¹; Mark DeBruin²; ¹Skuld LLC, Worcester Polytechnic Institute; ²Skuld LLC

8:40 AM

Additive Manufacturing to Accelerate Forging Operations: Inconel 718 and 316L Stainless Steel: Henry Young¹; Showmik Ahsan¹; Sambhaji Kusekar²; Raghavan Srinivasan¹; Ahsan Mian¹; Bishal Silwal³; Hossein Taheri³; Yashwanth Bandari⁴; Prabir Chaudhury⁵; *Tushar Borkar*⁵; ¹Wright State University; ²Cleveland State University; ³Georgia Southern University; ⁴FasTech LLC; ⁵Education and Consulting LLC

9:00 AM

Design of Additively Manufactured Preforms for Hot Forging: *Vignesh Asam*¹; Showmik Ahsan¹; Ahsan Mian¹; Raghu Srinivasan¹; Henry Young¹; ¹Wright State University

9:20 AM

Characterization of Additively Manufactured AF9628 Steel Parts Produced Via Metal Fused Filament Fabrication: Quinn Johnson¹; Aaron Bauer¹; *Tanjore Jayaraman*¹; ¹United States Air Force Academy

9:40 AM

Electrodeposition of Nickel for Load Carrying Applications: Mohammad J. Mahtabi¹; George Thompson¹; *Alireza Behvarz*²; Ahu Celebi²; Mohammad Elahinia²; ¹The University of Tennessee Chattanooga; ²The University of Toledo

10:00 AM

SolidStir® Additive Manufacturing Using Conventional Machine Tools and Low-Cost Feedstock: *Kumar Kandasamy*¹; Anurag Gumaste¹; Pankaj Kulkarni¹; Ravi Sankar Haridas²; Rajiv Mishra²; ¹Enabled Engineering; ²University of North Texas

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments VI — Advanced Characterization Session I

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Khalid Hattar, University of Tennessee Knoxville

Monday AM | September 29, 2025
D280 | Convention Center

Session Chairs: Cheng Sun, Clemson University; Khalid Hattar, University of Tennessee Knoxville

8:00 AM

Unique Aspects of Coupling Experiment and Modeling in Understanding Irradiation Behavior of Nuclear Materials: *Marat Khafizov*¹; ¹Ohio State University

8:30 AM

Coupled Experimental and Modeling of the Interactions Between Dislocations, Precipitates, and Grain Boundaries from Atomic to Mesoscale: *Liming Xiong*¹; ¹North Carolina State University

8:50 AM

High-Temperature Corrosion of Pure Vanadium in Molten Chloride Salt Environments: Aaron Penders¹; Stephanie Baldivieso²; Alejandro Ballesteros²; Ruchi Gakhar²; Kaustubh Bawane²; ¹University of Michigan; ²Idaho National Laboratory

9:10 AM

Comparative Assessment of Biaxial Creep Anisotropy in ZIRLO® and HANA-4 Zirconium Alloys: Influence of Microstructure and Processing: Mahmoud Hawary¹; K.L. Murty¹; ¹North Carolina State University

9:30 AM

Strain Field Evolution Around MX Precipitates in a Ferrite Matrix After Neutron Irradiation at 490\176C to 7.4 dpa: Emily Proehl¹; Yan-Ru Lin²; Weicheng Zhong²; Steven Zinkle¹; ¹University of Tennessee-Knoxville; ²Oak Ridge National Laboratory

9:50 AM Break

10:10 AM

In-Situ and 3D Measurements of Dynamic Processes in Nuclear Materials Utilizing Synchrotron High-energy X-rays: Xuan Zhang¹; Jun-Sang Park¹; Peter Kenesei²; Jonathan Almer¹; James Stubbins¹; Lin Gao¹; Mark Messner¹; Meimei Li¹; ¹Argonne National Laboratory

10:40 AM

Influence of Point Defect Evolution on Thermal Conductivity Degradation and Fission Gas Behavior in UO Under Accelerated Irradiation: Mutaz Alshannaq¹; Marat Khafizov¹; ¹Ohio State University

11:00 AM

Ultra-High Temperature Thermal Characterization of Materials for Nuclear Applications: Heng Wang¹; Florian Linseis¹; ¹Linseis Inc.

11:20 AM

The Influence of Irradiation-Induced Microstructural and Chemical Heterogeneity on Corrosion Dealloying of a Ni-20Cr Alloy: Sean Mills¹; Ho Lun Chan²; Matthew Chancey³; Kayla Yano⁴; Elena Romanovskaia²; Nathan Bieberdorf¹; Harjot Singh²; Valentin Romanovski²; Daniel Schreiber⁴; Mark Asta¹; Yongqiang Wang³; Peter Hosemann¹; John Scully²; Andrew Minor¹; ¹University of California, Berkeley; ²University of Virginia; ³Los Alamos National Laboratory; ⁴Pacific Northwest National Laboratory

MATERIALS-ENVIRONMENT INTERACTIONS

Advancement of Measurement Technologies for Harsh Environments — Advancement of Measurement Technologies for Harsh Environments

Sponsored by: TMS: Energy Committee

Program Organizers: Ruchi Gakhar, Idaho National Laboratory; Ammon Williams, Idaho National Laboratory; Tae-sic Yoo, Idaho National Laboratory

**Monday AM | September 29, 2025
D180 | Convention Center**

Session Chairs: Ruchi Gakhar, Idaho National Laboratory; Ammon Williams, Idaho National Laboratory; Tae-Sic Yoo, Idaho National Laboratory

8:00 AM

Gathering Corrosion Data for Light Water Reactors and Molten Salt Reactors While Keeping Fires to a Minimum: Stephen Raiman¹; ¹University of Michigan

8:20 AM

Thermal Conductivity of High Temperature Liquids Using Fiber Optic Thermorefectance: Alexander Bataller¹; Kyle Rizzuto¹; ¹North Carolina State University

8:40 AM

Demonstration of a Sensor for On-Line Monitoring of Liquids in Extreme Environments: Davis Bryars¹; Kayla Hahn¹; Munmun Jahan¹; Ammon Williams²; Alexander Bataller¹; ¹NCSU; ²Idaho National Laboratory

9:00 AM

Demonstration of the SPIDER Probe on Actinide-Bearing Molten Salts: Kayla Hahn¹; Alexander Bataller¹; Ammon Williams²; ¹North Carolina State University; ²Idaho National Lab

9:20 AM

Operation and Sensor Testing with INL Molten Salt Sensor Testbed: Diego Macias¹; Qiufeng Yang¹; Silvino Balderrama Prieto¹; Christopher Gundersen¹; Victoria Davis¹; Charles Payne¹; Ammon Williams¹; Ruchi Gakhar¹; ¹Idaho National Laboratory

9:40 AM

Infrared Video Imaging for In-Line Evaluation of Oxide Descaler Performance on Steel Strips: Ry Karl¹; Jarrod Angove¹; Jonas Vallotton¹; J. Barry Wiskel¹; Chad Cathcart²; Tihe Zhou²; Christopher Martin-Root²; Hani Henein¹; ¹University of Alberta; ²Stelco Inc

10:00 AM Break

10:20 AM

Molten Salt Composition Measurements with Double-Pulse and Resonant Laser-Produced Plasmas: Igor Jovanovic¹; Londrea Garrett¹; George Sun¹; Miloš Burger¹; Ammon Williams²; ¹University of Michigan; ²Idaho National Laboratory

10:40 AM

Development of an Improved Needle Probe to Measure the Thermal Conductivity Molten Salts: Britton Baltich¹; Troy Munro¹; Jacob Numbers¹; Andrew Christensen¹; Sam Nasman¹; Isaac Walker¹; Ryan Ruth¹; Hailey Snodgrass²; ¹Brigham Young University; ²RIT

11:00 AM

Digital Twin Development of a High-Temperature Molten Salt System: *Xingang Zhao¹; Vineet Kumar²; Wesley Williams²; William Gurecky²; ¹University of Tennessee; ²Oak Ridge National Laboratory*

11:20 AM

Hot Hardness Method for High Temperature Materials Applications: *C Paul Qiao¹; Dan Tanguay¹; Steve Schmitz¹; Joe Schreiner¹; Levi Kempka¹; ¹L.E. Jones*

11:40 AM

Interaction of Liquid Phase Diisopropyl Methyl Phosphonate(Dimp) with Material Surrogates for Components of Soil and Combustion Products of Metal Fuels: *Swapnil Das¹; Khushi Patel¹; Mirko Schoenitz¹; Edward Dreizin¹; ¹New Jersey Institute of Technology*

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Process Metallurgy — Simulations & Modeling

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

Program Organizers: Yashwanth Injeti, Big River Steel; Viraj Ashok Athavale, Nucor Steel Memphis Inc; Judy Qiu Jin Li, ClevelandCliffs

Monday AM | September 29, 2025
D281 | Convention Center

Session Chairs: Yashwanth Injeti, Big River Steel; Tracy Lingafelter, Enerfab

9:00 AM

Numerical Investigation of Continuous Casting Parameters on Slag Entrapment and Surface Quality in 304 Stainless Steel: *Xuexia Song¹; Kun Dou¹; Jingzhou Lu¹; Wanlin Wang¹; ¹Central South University*

9:20 AM

A Novel Lab Scale Casting Simulator to Quantify Submerged Entry Nozzle Clogging: *Naziru Fuseini¹; Ronald O'Malley¹; Todd Sander¹; Jeffrey Smith¹; Haiming Wen¹; Laura Bartlett¹; ¹Missouri University of Science and Technology*

9:40 AM

Modeling Weld Oxygen Transfer in Submerged Arc Welding of High Strength Low Alloy Steels Using a Process Informed CALPHAD Method: *Thomas Avey¹; Daniel Bechetti¹; Charles Fisher²; ¹Naval Surface Warfare Center Carderock; ²Office of Naval Research*

10:00 AM Break

10:20 AM

Role of Magneto-Elastic Effects in the Nucleation Behavior and Microstructural Evolution in Austenite (γ) – Ferrite (α) Transformation in Fe-C Alloys: A Quantitative Phase-Field Modeling Approach: *Soumya Bandyopadhyay¹; Michael Tonks¹; ¹University of Florida*

10:40 AM

Enhancing Property Prediction in Steel Alloys Through Quantitative Microstructural Data: *Malavikha Rajivmoorthy¹; Patrick Cleaver²; ¹Cleveland Cliffs Research and Innovation Center; ²Cleveland-Cliffs Steel Corporation*

11:00 AM

Numerical Study of Flow Behavior in an Industrial RH Degasser Using a VOF-DPM Method: *Nihal Saji¹; Xipeng Guo¹; Kiranchandru Lingewaran¹; Nicholas Walla¹; Armin Silaen¹; Rudolf Moravec²; Chenn Zhou¹; ¹Purdue University Northwest; ²U.S. Steel*

11:20 AM

Thermal Analysis Methods for Molten Steels and Thermite Welds by Optical Emission: *Maria Beldouque Correa¹; Hugo Barragan Vargas¹; Anika Lim¹; Lori Hathon²; Ricardo Cuenca Alvarez²; Shelton Taylor²; Francisco Robles Hernandez²; ¹University of Houston, Cullen College of Engineering, Technology Division; ²University of Houston*

11:40 AM

Study on the Thermal Stress and Thermal Crack Formation Behaviors in Ferritic-Silicon Steels and Austenitic Manganese Steels: *Yeon-Seok Kim¹; Soo-Hyun Kim¹; Chang-Gon Jeong¹; Kyungchul Cho²; Jae Sang Lee³; Yoon-Uk Heo¹; ¹POSTECH; ²POSCO*

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Hydrogen Fuel in Aerospace Sectors, and Progress in Hydrogen Production by Electrochemical Method - Technical Advances and Obstacles

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory; Jorgen Rufner, Idaho National Laboratory

Monday AM | September 29, 2025
B246 | Convention Center

Session Chairs: Zhien Liu, University of North Dakota EERC; Brian Gorman, Colorado School of Mines; Jie Lian, Rensselaer Polytechnic Institute; Sandrine Ricote, Colorado School of Mines

8:00 AM

Hydrogen Embrittlement of a High-Strength Ni-Based Superalloy with Varying Ti/Al Ratio and Ta Content: *Martin Detroits¹; Yuan Tian¹; Chris San Marchi²; Stoichko Antonov¹; Paul Jablonski¹; ¹National Energy Technology Laboratory; ²Sandia National Laboratories*

8:20 AM Invited

Hydrogen - Hydrocarbon Fuel Blends for Turbine Engines: High Temperature Material Issues: *Elizabeth Opila¹; ¹University of Virginia*

8:50 AM Invited

High Temperature Steam Corrosion of Single Component and High Entropy Rare-Earth Phosphates: *Bishnu Majee¹; Keith Bryce¹; Liping Huang¹; Jie Lian¹; ¹Rensselaer Polytechnic Institute*

9:20 AM

Friction and Wear Characteristics of Hydrogen-Aged DLC and MoS₂ Coatings: *Julian Long¹; Kylie Van Meter²; Catherine Fidd¹; Santiago Lazarte¹; Craig Barbour¹; Joshua Turner¹; Yan Xin³; Tomas Babuska²; William Oates¹; Fumitake Kametani¹; James Schall⁴; Nicolas Argibay⁵; Brandon Krick¹; ¹FAMU-FSU College of Engineering; ²Sandia National Laboratories; ³National High Magnetic Field Laboratory; ⁴North Carolina Agriculture & Technical State University; ⁵AMES National Laboratory*

9:40 AM Invited

Research Advancement of Proton Conducting Solid Oxide Electrolysis Cells (p-SOEC) for Hydrogen Production at Idaho National Laboratory: *Dong Ding*¹; ¹Idaho National Laboratory

10:10 AM Break

10:30 AM Invited

Advanced Materials for Low-Temperature Oxygen-Ion Conducting Solid Oxide Electrolysis Cell for Hydrogen Production: *Zhijun Liu*¹; Benjamin Peterson²; Micah Midgett³; Xuefei Zhang²; Weining Wang¹; Kaiwen Wang¹; Nicholas Stanislawski²; Meilin Liu¹; Jiahong Zhu³; *Zhien Liu*²; ¹Georgia Institute of Technology; ²University of North Dakota; ³Tennessee Tech University

11:00 AM Invited

Chemical Modulation of Grain Boundaries and Electrochemical Interfaces for Enhanced Performance: *Harry Tuller*¹; Thomas Defferriere¹; Han Gil Seo¹; Masahiro Yasutake²; Zijie Sha¹; ¹Massachusetts Institute of Technology; ²Kyushu University

11:30 AM

Solar Thermoelectrochemical Hydrogen Production Using Reversible Electrolysis and Its Immediate Impact in AI Data Centers, Automotive, and Space Technology: *Xueyan Song*¹; Cesar-Octavio Romo-De-La-Cruz¹; Yun Chen¹; ¹West Virginia University

MODELING

Advances in Multiphysics Modeling and Multi-Modal Imaging of Functional Materials — Operator Learning / Phase-Field Modeling

Sponsored by: ACerS Basic Science Division

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

Monday AM | September 29, 2025
B244/245 | Convention Center

Session Chairs: Wenrui Hao, Pennsylvania State University; Jiamian Hu, University of Wisconsin-Madison; Yanzhou Ji, Ohio State University

8:00 AM Keynote

From Centralized to Federated Learning of Neural Operators: Accuracy, Scalability, and Reliability: *Lu Lu*¹; ¹Yale University

8:40 AM Keynote

Operator Learning Neural Scaling and Distributed Applications: *Zecheng Zhang*¹; Wenjing Liao²; Hayden Schaeffer³; Hao Liu⁴; Guang Lin⁵; ¹University of Notre Dame; ²Georgia Institute of Technology; ³University of California Los Angeles; ⁴Hong Kong Baptist University; ⁵Purdue University

9:20 AM Invited

Phase-Field Modeling Coupled with FFT-Based Crystal Plasticity for Recrystallization Dynamics Driven by Geometrically Necessary Dislocations in Gradient Grained Metals: *Lei Chen*¹; Xinxin Yao¹; *Hossein Abbas*¹; ¹University of Michigan Dearborn

9:45 AM Invited

Phase-Field Modeling of Optical Properties in Ferroelectric Materials: *Aiden Ross*¹; Long-Qing Chen¹; ¹Penn State University

10:10 AM Break

10:30 AM Invited

Diffusion Under Variable Molar Volume: Continuum Theory and Phase-Field Modeling: *Chengyin Wu*¹; *Yanzhou Ji*²; ¹The Ohio State University

10:55 AM Invited

Interaction Between Terahertz Waves and Ferroelectric Materials: Analytical Model and Dynamic Phase-Field Simulations: *Yujie Zhu*¹; Jiamian Hu¹; ¹University of Wisconsin Madison

PROCESSING AND MANUFACTURING

Alloy Phase Transformations at Elevated Temperatures — Ni-Based Superalloys

Sponsored by: TMS: High Temperature Alloys Committee, TMS: Phase Transformations Committee

Program Organizers: Dinc Erdeniz, University of Cincinnati; Mark Aindow, University of Connecticut; Jonathan Priedeman, GE Aerospace; Vahid Tari, ATI - Allegheny Technologies Incorporated

Monday AM | September 29, 2025
B232 | Convention Center

Session Chair: Dinc Erdeniz, University of Cincinnati

8:00 AM Invited

Strengthening Superalloys via Locally Transformed Two-Dimensional Defect Phases: *Andreas Bezold*¹; Jan Vollhüter²; Lukas Amon²; Longsheng Feng³; Nicolas Karpstein²; Erdmann Spiecker²; Yunzhi Wang¹; Steffen Neumeier²; Michael Mills¹; ¹The Ohio State University; ²Friedrich-Alexander-Universität Erlangen-Nürnberg; ³Lawrence Livermore National Laboratory

8:30 AM

Heterogenous Nucleation of γ' Precipitates at Annealing Twin Boundaries in Superalloys: A Phase Field Study: *Vignesh Karunakaran*¹; Longsheng Feng²; Semanti Mukhopadhyay¹; Hariharan Sriram¹; Fei Xue³; Emmanuelle Marquis³; Michael Mills¹; Yunzhi Wang¹; ¹The Ohio State University; ²Lawrence Livermore National Laboratory; ³University of Michigan

8:50 AM

Revealing the Origin of Twin Boundary-Induced Phase Transformation within L1 Precipitate in Ni-Based Superalloys: *Jae Bok Seol*¹; Joong Eun Jung²; Won-Seok Ko³; Jae-Hoon Jang²; Jong Bae Jeon⁴; Jae Wung Bae⁵; Hyokyung Sung¹; Hyoung Seop Kim⁶; Kookmin University; ²Korea Institute of Materials Science; ³Inha University; ⁴Dong-A University; ⁵Pukyong National University; ⁶Pohang University of Science and Technology

9:10 AM

Study of the Effect of Two Different Regeneration Heat Treatments in a Nickel-Based Alloy System: *J. Emiliano Resendiz-Hernandez*¹; Erika O. Avila-Davila¹; Edgar E. Vereas-Cardenas¹; Armando I. Martinez-Perez¹; Nicolas Cayetano-Castro¹; Hugo Martinez-Gutierrez²; Hector Dorantes-Rosales¹; ¹Tecnológico Nacional de México-Pachuca

9:30 AM

Cooling-Rate-Driven Microstructural Evolution in Novel Ni-Based Cr-Fe-Al-Ti Alloys: *Rakhmatjon Gaipov*¹; Elyorjon Jumaev¹; Omon Sultonov¹; Jakhongir Bakirov¹; Mukhiddin Abduazimov¹; Nilufarkhon Sattarova¹; Ki Buem Kim²; ¹University of Business and Science; ²Sejong University

9:50 AM Break

10:10 AM

Effect of Copper Addition on High-Temperature Mechanical Properties of Ni-Based Multi-Principal Element Alloys: *Elyorjon Jumaev*¹; Rakhmatjon Gaipov¹; Omon Sultonov¹; Amir Abidov²; Farkhod Abdullaev²; Ki Buem Kim³; ¹University of Business and Science; ²Uzbekistan Technological Metals Complex JSC; ³Sejong University

10:30 AM

Investigation of Hot Workability and Dynamic Recrystallization of a Wrought R65 Nickel-Based Superalloy: *Vahid Tari*¹; David J. Bryan¹; Hossein Beladi²; ¹ATI Specialty Materials; ²Deakin University

10:50 AM

Effect of Thermal Cycling on Coarsening Kinetics of L12 of a Ni-Based Superalloy: *Sharat Chandra*¹; Rajesh Kumar Rai¹; ¹Malaviya National Institute of Technology

FUNDAMENTALS AND CHARACTERIZATION

Emergent Materials Under Extremes and Decisive In Situ Characterizations — In Situ Technologies Combined with Extreme Conditions

Sponsored by: ACeRS Basic Science Division

Program Organizers: Xiaofeng Guo, Washington State University; Hua Zhou, Argonne National Laboratory; Xujie Lu, Center for High Pressure Science & Technology Advanced Research; Judith Driscoll, University of Cambridge; Andrew Strzelecki, Los Alamos National Laboratory

Monday AM | September 29, 2025
C162A | Convention Center

Session Chairs: Zhou Hua, Argonne National Laboratory; Xingyuan Zhao, Johns Hopkins University; Di Chen, University of Nevada, Las Vegas

8:00 AM Invited

High Temperature Creep, Plasticity and Failure; New Insights from In Situ TEM: *Shen Dillon*¹; ¹University of California, Irvine

8:30 AM

In-Situ Neutron Diffraction-Based Creep Evaluation of Co- and Ni-Based Superalloys Produced by Laser Powder Bed Fusion: *Noah Holtham*¹; Patxi Fernandez-Zelaia¹; Frank Brinkley¹; Christopher Fancher¹; Christopher Ledford¹; Ning Zhou²; Stéphane Forsik²; Tresa Pollock³; Michael Kirka¹; ¹Oakridge National Laboratory; ²Carpenter Technology Corporation; ³University of California, Santa Barbara

8:50 AM

Quantifying Micromechanical Behavior of Fe-36Ni Invar Alloy in Low-Temperature Conditions Using 3D X-Ray Diffraction: *Raghul Asokkumar*¹; *Darren Pagan*¹; ¹Pennsylvania State University

9:10 AM Invited

Exploring Catalytic Pathways Using Advanced X-Ray Spectroscopy Techniques: *Chengjun Sun*¹; Di-Jia Liu¹; ¹Argonne National Laboratory

9:30 AM Invited

In Situ Characterization of Rare Earth Element Complexation and Crystallization Pathways in Hydrothermal Fluids Under Extreme Conditions: *Xin Zhang*¹; ¹Pacific Northwest National Laboratory

9:50 AM Break

10:10 AM Invited

Studies of Quantum Materials Under High Pressure: *Wenli Bi*¹; ¹University of South Carolina

10:40 AM Invited

Dynamic Behavior of Porous Materials Under Shock Loading: *Jonathan Lind*¹; ¹Lawrence Livermore National Laboratory

11:00 AM

Pressure-Induced Changes in the Density and Local Structure of GeO2 Glass Under High Pressure: *Xinguo Hong*¹; Kevin Hong²; ¹Center for High Pressure Science & Technology Adva; ²Earl L. Vandermeulen High School

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Battery and Storage I

Sponsored by: ACeRS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Monday AM | September 29, 2025
B234 | Convention Center

Session Chairs: Kai He, University of California, Irvine; Jianhua Tong, Clemson University

8:00 AM Session Introduction: Join us in Room B235 for the D.T. Rankin Awardee followed by Keynote Presentation with Takao Mori, National Institute for Materials Science

9:00 AM Invited

Dielectric Interfaces for Accelerating Charge Transfer in Secondary Batteries: *Takashi Teranishi*¹; ¹Okayama University

9:30 AM Invited

Enhancing Battery Performance Through Structural Design of Wadsley-Roth Shear Phases: *C.J. Sturgill*¹; Sean Wechsler¹; *Iva Milisavljevic*²; Md Abdullah Al Muhi¹; Manish Kumar¹; Hans-Conrad zur Loye¹; Christopher Sutton¹; Scott Mixture²; Morgan Stefik¹; ¹University of South Carolina; ²Alfred University

10:00 AM Break

10:20 AM Invited

New Cathode Chemistries and Electrochemical Mechanisms to Advance Batteries: *Juhyeon Ahn*¹; ¹University of Wyoming

10:50 AM Invited

Visualizing Solid-State Reactions in Batteries Using Advanced Transmission Electron Microscopy: *Kai He*¹; ¹University of California, Irvine

11:20 AM Invited

A Water-Based Lithium-Ion Solid-State Battery with an Easy Direct-Recycling System: *Shintaro Yasui*¹; Yosuke Shiratori¹; ¹Institute of Science Tokyo

11:50 AM

Understanding the Reaction Pathway in Conversion Cathodes: *Jordan Sweeney*¹; Eve Mozur¹; ¹Colorado School of Mines

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics I

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Lonergan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Monday AM | September 29, 2025
B235 | Convention Center

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

8:00 AM Introductory Comments: D.T. Rankin Awardee

8:20 AM Keynote

High Performance Thermoelectric Materials & Various Device Formats for Power Generation: *Takao Mori*¹; ¹National Institute for Materials Science

9:00 AM Invited

Advancing Misfit-Layered Calcium Cobaltite: Boosting Thermoelectric Efficiency Through Electrospun Nanoribbons and Spark Plasma Texturing: *Armin Feldhoff*¹; Katharina Kruppa¹; Itzhak Maor²; Anat Karlin²; Kristina Kebel¹; Frank Steinbach¹; Hilke Petersen¹; Dorothea Stobitzer³; Wenjie Xie⁴; Anke Weidenkaff⁴; Gennady Shter²; Meirav Mann-Lahav²; Gideon Grader²; ¹Leibniz University Hannover; ²Technion - Israel Institute of Technology; ³NETZSCH-Gerätebau GmbH; ⁴Technical University of Darmstadt

9:30 AM

Designing the Intergranular Phase for Decoupling the Strongly Correlated Thermoelectric Parameters in Perovskite Oxide Ceramics: *Cesar-Octavio Romo-De-La-Cruz*¹; Sergio-Andres Paredes-Navia¹; Yun Chen¹; Xueyan Song¹; ¹West Virginia University

9:50 AM Invited

Pushing the Boundaries in Thermoelectrics: Intergranular Engineering at Atomic and Nano Scales to Achieve the Oxide Ceramics with ZT>1: *Xueyan Song*¹; Cesar-Octavio Romo-De-La-Cruz¹; Yun Chen¹; ¹West Virginia University

10:20 AM Break

10:40 AM Invited

Tuning Thermal Transport in Perovskite Oxides via Defect and Strain Engineering: *Sepideh Akhbarifar*¹; Mohammad El Loubani²; Md Shafkat Bin Hoque³; Scott Bender³; Dongkyu Lee²; Patrick Hopkins³; ¹Catholic University of America -Vitreous State Lab; ²University of South Carolina; ³University of Virginia

11:10 AM

A New Path for Thermoelectric Ceramics: Additive Manufacturing of Misfit Oxides: *Ellena Gemmen*¹; Cesar-Octavio Romo-De-La-Cruz¹; Yun Chen¹; Xueyan Song¹; ¹West Virginia University

11:30 AM

High Thermoelectric Seebeck Coefficient in DyCoO₃ and Processing Optimization for Its Potential Application in Energy Conversion: *Geoffroy Gauneau*¹; Cesar-Octavio Romo-De-La-Cruz¹; Fuming Jiang¹; Xueyan Song¹; ¹West Virginia University

ARTIFICIAL INTELLIGENCE

Enhancing the Accessibility of Machine Learning-Enabled Experiments — Advancing Materials Research with Foundational Models

Sponsored by: ACerS Basic Science Division

Program Organizers: Yongtao Liu, Oak Ridge National Laboratory; Arpan Biswas, University of Tennessee

Monday AM | September 29, 2025
D283 | Convention Center

Session Chairs: Yongtao Liu, Oak Ridge National Laboratory; Arpan Biswas, University of Tennessee Oak Ridge Innovation Institute

9:00 AM Invited

DiffraGPT: Atomic Structure Determination from X-Ray Diffraction Patterns Using a Generative Pretrained Transformer: *Kamal Choudhary*¹; ¹National Institute of Standards and Technology

9:30 AM

Hypothesis Formation and Predictive Modeling of 2D Perovskite Spacer Cations Using Retrieval Augmented LLMs and Deep Kernel Learning: *Jordan Marshall*¹; Elham Foadian¹; Sheryl Sanchez¹; Utkarsh Pratiush¹; Rushik Desai²; Mahshid Ahmadi¹; Sergei Kalinin¹; Arun Kanakkithodi²; ¹University of Tennessee; ²Purdue University

9:50 AM Break

10:10 AM Invited

ATOMIC: Autonomous Characterization of 2D Materials Through Foundation Models: *Haozhe "Harry" Wang*¹; ¹Duke University

10:40 AM Invited

Autonomous Atomic Force Microscopy Using Large Language Model Agents: *N M Anoop Krishnan*¹; Indrajeet Mandal¹; ¹Indian Institute of Technology Delhi

11:10 AM

Foundational Workflows for Processing Legacy Data and Realizing Domain-Specific Multi-Modal AI Models: *Kevin Le*¹; Andrew Richards¹; Robert Hackenberg¹; ¹Los Alamos National Laboratory

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Challenges, Advances, and Applications — Glass Formation and Manufacturing

Sponsored by: ACerS Glass and Optical Materials Division

Program Organizers: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Monday AM | September 29, 2025
B132 | Convention Center

Session Chairs: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, IIT Delhi

8:00 AM Invited

Accessing Glass Forming Ability via Experiments, Theoretical Calculations, and Computer Simulations: *Edgar Zanutto*¹; ¹Federal University of Sao Carlos

8:30 AM

Time-Temperature-Transformation Diagram Development for a Coupled-Operation Glass Composition with SWPF: *Matthew Page*¹; Fabienne Johnson¹; Nicodemus Rod¹; Madison Hsieh¹; ¹Savannah River National Laboratory

8:50 AM

Liquidus Temperature of Phosphate Crystalline Phases in Borosilicate Waste Glasses: *Jincheng Bai*¹; Jarrod Crum¹; Xiaonan Lu¹; John Vienna²; Albert Kruger²; ¹Pacific Northwest National Laboratory; ²U.S. Department of Energy

9:10 AM Invited

LionGlass™: A Low Carbon Footprint Alternative to Soda Lime Silicate Glass: *John Mauro*¹; ¹Pennsylvania State University

9:40 AM

LionGlass™: Development and Assessment as a Sustainable, High-Performance Glazing Material: *Mehmet Arda Ozay*¹; Nicholas Clark¹; Mohammad Elmi¹; Elif Pinar Akman-Ozay¹; Julian Wang¹; John Mauro¹; ¹Penn State University

10:00 AM Break

10:20 AM

Recycling LionGlass™: Optical and Elemental Sorting for Sustainable Glass Manufacturing: *Elif Pinar Akman-Ozay*¹; Nicholas Clark¹; Mehmet Arda Ozay¹; John C. Mauro¹; ¹Penn State University

10:40 AM

In the World of Borosilicate Glass: Applications and Challenges of the Past, the Presence and the Future: *Juliane Brandt-Slowik*¹; ¹SCHOTT Technical Glass Solutions GmbH

11:00 AM

New Synthesis of Blue and Purple Pigments from Pyrex -Type Glass: *Jacob Hormadaly*¹; ¹Ben Gurion University

11:20 AM

Short and Medium Range Structures of Binary GeO₂-SiO₂ Glasses From Molecular Dynamic Simulations: *Navid Marchin*¹; Jincheng Du¹; ¹University of North Texas

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; Klaus van Benthem, The University of Alabama; Wayne Kaplan, Technion - Israel Institute of Technology

Monday AM | September 29, 2025
C161A | Convention Center

Session Chairs: Craig Carter, Massachusetts Institute of Technology; Melissa Santala, Oregon State University

8:00 AM Invited

Evidence for Accelerated Grain Boundary Diffusion During Ultrafast Firing (UHS) of Alumina: *Zonghao Guo*¹; *Richard Todd*¹; ¹University of Oxford

8:30 AM

4D Observations of Grain Growth in Polycrystalline Alumina: *Hailey Hall*¹; Daniel DeLellis¹; Michael Kesler²; Amanda Krause¹; ¹Carnegie Mellon University; ²Oak Ridge National Laboratory

8:50 AM

Correlating Atomic Structure to Velocity of Grain Boundaries in Metal Oxides: *Mehmet Can Dursun*¹; Hailey Hall¹; Amanda Krause¹; ¹Carnegie Mellon University

9:10 AM

Sub-Grain Boundary Dynamics During Early-Stage Recrystallization in High-Purity Aluminum: *Zehua Liu*¹; Marc DeGraef¹; ¹Carnegie Mellon University

9:30 AM

Influence of the Duplex CoTiO₃-TiO₂ Microstructure on the Nucleation and Growth of Entropy-Stabilized CoTi₂O₈: *Koen Verrijt*¹; Junyan Zhang¹; Jeffrey Rickman¹; Helen Chan¹; ¹Lehigh University

9:50 AM Break

10:10 AM Invited

Using Interface Layer Quantities to Compute Unambiguous Thermodynamic Quantities From Atomic Data Sets: *W Craig Carter*¹; Catherine Bishop²; ¹Massachusetts Institute of Technology; ²University of Canterbury

10:40 AM

Atomistic Modeling of Structure and Tritium Transport in Fe-Al-Cr Quasicrystal Phase: *Kashi Subedi*¹; Krishna Pitike¹; Matthew Olszta¹; David Senor¹; Ayoub Soulami¹; Andrew Casella¹; ¹Pacific Northwest National Laboratory

11:00 AM

Atomic and Electronic Structure of Impurity-Segregated Grain Boundaries in γ -Al₂O₃: *Tatsuya Yokoi*¹; Yu Ogura¹; Katsuyuki Matsunaga¹; ¹Nagoya University

11:20 AM

Neural-Network Potential Based on Trainable Descriptor for Modeling Complex Interfacial Structures and Properties: *Masami Uchida*¹; Tatsuya Yokoi¹; Yu Ogura¹; Katsuyuki Matsunaga¹; ¹Nagoya University

11:40 AM Invited

In-Situ Characterization of Interface Evolution During Zinc Electrodeposition in Alkaline Electrolytes: *Ming Tang*¹; ¹Rice University

FUNDAMENTALS AND CHARACTERIZATION

High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI — Physics-Based Models

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

Program Organizers: Shuozhi Xu, University of Oklahoma; 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

Monday AM | September 29, 2025

C170 | Convention Center

Session Chairs: Yunzhi Wang, Ohio State University; Dilpuneet Aidhy, Clemson University

8:00 AM Invited

Microstructural Engineering for Multi-Phase High-Entropy Alloys: Shiddhartha Ramprakash¹; Brian Welk¹; Paraic O'Kelly¹; Hamish Fraser¹; *Yunzhi Wang*¹; ¹Ohio State University

8:30 AM Invited

Better, Faster Alloy Simulations: An Improved Hybrid MC/MD Algorithm for LAMMPS: *Megan McCarthy*¹; Aidan Thompson¹; ¹Sandia National Laboratories

9:00 AM Invited

Molecular Dynamic Studies of Strain Rate Effects on Screw Dislocation Mobility and Glide Mechanisms in BCC Complex Concentrated Alloys: Subhendu Chakraborty¹; *Liang Qi*¹; ¹University of Michigan

9:30 AM

Electronic Structure Origin of the B2 Phase Stability Among Refractory Metals: *Ali Barooni*¹; Maryam Ghazisaeidi¹; ¹The Ohio State University

9:50 AM Break

10:10 AM Invited

Electronic Structure, a Fundamental Descriptor of Elastic and Plastic Properties in BCC Refractory Alloys: Dharmendra Pant¹; *Dilpuneet Aidhy*¹; ¹Clemson University

10:40 AM Invited

Larger Than Uncorrelated Diffusion Contributions in Disordered Materials: *Soham Chattopadhyay*¹; Blas Uberuaga¹; ¹Los Alamos National Laboratory

11:10 AM Invited

Lattice Distortion Due to Oxygen Vacancies in MgO-Based High Entropy Oxides From DFT: *Oriyomi Opetubo*¹; Dilpuneet Aidhy¹; ¹Clemson University

MATERIALS-ENVIRONMENT INTERACTIONS

High-Temperature Corrosion and Degradation of Materials — High-Temperature Corrosion and Degradation of Materials

Sponsored by: TMS: Corrosion and Environmental Effects Committee

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

Monday AM | September 29, 2025

D182 | Convention Center

Session Chair: Richard Oleksak, National Energy Technology Laboratory

8:00 AM

Predicting Passivity of Refractory High Entropy Alloys: *David Shifler*¹; ¹Office of Naval Research

8:20 AM

Effects of Steam, Carbon Dioxide, and Oxygen Potential on the Early-Stage Oxidation Behavior of Ni-Based Alloys: *Jonathan Locker*¹; Brian Gleeson¹; ¹University of Pittsburgh

8:40 AM

Steam Oxidation and Environmental Effects on Zr-Nb Alloys: *Sean Li*¹; Chaitanya Deo¹; Remi Dingreville²; Scott Monismith²; Preet Singh¹; ¹Georgia Institute of Technology; ²Sandia National Laboratories, Center for Integrated Nanotechnologies

9:00 AM

Selective Oxidation of Sm in SmCo-Based Magnets: Kinetics and Mechanisms: *Mitchell Harvey*¹; Courtney Young¹; Mario Caccia²; ¹Montana Technological University; ²Alfred University

9:20 AM

Erosion Resistant Effect on Engine Valvetrain Performance: *C. Paul Qiao*¹; Jake Beavers¹; Dan Tanguay¹; ¹L.E. Jones

9:40 AM

Optimizing Conditions for Environmental Barrier Coating Testing in High-Temperature, High-Velocity Steam Environments: *Matthew Caulfield*¹; Elizabeth Opila¹; ¹University of Virginia

10:00 AM Break

10:20 AM

Quantitative Analysis and 3D Structure of High-Temperature Steam-Induced Porosity in Rare-Earth Disilicates for Environmental Barrier Coating Applications: *Marcus Lam*¹; Chathuranga Witharamange¹; Elizabeth Opila¹; ¹University of Virginia

10:40 AM

Evaluating Steam Stability of Xenotime-Inspired Rare Earth Orthophosphate Environmental Barrier Coatings: *Imoen Hawthorne*¹; Elizabeth Opila¹; ¹University of Virginia

11:00 AM

Design and Performance Testing of Low-Cost Multicomponent Rare Earth Disilicate Environmental Barrier Coatings: *Richard Oleksak*¹; Casey Carney¹; Shiqiang Hao¹; Michael Gao¹; Kenneth Kane²; ¹National Energy Technology Laboratory; ²Johns Hopkins University Applied Physics Laboratory

11:20 AM

Predicting Creep Deformation and Damage Using the Wilshire Cano Stewart (WCS) Model with Strain Energy Density (SED) for Alloy 617: *Kojo Benefo*¹; Calvin Stewart¹; ¹The Ohio State University

ARTIFICIAL INTELLIGENCE

Materials Informatics for Images and Multi-Dimensional Datasets — Materials Informatics for Images and Multi-Dimensional Datasets I

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division

Program Organizers: Amanda Krause, Carnegie Mellon University; Daniel Ruscitto, GE Aerospace Research; Alp Sehirlioglu, Case Western Reserve University; Roger French, Case Western Reserve University; Erika Barcelos, Case Western Reserve University

Monday AM | September 29, 2025
D282 | Convention Center

Session Chair: Amanda Krause, Carnegie Mellon University

8:00 AM Invited

Nanocrystalline Films: Imaging, Orientation Mapping, Machine Learning and Data Analytics: *Katayun Barmak*¹; Jeffrey Rickman²; ¹Columbia University; ²Lehigh University

8:30 AM

3D Data Pipelines and Workflows to Mesh Experimental and Computational Results: *Paul Chao*¹; Chad Hovey¹; Brian Phung¹; Ashley Spear²; Kyle Karlson¹; John Emery¹; Andrew Polonsky¹; ¹Sandia National Laboratories; ²University of Utah

8:50 AM Invited

Harnessing of Photodiode Signals to Predict Mechanical Properties in Laser Powder Bed Fusion Additive Manufacturing: *Allison Beese*¹; ¹Pennsylvania State University

9:20 AM Invited

Mapping Microstructure: Manifold Construction and Exploitation for Accelerated Materials Discovery: *Stephen Niezgoda*¹; Simon Mason¹; Jeff Simmons²; Megna Shah²; ¹The Ohio State University; ²U.S. Air Force Research Laboratory

9:50 AM

Non-Destructive 3D Characterization of Structural Failures Using X-Ray Computed Tomography: *Tai-Jan Huang*¹; Angela Criswell¹; ¹Rigaku Americas Corporation

NANOMATERIALS

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

Sponsored by: ACerS Other

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

Monday AM | September 29, 2025
B240/241 | Convention Center

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

8:00 AM Keynote

Modeling Stress Transfer in High-Loading Nanocomposites through Particle Interaction Mechanics and Spectroscopic Validation: Peter W¹; Gary Pickrell²; *Navin Manjooran*¹; ¹Solve; ²Virginia Tech

8:30 AM

Surface Modification of Nanoclay Using Low Plasma Irradiation for Environmental Remediation: *Paulo Henrique Caman*¹; Sushrisangita Sahoo¹; Abhinav Yadav¹; Derval Rosa²; Lucia Helena Innocentini Mei³; Vijaya Kumar Rangari¹; ¹Tuskegee University; ²Federal University of ABC; ³State University of Campinas

8:50 AM

Novel Sweet Spot Techniques in Imaging and Analyzing Battery Materials in the FE-SEM Enhanced by AI-Based Particle Characterization: *Andy Holwell*¹; Ria Mitchell¹; ¹Carl Zeiss Microscopy LLC

9:10 AM

Green Synthesis of Nanostructured MgO Using Tropical Foliage Extracts (Siamweed) for Multifunctional Applications: Photocatalysis and Antimicrobial Properties: *Esther Ikhuoria*¹; Godfrey Otabor²; Joshua Onaifo²; Ikhuazugbe Ifijen³; ¹University of Benin; ²Ambrose Alli University; ³Rubber Research Institute of Nigeria

9:30 AM

Stabilizing High-Valent Mn Single Atoms on Defect-Rich CeO Nanoislands to Enhance N Selectivity and SO Resistance in Ultra-Low-Temperature NH-SCR Process: *Feibin Wei*¹; Taotao Hu¹; ¹Northwestern Polytechnical University

9:50 AM Break

10:10 AM

Nanorobotics for Early Detection and Targeted Treatment of Pancreatic Ductal Adenocarcinoma: *Kate Fox*¹; Shawn Goussous²; Melissa Stanfield¹; William Louis¹; Nhiem Tran¹; ¹RMIT University; ²Nanocube Health

10:30 AM Concluding Comments

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials I

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

Monday AM | September 29, 2025
C171 | Convention Center

Session Chairs: Antonia Ressler, Tampere University; Masahiro Yoshimura, National Cheng Kung University

8:00 AM Invited

Direct Formation of Bio-Active Ceramic Coating on Titanium based Metallic Alloys via Growing Integration Layer [GIL] Strategy: *Masahiro Yoshimura*¹; Chi-Huang Huang²; ¹Tokyo Institute of Technology; National Cheng Kung University; ²National Cheng Kung University

8:20 AM Invited

Porous Graphene Nanomaterials for Vascular Delivery of Nitric Oxide: *Tanveer Tabish*¹; ¹University of Oxford

8:40 AM Invited

Lipid-Functionalized Hybrid Nanocarriers for Precision Drug Delivery and Tumor Targeting Applications: *Sanjay Mathur*¹; ¹University of Cologne

9:00 AM Invited

Global Young Bioceramicist Award: The Art of Biomimetic Bone Tissue Regeneration: *Antonia Ressler*¹; ¹Tampere University

9:20 AM Invited

Bioceramics Young Scholar Award: Flow Chemistry-Governed Scale-Up of Oxide Bioceramics as Multifunctional Sunscreens for Broad-Spectrum Photoprotection: *Sayoni Sarkar*¹; Ajit Kulkarni²; ¹ETH Zurich; ²Indian Institute of Technology Bombay

9:40 AM Invited

Larry L. Hench Lifetime Award: Larry Hench's Insights and Ionic Medicine: Current and Future Opportunities for Bioactive Glasses: *Aldo Boccaccini*¹; ¹University of Erlangen-Nuremberg

10:00 AM Invited

Theranostic Application of Polyethyleneimine Stabilized Gold Nanoparticles: *Atul Tiwari*¹; Roger Narayan²; ¹Indian Institute of Technology (BHU), Varanasi, India; ²University of North Carolina and North Carolina State University

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division

Program Organizers: Morsi Mahmoud, Abdullah Al Salem University (AASU); Rishi Raj, University of Colorado; Motoyasu Sato, Chubu University; Dinesh Agrawal, Pennsylvania State University; Christina Wildfire, National Energy Technology Laboratory; Guido Link, Karlsruhe Institute of Technology; Daudi Waryoba, Pennsylvania State University

Monday AM | September 29, 2025
B233 | Convention Center

Session Chair: Morsi Mahmoud, Abdullah Al Salem University

8:00 AM Invited

Dual Effect of Burst-Type Alternating Electromagnetic Fields on Bacterial Proliferation and Biofilm Suppression at Low Cell Concentration: Hidekazu Miura¹; *Hideyuki Kanematsu*²; Risa Kawai³; Takayoshi Nakano²; ¹Suzuka University of Medical Science; ²Osaka University; ³Nara Women's University

8:30 AM Invited

Graphene Infused Copper: A New State of Matter Enabled by "Flash": *Rishi Raj*¹; Suprabha Das¹; ¹University of Colorado

9:00 AM

Microstructural Evolution of Copper During Ultrasonic Surface Modification: Teddy Magheto¹; Carl Boehlert¹; Upama Biswas Tonny¹; *Sunil Chakrapani*¹; ¹Michigan State University

9:20 AM

Microwave-Assisted Sintering of SOEC Electrodes Materials for Accelerated Sintering Kinetics, Microstructural Development, Defect Formation, and Chemical Stability: *Javier Mena*¹; Edward Sabolsky¹; Katarzyna Sabolsky¹; Tugrul Yumak¹; Mason Cavalier¹; Shavinka Jayasekera¹; Geethanath Duggiralla¹; Terence Musho¹; Ansan Pokharel¹; ¹West Virginia University

9:40 AM

Detecting Rare Earth Elements and Critical Transition Metals via Optically Detected Magnetic Resonance (ODMR) and Spin-Relaxometry Using Nitrogen Vacancy Centers in Nanodiamonds: *Ghadendra Bhandari*¹; Gary Lander¹; Matthew Brister¹; Crawford Scott¹; Hari Paudel¹; Jeffrey Wuenschell¹; Michael Buric¹; Ruishu Wright¹; Yuhua Duan¹; ¹NETL

10:00 AM Break

10:20 AM Invited

Corrosion Protection of Powder Metal Parts by Cold Spray Coating of AlCrCoFeNi High Entropy Alloy: Ezeck Olinger¹; *Daudi Waryoba*¹; Dylan Treaster²; ¹Pennsylvania State University; ²HAMR Industries LLC

10:50 AM

Influence of SiC Particles on the Mechanical Properties of Cu-Based Composite Casting Developed Through Microwave Hybrid Heating: Khalid Bashir¹; Dheeraj Gupta¹; Vivek Jain¹; ¹Thapar Institute of Engineering and Technology Patiala Punjab

11:10 AM

Development of Femtosecond Laser-Based Purification Techniques of High-Purity Quartz for Industrial Energy Applications: Arish Naim¹; Subhash Risbud¹; ¹University of California, Davis

11:30 AM

Effects of Magnetic Field Heat Treatment on Irradiated HT9 F/M Steel: Kirk Lemmen¹; Xiatong Yang²; Haluk Karaca¹; Osman Anderoglu²; Stuart Malay³; Nan Li⁴; ¹University of Kentucky; ²University of New Mexico; ³Pacific Northwest National Laboratory; ⁴Los Alamos National Laboratory

11:50 AM

Multiphysics Simulation of Laser Welding Aluminum Structures: Cory Webber¹; Jeong-Hoi Koo¹; Carter Hamilton¹; Hee-Shin Kang²; ¹Miami University; ²Korea Institute of Machinery & Materials

CERAMIC AND GLASS MATERIALS

Solid-State Optical Materials and Luminescence Properties — Solid-State Optical Materials and Luminescence Properties

Sponsored by: ACerS Basic Science Division, ACerS Glass and Optical Materials Division

Program Organizers: Mathieu Allix, Laboratoire CEMHTI; Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Institute of Low Temperature and Structure Research; Jan Hostaša, CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics

Monday AM | September 29, 2025
 B230 | Convention Center

Session Chairs: Yiquan Wu, Alfred University; Matthew Dejneka, Corning

8:00 AM

Low-Loss Ion-Exchange Waveguides in Glass: High Speed Optical Communications to the Chip: Matthew Dejneka¹; Lars Brusberg¹; David McEnroe¹; Jorge Holguin-Lerma¹; Chad Terwilliger¹; Charisse Spier¹; Jonathan Walter¹; ¹Corning Research and Development

8:20 AM

Efficient Generation of High Harmonic Generation and Polarization-Dependent Nonlinearity in van der Waals Material: AgScP₂S₆: Mohamed Yaseen Noor¹; Ryan Siebenaller¹; Conrad Kuz¹; Simin Zhang¹; Adam Fisher¹; Rahul Rao²; Emmanuel Rowe²; Bing Lv³; Benjamin Conner²; Michael Susner²; Enam Chowdhury¹; ¹The Ohio State University; ²Airforce Research Laboratory; ³University of Texas at Dallas

8:40 AM

Evaluation of Line and Point Defects Using Optical Methods in ZnSe Crystal: Jakob Peabody¹; Lauren Gower¹; Leslie Scheurer¹; Ching Hua Su¹; Eric Bowman¹; Bradley Arnold¹; Florence Lucey¹; Fow-Sen Choa¹; Brian Cullum¹; Narsingh Singh¹; ¹University of Maryland Baltimore County

9:00 AM

Distributed Static Magnetic Field Sensing via Acoustic Sensing Optical Fiber and Magnetostrictive Materials: Zachary Dejneka¹; ¹Virginia Tech

9:20 AM

Negative Thermal Expansion Hosts for Anti-Thermal Quenching Phosphors: Yuanbing Mao¹; ¹Illinois Institute of Technology

9:40 AM

Phonon Polaritons for Enhanced Mid-Infrared Sensing: Thomas Folland¹; ¹The University of Iowa

10:00 AM Break

10:20 AM

Photochemically-Programmable Optically-Functional High-Precision 3-D Chalcogenide Surface Glass Structures: Myungkoo Kang¹; ¹Alfred University

10:40 AM

Self-Powered Visible Light Detection Using Silver and Cesium Antimony Iodide Thin Films Synthesized by Rapid Iodization Techniques: Varshika Puthan Veedu Sasidharan¹; Sadasivan Shaji²; David Avellaneda³; Manuel García Méndez¹; Bindu Krishnan²; ¹Facultad de Ciencias Físico Matemáticas, Universidad Autónoma de Nuevo León, San Nicolás de los Garza; ²Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Centro de Innovación, Investigación y Desarrollo en Ingeniería y Tecnología (CIIDIT)- Universidad Autónoma de Nuevo León, Parque de Investigación e Innovación Tecnológica (PIIT); ³Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza

11:00 AM

Stabilizing Mn⁵⁺ in High Optical Basicity Glasses: A New Class of NIR-II Phosphors for Bioimaging: Amir Ashjari¹; Jiao Li¹; Danielle Perry¹; Brian Topper²; Yiquan Wu¹; Doris Möncke¹; ¹Alfred University; ²Clemson University

11:20 AM

Thermally Stable Near-Infrared-Emitting Phosphors: Hexi Zhang¹; Yuanbing Mao¹; ¹Illinois Institute of Technology

11:40 AM

Trap Engineering of Persistent Phosphors for Optical Data Storage: Thulitha Abeywickrama¹; Yuanbing Mao¹; ¹Illinois Institute of Technology

SPECIAL TOPICS

The Navrotsky Award for Experimental Thermodynamics of Solids — The Navrotsky Award for Experimental Thermodynamics of Solids

Monday AM | September 29, 2025
 B142/143 | Convention Center

Session Chairs: Kyle Brinkman, Clemson University; Xiaofeng Guo, Washington State University

8:00 AM Invited

Investigation of Complex Metal Hydrides for Hydrogen Storage Using Thermochemistry, Analytical Methods, and Theory: Konrad Burkman¹; ¹Arizona State University

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Thermodynamics of Materials in Extreme Environments

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

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

Monday AM | September 29, 2025
D181 | Convention Center

Session Chair: Xiaofeng Guo, Washington State University

8:00 AM Invited

Inferring Structure from Raman Spectroscopy and Connecting It to the Macroscopic Behavior of Molten ThCl₄: *Vyacheslav Bryantsev*¹; Luke Gibson¹; Rajni Chahal¹; ¹ORNL

8:20 AM Invited

Computational Tools for High Temperature Materials Properties: *Qijun Hong*¹; ¹Arizona State University

8:40 AM Invited

Achieving Accurate Entropy and Melting Point by Ab Initio Molecular Dynamics and Zentropy Theory: Application to Fluoride and Chloride Salts: *Shun-Li Shang*¹; Xiaofeng Guo²; Qijun Hong³; Zi-Kui Liu¹; ¹Pennsylvania State University; ²Washington State University; ³Arizona State University

9:00 AM

First-Principles Thermodynamic Assessments of Sr-Containing Secondary Phase Formation in La_{1-x}Sr_xMnO₃ Perovskites for Solid Oxide Cell Applications: *Yueh-Lin Lee*¹; Yuhua Duan¹; Dan Sorescu¹; Wissam Saidi¹; Dane Morgan²; William Epting¹; Harry Abernathy¹; ¹National Energy Technology Laboratory; ²University of Wisconsin-Madison

9:20 AM

Multiscale Prediction of α -Precipitate Nucleation in β -Stabilized Alloys: CALPHAD-based Model: *Astrid Rodriguez Negron*¹; Aaron Tallman¹; Audrey Torres¹; ¹Florida International University

9:40 AM Invited

Metal Di-Boride (MB₂ | M = Ti, Zr, Nb, Hf, Ta) Properties Above 3000 C: Elizabeth Sobalvarro¹; Fox Thorpe²; Jesus Rivera¹; Harry Charalambous¹; Gabriella King¹; James Cahill¹; Wyatt Du Frane¹; Joshua Kuntz¹; *Scott McCormack*²; ¹Lawrence Livermore National Laboratory; ²University of California, Davis

10:00 AM Break

10:20 AM Invited

Thermochemical Stability of Oxides in High-Temperature, High-Velocity Steam: *Elizabeth Oplal*¹; ¹University of Virginia

10:40 AM

Nanoparticle-Reinforced Polymers for Blast Mitigation Technologies: *Jack Gugin*¹; Morgan Gillis¹; Mark Krekeler¹; Mithun Bhowmick¹; ¹Miami University

11:00 AM

Ultra-Lightweight Single-Phase Al-Based Complex Concentrated Alloy With High Specific Strength: *Qiaoshi Zeng*¹; ¹Hpstar

SPECIAL TOPICS

Plenary Sessions — TMS Plenary Session

Monday PM | September 29, 2025
Short North Ballroom B | Convention Center

2:00 PM Introductory Comments

2:05 PM Plenary

TMS Plenary: Making Materials Science Go Viral! *Taylor Sparks*¹; ¹University of Utah

2:55 PM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

17th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Green and Sustainable Technologies for Manufacturing Materials 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; Wei Ji, Wuhan University of Technology

Monday PM | September 29, 2025
B242/243 | Convention Center

Session Chairs: Lan Li, Pacific Northwest National Laboratory; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University

2:00 PM Invited

Toward Scalable and Practical Quantum Devices: A Molecular Approach: *Lan Li*¹; ¹Boise State University

2:30 PM Invited

Graphene Coating by Mechanical Treatment to Provide Water Resistance to Aluminium Nitride Particles Used in Spray-Freeze Granulation Drying of Aqueous Slurries: *Junichi Tatami*¹; Riko Yamazaki¹; Motoyuki Iijima¹; Naoki Kondo²; Shinya Kawaguchi³; ¹Yokohama National University; ²National Institute of Advanced Industrial Science and Technology; ³Preci Co., Ltd.

3:00 PM

Recycled PET-Coir Fiber Composites: Advancing Circular Economy Through Sustainable Material Innovation: *Enis Agyeman Boateng*¹; Danielle Cote¹; Robert Krueger¹; ¹Worcester Polytechnic Institute

3:20 PM Break

3:40 PM

Eco-Friendly Paperclay Research Questions: *Rosette Gault¹*; ¹New Century Arts, Inc (paperclaylab)

4:00 PM

Evaluation of the Mechanical, Thermal and Microstructural Behaviour of Gum Arabic Reinforced Polylactide Fibre: *Victoria Obasa¹*; *Olanrewaju Oludolapo²*; *Isaiah Owoyemi³*; *Samson Adeosun³*; ¹Lagos State University; ²Durban University of Technology; ³University of Lagos

4:20 PM Invited

Mitigating the Impact of Mechanical Vibration on the Storage Performance of High Ni Based Lithium-Ion Batteries: *Naresh Vangapally¹*; *Morekonda Ganesh Babu Karthick Babu¹*; *Lee Heow Pueh¹*; *Palani Balaya¹*; ¹National University of Singapore

SPECIAL TOPICS

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

Sponsored by: ACerS

Monday PM | September 29, 2025
B131 | Convention Center

Session Chair: Junichi Tatami, Yokohama National University

2:20 PM Invited

Ferrocenyl Complex Oxide Thin Films: From Fundamental Understanding to Next-Generation Devices: *Lane Martin¹*; ¹Rice University

3:00 PM Invited

Development of Highly Heat-Dissipating and Filling Boron Nitride Particles and Improvement of Thermal Management Technology: *Shota Daiki¹*; ¹Tokuyama Corporation

3:20 PM Break

3:40 PM Invited

Measuring Complex Permittivity: *Nathan Orloff¹*; ¹National Institute of Standards and Technology

4:00 PM Invited

Ferrite/Metal Composite Materials for Magnetic Powder Cores With High Saturation Flux Density and Low Loss Properties: *Satoshi Mori¹*; ¹Niterra Co., Ltd.

4:20 PM Invited

Polarization Behavior in BaTiO₃-Based Dielectrics and Their Application to Secondary Batteries: *Takashi Teranishi¹*; ¹Okayama University

ADDITIVE MANUFACTURING

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

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

Monday PM | September 29, 2025
C160A | Convention Center

Session Chairs: Matt Caputo, Penn State Beaver; Ola Rashwan, Penn State Harrisburg

2:00 PM

Continuous Carbon Fiber-Reinforced Composites for Aerospace Applications Using Advanced Manufacturing Techniques: *Kevin Tennant¹*; *Austin Harper¹*; *Noah Osborne¹*; *Konstantinos Sierros¹*; *Thorsten Wuest²*; *Edward Sabolsky¹*; *Wade Huebsch¹*; *Chris Griffin¹*; ¹West Virginia University; ²University of South Carolina

2:20 PM

Extrusion of Antimicrobial PEEK/AgNPs 3D Printing Filament for Patient-Specific Implants: *Mohamed Abdalla¹*; *Caden Kurzenknebe¹*; *Ola Rashwan¹*; ¹Pennsylvania State University- Harrisburg

2:40 PM

New Permittivity-Based and Inductance-Based Functionalities for 3D-Printed Polymer-Based Materials: *Deborah Chung¹*; ¹University at Buffalo, The State University of New York

ADDITIVE MANUFACTURING

Additive Manufacturing of Thick Films Using Dry Aerosol Processes: Process Development, Materials, Process Optimization and Applications — Solid Particle Aerosol Deposition

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Desi Kovar, University of Texas at Austin; Shannon Murray, Sandia National Laboratories; Michael Gammage, CCDC Army Research Laboratory

Monday PM | September 29, 2025
C150 | Convention Center

Session Chair: Desiderio Kovar, University of Texas at Austin

3:00 PM

Development of Variable Composition Aerosol Deposition Coatings: *Shannon Murray¹*; *Jacob Williamson¹*; *Seth Davis¹*; *Stephen Bierschenk²*; *Desiderio Kovar²*; ¹Sandia National Laboratories; ²University of Texas at Austin

3:20 PM

Helium-Free High-Performance Cold Spray: *David Brennan¹*; *Kyle Johnson¹*; *Aaron Nardi¹*; ¹VRC Metal Systems



3:40 PM Break

4:00 PM

Surface Protection of Low Carbon Steel with Dense Aluminosilicate Coatings by Dry Aerosol Deposition: *Arezou Karimian¹; Paul Fuierer¹*;
¹New Mexico Institute of Mining and Technology

4:20 PM

Quasi Tempering of Glass via Dry Aerosol Deposition: *Paul Fuierer¹*;
Robert Borrego¹; ¹New Mexico Institute of Mining and Technology

4:40 PM

A Deep Learning-Based Molecular Dynamics Study of the Effect of an Oxide Layer on the Deposition of Tantalum Particles: Stephen Bierschen¹; Michael Becker¹; *Desiderio Kovar¹*; ¹University of Texas at Austin

5:00 PM

Micro-Cold Spray of Zinc Oxide Nanoparticle Aggregates with Different Fractal Dimensions: Scott Burlison¹; Michael Becker¹; *Desiderio Kovar¹*; ¹University of Texas at Austin

5:20 PM

Room-Temperature Fabrication of Functional Ceramic Films: *Neamul Hayet Khansur¹*; Shan He¹; ¹Case Western Reserve University

ADDITIVE MANUFACTURING

Additive Manufacturing, Directed Energy Deposition of Metals: Processing – Microstructure – Mechanical Property Relationships — Nickel Alloys

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Joy Gockel, Colorado School of Mines

Monday PM | September 29, 2025
C160B | Convention Center

Session Chair: Benjamin Adam, Oregon State University

3:00 PM

The Next Step: Tailored Ni and Co Based Superalloy Development via High-Throughput Additive Manufacturing: *Ajay Talbot¹*; Yu Zou¹;
¹University of Toronto

3:20 PM Break

3:40 PM Invited

Process-Microstructure-Property Relationships in Low Heat Input Wire-Arc Additive Manufacturing (WAAM) of Ni-Based Superalloy Haynes 282: *Benjamin Adam¹*; Rui Feng²; Robert Turpin¹; Shane Namie²; Dustin Crandall²; Graham Tewksbury²; Chantal Sudbrack²; ¹Oregon State University; ²National Energy Technology Laboratory

4:20 PM

Influence of Compositional and Microstructural Complexity on Ion Irradiation Resistance in Additively Manufactured CoCrFeNi-Based High-Entropy Alloys: Jiaxuan Li¹; Som Dixit¹; Yongqiang Wang²; *Shunyu Liu¹*; ¹Clemson University; ²Los Alamos National Laboratory

4:40 PM

Shaped Laser Texture Modulation in the Directed Energy Deposition of a Nickel Superalloy: *Jack Dale¹*; Annabel Shim²; James Zuback³; Carelyn Campbell³; Samantha Webster¹; ¹Colorado School of Mines; ²Ohio State University; ³NIST

5:00 PM

Application of Direct Energy Deposition Additive Manufacturing for Forging Die Repair: *Akash Belure¹*; Mayank Garg¹; David Schwam¹; Tushar Borkar¹; ¹Cleveland State University

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session I

Sponsored by: ACerS Other

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

Monday PM | September 29, 2025
C151 | Convention Center

Session Chairs: Danielle Cote, Worcester Polytechnic Institute; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

2:00 PM Invited

Incorporation of Artificial Intelligence in Powder-Based Metal Additive Manufacturing Processes: *Danielle Cote¹*; Stephen Price¹;
¹Worcester Polytechnic Institute

2:30 PM

Effect of Recrystallization on the Fatigue Properties of SS316L-Inconel 718 Bimetallic Medium-High Entropy Alloy Fabricated by Laser Powder Bed Fusion: *Liyi Wang¹*; Xuanzhuo Nie¹; Mustafa Kas²; Wei Xiong¹; ¹University of Pittsburgh; ²Gazi University

2:50 PM

Influence of Feedstock and Heat Treatment on Cold Spray Additive Manufacturing of Al 7075: *Dylan Treaster¹*; Michael Schmitt¹; ¹HAMR Industries LLC

3:10 PM

Latest Developments in HIP and High-Pressure Heat Treatment for Additive Manufacturing: *Chad Beamer¹*; Andrew Cassese¹; ¹Quintus Technologies LLC

3:30 PM Break

3:40 PM

Mechanical Behavior of CuSnNi Components Manufactured by Laser Powder Bed Fusion: *Sanid Dahal¹*; John Martin¹; Sai Teja Bokka¹; Constantin Solomon¹; ¹Youngstown State University

4:00 PM

Mechanical Strength of Interfacial Bonds of Multi Material FGMs Using Laser Powder Bed Fusion: *Gabriel Awuku¹*; Sara Ranjbareslamloo¹; Md. Muhiul Muhit¹; Ala Qattawi¹; ¹University of Toledo

4:20 PM

Microstructural Evolution and Mechanical Response of LPBF-Fabricated IN718/SS316L Functionally Graded Materials: *Sara Ranjbareslamloo¹; Gabriel Awuku¹; Md. Muhiul Muhit¹; Ala Qattawi¹*
¹University of Toledo

4:40 PM

Unveiling Creep-Induced Microstructural Changes in 3D-Printed ODS Alloys via Advanced SEM-Based Characterization: *Subham Chatteraj¹; Johan Westraadt¹; Andreas Bezold¹; Timothy Smith²; Michael Mills¹*
¹The Ohio State University; ²NASA Glenn Research Center

5:00 PM

Advancement in Alloys Performance Through Additive Manufacturing with Breakthrough Properties Improvement Without Modifying Alloys Chemistry: *Youping Gao¹*
¹Castheon Inc

5:20 PM

Additive Manufacturing of High-Strength Al-Ti Composites: *Yu Zou¹*
¹University of Toronto

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments VI — Advanced Characterization Session II

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Khalid Hattar, University of Tennessee Knoxville

Monday PM | September 29, 2025
D280 | Convention Center

Session Chairs: Xuan Zhang, Argonne National Laboratory; Cheng Sun, Clemson University

3:00 PM

Bridging Distributed Autonomous Platforms for Materials Innovation: *Yongtao Liu¹; Sumner Harris¹*
¹Oak Ridge National Laboratory

3:30 PM Break

3:50 PM

Corrosion of Ni-Based Alloys in Light Water Reactor Environment: An In-Situ Bragg Coherent Diffraction Imaging Approach: *Sayantana Mondal¹; David Simonne¹; Riley Hultquist¹; Ericmoore Jossou¹*
¹MIT

4:10 PM

Development, Validation, and Uncertainty Quantification of a BISON Model for Pd Penetration in TRISO Particle Fuels: *Chaitanya Bhave¹; Jacob Hirschhorn¹; Som Dhulipala¹; Mathew Swisher¹; Ryan Sweet¹*
¹Idaho National Laboratory

4:30 PM

A Time Dependent Multiaxial Inelastic Constitutive Model for Nuclear Graphite: *Mirza Baig¹; Stephen Duffy¹; Joisah Owusu-Danquah¹*
¹Cleveland State University

4:50 PM

Gamma Ray Shielding Performance of 3D Printed Polymers: *Lucas Clark¹; Fahima Ouchen²; Laura Davidson²; Emily Heckman³; Carrie Bartsch³; Ahsan Mian¹*
¹Wright State University; ²KBR; ³Air Force Research Laboratory

MATERIALS-ENVIRONMENT INTERACTIONS

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

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

Monday PM | September 29, 2025
D181 | Convention Center

Session Chairs: Evelina Vogli, Flame Spray Inc.; Virendra Singh, Schlumberger

2:00 PM

Cold-Sprayed and Arc-Melted High-Entropy Alloys: Wear, Erosion and Oxidation: *Yu Zou¹*
¹University of Toronto

2:20 PM

Understanding the Role of Particle Size on Thin Coating Formation and Mechanical Properties of WC-Co-Cr Coatings Deposited by HVAF Spray: *Vijaya Lakshmi Devara¹; Sivakumar Govindarajan¹; Prasad M.J.N.V.²; Suresh Babu Pitchuka¹*
¹ARCI-HYDERABAD; ²Indian Institute of Technology, Bombay

2:40 PM

NbC Reinforced Ni Based Alloy Cladding by Thermal Spray Coatings and Weld Overlay Technique: *Leo V. M. Antony¹; David Rigg¹; Damon Fields¹; Dustin Reitmeyer¹; Leo Baird¹*
¹SCM Metal Products

3:00 PM

Open-Air Plasma Assisted Organosilicon Coating on Automotive Aluminum Alloys for Corrosion Protection: *Jiheon Jun¹; Yong Chae Lim¹; Tianzhao Wang¹; Yi-Feng Su¹; Ryan Robinson²; Daphne Pappas²*
¹Oak Ridge National Laboratory; ²Plasmatrete USA

3:20 PM Break

3:40 PM

Tailored DLC Coating for Regolith Dust Mitigation: *Tyler Roy¹; Sharon Gray¹; Jacqueline Johnson¹; Lee Leonard¹; William Scott²; Matthew Mazurkivich²*
¹University of Tennessee Space Institute; ²NASA Marshall Space Flight Center

4:00 PM

Tribocorrosion Performance of TiAlN and AlTiN Coatings on Ti6Al4V Alloy for Biomedical Applications: *Thiago Gontarshi¹; Bruno Pereira¹; Ricardo Torres¹; Paulo Soares¹*
¹Pontifical Catholic University of Paraná

4:20 PM

Anti-Erosion Coatings of Silicon Carbide and Tantalum Carbonitride Nanocomposite by Chemical Vapor Deposition: *Hirokazu Katsui¹; Kazuya Shimoda²; Katsuyoshi Harada³; Jun Kumagai³; Mikiyori Hotta¹*
¹National Institute of Advanced Industrial Science and Technology (AIST); ²National Institute for Materials Science (NIMS); ³Nagoya University

4:40 PM

Oxide Thin Films Obtained by Reactive Sputtering for Antifouling Purposes: *Gabriel Abelha Carrijo Gonçalves¹; Bruno Leonardo Ribeiro Oliveira²; Denise Tornavoi de Castro²; Marcelo Rodrigues Pinto²; Rogério Valentim Gelamo³; Jeferson Aparecido Moreto³; Idalina Vieira Aoki¹; ¹University of São Paulo; ²University of Uberaba; ³Federal University of Triângulo Mineiro*

5:00 PM

Effects of Cu, Sn, and Mn Additions on Intermetallic Layer Growth in Hot-Dip Aluminizing with Al-9Si Bath: *Jihun Choi¹; Eui-Jin Jung¹; Dae-Yoon Kim¹; Joo-Youl Huh¹; ¹Korea University*

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — 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

Monday PM | September 29, 2025
B142/143 | Convention Center

Session Chairs: Amar Bhalla, University of Texas at San Antonio; Ruyan Guo, University of Texas at San Antonio

2:00 PM Invited

Machine Learning-Assisted Identification of Crystal Symmetries in Ferroelectric Perovskites Using X-Ray Diffraction Patterns: *Luiz Cotica¹; Hugo Machado¹; Gustavo Dias¹; Ivair Santos¹; Ruyan Guo¹; Amar Bhalla²; ¹State University of Maringa; ²University of Texas at San Antonio*

2:20 PM

Anomalous Dielectric Behavior and Domain Reorientation/Switching in the (Bi_{0.5}Na_{0.5})_{0.92}Ba_{0.08}TiO₃ Ceramic System Below a Critical Temperature: *Aimé Peláiz-Barranco¹; Yon Leandro Leyvas-López¹; Alejandro Carlos Iglesias-Jaime¹; Mohammad Bakhtbidar²; Andreas Ruediger²; Tongqing Yang³; Marcos Aparecido dos Santos Mariano⁴; Tawan H. T. Rosa⁴; Jose de los Santos Guerra⁴; ¹Universidad de La Habana; ²Institut National De La Recherche Scientifique; ³Tongji University; ⁴Universidade Federal de Uberlandia*

2:40 PM

Enhancement of Spontaneous Ferroelectric Polarization in Sm-Doped BaFe_{0.2}Ti_{0.8}O₃ Ceramics: *Anumeet Kaur¹; ¹Global Group of Institutes*

3:00 PM

Influence of Monoclinic Phase on Energy Harvesting Performance and Contribution of Tetragonal Phase to Uncertainty in Pb(Mg,Nb)O₃ PbTiO₃ Ceramics: *Yang Bai¹; ¹University of Oulu*

3:20 PM Break

3:40 PM Invited

Unlocking High Capacitive Energy-Density in Sm-Doped PMN-PT Thin Films: *Matjaž Spreitzer¹; Zouhair Hanani¹; Urška Trstenjak¹; Jamal Belhadi²; Anna Razumnaya¹; Igor Lukyanchuk¹; Zdravko Kutnjak¹; Jožef Stefan Institute*

4:00 PM

Investigation of the Dielectric Relaxation Processes in Donor-Doped BaTiO₃-Based Ceramics: *Tawan H. T. Rosa¹; Marco Aurélio de Oliveira²; Yanela Mendez González³; Fidel Guerrero Zayas⁴; Ruyan Guo⁵; Amar Bhalla⁵; José de los Santos Guerra¹; ¹Universidade Federal de Uberlândia; ²Universidade Federal do Vale do Jequitinhonha e Mucuri; ³Universidad Politécnica de Madrid; ⁴Universidade Federal do Amazonas; ⁵The University of Texas at San Antonio*

4:20 PM

Investigation of the Structural Properties and Dielectric Relaxation Processes in NBT–KBT Based Lead-Free Ceramics: *Marcos Aparecido dos Santos Mariano¹; José Eduardo Garcia²; Ruyan Guo³; Amar Bhalla³; José de los Santos Guerra¹; ¹Instituto de Física, Universidade Federal de Uberlandia; ²Universitat Politècnica de Catalunya - BarcelonaTech; ³The University of Texas at San Antonio*

4:40 PM Invited

Ferroelectrics of Sustainable Nanostructured Films Derived by Bacterial Cellulose: *Hathaikarn Manuspiya¹; Bhumin Than-ardna¹; Siwat Penrasamee¹; ¹Chulalongkorn University*

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Process Metallurgy — Processing & Characterization

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

Program Organizers: Yashwanth Injeti, Big River Steel; Viraj Ashok Athavale, Nucor Steel Memphis Inc; Judy Qiujin Li, ClevelandCliffs

Monday PM | September 29, 2025
D281 | Convention Center

Session Chairs: Olujide Oyerinde, Francis Marion University; Yashwanth Injeti, Big River Steel

2:00 PM

Analysis of the Behavior Change of STS Transforming to Austenite After Delta Solidification Based on In-Situ Images: *Dae-Geun Hong¹; ¹Pohang University of Science and Technology*

2:20 PM

Effect of Al or Ti Addition on the Austenite Grain Size and Ferrite Formation in Ultra-Low Oxygen Weld Metal of Low-Carbon Steel: *Takashi Mizuguchi¹; Masatoshi Sukemiya¹; Takumi Yoneji¹; Daichi Miyata¹; ¹Ehime University*

2:40 PM

Effect of Residual Elements on the Microstructure and Properties of High Strength DP Steel for Automotive Application: *Hyuntaek Na¹; Hwangoo Seong¹; Jaehoon Lee¹; Jaejoong Kim¹; Dongwan Kim¹; Young-Roc Im¹; ¹POSCO*

3:00 PM

Effects of Nb and Si Addition on the Microstructure and Mechanical Properties in Friction Welded Joint of Non-Quenched and Tempered Steels: *Bongjun Kim¹; Joonoh Moon¹; Jun-Yun Kang²; Jungwon Lee³; Yonghyun Kim³; ¹Changwon National University; ²Korea Institute of Materials Science; ³DY Power*

3:20 PM Break

3:40 PM

Microstructure and Mechanical Properties of High Nitrogen Austenitic Stainless Steels Manufactured by PM-HIP Process and the Effects of Nb Addition: *Byeongchan Lee*¹; Joonoh Moon¹; Hyun-Uk Hong¹; Dongsoo Kim²; Sehwan An²; ¹Changwon National University; ²Doosan Enerbility

4:00 PM

Nanotomographic Characterization of Iron Pellets: *Samuel Pennell*¹; Vivek Kashyap¹; Robert Bell¹; Kerry Rippy¹; ¹NREL

4:20 PM

Transient Development of Molten Slag-Metal Systems: *Brian Hicks*¹; Vanshika Singh¹; Yiyu Wang¹; Rangasayee Kannan¹; Brett Spigarelli²; Julio Ortega Rojas¹; Dustin Gilmer³; Bradley Jared³; Sudarsanam Babu⁴; Tony Schmitz³; Alan Frederick¹; Sarah Graham¹; David Hebble⁵; Adam Stevens¹; ¹Oak Ridge National Laboratory; ²University of Minnesota; ³University of Tennessee; ⁴University of Maryland; ⁵Arc Specialties, Inc.

4:40 PM

Using Laser Heat Treatment to Influence Fatigue Crack Initiation Location: *Jenna Stanton*¹; ¹Ohio University

5:00 PM

Innovative Technology for the Restoration of Metal Steel Parts: *Borys Sereda*¹; Irina Kruglyak¹; Yuriy Petrusha²; Dmytro Sereda²; ¹DSTU; ²NU (Zaporizhzhia Polytechnic)

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Complex Interactions of Materials, Components, and Systems for Hydrogen Production, Separation, Storage, Transport, and Utilization

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory; Jorgen Rufner, Idaho National Laboratory

Monday PM | September 29, 2025
B246 | Convention Center

Session Chairs: Xueyan Song, West Virginia University; Amrita Bag, Interpro Pipe & Steel Inc.; Julian Long, FAMU-FSU College of Engineering- Florida State University; Martin Detrois, National Energy Technology Laboratory

2:00 PM Invited

Materials Development for Protonic Ceramic Electrolysis Cells: *Sandrine Ricote*¹; Yewon Shin¹; Robert Kee¹; ¹Colorado School of Mines

2:30 PM Invited

Performance and Durability of Solid Oxide Fuel Cells Operated on Cleaned Coal-Derived Syngas: *Jivan Thakare*¹; ¹University of North Dakota

3:00 PM Invited

LaO.6Sr0.4Co0.2Fe0.8O3 Degradation Under SOEC Conditions and Its Effects on Operational Lifetimes: *Brian Gorman*¹; Heather Slomski²; Madeline Van Winkle³; Nicholas Strange⁴; Liam Nagle-Cocco⁴; Andrew Rowberg⁵; Jonas Kaufman⁵; Michael Dzara³; David Ginley³; Sarah Shulda³; ¹Colorado School of Mines; ²Colorado School of Mines and National Renewable Energy Laboratory; ³National Renewable Energy Laboratory; ⁴SLAC National Accelerator Laboratory; ⁵Lawrence Livermore National Laboratory

3:30 PM Break

3:50 PM

Quantification of 4 Phase Microstructural Changes in Solid Oxide Cells Fuel Electrodes After Electrolysis and Reversible Operations: *Emily Ghosh*¹; John-In Lee¹; Srikanth Gopalan¹; Uday Pal¹; Soumendra Basu¹; ¹Boston University

4:10 PM Invited

Debunking Generalizations Regarding Interactions of Hydrogen with Fe- and Ni-Based Alloys at Temperatures > 400°C: *Rishi Pillai*¹; Marie Romedenne¹; Dean Pierce¹; J.A. Haynes¹; ¹Oak Ridge National Laboratory

4:40 PM

Effect of Compressive Residual Stress on Hydrogen Permeability in Shot-Peened Steel Under Cathodic Charging: *Jia-Huei Tien*¹; Ana Armendariz¹; David Johnson¹; David Bahr¹; ¹Purdue University

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: Ana Paula Domingos Cardoso, International Zinc Association; Daniel Baker, LIFT

Monday PM | September 29, 2025
D283 | Convention Center

Session Chairs: Ana Paula Domingos Cardoso, International Zinc Association; Daniel Baker, LIFT

2:00 PM

Correlation Between Surface Topography and Radiometric Properties During Galvannealing: *Michiyo Kagaya*¹; Fatima Suleiman¹; Ana Cardoso²; Kyle Daun¹; ¹University of Waterloo; ²International Zinc Association

2:30 PM

Grain-Boundary Precipitation as a Mechanism of Liquid-Metal Embrittlement in Advanced High-Strength Steels: *Seungchang Han*¹; Yuki Ikeda¹; Theophilus Wallis¹; Reza Darvishi Kamachali¹; *Robert Maass*¹; ¹Federal Institute of Materials Research and Testing (BAM)

3:00 PM

Production of Zinc Coating on Sheet Steel Using FA Charges Containing Nickel Additives: *Borys Sereda*¹; Irina Kruglyak¹; Dmytro Sereda¹; ¹DSTU

3:30 PM Break

3:50 PM

Surface-Modified High-Mn Steel via HSLA Multilayer Additive Manufacturing: Robust LMAC Resistance: *Du-Rim Eo*¹; Seok-Hyun Hong²; Jung-Wook Cho³; ¹Korea Institute of Industrial Technology; ²POSCO; ³Pohang University of Science and Technology

4:20 PM

Zinc Coating Control Using the New ICP-Zn Integral Indicator: Borys Sereda¹; *Kruglyak Irina*¹; Dmytro Sereda¹; Konstantin Skrebkov¹; ¹DSTU

PROCESSING AND MANUFACTURING

Advances in Refractory High Entropy Alloys and Ceramics — High-Temperature Mechanical Properties

Sponsored by: TMS: Refractory Metals & Materials Committee, ACerS Basic Science Division

Program Organizers: Mingwei Zhang, University of California, Davis; Arezoo Zare, Washington State University; John Perepezko, University of Wisconsin-Madison; Bai Cui, University of Nebraska Lincoln

Monday PM | September 29, 2025
B232 | Convention Center

Session Chair: Arezoo Zare, Washington State University

3:40 PM Invited

Creep Behavior of a Precipitation-Strengthened A2-B2 Refractory High Entropy Alloy: *Sandipan Sen*¹; Liu Yang¹; Daniel Schliephake¹; Alexander Kauffmann¹; Raja Vikram¹; Stephan Laube¹; Aparajita Pramanik²; Ankur Chauhan²; Martin Heilmaier¹; ¹Karlsruhe Institute of Technology; ²Indian Institute of Science Bengaluru

4:10 PM Invited

High-Temperature Mechanical Behavior of Refractory Alloys: *Gianna Valentino*¹; ¹University of Maryland

4:40 PM

Tensile Creep Mechanisms of the Nb45Ta25Ti15Hf15 and NbTaTiV Refractory High-Entropy Alloys: *Mingwei Zhang*¹; Michael Lau¹; Tamanna Zakia¹; Gianmarco Sahragard-Monfared¹; Satish Rao²; Wenqing Wang²; Calvin Belcher³; Mark Asta²; Diran Apelian³; Enrique Lavernia⁴; ¹University of California, Davis; ²University of California, Berkeley; ³University of California, Irvine; ⁴Texas A&M University

FUNDAMENTALS AND CHARACTERIZATION

Applications of Uncertainty Quantification (UQ) in Science and Engineering — UQ Applications in Materials and Engineering - Bayesian Calibration, Sparse Grid Surrogates, Meso-Scaling, Meta Analysis, Deep Kernel Learning

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Mark Andrews, SmartUQ (retired); Miroslav Stoyanov, Oak Ridge National Laboratory

Monday PM | September 29, 2025
C162B | Convention Center

Session Chairs: Mark Andrews, Independent Consultant; Miroslav Stoyanov, Oak Ridge National Laboratory

2:00 PM Introductory Comments

2:05 PM

A Case Study of Bayesian Parameter Estimation for Thermal Property Inference and Uncertainty Quantification: *Jeremy Drew*¹; Shravan Godse¹; Yuxing Liang¹; Abhishek Pathak¹; Jonathan Malen¹; Rachel Kurchin¹; ¹Carnegie Mellon University

2:25 PM

Sparse Grids for Magneto-Hydrodynamics: *Miroslav Stoyanov*¹; Hoang Tran¹; ¹Oak Ridge National Laboratory

2:45 PM

Representative Microstructure for Macro-Scale Property Prediction Using Multi-Scale Models: *Arulmurugan Senthilnathan*¹; Pranav Karve¹; Sankaran Mahadevan¹; ¹Vanderbilt University

3:05 PM

Leveraging Archival Additively Manufacturing Fatigue Data to Investigate the Role of Processing Porosity with Greater Precision: *Ian Wietecha-Reiman*¹; Todd Palmer¹; ¹Pennsylvania State University

3:25 PM Break

3:45 PM

Uncertainty Quantification via Deep Kernel Learning for Predicting Multimodal -Phase Volume Fraction from SXR Patterns: *Ayorinde Olatunde*¹; Ozan Dernek¹; Gabriel Ponon¹; Weiqi Yue¹; Qingzhe Guo¹; Amit Samantha²; Donald Brown³; Roger French¹; Pawan Tripathi¹; Anirban Mondal¹; ¹Case Western Reserve University; ²Lawrence Livermore National Laboratory; ³Los Alamos National Laboratory

4:05 PM Concluding Comments

NUCLEAR ENERGY

Ceramic Materials for Nuclear Energy System — Materials and Processes for Nuclear Energy Systems

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

Program Organizers: Krista Carlson, University of Nevada, Reno; Lingfeng He, North Carolina State University; Charmayne Loneragan, Missouri University of Science and Technology; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory

Monday PM | September 29, 2025
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Session Chairs: Jake Amoroso, Savannah River National Laboratory; Krista Carlson, University of Nevada, Reno; Charmayne Loneragan, Missouri University of Science and Technology

2:00 PM

Point Defect Energetics in AlGaN Alloys by Machine Learning Force Field: *Farshid Reza*¹; Bei Han Chen¹; Miaomiao Jin¹; ¹Pennsylvania State University

2:20 PM

The Role of Microstructures in Hydrogen Retention in Zirconium Hydride Moderator: *Yuwen Xu*¹; Wenwen Leng¹; Nicholas Dailey¹; Jianqi Xi¹; ¹University of Illinois Urbana-Champaign

2:40 PM

Cluster Dynamics Modeling of Extended Defect Evolution with Loop Unfaulting in Proton-Irradiated Single Crystal ThO₂: *Md Minaruzzaman*¹; Yongfeng Zhang²; Miaomiao Jin³; Mutaz Alshannaq¹; Anshul Kamboj⁴; Kaustubh Bawane⁴; Boopathy Kombaiiah⁴; Lingfeng He⁵; David Hurley⁴; Marat Khafizov¹; ¹The Ohio State University; ²University of Wisconsin-Madison; ³Pennsylvania State University; ⁴Idaho National Laboratory; ⁵North Carolina State University

3:00 PM

Swift Heavy Ions to Study Amorphization Behavior of Compositionally Complex Oxides: *Kenneth Sanders*¹; George Adamson¹; Cale Overstreet¹; Eric O'Quinn¹; Tao Liang¹; Haixuan Xu¹; Pascal Simon²; Jesse Smith³; Joerg Neufeind⁴; Joshua Safin¹; Katharine Page¹; David Sprouster⁵; Maik Lang¹; ¹University of Tennessee, Knoxville; ²GSI Helmholtzzentrum für Schwerionenforschung; ³Argonne National Laboratory; ⁴Oak Ridge National Laboratory; ⁵Stony Brook University

3:20 PM

In Situ High-Temperature Behavior of Uranium Borides: Riley Moeykens¹; Axel Tran²; Anthony Harrup¹; Mehmet Topsakal³; Bruce Ravel³; *Ericmoore Jossou*¹; ¹Massachusetts Institute of Technology; ²École Polytechnique; ³Brookhaven National Lab

3:40 PM Break

4:00 PM

Stabilization of Research Reactor Spent Nuclear Fuel to Ceramic Form for Potential Disposal in a Deep Geological Repository: *Anil Prasad*¹; Aaron Barry¹; Ernesto Geiger¹; James Crigger¹; Madalena Spencer¹; Ray Dickson¹; ¹Canadian Nuclear Laboratories

4:20 PM

Analysis of Crucible-Scale Corrosion Testing of Monofrax® K-3 Refractory in Contact with Glass Melts: *Matthew Page*¹; Jake Amoroso¹; Nicodemus Rod¹; Daniel Odell¹; ¹Savannah River National Laboratory

4:40 PM

Synthesis and Characterization of Rhenium Chalcogenides for Nuclear Waste Management: *Logan Breton*¹; Jake Amoroso¹; ¹Battelle Savannah River Alliance/Savannah River National Laboratory

5:00 PM

Chemical Durability of Cermet Waste Forms for Advanced Reactor Wastes: *Jake Amoroso*¹; Matthew Page¹; Nathaniel Marrero²; Shanmugavelayutham. K. Sundaram²; Alevtina Maksimova³; Gregory Morrison³; Hans-Conrad zur Loye³; ¹Savannah River National Laboratory; ²Alfred University; ³University of South Carolina

5:20 PM

Dechlorination and Immobilization of Electrefiner Salt Waste in Phosphate Glass Matrices: *Lucas Greiner*¹; Charmayne Loneragan¹; ¹Missouri University of Science and Technology

NANOMATERIALS

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

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; Oliver Diwald, Paris Lodron Universitaet Salzburg; Hyunjoo Choi, Kookmin University

Monday PM | September 29, 2025
B230 | Convention Center

Session Chairs: Babak Anasori, Purdue University; Michael Naguib, Tulane University; Gurpreet Singh, Kansas State University

2:00 PM Invited

Structure–Property Relationships in Ti and Mo-Based MXenes for Advanced Biosensing: *Lia Stanciu*¹; Ya-Ching Yu¹; ¹Purdue University

2:30 PM Invited

The Role of Surface Terminations in MXene Optical and Electronic Properties: *Zahra Fakhraei*¹; Hui Fang¹; Zhenyao Fang¹; Anupma Thakur²; Vahid Rad³; Pawe Michałowski⁴; Masoud Soroush³; Babak Anasori²; Andrew Rappe¹; ¹University of Pennsylvania; ²Purdue University; ³Drexel University; ⁴Lukasiewicz Research Network

3:00 PM

Design of Nanolayered Carbides Through Assembly & Fusion of 2D Building Blocks: *Brian Wyatt*¹; Kat Nykiel¹; Pawe Michałowski²; Alejandro Strachan¹; Babak Anasori¹; ¹Purdue University; ²Lukasiewicz Research Network

3:20 PM Break

3:40 PM Invited

Engineered Laser-Induced Nanomaterials for Long-Term Stable, Skin-Conformal, and Non-Invasive Biosensing Applications: *Farnaz Lorestan*¹; ¹Penn State University

4:10 PM

Defect Engineering and Phase Stability of MXenes for High Temperatures: *Caleb Wasserbeck*¹; Brian Wyatt¹; Babak Anasori¹; ¹Purdue University

4:30 PM

High Throughput Synthesis of Double Transition Metal MAX for Future Machine-Learning Integrated Research: *Annabelle Bedford*¹; Bethany Wright¹; Brian Wyatt¹; Anupma Thakur¹; Babak Anasori¹; ¹Purdue University

4:50 PM

From Bulk Synthesis to Storage: Cation-Substituted Transition Metal Dichalcogenides as Electrodes for Alkali Metal Ion Batteries: *Arijit Roy*¹; Gurpreet Singh¹; ¹Kansas State University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion, Protection and Damage Monitoring of Advanced Materials in Natural and Specific Environments — Deepened Understandings of Corrosion And Protection Mechanisms with a Focus on Novel Materials, the Change of Corrosive Media and Coating

Sponsored by: ACerS Education and Professional Development Council, ACerS Energy Materials and Systems Division, TMS Energy Committee, TMS: Energy Conversion and Storage Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Xueyuan Zhang, Gamry Instruments; Guang-ling Song, Southern University of Science and Technology

Monday PM | September 29, 2025
D182 | Convention Center

Session Chairs: Qixin Zhou, The University of Akron; Guang-ling Song, Southern University of Science and Technology

3:00 PM Keynote

Corrosion Resistance of an Fe-Al Reactive Bond in Acidic Environments: *Jamieson Brecht*¹; Melanie Moses-DeBusk¹; Yan-Ru Lin¹; Ercan Cakmak¹; Tracie Lowe¹; Michael Thompson¹; James Keiser¹; Michael Kesler¹; David Weiss²; Kashif Nawaz¹; ¹Oak Ridge National Laboratory; ²Loukus Technologies, Inc.

3:30 PM Break

3:50 PM Invited

Electrochemical Investigation of Pipeline Coating Disbondment Under Excessive Cathodic Protection: Yuhan Su¹; Qixin Zhou¹; ¹The University of Akron

4:20 PM

Biofouling and Corrosion of Magnesium Alloys WE43, AM60 and Mg-Zr-Gd-Nd-Y-Zn Alloy by Chlorella Vulgaris in Artificial Seawater: *Qi Fu*¹; Guang-Ling Song¹; Xinran Yao¹; ¹Southern University of Science and Technology

4:40 PM

Evaluation of Direct Energy Deposited SS316L for CO₂ Containing Environmental Service: *Adnan Khan*¹; Vasanth C. Shunmugasamy¹; Bilal Mansoor¹; ¹Texas A&M University

5:00 PM

Study on the Corrosion Performance of Nickel Coating on Bipolar Plates for Anion Exchange Membrane Water Electrolysis: Yunze Dong¹; Qing Mao¹; Ruiyu Ma²; Xueyuan Zhang³; ¹DaLian University of Technology; ²Institute of Corrosion Science and Technology; ³Gamry Instruments

FUNDAMENTALS AND CHARACTERIZATION

Emergent Materials Under Extremes and Decisive In Situ Characterizations — Advanced Characterization of Fuel and Ceramic Materials Under Extreme Conditions

Sponsored by: ACerS Basic Science Division

Program Organizers: Xiaofeng Guo, Washington State University; Hua Zhou, Argonne National Laboratory; Xujie Lu, Center for High Pressure Science & Technology Advanced Research; Judith Driscoll, University of Cambridge; Andrew Strzelecki, Los Alamos National Laboratory

Monday PM | September 29, 2025
C162A | Convention Center

Session Chair: Xiaofeng Guo, Washington State University

2:00 PM Invited

In Situ Ion Irradiation of Uranium Carbide: Rashed Almasri¹; Wei-Ying Chen²; Adrian Wagner³; Jennifer Watkins³; Laura Hawkins³; Yuhua Li³; Jian Gan³; *Lingfeng He*¹; ¹North Carolina State University; ²Argonne National Laboratory; ³Idaho National Laboratory

2:30 PM Invited

Deployment and Testing of a Fiber-Based Instrument for In-Reactor Thermal Property Measurements at MIT Research Reactor: *Zilong Hua*²; Alex Pomo¹; Colby Jensen¹; Austin Fleming¹; Weiyue Zhou²; Michael Short²; David Carpenter²; Caleb Picklesimer¹; Robert Schley¹; David Hurley¹; ¹Idaho National Laboratory; ²Massachusetts Institute of Technology

2:50 PM Invited

Metal Fuel Performance in Sodium-Cooled Fast Reactors: Post Irradiation Examination: *Tiankai Yao*¹; Randall Fielding¹; Yachun Wang¹; Colby Jensen¹; Douglas Porter¹; ¹Idaho National Laboratory

3:10 PM Invited

In-Situ Characterization of High-Temperature Degradation of Nuclear Materials Under Extreme Environments: *Di Chen*¹; ¹University of Nevada, Las Vegas

3:30 PM Break

3:50 PM Invited

Characterization of Phase Transformations in Oxides Driven by Far-From-Equilibrium Conditions: *Eric O'Quinn*¹; John Hirtz¹; Cale Overstreet¹; William Reed¹; Antonio Fuentes²; Maik Lang¹; ¹University of Tennessee; ²Cinvestav Unidad Saltillo

4:10 PM Invited

Emergent Material Characterization by Synchrotron-Based X-Ray Imaging, Spectroscopy and Scattering: *Wilson Chiu*¹; ¹University of Connecticut

4:40 PM

Assessment of Defects in AlGaN Induced by High Electronic Excitations Using Ionoluminescence and RBS Channeling: *Savannah Watson*¹; ¹University of Tennessee

5:00 PM

In Situ Tomography Testing in Extreme Environments: *Alex Arzoumanidis*¹; ¹Psylotech Inc

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Battery and Storage II

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Lonergan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Monday PM | September 29, 2025
B234 | Convention Center

Session Chairs: Charmayne Lonergan, Missouri University of Science and Technology; Ekaterina Pomerantseva, Drexel University

2:00 PM Invited

Design, Development, and Characterization of Fast Ion Conductors: *Yan-Yan Hu*¹; ¹Florida State University

2:30 PM Invited

Development of Electrolyte and Electrode Materials for Solid State Batteries: *Fudong Han*¹; ¹Rensselaer Polytechnic Institute

3:00 PM Invited

Rapid Laser Sintering of Ga-Doped LLZO Solid-State Battery Electrolytes: *Yanfei Cai*¹; *Hua Huang*¹; *Tianyi Zhou*¹; *Jianhua Tong*¹; ¹Clemson University

3:30 PM Break

3:50 PM

Rapid and Scalable Microwave-Assisted Synthesis of Garnet-Type Solid Electrolytes for All-Solid-State Batteries: *Eric Yoshida*¹; *Kai He*¹; ¹University of California Irvine

4:10 PM

Potassium Ion Mobility in Khibinskite, K₂ZrSi₂O₇: *Daniel White*¹; *Yiyang Wu*¹; ¹The Ohio State University

4:30 PM Invited

Thin-Film Li Glassy Solid Electrolytes as a New Functionality for Glass Enabling High Energy Density Li All Solid State Batteries: *Steve Martin*¹; ¹Iowa State University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics II

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Lonergan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Monday PM | September 29, 2025
B235 | Convention Center

Session Chairs: Akira Nagaoka, University of Miyazaki; Takayoshi Katase, Institute of Science Tokyo

2:00 PM Invited

Promising Routes to Boost Thermoelectricity of p- and n-Type Full-Heusler Compounds: *Ernst Bauer*¹; *Michael Parzer*¹; *Fabian Garmroudi*¹; *Takao Mori*²; ¹Technische Universität Wien; ²NIMS, Tsukuba

2:30 PM Invited

Broadening Exploration of Chemical Systems for Half-Heusler Thermoelectrics: *Kamil Ciesielski*¹; ¹Colorado School of Mines

3:00 PM Invited

Development of High-Entropy-Type Thermoelectric Materials: *Aichi Yamashita*¹; ¹Tokyo Metropolitan University

3:30 PM Break

3:50 PM Invited

Synthesis and Thermoelectric Properties of ACu₂Q₄ Sulfoselenides: *James Hodges*¹; ¹Pennsylvania State University

4:20 PM Invited

High Thermoelectric Performance in High-Quality Kesterite Single Crystals: *Akira Nagaoka*¹; *Shoma Miura*¹; *Hiroki Ienaga*¹; *Mao Mori*¹; *Keita Nomoto*²; *Naoki Sato*³; *Kenji Yoshino*¹; *Kensuke Nishioka*¹; ¹University of Miyazaki; ²The University of Sydney; ³National Institute for Materials Science

4:50 PM Invited

Solid-State Electrochemical Thermal Switches Using YSZ Solid Electrolyte: *Ahrong Jeong*¹; *Hiromichi Ohta*¹; ¹Hokkaido University

ARTIFICIAL INTELLIGENCE

Enhancing the Accessibility of Machine Learning-Enabled Experiments — Integrating AI, Automation, and Workflow for Intelligent Research Pipelines

Sponsored by: ACerS Basic Science Division

Program Organizers: Yongtao Liu, Oak Ridge National Laboratory; Arpan Biswas, University of Tennessee

Monday PM | September 29, 2025
D180 | Convention Center

Session Chairs: Yongtao Liu, Oak Ridge National Laboratory; Arpan Biswas, University of Tennessee Oak Ridge Innovation Institute

2:00 PM Invited

Adaptive Workflows for Lab of the Future: *Olga Ovchinnikova*¹; ¹Thermo Fisher Scientific

2:30 PM Invited

High-Throughput, Ultra-Fast Laser Sintering of Ceramics and Machine-Learning Based Prediction on Processing-Microstructure-Property Relationships: Ningxuan Wen¹; Jianhua Tong¹; Rajendra Bordia¹; Dongsheng Li²; Hai Xiao¹; *Fei Peng*¹; ¹Clemson University; ²Advanced Manufacturing LLC

3:00 PM Invited

Pycroscopy, AECroscopy, and Data Workflows: Integrating Customized Control, Data Analysis and Workflows in an Autonomous Microscopy Facility: *Rama Vasudevan*¹; Jawad Chowdhury¹; Narasimha Ganesh¹; Zijie Wu¹; Stephen Jesse¹; Gerd Duscher²; Yongtao Liu¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

3:30 PM Break

3:50 PM Invited

From Automated to Autonomous – Creating a General Active Learning Service for Self-Driving Laboratories: *Stephen DeWitt*¹; Ankit Shrivastava¹; Marshall McDonnell¹; Singanallur Venkatakrishnan¹; Chris Fancher¹; Jorge Ramirez Osorio¹; Paul Laiu¹; Lance Drane¹; Ayana Ghosh¹; David Joy²; ¹Oak Ridge National Laboratory; ²University of Auburn

4:20 PM Invited

Accelerating Scientific Discovery with Machine Learning: Data Analysis for Computational Beamlines: *Tanny Chavez*¹; Xiaoya Chong¹; Bowen Zheng¹; Anas Nassar¹; Monika Choudhary¹; Wiebke Koepf¹; Dylan McReynolds¹; Slavomir Nemsak¹; Alexander Hexemer¹; ¹Lawrence Berkeley National Laboratory

4:50 PM Invited

Ptychography Data Pipelines at the Advanced Photon Source: *Steven Henke*¹; Hannah Parraga¹; Albert Vong¹; Oliver Hoidn²; Nicholas Schwarz²; ¹Argonne National Laboratory; ²SLAC National Accelerator Laboratory

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Challenges, Advances, and Applications — Non-Oxide Glasses, Optics, and Glassy Electrolytes

Sponsored by: ACerS Glass and Optical Materials Division

Program Organizers: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Monday PM | September 29, 2025
B132 | Convention Center

Session Chairs: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, IIT Delhi

2:00 PM Invited

Challenges in Engineering Non-Oxide Optical Nanocomposites: Hitting Performance Metrics: *Kathleen Richardson*¹; Rashi Sharma¹; Myungkoo Kang²; ¹University of Central Florida; ²NYSCC at Alfred University

2:30 PM

Multi-Faceted Quantitative Cross-Correlating Characterization and Phase Mapping of Gradient Refractive Index Chalcogenide Glass-Ceramic Bulk Nanocomposites: *Zephyr Ramsey*¹; Gil Blas Sop Tagne¹; Lam Tran¹; Patrick Lynch¹; Jessica Lyza¹; Christian Cano²; Phillip Marrero²; Roberto Alvarez³; Daniel Wiedeman³; Rashi Sharma³; Nicholas Kochan⁴; Kathleen Richardson³; Steven Feller²; Darren Stohr¹; Collin Wilkinson¹; Rebecca Welch¹; S.K. Sundaram¹; Scott Mixture¹; Kun Wang¹; Myungkoo Kang¹; ¹New York State College of Ceramics, Alfred University; ²Coe College; ³CREOL, College of Optics and Photonics, University of Central Florida; ⁴Physical Sciences Inc.

2:50 PM

Accelerated Low-Temperature Stabilization of Glasses via Thermo-Ultrasonication: *Lam Tran*¹; Patrick Lynch¹; Ecem Yamac¹; Gil Sop Tagne¹; Rebecca Welch¹; William LaCourse¹; Collin Wilkinson¹; Myungkoo Kang¹; Stuart Yaniger¹; Cristian Cano²; Philip Marrero²; Aaron Phillips²; Steven Feller²; Daniel Wiedeman³; Rashi Sharma³; Kathleen Richardson³; ¹Alfred University; ²Coe College; ³College of Optics and Photonics University of Central Florida

3:10 PM Invited

Thin-Film Glassy Solid Electrolytes as a New Functionality for Glass Enabling High Energy Density Li and Na All Solid State Batteries: *Steve Martin*¹; ¹Iowa State University

3:40 PM Break

4:00 PM

Correlating Structure With Ion Dynamics in Disordered Solid-State Electrolytes: *Morten Smedskjaer*¹; Zhimin Chen¹; Tao Du¹; ¹Aalborg University

4:20 PM

Nanoparticle Morphology Dependent Nonlinear Optical Behaviour in Bismuth Borate Glasses: *Shivani Singla*¹; Venu Achanta²; Gopi Sharma³; ¹Chandigarh University; ²NPL, Delhi; ³Kanya Maha Vidyalaya

4:40 PM

Interfacial Mechanisms for Enhanced Photoluminescence in AgI-Doped CsPbBr₃ Perovskite Quantum Dot Glass: *Yongmin Duan¹; Xingzhen Huang¹; Shugang Li¹; Wenyan Zheng¹; Junjie Zhang¹; ¹China Jiliang University*

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; Klaus van Benthem, The University of Alabama; Wayne Kaplan, Technion - Israel Institute of Technology

Monday PM | September 29, 2025
C161A | Convention Center

Session Chairs: Melissa Santala, Oregon State University; Ivar Reimanis, Colorado School of Mines

2:00 PM Invited

Clay-Based Ceramics: A Material Full of Interfaces and Surfaces: *Ivar Reimanis¹; Ryan McGinnis¹; Sandrine Ricote¹; Grover Coors²; Rachel Marder³; Wayne Kaplan³; ¹Colorado School of Mines; ²Hydrogen Helix, LLC; ³Technion*

2:30 PM

Quantifying Surface and Grain-Boundary Energies in Yttria-Stabilized Zirconia: Influence of Grain Size and Sintering Conditions: *Mst Sharmin Mostari¹; Ricardo Castro¹; ¹Lehigh University*

2:50 PM Invited

On the Soda-Lime Glass Surface and Its Interactions With Water: *Mattia Biesuz¹; ¹University of Trento*

3:20 PM Break

3:40 PM Invited

Evolution of Metal Nanoparticles at Solid-Gas and Solid-Solid Interfaces: Segregation Reactions in Ceramic Matrices: *Simone Mascotto¹; Benjamin Rudolph²; ¹University of Koblenz; ²University of Hamburg*

4:10 PM

Preliminary Investigation of Metal-SiC Interface Behavior via Deposition of Mo and W for High-Temperature Applications: *Stan Watson Teagho Voufo¹; David Field¹; ¹Washington State University*

4:30 PM

Developments in XPS Surface Analysis: Femtosecond Laser Ablation Depth Profiling: *James Lallo¹; Tim Nunney¹; Richard White¹; Mark Baker²; ¹Thermo Fisher Scientific; ²University of Surrey*

FUNDAMENTALS AND CHARACTERIZATION

High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI — Experiments: Non-Alloys

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

Program Organizers: Shuozhi Xu, University of Oklahoma; 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

Monday PM | September 29, 2025
C170 | Convention Center

Session Chairs: Rubayet Tanveer, University of Tennessee-Knoxville; Antonio Fuentes, Cinvestav del IPN

3:00 PM Invited

Local Disorder Effects on Structure-Property Correlations in Configurationally Enriched Yttrium Iron Garnets: *Rubayet Tanveer¹; Dylan Windsor¹; Cale Overstreet¹; Tatenda Kanyowa¹; Bin Hu¹; Maik Lang¹; Haixuan Xu¹; Veerle Keppens¹; William Weber¹; ¹University of Tennessee-Knoxville*

3:30 PM Break

3:50 PM Invited

Mn and Fe in Rock Salt Oxides: Thermodynamics-Inspired High-Entropy Oxide Synthesis: *Matthew Furst¹; Joseph Petruska¹; Dhiya Srikanth¹; Yueze Tan¹; Jacob Sivak¹; Gerald Bejger²; Christina Rost²; Susan Sinnott¹; Long-Qing Chen¹; Saeed Almishal¹; Jon-Paul Maria¹; ¹The Pennsylvania State University; ²Virginia Polytechnic Institute and State University*

4:20 PM

Structural Evolution of Compositionally Complex Pyrochlore Oxides Under Swift Heavy Ion Irradiation: *Kenneth Sanders¹; George Adamson¹; Cale Overstreet¹; Eric O'Quinn¹; Tao Liang¹; Haixuan Xu¹; Pascal Simon²; Jesse Smith³; Joerg Neuefeind⁴; Joshua Safin¹; Katharine Page¹; David Sprouster⁵; Maik Lang¹; ¹University of Tennessee, Knoxville; ²GSI Helmholtzzentrum für Schwerionenforschung; ³Argonne National Laboratory; ⁴Oak Ridge National Laboratory; ⁵Stony Brook University*

4:40 PM Invited

Tuning the Structural and Electronic Properties of High Entropy Oxide Thin Films for Water Oxidation: *Le Wang¹; Minju Choi¹; Krishna Prasad Koirala¹; Mark Bowden¹; Hsin-Mei Kao¹; Dongchen Qi¹; Anton Tadich¹; Zihua Zhu¹; Yingge Du¹; ¹Pacific Northwest National Laboratory*

5:10 PM Invited

Advanced Synthesis of Compositionally Complex Carbides Using Polymer-Derived Ceramics for Extreme Environmental Applications: *Dustin Gilmer¹; Erik Akbar¹; Jacob Fischer¹; Roo Walker¹; ¹University of Tennessee*



5:40 PM Invited

Structural Systematics of a Fluorite-Type Solid Solution in Compositionally Complex Oxides: Goretti Fraustro-Castañeda¹; Sagrario Montemayor²; William Reed³; Eric O'Quinn³; Maik Lang³; Antonio Fuentes¹; ¹Investav del IPN; ²Centro de Investigación en Química Aplicada; ³University of Tennessee

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

Monday PM | September 29, 2025
B240/241 | Convention Center

Session Chairs: Gregory Thompson, University of Alabama; Manoj Mahapatra, University of Alabama at Birmingham; Alexander Dupuy, University of Connecticut

2:00 PM Invited

Processing Diagrams for Phase and Microstructural Formations in Manufacturing Laser Chemical Vapor Deposited TiC Fibers: Kendall Mitchell¹; Michael Pavel¹; Gregory Thompson¹; ¹University of Alabama

2:30 PM Invited

Superplastic Deformation in High Entropy Oxides: Alexander Dupuy¹; Julie Schoenung²; ¹University of Connecticut; ²Texas A&M University

3:00 PM

The Joining and Fabrication of Ceramic Matrix Composites With Embedded Wire Chemical Vapor Deposition (EW-CVD): Seth Shuster¹; Joseph Pegna¹; Shay Harrison¹; Kirk Williams¹; Jeff Vervlied¹; ¹Free Form Fibers

3:20 PM Break

3:40 PM

Towards Complex Shaping of UHTCs: From Particle Packing to Mechanical Behavior: Hui-Chun Yu¹; Carolina Tallon¹; ¹Virginia Tech

4:00 PM Invited

Gahnite (ZnAl₂O₄) as an Alternative for Chrome-Free Spinel (MgAl₂O₄) Refractories: Manoj Mahapatra¹; Rajat Ramteke¹; James Hemrick²; ¹University of Alabama at Birmingham; ²Oak Ridge National Laboratory

4:30 PM

Microstructural Analysis of SiC/SiC Ceramic Composite Tubes Produced via Filament Winding, Vacuum Infusion, Pyrolysis and CVI Densification: Nadim Hmeidan¹; Corson Cramer¹; Julio Ortega¹; Brittany Rodriguez²; Ahmed Hassen¹; Takaaki Koyanagi¹; ¹Oak Ridge National Laboratory

4:50 PM

Evaluating and Predicting Color Mixing of High-Temperature Ceramic Stains: Grace Dunham¹; Ally Bruno¹; William Carty¹; ¹Alfred University

5:10 PM

Innovative Electrostatic Painting of 3Y-TZP With Epoxy Powder for Enhanced Bond Shear Strength of Dental Prostheses to Dentin: Carlos Elias¹; Alessandro Thomaz¹; Heraldo Salomão¹; Celso Resende²; Claudinei dos Santos³; ¹Military Institute of Engineering; ²ProtMat Materialis Avançados; ³Universidade do Estado do Rio de Janeiro

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials II

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

Monday PM | September 29, 2025
C171 | Convention Center

Session Chairs: Kate Fox, RMIT University; Tanveer Tabish, University of Oxford

3:00 PM

Battery-Operated Pressure Spinning of Biomaterials: Mehmet Onur Aydogdu¹; Mohan Edirisinghe¹; ¹University College London

3:20 PM Break

3:40 PM Invited

Development of New Diamond Biomaterials: Kate Fox¹; ¹RMIT University

4:00 PM

Bone Stress and Primary Stability of a Dental Implant Using Strain and Torque Measurements: Carlos Elias¹; Larissa Ramos Nascimento¹; Guilherme Torelly¹; ¹Military Institute of Engineering

4:20 PM Invited

Silicone-Based Emulsions for High Precision Manufacturing of Highly Porous Bioceramic Scaffolds: Hamada Elsayed¹; Barbora Nikendey Holubová²; Enrico Bernardo¹; ¹University of Padova; ²Technical University of Liberec

4:40 PM Invited

Next-Generation of Soft Bioelectronic Devices From Nature-Inspired Materials via Pressurized Spinning: Seda Gungordu Er¹; Mohan Edirisinghe¹; ¹University College London

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Phasing Out Carbon: Phase Transformation Challenges in Decarbonization Technologies — Phasing Out Carbon: Phase Transformation Challenges in Decarbonization Technologies

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Matthew Steiner, University of Cincinnati; Eric Payton, University of Cincinnati; James Zuback, National Institute of Standards and Technology; Alec Saville, Elementum 3D; Bryan Lim, Oak Ridge National Laboratory; Ian Zuazo, ArcelorMittal Global R&D - Industeel

Monday PM | September 29, 2025
B244/245 | Convention Center

Session Chairs: Matthew Steiner, University of Cincinnati; Eric Payton, University of Cincinnati

3:00 PM Invited

Transition From Natural Gas Combustion to Hydrogen Combustion: Impact on Steel Quality during Reheating of Carbon Steels: *Amaia Iza-Mendia*¹; Yaiza Montaña¹; Xabier Zapiain¹; ¹Ceit-Basque Research & Technology Alliance (BRTA) and Universidad de Navarra, Tecnun

3:30 PM Break

3:50 PM Invited

Enabling Ore-to-Part Manufacturing of Sustainable Iron: Coupling Hydrogen Plasma Reduction With Industrial Waste Red Mud as Flux: *Rangasayee Kannan*¹; Adam Stevens¹; Vanshika Singh¹; Brian Hicks¹; Sudarsanam Babu²; Peeyush Nandwana¹; ¹Oak Ridge National Laboratory; ²University of Maryland

4:20 PM

Anomalous Behavior of Dilute Phosphorus Alloying on Phase Transformations in the Fe-Ni System: *Ugochukwu Ochieze*¹; Matthew Steiner¹; ¹University of Cincinnati

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division

Program Organizers: Morsi Mahmoud, Abdullah Al Salem University (AASU); Rishi Raj, University of Colorado; Motoyasu Sato, Chubu University; Dinesh Agrawal, Pennsylvania State University; Christina Wildfire, National Energy Technology Laboratory; Guido Link, Karlsruhe Institute of Technology; Daudi Waryoba, Pennsylvania State University

Monday PM | September 29, 2025
B233 | Convention Center

Session Chairs: Daudi Waryoba, Penn State DuBois; Hideyuki Kanematsu, National Institute of Technology (NIT), Suzuka College

2:00 PM Keynote

A New State of Matter Induced by the Flash Process: *Rishi Raj*¹; Devinder Yadav¹; ¹University of Colorado

2:30 PM

Electrophoretic Alignment of Boron-Nitride Nanotubes Within Silicone Polymers: E-field Control of Anisotropic Thermal Conductivity: *Christopher Kovacs*¹; ¹Scintillating Solutions LLC

2:50 PM Invited

Hybrid Microwave Processing, Characterization, and Hot Corrosion of Yttria Stabilized Zirconia: *Morsi Mahmoud*¹; Mohammed Arif²; Nestor Anka²; Zuhair Gasem²; ¹Abdullah Al Salem University (AASU); ²King Fahd University of Petroleum and Minerals

3:20 PM Break

3:40 PM

Finite Element Modeling of Temperature-Dependent Microwave Dielectric Properties in Engineered Particulate Composites: *Ansan Pokharel*¹; Divakar Aireddy²; Pranjali Muley²; Christina Wildfire²; Terence Musho¹; ¹West Virginia University; ²National Energy Technology Laboratory

4:00 PM

Ultra-Fast Sintering of SOECs Electrodes Ceramics: Microstructure Optimization in Seconds via Joule-Driven Heating: *Javier Mena*¹; Edward Sabolsky¹; Katarzyna Sabolsky¹; Tugrul Yumak¹; Mason Cavalier¹; Davis Warmuth¹; Emrah Demirkal¹; ¹West Virginia University

4:20 PM

Enhancing Radiation Resilience of Wide-Bandgap Semiconductors and Alloys via Electron Wind Force Annealing: *Md Hafijur Rahman*¹; Aman Haque¹; ¹Pennsylvania State University

4:40 PM

Optimizing Ultrafast Laser Bessel Beam Glass Cutting via Machine Learning: *Conrad Kuz*¹; Andy Lee¹; Justin Twardowski¹; Mohamed Yaseen Noor¹; Enam Chowdhury¹; ¹The Ohio State University

5:00 PM

Wide Two-Transition Magnetocaloric Effect in Ho_{1-x}Ce_xNi (x = 0-0.1) From 4-35 K: *Casen Legreid*¹; Ben Hilliard²; ¹Iowa State University; ²Ames National Laboratory

SPECIAL TOPICS

Plenary Sessions — ACerS Plenary Session

Tuesday AM | September 30, 2025
Short North Ballroom B | Convention Center

8:00 AM Introductory Comments

8:05 AM Plenary

ACerS Edward Orton Jr. Memorial Lecture: Ceramics for Structural Applications – Overcoming the Challenges of This Formidable Material: *Tatsuki Ohji*¹; ¹Yokohama National University; Nagoya Institute of Technology; National Institute of Advanced Industrial Science and Technology

8:45 AM Award Presentation

8:50 AM Concluding Comments

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Mechanical Properties

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

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

Tuesday AM | September 30, 2025
C150 | Convention Center

Session Chairs: Jing Zhang, Purdue University; Li Ma, Johns Hopkins University Applied Physics Laboratory; Charles Fisher, NSWC Carderock Division, Naval Surface Warfare Center; Brandon McWilliams, CCDC Army Research Laboratory; Yeon-Gil Jung, Changwon National University

8:00 AM

3D Surrogate Modeling of Elasto-Viscoplastic FFT Simulations for Porosity-Driven Fatigue Prediction in Additive Manufacturing: *Daniel Diaz*²; Justin Miner¹; Sneha Narra¹; Anthony Rollett¹; ¹Carnegie Mellon University

8:20 AM

Modelling the Effects of Composition Variation and Heat Treatment on Microstructure of TiAl6V4 Produced Via Laser Powder Bed Fusion: *Sierra Green*¹; Hasan Jame¹; S. Mohadeseh Taheri-Mousavi¹; Anthony Rollett¹; Bryan Webler¹; ¹Carnegie Mellon University

8:40 AM

Investigating Mechanical Anisotropy in Additively Manufactured 316L Stainless Steel: Som Dixit¹; Pauline Smith²; *Shunyu Liu*¹; ¹Clemson University; ²DEVCOM Army Research Laboratory

9:00 AM

Robust Additive Manufacturable Ni Superalloys Designed by the Integrated Optimization of Local Elemental Segregation and Cracking Susceptibility Criteria: *Hao Yu*¹; ¹Northeastern University

9:20 AM

A Micromechanical Comparison of Wrought and Additively Manufactured Inconel 718 Subject to High Strain Rates: *Katie Bruggeman*¹; Anthony Palazotto¹; Dan Young¹; ¹Wright State University

9:40 AM

A Crystal Plasticity Finite Element Approach to Understand Effect of Acoustoplasticity on FCC and BCC Structures: *Upama Biswas Tonny*¹; Chang Yang²; Liming Xiong²; Sunil Chakrapani¹; ¹Michigan State University; ²North Carolina State University

10:00 AM Break

10:20 AM

Application of Ductile Fracture Modeling to Complex, Additively Manufactured SS316L Structure: *Erik Furton*¹; Allison Beese¹; ¹Pennsylvania State University

10:40 AM

Computational Modeling for Accurate Prediction of Powder Densification and Shape Distortion in Large-Scale Components Using Powder Metallurgy Hot Isostatic Pressing (PM-HIP): *Subrato Sarkar*¹; Jason Mayeur¹; KPK Ajjarapu¹; Fred List¹; Soumya Nag¹; Ryan Dehoff¹; ¹Oak Ridge National Laboratory

ADDITIVE MANUFACTURING

Additive Manufacturing, Directed Energy Deposition of Metals: Processing – Microstructure – Mechanical Property Relationships — Monitoring, Modeling, and Functionally Grading / Arc Based DED and Copper Alloys

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Joy Gockel, Colorado School of Mines

Tuesday AM | September 30, 2025
C160B | Convention Center

Session Chairs: Samantha Webster, Colorado School of Mines; Bradley Jared, University of Tennessee, Knoxville

8:00 AM Invited

High-Speed Schlieren Imaging of Laser Powder Blown Directed Energy Deposition: *Samantha Webster*¹; Steven Mates²; Carelyn Campbell²; ¹Colorado School of Mines; ²National Institute of Standards and Technology

8:40 AM

Towards Statistical Microstructure Quantification to Guide the Directed Energy Deposition Process: *Bhagyashree Prabhune*¹; Patxi Fernandez-Zelaia¹; Gyan Shankar¹; Brian Jordan¹; Michael Kirka¹; Yousub Lee¹; ¹Oak Ridge National Laboratory

9:00 AM

Inhomogeneities in Directed Energy Deposition of Refractory Metals with Different Melting Temperatures and Mass Densities: *Anthony Stair¹; Bryan Webber¹; Jack Beuth¹; Maarten de Boer¹; ¹Carnegie Mellon University*

9:20 AM

Thermal and Microstructural Analysis of Inconel-GRCo Dissimilar Joint Fabricated by Powder-Based Laser Directed Energy Deposition: *Nahal Ghanadi¹; Somayeh Pasebani¹; ¹Oregon State University*

9:40 AM

Additive Manufacturing of Functionally Graded Materials: *Abdul Khan¹; Brian Jordan¹; Yousub Lee¹; James Haley¹; Soumya Nag¹; ¹Oak Ridge National Laboratory*

10:00 AM Break

10:20 AM

Effect of Precipitation on Fatigue Crack Growth and Cyclic Deformation in Additively Manufactured Nickel Aluminum-Bronze: *Nathan Heniken¹; Jiashi Miao¹; Veronika Mazanova²; Aerial Murphy-Leonard¹; ¹Ohio State University; ²Institute of Physics of Materials, Czech Academy of Sciences*

10:40 AM

Influence of Part Orientation on Microstructure and Mechanical Properties of Wire-Arc Additively Manufactured Cu-30Ni Alloy: *Oluwatumininu Adeeko¹; John Lewandowski¹; ¹Case Western Reserve University*

11:00 AM Invited

Multi-Mode Defect Monitoring for Wire-Arc Additive Manufacturing: *Bradley Jared¹; ¹University of Tennessee, Knoxville*

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session II

Sponsored by: ACerS Other

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

Tuesday AM | September 30, 2025
C151 | Convention Center

Session Chairs: Sandra Devincent Wolf, Carnegie Mellon University; Clinique L. Brundidge, Naval Nuclear Laboratory

8:00 AM Invited

Overcoming Design, Materials and Processing Challenges in Additive Manufacturing: *Sandra Devincent Wolf¹; ¹Carnegie Mellon University*

8:30 AM

Additive Manufacturing of Multifunctional Fe–Cr–Al-Base Alloys via Laser Powder Bed Fusion: *Sydney Lynch¹; Thinh Huynh¹; Kevin Graydon¹; Brendan Ensor²; Paul Day²; Kiran Nimishakavi²; Yongho Sohn¹; ¹University of Central Florida; ²Naval Nuclear Laboratory*

8:50 AM

Advancing Automotive Lightweighting: Heat-Treatment Optimization and rapid Additive Manufacturing of AlSi10Mg Alloy for Body and Chassis Systems: *Hyomoon Joo¹; ¹Hyundai Motor Group*

9:10 AM

Breaking the Myth of Spherical Powders: Pure Tungsten Manufactured by Electron Beam Powder Bed Fusion (PBF-EB) Using Cost-Effective Powder of Irregular Shape: *Ian Crawford¹; William Sjoström²; Stefan Roos²; Carlos Botero²; Lidija Stjepanic Peric³; Ulf Ackelid³; Arun Balachandramurthi³; ¹Freemelt Americas Inc.; ²Mid-Sweden University; ³Freemelt AB*

9:30 AM

Design of New NiCoCr Alloys for Additive Manufacturing through High-Throughput Experiments: *Ajay Talbot¹; Yu Zou¹; ¹University of Toronto*

9:50 AM

Comparative Study on Irradiation Resistance of Additively Manufactured 316L Stainless Steel and CoCrFeNi High-Entropy Alloys: *Som Dixit¹; Yongqiang Wang²; Shunyu Liu¹; ¹Clemson University; ²Los Alamos National Laboratory*

10:10 AM Break

10:30 AM

Enhance Electrical Conductivity and Mechanical Properties of Cu-Cr Alloys Through Rapid Directional Solidification During Laser Powder Bed Fusion: *Runzhi Zhang¹; Tao Sun²; Ji Ma¹; ¹University of Virginia; ²Northwestern University*

10:50 AM

Hybrid Multi-Axis Additive and Subtractive Manufacturing: Toolpath Design and Simulation for Thermal and Geometric Control: *Yousub Lee¹; Miguel Hoffmann Rodriguez¹; Xinyi Xiao²; Thomas Feldhausen¹; ¹Oak Ridge National Laboratory; ²University of North Texas*

11:10 AM

Additive Manufacturing in Austere Environments: *Clinique Brundidge¹; ¹Naval Surface Warfare Center*

ADDITIVE MANUFACTURING

Additive Manufacturing: Development of Powders — Foundations and Advances in Atomization Refractory Powder Production

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Tim Horn, North Carolina State University; Ian McCue, Northwestern University; Gianna Valentino, University of Maryland; Iver Anderson, Iowa State University Ames Laboratory; Michael Kirka, Oak Ridge National Laboratory

Tuesday AM | September 30, 2025
C160A | Convention Center

Session Chairs: Tim Horn, North Carolina State University; Chris Rock, North Carolina State University

8:00 AM Invited

Industrialization Needs for New Powder Alloys: *John Foltz¹; ¹ATI Specialty Materials*

8:40 AM

Gas Atomization and Additive Manufacturing of Nb-W-Zr Alloy: *John Reidy*¹; Gianna Valentino²; Ian McCue¹; ¹Northwestern University; ²University of Maryland

9:00 AM

Gas Atomization and Powder Characterization of Legacy Niobium Alloys for High-Temperature Applications: *Emre Tekoglu*¹; Benjamin Labiner¹; Jenny Forrester¹; Christopher Rock¹; Tim Horn¹; ¹North Carolina State University

9:20 AM

Production of Additive Manufacturing Compatible Powders of Multi-Principal Element Alloys Via Ultrasonic Atomization: *Brendon Dodge*¹; Suyash Niraula¹; Thomas Berfeld¹; Justin Gillham¹; Rosa Shokri¹; ¹University of Louisville

9:40 AM

Ultrasonic Atomization of Refractory Medium Entropy Alloys Powders: *Tomasz Choma*¹; Bartosz Kalicki¹; Jakub Ciftci¹; Lukasz Zrodowski¹; Bartosz Moronczyk¹; ¹Amazemet Sp. Z O. O.

10:00 AM Break

10:20 AM

Development of Refractory Spherical Powders by Plasma Technique: Leo V. M. Antony¹; *Dustin Reitmeyer*¹; Leo Baird¹; David Rigg¹; Damon Fields¹; ¹SCM Metal Products

10:40 AM

Microstructure Evolution, Mechanical Behavior, and Additive Manufacturing Processability of Novel Mo-Si-B Alloys: *Haozhi Zhang*¹; Victoria Himelstein¹; Jenny Forrester¹; Sourabh Saptarshi¹; Saket Thapliyal²; Patxi Fernandez-Zelaia²; Christopher Ledford²; Michael Kirka²; Tim Horn¹; ¹North Carolina State University; ²Oak Ridge National Laboratory

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advancements in Molten Salt/Metal Technology in Energy Applications: From Atoms to Plants — Molten Salt Fundamentals, Properties, and Simulation

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Tae-sic Yoo, Idaho National Laboratory; Ruchi Gakhar, Idaho National Laboratory; Rocio Rodriguez Laguna, Idaho National Laboratory; Michael Simpson, University of Utah; Hojong Kim, Pennsylvania State University

Tuesday AM | September 30, 2025
B242/243 | Convention Center

Session Chairs: Rocio Rodriguez Laguna, Idaho National Laboratory; Ruchi Gakhar, Idaho National Laboratory

8:00 AM

Accurate Free Energy Simulations in Molten Salts with Machine Learning Potentials and High-Level Quantum Chemical Methods: *Vyacheslav Bryantsev*¹; Luke Gibson¹; Rajni Chahal¹; ¹Oak Ridge National Laboratory

8:30 AM

Development of a Thermal Conductivity Model for Molten Salts Based on the Pair Distribution Function: Jacob Numbers¹; Troy Munro¹; Tony Birri²; Nick Termini²; *Isaac Walker*¹; Tyler Hamm¹; ¹Brigham Young University; ²Oak Ridge National Laboratory

8:50 AM

Experimental Calorimetry of Heat Capacity and Mixing Enthalpy of Molten Chloride Salts: *Xiaofeng Guo*¹; Hongwu Xu²; Zi-Kui Liu³; Vyacheslav Bryantsev⁴; Aurora Clark⁵; Dev Chatterjee⁶; ¹Washington State University; ²Arizona State University; ³Pennsylvania State University; ⁴Oak Ridge National Laboratory; ⁵University of Utah; ⁶TerraPower

9:20 AM

Molten Salt Properties Capabilities at ORNL: *Ryan Chesser*¹; Nicholas Termini¹; Anthony Birri¹; ¹Oak Ridge National Laboratory

9:50 AM Break

10:05 AM

The Effect of Irradiation on the Densities of Chloride-Bearing Molten Salts: *Joanna McFarlane*¹; Molly Ross¹; Daniel Orea¹; Yuxuan Zhang¹; Kevin Robb¹; Jisue Braatz¹; Sean Fayfar²; Boris Khaykovich²; Thomas Bork²; ¹Oak Ridge National Laboratory; ²Massachusetts Institute of Technology

10:35 AM

Radiation-Induced Iodine Chemistry in High-Temperature Molten Salts: *Gregory Holmbeck*¹; Jacy Conrad¹; Alejandro Ramos Ballesteros¹; Stephanie Castro Baldivieso¹; Andrew Cook²; Ruchi Gakhar¹; ¹Idaho National Laboratory; ²Brookhaven National Laboratory

11:05 AM

Synchrotron-Based X-Ray Spectroscopy of Molten Salts: *Wilson Chiu*¹; ¹University of Connecticut

11:35 AM

Laser-Spectroscopy Testbed for Impurity Monitoring in High-Temperature Reactors: *Adam Burak*¹; Leandro Frigerio²; Joseph Brown¹; Teddy Kent³; Joe Craparo⁴; Igor Jovanovic²; Robert De Saro⁴; Milos Burger²; ¹University of Michigan; ²University of Michigan; Gérard Mourou Center for Ultrafast Optical Science; ³Argonne National Laboratory; ⁴Energy Research Company

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Dielectrics for Catalysis, Energy Harvesting, and Other Applications

Sponsored by: ACerS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Ubig, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

Tuesday AM | September 30, 2025
B142/143 | Convention Center

Session Chairs: Tanmoy Maiti, IIT Kanpur; Jani Peräntie, University of Oulu

9:00 AM Invited

Study of In Situ Doping of Diamond with Nitrogen and Silicon for Quantum Applications: Lakshmi Ramasubramanian¹; Raj Singh¹; ¹Oklahoma State University

9:20 AM

Atomistic Understanding of Reversible Electronic Transitions in Complex Oxides for Neuromorphic Computing: Badri Narayanan¹; ¹University of Louisville

9:40 AM

Performance of Praseodymium Copper Titanate (PCTO) Perovskites Processed in Flux for the Dielectric Energy Storage Ceramic: Hanna Teye¹; Laxmi Hatte¹; Ching H. Su¹; Narasimha Prasad¹; Bradley Arnold¹; Fow-Sen Choa¹; Brian Cullum¹; Sundaram Singh¹; Kamdeo Mandal¹; Narsingh Singh¹; ¹University of Maryland Baltimore County

10:00 AM Break

10:20 AM

Inductance of Stranded Metal Wires Stemming from Contacts Among the Strands: Deborah Chung¹; Sruthi Krishnaswamy Narayanan¹; ¹University at Buffalo, The State University of New York

10:40 AM

Synthesis, Characterization and Dielectric Property Measurements of Complex Perovskite Oxides: Anup Kumar¹; Tarun Veeramarchani²; N. Singh²; Kamdeo Mandal¹; ¹Indian Institute of Technology (Banaras Hindu University) Varanasi; ²University of Maryland and Baltimore County

11:00 AM

Harnessing and Quantifying A-Site Vacancies for Transparent Conductive Behavior in Correlated Perovskites: Dhiya Srikanth¹; Joseph Petruska¹; Matthew Furst¹; Jon-Paul Maria¹; Saeed Almishal¹; ¹Pennsylvania State University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advances in Materials and Systems for a Hydrogen Economy — Hydrogen Fuel for Industrial Decarbonization and Advances in Energy Technologies - Material Issues

Sponsored by: ACerS Manufacturing Division, ACerS Refractory Ceramics Division

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory; Jorgen Rufner, Idaho National Laboratory

Tuesday AM | September 30, 2025
B246 | Convention Center

Session Chairs: Tanumoy Banerjee, Lawrence Berkeley National Laboratory; ShinYoung Kang, Lawrence Livermore National Laboratory; Julian Long, FAMU-FSU College of Engineering- Florida State University; Jorgen Rufner, Idaho National Laboratory

9:00 AM Invited

Role of Hydrogen in Iron and Steel Production: Hanna Breunig¹; Tanumoy Banerjee¹; ¹LBNL

9:30 AM

Initiatives in Steel Products to Achieve Carbon-Neutrality: Kaori Kawano¹; ¹Nippon Steel Corporation

10:00 AM Break

10:20 AM

Evaluating Hydrogen Embrittlement Resistance in Line Pipe Steels Using Double Cantilever Beam Test: Amrita Bag¹; Syed Alam¹; Shaojie Chen¹; David Sponseller²; Muhammad Rashid¹; Muhammad Arafin³; ¹Interpro Pipe & Steel Inc.; ²Omni Metals Laboratory Inc.; ³Orion Steel

10:40 AM

Degradation of Stoichiometric and Non-Stoichiometric Mullites in Dry (Ar - 10% H₂) and Humid Hydrogen (Ar - 10% H₂-3% H₂O) Environment: Manoj Mahapatra¹; Rajat Ramteke¹; James Hemrick²; ¹University of Alabama at Birmingham; ²Oak Ridge National Laboratory

11:00 AM Invited

Data-Enabled and Materials Computations for Designing Materials for a Hydrogen Economy: Ganesh Balasubramanian¹; Tanumoy Banerjee²; ¹University of New Haven; ²LBNL

PROCESSING AND MANUFACTURING

Advances in Refractory High Entropy Alloys and Ceramics — Structures and Mechanical Properties

Sponsored by: TMS: Refractory Metals & Materials Committee, ACerS Basic Science Division

Program Organizers: Mingwei Zhang, University of California, Davis; Arezoo Zare, Washington State University; John Perepezko, University of Wisconsin-Madison; Bai Cui, University of Nebraska Lincoln

Tuesday AM | September 30, 2025
B232 | Convention Center

Session Chairs: Mingwei Zhang, University of California, Davis; Arezoo Zare, Washington State University

8:00 AM Invited

The Power and Beauty of Cantor's First Experiment – A 20 Year Retrospective: *Daniel Miracle*¹; ¹Air Force Research Laboratory

8:30 AM Invited

Refractory High Entropy Alloys in Extreme Environments: *Sergey Tsurkan*¹; Daniel Velazquez¹; ¹Avalanche Energy Designs

9:00 AM Invited

On the Strength and Ductility of Refractory High Entropy Alloys: *Mingwei Zhang*¹; Jacob Pustelnik¹; Tamanna Zakia¹; Ayeman Nahin¹; Michael Lau¹; ¹University of California, Davis

9:30 AM Invited

Mechanisms of Spall Failure in Niobium Subjected to High-Throughput Laser-Driven Micro-Flyer Impact: *Nicolo Della Ventura*¹; *Arezoo Zare*²; Jacob Diamond³; Todd Hufnagel³; K.T. Ramesh³; Daniel Gianola¹; ¹University of California, Santa Barbara; ²Washington State University; ³Johns Hopkins University

10:00 AM Break

10:20 AM Invited

Elastic and Plastic Behavior of Refractory Multi-Principal-Element Alloys: Rui Feng¹; George Kim²; Dunji Yu³; Yan Chen³; Yongjie Hu⁴; Wei Chen⁵; Ke An³; *Peter Liaw*⁶; ¹National Energy Technology Laboratory; ²Illinois Institute of Technology; ³Oak Ridge National Laboratory; ⁴Drexel University; ⁵University at Buffalo; ⁶University of Tennessee, Knoxville

10:50 AM Invited

Multi-Modal Characterization of the B2 Phase in the Ta-Re Binary System: *Bryan Crossman*¹; Junxin Wang¹; Loic Perrière²; Si Athena Chen³; Jean-Philippe Couzinié²; Maryam Ghazisaeidi¹; Michael Mills¹; ¹The Ohio State University; ²East Paris Institute of Chemistry and Materials (ICMPE); ³Oak Ridge National Laboratory

11:20 AM

Understanding Compositional and Structural Non-Uniformities in Refractory High Entropy Alloys: *Deepak Pillai*¹; Merbin John¹; Lin Li²; Feng Yan²; Liang Qi³; Yufeng Zheng¹; ¹University of North Texas; ²Arizona State University; ³University of Michigan

11:40 AM Invited

Multiphase Design Strategies in Nb-Ti Refractory Alloys with Interstitial Alloying: *Ravit Silverstein*¹; Nicolo Della Ventura²; Florent Mignerot²; Julia Purstl²; Tresa Pollock²; Daniel Gianola²; ¹University of Florida; ²University of California Santa Barbara

LIGHTWEIGHT ALLOYS

Advances in Titanium Technology — Characterization of Phase Transformation Pathways

Sponsored by: TMS: Titanium Committee

Program Organizers: G. Babu Viswanathan, Ohio State University; Michael Mills, Ohio State University; Sriram Vijayan, Michigan Technological University; Abhishek Sharma, Worcester Polytechnic Institute; Soumya Nag, Oak Ridge National Laboratory; Thomas Broderick, Federal Aviation Administration; Simon Ringer, University of Sydney; Vasisht Venkatesh, Howmet Aerospace; Paraic O'Kelly, Ohio State University

Tuesday AM | September 30, 2025
C172 | Convention Center

Session Chairs: Adam Pilchak, Pratt & Whitney; Yufeng Zheng, University of North Texas

8:00 AM Keynote

Exploiting Principles of Physical Metallurgy for the Optimization of Processing of Titanium Alloys for Structural Applications: Brian Welk¹; Gopal Viswanathan¹; Paraic O'Kelly¹; *Hamish Fraser*¹; ¹The Ohio State University

8:30 AM Invited

Grain Boundary Precipitation Pathways in the Metastable -Titanium Ti-5Al-5Mo-5V-3Cr: *Stoichko Antonov*¹; T.S. Prithiv²; Zachary Kloenne³; Saurabh Mohan Das²; Dian Li⁴; Yufeng Zheng⁴; Hamish Fraser³; Baptiste Gault²; ¹National Energy Technology Laboratory; ²Max Plank Institute for Sustainable Materials; ³The Ohio State University; ⁴University of North Texas

8:50 AM

Hydrogen Promoted Ti3Al Precipitation in Ti-6Al-4V: Velile Vilane¹; *Johan Westraadt*²; Robert Knutsen³; ¹Nelson Mandela University; ²The Ohio State University; ³University of Cape Town

9:10 AM

Microstructure and Residual Stress at Diffusion Bonded Interface Between Vanadium and Ti-6Al-4V: *Claire Adams*¹; Bernard Gaskey²; John Carpenter²; David Field¹; ¹Washington State University; ²Los Alamos National Laboratory

9:30 AM

On the Variant Selections in (α) Titanium Alloys by In-Situ High Temperature X-Ray Texture Measurement: *Shibayan Roy*¹; Saumya Gupta¹; Arjun Mahato¹; KV Mani Krishna¹; ¹Indian Institute of Technology Kharagpur

9:50 AM Invited

Advances in Thermochemical Surface Engineering and Heat Treatment of Titanium Alloys: *Thomas Christiansen*¹; ¹Worcester Polytechnic Institute

10:10 AM Break

10:30 AM Invited

Advancements in Titanium Microstructure Characterization: Integrating AI for Automated Complex Quantification: *John Sosa*¹; ¹MIPAR Software

10:50 AM Invited

Development and Characterization of Titanium Alloys for Powder Metallurgy: *Brian Welk*¹; Andrew Baker²; Nicole Hudak¹; Paraic O'Kelly¹; G. Babu Viswanathan¹; Hamish Fraser¹; ¹The Ohio State University; ²Boeing Company

ARTIFICIAL INTELLIGENCE

Autonomous Platforms for Designing and Understanding Materials — Autonomous Platforms for Designing and Understanding Materials

Sponsored by: TMS: Computational Materials Science and Engineering Committee

Program Organizers: Rama Vasudevan, Oak Ridge National Laboratory; Badri Narayanan, University of Louisville; Mathew Cherukara, Argonne National Laboratory; Emine Gulsoy, Northwestern University; Charudatta Phatak, Argonne National Laboratory

Tuesday AM | September 30, 2025
D282 | Convention Center

Session Chair: Badri Narayanan, University of Louisville

8:00 AM Invited

Self Driving Labs and Digital Twins: *James Warren*¹; ¹National Institute of Standards and Technology

8:20 AM Invited

Digital Laboratory with Modular Measurement System and Standardized Data Format: *Taro Hitosugi*¹; ¹The University of Tokyo

8:40 AM Invited

Operating Autonomous Laboratories with AI Agents: *Aikaterini Vriza*¹; Michael Prince¹; Henry Chan¹; Tao Zhou¹; Matthew Cherukara¹; ¹Argonne National Laboratory

9:00 AM Invited

From Deposition to Degradation of Thin Films and Devices Through Autonomous Experimentation: *Davi Febba*¹; Stephen Schaefer¹; Brooks Tellekamp¹; William Callahan¹; Andriy Zakutayev¹; ¹National Renewable Energy Laboratory

9:20 AM

Knowledge Graphs for Chemical Synthesis: Using Historical Data for Querying and Semantic Reasoning: *Quynh Tran*¹; Ethan Tobey¹; Holly Schreiber¹; Laura Bruckman¹; Roger French¹; ¹Case Western Reserve University

9:40 AM Invited

Materials Discovery Using Deep Microscopic Optics: Pronoy Das¹; Sathwik Bharadwaj¹; *Zubin Jacob*¹; ¹Purdue University

10:00 AM Break

10:20 AM Invited

Ferroics Reimagined with Causal Machine Learning: *Ayana Ghosh*¹; ¹Oak Ridge National Laboratory

10:40 AM Invited

Robust Reflection Set Matching for Online Phase Identification from X-Ray Diffraction Data: *Brian DeCost*¹; Joseph Aroh¹; Austin McDannald¹; Howie Jorress¹; Fan Zhang¹; ¹National Institute of Standards and Technology

11:00 AM

Towards Autonomous Imaging and Analysis of Magnetic Domains: *Charudatta Phatak*¹; Hanu Arava¹; Emine Gulsoy²; ¹Argonne National Laboratory; ²Northwestern University

11:20 AM Invited

Sparse Sampling and Inpainting for High-Throughput Scanning Transmission Electron Microscopy: *Alex Robinson*¹; Jack Wells¹; Daniel Nicholls¹; James Hainsworth¹; Romanas Sonkinas¹; Nigel Browning²; ¹SenseAI Innovations Ltd.; ²University of Liverpool

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — 1D Nanostructures

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; Oliver Diwald, Paris Lodron Universitaet Salzburg; Hyunjoo Choi, Kookmin University

Tuesday AM | September 30, 2025
B230 | Convention Center

Session Chairs: Gurpreet Singh, Kansas State University; Haitao Zhang, University of North Carolina at Charlotte; Wonmo Kang, Arizona State University

9:00 AM Invited

Understanding the Structure of Nanomaterials Using Infrared Spectroscopy: *Thomas Folland*¹; ¹The University of Iowa

9:30 AM Invited

Hierarchical Hybrid Nanostructures (HHN) for Next Generation Electrochemical Devices: Sanskar Shrestha¹; Wenhui Wang¹; *Sharmila Mukhopadhyay*¹; ¹University of Maine

10:00 AM Break

10:20 AM

Controlled Growth of Tellurium Network Structures for Multi-Spectral Photodetector Applications: Ahmed Abdelazeez¹; Yizhou Wang¹; Wanseok Oh¹; Michael Walter¹; Thomas Schmedake¹; Yong Zhang¹; *Haitao Zhang*¹; ¹University of North Carolina at Charlotte

10:40 AM

Lightweight Silver–Carbon Nanotube Fiber Conductors for High-Efficiency Power Transmission: *Qichen Fang*¹; Han Tran¹; Ayush Raut¹; David Mast¹; Vesselin Shanov¹; ¹University of Cincinnati

11:00 AM

Nanofiber-Based Metastable TiO₂ Phases for Efficient, Standalone Visible-Light Photocatalyst: *Mohammad Mahafuzur Rahaman*¹; Fateh Mikaeili¹; Pelagia-Irene (Perena) Gouma¹; ¹The Ohio State University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion of Advanced Materials: Theory and Practice — Corrosion of Advanced Materials: Theory and Practice I

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Haozheng Qu, GE Global Research; Bai Cui, University of Nebraska Lincoln; Jie Lian, Rensselaer Polytechnic Institute; Karthikeyan Hariharan, Friedrich-Alexander-Universität Erlangen-Nürnberg

Tuesday AM | September 30, 2025
D180 | Convention Center

Session Chairs: Xiaolei Guo, Colorado School of Mines; Chaitanya Bhavne, Idaho National Laboratory

8:00 AM Invited

Corrosion of Hybrid IN718/SS316L Alloy Produced Via Laser Powder Bed Fusion: Xiaolei Guo¹; Hailong Dai¹; Liyi Wang²; Wei Xiong²; Samuel Friedlein¹; ¹Colorado School of Mines; ²University of Pittsburgh

8:30 AM

Corrosion Behavior of Cu-30Ni Alloy Produced by Wire Arc Additive Manufacturing: Xiaolei Guo¹; Hailong Dai¹; Samuel Friedlein¹; Joseph Kleindienst¹; Jonah Klemm-Toole¹; ¹Colorado School of Mines

8:50 AM

Assessing the Performance of Additively Manufactured Alloy 718 After Heat Treatment Optimized for Oil and Gas Applications: Mark Stoudt¹; Maureen Williams¹; Carelyn Campbell¹; James Zuback¹; Mark Yunovich²; ¹National Institute of Standards and Technology; ²Shell Technology Center

9:10 AM

Effect of Aging on Hardness and Corrosion Resistance of WE43: Nazli Buyukatak¹; ¹Bursa Technical University

9:30 AM Invited

Development of a CALPHAD-Informed Phase-Field Model for Fe-Ni-Cr Corrosion in Molten Salts Using MOOSE: Chaitanya Bhavne¹; Parikshit Bajpai¹; Daniel Schwen¹; Mauricio Tano Retamales¹; Markus Piro²; Thompson Igunma³; ¹Idaho National Laboratory; ²McMaster University; ³University of Florida

10:00 AM

Corrosion Behaviour of Directed Energy Deposited NiCoCr Alloy in Cryogenic Environments: Adnan Khan¹; Thaer Syam¹; Bilal Mansoor¹; ¹Texas A&M University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion, Protection and Damage Monitoring of Advanced Materials in Natural and Specific Environments — Development and Applications of Advanced Instrumentation, Characterization Techniques and Methods for Degradation Study

Sponsored by: ACerS Education and Professional Development Council, ACerS Energy Materials and Systems Division, TMS Energy Committee, TMS: Energy Conversion and Storage Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Xueyuan Zhang, Gamry Instruments; Guang-ling Song, Southern University of Science and Technology

Tuesday AM | September 30, 2025
D182 | Convention Center

Session Chairs: John Zhang, Gamry Instruments; Guang-ling Song, Southern University of Science and Technology

9:00 AM Keynote

Enhancing Corrosion Resistance of Aluminum Alloys Through AI and ML Modeling: Maham Khalid¹; Farnaz Kaboudvand¹; Nydia Assaf¹; Vardaan Sahgal¹; Jon Ruffley²; Brian McDermott²; ¹The Washington Institute for STEM; ²Naval Nuclear Laboratory

9:30 AM Invited

Corrosion of Biomedical Implants Using EFM and Sinusoidal Signals: Alyssa Kerr¹; Shashi Lalvani²; ¹Indian Hill High School; ²Miami University

10:00 AM Break

10:20 AM

Application of EQCM in Investigating Iron Carbonate Formation and Surface Changes: Kamila Turganova¹; Kushal Singla¹; Sahithi Ayyagari¹; Bruce Brown¹; Hubert Perrot²; Srdjan Nesic¹; ¹Ohio University; ²Sorbonne Université

10:40 AM

Enhancing Copper Foil Manufacturing: Electrochemical Strategies for Monitoring the Corrosion of Electrode: Qingdong Li¹; Ruiyu Ma¹; Jiangbo Feng²; Baigang An²; Lina Wang³; Shengxian Wang³; Xueyuan Zhang⁴; ¹Institute of Corrosion Science and Technology; ²University of Science and Technology Liaoning; ³Nanjing Lodian Wason New Energy Materials Industry Technology Research Institute Co., Ltd.; ⁴Gamry Instruments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

**Energy Materials for Sustainable Development —
Battery and Storage III**

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

**Tuesday AM | September 30, 2025
B234 | Convention Center**

Session Chairs: Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

9:00 AM Invited

Nuclear Probes for Investigation of Energy Storage Materials: *Hillary Smith*¹; Eric Novak¹; ¹Swarthmore College

9:30 AM Invited

Direct Monitoring of Electrochemical Current Distributions Between Individual Battery Particles Using Microelectrode Arrays: *Wonjoon Suk*¹; Yiyang Li¹; ¹University of Michigan

9:50 AM Invited

Study of Li and Na Ion Transport in Battery Materials with Machine Learning Interatomic Potentials: *Wei Lai*¹; ¹Michigan State University

10:20 AM Break

10:40 AM Invited

Upcycling Spent Li-Ion Battery Cathodes Through Co/Ni Exchange in LiCoO₂ Exfoliated Nanosheets: Hsin-Juei Wang¹; Candace Chan¹; ¹Arizona State University

11:10 AM Invited

Scalable Synthesis of Battery-Grade Lithium Iron Phosphate Using Low-Cost Iron Oxide Feedstocks: *Tianyu Zhu*¹; ¹Clemson University

11:40 AM

Upcycling Polyethylene Waste Into Hybrid Graphitic Porous Carbon Materials Used in High-Performance Zinc-Ion Hybrid Capacitors: *Viet Hung Pham*¹; Yuan Gao¹; Ngoc Tien Huynh¹; Yun-Yang Lee¹; Ki-Joong Kim¹; Congjun Wang¹; Christopher Matrangola¹; ¹National Energy Technology Laboratory

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

**Energy Materials for Sustainable Development —
Thermoelectrics III**

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

**Tuesday AM | September 30, 2025
B235 | Convention Center**

Session Chairs: Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University

9:00 AM Invited

Strategies for Improving Efficiency and Performance in Thermoelectric Generators: *Bed Poudel*¹; Shankar Kunwar¹; Rabeya Smriti¹; Subrata Ghosh¹; Wenjie Li¹; ¹Pennsylvania State University

9:30 AM

Design and Development of Segmented Mg₃(Sb, Bi)₂-Based Thermoelectric Devices: *Jayachandran Babu*¹; Raju Chetty¹; Takao Mori¹; ¹National Institute for Materials Science

9:50 AM

Investigation of Thermoelectric Performance of n-Type Mg₃Sb₂ at High Temperatures with Mg Excess Compositions: *Harish Subramania Iyer*¹; Raju Chetty¹; Jayachandran Babu¹; Takao Mori¹; ¹National Institute for Materials Science

10:10 AM Break

10:30 AM Invited

Maximizing Solid-State Cooling and Temperature Control Performance Using Distributed Transport Properties (DTP) Material Systems: *Doug Crane*¹; Chris Caylor¹; Lon Bell¹; ¹DTP Thermoelectrics

11:00 AM Invited

Beyond Conventional Doping: Polarity Switching and Carrier Control in Sn-Based Chalcogenides: *Takayoshi Katase*¹; ¹Institute of Science Tokyo

11:30 AM Invited

Binary Metallic Alloys for Energy Conversion and Cooling: *Mona Zebarjadi*¹; Sourav Das¹; ¹University of Virginia

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Challenges, Advances, and Applications — GOMD Alfred R. Cooper Award Session

Sponsored by: ACerS Glass and Optical Materials Division

Program Organizers: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Tuesday AM | September 30, 2025
B132 | Convention Center

Session Chair: Jose Marcial, Pacific Northwest National Laboratory

9:20 AM Invited

Glass Still Breaks: Understanding Crack Initiation and Growth: *Morten Smedskjaer*¹; ¹Aalborg University

10:00 AM Break

10:20 AM Invited

Optimization of the Heat Treatment Protocol and Metrology of Ge-As-Pb-Se Glass: *Jake Klucinec*¹; ¹University of Central Florida

10:40 AM Invited

Extending Electrochemical Impedance Spectroscopy Capabilities for Non-Arrhenius and Fast-Ion-Conduction Studies of Glassy-Solid-State-Electrolytes: *Chris Martin*¹; ¹Iowa State University

11:00 AM Invited

Thermodynamic Properties of Pt-Cu-P Bulk Metallic Glasses: *Wuqian Zhang*¹; ¹Swarthmore College

FUNDAMENTALS AND CHARACTERIZATION

Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships — Electronic and Mechanical Properties

Sponsored by: ACerS Basic Science Division

Program Organizers: Melissa Santala, Oregon State University; Catherine Bishop, University of Canterbury; Klaus van Benthem, The University of Alabama; Wayne Kaplan, Technion - Israel Institute of Technology

Tuesday AM | September 30, 2025
C161A | Convention Center

Session Chairs: Ming Tang, Rice University; Klaus van Benthem, The University of Alabama

9:00 AM

Local Multimodal Electro-Chemical-Structural Characterization of Solid-Electrolyte Grain Boundaries: *Sossina Haile*¹; *Xin Xu*²; ¹Northwestern University; ²Arizona State University

9:20 AM

Grain Boundary Segregation and Conductivity in 3YSZ: *Yan Wang*¹; *Cai Ling*¹; *Aram Rezikyan*¹; *Kimberley Work*¹; *Tricia Harnas*¹; ¹Corning

9:40 AM

Phase Field Modeling of Microstructure-Dependent Effective Electrical Conductivity in Battery Electrodes: *Lenissongui Yeo*¹; *Jacob Bair*¹; ¹Oklahoma State University

10:00 AM Break

10:20 AM

An Analysis of Intergranular Fracture in Binary Refractory Alloys and the Influence of Segregation: *Samuel Wagers*¹; *Adib Samin*¹; ¹Air Force Institute of Technology

10:40 AM

Tuning Hardness and Fracture Toughness of SPS-Sintered MgAl₂O₄ + YSZ via Na Doping and Field-Assisted Microindentation: *Kavan Joshi*¹; *Ricardo Castro*¹; ¹Lehigh University

11:00 AM

Finding the 'Right' Boundary: Grain Boundary-Stress Fundamental Zones: *Fernando Daniel León Cázares*¹; *Coleman Alleman*¹; *Andrew Polonsky*¹; ¹Sandia National Laboratories

11:20 AM

Polarization Behavior of Electrical Conductors and Its Dependence on the Microstructure: *Deborah Chung*¹; ¹University at Buffalo, The State University of New York

11:40 AM Invited

Dislocation-Grain Boundary Interactions in Bi-Crystal and Polycrystalline Strontium Titanate: *Xufei Fang*¹; *Chukwudalu Okafor*¹; *Atsutomo Nakamura*²; ¹Karlsruhe Institute of Technology; ²The University of Osaka

FUNDAMENTALS AND CHARACTERIZATION

High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI — Data-Driven, Data Analysis, and Design

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

Program Organizers: Shuozhi Xu, University of Oklahoma; 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

Tuesday AM | September 30, 2025
C170 | Convention Center

Session Chairs: Jamieson Brechtel, Oak Ridge National Lab; Mashroor Nitol, Los Alamos National Laboratory

9:00 AM Invited

Microstructure-Aware Bayesian Design of High Entropy Alloy Materials: *Raymundo Arroyave*¹; ¹Texas A&M University

9:30 AM Invited

Bridging Scales: A Deep Dive into Macroscopically Smooth Plastic Flow in Al-Containing High-Entropy Alloys: *Jamieson Brechtel*¹; *Rui Feng*²; *Peter Liaw*³; *Benoit Beausir*⁴; *Hafsa Jaber*⁴; *Tatiana Lebedkina*⁴; *Mikhail Lebyodkin*⁴; ¹Oak Ridge National Laboratory; ²National Energy Technology Laboratory; ³University of Tennessee; ⁴Université de Lorraine

10:00 AM Break

10:20 AM Invited

Atomistic Modeling of Defect Energetics and Plasticity in CoCrFeMnNi Using a Moment Tensor Potential: *Mashroor Nitol¹; Subah Mubassira²; Shuozhi Xu²; Saryu Fensin¹; ¹Los Alamos National Laboratory; ²University of Oklahoma*

10:50 AM

Active Learning Driven Materials Discovery for Low Thermal Conductivity Rare-Earth Pyrochlore-Oxide: *Amiya Chowdhury¹; Acacio Rincon Romero¹; Tanvir Hussain¹; Graziela Figueredo¹; ¹University of Nottingham*

11:10 AM Invited

Assessing Thin Films as Predictors of Bulk Properties in High-Throughput Alloy Design: *Janith Wann¹; Chanho Lee²; Deva Neelakandan²; Benjamin Derby¹; Osman Atwani³; James Valdez¹; Michael Gao⁴; Mikayla Obrist¹; Gaskey Bernard¹; Nan Li¹; Saryu Fensin¹; ¹Los Alamos National Lab; ²Auburn University; ³Pacific Northwest National Laboratory; ⁴National Energy Technology Laboratory*

11:40 AM

Completely Bypassing DFT Calculations via Graph Neural Networks for Vacancy Formation Energies in High Entropy Alloys: *Nathan Linton¹; Parampreet Singh¹; Dilpuneet Aidhy¹; ¹Clemson University*

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; Zhengtao Gan, Arizona State University; Lei Li, Pacific Northwest National Laboratory; Yucheng Fu, Pacific Northwest National Laboratory; Philip Goins, US Army Research Laboratory

Tuesday AM | September 30, 2025
D283 | Convention Center

Session Chair: Philip Goins, US Army Research Laboratory

8:00 AM

The Study of Iron Strontium Through Experiment, Simulation, and Data Science: *Philip Goins¹; ¹US Army Research Laboratory*

8:20 AM

Understanding and Design of Metallic Alloys Guided by Integrated Phase-Field Simulations: *Yuhong Zhao¹; ¹North University of China; University of Science and Technology Beijing*

8:40 AM

Ab Initio Prediction of the Magnetic Thermodynamics of LaCoO₃ Perovskite Based on the Zentropy Theory: *Songge Yang¹; Yu Zhong¹; ¹Worcester Polytechnic Institute*

9:00 AM

Accelerated Nuclear Materials Thermochemistry in MOOSE Through Surrogate Modeling: *Parikshit Bajpai¹; Andrew Kitterman¹; Chaitanya Bhawe¹; Daniel Schwen¹; ¹Idaho National Laboratory*

9:20 AM

A GNN Based Finite Element Simulations Emulator: Application to Parameter Identification for Aluminum Alloy 6DR1: *Ossama Abou Ali Modad¹; Georges Ayoub¹; ¹University of Michigan-Dearborn*

9:40 AM

Bayesian Optimization of KWN Precipitation Model Parameters for Improved Predictive Performance: *Emre Cinkilic¹; Batuhan Dogdu²; Tomas Manik¹; Bjorn Holmedal¹; ¹Norwegian University of Science and Technology; ²CMS Wheels*

10:00 AM Break

10:20 AM

Thermal Response of Stochastically Modeled Mesoscale Metal Foam: *Ryan Griffith¹; Matthew Beck¹; ¹University of Kentucky*

10:40 AM

Fe-Based Alloy Design via Graph DNN Training and Inversion: *Vyacheslav Romanov¹; ¹DOE-NETL*

11:00 AM

Atomistic and AI-Driven Insights Into Ferroelectric Switching in Hybrid Improper Double Perovskite Oxides: *Gayathri Palanichamy¹; ¹SRMIST*

PROCESSING AND MANUFACTURING

Lightweight Composites, Materials & Alloys — Microstructure and Processing

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

Tuesday AM | September 30, 2025
B231 | Convention Center

Session Chair: Ramachandra Canumalla, Weldaloy Specialty Forgings

8:00 AM

Cast Composition to Wrought Part in Single Step Using SolidStir® Additive Manufacturing: *Kumar Kandasamy¹; Anurag Gumaste¹; Pankaj Kulkarni¹; Ravi Sankar Haridas²; Rajiv Mishra²; ¹Enabled Engineering; ²University of North Texas*

8:20 AM

Development and Application of Phosphate Glass Fiber-Reinforced Composites With Chopped and Continuous Fiber Architecture: *Iliass Daki¹; ¹FSBM*

8:40 AM

Effects of Mn Addition and Cooling Rate on Solidification Microstructure of Al-Mg-Si Alloys: *Takeshi Kaneshita¹; Kakefumi Hashimoto¹; ¹Resonac Corporation*

9:00 AM

Effect of Solution Treat Temperatures on Grain Size of CuCrZr Alloy: *Robert Meyer¹; Conor McKinney¹; Nathan Fleming¹; Ben Schaus¹; Ram Canumalla¹; ¹Weldaloy Specialty Forgings*

9:30 AM

Development of Al-Mg-Si Alloy Material and Process for Automotive Structures Based on Strip Casting of Al-Mg-Si Alloy Sheet: *Junyeong Jeong*¹; Hyuckmin Kwon¹; Seongguk Son¹; Chang Yeol Yoo¹; Youn il Jung¹; Heon Kang²; ¹Hyundai Motor; ²KITECH

10:00 AM

Effect of Fast Shot Speed on ESCs and Porosity in Non-Heat Treated Al-Si Alloy: *Saria Akhtar*¹; Xiong Shoumei¹; ¹Tsinghua 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

Tuesday AM | September 30, 2025
B240/241 | Convention Center

Session Chairs: Jie Lian, Rensselaer Polytechnic Institute; Jorgen Rufner, Idaho National Laboratory

9:00 AM Invited

Manufacturing Ceramic Fuels With Controlled Microstructure by Field Assisted Sintering Technology for Nuclear Applications: *Jie Lian*¹; ¹Rensselaer Polytechnic Institute

9:30 AM Invited

Advanced Processing of Functional Ceramics: From Powder to Product at California Nanotechnologies: Eric Eyerman¹; *Christopher Melnyk*¹; ¹California Nanotechnologies

10:00 AM Break

10:20 AM

Latest Capabilities in Hot Isostatic Pressing for Advanced Ceramic Materials: *Chad Beamer*¹; Andrew Cassese¹; Anders Magnusson¹; ¹Quintus Technologies LLC

10:40 AM Invited

Effect of Microstructure on the Mechanical Properties of Reaction-Bonded SiC-B4C Composites: Dongwook Kim¹; Hui Jung Kim¹; *Young-Wook Kim*¹; Woohyuk Choi²; Sungmin So²; ¹Worldex Industry & Trading Co., Ltd.; ²Samyang Comtech Co., Ltd.

11:10 AM Invited

Data-Driven Electric Field Assisted Sintering for Complex 3D Printed Preforms and CTE Interface Engineering of High Temperature CMCs: *Jorgen Rufner*¹; Andrew Gorman¹; Arin Preston¹; Xinchang Zhang¹; Stephanie Pitts¹; Victor Walker¹; William Chirazzini¹; Michael Moorehead¹; Mario Matos¹; ¹Idaho National Laboratory

11:40 AM

Densification Behavior of Dispersed and Coagulated Microstructures Via Two-Step Sintering: *Emelia Enke*¹; William Carty¹; ¹New York State College of Ceramics at Alfred University

12:00 PM

Role of Hard Agglomerates on Defect Free Microstructures: *Emelia Enke*¹; William Carty¹; ¹New York State College of Ceramics at Alfred University

SPECIAL TOPICS

Materials and Manufacturing in Low Earth Orbit (and Beyond) — Manufacturing of Organics/Biomaterials in Low Earth Orbit

Sponsored by: TMS: Solidification Committee

Program Organizers: David Williams, Ohio State University; Alan Luo, Ohio State University; Glenn Daehn, Ohio State University; Antonio Ramirez, The Ohio State University; Boyd Pantan, Ohio State University; Nathan Ames, Ohio State University; Ken Savin, Redwire Space; Jonathan Volk, Voyager Space

Tuesday AM | September 30, 2025
C161B | Convention Center

Session Chair: Jonathan Volk, Voyager Technologies

9:00 AM Introductory Comments

9:10 AM

Building Materials Research and Manufacturing Capabilities in Low Earth Orbit: *Jonathan Volk*¹; ¹Voyager Technologies

9:30 AM

Beyond Microgravity: Considering Other Biomechanical Features of Organoids and Tissue Models for In-Space Biomedicine and Biomanufacturing: *Meenal Datta*¹; ¹University of Notre Dame

9:50 AM

Towards On-Orbit Synthesis of Metal-Organic Frameworks: *Owen Ryan*¹; Youngjun Kim²; Zhou Li³; Yaprak Ozbakir²; Hyo Jun Min²; Zahra Heussen¹; Clint Luna¹; Rachel Ormsby³; Christopher Scherzer³; Jessica Frick¹; Carlo Carraro²; Roya Maboudian²; Debbie Senesky¹; ¹Stanford University; ²University Of California, Berkeley; ³Redwire Space

10:10 AM Break

10:30 AM

Leveraging Microgravity to Produce Bacteriorhodopsin-Based Thin Films for Biohybrid Applications: *Nicole Wagner*¹; ¹LambdaVision

10:50 AM

The Generation of Gold Nanospheres in the Microgravity Environment of Low Earth Orbit: *Molly Mulligan*¹; Kenneth Savin¹; ¹Redwire

11:10 AM Concluding Comments

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; Ana Carolina Trindade, University of Sao Paulo; Pozhhan Mokhtari, University of Illinois Urbana-Champaign

Tuesday AM | September 30, 2025
B244/245 | Convention Center

Session Chair: Waltraud Kriven, University of Illinois at Urbana-Champaign

9:00 AM

Design, Fabrication, Performance Optimization, and Testing of CO₂ Absorber Systems: *Michael Halbig*¹; *Mrityunjay Singh*²; *Meelad Ranaiefar*³; *William Huddleston*³; *Christopher Brady*¹; *Roy Sullivan*¹; *Lyndsey McMillon-Brown*¹; ¹NASA Glenn Research Center; ²Ohio Aerospace Institute; ³HX5, LLC

9:20 AM

Geopolymer-Based Zeolite 4A Composites for Efficient and Cost-Effective CO₂ Sequestration: *Pozhhan Mokhtari*¹; *Phillip Sin*¹; *Maja Wlodarczyk*¹; *Prapassorn Numkiatsakul*¹; *Waltraud Kriven*¹; ¹University of Illinois Urbana-Champaign

9:40 AM

Improving the Wettability of Plastic Packing During Operation: *Ted Parsons*¹; ¹Brentwood Industries

10:00 AM Break

10:20 AM

Correlating Intermediate Species to Product Selectivity in Dry Reforming Methane (DRM) Reaction: *Ruigang Wang*¹; *Md Hossain*¹; ¹Michigan State University

10:40 AM

Tunable Optical Fiber Gas Sensors Based on MOF@PDMS Composite Films: *Jahid Inam Chowdhury*¹; *Devika Mohan*¹; *Tulika Khanikar*¹; *Jeffrey T. Culp*²; *Yang-Duan Su*¹; *Khurram Naeem*¹; *Ruishu Wright*²; *Paul Richard Ohodnicki*¹; ¹University of Pittsburgh; ²National Energy Technology (NETL)

11:00 AM

Optical Fiber-Based pH Sensing for Oceanographic Applications: *Devika Mohan*¹; *Tulika Khanikar*¹; *Alexander Shumski*²; *Yang-Duan Su*¹; *Jahid Inam Chowdhury*¹; *Khurram Naeem*¹; *Ruishu Wright*²; *Paul R. Ohodnicki*¹; ¹University of Pittsburgh; ²National Energy Technology Laboratory Support Contractor

ARTIFICIAL INTELLIGENCE

Materials Informatics for Images and Multi-Dimensional Datasets — Materials Informatics for Images and Multi-Dimensional Datasets II

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division

Program Organizers: Amanda Krause, Carnegie Mellon University; Daniel Ruscitto, GE Aerospace Research; Alp Sehirlioglu, Case Western Reserve University; Roger French, Case Western Reserve University; Erika Barcelos, Case Western Reserve University

Tuesday AM | September 30, 2025
B233 | Convention Center

Session Chair: Amanda Krause, Carnegie Mellon University

9:00 AM Invited

High Throughput Instrumented Indentation Techniques to Extract Bulk-Like Properties of Commercial Metal Alloys: *Stephen Toller*¹; *Geeta Kumari*¹; *Erik Herbert*¹; ¹Oak Ridge National Laboratory

9:30 AM

Bidirectional Prediction of Microstructure–Property/Process Relationships in Advanced Structural Materials Using Deep Generative Models: *Xiaofan Zhang*¹; *Junya Inoue*¹; *Satoshi Noguchi*²; ¹The University of Tokyo; ²JAMSTEC

9:50 AM

Graph-Based Materials Informatics for Fe-Based Alloy Modeling and Design: *Vyacheslav Romanov*¹; ¹DOE-NETL

10:10 AM Break

10:30 AM Invited

Microstructure Representation With Foundational Vision Models for Efficient Learning of Microstructure–Property Relationships: *Sheila Whitman*¹; *Marat Latypov*¹; ¹University of Arizona

11:00 AM Invited

Parametrization of Phases, Symmetries and Defects Through Local Crystallography: *Alex Belianinov*¹; ¹Sandia National Laboratories

11:30 AM

Smart E-Waste Sorting: Confidence-Aware Rare Earth and Hazardous Material Mapping via Hyperspectral Imaging: *Sambandh Bhusan Dhal*¹; *Prabhat Kumar Tripathy*¹; *Lorenzo Vega-Montoto*¹; *Keerthan Raghavendra Rao*¹; *Miranda Kuns*¹; *Jeffrey Alan Lacey*¹; *Edna Stella Cardenas*¹; *John Earl Aston*¹; ¹Idaho National Laboratory

NUCLEAR ENERGY

Metallic Nuclear Fuel Design, Fabrication and Characterization — Metallic Nuclear Fuel Design, Fabrication and Characterization I

Sponsored by: TMS: Materials Characterization Committee, TMS: Nuclear Materials Committee

Program Organizers: Ericmoore Jossou, Massachusetts Institute of Technology; Linu Malakkal, Idaho National Laboratory; Nana Ofori-Opoku, McMaster University; Anil Prasad, Canadian Nuclear Laboratories; Lingfeng He, North Carolina State University; Marat Khafizov, Ohio State University

Tuesday AM | September 30, 2025
D280 | Convention Center

Session Chairs: Anil Prasad, Canadian Nuclear Laboratories; Ericmoore Jossou, Massachusetts Institute of Technology; Anthony Harrup Gutiérrez, Massachusetts Institute of Technology; Zilong Hua, Idaho National Laboratory

8:00 AM Invited

Exploring the Complex Interplay Between Phases, Porosity, and Thermal Properties in Metallic Fuels: *Assel Aitkaliyeva*¹; Mitchell Mika¹; Allison Probert¹; Mary Severt¹; Tiankai Yao²; Ethan Hisle²; Tsvetoslav Pavlov²; Cynthia Adkins²; Karen Wright²; Luca Capriotti³; ¹University of Florida; ²Idaho National Laboratory; ³SCK-CEN

8:30 AM

Nitinol as Surrogate for Laser Additive Manufacturing of Uranium-10 Zirconium Metallic Nuclear Fuel: Abhi Ghosh¹; Reza Esmaeilizadeh¹; *Anil Prasad*¹; Gregory Hamilton¹; Ike Dimayuga¹; ¹Canadian Nuclear Laboratories

8:50 AM Invited

Multi-Scale Modeling of Wastage Layer Formation in Metallic Fuel Cladding: *Larry Aagesen*¹; Jacob Hirschhorn¹; Chao Jiang¹; Geoffrey Beausoleil¹; ¹Idaho National Laboratory

9:20 AM

Mitigating FCCI in Metallic Fuels: Evaluating Cladding Liners Using Multiscale Modeling: *Shehab Shousha*¹; Benjamin Beeler¹; Larry Aagesen²; Geoffrey Beausoleil II²; Nicole Rodriguez Perez³; Maria Okuniewski³; ¹North Carolina State University; ²Idaho National Laboratory; ³Purdue University

9:40 AM Invited

Metal Fuel Performance in Sodium Fast Reactors: Post-Irradiation Examination and Innovative Experiments: *Tiankai Yao*¹; ¹Idaho National Laboratory

10:10 AM Break

10:30 AM Invited

Multiscale Fuel Performance Modeling of U-Mo Fuel for Research Reactors: *Benjamin Beeler*¹; Bei Ye²; Shenyang Hu³; Yongfeng Zhang⁴; Maria Okuniewski⁵; Sourabh Kadambi⁶; Linu Malakkal⁶; Zhi-Gang Mei²; ¹North Carolina State University; ²Argonne National Laboratory; ³Pacific Northwest National Laboratory; ⁴University of Wisconsin, Madison; ⁵Purdue University; ⁶Idaho National Laboratory

11:00 AM Invited

Perspectives on Accelerated Fuel Irradiation Testing in Uranium-Zirconium Alloys: *Maria Okuniewski*¹; Nicole Rodríguez Pérez¹; Morgan Smith¹; Lily Alberts¹; Geoffrey Beausoleil²; ¹Purdue University; ²Idaho National Laboratory

11:30 AM

Refractory Systems in Uranium-Containing Alloys for High Temperature Metallic Fuel: *Malachi Nelson*¹; Boone Beausoleil¹; James Zillinger¹; George Evans¹; Brian Newell¹; ¹Idaho National Laboratory

SPECIAL TOPICS

Navigating Career Pivots at the Mid-Career and Beyond — Navigating Career Pivots at the Mid-Career and Beyond

Sponsored by: TMS: Professional Development Committee

Program Organizers: Punmathat Bordeenithikasem, Machina Labs; Emily Kinser, Advanced Research Projects Agency-Energy (ARPA-E); Janelle Wharry, University of Illinois

Tuesday AM | September 30, 2025
C162B | Convention Center

Session Chair: Janelle Wharry, University of Illinois

9:00 AM

Empowering Researchers: Insights on Career Development, Work-Life Choice, and Passion for Research at Resonac: *Yoshishige Okuno*¹; ¹Resonac Corporation

9:20 AM

My 50-Year Journey in Science and Engineering: *Deborah Chung*¹; ¹University at Buffalo, The State University of New York

9:40 AM

So, You Think You Want to Be an Entrepreneur: *Sarah Jordan*¹; ¹Skuld LLC, Worcester Polytechnic Institute

10:00 AM Break

10:20 AM Panel Discussion - Panelists include Chelsey Hargather, Los Alamos National Laboratory and Edward D. Herderick, America Makes.

IRON AND STEEL (FERROUS ALLOYS)

New Frontiers in Physical Metallurgy of Steels — New Frontiers in Physical Metallurgy of Steels I

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

Program Organizers: Badirujjaman Syed, Arcelormittal Global Research And Development; Maedeh Pourmajidian, Arcelormittal Global R&D - East Chicago

Tuesday AM | September 30, 2025
D281 | Convention Center

Session Chairs: Badirujjaman Syed, ArcelorMittal Global R&D - East Chicago; Maedeh Pourmajidian, ArcelorMittal Global R&D - East Chicago

9:00 AM

Influence of Isothermal Hold Times on the Microstructure and Mechanical Properties During the Quenched and Partitioning Process for Medium Carbon Steel: Miranda Bell¹; Adira Balzac¹; Kip Findley¹; John Speer¹; ¹Colorado School of Mines

9:20 AM

Synergistic Effects of Cold Rolling and Quenching on the Microstructure and Mechanical Performance of Interstitial Free (IF) Steel: Sandeep Yadav¹; Sadhan Ghosh¹; ¹Indian Institute of Technology Roorkee

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials III

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

Tuesday AM | September 30, 2025
C171 | Convention Center

Session Chairs: Muhammad Rizwan, University of Texas Southwestern Medical Center; Masanori Kikuchi, National Institute for Materials Science

9:00 AM Keynote

Invention, Evolution and Growth of Manufacturing by Pressure Spinning for Healthcare: Mohan Edirisinghe¹; Mehmet Aydogdu¹; ¹University College London

9:20 AM Invited

Computer-Aided Engineering (CAE) for Tissue Engineering: Min Wang¹; ¹University of Hong Kong

9:40 AM Invited

Material Driven Approaches to Improve Soft Tissue Regeneration: Muhammad Rizwan¹; ¹University of Texas Southwestern Medical Center

10:00 AM Break

10:20 AM Invited

Influence of Hydroxyapatite Nanocrystal Containing Substances on Deoxyribonucleic Acid Extraction: Masanori Kikuchi¹; Suthir Prabakaran¹; ¹National Institute for Materials Science

10:40 AM

Surface Modified Additively Manufactured Titanium for Orthopedic and Dental Applications: Susmita Bose¹; Amit Bandyopadhyay¹; ¹Washington State University

11:00 AM

4D Bioprinting of Biomimetic Trilayer Scaffolds for Uterine Tissue Regeneration: Shangsi Chen¹; Liwu Zheng¹; Min Wang¹; ¹University of Hong Kong

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development IV — Development of Steels with Enhanced Mechanical Properties for Sustainable Applications

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

Program Organizers: Joshua Mueller, Michigan Technological University; Adriana Eres-Castellanos, Los Alamos National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, CEIT-BRTA; Jeongho Han, Hanyang University; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Michigan Technological University

Tuesday AM | September 30, 2025
D181 | Convention Center

Session Chairs: Joshua Mueller, Michigan Technological University; Hyunseok Oh, University of Wisconsin-Madison; Jeongho Han, Hanyang University

8:00 AM Introductory Comments

8:05 AM Invited

Evaluating Cooling Rate Effects on the Microstructure and Mechanical Properties of High Performance 10Ni QLT Steel: Melissa Thrun¹; Virginia Euser¹; Alexandra Glover²; Joshua Mueller²; Caleb Minasian²; Evan Stafford²; Sven Vogel¹; Bjorn Clausen¹; Daniel Savage¹; ¹Los Alamos National Laboratory; ²Michigan Technological University

8:45 AM

Crack Propagation in a Martensitic/Austenitic Stainless-Steel Composite With a High Combination of Strength and Toughness: Edouard de Sonis¹; ¹Université Catholique de Louvain

9:15 AM

Toughness Response of Ni-Mo Alloyed Heavy Gauge Plates to Quenching and Tempering Conditions: Xabier Azpeitia¹; Unai Mayo¹; Nerea Isasti¹; Eric Detemple²; Hardy Mohrbacher³; Pello Uranga¹; ¹CEIT and University of Navarra-Tecnun; ²Aktien-Gesellschaft der Dillinger Hüttenwerke; ³NiobelCon BV

9:45 AM

1.8 GPa Class Steel Sheet With the Elongated Pearlite Similarly Observed in Music Wire: *Rintaro Ueji*¹; Hidetoshi Somekawa¹; Akinobu Shibata¹; Tsubasa Tokuzumi¹; ¹National Institute for Materials Science

10:15 AM Break

10:35 AM

Enhanced Austenite Stability and Ductility by Isothermal Heat Treatment of the 3Mn TRIP Steel With Bimodal Grain Structure: *Yong Su Lim*¹; Jin Kyung Kim¹; ¹Hanyang University

SPECIAL TOPICS

TMS Frontiers of Materials Award Symposium: Harnessing Charged and Chemical Defects for Exceptional Structural and Functional Properties — TMS Frontiers of Materials Award Symposium I

Sponsored by: TMS: Nanomechanical Materials Behavior Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizer: Yu Zou, University of Toronto

Tuesday AM | September 30, 2025
C162A | Convention Center

Session Chair: Yu Zou, University of Toronto

8:00 AM Invited

Nanoscale Evaluation of Light Illumination Effect on Dislocation Behavior in III-V Group Semiconductors by Photoindentation: *Ryosuke Kinoshita*¹; Yan Li¹; Hiroto Oguri¹; Eita Tochigi²; Atsutomo Nakamura¹; ¹University of Osaka; ²University of Tokyo

8:30 AM Invited

Electric Fields Effects on Microstructural Evolution: *Jian Luo*¹; Jingjing Yang¹; Keqi Song¹; ¹University of California, San Diego

9:00 AM Invited

Dislocation Induced Plasticity in Ceramics: *Xinghang Zhang*¹; Chao Shen¹; Huan Li¹; R. Edwin Garcia¹; Haiyan Wang¹; ¹Purdue University

9:30 AM Invited

Defect Chemistry Regulated Dislocation Plasticity Across the Length Scale in SrTiO₃: *Xufei Fang*¹; Chukwudalu Okafor¹; Atsutomo Nakamura²; ¹Karlsruhe Institute of Technology; ²University of Osaka

10:00 AM Break

10:20 AM Keynote

Charged Dislocations, Electroplasticity and Photoplasticity in Ionic Crystals and Semiconductors: *Yu Zou*¹; ¹University of Toronto

10:50 AM Invited

Investigation of Grain Boundary Segregation in Ceramic Materials Using Advanced Electron Microscopy: *Bin Feng*¹; Naoya Shibata¹; Yuichi Ikuhara¹; ¹University of Tokyo

11:20 AM Invited

Dynamics of Dislocations and Grain Boundaries in Oxides: *Yuichi Ikuhara*¹; ¹University of Tokyo/Tohoku University/JFCC

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

17th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Green and Sustainable Technologies for Manufacturing Materials 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; Wei Ji, Wuhan University of Technology

Tuesday PM | September 30, 2025
B240/241 | Convention Center

Session Chairs: Surojit Gupta, University of North Dakota; Meelad Ranaiefar, NASA Glenn Research Center

2:00 PM Invited

Sustainable Biomimetic Corrosion Protection Coatings for Steel Infrastructure: *Kalpana Katti*¹; Dinesh Katti¹; Ying Huang¹; Dawei Zhang¹; Hanmant Gaikwad¹; Pooyan Vahidi Pashaki¹; ¹North Dakota State University

2:30 PM Invited

Manufacture and Mechanical Performance of Bio-Based Thermoplastic Composites for Advanced Air Mobility Vehicles: *Meelad Ranaiefar*¹; Allison Christy¹; Sandi Miller¹; Joseph Pinakidis¹; ¹NASA Glenn Research Center

3:00 PM

Characterization, Processing, and Additive Manufacturing of Indigenous Materials From the Black Hills: *Bayler Larson*¹; Brayden Sanderson¹; Katrina Donovan¹; Jon Kellar¹; ¹South Dakota School of Mines and Technology

3:20 PM

Ionothermal Synthesis of Sugarcane Bagasse-Derived Activated Carbons for Li-/Na- Ion Batteries: *Cyril Ehi-Eromosele*¹; Samuel Ajayi²; ¹Covenant University; ²University of South Africa - Florida Campus

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 | September 30, 2025
B131 | Convention Center

Session Chair: Subhash Risbud, University of California

1:00 PM Invited

Toward Sustainable and High-Energy Lithium Batteries: Materials and Manufacturing at the Energy Frontier: *Ungyu Paik*¹; ¹Hanyang University

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Artificial Intelligence and Machine Learning (AI/ML)

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

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

Tuesday PM | September 30, 2025
C150 | Convention Center

Session Chairs: Charles Fisher, NSWC Carderock Division; Li Ma, Johns Hopkins University Applied Physics Laboratory; Jing Zhang, Purdue University

2:00 PM

Neural Network-Based Optimization of Stepover Distance for Wire-Arc Additive Manufacturing: *Rida Adhami¹, Kaue Riffel¹, Rakhi Bawa¹, Justin Chan¹, Daniil Gofman¹, Antonio Ramirez¹, ¹The Ohio State University*

2:20 PM

Prediction Optimal Parameters for Wire-ARC DED Welding Using Multilayer-Perceptron Trained on Synthetic Data: *Daniil Gofman¹, Antonio Ramirez¹, ¹The Ohio State University*

2:40 PM

Shallow Neural Network Informed Dwell Time Selection for Thermal History Control in Laser Hot Wire Thin-Walled Parts: *Logan-Samuel Maurer¹, Jack Beuth¹, ¹Carnegie Mellon University*

3:00 PM

Machine Learning-Aided Optimization for Laser-Based AM: Powder Selection: *Yu Zou¹, ¹University of Toronto*

3:20 PM Break

3:40 PM

Developing a Digital Twin for Metals Additive Manufacturing: *Anthony Rollett¹, Somnath Ghosh², ¹Carnegie Mellon University; ²Johns Hopkins University*

4:00 PM

Probabilistic Metrics for Validation of Grain Growth Models: *Arulmurugan Senthilnathan¹, Pranav Karve¹, Sankaran Mahadevan¹, ¹Vanderbilt University*

4:20 PM

LLMs for Automated Data Extraction: A Case Study on AI's Applications to Accelerate Meta Analysis for Cold Spraying: *Stephen Price¹, James Saal², Marco Musto², Kyle Tsakopoulos¹, Kenneth Kroelein², Danielle Cote¹, ¹Worcester Polytechnic Institute; ²Citrine Informatics*

4:40 PM

Comparative Analysis of Data Augmentation Strategies for Defect Classification in Fused Deposition Modelling Additive Manufacturing Using VGG-16: *Tejaswini Bhosale¹, Sudarshan Sanap¹, Mayur Sawant¹, ¹MIT Art, Design & Technology University*

ADDITIVE MANUFACTURING

Additive Manufacturing of Ceramic-Based Materials: Process Development, Materials, Process Optimization and Applications — Ceramic Vat Photopolymerization Processes

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

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

Tuesday PM | September 30, 2025
C161A | Convention Center

Session Chairs: Sadaf Sobhani, Cornell University; Saptarshi Mukherjee, Idaho National Laboratory

2:00 PM Invited

Understanding Slurry Degradation in Digital Light Processing of High Refractive Index Ceramics: *Sadaf Sobhani¹, ¹Cornell University*

2:30 PM

Mitigating Sintering-Induced defects in Additively Manufactured Silica-Based Ceramics Through Optimized Debinding and Sintering Approaches: *Jihyeon Kim¹, Dana Dattelbaum¹, Arthur Charrue², Yohann Scaringella², Denis Rochais², Philippe Belleville², Kwan-Soo Lee¹, ¹Los Alamos National Laboratory; ²CEA*

2:50 PM

Engineering the Physicochemical Characteristics of Additively Manufactured Ceramics: *Kim Cuc Trinh¹, Jihyeon Kim¹, Ryan P. Wilkerson¹, Kwan-Soo Lee¹, ¹Los Alamos National Laboratory*

3:10 PM

Three-Dimensional Printing of Hierarchically Porous Ceramics for Multifunctional Applications: *Ziyong Li¹, Giancarlo D'Orazio¹, Sadaf Sobhani¹, ¹Cornell University*

3:30 PM Break

3:50 PM Invited

Towards Microwave Volumetric Additive Manufacturing for Ceramics: Beamforming Experiments: *Saptarshi Mukherjee¹, Ethan Rosenberg¹, Johanna Vandenbrande¹, Johanna Schwartz¹, Emerald Baluyot¹, Maxim Shusteff¹, James Kelly¹, Joseph Tringe¹, Corey DeChant², Casey Icenhour², Donna Guillen², Nelson Bell³, Kevin Srtrong³, ¹Lawrence Livermore National Laboratory; ²Idaho National Laboratory; ³Sandia National Laboratories*

4:20 PM Invited

Multiphysics Modeling of Volumetric Additive Manufacturing with Microwave Beamforming for Ceramic 3D Printing: *Corey DeChant¹, Ethan Rosenberg², Johanna Vandenbrande², Donna Guillen¹, Casey Icenhour¹, Saptarshi Mukherjee², ¹Idaho National Laboratory; ²Lawrence Livermore National Laboratory*

4:50 PM

Photonic Curing of Chemically Bonded Phosphate Ceramics (CBPC) via Flash Lamp Annealing and the Effect of Optical Absorbers on the Reaction Kinetics and Microstructure: *Eren Ozmen¹, Mark D. Losego¹, ¹Georgia Institute of Technology*

ADDITIVE MANUFACTURING

Additive Manufacturing, Directed Energy Deposition of Metals: Processing – Microstructure – Mechanical Property Relationships — Steels / Titanium and High Entropy Alloys

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Joy Gockel, Colorado School of Mines

Tuesday PM | September 30, 2025
C160B | Convention Center

Session Chairs: Jonah Klemm-Toole, Colorado School of Mines; Joy Gockel, Colorado School of Mines

2:00 PM

Microstructural and Mechanical Investigation of High Strength Steel Replacements Fabricated via Wire-Arc Directed Energy Deposition (DED): *Jason Langevin*¹; *Kyle Tsaknopoulos*¹; *Danielle Cote*¹; ¹Worcester Polytechnic Institute

2:20 PM

Microstructural Evolution of M250 Steel Fabricated via Laser Wire Directed Energy Deposition: *Ann Choi*¹; *Clinton Bettner*²; *Justin Warner*²; *Paul Lambert*²; *Bianca Piloseno*²; *Morgana Trexler*²; *Eddie Gienger*²; ¹JHU/APL; ²Johns Hopkins University

2:40 PM

Investigation of Micro-Cracks with Mechanical and Electropolishing of Additively Manufactured TiAl: *Collin Pickersgill*¹; *Zhaoying Ding*¹; *Chenwei Shao*¹; *Yu Zou*¹; ¹University of Toronto

3:00 PM

Microstructural Differences in AlCoCrFeNi High-Entropy Alloys from Binder Jetting and Directed Energy Deposition: *Jide Oyerinde*¹; *Ioannis Mastorakos*¹; *Ajit Achuthan*¹; *Philip Yuya*¹; ¹Clarkson University

3:20 PM Break

3:40 PM

Process-Structure-Property Relationship in LHW-DED Ti-6Al-4V: *Rajib Halder*¹; *Anthony Rollett*¹; ¹Carnegie Mellon University

4:00 PM

Process-Structure Relationships in Laser Directed Energy Deposition of Molybdenum Powder Within a Ti-6Al-4V Matrix: *Marwan Haddad*¹; *Mathew Cohen*¹; *Aslan Bafahm Alamdari*¹; *Brian Welk*¹; *Kamel Fezzaa*²; *Sarah Wolff*¹; ¹Ohio State University; ²Argonne National Laboratory

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session III

Sponsored by: ACerS Other

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

Tuesday PM | September 30, 2025
C151 | Convention Center

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

2:00 PM Keynote

Data-Driven Image Processing for Real-Time Prediction of Binder Dynamics in Additive Manufacturing: *Peter W*¹; *Gary Pickrell*²; *Navin Manjooran*¹; ¹Solve; ²Virginia Tech

2:30 PM

Impact of Defects and Geometric Deviations on the Mechanical Performance of Laser Powder Bed Fusion Fabricated Plate-Lattice Structures: *Joseph Berthel*¹; *Jack Beuth*¹; *Rahul Panat*¹; ¹Carnegie Mellon University

2:50 PM

Incorporating Residual Stress and Surface Condition in a Fracture Mechanics Based Criteria for Curvature of Additively Manufactured Parts: *Sushant Jha*¹; *Shamachary Sathish*¹; *Nathan Bryant*¹; *Hannah Moen-Vazquez*¹; *Howard Sizek*²; ¹University of Dayton Research Institute; ²US Air Force Life Cycle Management Center

3:10 PM

Microstructural Characterization and Mechanical Behavior of Ti6Al4V After Hybrid Directed- Energy Deposition (DED) - Wrought Processing: *Ananth Balasubramanian*¹; *Ayobami Oladipo*¹; *Eric Payton*¹; ¹University of Cincinnati

3:30 PM

Process Parameter Control of Submicron Particle During Immiscible Alloy Rapid Solidification via LPBF: *Fanyue Kong*¹; *Ji Ma*¹; ¹University of Virginia

3:50 PM Break

4:00 PM

Role of Minor Composition Changes in Driving Uncertainty in the Mechanical Properties of AM Fabricated Materials: *Ian Wietecha-Reiman*¹; *Todd Palmer*¹; ¹Pennsylvania State University

4:20 PM

SolidStir® Additive Manufacturing for Structural Repair: *Anurag Gumaste*¹; *Pankaj Kulkarni*¹; *Ravi Sankar Haridas*²; *Rajiv Mishra*²; *Kumar Kandasamy*¹; ¹Enabled Engineering; ²University of North Texas

4:40 PM

A Comprehensive Characterization of Gradient Properties and Feasibility Mapping Across the Cr-Fe-Ni Ternary Alloy Space: *Levi Nusz*¹; *Eric Faierson*¹; *Peter Collins*¹; ¹Iowa State University

5:00 PM

Accelerating Forging Process Through the Industrialization of Additively Manufactured Preforms: Process Selection, Testing, and Evaluation: *Sambhaji Kusekar*¹; Tushar Borkar¹; David Schwam¹; ¹Cleveland State University

5:20 PM

Acoustic Energy Assisted Shaping and Joining Process of Metals for In-Space 3D Printing Applications: *M Faisal Riyad*¹; Pu Han¹; Keng Hsu¹; ¹Arizona State University

ADDITIVE MANUFACTURING

Additive Manufacturing: Development of Powders — Bridging Lab Scale Innovation and Industrial Powder Needs

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Tim Horn, North Carolina State University; Ian McCue, Northwestern University; Gianna Valentino, University of Maryland; Iver Anderson, Iowa State University Ames Laboratory; Michael Kirka, Oak Ridge National Laboratory

Tuesday PM | September 30, 2025
C160A | Convention Center

Session Chairs: John Reidy, Northwestern University; Emre Tekoglu, North Carolina State University

2:00 PM Invited

The Art of Precision Atomization: Crafting Better Powders for Additive Manufacturing: *Jordan Tiarks*¹; David Byrd¹; Ross Anderson¹; Trevor Riedemann¹; Iver Anderson¹; ¹Ames National Laboratory

2:40 PM

A Table-Top Gas Atomizer for Rapid Development of Novel Alloys: *Andrew Seltzman*¹; Andrei-Alexandru Popa²; Mariabelle Azemar¹; Mia Chen¹; Kyle Williams¹; ¹Massachusetts Institute of Technology; ²University of Southern Denmark

3:00 PM

Gas Atomization and Processing of a Co-Cu Based Immiscible Alloy Feedstock: *Katherine Moody*¹; Ben Labiner¹; Bharat Gwalani¹; Tim Horn¹; Christopher Rock¹; ¹North Carolina State University

3:20 PM Break

3:40 PM

Use of Mechanical Alloying to Produce Metal Matrix Composite Powders for Additive Manufacturing: *Ethan Parsons*¹; ¹MIT Lincoln Laboratory

4:00 PM

Mechanonanosynthesis - Rapid Alloy Powder Development: *Edward Laitila*¹; ¹Michigan Technological University

4:20 PM

Microstructural Differences in Alloy 800H Processed Traditionally and Additively: *Benjamin Labiner*¹; Emre Tekoglu¹; Christopher Rock¹; Timothy Horn¹; ¹North Carolina State University

4:40 PM

Developing Figure of Merit for Feedstock Powders for Printable Inks Through AI-Based SEM Image Processing: *Simay Ozsoysal*¹; Jonathan McNanna¹; Mysha Montaz¹; Mirko Schoenitz¹; Edward Dreizin¹; ¹New Jersey Institute of Technology

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advancements in Molten Salt/Metal Technology in Energy Applications: From Atoms to Plants — Molten Salt Corrosion, Electrochemistry, Synthesis, and Separations

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Tae-sic Yoo, Idaho National Laboratory; Ruchi Gakhar, Idaho National Laboratory; Rocio Rodriguez Laguna, Idaho National Laboratory; Michael Simpson, University of Utah; Hojong Kim, Pennsylvania State University

Tuesday PM | September 30, 2025
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Session Chairs: Michael Simpson, University of Utah; Hojong Kim, Penn State University

2:00 PM

Testing Reference Electrodes in FLiNaZr Molten Salt: *Padma Krishnakumar*¹; Michael Simpson¹; Michael Clegg¹; Jim Steppan²; Tom Meaders²; Byron Millet²; ¹University of Utah; ²HiFunda LLC

2:20 PM

A Computational Approach to Investigate the Role of Impurities on Corrosion Behavior in Molten Salt Reactors: *Soumya Bandyopadhyay*¹; Michael Tonks¹; ¹University of Florida

2:50 PM

Electrochemical Behavior of Oxygen-Evolving Precious Metal Anodes in Molten LiCl-Li2O Electrolyte: *Md Ikram Khan*¹; *Hojong Kim*¹; ¹Pennsylvania State University

3:20 PM

EuCl3 Mediated Corrosion of Ni and Ni-20Cr Model Alloy in LiCl-KCl Molten Salt: *Kaustubh Bawane*¹; Yuxiang Peng²; Linu Malakkal¹; Mario Matos¹; William Phillips¹; James Wishart³; Yu-chen Karen Chen-Wiegart²; Ruchi Gakhar¹; ¹Idaho National Laboratory; ²Stony Brook University; ³Brookhaven National Laboratory

3:40 PM Break

3:55 PM

Towards the Development of an Inert Anode for Reprocessing of Used Nuclear Fuel: *Dev Chidambaram*¹; ¹University of Nevada, Reno

4:25 PM

Novel Al/Ti-Modified Ni-Mo-W-Cr Alloys for High Temperature Structural Applications in Molten Chloride Fast Reactors: *Sonali Ravikumar*¹; Naveen Kumar Nagaraja¹; Boateng Twum Donkor²; Vishal Soni¹; Vijay K Vasudevan¹; Jie Song³; ¹University of North Texas; ²University of Cincinnati; ³Virginia Tech University

4:45 PM

Separation of Fission Products from High-Level Waste Salt via Melt-Crystallization: *Rocio Rodriguez Laguna*¹; Tae-Sic Yoo¹; Kevin Tolman¹; Brian Newell¹; Jacob Yingling¹; Morgan Kropp¹; Stephanie Castro Baldivieso¹; ¹Idaho National Laboratory

5:05 PM

Beyond Proof of Concept: The Role of Lab Scale Pilots in Parallel to Commercial Operations: *Benjamin Dacus*¹; Sean Robertson¹; ¹Mantel Capture

IRON AND STEEL (FERROUS ALLOYS)

Advances and Challenges in Decarbonization of the Steel Industry — Advances and Challenges in Decarbonization of the Steel Industry

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

Program Organizers: Ashwin Kannan Iyengar, ArcelorMittal Calvert; Chad Cathcart, Stelco; Ronald O'Malley, Missouri University of Science and Technology; Feng Liu, Hatch Ltd

Tuesday PM | September 30, 2025
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Session Chairs: Ashwin Kannan Iyengar, AM/NS Calvert LLC; Chad Cathcart, Stelco; Ronald O'Malley, Missouri University of Science and Technology; Feng Liu, Hatch Ltd

2:00 PM Introductory Comments

2:20 PM

Pellet Design for Hydrogen Reduction: *Petrus Pistorius*¹; ¹Carnegie Mellon University

2:50 PM

Iron From Iron Ore by Chemical Comminution: *Edward Laitila*¹; Donald Mikkola¹; ¹Michigan Technological University

3:20 PM

A Percolation Model to Scale Sustainable Ironmaking for Low Emissions Steel: *Subhechchha Paul*¹; Leora Dresselhaus-Marais¹; Brinthan Kanesalingam¹; Yan Ma²; Dierk Raabe³; Ilenia Battiatto¹; Julie Villanova⁴; Guillermo Requena⁵; Stanley Akpu⁶; ¹Stanford University; ²TU Delft; ³Max Planck Institute for Sustainable Materials; ⁴European Synchrotron Radiation Facility (ESRF); ⁵RWTH-Aachen University; ⁶Nnamdi Azikiwe University

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Additive Manufacturing and Perovskite Photovoltaics

Sponsored by: ACeRS Electronics Division

Program Organizers: Amar Bhalla, University of Texas; Ruyan Guo, University of Texas at San Antonio; Rick Uvic, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

Tuesday PM | September 30, 2025
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Session Chairs: Matjaž Spreitzer, Jožef Stefan Institute; Luiz Cotica, State University of Maringa

2:00 PM

Current Pathways in Inkjet-Printed Metal Nanoparticle Films: COMSOL Analysis of Measurement Techniques: *Luis Santillan*¹; William Flynn¹; Ruyan Guo¹; Amar Bhalla¹; ¹University of Texas at San Antonio

2:20 PM

Exploring Functional Ink Materials and Process Evaluation of High-Precision Additive Manufacturing Inkjet Printing Technique: *Arashdeep Singh*¹; Ahsan Mian¹; ¹Wright State University

2:40 PM

Effects of Annealing Conditions and Temperatures on Sputtered NiOx Thin Films for Perovskite Solar Cell: *Firdous Ali*¹; Saied Vaezsis¹; Dawen Li¹; *Subhadra Gupta*¹; ¹University of Alabama

3:00 PM Invited

Enhancement of Bulk Photovoltaic Effect in Pb(Mg_{1/3}Nb_{2/3})O₃-PbTiO₃ Single Crystals After Domain Structure Manipulation via AC Poling: *Vasilii Balanov*¹; *Jani Peräntie*¹; Jaakko Palosaari¹; Suhas Yadav¹; Yang Bai¹; ¹University of Oulu

3:20 PM Break

3:40 PM

Finite Element Analysis and Inkjet Printing Design of Magnetoelectric Coupling in CFO-BTO Composite System: *William Flynn*¹; Sean Garnsey¹; Luis Santillan¹; Amar Bhalla²; Ruyan Guo¹; ¹University of Texas at San Antonio; ²University of Texas

4:00 PM

BCZT/PVDF as Ferroelectric Relaxors and Its Energy Storage Capabilities: *Amolak Sekhon*¹; Navneet Dabra²; ¹Sekhon Physics Classes; ²Mata Sahib Kaur Girls College

PROCESSING AND MANUFACTURING

Advances in Refractory High Entropy Alloys and Ceramics — High Entropy Ceramics

Sponsored by: TMS: Refractory Metals & Materials Committee, ACerS Basic Science Division

Program Organizers: Mingwei Zhang, University of California, Davis; Arezoo Zare, Washington State University; John Perepezko, University of Wisconsin-Madison; Bai Cui, University of Nebraska Lincoln

Tuesday PM | September 30, 2025
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Session Chair: Zilong Hua, Idaho National Laboratory

2:00 PM Invited

Refractory High-Entropy Borides, Nanoalloys, and Dual-Phase Composites with a Broader Perspective: *Jian Luo*¹; ¹University of California, San Diego

2:30 PM Invited

High-Entropy Oxides and Halides: Expanding the Energy-Materials Space: *Corey Oses*¹; ¹Johns Hopkins University

3:00 PM Invited

Thermal Conductivity of High Entropy Ceramics Before and After Irradiation: *Zilong Hua*¹; Kaustubh Bawane¹; Linu Malakkal¹; Lanh Trinh²; Xin Chen²; Luke Wadle²; Bai Cui²; Yongfeng Yu²; Lingfeng He³; ¹Idaho National Laboratory; ²University of Nebraska Lincoln; ³North Carolina State University

3:30 PM Break

3:50 PM Invited

Selective Laser Sintering and Spark Plasma Sintering of Compositionally Complex Carbide Ceramics: *Bai Cui*¹; Lanh Trinh¹; Xin Chen¹; Luke Wadle¹; Yongfeng Lu¹; Zilong Hua²; Kaustubh Bawane²; Linu Malakkal²; Lingfeng He³; ¹University of Nebraska Lincoln; ²Idaho National Laboratory; ³North Carolina State University

4:20 PM Invited

Exploring the Thermodynamic Stability of the High Entropy Ultra-High Temperature Ceramic Composition Space (Ti,Zr,Hf,Nb,Ta)C_{1-x}: *Theresa Davey*¹; Ying Chen²; ¹Bangor University; ²Tohoku University

4:50 PM Invited

Microstructure, Micromechanical and Thermal Properties of Irradiated High Entropy Carbide Ceramics: *Kaustubh Bawane*¹; Lanh Trinh²; Linu Malakkal¹; Yongfeng Lu²; Lingfeng He³; Bai Cui²; ¹Idaho National Laboratory; ²University of Nebraska Lincoln; ³North Carolina State University

5:20 PM

Fundamental Property Measurements of Fully Dense (Cr,Mo,Ta,V,W) C_{1-x} High-Entropy Carbide Ceramics: *Ali Sarikhan*¹; William Fahrenholtz¹; Gregory Hiltmas¹; Yew San Hor¹; ¹Missouri University of Science and Technology

LIGHTWEIGHT ALLOYS

Advances in Titanium Technology — Alloy Design & Material Discovery

Sponsored by: TMS: Titanium Committee

Program Organizers: G. Babu Viswanathan, Ohio State University; Michael Mills, Ohio State University; Sriram Vijayan, Michigan Technological University; Abhishek Sharma, Worcester Polytechnic Institute; Soumya Nag, Oak Ridge National Laboratory; Thomas Broderick, Federal Aviation Administration; Simon Ringer, University of Sydney; Vasisht Venkatesh, Howmet Aerospace; Paraic O'Kelly, Ohio State University

Tuesday PM | September 30, 2025
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Session Chairs: G. Babu Viswanathan, Ohio State University; Peter Collins, Iowa State University

2:00 PM Invited

A New High-Temperature Titanium Alloy for Directed Energy Deposition: *Thomas Klein*¹; Jose Neves¹; David Obersteiner²; Michael Musi²; Ehsan Farabi³; Michael Lasisi³; Sophie Primig³; ¹LKR Light Metals Technologies Ranshofen; ²Montanuniversität Leoben; ³University of New South Wales

2:20 PM Invited

Industrial Perspectives on Titanium Research and Development Needs: *John Foltz*¹; ¹ATI Specialty Materials

2:40 PM Invited

Advances in Designing and Manufacturing Gradient Ti-Based Alloys: *Matt Dolde*¹; Erin Cleary¹; *Peter Collins*¹; ¹Iowa State University

3:00 PM Invited

Decision Science-Driven Assessment of Titanium Alloys for Aircraft Landing Gear Beams: *Ramachandra Canumalla*¹; Tanjore V. Jayaraman²; ¹Weldaloy Specialty Forgings; ²United States Air Force Academy

3:20 PM Break

3:40 PM Invited

Investigation of Processing-Structure-Property Relationships in Ti Alloys for Defense Application: *Soumya Nag*¹; Brian Gibson¹; Lisa Smith¹; Alex Waters¹; Jennifer Semple²; Brian Post¹; Craig Blue¹; ¹Oak Ridge National Laboratory; ²Naval Surface Warfare Center

4:00 PM

A High Throughput Investigation of Al and Cr Additions to the Ti-Fe System via Diffusion Couple Technique, and the Oxidation Characteristics of a Microstructural Gradient: *Paraic O'Kelly*¹; Clara Schlereth²; Gerald Schmidt²; Katharina Beck²; Mathias Galetz²; Alexander Knowles³; ¹The Ohio State University; ²DEHEMA-Forschungsinstitut; ³University of Birmingham

4:20 PM

Nanostructures in an Additively Manufactured Ti-5Al-5Mo-5V-3Cr Alloy: *Sydney Fields*¹; Deepak Pillai¹; Yiliang Liao²; Yufeng Zheng¹; ¹University of North Texas; ²Iowa State University

4:40 PM

Nanostructure-Mediated Phase Transformation and Deformation in Metastable Beta Titanium Alloys: Deepak Pillai¹; Stoichko Antonov²; Hamish Fraser³; Yufeng Zheng¹; ¹University of North Texas; ²National Energy Technology Laboratory; ³The Ohio State University

CERAMIC AND GLASS MATERIALS

American Ceramic Society Journal Awards Symposium — American Ceramic Society Journals Awards Symposium

Sponsored by: ACerS Other

Program Organizer: John Mauro, Pennsylvania State University

Tuesday PM | September 30, 2025
B130 | Convention Center

Session Chair: John Mauro, The Pennsylvania State University

2:00 PM

Engineering Grain Boundary Energy with Thermal Profiles to Control Grain Growth in SrTiO₃: Vivekanand Muralikrishnan¹; Jackson Langhouth²; Daniel DeLellis¹; Kristy Schepker²; Amanda Krause¹; ¹Carnegie Mellon University; ²University of Florida

2:20 PM

Fracture Anisotropy in Tantalum Carbide Ceramics: Sajjad Hossain¹; Alyssa Stubbers²; Gregory Thompson²; Christopher Weinberger¹; ¹Colorado State University; ²University of Alabama

2:40 PM

High Strength Si-SiC Lattices Prepared by Powder Bed Fusion, Infiltration-Pyrolysis and Reactive Silicon Infiltration: Marco Pelanconi¹; Alberto Ortona¹; Paolo Colombo²; Dietmar Koch³; ¹University of Applied Sciences and Arts of Southern Switzerland; ²University of Padua; ³University of Augsburg

3:00 PM

Material Selection and Manufacturing for High-Temperature Heat Exchangers: A Ceramics Perspective: Corson Cramer¹; ¹Oak Ridge National Laboratory

3:20 PM Break

3:40 PM

3D Printing of Ceramics: Advantages, Challenges, Applications, and Perspectives: Susmita Bose¹; Amit Bandyopadhyay¹; ¹Washington State University

4:00 PM

3D Printing of Fiber-Reinforced Ultra High-Temperature Ceramics via Paste Extrusion Technique: Saqlain Zaman¹; Joseph Munoz¹; Laura Molina¹; Md Sahid Hassan¹; Md Shahjahan Mahmud¹; Joshua Dantzler¹; Alexis Lopez²; Dominic Austen¹; Evgeny Shafirovich¹; Shadman Nabil¹; Francisco Medina¹; Nicholas Ku²; Lionel Gonzalez²; Yirong Lin¹; ¹The University of Texas at El Paso; ²DEVCOM Army Research Laboratory

4:20 PM

Slurry Material Extrusion of Chopped Carbon Fiber Reinforced Silicon Carbide Ceramic Matrix Composites (CMCs): Rodney Trice¹; Jeffrey Youngblood¹; Kyle Cox¹; Tess Marconie¹; Raina Shreiner Barger¹; Karan Motwani¹; ¹Purdue University

4:40 PM

Room-Temperature Plastic Deformation of Polycrystalline SrTiO₃ Via Dislocations: Chukwudalu Okafor¹; Kuan Ding²; Oliver Preuß³; Neamul Khansur⁴; Wolfgang Rheinheimer⁵; Xufei Fang¹; ¹Karlsruhe Institute of Technology; ²Max Planck Institute for Sustainable Materials; ³Technical University of Darmstadt; ⁴Case Western Reserve University; ⁵University of Stuttgart

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Nanocomposites & Hybrid 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; Oliver Diwald, Paris Lodron Universitaet Salzburg; Hyunjoo Choi, Kookmin University

Tuesday PM | September 30, 2025
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Session Chairs: Kathy Lu, University of Alabama at Birmingham; Wonmo Kang, Arizona State University; Sanjay Mathur, University of Cologne

2:00 PM Invited

Multilayer 3D Printed Carbonaceous Structures with Hyperbranched Pre-Ceramic Polymeric Coatings: Arko Dasa¹; Jordan Sinclair¹; Garvit Nayyar¹; Margaret Madsen¹; Christina Birkel¹; Timothy Long¹; ¹Arizona State University

2:30 PM

Mechanical Characterization of Polymer Derived Ti₃C₂ MXene-SiC Ceramic: Mohammad Hassan Shirani Bidabadi¹; Kathy Lu¹; Wei Li¹; ¹University of Alabama Birmingham

2:50 PM

High Temperature Phase Stability and Transformation of Polymer Derived Ti₃C₂ MXene-SiC Composites: Srinivasa Kartik Neman¹; Wei Li¹; Brian Wyatt²; Kaustubh Bawane³; Babak Anasori²; Kathy Lu¹; ¹University of Alabama at Birmingham; ²Purdue University; ³Idaho National Laboratory

3:10 PM

An Innovative Graphene-Metal Composite Conductor for Ultrahigh Temperatures: Wonmo Kang¹; Won June Choi¹; Chunghwan Kim¹; ¹Arizona State University

3:30 PM Break

3:50 PM

Organic-Inorganic MXene Hybrid for High-Temperature Applications: Krutarth Kamath¹; Aditi Akella¹; Nithin Chandran BS¹; Pratyush Chettri¹; Anupma Thakur¹; Brian Wyatt¹; Babak Anasori¹; ¹Purdue University

4:10 PM

Bifunctional TiO_2 - and V_2O_5 -Composite Nanofibers for Photo-Rechargeable Lithium-Ion Batteries: *Tom-Jonas Schneider*¹; Sanjay Mathur¹; Michael Wilhelm¹; Ruth Adam¹; Aman Bhardwaj¹; Iuliia Neumann¹; Sung Cho²; Yuki Yamada²; Tohru Sekino²; Jianming Tao³; Zhensheng Hong³; Thomas Fischer¹; David Patrun¹; ¹University of Cologne; ²SANKEN, Institute of Scientific and Industrial Research; ³Fujian Provincial Solar Energy Conversion and Energy Storage Engineering Technology Research Center

4:30 PM

Exploring Sn–Cu Mixed Perovskites: A Novel Approach to Lead-Free Photovoltaic Absorbers: *Ruth Adam*¹; Sanjay Mathur¹; Shahzada Ahmad²; Samrana Kazim³; Ashish Kulkarni⁴; Thomas Kirchartz⁵; Benjamin Klingebiel⁶; Luis Lezama⁶; ¹University of Cologne; ²Basque Center for Materials Applications & Nanostructures UPV/EHU; ³Materials Physics Centre-MPC (CSIC-UPV/EHU); ⁴Indian Institute of Technology Tirupati; ⁵Forschungszentrum Jülich GmbH; ⁶University of the Basque Country (UPV/EHU)

4:50 PM

YSZ-Bi Hybrid Thermal Barrier Coating for Aluminum: *Charlotte Jaffe*¹; *Madeline Jones*¹; Daniela da Fonseca¹; Ricardo Castro¹; ¹Lehigh University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion of Advanced Materials: Theory and Practice — Corrosion of Advanced Materials: Theory and Practice II

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Haozheng Qu, GE Global Research; Bai Cui, University of Nebraska Lincoln; Jie Lian, Rensselaer Polytechnic Institute; Karthikeyan Hariharan, Friedrich-Alexander-Universität Erlangen-Nürnberg

Tuesday PM | September 30, 2025
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Session Chairs: Bai Cui, University of Nebraska-Lincoln; Gabriel Plummer, NASA Ames Research Center

2:00 PM Invited

Atomistic Simulations of Early-Stage Oxidation Mechanisms in Oxide Dispersion Strengthened Alloys: *Gabriel Plummer*¹; Mikhail Mendelev¹; Timothy Smith²; John Lawson¹; ¹Nasa Ames Research Center; ²NASA Glenn Research Center

2:30 PM

A Paper on Green Corrosion Inhibitors for Reinforcement in Various Reinforced Concrete Structures: *Mohit Kansal*¹; ¹Water Resources Department

2:50 PM

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

3:10 PM

A Study on the Mechanical and Corrosion Properties of a Mg–Ca binary Alloy with 1% Sn Addition: *Fatima Zohora*¹; Israt Upama¹; Hossain Rashed¹; ¹Bangladesh University of Engineering & Technology

3:30 PM Break

3:50 PM

Electrochemical Characteristics of Second Phases in 6xxx Series Aluminum Alloys: *Ankur Kumar*¹; I-Wen Huang²; Mary Lyn Lim²; Gerald Frankel¹; ¹The Ohio State University; ²Novelis Global R&T Center

4:10 PM

Production of New Protective Alloy Coatings FA for Protection Against Wear and Corrosion, Working in an Acidic Environment: Borys Sereda¹; *Irina Kruglyak*¹; Dmytro Sereda¹; ¹DSTU

4:30 PM

Understanding High Temperature Hydrogen Attack (HTHA) in A516-G70 and C-0.5Mo Steels: *Yuan Tian*¹; Casey Carney¹; Paul Jablonski¹; Martin Detrois¹; Stoichko Antonov¹; ¹National Energy Technology Laboratory

4:50 PM

A Comparative Study Among Methodologies for Determining the Critical Concentration for Pit Stability: *Ccrit: Mariana Georges*¹; Gerald Frankel¹; ¹Ohio State University

IRON AND STEEL (FERROUS ALLOYS)

Developments in Plate and Line Pipe Steels — Developments in Plate and Line Pipe Steels

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

Program Organizers: Badirujjaman Syed, Arcelormittal Global Research And Development; Maedeh Pourmajidian, Arcelormittal Global R&D - East Chicago; Matthew Pukansky, Lincoln Electric

Tuesday PM | September 30, 2025
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Session Chairs: Badirujjaman Syed, ArcelorMittal Global R&D - East Chicago; Maedeh Pourmajidian, ArcelorMittal Global R&D - East Chicago

2:00 PM

Non-Isothermal Modeling of NbC Nanoprecipitation During TMCP of X70 Microalloyed Steels Using PRISMA (ThermoCalc): *Rishav Raj*¹; Barry Wiskel¹; Douglas Ivey¹; Michael Gaudet²; Hani Henein¹; ¹University of Alberta; ²EVRAZ, NA

2:20 PM

Assessment of Pressure Reversal Susceptibility in API X70 ERW Welds Under Hydrogen Environment: *Jongmin Baek*¹; Chan-hee Lee²; Jin-Seop Kwack³; Dong-Hyeon Jeon³; Hyun-Uk Hong¹; ¹Changwon National University; ²Korea Advanced Institute of Science and Technology; ³Hyundai-Steelpipe

2:40 PM

Investigation of Strain Partitioning in High-Strength Low-Alloy (HSLA) Steels Using In-Situ Tensile Testing with Digital Image Correlation (DIC): *Nafiseh Mohammadtabar*¹; *Alexander Bardelcik*¹; Tom Zhou²; Chad Cathcart²; ¹University of Guelph; ²Stelco Incorporated

3:00 PM

Forensic Metallurgy of Pipeline Steel Thermal Histories: Prospects Through EBSD Characterization: *Ayobami Oladipo*¹; Matthew Steiner¹; Eric Payton¹; ¹University of Cincinnati

3:20 PM

Creep Performance of P92 Steel Around Its Composition Range: Effect of N Solubility and Normalization Temperature: *Stoichko Antonov*¹; Chang-Yu Hung¹; Yuan Tian¹; Martin Detrois¹; Paul Jablonski¹

¹National Energy Technology Laboratory

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Battery and Storage IV

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Tuesday PM | September 30, 2025
B234 | Convention Center

Session Chairs: Jianhua Tong, Clemson University; Candace Chan, Arizona State University

2:00 PM Invited

Sustainable Future Batteries: Progress and Opportunities Through Materials Design: *Amy Marschilok*¹; Esther Takeuchi¹; Kenneth Takeuchi¹; ¹Stony Brook University

2:30 PM Invited

Electrochemical Energy Storage with Nanoscale Materials: *Bruce Dunn*¹; ¹University of California

3:00 PM Invited

Tailoring MXene-Derived Bilayered Vanadium Oxides for High-Performance Energy Storage in Diverse Ion Systems: *Ekaterina Pomerantseva*¹; ¹Drexel University

3:30 PM Break

3:50 PM Invited

Two-Dimensional Transition Metal Carbides, Carbo-Chalcogenide, and Borides for Electrochemical Energy Storage: *Michael Naguib*¹; ¹Tulane University

4:20 PM

Inductance-Dominant Impedance Discovered in Polyelectrolyte: *Deborah Chung*¹; Sathwika Chittluri¹; ¹University at Buffalo, The State University of New York

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics IV

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Tuesday PM | September 30, 2025
B235 | Convention Center

Session Chairs: Amin Nozariasbmarz, Rowan University; Mona Zebarjadi, University of Virginia

2:00 PM Invited

Effective Mass from Carrier Concentration-Dependent Seebeck Coefficient: *Hyun-Sik Kim*¹; ¹University of Seoul

2:30 PM Invited

Uncovering a New Bonding Class: Metavalent Materials and Their Unusual Thermal Transport Properties: *Keivan Esfarjani*¹; Ali Rayat¹; Safoura Nayeib Sadeghi¹; James Xu¹; ¹University of Virginia

3:00 PM Invited

Hybrid Transverse Thermoelectrics in Artificially Tilted Multilayers: *Takamasa Hirai*¹; ¹National Institute for Materials Science

3:30 PM Break

3:50 PM Invited

Phonon-Drag-Enhanced Thermoelectric Performance in n-Type Si_{1-x}Sn_x Epitaxial Layers: *Masashi Kurosawa*¹; Tatsuki Oiwa¹; Shigehisa Shibayama¹; Mitsuo Sakashita¹; Osamu Nakatsuka¹; ¹Nagoya University

4:20 PM Invited

Thermoelectric Tin-Based Zintl Compounds Containing Rattling Atoms in Tunnel Frameworks: *Takahiro Yamada*¹; ¹Tohoku University

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Challenges, Advances, and Applications — Structure and Properties of Oxide Glasses

Sponsored by: ACerS Glass and Optical Materials Division

Program Organizers: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

Tuesday PM | September 30, 2025
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Session Chairs: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, IIT Delhi

2:00 PM Invited

Crack Initiation Load of Glass During a Drop Indentation Test: *Satoshi Yoshida*¹; ¹AGC Inc.

2:30 PM

Strain Rate Dependence of Deformation Mechanisms: Garth Scannell¹; *Erick VanDuyne*¹; ¹Corning

2:50 PM

Revealing the Deformation Zone in Oxide Glasses Using *In Situ* X-Ray Nanodiffraction: *M. Faizal Ussama Jalaludeen*¹; Johan F. S. Christensen¹; Anders K. R. Christensen¹; Soeren S. Soerensen¹; Sidsel M. Johansen¹; Samraj Mollick¹; Yuanzheng Yue¹; Sebastian Kalbfleisch²; Morten M. Smedskjaer¹; ¹Aalborg University; ²Lund University

3:10 PM

Modeling Sodium Aluminophosphate Glasses with Two- and Three-Body Potentials From Molecular Dynamics Simulations: *Navid Marchin*¹; Shingo Urata²; Jincheng Du¹; ¹University of North Texas; ²AGC Inc.

3:30 PM Break

3:45 PM

Unveiling Structure-Property Relationships in ZrO-Containing Bioactive Glasses via Molecular Dynamics Simulations: *Wenqing Xie*¹; Jincheng Du¹; Ying Shi²; Qiang Fu²; Randall Youngman²; ¹University of North Texas; ²Corning Inc.

4:05 PM

Reactions of Transition Metal Ion-Doped pH-Neutral Borophosphate Glasses in Flowing Simulated Body Fluid: *Rebekah Blatti*¹; Richard Brow¹; ¹Missouri University of Science and Technology

4:25 PM

Double-Layer Bioactive Glass Coatings on Titanium Alloy Bioimplants: Composition Effects of Zirconia on Enhancing *In Vitro* Bioactivity: *Wenqing Xie*¹; Jincheng Du¹; Qiang Fu²; Ying Shi²; ¹University of North Texas; ²Corning Inc.

4:45 PM

Structure-Property Correlations in the Bi₂O₃-ZnO-B₂O₃ Pyroborate Glass System and the Effects of Crucible Dissolution: *Lenorah Haight-Stott*¹; Nagia Tagiara²; Henrik Bradtmüller³; Efstratios Kamitsos²; Doris Möncke¹; ¹Alfred University; ²National Hellenic Research Foundation; ³University of São Paulo

5:05 PM

Development of Sulfur Melter Tolerance Apparatus for Hanford Nuclear Waste Vitrification: *Jose Marcial*¹; ¹Pacific Northwest National Laboratory

5:25 PM

Development of Advanced Phosphate Glass Fibers for a Wide Range of Applications: *Nezha Saloum*¹; Iliass Daki¹; ¹Esith, Maroc

FUNDAMENTALS AND CHARACTERIZATION

High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI — Experiments: Alloy I

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

Program Organizers: Shuozhi Xu, University of Oklahoma; 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

Tuesday PM | September 30, 2025
C170 | Convention Center

Session Chairs: Jinkyung Kim, Hanyang University; Bunty Tomar, Oklahoma State University

2:00 PM Invited

BCC Particle-Induced Distorted Dislocation Patterns and Deformation Twinning in the Equiatomic FeCrNi Alloy: *Jinkyung Kim*¹; Jin-Seob Kim¹; ¹Hanyang University

2:30 PM Invited

Co-Existence of Ferro-Antiferromagnetism and Transport Properties in Fe₂MnAl Heusler Alloy: *Aparna Ashok*¹; Neeru Bhagat²; ¹Symbiosis International (Deemed) University; ²St. Mira's College for Women

3:00 PM

Cryogenic Deformation Behavior of the L12-Precipitation Strengthened FeNiCrCu-Based Ferrous Alloy: *Jin-Seob Kim*¹; Jinkyung Kim¹; ¹Hanyang University

3:20 PM Break

3:40 PM Invited

Entropy Stabilized (Co,Cu,Ni,Mg,Zn)O: A Comprehensive Study of Cu-Compositional Variation on Structure and Electrical Behavior: Arturo Meza¹; *Aneeta Padhan*²; Alexander Dupuy³; Julie Schoenung²; ¹University of California, Irvine; ²Texas A&M University; ³University of Connecticut

4:10 PM Invited

Defect-Driven Precipitation Pathways in a High Entropy Alloy: Interplay Between Recovery, Recrystallization, and Phase Evolution: *Bharat Gwalani*¹; ¹North Carolina State University

4:40 PM

Mechanocatalysis on NiCoCr Alloy: An *In-Situ* Atomic Force Microscopy Study of Stress-Induced Tribofilm Formation: *Bunty Tomar*¹; Vikas Paduri¹; Ritesh Sachan¹; Pranjal Nautiyal¹; ¹Oklahoma State University

5:00 PM Invited

Wear and Oxidation Mechanism Transitions in MEAs and HEAs From Room Temperature to 1,000° C: *Yu Zou*¹; ¹University of Toronto

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Hybrid Organic-Inorganic Materials for Alternative Energy — Hybrid Organic-Inorganic Materials for Alternative Energy I

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University; Alessandro Martucci, University of Padova

Tuesday PM | September 30, 2025
B246 | Convention Center

Session Chair: Lisa Klein, Rutgers University

2:00 PM Invited

Novel Organic-Inorganic Hybrid Thin Films for Energy-Efficient Future Microelectronics: *Chang-Yong Nam*¹; ¹Brookhaven National Laboratory

2:30 PM Invited

Silicalite Nanosheets with Surface Quaternary Ammonium Cations for Polymer Composite Anion Exchange Membranes: *Yukta Sharma*¹; Chloe Constantinides¹; Devraj Singh¹; Junhang Dong¹; ¹University of Cincinnati

3:00 PM Invited

Carbon Dots-Based Nanocomposites for Energy and Optical Applications: *Luca Malfatti*¹; ¹University of Sassari

3:30 PM Break

3:40 PM Invited

Hybrid Carbon Nanotube – Gold Electrode Materials for High Performance Energy Storage Devices: *Noe Alvarez*¹; Chaminda Nawarathne¹; Jorge Seminario¹; Camila Jaillita¹; ¹University of Cincinnati

4:10 PM Invited

Tuned Wettability of Hybrid Sol-Gel Coatings for Thermal Management and Ice Prevention: *Alessandro Martucci*¹; ¹University of Padova

4:40 PM Invited

New Families of Layered Hybrid Organic/Inorganic Crystals via the Topotactic Transformation of Solid-State Lattices: *Joshua Goldberger*¹; Yetunde Odeyemi¹; ¹The Ohio State University

5:10 PM Invited

Anticorrosive Hybrid Glass Coatings for Protection of AZ31B Magnesium Alloy in Alkaline Media: *Andrei Jitianu*¹; Mario Aparicio²; Jadra Mosa²; Patrick Garana³; Helen Yousaf³; Mihaela Jitianu³; Lisa Klein⁴; ¹Lehman College, City University of New York; ²Instituto de Cerámica y Vidrio, Consejo Superior de Investigaciones Científicas (CSIC); ³William Paterson University; ⁴Rutgers University

SPECIAL TOPICS

Innovative Materials Solutions for a Rapidly Evolving Market — Innovative Materials Solutions for a Rapidly Evolving Market

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

Program Organizers: Carelyn Campbell, National Institute of Standards and Technology; Paul Mason, Thermo-Calc Software Inc.; James Saal, Citrine Informatics

Tuesday PM | September 30, 2025
C162B | Convention Center

Session Chairs: Carelyn Campbell, NIST; James Saal, Citrine Informatics

2:00 PM Introductory Comments

2:05 PM Keynote

A Materials Enabled Automotive Future: *Paul Krajewski*¹; Linda Stancin¹; Xiaosong Huang¹; ¹General Motors R&D Center

2:45 PM Keynote

Innovative Metals Processing with Molten Oxide Electrolysis: *Guillaume Lambotte*¹; ¹Boston Metals

3:25 PM Question and Answer Period

3:45 PM Break

4:05 PM Keynote

From Microstructure to Market: Data-Driven Steel Design & Commercialization: *Patrick Cleaver*¹; ¹Cleveland-Cliffs Steel Corporation

4:45 PM Keynote

A Look at Today's Manufacturing Challenges and Opportunities: *Pin Lu*¹; ¹Solvus Global

5:25 PM Question and Answer Period

PROCESSING AND MANUFACTURING

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

Tuesday PM | September 30, 2025
B231 | Convention Center

Session Chair: Tanjore Jayaraman, United States Air Force Academy

2:00 PM

Effect of 3D Fiber Architecture on the Internal Microstructure and Dynamic Mechanical Properties of Multi-Directional Cf-SiC Composites: *Shibayan Roy*¹; Arjun Mahato¹; Samar Mondal¹; Saurav Sahoo¹; M Thangarasu¹; ¹Indian Institute of Technology Kharagpur

2:20 PM

Effect of Microstructure on Tensile Properties of Nickel Foam With Open Cell Structure: *Farrukh Saleem*¹; ¹South China University of Technology

2:40 PM

Evaluation of Al-Ca-Ce Alloy System for High Temperature Applications: *Aditya Rohan Narra*¹; Clement Ekaputra²; Amit Shyam²; Alex Plotkowski²; ¹University of Tennessee, Knoxville; ²Oak Ridge National Laboratory

3:00 PM

Improving Al7075 Mechanical Properties via Ag Reinforcement: *Mohammed Tashkandi*¹; ¹Northern Border University

3:20 PM Break

3:40 PM

Investigation of Al-Al₂O₃ Metal/Ceramic Multilayers and Lightweight Composites: *Ramasis Goswami*¹; Alex Moser¹; James Wollmershauser¹; Chandra Pande¹; ¹Naval Research Laboratory

4:00 PM

Precipitate Patterning of Chromium in CuCrZr Alloy: *Robert Meyer*¹; Nathan Fleming¹; Ram Canumalla¹; ¹Weldaloy Specialty Forgings

4:30 PM

Microstructure Evolution, Mechanical Properties, and Biological Response of Ti-Nb-Zr-Ta (TNZT)/hBN Metal Matrix Composites Processed via Spark Plasma Sintering (SPS): *Satyavan Digole*¹; Sanoj Karki¹; Tushar Borkar¹; ¹Cleveland State University

4:50 PM

Novel, Energy-Efficient Spot-Welding Process Optimized for Dissimilar Joining of 6XXX-Series Aluminum to Advanced High Strength Steels: *Rakhi Bawa*¹; Kaue Riffel¹; Antonio Ramirez¹; ¹The Ohio State University

SPECIAL TOPICS

Materials and Manufacturing in Low Earth Orbit (and Beyond) — Materials Testing & Modeling for Space Applications

Sponsored by: TMS: Solidification Committee

Program Organizers: David Williams, Ohio State University; Alan Luo, Ohio State University; Glenn Daehn, Ohio State University; Antonio Ramirez, The Ohio State University; Boyd Pantou, Ohio State University; Nathan Ames, Ohio State University; Ken Savin, REDwire Space; Jonathan Volk, Voyager Space

Tuesday PM | September 30, 2025
C161B | Convention Center

Session Chair: Tengfei Luo, University of Notre Dame

2:00 PM Introductory Comments

2:10 PM

Ultra-Strong, Lightweight Polymer Composite Films for Space Applications: *Tengfei Luo*¹; Seunghyun Moon¹; JR Dennison²; ¹University of Notre Dame; ²Utah State University

2:30 PM

The Ionizing Radiation Environment in Low Earth Orbit: *Jim Adams*¹; Samuel Eichel¹; Gary Zank¹; ¹University of Alabama in Huntsville

2:50 PM

Machine Learning-Driven Design of Polymers Resistant to Atomic Oxygen in Low Earth Orbit: *Aubrey Toland*¹; ¹Georgia Institute of Technology

3:10 PM

Delta-to-Gravity™: Machine Learning Informed Predictive Analytics for Microgravity and Scalable In-Space Manufacturing: *Ioana Cozmata*¹; ¹G-SPACE Inc

3:30 PM Break

3:50 PM

Atomic Oxygen-Induced Degradation in a Polyimide Film From Reactive Molecular Dynamics Simulations: *Jacob Breese*¹; Lisa Hall¹; Cody Bezik²; Vikas Varshney²; ¹The Ohio State University; ²Air Force Research Laboratory

4:10 PM

Bridging Atomistic-Continuum Simulations for Spacecraft Materials in Extreme Conditions: *Chinonso Ugwumadu*¹; Roxanne Tutchton¹; ¹Los Alamos National Laboratory

4:30 PM

Towards Lifetime Predictions for Widegap Semiconductors in Low Earth Orbit: *Wolfgang Windl*¹; ¹Ohio State University

4:50 PM Concluding Comments

NUCLEAR ENERGY

Metallic Nuclear Fuel Design, Fabrication and Characterization — Metallic Nuclear Fuel Design, Fabrication and Characterization II

Sponsored by: TMS: Materials Characterization Committee, TMS: Nuclear Materials Committee

Program Organizers: Ericmoore Jossou, Massachusetts Institute of Technology; Linu Malakkal, Idaho National Laboratory; Nana Ofori-Opoku, McMaster University; Anil Prasad, Canadian Nuclear Laboratories; Lingfeng He, North Carolina State University; Marat Khafizov, Ohio State University

Tuesday PM | September 30, 2025
D280 | Convention Center

Session Chairs: Anil Prasad, Canadian Nuclear Laboratories; Ericmoore Jossou, Massachusetts Institute of Technology; Anthony Harrup Gutiérrez, Massachusetts Institute of Technology; Zilong Hua, Idaho National Laboratory

2:00 PM

Three-Dimensional Microstructural Evolution of Irradiated U-10Zr Nuclear Fuel Revealed by Synchrotron X-Ray Micro-CT: *Anthony Harrup Gutiérrez¹; Riley Moeykens¹; Jana Howard²; Michael Drakopoulos³; Tiankai Yao⁴; Ericmoore Jossou⁴; ¹Massachusetts Institute of Technology; ²Boise State University; ³Brookhaven National Laboratory; ⁴Idaho National Laboratory*

2:20 PM

Advanced Characterization of Pu Oxidation With S/TEM: *Douglas Smith¹; Matthew Janish¹; Sarah Hernandez¹; ¹Los Alamos National Laboratory*

2:40 PM

Understanding Grain Refinement and Gas Bubble Evolution in U-10Mo Fuel Using Phase-Field Modeling: *Sourabh Bhagwan Kadamb¹; Larry Aagesen¹; Benjamin Beeler²; ¹Idaho National Laboratory; ²North Carolina State University*

3:00 PM Invited

High Temperature Structures, Oxidation, and Thermodynamics of Uranium Fuels: *Xiaofeng Guo¹; Emma Kindall¹; Natalie Yaw¹; Sam Karcher¹; Malin Wilkins¹; John McCloy¹; Adrien Terricabras²; Scarlett Widgeon Paisner²; Arjen van Veelen²; Hongwu Xu²; Joshua White²; ¹Washington State University; ²Los Alamos National Laboratory*

3:30 PM Break

3:50 PM

Impact of Dislocation Loops on the Thermal Transport in Nuclear Fuels: A First-Principles Atomistic Approach: *Saqeeb Adnan¹; Marat Khafizov¹; ¹The Ohio State University*

4:10 PM Invited

Thermal Transport of Uranium Nitride (UN) After Irradiation: *Zilong Hua¹; Emma Kindall²; Md Minaruzzaman³; Anshul Kamboj¹; Daniel Murray¹; Kaustubh Bawane¹; Amey Khanolkar¹; Ella Pek¹; Jennifer Watkins¹; Marat Khafizov³; David Hurley¹; ¹Idaho National Laboratory; ²Washington State University; ³The Ohio State University*

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials IV

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

Tuesday PM | September 30, 2025
C171 | Convention Center

Session Chairs: Abby Whittington, Virginia Tech; Donna Guillen, Idaho National Laboratory

2:00 PM Invited

Developing Multi-Material Resins for Vat Photopolymerization Systems: *Abby Whittington¹; ¹Virginia Tech*

2:20 PM Invited

All-Solid-State Ion-Selective Sensors for Continuous Measurements of Electrolyte Biomarkers: *Andreas Stein¹; ¹University of Minnesota*

2:40 PM Invited

Next-Generation Biomaterials from Mycelial Materials: *Steven Naleway¹; ¹University of Utah*

3:00 PM Invited

Super-Resolution Live Imaging of Cells in Confined Microspaces Using 3D CYTOP Microfluidic Chips Fabricated by Femtosecond Laser: *Koji Sugioka¹; Mirai Hanzawa¹; Kotaro Obata¹; Masatoshi Takagi²; Asako Sakaue-Sawano²; Asako Tosaki²; Satoshi Shimozone²; Felix Sima¹; Hiroyuki Kawano²; Takuro Tojima¹; Daisuke Miyashiro¹; Akihiko Nakano¹; Atsushi Miyawaki²; ¹RIKEN Center for Advanced Photonics; ²RIKEN Center for Brain Science*

3:20 PM Break

3:40 PM Invited

Unlocking the Secrets of Enamel: Advancing Fracture-Resistant Ceramics: *Donna Guillen¹; Zherui Guo²; Bradley Huddleston¹; Jack Grimm³; Cameron Renteria³; Dula Parkinson⁴; Viktor Nikitin⁵; Carli Marsico³; Dwayne Arola³; ¹Idaho National Laboratory; ²Purdue University; ³University of Washington; ⁴Lawrence Berkeley National Laboratory; ⁵Argonne National Laboratory*

4:00 PM Invited

Programmed Apoptosis in Bone-Metastatic Prostate and Breast Cancer via Phyto-Therapeutic Application in 3D in Vitro Models of Breast and Prostate Cancer: *Kalpna Katti¹; Quyen Hoang¹; Preetham Ravi¹; Kalidas Shetty¹; Dinesh Katti¹; ¹North Dakota State University*

4:20 PM Invited

Scalable Electrospinning for Biomaterials Applications: *Pelagia-Irene Gouma¹; ¹Ohio State University*

4:40 PM Invited

Hybrid Nanostructured Scaffolds for Tissue-Engineering and Bio-Detection: *Sharmila Mukhopadhyay¹; ¹University of Maine*

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Porous Materials for Energy and Environment Applications — Porous Materials I

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

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

Tuesday PM | September 30, 2025
B244/245 | Convention Center

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

2:00 PM Introductory Comments

2:05 PM Invited

Adsorption and Separations of Small Molecules in MOFs: *Craig Brown*¹; Ryan Klein²; Hayden Evans¹; ¹National Institute of Standards and Technology; ²University of California Berkeley

2:35 PM Invited

Design of Novel Porous Materials From Biomass Based Precursors for Functional Applications: *Surojit Gupta*¹; ¹University of North Dakota

3:05 PM Invited

Density Functional Theory Calculations of Metal-Organic Frameworks for Selective Gas Adsorption: *Eric Cockayne*¹; ¹National Institute of Standards and Technology

3:35 PM Break

3:55 PM Invited

Development of Phase Inversion Derived Solid Oxide Cells: Yeting Wen¹; Jiaxin Lu¹; *Kevin Huang*¹; ¹University of South Carolina

4:25 PM Invited

Beyond Ideal Strength Scaling in Ceramic Architected Materials Subjected to Hydrostatic Loads: Fakhreddin Emami¹; *Andrew Gross*¹; ¹University of South Carolina

4:55 PM Invited

Examination of Pressure Drop Exhibited During the Flow of Air Through Binder Jet Printed Porous Metals: *Samuel Greulich*¹; Markus Chmielus¹; ¹University of Pittsburgh

5:25 PM

SPH Modeling of Microstructure Evolution During Battery Electrode Drying: *Zirui Mao*¹; Shenyang Hu¹; ¹Pacific Northwest National Laboratory

NUCLEAR ENERGY

Progressive Solutions to Improve the Corrosion Resistance of Nuclear Waste Storage Materials — Iron Phosphate Glasses and Advanced Characterization Techniques for Nuclear Waste Forms

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: Energy Committee

Program Organizers: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech

Tuesday PM | September 30, 2025
D283 | Convention Center

Session Chairs: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech

2:00 PM Introductory Comments

2:05 PM Invited

Elucidating the Structure-Property Relation of Iron Phosphate Glasses as a Nuclear Waste Form: *Jincheng Du*¹; Jayani Kalahe¹; ¹University of North Texas

2:35 PM Invited

Iron Phosphate Glasses for Molybdenum-Rich Waste Streams: *Richard Brow*¹; Jincheng Bai¹; CW Kim²; ¹Missouri University of Science and Technology; ²Mo-Sci, LLC

3:05 PM Invited

Recent Developments of Structure-Terahertz Property Relationships in Borosilicate Glasses: *S. K. Sundaram*¹; ¹Alfred University

3:35 PM Break

3:55 PM

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; ¹Carl Zeiss Microscopy LLC

4:25 PM Invited

Improving the Surface Properties of Glasses With 2D Material Coatings: *N M Anoop Krishnan*¹; Sourav Sahoo¹; Nitya Gosvami¹; ¹Indian Institute of Technology Delhi

PROCESSING AND MANUFACTURING

Sintering and Related Powder Processing Science and Technologies — Flash and Ultra-Rapid Sintering: Mechanisms, Control, and Applications

Sponsored by: TMS: Powder Materials Committee, ACerS Basic Science Division

Program Organizers: Charles Maniere, CNRS; Eugene Olevsky, San Diego State University; Ricardo Castro, Lehigh University; Elisa Torresani, San Diego State University; Diletta Giuntini, Eindhoven University of Technology; Wolfgang Rheinheimer, University of Stuttgart

Tuesday PM | September 30, 2025
B233 | Convention Center

Session Chairs: Mattia Biesuz, Trento University; Eugene A. Olevsky, San Diego State University

2:00 PM Invited

Uniform Flash Sintering of Zirconia-Based Ceramics by Compositional Design: Shenghuan Ding¹; Richard Todd¹; ¹University of Oxford

2:30 PM Invited

Electro-Nano-Pulsing for Localized Grain Boundary Engineering and Quasi-Instantaneous Microstructural Control: Eugene Olevsky¹; Wenwu Xu¹; Elisa Torresani¹; Runjian Jiang¹; Andrii Maximenko¹; ¹San Diego State University

3:00 PM Invited

Ultrafast High-Temperature Sintering of YSZ: Mattia Biesuz¹; ¹University of Trento

3:30 PM Break

3:50 PM Invited

From Flash Sintering to Ultrafast Sintering Without Electric Currents in Specimens: Jian Luo¹; ¹University of California, San Diego

4:20 PM

Low-Temperature Rapid Sintering for the Fabrication of Biphasic Si₃N₄ Ceramics With Outstanding Mechanical Properties: Shuo Zhao¹; ¹Tsinghua University

SPECIAL TOPICS

TMS Frontiers of Materials Award Symposium: Harnessing Charged and Chemical Defects for Exceptional Structural and Functional Properties — TMS Frontiers of Materials Award Symposium II

Sponsored by: TMS: Nanomechanical Materials Behavior Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizer: Yu Zou, University of Toronto

Tuesday PM | September 30, 2025
C162A | Convention Center

Session Chair: Yu Zou, University of Toronto

2:00 PM Invited

Exploring Photoplastic and Electroplastic Phenomena in ZnS by Misfit Dislocation Imaging: Alexandra Fonseca Montenegro¹; Sevim Genlik Polat¹; Md Mohsinur Rahman Adnan¹; Maryam Ghazisaeidi¹; Roberto Myers¹; ¹Ohio State University

2:30 PM Invited

Phenomena in Metals and Alloys Controlled at the Single Defect Level: Daniel Gianola¹; ¹University of California, Santa Barbara

3:00 PM Invited

Electroplasticity of Metallic Nanomaterials Under Extreme Electrical Field: Jiangwei Wang¹; ¹Zhejiang University

3:30 PM Break

3:50 PM Invited

Understanding Recombination-Enhanced Dislocation Processes for Semiconductor Optoelectronics: Kunal Mukherjee¹; ¹Stanford University

4:20 PM Invited

Concentration Gradients of Ionic Point Defects in Functional Oxides: Qiyang Lu¹; ¹Westlake University

MATERIALS-ENVIRONMENT INTERACTIONS

Understanding and Mitigating High Temperature Corrosion Processes Through Synergistic Integration of Experimental, Computational and Manufacturing Techniques — High Temperature Corrosion Challenges and Corrosion Resistant Coatings: An Industrial Perspective

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Brian Gleeson, University of Pittsburgh; Tianle Cheng, National Energy Technology Laboratory; Mathias Galetz, DECHEMA-Forschungsinstitut

Tuesday PM | September 30, 2025
D181 | Convention Center

Session Chairs: Rishi Pillai, ORNL; Mathias Galetz, DECHEMA Corrosion Center; Brian Gleeson, University of Pittsburgh

2:00 PM Invited

High-Temperature Corrosion Challenges of Wrought Alloys in Extreme Environments: *Bingtao Li¹; Lee Pike¹; Vinay Deodeshmukh¹; ¹Haynes International*

2:30 PM

Understanding Compositional Effects on the Oxidation Behavior of Binary Nb-Ti Alloys: *Lauren Bowling¹; Elizabeth Opila¹; ¹University of Virginia*

2:50 PM

Impact of Water Vapor and Hydrogen on Oxidation Behavior of Chromia-Forming Ni-Based Alloys: *Marie Romedenne¹; Yi-Feng Su¹; Ashok Vayyala²; Jonathan Poplawsky¹; Rishi Pillai¹; ¹Oak Ridge National Laboratory; ²FZ Juelich*

3:10 PM Break

3:30 PM Invited

Evaluating CMAS-Coating Interactions for Jet Engine Applications: *Eeshani Paresh Godbole¹; ¹GE Aerospace Research*

4:00 PM Invited

Development of Low Temperature Sulphidation Resistant Coatings in Aerospace Environments: *Jonathan Leggett¹; ¹Rolls-Royce Plc*

4:20 PM

Novel Corrosion Resistant Coatings Working with High-Temperature Corrosion Obtained Using FA- Charges: *Borys Sereda¹; Irina Kruglyak¹; Dmytro Sereda¹; Oleg Stasevich¹; Konstantin Komendarov¹; ¹DSTU*

MATERIALS-ENVIRONMENT INTERACTIONS

Understanding Corrosion-Related Cracking — Corrosion at Elevated Temperatures and Cracking

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Tianle Cheng, National Energy Technology Laboratory; Hyokyung Sung, Kookmin University; Gordon Tatlock, University of Liverpool

Tuesday PM | September 30, 2025
D182 | Convention Center

Session Chairs: Gordon Tatlock, University of Liverpool; Tianle Cheng, National Energy Technology Laboratory

2:00 PM Keynote

Pre-Crack Degradation Pathways of NaCl-Assisted Hot Corrosion of a 2nd Generation Ni-Based Superalloy: *Preston Nguyen¹; Douglas Konitzer¹; Brian Gleeson¹; ¹University of Pittsburgh*

2:40 PM

Understanding Pit Morphological Features That Initiate SCC in SS304H Used for Nuclear Waste Storage Canisters: *Daria Bentley¹; Timothy Burnett²; Jenifer Locke¹; ¹Ohio State University; ²University of Manchester*

3:00 PM Invited

Effect of Deposit Chemistry on the Stress Corrosion Cracking Susceptibility of CMSX-10 at 550°C and 700°C: *Fabian Duarte Martinez¹; Jonathan Leggett²; Grant Gibson²; Simon Gray¹; John Nicholls¹; ¹Cranfield University; ²Rolls Royce Ltd*

3:30 PM Break

3:50 PM Keynote

Environmentally Assisted Cracking in Ni-based Superalloys: *Gordon Tatlock¹; ¹University of Liverpool*

4:30 PM

Impact of Alloy Composition and Liquid Chemistry on Cracking Susceptibility of Fusion Candidate Structural Materials in Liquid Lithium: *Marie Romedenne¹; Claude De Lamater-Brotherton¹; Bruce A. Pint¹; ¹Oak Ridge National Laboratory*

4:50 PM Invited

Phase-Field Modeling of Oxidation and Cracking in Environmental Barrier Coatings: *Tianle Cheng¹; Fei Xue¹; Yinkai Lei¹; Richard Oleksak¹; Youhai Wen¹; ¹National Energy Technology Laboratory*

5:20 PM

First Experimental Evidence of Liquid Metal Embrittlement of Two Titanium Alloys by Lithium: *Itza Camila Hittner¹; Thierry Auger¹; Bassem Barkia¹; Jean-Louis Courouau²; ¹PIMM Laboratory, Arts et Metiers Institute of Technology, CNRS, CNAM; ²Université Paris-Saclay, CEA, Service de recherche en Corrosion et Comportement des Matériaux*

CERAMIC AND GLASS MATERIALS

2D Materials: Synthesis, Properties, and Applications — 2D Materials: Synthesis, Properties, and Applications

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

Program Organizers: Christopher Shuck, Rutgers University; Dave Estrada, Boise State University; Nicholas Glavin, Air Force Research Laboratory

Wednesday AM | October 1, 2025
B130 | Convention Center

Session Chair: David Estrada, Boise State University

8:00 AM

Mn-Doping of Double Transition Metal MXenes for Magnetic Property Tuning: *Annabelle Bedford*¹; Anupma Thakur¹; Kat Nykiel¹; Nithin Chandran¹; Spencer Isbell¹; Alejandro Strachan¹; Babak Anasori¹; ¹Purdue University

8:30 AM

Thermal and Mechanical Properties of Low Dimensional Carbon Materials: Abigail Eaton¹; Arun Nair¹; ¹Air Force Institute of Technology

8:50 AM

Ab Initio Investigation of 2D-NbC and NbCO MXenes as High-Performance Anode Materials for Na- and Li-Ion Batteries: *Nishat Sultana*¹; Abdullah Amin²; Eric Payton¹; Kyun Kim Woo¹; ¹University of Cincinnati; ²University of Dayton

9:10 AM

Improving the Electromagnetic Interference Shielding Performance of Exfoliated-Graphite-Based Flexible Graphite Sheet by Engineering a Monotonic Density Gradient Along the Thickness of the Sheet: *Deborah Chung*¹; Akshita Yadav¹; ¹University at Buffalo, The State University of New York

9:30 AM

Multi-Band Luminescence From a Rare Earth-Based Two-Dimensional Material: *Michael Susner*¹; Rahul Rao¹; Emmanuel Rowe¹; Ryan Siebenaller¹; Thuc Mai¹; Ruth Pachter¹; Deep Jariwala¹; Joshua Hendrickson¹; ¹AFRL Materials and Manufacturing Directorate

10:00 AM Break

10:20 AM

Surface Inductance as a New Attribute for Revealing the Surface Structure of Materials: *Deborah Chung*¹; ¹University at Buffalo, The State University of New York

10:40 AM

Multifunctional CeSe@TiSe-C Coated Separators for Improved Lithium-Sulfur Battery Performance: Amirhossein Mirtaleb¹; Ruigang Wang¹; ¹Michigan State University

11:00 AM

Synthesis of a Novel High-Performance Siloxene Based 2D Material for Durable and Transparent Superhydrophobic Coatings with Self-Cleaning and Anti-Icing Properties: *Brahim Nomeir*¹; ¹MASCIR

11:20 AM

Synthesis of Two-Dimensional Rare Earth Oxychloride Phases: LaOCl, NdOCl, ErOCl, and YbOCl: *Muhammad Sharif Uddin*¹; Nithin Chandran B.S.¹; Anupma Thakur¹; Brian C. Wyatt¹; Babak Anasori¹; ¹Purdue University

11:40 AM

Comparison of Thermodynamic Prediction with Experimental Observations of Refractory Metal Carbides Synthesized Using CVD: *Sajjad Hasan*¹; Nishat Sultana¹; Phillisity Neal¹; Jesus Acosta¹; Eric Payton¹; ¹University of Cincinnati

SPECIAL TOPICS

ACerS Robert B. Sosman Award Symposium: Solid State Chemistry Meets Solid State Ionics — ACerS Robert B. Sosman Award Symposium

Sponsored by: ACerS Basic Science Division

Program Organizer: William Chueh, Stanford University

Wednesday AM | October 1, 2025
B131 | Convention Center

Session Chair: Xin Xu, Arizona State University

8:00 AM Invited

A Deep Dive into the Structure, Transport, and Surface Exchange Kinetics of the BaCo_xFe_{0.8-x}Zr_{0.1}Y_{0.1}O_{3-d} (BCFZY, 0.1x0.7) Triple-Conducting Oxide System: *Ryan O'Hayre*¹; Yewon Shin¹; Michael Sanders¹; Zhen Jiang²; Christopher Wolverton²; Sossina Haile²; Kennedy Agyekum³; Bernadette Cladek³; Katharine Page³; Jue Liu⁴; Bright Ogbolu⁵; Erica Truong⁵; Yan-Yan Hu⁵; ¹Colorado School of Mines; ²Northwestern University; ³University of Tennessee; ⁴Oak Ridge National Laboratory; ⁵Florida State University

8:30 AM Question and Answer Period

8:35 AM Invited

Electro-Chemo-Mechanics of (Ce,Pr)O_{2-δ} Nanostructures: *Nicola Perry*¹; ¹University of Illinois at Urbana-Champaign

9:05 AM Question and Answer Period

9:10 AM Invited

Atomic and Dynamic Insights into Transport, Mechanics and Failure in Energy Electroceramics: *Xin Xu*¹; ¹Arizona State University

9:40 AM Question and Answer Period

9:45 AM Invited

Guiding Mixed Anion Material Synthesis with a Computational-Experimental Feedback Loop: Aksha Prince¹; Dmitri LaBelle¹; Yong-Jie Hu¹; *Jill Wenderott*¹; ¹Drexel University

10:15 AM Question and Answer Period

10:20 AM Break

10:40 AM Invited

Earth as a Factory: Interfacial and Subsurface Electron Transfer for Clean Fuel Generation: *Iwnetim Abate*¹; ¹Massachusetts Institute of Technology

11:10 AM Question and Answer Period

11:15 AM Invited

Oxygen Transport in Lithium Layered Oxides: *William Chueh*¹;

¹Stanford University

11:45 AM Question and Answer Period

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Microstructures and Thermal Analyses I

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

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

Wednesday AM | October 1, 2025

C150 | Convention Center

Session Chairs: Li Ma, Johns Hopkins University Applied Physics Laboratory; Charles Fisher, NSWC Carderock Division; Jing Zhang, Purdue University

8:00 AM

Enhancing Additive Manufacturing Process Parameter Design by Computational Fluid Dynamics: *Adriana Eres-Castellanos*¹; Tomas Scuseria¹; Omar Mireles¹; Zach Jibben¹; Nathan Peterson¹; Lindsay O'Brien¹; Cheryl Hawk¹; Amber Black¹; Amy Clarke¹; ¹Los Alamos National Laboratory

8:20 AM

Interpreting Peak Temperature Distributions in Laser Powder Bed Fusion Through Surface Geometry and Simulated Imaging: *Craig Weeks*¹; Jonathan Malen¹; Satbir Singh¹; ¹Carnegie Mellon University

8:40 AM

Cellular Automata Modeling of Microstructure and Porosity Formation in Al-10Si Alloy Laser Powder Bed Fusion Process: *Buwei Chen*¹; Michael Moodispaw¹; Jianyue Zhang¹; Qigui Wang¹; Alan Luo¹; ¹Ohio State University

9:00 AM

Process Monitoring in SolidStir® AM for Process Control and Quality Assurance: *Anurag Gumaste*¹; Pankaj Kulkarni¹; Kumar Kandasamy¹; ¹Enabled Engineering

9:20 AM

Melt Pool Plume Behavior in Laser Powder Bed Fusion: *Jack Beuth*¹; Alexander Myers¹; Christian Gobert¹; Jonathan Malen¹; ¹Carnegie Mellon University

9:40 AM

Microstructure Design Using Kinetic Model of the α -Ferrite to α -Austenite Phase Transformation in 17-4 PH Stainless Steel LPBF: *Sohee An*¹; Seung-Ho Lee¹; Jongcheon Yoon¹; Il Sohn²; Kyunsuk Choi³; Du-Rim Eo¹; ¹Korea Institute of Industrial Technology; ²Yonsei University; ³Hanbat University

10:00 AM Break

10:20 AM

Multi-Physics Simulation of Directed Energy Deposition With Blended Materials: *Chao Tang*¹; Peng Chen²; Siu Sin Quek¹; Ke Wu Bai¹; ¹Institute of High Performance Computing (IHPC), Agency for Science Technology and Research (A*STAR); ²Singapore Institute of Manufacturing Technology (SIMTech), Agency for Science Technology and Research (A*STAR)

10:40 AM

The Melt Pool Spatter Problem in Additive Manufacturing: *Jack Beuth*¹; Nicholas O'Brien¹; Christian Gobert¹; Satbir Singh¹; David Deisenroth²; Jordan Weaver²; Amir Barati Farimani¹; ¹Carnegie Mellon University; ²NIST

ADDITIVE MANUFACTURING

Additive Manufacturing of Ceramic-Based Materials: Process Development, Materials, Process Optimization and Applications — Ceramic Direct Ink Writing Processes

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

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

Wednesday AM | October 1, 2025

C161A | Convention Center

Session Chairs: Rodney Trice, Purdue University; Joel Destino, Creighton University

8:00 AM Invited

Extrusion Manufacturing (Direct Ink Write) of Carbon-Loaded Ultra-High Temperature Ceramic Matrix Composites: David Calvo¹; Jeffrey Youngblood¹; *Rodney Trice*¹; ¹Purdue University

8:30 AM

Plasma Jet Oxidation of Additively Manufactured Monolithic and High Entropy Ultra High Temperature Ceramic Carbides: *Varad Agarwal*¹; Ambreen Nisar¹; ¹Florida International University

8:50 AM

Additive Manufacturing of Oxide and Non-Oxide Ceramics for Functional and Structural Applications: *Yirong Lin*¹; Saqlain Zaman¹; Anabel Renteria¹; Jessica Cobos¹; Fancisco Medina¹; ¹University of Texas at El Paso

9:10 AM Invited

Advanced Manufacturing and Densification Techniques for Fabricating Ceramic Matrix Composites: *David Mitchell*¹; ¹University of Central Florida

9:40 AM

Development of Direct Ink Write Radially Graded Alumina/Zirconia: *Benjamin Lamm*¹; Beth Armstrong¹; Corson Cramer¹; Alex Rogers¹; Chanaka Kumar¹; ¹Oak Ridge National Laboratory

10:00 AM Break

10:20 AM

Colloidal Material Design for Additively Manufacturing Optical Glasses: Joel Destino¹; Monisha Murthi²; Nicholas Tobin¹; Jackson Chou¹; Azriel Carr¹; Rachel Wayne¹; Lachlan O'Keefe¹; Shruti Garapati¹; ¹Creighton University

10:40 AM

Effect of Dispersants on the Direct Ink Write Printability of SiC Powder in Phenolic Resin for Sintered SiC: Nadim Hmeidat¹; Jordan Wright¹; Chase Mortensen²; Patrick Snarr¹; Brett Compton²; Corson Cramer¹; ¹Oak Ridge National Laboratory; ²University of Tennessee, Knoxville

11:00 AM

Development of Models for Densification and Microstructural Evolution of Ceramic Green Bodies Produced by Direct Ink Writing: Deeksha Kodangal¹; Nikhil Dhanankam²; Rajendra Bordia¹; Ulf Schiller²; ¹Clemson University; ²University of Delaware

11:20 AM

Viscosity Adjustment Without Binder: Jacob Feldbauer¹; ¹Oakridge National Laboratory

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session IV

Sponsored by: ACerS Other

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

Wednesday AM | October 1, 2025
C151 | Convention Center

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

8:00 AM Invited

Fracture-Resistant Soft Materials by Topology Engineering: Junsoo Kim¹; ¹Northwestern University

8:30 AM

Augmenting Standard Thermal Analysis to Evaluate Thermoelastic Reversibility in Additively Manufactured Ti-Rich Classes of NiTi Shape Memory Alloys: Foster Fen¹; Blake Miller¹; Reginald Hamilton¹; ¹Pennsylvania State University

8:50 AM

Drift and Repeatability of Aerosol Jet Printing Process Parameters: Caroline Kromalic¹; Aidan Selkirk¹; Krish Gupta¹; Anthony DeCarlo¹; Janet Gbur¹; ¹Case Western Reserve University

9:10 AM

Effect of Dilution on Fabricated Functionally Graded Materials Compositions: Modelling and Mitigation Strategies Validated Using the Ni-, Fe-, Cu- Alloy System: Zhening Yang¹; Zi-Kui Liu¹; Allison Beese¹; ¹Penn State University

9:30 AM

Evolution of Solidification Microstructure in Laser Powder Bed Fusion: Role of Epitaxy, Growth Direction, and Thermal Gradients: Prosenjit Biswas¹; Zhongshu Ren²; Tao Sun³; Ji Ma¹; ¹University of Virginia; ²Brookhaven National Laboratory; ³Northwestern University

9:50 AM

Exploring Additive Friction Stir Deposition of a Novel 5xxx Aluminum Alloy: Mason Smith¹; Eli Logan¹; Dayakar Penumadu¹; Bradley Jared¹; ¹University of Tennessee

10:10 AM Break

10:20 AM

Functionally Graded Wear-Resistant Lightweight Steel Manufactured by Laser Powder Bed Fusion Deposition: Jin-su Park¹; Joonoh Moon¹; Hansol Kwon²; Seong-Jun Park²; ¹Changwon National University; ²Korea Institute of Materials Science

10:40 AM

High-Throughput Thermo-Mechanical Testing of Additively Manufactured Materials: Sean Caulfield¹; Christopher Hale²; John Lewandowski³; Vishnu Ramasamy³; Zhigang Xu²; Bradley Jared¹; ¹University of Tennessee, Knoxville; ²North Carolina A&T University; ³Case Western Reserve University

11:00 AM

Manufacturing of Jet Turbine Engine Exhaust System with Optimized Geometry by Laser Powder Bed Fusion of Cu-Based Alloys: Melik Kilic¹; Ty Barzak²; Stefan Moldovan¹; Constantin Solomon¹; ¹Youngstown State University; ²Ursa Major Technologies

11:20 AM

Multi-Material Laser Powder Bed Fusion With Intra-Layer 3-Way Composition Control: Christopher Carson¹; Jacklyn Griffis¹; Hunter Rauch¹; Guha Manogharan¹; ¹Pennsylvania State University

ADDITIVE MANUFACTURING

Additive Manufacturing: Development of Powders — Powder Engineering, Functionalization & Simulation for AM

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Tim Horn, North Carolina State University; Ian McCue, Northwestern University; Gianna Valentino, University of Maryland; Iver Anderson, Iowa State University Ames Laboratory; Michael Kirka, Oak Ridge National Laboratory

Wednesday AM | October 1, 2025
C160B | Convention Center

Session Chairs: Gianna Valentino, University of Maryland; Haozhi Zhang, North Carolina State University

8:00 AM Invited

Defect-Free PREP Powders for Enhanced Powder Bed Fusion: Reducing Electrostatic Charge and Gas Porosity for Superior Mechanical Performance: Akihiko Chiba¹; ¹Tohoku University

8:40 AM

TiC Surface Functionalization of AA2017 Powders for L-PBF: Influence of TiC Particle Size and Concentration: *Bruna Batistão*¹; Sergio Amancio-Filho²; Piter Gargarella¹; ¹Federal University of Sao Carlos; ²Graz University of Technology

9:00 AM

Powder Behavior Simulation for Enhanced Processability and Flowability in Metal Additive Manufacturing: *Hideyuki Kanematsu*¹; Masahiko Kuwabara²; Jeremy Knopp²; Tadaomi Fujieda³; Takayoshi Nakano⁴; ¹BEL Inc.; ²Armatus ai; ³Prometech Software Inc.; ⁴Osaka University

9:20 AM

Atomic Layer Deposition (ALD) for Improved Ti64 Feedstocks for Laser Powder Bed Fusion Processes: *Alexandra Koegel*¹; Chris Gump¹; Brandon Castro¹; Joshua Campbell¹; Tommy Martin¹; ¹Forge Nano

9:40 AM

Investigating Process Parameters of WA IN740H in PBF-LB: *Sarah Birchall*¹; Junwon Seo¹; Anthony Rollett¹; Bryan Webler¹; ¹Carnegie Mellon University

10:00 AM

Thermal Processing of Virgin Ti-6Al-4V Powders to Enhance Cold Spray Deposition: *Caroline Dowling*¹; Kiran Judd¹; Kyle Tsaknopoulos¹; Danielle Cote¹; ¹Worcester Polytechnic Institute

ADDITIVE MANUFACTURING

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

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Samantha Webster, Colorado School of Mines; Jihoon Jeong, Texas A&M University; Benjamin Bevans, University of Oklahoma

Wednesday AM | October 1, 2025
C160A | Convention Center

Session Chairs: Samantha Webster, Colorado School of Mines; Benjamin Bevans, University of Oklahoma; Yash Parikh, EOS of North America, Inc.

8:00 AM Invited

Effect of Beam Shaping on Ratio Pyrometric Temperatures in DED-LB/M: *Lova Chechik*¹; Karen Schwarzkopf¹; Michael Schmidt¹; ¹Friedrich Alexander University

8:30 AM Invited

Thermal Imaging with Off-The-Shelf Color Cameras Yields New Insights to Melt Pool Physics in AM Processes: *Jonathan Malen*¹; ¹Carnegie Mellon University

9:00 AM

Real-Time Infrared Thermography on Inconel 718 With CT Scan & Surface Roughness Analysis: *Aniqa Lim*¹; Santosh Rauniyar¹; Ben Xu¹; Lori Hathon¹; Venkat Selvamani¹; Francisco Robles Hernandez¹; ¹University of Houston

9:20 AM

TOPS: A High-Throughput, Laser-Based Method for Measuring Thermal Conductivity in Additive Manufactured and Other Materials: Jan Mundell¹; Jeffrey Braun¹; *Andrew Jones*¹; ¹Laser Thermal Analysis

9:40 AM

Laser Beam Profiling and High-Temperature Thermal Conductivity Measurements with a Commercial Camera: *Hao-Yuan Cheng*¹; Alexander Myers¹; David Deisenroth²; Sergey Mekhontsev²; Jordan Weaver²; Jonathan Malen¹; ¹Carnegie Mellon University; ²National Institute of Standards and Technology

10:00 AM Break

10:20 AM Invited

In-Situ Nondestructive Evaluation of Residual Stresses in Directed Energy Deposition: *Andrea Camacho-Betancourt*¹; *Iris Rivero*¹; ¹University of Florida

10:50 AM Invited

Sub-Surface Thermal Measurement in Additive Manufacturing via Machine Learning-Enabled High-Resolution Fiber Optic Sensing: *Rongxuan Wang*¹; ¹Auburn University

11:20 AM Invited

Ultrasonic Measurements for In Situ Material Characterization in Hybrid Additive Manufacturing: *Luz Sotelo*¹; Rakeshkumar Karunakaran²; Michael Sealy¹; Joseph Turner³; ¹Purdue University; ²ASM International; ³University of Nebraska-Lincoln

11:50 AM

Electrical 3D-Printing Process Monitoring Methods: *Deborah Chung*¹; ¹University at Buffalo, The State University of New York

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Advanced Materials for Harsh Environments - Session I

Sponsored by: ACerS Other

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

Wednesday AM | October 1, 2025
D180 | Convention Center

Session Chairs: Cheng Sun, Clemson University; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

8:00 AM Keynote

Mechanical Behavior and Microstructural Insights of Compacted Lunar and Martian Regolith Simulants for Off-Earth Infrastructure: Peter W¹; Gary Pickrell²; *Navin Manjooran*¹; ¹Solve; ²Virginia Tech

8:30 AM

Influence of the TiB₂ Nanoparticles Addition on Microstructure, Stability and Oxidation Resistance of Ex-Situ Alloy 625•TiB₂ Nanocomposites Processed via Suction Casting: *Lukasz Rakoczy*¹; ¹Agh University of Krakow

8:50 AM

Corrosion Resistance of Alitized Coatings Operating in Harsh Environments of Arsenic-Soda Desulfurization of Coke Chemical Production: *Borys Sereda*¹; Irina Kruglyak¹; Dmytro Sereda¹; Evgeniy Zyuzin¹; Vitaliy Orel¹; ¹DSTU

9:10 AM

Understanding the Influence of Impurity Elements on the Localized Corrosion in Recycled Cast Al A356 Alloy: *Mohammad Umar Farooq Khan*¹; Alphan Berkem¹; Alan Luo¹; Jenifer Locke¹; ¹Ohio State University

9:30 AM

Corrosion Propensity of Polyester-Chromium Nitrate Coated Al7xxx in a Humid Environment: *Joseph Agboola*¹; Olatunde Sekunowo¹; Chiamaka Uzuegbu¹; ¹University of Lagos

9:50 AM Break

10:10 AM Invited

Phase Stability and Mechanical Properties of Yttria-Stabilized Zirconia Under Irradiation: *Cheng Sun*¹; ¹Clemson University

10:40 AM

Benefits of Durable and Reliable Borosilicate Glass in the Harsh Environments of the Transportation Sector: *Juliane Brandt-Slowik*¹; ¹SCHOTT Technical Glass Solutions GmbH

PROCESSING AND MANUFACTURING

Advances in Refractory High Entropy Alloys and Ceramics — Alloy Processing and Mechanical Behavior

Sponsored by: TMS: Refractory Metals & Materials Committee, ACerS Basic Science Division

Program Organizers: Mingwei Zhang, University of California, Davis; Arezoo Zare, Washington State University; John Perepezko, University of Wisconsin-Madison; Bai Cui, University of Nebraska Lincoln

Wednesday AM | October 1, 2025
B232 | Convention Center

Session Chair: Dan Thoma, University of Wisconsin-Madison

8:00 AM Invited

Design, Synthesis, and Properties of WTaCrVHf High Entropy Alloys: *Dan Thoma*¹; Caleb Hatler¹; Matthew Vigil¹; Enrique Martinez²; Bochuan Sun²; Saryu Fensin³; Nathan Curtis¹; Adrien Couet¹; Osman El Atwani⁴; ¹University of Wisconsin-Madison; ²Clemson University; ³Los Alamos National Laboratory; ⁴Pacific Northwest National Laboratory

8:30 AM Invited

Advancements and Challenges in Electron Beam Powder Bed Fusion of Refractory Alloys: *Mohsen Taheri Andani*¹; Enrique Lavernia¹; ¹Texas A&M University

9:00 AM

Thermal Control During Laser Powder Bed Fusion of Pure Tungsten Through Optimization of Follower Beam: *Daniel Sinclair*¹; Amaranth Karra¹; Bryan Ebler¹; ¹Carnegie Mellon University

9:20 AM

Tailoring Nb-Ti-Si-B RCCA Microstructures by Modeling and Thermomechanical Processing: *John Titus Barnett*¹; Maria Quintana¹; Byron McArthur²; Peter Collins¹; ¹Iowa State University; ²Air Force Research Laboratory

9:40 AM

Tuning Chemical Short-Range Ordering and Mechanical Properties in a Ductile Refractory Multi-Principal-Element Alloy: *Luke Gaydos*¹; Hailong Huang²; Zongyang Lyu²; Prashant Singh²; Duane Johnson²; Ryan Ott²; Nicolas Argibay²; ¹Iowa State University; ²Ames National Laboratory

10:00 AM Break

10:20 AM

Ultrasonic Atomization of a Hafnium Based Refractory High-Entropy Alloy Ti20Zr20Nb20Hf20Ta20: *Brendon Dodge*¹; Suyash Niraula¹; Thomas Berfield¹; Justin Gillham¹; ¹University of Louisville

10:40 AM Invited

Refractory HEAs: From Nanomechanical Testing to Nanocrystalline Development: *Yu Zou*¹; ¹University of Toronto

LIGHTWEIGHT ALLOYS

Advances in Titanium Technology — Deformation Mechanisms and Mechanical Properties I

Sponsored by: TMS: Titanium Committee

Program Organizers: G. Babu Viswanathan, Ohio State University; Michael Mills, Ohio State University; Sriram Vijayan, Michigan Technological University; Abhishek Sharma, Worcester Polytechnic Institute; Soumya Nag, Oak Ridge National Laboratory; Thomas Broderick, Federal Aviation Administration; Simon Ringer, University of Sydney; Vasisht Venkatesh, Howmet Aerospace; Paraic O'Kelly, Ohio State University

Wednesday AM | October 1, 2025
C172 | Convention Center

Session Chairs: Michael Mills, Ohio State University; Paraic O'Kelly, Ohio State University

8:00 AM Invited

Opportunities and Challenges in Titanium Aerospace Materials from an Industry Perspective: *Kayla Calvert*¹; *Stacey Sharp-Rose*¹; ¹Titanium Metals Corporation (TIMET)

8:20 AM Invited

Probabilistic Dwell Fatigue Life Prediction of Microtextured Ti-6Al-4V: *Sushant Jha*¹; Adam Pilchak²; James Larsen³; Patrick Golden³; Reji John³; ¹University of Dayton Research Institute; ²Pratt and Whitney; ³US Air Force Research Laboratory

8:40 AM Invited

New Insights into the Cold Dwell Fatigue of Titanium: *Adam Pilchak*¹; Asa Frye¹; Michael Gram¹; Iuliana Cernatescu¹; David Furrer¹; ¹Pratt & Whitney

9:00 AM Invited

Influence of Processing and Thermomechanical Loading on Cold Dwell Fatigue Behaviour of Titanium Alloys: *Rolls Royce, UK: K.M. Fox*¹; M. Mulyadi¹; ¹Rolls-Royce plc.

9:20 AM Invited

Parametrically Upscaled Constitutive Models for Multiscale Analysis of Fatigue Nucleation in Ti Alloys: *Somnath Ghosh*¹; Tawqeer Tak¹; Kishore Nair¹; ¹Johns Hopkins University

9:40 AM Invited

Deformation Substructures and Shear Localization at Basal Twist Boundaries in Fatigued Ti-6Al-4V: Nadib Akram¹; Baris Yavas¹; Christopher Collins²; Asa Frye²; Vasisht Venkatesh²; Adam Pilchak²; David Furrer²; Iuliana Cernatescu²; Mark Aindow¹; ¹University of Connecticut; ²Pratt & Whitney

10:00 AM Break

10:20 AM

Slip Analysis in Ti-6246 Alloy During Dwell Fatigue: Yukthesh Venkat Suriseti¹; Vasisht Venkatesh²; Michael Mills¹; G. Babu Viswanathan¹; ¹The Ohio State University; ²Pratt and Whitney

10:40 AM

Understanding the Stochastic Evolution of Microstructural Damage in Aero-Grade Ti-6Al-4V Specimens During Dwell Loading at Ambient Temperature: Nicholas Armstrong¹; Jun Wang²; Sitarama Kada²; Pavel Cizek²; Ross Antoniou¹; Peter Lynch²; ¹Defence Science and Technology Group; ²Institute for Frontier Materials

11:00 AM

Defect-Driven Fatigue Behavior in LPBF Ti-6Al-4V: Insights From Fractographic Analysis: Brett Ley¹; Austin Ngo¹; Oluwatumininu Adeeko¹; Anthony Rollett²; Christian Gobert²; Jack Beuth²; John Lewandowski¹; ¹Case Western Reserve University; ²Carnegie Mellon University

11:20 AM

Slip Heterogeneity in a Colony-Structured Titanium Alloy: Planar Versus Wavy Slip Traces: Yu Zou¹; ¹University of Toronto

IRON AND STEEL (FERROUS ALLOYS)

Advances in Understanding of Martensite in Steels III — Martensite in Steels III

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

Program Organizers: Viraj Ashok Athavale, Nucor Steel Memphis Inc; Michael Gammage, DEVCOM Army Research Laboratory; Daniel Baker, LIFT

Wednesday AM | October 1, 2025
D281 | Convention Center

Session Chairs: Malavikha Rajivmoorthy, Cleveland-Cliffs Research and Innovation Center; Viraj Ashok Athavale, Nucor Steel Memphis Inc

8:00 AM

Cooling Rate Effects on Auto-Tempered Martensite: Insights from High-Resolution Microscopy: Daniel Schrittwieser¹; Hannes Pahr²; Oleksandr Glushko¹; Ronald Schnitzer¹; ¹Montanuniversität Leoben; ²voestalpine Böhler Welding Austria GmbH

8:20 AM

Dislocation Behavior During Yielding and Strain-Hardening of As-Quenched Martensitic Steel: Takumi Osanai¹; Hirotoyo Nakashima¹; Eisaku Sakurada¹; ¹Nippon Steel Corporation

8:40 AM

A Multi-Technique Study on Precipitate Evolution and Mechanical Properties in Q&T Steels: Kapil Dev Sharma¹; Anish Karmakar¹; ¹Indian Institute of Technology, Roorkee

9:00 AM

In-Situ Multi-Scale Analysis of Local Deformation Behavior of Lath Martensite in Low-Carbon-Steel: Shuang Gong¹; Junya Inoue¹; ¹The University of Tokyo

9:20 AM

Effect of Volume Fraction and Mechanical Stability of Retained Austenite on Strain Hardening Behaviour of Fe-0.2C-5Mn-0.8Si-0.4Al Medium Mn Steel: Kamal Kumar Gupta¹; Shiv Brat Singh¹; ¹Indian Institute of Technology Kharagpur

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Growth and Property Control of Nanomaterials I

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; Oliver Diwald, Paris Lodron Universität Salzburg; Hyunjoon Choi, Kookmin University

Wednesday AM | October 1, 2025
B230 | Convention Center

Session Chairs: Haitao Zhang, University of North Carolina at Charlotte; Hyunjoon Choi, Kookmin University; Sanjay Mathur, University of Cologne

8:00 AM Invited

Metal and Metal Oxide Nanoparticles and Quantum Dots for Printed Electronics: Hye-Ryeong Jo¹; Eunhwa Jeon¹; Chang Hoon Koh¹; Yoon-Bong Hahn²; ¹Electronic Materials & Ink, Co., Ltd.; ²Jeonbuk National University

8:30 AM Invited

Creating Nanomaterials in Molten Salts: Yuanbing Mao¹; ¹Illinois Institute of Technology

9:00 AM Invited

Challenges in Manufacturing of Composite Powders for Laser Powder Bed Fusion: Naoyuki Nomura¹; Weiwei Zhou¹; Zhenxing Zhou¹; Mingqi Dong¹; ¹Tohoku University

9:30 AM

Systematic Control of Crystallization and Phase Transformation Behavior of Nanoscale NiTi Films Using Seed Layers: Amirhossein Shafeizad¹; Axel Miranda¹; Jagannathan Rajagopalan¹; ¹Arizona State University

9:50 AM

Utilizing Ternary Halide Salts as a Mechanistic Probe To Explore the Synergy of Cl and Br Ions in the Polyol Synthesis of Silver Nanocubes: Felix Messick¹; Kathryn MacIntosh¹; Robert Rioux¹; ¹Pennsylvania State University

10:10 AM Break

10:30 AM

The Nanofabrication and Unique Properties of Diamond Nancone Arrays with High Gaseous Sensitivity: *Changzhi Gu*¹; ¹Chinese Academy of Sciences

10:50 AM

Shapeshifting and Self-Regenerating Supported Metal Catalysts for Effective CO Conversion: Filippo Colombo¹; Anastasios Tsiotsias²; Benjamin Rudolph¹; Maria Goula²; *Simone Mascotto*³; ¹University of Hamburg; ²University of Western Macedonia; ³University of Koblenz

11:10 AM

Self-Healing, Transparent, and Superhydrophobic Coating with Dual Self-Cleaning Functionality for Enhanced PV Panel Performance: *Sara Lakhoul*¹; ¹UM6P

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Battery and Storage V / Photovoltaics and Photocatalysis

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Wednesday AM | October 1, 2025
B234 | Convention Center

Session Chairs: Michael Naguib, Tulane University; Jianhua Tong, Clemson University

8:00 AM

Extraordinary Inductive and Capacitive Discharge/Charge Behavior of Carbon Fiber, and the Enabled Nonstop Discharge of a Fiber Assembly: *Deborah Chung*¹; Sathwika Chittluri¹; ¹University at Buffalo, The State University of New York

8:20 AM Invited

Solution-Mediated Solid-Solid Transformation Reactions for Electrochromic Materials: *Xuefei Li*¹; ¹Georgia State University

8:50 AM

A Composite Anode of Silicon Oxycarbide and Reduced Graphene Oxide for Lithium-Ion Batteries: *Dillip Panda*¹; Nawraj Sapkota¹; Gangadhar Jella²; Ravindran Sujith²; Apparao Rao¹; Rajendra Bordia¹; ¹Clemson University; ²BITS Hyderabad

9:10 AM

Crystallization Control and Green Fabrication Pathways for Next-Generation Perovskite Solar Cells: *Cyril Chu Fubin Kumachang*¹; Julie Tring¹; Brittlee Reese¹; Mac Fitzgerald¹; Tawanda J. Zimudzi¹; Ivy M. Asuo¹; Nutifafa Y. Doumon¹; ¹Pennsylvania State University

9:30 AM

Optimal Co-Doping of Ti and Co in CaMnO for Solar Thermochemical Fuel Production: *Ting Shen*¹; Jianhua Tong¹; Dina Besisa²; Yasser Ahmed²; Rajendra Bordia¹; ¹Clemson University; ²Central Metallurgical Research and Development Institute

9:50 AM Break

10:10 AM

Polythiophene Based P-N Junction Solar Cells: *Geethanath Duggiralla*¹; Dianlu Jiang¹; ¹California State University Los Angeles

10:30 AM

Silver Bismuth Iodide (Ag₂BiI₅) Screen-Printed Perovskite Carbon Solar Cells: *Varshika Puthan Veedu Sasidharan*¹; Wu Qinjie²; Priyanka Kajal²; Paul Erinjeri Jogi²; Darrell Jun Jie Tay²; Nripan Mathews²; ¹Universidad Autónoma de Nuevo León; ²Nanyang Technological University

10:50 AM

The Photocatalytic Properties of Sr-Excess SrTiO₃: *Sipei Li*¹; Paul Salvador¹; Gregory Rohrer¹; ¹Carnegie Mellon University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Thermoelectrics V/ Energy Harvesting, System and Application

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Wednesday AM | October 1, 2025
B235 | Convention Center

Session Chairs: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jani Peräntie, University of Oulu

8:00 AM Invited

Predicting the Thermoelectric Figure of Merit by Machine Learning: *Holger Kleinke*¹; ¹University of Waterloo

8:30 AM Invited

Machine Learning Pathways to High Thermoelectric Figure-of-Merit: *Joseph Poon*¹; C. T. Ma¹; Wenjie Li²; Bed Poudel²; ¹University of Virginia; ²Pennsylvania State University

9:00 AM Invited

Microwave Processing of Thermoelectric Materials: *Amin Nozariasbmarz*¹; ¹Rowan University

9:30 AM Invited

Thermal Conductivity Imaging to Advance Microstructure Engineering in Thermoelectric and Energy Materials: *Eleonora Isotta*¹; ¹Max Planck Institute Susmat

10:00 AM Break

10:20 AM

Harvesting Indoor Lights for Energy Generation via Photothermal Transparent Thin Films and PVs: Anudeep Katepalli¹; Meher Saketh Gandharapu¹; Thiraj Mohankumar¹; Anton Harfmann¹; Mathias Bonmarin¹; John Krupczak¹; *Donglu Shi*¹; ¹University of Cincinnati

10:40 AM

Single- and Multi-Component Metal Composite Nano-Catalysts for Enhanced Solid Oxide Fuel Cell Operation in Hydrocarbon Fuels: Saad Waseem¹; Edward Sabolsky¹; Katarzyna Sabolsky¹; Seunghyuck Hong²; Mingfei Liu²; Richard Hart³; ¹West Virginia University; ²GE Aerospace; ³GE Vernova

11:00 AM

True Binary Ferroelectric WO₃ Nanoparticles and It's Polaron Driven Opto-Electronic Interaction: Mohammad Mahafuzur Rahman¹; Jose Flores²; Mohamed Yaseen Noor¹; Md Mohsinur Rahman Adnan¹; Alex Blackston¹; Enam Chowdhury¹; Roberto Myers¹; Michael Newburger²; Pelagia-Irene (Perena) Gouma¹; ¹The Ohio State University; ²Air Force Research Lab, Wright Patterson Air Force

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Advanced Processing Technology / Corrosion Behavior of Ceramics / Modeling and Simulation

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Junichi Tatami, Yokohama National University; Young-Wook Kim, WORLDEX Industry & Trading Co., Ltd.; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

Wednesday AM | October 1, 2025
B240/241 | Convention Center

Session Chairs: Sagrario M. Montemayor, Centro de Investigación en Química Aplicada; Tugrul Yumak, West Virginia University

8:00 AM

Design of an Environmentally Safe and Sustainable Process to Synthesize Compositionally Complex Cubic Spinel Ferrites: B. A. Puente-Urbina¹; G. F. Hurtado-López¹; Antonio Fuentes²; F. J. Rodríguez-Varela²; F. J. Rodríguez-González¹; Eric C. Eric C. O'Quinn³; Maik Lang³; Sagrario M. Montemayor¹; ¹Centro de Investigación en Química Aplicada; ²CINVESTAV del IPN; ³University of Tennessee

8:20 AM

Hybrid Microwave Sintering of Electrolytes for SOEC/SOFC Applications: Tugrul Yumak¹; Mohan Thorat¹; Ansan Pokharel¹; Javier Mena¹; Katarzyna Sabolsky¹; Shavinka Jayasekera¹; Terence Musho¹; Edward Sabolsky¹; ¹West Virginia University

8:40 AM

Finite Element Modeling of Microwave-Assisted Calcination of SOEC Perovskite Precursor Powders: Hongwei Liu¹; Ansan Pokharel¹; Logan Proud¹; Brandon Robinson¹; Jianli Hu¹; Katarzyna Sabolsky¹; Javier Mena¹; Tugrul Yumak¹; Ashley Daniszewski²; Christina Wildfire²; Edward Sabolsky¹; Terence Musho¹; ¹West Virginia University; ²National Energy Technology Laboratory

9:00 AM

Firing Behavior of 18th Century European Porcelains: Grace Dunham¹; Thomas Lam²; William Carty¹; ¹Alfred University; ²MCI

9:20 AM

Measurement of Glaze Thermal Expansion via Craze: Michael Carson¹; William Carty²; Hyojin Lee²; Grace Dunham²; ¹Amaco; ²Alfred University

9:40 AM

Development of a Li-Corrosion Resistant Coating for Mullite-Cordierite-Based Refractory: Hyojin Lee¹; William Carty¹; ¹Alfred University

10:00 AM Break

10:20 AM

Effect of SiO₂ Content on High-Temperature Phase Transition and Physical Properties in Calcium Aluminate Cement: Sang-Min Hong¹; Jong-Won Kim¹; Ha-Jin Gu¹; Young-Jae Kim¹; Ah-Hyeon Park¹; Eun-Hee Kim¹; Yong-Hyuk Kim²; Sang-Bae Choi²; Sang-Chae Jeon¹; ¹Changwon National University; ²Chosun Refractories Co., Ltd.

10:40 AM

Reduction Behavior of Mullite/Andalusite-Based Refractories Under Hydrogen Atmosphere and the Effect of Crystalline SiO₂ on Mechanical Strength: Sung-Hyun Kim¹; Jong-Won Woo¹; *Jong-Won Kim*¹; Sang-Min Hong¹; Eun-Hee Kim¹; Rae-Hyeong Park²; Sang-Bae Choi²; Sang-Chae Jeon¹; ¹Changwon National University; ²Chosun Refractories Co., Ltd.

11:00 AM

Breaking the Charge Neutrality Boundary in Perovskite Using the PyCALPHAD Approach: Adam Shenk¹; Ethan Cummings¹; Samuel Krimmel¹; Richard Otis²; Yu Zhong¹; ¹Worcester Polytechnic Institute; ²Proteus Space, Inc.

FUNDAMENTALS AND CHARACTERIZATION

High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI — Experiments: Alloy II

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

Program Organizers: Shuozhi Xu, University of Oklahoma; 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

Wednesday AM | October 1, 2025
C170 | Convention Center

Session Chairs: Yu Zou, University of Toronto; Lia Amalia, University of Tennessee

8:00 AM Invited

Diffraction-Guided Understanding of Materials Processing in High-Entropy Alloys: Fan Zhang¹; ¹National Institute of Standards and Technology

8:30 AM Invited

Direct Visualization of the Existence of Surface Local Chemical Order in a High Entropy CoCrFeMnNi Alloy: *Teyu Chien*¹; ¹University of Wyoming

9:00 AM Invited

Effects of Al Addition in High-Entropy Alloys on the Structure and Properties: *Fuxiang Zhang*¹; ¹Songshan Lake Materials Laboratory

9:30 AM

The Role of Precipitate Size in Cryogenic Deformation Mechanisms and Mechanical Properties of the L12-Strengthened Ferrous Alloy: *Gwanghyeon Moon*¹; *Jinkyung Kim*¹; ¹Hanyang University

9:50 AM Break

10:10 AM Invited

Recent Progress on Short-Range Atomic Ordering in High-Component Materials: *Peter Liaw*¹; *Rui Feng*¹; *Jian-Min Zuo*²; *Lia Amalia*¹; ¹University of Tennessee; ²University of Illinois Urbana-Champaign

10:40 AM

Systematic Investigation on the Mechanical and Deformation Behavior of Additively Manufactured NiCoCr Alloy Under Various Environments: *Thaer Syam*¹; *Adnan Khan*¹; *Imroj Syed*¹; *Ibrahim Karaman*¹; *Bilal Mansoor*¹; ¹Texas A&M University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Hybrid Organic-Inorganic Materials for Alternative Energy — 2 D Materials and Computational Design of Hybrid Organic-Inorganic Materials for Alternative Energy

Program Organizers: *Andrei Jitianu*, Lehman College, City University of New York; *Lisa Klein*, Rutgers University; *Lia Stanciu*, Purdue University; *Mihaela Jitianu*, William Paterson University; *Alessandro Martucci*, University of Padova

Wednesday AM | October 1, 2025
B246 | Convention Center

Session Chair: *Andrei Jitianu*, Lehman College of the City University of New York

8:00 AM Invited

Thermal and Anodic Oxidation Routes to Scalable Metal Oxide Nanostructures and Their Graphene-Based Hybrids for Photoreduction of Cr(VI): *Wai Kian Tan*¹; *Go Kawamura*¹; *Zainovia Lockman*²; *Hiroyuki Muto*¹; *Atsunori Matsuda*¹; ¹Toyohashi University of Technology; ²Universiti Sains Malaysia

8:30 AM Invited

Tuning Chemistry and Morphology in Graphene-Supported Hybrids for Environmental and Energy Applications: *Hong Huang*¹; *Zhuo Yao*²; ¹Wright State University; ²University of Science and Technology Liaoning

9:00 AM Invited

Control of 2D MXenes and their Hybrids for Hydrogen Evolution Electrocatalysis: *Anupma Thakur*¹; *Babak Anasori*¹; ¹Purdue University

9:30 AM Invited

MXenes Hybrids for Energy Applications: *Michael Naguib*¹; ¹Tulane University

10:00 AM Break

10:20 AM Invited

Harnessing Machine Learning and Molecular Design to Advance Low-Dimensional Organic-Inorganic Lead Halides: *Yiying Wu*¹; ¹Ohio State University

10:50 AM Invited

Computational Discovery of New Materials for Singlet Fission in the Solid State: *Noa Marom*¹; ¹Carnegie Mellon University

PROCESSING AND MANUFACTURING

Lightweight Composites, Materials & Alloys — Microstructure, Processing 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

Wednesday AM | October 1, 2025
B231 | Convention Center

Session Chair: *Ramasis Goswami*, Naval Research Laboratory

8:00 AM

Microstructural Refinement Using Ultrasonic Processing of Copper-Chromium-Zirconium Alloy: *Kate Rader*¹; *Robert Meyer*²; *Jaime George*¹; *Aashish Rohatgi*¹; *Ram Canumalla*²; ¹Pacific Northwest National Laboratory; ²Weldaloy Specialty Forgings

8:30 AM

Investigating Filler Wire Contributions to Porosity and Strength in Al 6061-T6 Welds: *Tinku Kumar*¹; *Hariharan V S*¹; ¹Lincoln Electric Company India Private Limited

8:50 AM

Integrating Data-Driven Analyses and Selection of Lightweight Manganite-Based Magnetocaloric Materials for Ambient Temperature Magnetic Refrigeration: *Tanjore Jayaraman*¹; ¹United States Air Force Academy

9:20 AM

Understanding The Role of Alloying on Low Cycle Fatigue Behavior in Mg Alloys: *Justin Smith*¹; *Aeriel Murphy-Leonard*¹; ¹The Ohio State University

9:40 AM Invited

Thermomechanical Fatigue Behavior and Microstructure of Casting Aluminum Alloy Used for Engine Components: *Yi Liu*¹; *Qigui Wang*¹; *Jason Coryell*¹; ¹General Motors

10:10 AM

Anisotropic Continuum Damage Mechanics Based-Fracture Surface: Application to Aluminum Alloy 6DR1: *Ossama Abou Ali Modad*¹; *Georges Ayoub*¹; ¹University of Michigan-Dearborn

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

Wednesday AM | October 1, 2025
B142/143 | Convention Center

Session Chairs: Fei Peng, Clemson University; Surojit Gupta, University of North Dakota

8:00 AM Invited

Direct-Laser-Writing of Transparent Silica and Silica-Titania Glasses: Siddhartha Sarkar¹; Nicholas Tomlinson¹; Rajendra Bordia¹; Jianhua Tong¹; Shunyu Liu¹; Liping Huang²; Hai Xiao¹; *Fei Peng*¹; ¹Clemson University; ²Rensselaer Polytechnic Institute

8:30 AM Invited

Pulsed Neutron Characterization of Additively Manufactured Annular UO₂ Fuels: *Cheng Sun*¹; Sven Vogel²; Patrick Moo³; Donald Brown²; Bjorn Clausen²; ¹Clemson University; ²Los Alamos National Laboratory; ³Far West Fuels

8:50 AM

Sol-Gel Synthesis of Titanium Diboride Powders for Extreme Applications: *Isaac Ntiamoah*¹; Carolina Tallon¹; ¹Virginia Polytechnic Institute and State University

9:10 AM

Thermal Stability and Morphological Transformation of MXene/SiOC Interface: An In-Situ HRTEM Study: *Mubina Shaik*¹; Tim Pieshkov²; Abhijit Biswas²; Ajayan Pulickel²; Kathy Lu¹; ¹University of Alabama at Birmingham; ²Rice University

9:30 AM Invited

Design and Development of Novel Ceramics for Structural Applications: *Surojit Gupta*¹; ¹University of North Dakota

10:00 AM Break

10:20 AM

Superior Fracture Toughness of ZrO₂/Al₂O₃ Nano-Nano Composite With Eutectic Composition: *Manshi Ohyanagi*¹; Yuto Koyanagi¹; Shiryu Fujinaka¹; Kenshiro Shirai¹; Takahito Imai¹; Yoshihiro Shimizu¹; ¹Ryukoku University

10:40 AM

Ni-Zn Ferrite/Metal Nanocomposites Synthesized by Hydrogen Reduction Techniques: *Zisong Wang*¹; ¹University of Pittsburgh

11:00 AM

Influence of B₄C Content and Particle Size on the Mechanical Properties of Al₂O₃-B₄C Composites: *Nazeer Mohammed*¹; Ajit Kumar Naik¹; Prasad D.K.V.D¹; Lava Kumar Pillari²; Lukas Bichler²; Tapas Laha¹; Siddhartha Roy¹; ¹IIT Kharagpur; ²The University of British Columbia-Okanagan

SPECIAL TOPICS

Materials and Manufacturing in Low Earth Orbit (and Beyond) — Welding in Low Earth Orbit- History and Planned Experiments

Sponsored by: TMS: Solidification Committee

Program Organizers: David Williams, Ohio State University; Alan Luo, Ohio State University; Glenn Daehn, Ohio State University; Antonio Ramirez, The Ohio State University; Boyd Panton, Ohio State University; Nathan Ames, Ohio State University; Ken Savin, REDwire Space; Jonathan Volk, Voyager Space

Wednesday AM | October 1, 2025
C161B | Convention Center

Session Chair: Boyd Panton, Ohio State University

9:00 AM Introductory Comments

9:10 AM

Laser Beam Welding in Space – From Science to Technology Development: Antonio Ramirez¹; *Boyd Panton*¹; Ali Nassiri¹; Kaue Riffel¹; Eugene Choi¹; Aaron Brimmer¹; Will McAuley¹; ¹Ohio State University

9:30 AM

Instrumentation for the Testing of Laser Beam Welding Under Simulated Space Conditions via Parabolic Flight: *Aaron Brimmer*¹; Eugene Choi¹; Will McAuley¹; Kaue Riffel¹; Boyd Panton¹; Antonio Ramirez¹; ¹The Ohio State University

9:50 AM

Challenges in Laser Welding for Space: Metal Vapor, Lens Fogging, and Plume Effects: *Eugene Choi*¹; Boyd Panton¹; Antonio Ramirez¹; Kaue Riffel¹; Aaron Brimmer¹; Will McAuley¹; ¹The Ohio State University

10:10 AM Break

10:30 AM

Porosity Formation and Microstructure Characterization in Pulsed LBW of 316L SS Under Space Conditions and Different Levels of Gravity: *Kaue Riffel*¹; Eugene Choi¹; Aaron Brimmer¹; Will McAuley¹; Boyd Panton¹; Ali Nassiri¹; Antonio Ramirez¹; ¹Ohio State University

10:50 AM

Numerical Modeling of Laser Beam Welding for In-Space Applications: Insights From Parabolic Flight Experiments: *Will McAuley*¹; Aaron Brimmer¹; Eugene Choi¹; Kaue Riffel¹; Ali Nassiri¹; Boyd Panton¹; Antonio Ramirez¹; ¹The Ohio State University

11:10 AM Concluding Comments

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics I

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

Program Organizers: Fei Peng, Clemson University; Kathy Lu, University of Alabama Birmingham; Dilpuneet Aidhy, Clemson University; Yi Je Cho, Sunchon National University

Wednesday AM | October 1, 2025
D283 | Convention Center

Session Chair: Mohammad Hassan Shirani Bidabadi, University of Alabama at Birmingham

8:00 AM Invited

Is AI/ML All We Need for Autonomous Experiments: *Yongtao Liu*¹; ¹Oak Ridge National Laboratory

8:30 AM

The Emergence of Machine Learning and Deep Learning Based Image Segmentation for Powder and Particle Characterization in Materials: *Andy Holwell*¹; ¹Carl Zeiss Microscopy LLC

8:50 AM

Designing Materials and Processes for Power Generation Using Advanced AI Tools Such as Graph Neural Networks: *Vyacheslav Romanov*¹; ¹DOE-NETL

9:10 AM

The Applications of Generative Adversarial Networks (GANs) on the Prediction of the Material's Microstructure: Ningxuan Wen¹; Rajendra Bordia¹; Jianhua Tong¹; Dongsheng Li²; Hai Xiao³; *Fei Peng*¹; ¹Clemson University; ²Advanced Manufacturing LLC

9:30 AM

Optimizing Training Sets for Deep Learning-Based Platinum Particle Analysis for Nuclear Power Corrosion Prevention: *Txai Sibley*¹; Joe Giannelli²; Cem Topbas²; Elizabeth Holm²; Kevin Field²; ¹University of Michigan; ²EPRI

9:50 AM Break

10:10 AM Invited

Machine Learning Disordered Materials Properties: Hengrui Zhang¹; Jie Chen¹; James Rondinelli¹; *Wei Chen*¹; ¹Northwestern University

10:40 AM

Preprocessing of Inconsistent Creep Data Collected from a Literature Survey to Provide Reliable and Consistent Creep Life Prediction: *Taejoo Lee*¹; Chang-Seok Oh²; Yoon Suk Choi¹; ¹Pusan National University; ²Korea Institute of Materials Science

11:00 AM Invited

Imbalance Learning, Inverse Design and Transfer Learning of High Entropy Alloys: *Yoon Suk Choi*¹; Libin Zhang¹; Dae-Geun Nam²; ¹Pusan National University; ²Korea Institute of Industrial Technology

MATERIALS-ENVIRONMENT INTERACTIONS

Materials Under Extreme Environment — Materials Under Extreme Environment I

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

Program Organizers: Robert Slapikas, DEVCOM Army Research Laboratory; Anindya Ghoshal, DEVCOM Army Research Laboratory; Douglas Wolfe, Pennsylvania State University

Wednesday AM | October 1, 2025
D181 | Convention Center

Session Chairs: Robert Slapikas, DEVCOM Army Research Laboratory; Anindya Ghoshal, DEVCOM Army Research Laboratory; Douglas Wolfe, The Pennsylvania State University

8:00 AM Introductory Comments

8:05 AM

A High-Throughput Test Methodology for Determining the Hugoniot Elastic Limit: *Arjun Sreedhar Sreepadman*¹; K T Ramesh¹; ¹Johns Hopkins University

8:25 AM

Coupled Extremes in Nanoindentation: Temperature and Strain Rate Effects in Structural Materials: *Kevin Schmalbach*¹; Eric Hintsala¹; Sanjit Bhowmick¹; ¹Bruker Nano

8:45 AM

Design of Oxidation Resistant HfC-TaC Ultra-High Temperature Ceramics Based on Thermodynamic and Kinetic Modeling of the Hf-Ta-C-O System: *Rahim Zaman*¹; Elizabeth Opila²; Bi-Cheng Zhou¹; ¹University of Virginia

9:05 AM

Impact of Microstructure on the Oxidation Resistance of Silicon Carbide Manufactured by Two Step Sintering: *Cooper Howard*¹; Scott Mixture¹; ¹Alfred University

9:25 AM

Microstructural Evolution and Strength of 3D-Printed Oxide-Dispersion and Precipitate Strengthened Superalloys: *Andreas Bezold*¹; Subham Chattoraj¹; Kojo Benefo¹; Calvin Stewart¹; Timothy Smith²; Michael Mills¹; ¹The Ohio State University; ²NASA Glenn Research Center

9:45 AM

High Temperature Ablation of Pressureless Sintered HfC-SiC-TaC Ceramics: *Naomy Serrano*¹; Lucia Ruiz²; Caden Doolittle¹; David Burk¹; Anindya Ghoshal²; Scott Walck²; Lionel Vargas-Gonzalez²; Rick Reidy¹; Marcus Young¹; Andrey Voevodin¹; Samir Aouadi¹; ¹University of North Texas; ²DEVCOM Army Research Laboratory

10:05 AM Break

10:25 AM

Developing Advanced In-Situ Microscopy Techniques for Testing Materials Under Coupled Extremes: *Elijah Davis*¹; Khalid Hattar¹; ¹University of Tennessee Knoxville

10:45 AM

Development of Improved Titanium Coatings Based on Thermodynamic Modeling and Microstructure Studies: Borys Sereda¹; Irina Kruglyak¹; Dmytro Sereda¹; Dmytro Kiforuk¹; Ruslan Krivko¹; ¹DSTU

FUNDAMENTALS AND CHARACTERIZATION

Microstructural Control in Materials Processing: Role of Phase Transformation Pathways — Microstructural Control in Materials Processing: Role of Phase Transformation Pathways I

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Bharat Gwalani, North Carolina State University; Soumya Nag, Oak Ridge National Laboratory; Abhishek Sharma, Worcester Polytechnic Institute; Sriswaroop Dasari, University of Texas at El Paso; Ashley Paz y Puente, University of Cincinnati; Paul Gibbs, Los Alamos National Laboratory; Sophie Primig, University of New South Wales

Wednesday AM | October 1, 2025
C162B | Convention Center

Session Chairs: Bharat Gwalani, North Carolina State University; Soumya Nag, Oak Ridge National Laboratory; Ashley Paz y Puente, University of Cincinnati

8:00 AM Invited

Cold-Rolling-Induced Novel Sub-Grain Structures in NiTi SMAs Enabling Unique Transformation Pathways and Mechanical Behavior: Qianglong Liang¹; Dong Wang¹; Michael Mills²; Yunzhi Wang²; ¹Xi'an Jiaotong University; ²Ohio State University

8:30 AM

On the Balance Between Strengthening Effect and Shape Memory Properties in NiTiHf-Based Alloys With Different Al Additions and Complex Precipitation Structure: Flavia Gallo¹; Eitan Hershkovitz¹; Soumya Bandyopadhyay¹; Michael Tonks¹; Honggyu Kim¹; Michele Manuel²; ¹University of Florida; ²University of Pittsburgh

9:00 AM

Effect of Short Annealing Treatments on the Microstructure of Superelastic Nitinol Sheets: Aref Golsorkhi¹; Dinc Erdeniz¹; ¹University of Cincinnati

9:20 AM

High-Throughput Quantification of Recrystallization Parameters for Alloy Development: Finn Birchall¹; Catherine Bishop¹; ¹University of Canterbury

9:50 AM Break

10:10 AM Invited

Advancing Nuclear Material Processing via Friction Stir Consolidation and Layer Deposition: Subhashish Meher¹; Tianhao Wang¹; Mohan Sai Kiran Kumar Yadav Nartu¹; David Garcia¹; Jorge dos Santos¹; Isabella van Rooyen¹; ¹Pacific Northwest National Laboratory

10:40 AM

Thermo-Mechanical Processing for Significant Strength Improvements in a NiCoCr-Based Alloy Using a Multi-Length Scale Strengthening Approach: Martin Dettois¹; Chang-Yu Hung¹; Milan Heczko²; Chenyang Li³; Dallin Barton⁴; Wei Chen³; Arun Devaraj⁴; Michael Mills²; Paul Jablonski¹; Stoichko Antonov¹; ¹National Energy Technology Laboratory; ²The Ohio State University; ³University of Buffalo; ⁴Pacific Northwest National Laboratory

11:10 AM Invited

Microstructural Control Strategies to Slow Sensitization Rates in 5XXX Series Aluminum Alloys: Likun Sun¹; Gajanan Jayade¹; Matthew Steiner¹; ¹University of Cincinnati

11:40 AM

Effect of Hot Strength and Alloying on Additive Friction Stir Deposition: Merris Corinne Wells¹; Thomas Dorin¹; ¹Deakin University Institute for Frontier Materials

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials V

Sponsored by: ACeRS Bioceramics Division, TMS: Biomaterials Committee

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

Wednesday AM | October 1, 2025
C171 | Convention Center

Session Chairs: Janet Gbur, Case Western Reserve University; Antonia Ressler, Tampere University

8:00 AM Invited

Design, Fabrication, and Testing of a Novel High-Density, In-Line Connector for Neuroprosthetics: Janet Gbur¹; Douglas Shire¹; ¹Louis Stokes Cleveland VA Medical Center

8:20 AM Invited

Deciphering the Role of Microstructure in Governing Corrosion and Aluminum Release in Mg-Al Alloys: Sreenivas Raguraman¹; Mitchell Connon²; Camryn Byrum¹; Rohit Berlia¹; Veronica Ivanovskaya¹; Beril Ulugun¹; Suhas Prameela³; Roger Guillory²; Timothy Weihs¹; ¹Johns Hopkins University; ²Medical College of Wisconsin; ³University of Utah

8:40 AM

Effect of Processing on the Morphology and Electrical Properties of Synthetic Bioceramics: Jakob Peabody¹; Nithin Tangirala¹; Lauren Gower¹; Florence Lucey¹; Narasimha Prasad¹; Ching Hua Su¹; Bradley Arnold¹; Fow-Sen Choa¹; Brian Cullum¹; Laxmi Hatte¹; Narsingh Singh¹; ¹University of Maryland Baltimore County

9:00 AM

Tailoring Mechanical Properties of NiTi Shape Memory Alloys Through Key Parameters in One-Dimensional Compositional Modulation: Zexu Chen¹; Yunzhi Wang¹; ¹The Ohio State University

9:20 AM Invited

Battling Infections in Bone Regeneration: The Power of Metal-Doped Hydroxyapatite: *Antonia Ressler*¹; Tomislav Ivankovic²; Jasna Hrenovic²; Inga Urllic²; Setareh Zakeri¹; Blanka Dadic²; Virginia Alessandra Gobbo¹; Ivana Goic-Barisic³; Jonathan Massera¹; Erkki Levänen¹; ¹Tampere University; ²University of Zagreb; ³University Hospital of Split

9:40 AM

Novel Ceramic Nano-Composite Coatings for Improved Implant Performance: *Radha Trivedi*¹; Carolina Tallon¹; John-Paul O'Shea²; ¹Virginia Polytechnic Institute and State University; ²Virginia Tech Carilion School of Medicine

10:00 AM

Engineered Porosity Hydroxyapatite - Sodium Potassium Niobate Bio-Composites: *Komalakrushna Hadagall*¹; Bikramjit Basu²; Rajendra Bordia¹; ¹Clemson University; ²Indian Institute of Science, Bangalore

CERAMIC AND GLASS MATERIALS

Phase Transformations in Ceramics: Science and Applications — Phase Transformations in Ceramics I

Sponsored by: ACerS Basic Science Division

Program Organizers: Scott McCormack, University of California, Davis; Theresa Davey, Bangor University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Sanjay V. Khare, University of Toledo

Wednesday AM | October 1, 2025
B132 | Convention Center

Session Chairs: Scott McCormack, University of California, Davis; Theresa Davey, Bangor University

8:00 AM Introductory Comments

8:10 AM Invited

New Directions for Lattice Engineering in Shape Memory Ceramics: *Alejandra Slagter*¹; Christopher Schuh¹; ¹Northwestern University

8:40 AM Invited

Diffusionless Transformations in Ceramics: Can Brittle Materials Survive Martensitic Transitions?: *Katherine Faber*¹; Laura Quinn¹; ¹California Institute of Technology

9:10 AM Invited

Stress History Encoding in Rare Earth Orthophosphate Ceramics: *Corinne Packard*¹; ¹University of Southern California

9:40 AM Invited

Theory and Phase-Field Models of Phase Transformations Starting From Classical First and Second Laws of Thermodynamics: *Long-Qing Chen*¹; ¹Pennsylvania State University

10:10 AM Break

10:30 AM Invited

Pressure-Induced Crystal Transformation With Thermodynamic Implications: *Xiaofeng Guo*¹; Shinyo Bang¹; Xiaodong Zhao¹; Andrew Strzelecki²; Richard Brutchey³; Hongwu Xu²; ¹Washington State University; ²Los Alamos National Laboratory; ³University of Southern California

11:00 AM Invited

Atomic-Scale Structural Analysis of Metastable Zirconia: *Maik Lang*¹; Alexandre Solomon¹; Eric O'Quinn¹; Gianguido Baldinozzi²; Juejing Liu³; Xiaofeng Guo³; Joerg Neuefeind⁴; Christina Trautmann⁵; ¹University of Tennessee; ²Université Paris-Saclay; ³Washington State University; ⁴Oak Ridge National Laboratory; ⁵GSI Helmholtzzentrum für Schwerionenforschung

11:30 AM

Characterization of High-Energy Ball Mill Induced Metastable Phase Transformations in Lanthanide Sesquioxides: *William Reed*¹; Casey Corbridge¹; Antonio Fuentes²; Eric O'Quinn¹; Changyong Park³; David Sprouster⁴; Maik Lang¹; ¹University of Tennessee; ²Cinvestav Unidad Saltillo; ³Argonne National Laboratory Advanced Photon Source HPCAT; ⁴Stony Brook University, NSLII

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Porous Materials for Energy and Environment Applications — Porous Materials II

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

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

Wednesday AM | October 1, 2025
B244/245 | Convention Center

Session Chairs: Kevin Wang, University of South Carolina; Winnie Wong-Ng, National Institute of Standards and Technology (NIST); Lan Li, Boise State University; Eric Cockayne, National Institute of Standards and Technology

8:00 AM Invited

Simple, Tough, and Effective Porous Coating for Anti-Corrosion Application: *Fangming Xiang*¹; David Hopkinson¹; ¹National Energy Technology Laboratory

8:30 AM Invited

Novel Nanostructured Porous Materials for Detection and Degradation of Persistent Organic Pollutants: *Wenhu Wang*¹; Sathvik Peddamalla¹; *Sharmila Mukhopadhyay*¹; ¹University of Maine

9:00 AM Invited

Crystal Packing-Related Porosity in Molecular Co-Crystals: Porphyrin/C60 as a Working Model System: *Lawrence Cook*¹; Greg Brewer²; Winnie Wong-Ng³; ¹PhazePro Technologies; ²The Catholic University of America; ³National Institute of Standards and Technology

9:30 AM Invited

Binder Jet Printing and Sintering of Metal Foams Parts Through the Powder Space-Holder Technique: *Pierangeli Rodriguez De Vecchis*¹; *Markus Chmielus*¹; ¹University of Pittsburgh

10:00 AM Break

10:20 AM

Novel Porous Material for Energy Conservation: *Afsaneh Rabiei*¹; ¹North Carolina State University

10:40 AM

Preparation of Porous Catalysts With a Rene Structure Using Functionally Active Charges: Borys Sereda¹; Irina Kruglyak¹; Dmytro Sereda¹; ¹DSTU

11:00 AM

Production of Nickel-Based Catalysts for Efficient Purification of Waste Gas Emissions: Borys Sereda¹; Irina Kruglyak¹; Dmytro Sereda¹; Ivan Suslov¹; ¹DSTU

11:20 AM

Ultralow Thermal Conductivity of Porous SiOC Aerogels for High-Temperature Applications: Adane Muche Abebe¹; Mattia Biesuz¹; Cekdar Vakifahmetoglu²; Michele Cassetta³; Alexandro Martucci⁴; Gian Demonico Soraru¹; ¹University of Trento; ²Izmir Institute of Technology; ³University of Verona; ⁴University of Padova

NUCLEAR ENERGY

Progressive Solutions to Improve the Corrosion Resistance of Nuclear Waste Storage Materials — Improving Processing of Nuclear Waste Glass, Mechanical Mechanisms of Crack Propagation and Measurement of Residual Stresses in Stainless Steel

Sponsored by: TMS: Corrosion and Environmental Effects Committee, TMS: Energy Committee

Program Organizers: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech

Wednesday AM | October 1, 2025
 D280 | Convention Center

Session Chairs: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech

8:00 AM Introductory Comments

8:05 AM

Investigating the Effects of Alumina Sources and Rhenium Concentrations on the Rhenium Incorporation Into LAW Glass: Keith Bryce¹; Derek Dixon¹; Ji-Hye Seo¹; Richard Pokorný²; Albert Kruger³; ¹Pacific Northwest National Laboratory; ²University of Chemistry and Technology, Prague; ³US DOE Hanford Field Office

8:35 AM

Analysis of Plugging of High-Level Waste Melter Pour Spout: Donna Guillen¹; John Vienna²; Pavel Hrma³; Albert Kruger⁴; ¹Idaho National Laboratory; ²Pacific Northwest National Laboratory; ³AttainX; ⁴U.S. Department of Energy

9:05 AM Invited

Mechanical Perspectives on Chloride-Induced Stress Corrosion Cracking of Stainless Steel: Janelle Wharry¹; Lucille Dentice¹; Ronit Roy¹; Nathan Gehmlich²; Thang Duc Nguyen²; Maria Okuniewski²; Haozheng Qu³; Rebecca Schaller⁴; Mychailo Toloczko⁵; ¹University of Illinois; ²Purdue University; ³GE Vernova; ⁴Sandia National Laboratories; ⁵Pacific Northwest National Laboratory

9:35 AM Invited

Measuring Residual Stresses in Additively Manufactured Large 316L Stainless Steel Rings on VULCAN: Dunji Yu¹; Wei Tang¹; Ke An¹; Harley Skorpenske¹; Dominic Giuliano¹; Oscar Martinez¹; Andrzej Nycz¹; ¹Oak Ridge National Laboratory

PROCESSING AND MANUFACTURING

Sintering and Related Powder Processing Science and Technologies — Field-Assisted Sintering and SPS: Mechanisms, Materials, and Applications

Sponsored by: TMS: Powder Materials Committee, ACerS Basic Science Division

Program Organizers: Charles Maniere, CNRS; Eugene Olevsky, San Diego State University; Ricardo Castro, Lehigh University; Elisa Torresani, San Diego State University; Diletta Giuntini, Eindhoven University of Technology; Wolfgang Rheinheimer, University of Stuttgart

Wednesday AM | October 1, 2025
 B233 | Convention Center

Session Chairs: Dariusz Garbiec, Lukasiewicz; Balice Lucas, Juelich

8:00 AM Invited

Advanced Manufacturing Enabled by Spark Plasma Sintering: Dariusz Garbiec¹; Grzegorz Kubicki¹; Jakub Wiśniewski¹; Albert Kania¹; Wiktoria Krzyżaniak¹; Diana Marcano¹; Maria Wiśniewski¹; ¹Lukasiewicz Research Network - Poznan Institute of Technology

8:30 AM Invited

High-Efficient Sintering Technologies for Advanced Energy Materials: Luca Balice¹; Syed Ali Afzal¹; Moritz Kindelmann¹; Tarini Prasad Mishra¹; Martin Bram¹; Olivier Guillon¹; ¹IMD-2, Forschungszentrum Jülich GmbH

9:00 AM Invited

Enhancing Polymer-Derived TiC/SiC Ceramics With MXene Reinforcements via Spark Plasma Sintering: Kathy Lu¹; Mohammad Shirani¹; Wei Li¹; ¹University of Alabama Birmingham

9:30 AM

Enabling Advanced Materials With Spark Plasma Sintering: From R&D to Scalable Production at California Nanotechnologies: Eric Eyerma¹; Christopher Melnyk¹; ¹California Nanotechnologies

9:50 AM Invited

FAST/SPS: Industrial Post-Process for Full Densification of 3D Complex Shape From Sinter Based Additive Manufacturing Processes: Arnaud Fregeac¹; Meyane Hurtault¹; Yannick Beynet¹; Romain Epherre¹; ¹NORIMAT

10:20 AM Break

10:40 AM Invited

Effect of High Pressure Spark Plasma Sintering on Microstructure and Properties of Nano-Structured Magnesium Aluminate Spinel: Sandrine Cottirino¹; Thierry Douillard¹; Nicholas Blanchard¹; Laurent Gremillard¹; Sylvain Meille¹; Sylvie Le Floch¹; ¹MATEIS Laboratory

11:10 AM

Solid-State Diffusion Bonding for INCONEL 617 Superalloy Using Field-Assisted Sintering Technology (FAST) Guided by CALPHAD Approach: Husain Alnaser¹; Abdulaziz Kurdi²; Ahmed Degnah²; ¹TiCoNi Co.; ²KACST

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development IV — Steel Development Supporting Sustainable Manufacturing and Energy Infrastructure

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

Program Organizers: Joshua Mueller, Michigan Technological University; Adriana Eres-Castellanos, Los Alamos National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, CEIT-BRTA; Jeongho Han, Hanyang University; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Michigan Technological University

Wednesday AM | October 1, 2025
D282 | Convention Center

Session Chairs: Jonah Klemm-Toole, Colorado School of Mines; Josh Mueller, Michigan Technological University; Adriana Eres-Castellanos, Los Alamos

8:00 AM Introductory Comments

8:05 AM Invited

Low Emission Thin Slab Direct Rolling of Ultra-High Strength Steels: *Charles Enloe*¹; ¹Steel Dynamics

8:45 AM Invited

Advancing Steel: Innovations in Lightweight Applications and Sustainable Processing: *Daniel Coughlin*¹; ¹United States Steel Corp

9:25 AM Invited

Exploring the Scalability of Accumulative Roll Bonding Nanolaminates for Pulsed Electromagnets by Substituting an Interstitial Free Steel for Niobium: *Taylor Jacobs*¹; Tessa Van Volkenburg¹; Bradley Hall²; David Austin²; Ted Agerton¹; ¹Helion Energy; ²Materion Performance Materials - Lincoln

10:05 AM Break

10:25 AM

Methodology to Evaluate the Heat Checking Resistance of Open-Die Forge Tooling: *Jack Schaller*¹; Daniel Branagan¹; Joshua Mueller¹; ¹Michigan Technological University

10:55 AM Invited

Metallurgical Analysis and Forward Modeling of Hybrid Laser Arc Welds for SMR Containment Vessels: *Christopher Finfrook*¹; Jeffrey Rodelas¹; Dominic Piccone¹; Elizabeth Smith¹; Edmundo Corona¹; Charles Bryan¹; Frank DelRio¹; Priya Pathare¹; ¹Sandia National Laboratories

11:35 AM

Effect on Magnetic Properties of Simulated Twin Roll Cast Non-Grain Oriented Si Steel: *Naram Naidu Messala*¹; Justin Singleton¹; Mario Buchely¹; Ronald O'Malley¹; Paul Kelly²; Rama Mahapatra²; ¹Missouri University of Science and Technology; ²Consultant Castrip LLC

SPECIAL TOPICS

TMS Frontiers of Materials Award Symposium: Harnessing Charged and Chemical Defects for Exceptional Structural and Functional Properties — TMS Frontiers of Materials Award Symposium III

Sponsored by: TMS: Nanomechanical Materials Behavior Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizer: Yu Zou, University of Toronto

Wednesday AM | October 1, 2025
C162A | Convention Center

Session Chairs: Liang Qi, University of Michigan; Maryam Ghazisaeidi, The Ohio State University

8:00 AM Invited

Tailoring Defects in Semiconductors: From Highly Mismatched Alloys to Polytype Heterostructures: *Rachel Goldman*¹; ¹University of Michigan

8:30 AM Invited

Understanding Self-Catalyzed Growth Kinetics of III-V Semiconductors by Modeling Solid-Melt Interfaces: *Zhucong Xi*¹; *Liang Qi*²; ¹University of Michigan

9:00 AM Invited

The Origin of Photo Plasticity in II-V Compounds: *Maryam Ghazisaeidi*¹; ¹Ohio State University

9:30 AM Invited

Atomistic Roughening of m-Long Dislocation Lines Under Electric Fields: *Liming Xiong*¹; ¹North Carolina State University

10:00 AM Invited

On the Embrittlement of Grain Boundaries in CdTe from CdCl₂ Passivation: *Jonathan Cappola*¹; Joshua Carbajal¹; Feng Yan¹; Lin Li¹; ¹Arizona State University

MATERIALS-ENVIRONMENT INTERACTIONS

Understanding and Mitigating High Temperature Corrosion Processes Through Synergistic Integration of Experimental, Computational and Manufacturing Techniques — Multiscale Modeling of Corrosion Induced Degradation of High Temperature Alloys

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Brian Gleeson, University of Pittsburgh; Tianle Cheng, National Energy Technology Laboratory; Mathias Galetz, DECHEMA-Forschungsinstitut

Wednesday AM | October 1, 2025
B242/243 | Convention Center

Session Chairs: Mathias Galetz, DECHEMA Corrosion Center; Rishi Pillai, ORNL; Brian Gleeson, University of Pittsburgh

8:00 AM Invited

Modeling Premature Breakaway Oxidation of Ferritic Stainless Steels Above 850°C: *Anton Chyrkin*¹; Jan Froitzheim¹; ¹Chalmers University of Technology

8:30 AM Invited

Phase Field Informed Poisson-Nernst-Planck Model for Corrosion in Molten Salt Environments: *Chaitanya Bhavé*¹; Parikshit Bajpai¹; Mauricio Tano Retamales¹; Samuel Walker¹; ¹Idaho National Laboratory

9:00 AM

Predicting Internal to External Oxidation in High-Temperature Ni-Cr Alloys Using a CALPHAD-Informed Phase-Field Model: *Ziming Zhong*¹; Peichen Wu²; Rishi Pillai³; Kumar Ankit¹; ¹Arizona State University; ²Texas A&M University; ³Oak Ridge National Laboratory

9:20 AM

Discovering Mappings Between Thermodynamic States in Metal Oxidation Using Machine Learning: *Nathan Bianco*¹; Scott Monismith¹; Remi Dingreville¹; ¹Sandia National Laboratories

9:40 AM

AI-Driven Multiscale Computational Framework for Corrosion-Induced Degradation of High Temperature Alloys: *Praneeth Bachu*¹; Marie Romedenne¹; Severine Cambier¹; Rishi Pillai¹; ¹Oak Ridge National Laboratory

MATERIALS-ENVIRONMENT INTERACTIONS

Understanding Corrosion-Related Cracking — Complex Corrosion Conditions and Cracking, Corrosion Fatigue and Beyond

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Tianle Cheng, National Energy Technology Laboratory; Hyokyung Sung, Kookmin University; Gordon Tatlock, University of Liverpool

Wednesday AM | October 1, 2025
D182 | Convention Center

Session Chairs: Tianle Cheng, NETL; Hyokyung Sung, Kookmin University

8:00 AM Invited

Effect for Hydrogen Embrittlement and Sulfide Stress Cracking in HSLA Carbon Steel When Exposed to H₂S Environments: *Homero Castaneda*¹; Raymundo Case¹; Lianlian Liu²; ¹Texas A&M University; ²Verdag

8:30 AM Invited

Influence of Cold Work on Environmentally Assisted Cracking of a Single Crystal Nickel Based Superalloy CMSX-4: *Grant Gibson*¹; ¹Rolls-Royce Plc.

9:00 AM Invited

Understanding the Ability of Combined Effects Corrosion Fatigue Accelerated Testing to Properly Reflect In-Service Performance for Aerospace Al Alloys: *Jenifer Locke*¹; Olivia Underhill¹; Brandon Free²; Daniel Egbuzie¹; Jason Niebuhr³; Sarah Dorman³; Christopher Taylor¹; ¹Ohio State University; ²LTA Research; ³SAFE Inc

9:30 AM

Influence of Crack Environment pH on Corrosion Fatigue Crack Growth in Aerospace Aluminum Alloys: *Gabby Montiel*¹; Jenifer Locke¹; ¹Ohio State University

9:50 AM

Understanding the Role of Microstructure on the Sub Critical Crack Growth Rate and Crack Path in Pipeline Ferritic Steels: *Elisabeth Kuebel*¹; Aerial Leonard¹; Ramgopal Thodla²; ¹Ohio State University; ²DNV GL

10:10 AM Break

10:30 AM Invited

Misch Metal-Induced Corrosion Resistance Enhancement in Ti-Based Amorphous Powders: *YeonJoo Lee*¹; Hyokyung Sung¹; Jae Bok Seol¹; Kisub Cho¹; Hwi Jun Kim²; Hyunjoo Choi¹; ¹Kookmin University; ²Korea Institute of Industrial Technology

10:50 AM Invited

Reduced Graphene Oxide as a Protection Layer for Al: Hanuel Jang¹; Hyunjoo Cho¹; ¹Kookmin University

11:20 AM

Study of the Role of Hydrogen in the Cold-Cracking of As-Cast 7xxx Aluminum Alloys: *Jason Kramer*¹; ¹Carnegie Mellon University

SPECIAL TOPICS

ACerS Robert B. Sosman Award Symposium: Solid State Chemistry Meets Solid State Ionics — Basic Science Robert B. Sosman Award Lecture

Sponsored by: ACerS Basic Science Division

Program Organizer: William Chueh, Stanford University

Wednesday PM | October 1, 2025
B131 | Convention Center

Session Chair: Xin Xu, Arizona State University

1:00 PM Keynote

Interfacial Defect Chemistry of Ceria: *Sossina Haile*¹; ¹Northwestern University

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling - Microstructures and Thermal Analyses II

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

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

Wednesday PM | October 1, 2025
C150 | Convention Center

Session Chairs: Li Ma, Johns Hopkins University Applied Physics Laboratory; Jing Zhang, Purdue University; Charles Fisher, NSWC Carderock Division

2:00 PM

Investigation of Argon Gas Flow and Spatter Dynamics in Laser Powder Bed Fusion Using the Aconity MIDI System: *Jashanpreet Saini*¹; Nicholas O'Brien¹; Satbir Singh¹; Jack Beuth¹; ¹Carnegie Mellon University

2:20 PM

Multi-Fidelity Framework to Predict the Melt Pool Characteristics for Laser Powder Bed Fusion of Inconel 718: *Abdul Khalad*¹; ¹Deakin University

2:40 PM

Net Shape Metal Additive Manufacturing via Polymer Bound Energetics in a Non-Inert Environment: *Mrinaal Lorengo*¹; Ji Ma¹; ¹University of Virginia

3:00 PM

In Situ Modulation of Residual Stresses During Laser Powder Bed Fusion: *Edwin Schwalbach*¹; Rose Eckerle²; Joshua Ward²; Mark Obstalecki³; Paul Shade¹; Mitchell Hughes²; Gregory Sparks²; Taylor Schuller³; Christopher Budrow⁴; Kelly Nygren⁵; Diwakar Naragani⁶; ¹Air Force Research Laboratory; ²University of Dayton Research Institute; ³Materials Resources LLC; ⁴Budrow Consulting LLC; ⁵Cornell University; ⁶QuantiMACS LLC

3:20 PM Break

3:40 PM

Thermodynamic Modeling to Guide Process Optimization Through Minimization of Sigma Phase Formation in Graded Stainless Steel-Vanadium Structures: *Mikayla Obrist*¹; Bernard Gaskey¹; Cheryl Hawk¹; Robert Hackenberg¹; Saryu Fensin¹; John Carpenter¹; ¹Los Alamos National Laboratory

4:00 PM

In-Situ Exposure of Microstructure via Spot Melting in Electron Beam Powder Bed Fusion: *Toan Truong*¹; Haojun You¹; Mohsen Taheri Andani¹; ¹Texas A&M University

ADDITIVE MANUFACTURING

Additive Manufacturing of Ceramic-Based Materials: Process Development, Materials, Process Optimization and Applications — Ceramic Powder Bed Processes

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

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

Wednesday PM | October 1, 2025
C161A | Convention Center

Session Chairs: Chris Gump, Forge Nano; Hideyuki Kanematsu, BEL Inc.

2:00 PM Invited

Functional Defects in Advanced Ceramics Fabricated by Selective Laser Sintering: *Bai Cui*¹; Lanh Trinh¹; Xiang Zhang¹; Fei Wang¹; Luke Wadle¹; Haoyu Dong¹; Yongfeng Lu¹; ¹University of Nebraska Lincoln

2:30 PM

Expanding Laser Powder Bed Fusion to Functional Ceramics: Bulk MoC Cathodes for Catalysis: *Fanyue Kong*¹; Keithen Orson¹; Haobo Wang¹; Sanjay Choudhary¹; Petra Reinke¹; Ji Ma¹; ¹University Of Virginia

2:50 PM

Atomic Layer Deposition (ALD) for Nanoscale SiC AM Feedstock Improvement: *Chris Gump*¹; Guillermo Rojas¹; Dane Lindblad¹; Casey Christopher¹; Tommy Martin¹; ¹Forge Nano

3:10 PM Break

3:30 PM

Effect of Bimodal Powder on the Densification of a Green Body via Binder Jetting: *Akihiro Shimamura*¹; Chika Matsunaga¹; Chung Ying¹; Mikinori Hotta¹; Naoki Kondo¹; ¹National Institute of Advanced Industrial Science and Technology

3:50 PM

Development of Aluminium Coating via DC Pulse Electrophoretic Deposition on Inconel 625 Particles for High-Temperature Applications: *Manisha Chauhan*¹; Michael Zinigrad¹; Alexander Sobolev¹; ¹Ariel University

4:10 PM

Powder Behavior Simulation for Ceramic Additive Manufacturing: Enhancing Process Understanding and Material Performance: *Hideyuki Kanematsu*¹; Masahiko Kuwabara²; Jeremy Knopp²; Tadaomi Fujieda³; Takayoshi Nakano⁴; ¹BEL Inc.; ²Armatus ai; ³Prometech Software Inc.; ⁴Osaka University

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications - Session V

Sponsored by: ACerS Other

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

Wednesday PM | October 1, 2025
C151 | Convention Center

Session Chairs: A B M Tahidul Haque, University of Alabama; Navin Manjooran, Solve; Gary Pickrell, Virginia Tech

2:00 PM Invited

Agile Manufacturing Through Frontal Polymerization of Thermoset Composites with High Work Life: *A B M Tahidul Haque*¹; ¹University of Alabama

2:30 PM

Optimizing Three-Dimensional Topologies of Random Materials with Short-Range Order: *Aayushi Chauhan*¹; Christopher Schuh²; ¹Massachusetts Institute of Technology; ²Northwestern University

2:50 PM

Passively Deployable Shape Memory Alloy Heat Pipes for Small Satellite Thermal Management: *Mique Gonzales*¹; Damian Williams¹; Foster Feni¹; Alexander Rattner¹; Reginald Hamilton¹; ¹Pennsylvania State University

3:10 PM

Scan Strategies and Grain Growth of Laser Powder Bed Fusion 316L Stainless Steel: *Lucas Turner*¹; Ji Ma¹; Prosenjit Biswas¹; ¹University of Virginia

3:30 PM Break

3:40 PM

The Effect of Geometry on the Microstructure and Crystallographic Texture of Haynes 282 Superalloy Produced via Electron Beam Powder Bed Fusion: *Amamchukwu Ilogebe*¹; Maria Quintana¹; Peter Collins¹; ¹Iowa State University

4:00 PM

Tunable Mechanical Properties and Flowability of SUS316L Steel Foam Fabricated via Material Extrusion Additive Manufacturing: *Noh-Geon Song*¹; So-Yeon Park¹; Jung Yeul Yun²; Ju Yong Kim³; Kee-Ahn Lee¹; ¹Inha University; ²Korea Institute of Materials Science; ³Reprotech

ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Multi-Modal Monitoring, Data Integration, and Post-Process Analysis

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Samantha Webster, Colorado School of Mines; Jihoon Jeong, Texas A&M University; Benjamin Bevans, University of Oklahoma

Wednesday PM | October 1, 2025
C160A | Convention Center

Session Chairs: Samantha Webster, Colorado School of Mines; Jihoon Jeong, Texas A&M University

2:00 PM Invited

Leveraging Multi-Modal ISPM for Rapid PBF-LB Qualification: *Yash Parikh*¹; ¹EOS of North America, Inc.

2:30 PM Invited

Mitigating Printing Anomalies in Aerosol Jet Printing: A Data-Driven Approach for Process Planning and Optimization: *Shenghan Guo*¹; Hasnaa Ouidadi¹; Shihab Shakur²; Sri Ramesh²; ¹Arizona State University; ²Oklahoma State University

3:00 PM

Real-Time Defect Detection in Additive Manufacturing via In Situ Backscattered Electron Imaging: *Jonathan Buckley*¹; ¹JEOL USA

3:20 PM Break

3:40 PM

Novel Multi-Sensor Platform Based on In-Line 2D-X-Ray Diffraction and Dynamics Systems Approach for Real-Time Monitoring of Transient Microstructures & Properties of Additively Manufactured Metals: *Puskar Pathak*¹; ¹University of Houston

4:00 PM

Spatter Generators: Sizes, Locations, and Morphologies of Ejecta from Laser Powder Bed Fusion: *Nicholas O'Brien*¹; Jordan Weaver²; Dave Deisenroth²; Satbir Singh¹; Jack Beuth¹; ¹Carnegie Mellon University; ²National Institute of Standards and Technology

4:20 PM

Recovery and Processing of Metal Feedstock Powder for Re-Use in Cold Spray Deposition: *Ashton Lyon*¹; Kyle Tsaknopoulos¹; Danielle Cote¹; ¹Worcester Polytechnic Institute

PROCESSING AND MANUFACTURING

Advances in Refractory High Entropy Alloys and Ceramics — Alloy Design and Modeling

Sponsored by: TMS: Refractory Metals & Materials Committee, ACerS Basic Science Division

Program Organizers: Mingwei Zhang, University of California, Davis; Arezoo Zare, Washington State University; John Perepezko, University of Wisconsin-Madison; Bai Cui, University of Nebraska Lincoln

Wednesday PM | October 1, 2025
B232 | Convention Center

Session Chair: Mingwei Zhang, University of California, Davis

2:00 PM Invited

Two-Shot Optimization of Compositionally Complex Refractory Alloys: *Raymundo Arroyave*¹; ¹Texas A&M University

2:30 PM Invited

ULTERA Data Ecosystem for Compositionally Complex Materials: *Zi-Kui Liu*¹; Adam Krajewski¹; ¹Pennsylvania State University

3:00 PM

Improving the Use of Machine Learning Tools for High Entropy Alloy Development: *David Flores*¹; Wesley Reinhart¹; ¹Pennsylvania State University

3:20 PM Break

3:40 PM Invited

AI-Driven Discovery of Compositionally Complex Alloys for Enhanced Mechanical Performance: *Bernard Gaskey*¹; Janith Wanni¹; Mikayla Obrist¹; Avani Mishra¹; Nithin Mathew¹; Saryu Fensin¹; ¹Los Alamos National Laboratory

4:10 PM Invited

Simulations and Modelling of the Mechanical Behavior of Compositionally Complex Concentrated BCC Alloys: *Satish Rao*¹; ¹University of California, Berkeley

4:40 PM Invited

Composition Design of Refractory Compositionally Complex Alloys Using Machine Learning Models: *Tao Liang*¹; Haixuan Xu¹; ¹University of Tennessee at Knoxville

5:10 PM

Heat Transport in WMoTaNbV High-Entropy Alloy via First-Principles Calculation: *Himani Mishra*¹; Shuxiang Zhou¹; Michael Moorehead¹; Pierre-Clément Simon¹; ¹Idaho National Laboratory

LIGHTWEIGHT ALLOYS

Advances in Titanium Technology — Deformation Mechanisms and Mechanical Properties II

Sponsored by: TMS: Titanium Committee

Program Organizers: G. Babu Viswanathan, Ohio State University; Michael Mills, Ohio State University; Sriram Vijayan, Michigan Technological University; Abhishek Sharma, Worcester Polytechnic Institute; Soumya Nag, Oak Ridge National Laboratory; Thomas Broderick, Federal Aviation Administration; Simon Ringer, University of Sydney; Vasisht Venkatesh, Howmet Aerospace; Paraic O'Kelly, Ohio State University

Wednesday PM | October 1, 2025
C172 | Convention Center

Session Chairs: Sushant Jha, University of Dayton Research Institute; Soumya Nag, Oak Ridge National Laboratory; Olujide Oyerinde, Francis Marion University

2:00 PM Invited

Development of High Temperature Ti Alloys with Improved Mechanical Properties: *Jayaprakash Murugesan*¹; ¹Indian Institute of Technology Indore

2:20 PM

Mechanical Behavior and Failure Mechanisms of Ti-Al4%Mg Metal Laminates (MLs) and Reacted Metal-Intermetallic Laminates (MILs) at Micro and Nanometer Layer Thicknesses: *Daniel Yin*¹; Rodney McCabe¹; Thomas Nizolek¹; ¹Los Alamos National Laboratory

2:40 PM

Virtual Surgical Planning, Design, and Closed-Loop Fabrication, of Personalized Titanium-Based Skeletal Fixation Plates at the Point-of-Care: *Brian Thurston*¹; Luis Olivas-Alanis¹; Javier Vazquez-Armendariz¹; Raihan Uddin¹; Tyler Babinec¹; David Hoelzle¹; Glenn Daehn¹; Robert Gao²; David Dean¹; ¹The Ohio State University; ²Case Western Reserve University

3:00 PM

High-Throughput Investigation of Phase Transformation in Ti-Fe Alloys: *Deepak Pillai*¹; Yufeng Zheng¹; ¹University of North Texas

3:20 PM Break

3:40 PM

Production of Titanium-Based Intermetallic Alloy with Specified Structure and Properties: Borys Sereda¹; Irina Kruglyak¹; *Dmytro Sereda*¹; Anton Prolomov¹; Sergiy Chuhno¹; ¹DSTU

4:00 PM

Advanced Approach for Evaluation of Titanium Anomalies: *Masayuki Tsukada*¹; ¹Ihi Corporation

4:20 PM

Characterization and Optimization of a Novel Metastable β Ti Alloy: *Nicole Hudak*¹; Brian Welk¹; Gopal (Babu) Viswanathan¹; Hamish Fraser¹; ¹Ohio State University

4:40 PM

Development of a Novel Two Phase TWIP Alloy: *Mathew Cohen*¹; Paraic O'Kelly¹; Brian Welk¹; Gopal Viswanathan¹; Hamish Fraser¹; ¹The Ohio State University

5:00 PM

Site Specific Post Processing of β -Titanium Lattices Via Joule Heating: *Erin Cleary*¹; Jonathan Zaugg¹; Maria Quintana¹; Peter Collins¹; ¹Iowa State University

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Growth and Property Control of Nanomaterials II

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; Oliver Diwald, Paris Lodron Universitaet Salzburg; Hyunjoon Choi, Kookmin University

Wednesday PM | October 1, 2025
B230 | Convention Center

Session Chairs: Oliver Diwald, University of Salzburg; Haitao Zhang, University of North Carolina at Charlotte; Babak Anasori, Purdue University

2:00 PM Invited

Designing Functionality Through Disorder in Complex Oxides: *Christina Rost*¹; ¹Virginia Tech

2:30 PM Invited

Structure-Property Relationships in Polar Perovskite Oxides: *Neamul Hayat Khansur*¹; ¹Case Western Reserve University

3:00 PM

Ferroelectric Properties of BaTiO₃ Grains, Grains Inside Fibers and Microcrystalline Ceramics: *Kerstin Neuhauser*¹; Oliver Diwald¹; Thomas Berger¹; ¹University Salzburg

3:20 PM Break

3:40 PM

Engineering of Carbon Defects in TiO₂ Nanoparticle Architectures: *Guillem Vives Ollé*¹; Thomas Berger¹; Gilles Bourret¹; Oliver Diwald¹; ¹Paris Lodron Salzburg University

4:00 PM

Influence of Interface Energy on Nanoparticle Growth Kinetics: *Douglas Gouvêa*¹; ¹University of Sao Paulo

4:20 PM

Large Scale Production of Elemental Nano Boron Powder: *Selcuk Acar*¹; Mehmet Somer¹; ¹Pavezyum Chemicals

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Energy Harvesting, System and Application

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Loneragan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

Wednesday PM | October 1, 2025
B234 | Convention Center

Session Chairs: Armin Feldhoff, Leibniz University Hannover; Holger Kleinke, University of Waterloo

2:00 PM

AC Loss in CNT Composite Strands for Potential Application in Motor and Generator Windings at High Frequencies: *Mike Sumption*¹; ¹Ohio State University

2:20 PM

Advanced Ceramic Ion-Exchange Membranes for Energy Applications: *Amanda Gibson*¹; Susanna Tanck¹; Meghan Stout¹; Neil Kidner¹; ¹Nexceris

2:40 PM

Coil-Less Carbon Fiber Composites for Structural Inductors: A New Functionality for Smart Structures: *Deborah Chung*¹; Sruthi Krishnaswamy Narayanan¹; ¹State University of New York at Buffalo

3:00 PM

Growth of Vertically Aligned BaTiO Nanowire Arrays on Flexible Substrates for Piezoelectric Energy Harvesting: *Sakhavat Dadashov*¹; Ender Suvaci¹; ¹Eskisehir Technical University

3:20 PM Break

3:40 PM

Highly Crystalline Graphite Synthesis from Coal with a Sustainable Process: *Ki-Joong Kim*¹; Ngoc Tien Huynh¹; TheDung Nguyen¹; YunYang Lee¹; Yuan Gao¹; Viet Hung Pham¹; Congjun Wang¹; Christopher Matrangola¹; ¹National Energy Technology Laboratory

4:00 PM

Innovative Carbon Metal Composite Wires for Electric Motors: *Obieda Altarawneh*¹; Caleb Gula¹; Jakia Sharmin Mim¹; Michael Kennedy¹; Frank Kraft¹; Yahya Al-majali¹; ¹Ohio University

4:20 PM

Ionic Transport Properties of Acceptor Doped Layered Hexagonal Perovskites: *Joshua Willoughby*¹; Kyle Brinkman¹; ¹Clemson University

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Composites / Properties of Engineering Ceramics

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Junichi Tatami, Yokohama National University; Young-Wook Kim, WORLDEX Industry & Trading Co., Ltd.; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

Wednesday PM | October 1, 2025
B240/241 | Convention Center

Session Chairs: Alyssa Stubbers, University of Alabama; Junichi Tatami, Yokohama National University

2:00 PM

Effect of Carbon on the Microstructure and Phase Evolution of High Entropy Dual Phase Ceramics: *Rubia Hassan*¹; William G. Faherholtz¹; Gregory E. Hilmas¹; Jeremy Watts¹; ¹Missouri University of Science and Technology

2:20 PM

Percolation-Driven Thermal Conductivity Improvement in Pyrolyzed MXene/SiOC Nanocomposites: *Mubina Shaik*¹; Erica Schulz¹; Kathy Lu¹; ¹University of Alabama at Birmingham

2:40 PM

Design and Sintering of Ceramic-Metal Composites for Extreme Environment Applications: *Qiaofu Zhang*¹; ¹University of Alabama

3:00 PM

Microstructure Development of Electro-Conductive Aluminum Nitride for Sensor Applications: *Michael Mulholland*¹; Joy Morin¹; Jorgen Rufner¹; ¹Idaho National Laboratory

3:20 PM Break

3:40 PM

Effect of Carbon Content on Electrical, Thermal, and Mechanical Properties of Pressureless Sintered SiC Ceramics: *Hyun-Sik Kim*¹; Young-Wook Kim²; ¹University of Seoul; ²WORLDEX Industry & Trading Co., Ltd.

4:00 PM

A Statistical Model of Microstructural Toughening in Ceramics: Sajjad Hossain¹; Hunter Brumblay¹; Alyssa Stubbers²; Derek Dupre²; Gregory Thompson²; *Christopher Weinberger*¹; ¹Colorado State University; ²University of Alabama

4:20 PM

Small Tests that Make a Big Difference: Correction of the Plastic Size Effect During Micromechanical Testing: *Alyssa Stubbers*¹; Sajjad Hossain²; Christopher Weinberger²; Gregory Thompson¹; ¹University of Alabama; ²Colorado State University

4:40 PM

Fatigue Behavior of Grain Boundaries in High Thermal Conductivity Silicon Nitride Ceramics Evaluated by Microcantilever Bending Test: *Junichi Tatami*¹; Komaki Matsuura¹; Motoyuki Iijima¹; Takuma Takahashi²; Tatsuki Ohji¹; Hiromi Nakano³; ¹Yokohama National University; ²Kanagawa Institute of Industrial Science and Technology; ³Toyohashi University of Technology

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Hybrid Organic-Inorganic Materials for Alternative Energy — Hybrid Organic-Inorganic Materials for Alternative Energy II

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University; Alessandro Martucci, University of Padova

Wednesday PM | October 1, 2025
B246 | Convention Center

Session Chair: Alessandro Martucci, University of Padua

2:00 PM Invited

Hybrid Materials for Ion Conduction: *Bruce Dunn*¹; ¹University of California

2:30 PM Invited

Nanocomposite Photoelectrodes and Photocatalysts for Solar Water Splitting: *Go Kawamura*¹; ¹Toyohashi University of Technology

3:00 PM Invited

Optimizing LiCoO for Catalytic Applications: Novel Post-Processing Strategies for Enhanced Performance: *Alp Sehirliglu*¹; Emily Pentzer²; ¹Case Western Reserve University; ²Texas A&M

3:30 PM Break

3:50 PM Invited

Synthesis of CuWO₄ / CuO Photocatalyst and Use in Photodegradation of Organic Hydrocarbons in Water: *Pelagia-Irene Gouma*¹; ¹Ohio State University

4:20 PM Invited

On the Development of High-Performance III-V/Si Tandem Solar Cells: From Materials to Devices: Lauren Kaliszewski¹; Tal Kasher¹; Marzieh Baan¹; Steven Ringel¹; *Tyler Grassman*¹; ¹The Ohio State University

4:50 PM Invited

Tunable Bandgap Opening in Bilayer Silicene for Enhanced Mid-Infrared Photonic Energy Harvesting: Nihal Narra¹; Kumar Vishal¹; Hong Huang¹; *Yan Zhuang*¹; ¹Wright State University

PROCESSING AND MANUFACTURING

Lightweight Composites, Materials & Alloys — Processing and Mechanical Behavior

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

Wednesday PM | October 1, 2025
B231 | Convention Center

Session Chair: Aashish Rohatgi, Pacific Northwest National Laboratory

2:00 PM

Tailoring Damage-Tolerant Properties of Additively Manufactured Ti-6Al-4V via Post-Processing Heat Treatments: Ralph Bush¹; Benjamin Smith¹; Elijah Palm¹; Tessa Barbosa¹; Helen Works¹; Therasa Bush¹; Leah Watson¹; *Tanjore Jayaraman*¹; ¹United States Air Force Academy

2:30 PM

Tailoring of Microstructure Through Heat-Treatment for Enhanced Mechanical Properties in Nb-Rich -TiAl Alloy: *Raashid Firoz*¹; Rahul Mitra¹; ¹Indian Institute of Technology, Kharagpur

2:50 PM

Tailoring 7000 Series Aluminum Alloys via Magnetic Field Heat Treatment: *Kirk Lemmen*¹; Damilola Alewi¹; Haluk Karaca²; Paul Rottmann¹; Heather Murdoch²; Daniel Magagnosc²; ¹University of Kentucky; ²US ARMY DEVCOM

3:10 PM

Mechanical and Microstructural Behavior of Friction Stir Powder Additive Manufactured Ceria-Stabilized Zirconia and Polymer-Derived Ceramic Reinforced AA7075 Composites: *Nisar Khan*¹; Ajay Kumar¹; ¹Indian Institute of Technology Tirupati

SPECIAL TOPICS

Materials and Manufacturing in Low Earth Orbit (and Beyond) — Building Space Infrastructure in Low Earth Orbit and Beyond

Sponsored by: TMS: Solidification Committee

Program Organizers: David Williams, Ohio State University; Alan Luo, Ohio State University; Glenn Daehn, Ohio State University; Antonio Ramirez, The Ohio State University; Boyd Pantan, Ohio State University; Nathan Ames, Ohio State University; Ken Savin, REDwire Space; Jonathan Volk, Voyager Space

Wednesday PM | October 1, 2025
C161B | Convention Center

Session Chair: David Williams, Ohio State University

2:00 PM Introductory Comments

2:10 PM

Commercial Space Flight: Opportunities for Materials/Manufacturing: *David Williams*¹; ¹Ohio State University

2:30 PM

Analysis of Various Geopolymer Lunar Concrete Mixtures Mixed and Cured on the International Space Station: *Adam Johnson*¹; Louise Littles²; Aleksandra Radlinska¹; Sven Bilén¹; ¹The Pennsylvania State University; ²NASA Marshall Space Flight Center

2:50 PM

Laser Directed Energy Deposition Additive Manufacturing of Lunar Regolith Simulant: *Sizhe Xu*¹; Marwan Haddad¹; Aslan Bafahm Alamdari¹; Annabel Shim¹; Alan Luo¹; Sarah Wolff¹; ¹The Ohio State University

3:10 PM Break

3:30 PM

Oxide Dispersion Strengthening via Additive Processing: A Revolutionary New Approach for High Temperature Alloys: *Michael Mills*¹; Andreas Bezold¹; Subham Chatteraj¹; Timothy Smith²; Calvin Stewart¹; Stephen Niezgoda¹; Emmanuelle Marquis³; ¹The Ohio State University; ²NASA Glenn Research Center; ³University of Michigan

3:50 PM

A Multifunctional SolidStir® Manufacturing Technology for Extra Terrestrial Applications: *Kumar Kandasamy*¹; Anurag Gumaste¹; Pankaj Kulkarni¹; Ravi Sankar Haridas²; Rajiv Mishra²; ¹Enabled Engineering; ²University of North Texas

4:10 PM Concluding Comments

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics II

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

Program Organizers: Fei Peng, Clemson University; Kathy Lu, University of Alabama Birmingham; Dilpuneet Aidhy, Clemson University; Yi Je Cho, Sunchon National University

Wednesday PM | October 1, 2025
D283 | Convention Center

Session Chair: Kaustubh Bawane, Idaho National Laboratory

2:00 PM Invited

ML-Informed ReaxFF Development for Complex Metal Carbide, Oxide and Nitride Materials: Adrianus Van Duin¹; Asma Ul Hosna¹; Mozhdah Mirakhory¹; Zihan Wang²; Wei Chen²; Yun Kyung Shin¹; ¹Penn State University; ²Northwestern University

2:30 PM Invited

Thermodynamic Investigation of LCO/LSM-Based Perovskites via CALPHAD/DFT/ML: Yu Zhong¹; ¹Worcester Polytechnic Institute

3:00 PM

Unraveling Doping Effects in LaCoO₃ via Machine Learning-Accelerated First-Principles Simulations: Guangchen Liu¹; Songge Yang¹; Yu Zhong¹; ¹Worcester Polytechnic Institute

MATERIALS-ENVIRONMENT INTERACTIONS

Materials Under Extreme Environment — Materials Under Extreme Environment II

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

Program Organizers: Robert Slapikas, DEVCOM Army Research Laboratory; Anindya Ghoshal, DEVCOM Army Research Laboratory; Douglas Wolfe, Pennsylvania State University

Wednesday PM | October 1, 2025
D181 | Convention Center

Session Chairs: Robert Slapikas, DEVCOM Army Research Laboratory; Anindya Ghoshal, DEVCOM Army Research Laboratory; Douglas Wolfe, The Pennsylvania State University

2:00 PM Introductory Comments

2:05 PM

UHTCMC Green Bodies Formed by Electrophoretic Co-Deposition of ZrC and SiC on Carbon Fiber: Michael Ammendola¹; Ngon Tran²; Robert Slapikas³; Anindya Ghoshal²; Douglas Wolfe¹; ¹Pennsylvania State University; ²DEVCOM Army Research Laboratory; ³SURVICE Engineering Company

2:25 PM

The Effects of Dynamic Shock Compression of REE-Doped Cryptomelane (K-OMS-2): Morgan Gillis¹; Jack Gugino¹; Mithun Bhowmick¹; Mark Krekeler¹; ¹Miami University

2:45 PM

Novel Energy Absorbing Ceramic Materials for Rotating Detonation Engines: Rodney Trice¹; Benjamin Lam¹; Bianka Pajo¹; Carlos Martinez¹; ¹Purdue University

3:05 PM

Tailoring Microstructure and Phase Constitution of Ytterbium Disilicate Environmental Barrier Coatings Manufactured by Atmospheric Plasma Spraying: Jie Zhang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

3:25 PM Break

3:45 PM

Molecular Dynamics Simulations of Shock in the Ni-Al System: Logan Nagy¹; Adib Samin¹; ¹Air Force Institute of Technology

4:05 PM

On the Role of Grain Boundaries in Metal Oxidation: Colin McLagan¹; Mark Mysonhimer¹; Adib Samin¹; ¹Air Force Institute of Technology

FUNDAMENTALS AND CHARACTERIZATION

Microstructural Control in Materials Processing: Role of Phase Transformation Pathways — Microstructural Control in Materials Processing: Role of Phase Transformation Pathways II

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Bharat Gwalani, North Carolina State University; Soumya Nag, Oak Ridge National Laboratory; Abhishek Sharma, Worcester Polytechnic Institute; Sriswaroop Dasari, University of Texas at El Paso; Ashley Paz y Puente, University of Cincinnati; Paul Gibbs, Los Alamos National Laboratory; Sophie Primig, University of New South Wales

Wednesday PM | October 1, 2025
C162B | Convention Center

Session Chairs: Bharat Gwalani, North Carolina State University; Soumya Nag, Oak Ridge National Laboratory; Ashley Paz y Puente, University of Cincinnati

2:00 PM Invited

Characterization of Microstructural Disorder in Metallics: Charles Maher¹; Katherine Moody²; Michael Lastovich²; Katherine Newhall¹; Bharat Gwalani²; Christopher Rock²; ¹University of North Carolina at Chapel Hill; ²North Carolina State University

2:30 PM

Vacancy Migration and Kirkendall Pore Formation in the Ni-Cr-Al-Ti System: Nicholas Simpson¹; Ugochukwu Ochieze¹; Ashley Paz y Puente¹; ¹University of Cincinnati

2:50 PM Invited

Magnetic Field-Assisted Processing of Martensitic Steels: Megan Hurley¹; Ramon Padin-Monroig¹; Alexander Donald¹; James Hamlin¹; Michael Kesler²; Michele Manuel³; Mark Meisel¹; Victoria Miller¹; ¹University of Florida; ²Oak Ridge National Laboratory; ³University of Pittsburgh

3:20 PM Break

3:40 PM

In Situ Characterization of Plastic Flow and Strain Field in Metal Peeling: *Ashish Devkota¹; Prabhakar Pagilla¹; Dinakar Sagapuram¹*; ¹Texas A&M University

4:00 PM

Effect of Al, Ti and Ca Additions on the Structure and Mechanical Properties of Nickel-Alloyed Ductile Iron: *Adnan Adib Ahamed¹*; Jingjing Qing¹; Mingzhi Xu¹; ¹Georgia Southern University

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials VI

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

Wednesday PM | October 1, 2025
C171 | Convention Center

Session Chairs: Sung Kang, Korea Advanced Institute of Science and Technology (KAIST); Maria Quiñonez-Angulo, The Ohio State University

2:00 PM

Bone-Inspired Self-Adaptive Materials: *Sung Kang¹*; ¹Korea Advanced Institute of Science and Technology (KAIST)

2:20 PM

Biodegradable Mg Alloy Composite Fabrication Using SolidStir® Processing: *Pankaj Kulkarni¹*; Anurag Gumaste¹; Jasim Uddin²; Bharat Gwalani²; Kumar Kandasamy¹; ¹Enabled Engineering; ²North Carolina State University

2:40 PM

A Self-Sealing Patch Graft for Articular Cartilage Defect Repair: *Hasan Rafsan Jani¹*; Random Lyakisia¹; Solaiman Tarafder¹; ¹South Dakota State University

3:00 PM

Plasma/Ozone Induced PolyNaSS Graft-Polymerization on to PEEK Biomaterial for Bio-Integrated Orthopedic Implants: *Chandrima Karthik¹*; ¹University of Alabama at Birmingham

3:20 PM Break

3:40 PM

Substitution Mediated Change in Mechanical Properties of Bio-Mimetic Apatites: *Stephanie Wong¹; Abigail Eaton²; Arun Nair²; Alix Deymier³*; ¹Oak Ridge National Lab; ²Air Force Institute of Technology; ³University of Connecticut

4:00 PM

Synthesis of Poly(lactide) and Poly(lactones) Using Eutectic and Non-Eutectic Systems for Biodegradable Scaffold Applications: *Maria Quiñonez-Angulo¹*; Karla Barrera-Rivera²; Saul Carrasco-Saavedra³; Antonio Martínez-Richa²; José Torres-Lubian⁴; Joaquín Barroso-Flores³; Davita Watkins¹; Josué Mota-Morales³; ¹The Ohio State University; ²Universidad de Guanajuato; ³Universidad Nacional Autónoma de México; ⁴Centro de Investigación en Química Aplicada

4:20 PM

Production and Characterization of Panicum Maximum Derived Whey and Compost as Biomaterials for Sustainable Bioremediation: A Green Chemistry Approach: *Ita Uwidia¹*; Ibobo Victor¹; Stanley Eguae²; ¹University of Benin; ²Edo State College of Agriculture and Natural Resources

4:40 PM

Evaluating the Potential of Cow Bones and Horns for Environmentally Friendly Bioremediation of Agricultural Soils: *Ita Uwidia¹*; Faith Akhidenor¹; Etinosa Oshodin¹; ¹University of Benin

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials VII

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

Wednesday PM | October 1, 2025
C170 | Convention Center

Session Chair: Andy Holwell, Carl Zeiss Microscopy LLC

2:00 PM

Diagnosing Poor Efficacy Through Multi-Scale Characterization of Riboflavin Supplements Using Microscopy, Phase Analysis and AI: *Andy Holwell¹*; Ria Mitchell¹; ¹Carl Zeiss Microscopy LLC

2:20 PM

Decoupling Bulk and Surface Properties of Functionalized Solvent-Cast 3D Printed Scaffolds: *Matthew O'Connell¹*; Diana Hammerstone¹; Andrew Kitson¹; Santiago Lazarte²; Brandon Krick²; Lesley Chow¹; ¹Lehigh University; ²Florida A&M University - Florida State University

2:40 PM

Achieving Linear Superelasticity in NiTi by Tailoring Martensitic Transformation Through Composition Modulation: *Vidyanidhi Kabanur¹*; Zexu Chen¹; Yunzhi Wang¹; ¹Ohio State University

3:00 PM

Dual Functionalizing Polymer Membranes for Cornea Replacement: *Olivia Lundquist¹*; Christie Ortega¹; John Tolbert¹; Amelia Zellander²; Lesley Chow¹; ¹Lehigh University; ²BioLattice, LLC

CERAMIC AND GLASS MATERIALS

Phase Transformations in Ceramics: Science and Applications — Phase Transformations in Ceramics II

Sponsored by: ACerS Basic Science Division

Program Organizers: Scott McCormack, University of California, Davis; Theresa Davey, Bangor University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Sanjay V. Khare, University of Toledo

Wednesday PM | October 1, 2025
B132 | Convention Center

Session Chairs: Scott McCormack, University of California, Davis; Theresa Davey, Bangor University

2:00 PM Introductory Comments

2:10 PM Invited

Melting Point of Transition Metal Diborides via Conical Nozzle Levitator: *Fox Thorpe*¹; Elizabeth Sobalvarro²; Jesus Rivera²; Scott McCormack¹; ¹University of California, Davis; ²Lawrence Livermore National Laboratory

2:40 PM Invited

Troubles With Tantala: *Elizabeth Opila*¹; Connor Stephens¹; Niquana Smith¹; ¹University of Virginia

3:10 PM Invited

Phase Transformations and Superstructure Ordering in Layer- and Tunnel-Structure Ceramics: *Scott Misture*¹; Shivani Sharma¹; Jake Amoroso²; Kyle Brinkman³; Vaclav Petricek⁴; ¹Alfred University; ²Savannah River National Laboratory; ³Clemson University; ⁴Institute of Physics CAS

3:40 PM Break

4:00 PM Invited

Synthesis of Refractory High Entropy Alloys (RHEAs) by Solid State Reduction of Oxides: Wookyung Jin¹; Metri Zughbi¹; Ganesh Balasubramanian²; Animesh Kundu¹; *Helen Chan*¹; ¹Lehigh University; ²University of New Haven

4:30 PM

Phase Transitions Predictions in ZrO₂ Using Universal Machine Learning Force Fields: *Rajan Khadka*¹; Patrick Tepesch¹; ¹Corning Research and Development Corporation

4:50 PM

Thermodynamic Design and Reactive Synthesis of Ferrite-Metal Composites: *Azhagu Devathai Dhanapal*¹; Paul Ohodnicki¹; ¹University of Pittsburgh

PROCESSING AND MANUFACTURING

Sintering and Related Powder Processing Science and Technologies — Sintering Control: Linking Formulation, Simulation, and Material Properties

Sponsored by: TMS: Powder Materials Committee, ACerS Basic Science Division

Program Organizers: Charles Maniere, CNRS; Eugene Olevsky, San Diego State University; Ricardo Castro, Lehigh University; Elisa Torresani, San Diego State University; Diletta Giuntini, Eindhoven University of Technology; Wolfgang Rheinheimer, University of Stuttgart

Wednesday PM | October 1, 2025
B233 | Convention Center

Session Chairs: Elisa Torresani, San Diego State University; Douglas Gouvea, Laboratório de Processos Cerâmicos

2:00 PM

Sintering of Binder Jetted Stainless Steel 316L Components: Dimensional and Geometrical Changes: *Elisa Torresani*¹; Thomas Grippi¹; Marco Zago²; Ilaria Cristofolini²; Alberto Molinari²; Eugene Olevsky¹; ¹San Diego State University; ²University of Trento

2:20 PM Invited

Thermodynamic of Solid-State Sintering: Contributions of Grain Boundary Energy: *Douglas Gouvêa*¹; ¹University of Sao Paulo

2:50 PM

Simulating Powder Dynamics to Support Sintering Process Optimization in Powder Metallurgy: *Hideyuki Kanematsu*¹; Masahiko Kuwabara²; Jeremy Knopp²; Tadaomi Fujieda³; Takayoshi Nakano⁴; ¹BEL Inc.; ²Armatus ai; ³Prometech Software Inc.; ⁴Osaka University

3:10 PM

Convenient Application of SPS in the Understanding of Fundamental Kinetics and Sintering Behavior in Ceramics: *Caen Ang*¹; Sean Drewry²; Ethan Payne²; Brandon Connor²; ¹UT-ORII; ²University of Tennessee Knoxville

3:30 PM Break

3:50 PM

Fiber Reinforced Li₂O-Fe Composites for Tritium Breeding Applications: *Malachi Nelson*¹; Michael Moorehead¹; ¹Idaho National Laboratory

4:10 PM

In-Situ TEM Study of Nanoscale Sintering and Phase Evolution in High-Entropy Alloy Nanoparticles: *Daniela Fonseca*¹; Martin Harmer¹; Ricardo Castro¹; ¹Lehigh University

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development IV — Steel Development Supporting Circular Economics and Recyclability

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

Program Organizers: Joshua Mueller, Michigan Technological University; Adriana Eres-Castellanos, Los Alamos National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, CEIT-BRTA; Jeongho Han, Hanyang University; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Michigan Technological University

Wednesday PM | October 1, 2025
D282 | Convention Center

Session Chairs: Pello Uranga, University of Navarra; Josh Mueller, Michigan Technological University; Ian Zuazo, ArcelorMittal R&D - Industeel

2:00 PM Introductory Comments

2:10 PM Invited

Influence of Residual Copper on the Weldability and Weld Performance of Low Carbon Steels: *Jonah Klemm-Toole*¹; Henry Geerlings¹; Mohan Subramanian²; Grant Thomas²; Amy Clarke¹; Kester Clarke¹; ¹Colorado School of Mines; ²Cleveland-Cliffs Inc.

2:50 PM

Removal of Copper From Steel Scrap Via Sulfide Salts Treatment: Keyan Matar¹; Xiaolei Guo²; Jianyue Zhang¹; Yuxuan Shui¹; Gerald Frankel¹; Alan Luo¹; Jianxun Hu³; Brian Sieger³; ¹The Ohio State University; ²Colorado School of Mines; ³Honda Development and Manufacturing of America

3:20 PM Break

3:40 PM Invited

The Effect of Nitrogen on the Microstructure and Properties of Ultra-High Strength Steels: Allison Kosberg¹; John Speer¹; Emmanuel De Moor¹; ¹Colorado School of Mines

4:20 PM

Understanding the Role of Tramp Elements Introduced Through Increased Scrap Recycling: *Lukas Hatzenbichler*¹; Marek Gocnik¹; Phillip Haslberger²; Matthew Galler³; Jozef Keckes¹; Ronald Schnitzer¹; ¹Montanuniversität Leoben; ²voestalpine Forschungsservicegesellschaft Donawitz GmbH; ³voestalpine Wire Rod Austria GmbH

4:40 PM

Microstructural Evolution and Mechanical Response in Interstitial-Free Steel During Interrupted Tensile Deformation: *Sandeep Yadav*¹; Sadhan Ghosh¹; ¹Indian Institute of Technology Roorkee

Technical Meeting and Exhibition

MS&T25

MATERIALS SCIENCE & TECHNOLOGY

September 28–October 1, 2025 | Columbus, Ohio, USA

POSTER SESSION with Presenters

Posters are located in Exhibit Hall C/D

Monday, September 29

Poster Installation	2:00 p.m. – 4:00 p.m.
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Tuesday, September 30

Poster Installation	8:00 a.m. – 9:00 a.m.	(If you cannot set-up your poster on Monday)
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Poster Session Viewing	2:00 p.m. – 5:00 p.m.
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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)
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Wednesday, October 1

Poster Session Viewing	9:00 a.m. – 3:00 p.m.
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Poster Removal	3:00 p.m. – 4:00 p.m.
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SPECIAL TOPICS

2025 Graduate Student Poster Contest — Additive Manufacturing

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-1: Additively Manufactured AlCoCuFeNi – Microstructure, Internal Defect, Soft Magnetic and Mechanical Response: *Puskar Pathak*¹; ¹University of Houston

SPG-2: Binder Jet Additive Manufacturing of M2 Tool Steel: Microstructural Control and Mechanical Enhancement via Hot Isostatic Pressing: *Amit Choudhari*¹; Tushar Borkar¹; ¹Cleveland State University

SPG-3: Deformation Kinking in a Laser-Based Powder Bed Fusion-Processed Ti-5Al-5Mo-5V-3Cr Alloy: *Deepak V Pillai*¹; Dian Li¹; Sydney Fields¹; Yiliang Liao²; Fan Sun³; Liang Qi⁴; Rajarshi Banerjee¹; Yufeng Zheng¹; ¹University of North Texas; ²Iowa State University; ³PSL University; ⁴University of Michigan

SPG-4: Microstructure and Mechanical Properties of Direct Energy Deposited Metastable Beta Ti-5Al-5Mo-5V-3Cr Alloy After Post-heat Treatment: *Sydney Fields*¹; Deepak Pillai¹; Dian Li¹; Yiliang Liao²; Rajarshi Banerjee¹; Yufeng Zheng¹; ¹University of North Texas; ²Iowa State University

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Artificial Intelligence

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-5: Comparison of Derivative-Free and Gradient-Based Minimization for Multi-Objective Compositional Design of Shape Memory Alloys: *Sravva Josyula*¹; Yuval Noiman¹; Eric Payton¹; Tommaso Giovannelli¹; ¹University of Cincinnati

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Biomaterials

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-6: Innovative Fetal Shunt for Improved Pregnancy Outcomes Enhancing LUTO and Pleural Effusion Interventions: *Varun Chandra Sarkonda*¹; Saisri Nakirekanti¹; Janet Dong¹; Donglu Shi¹; Braxton Forde¹; ¹University of Cincinnati

SPG-7: Structural, Thermal, and Antimicrobial Properties of Gallium-Doped Hydroxyapatite: *Preston Guynup*¹; Scott Misture¹; Timothy Keenan¹; ¹Alfred University

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Ceramic and Glass Materials

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-8: CrNbO4 and CrTaO4 Stability in High Temperature Steam Environments: *Sarah Purdy*¹; Elizabeth Opila¹; ¹University of Virginia

SPG-9: Mechanical Strength and Microstructural Properties of Multilayer Zirconia After Glass Infiltration: *Raphaelle Monteiro de Sousa*¹; Tiago Campos²; Larissa Alves³; Ernesto Benalcázar Jalkh³; Ricardo Tanaka³; Edisa Sousa³; Gilmar Thim⁴; Jason Griggs¹; Estevam Bonfante³; ¹University of Mississippi Medical Center; ²Federal University of Pelotas; ³University of São Paulo; ⁴Aeronautics Institute of Technology

SPG-10: Microstructural and Mechanical Evaluation of Stainless Steel 316L Flake-Reinforced Vitreous Enamel Coatings: *Shruti Sanas*¹; Troy Trant²; Rama Chekka²; ¹University of Alabama at Birmingham; ²Rheem Manufacturing

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Fundamentals and Characterization

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-11: Continuum Sintering Models to Predict the Constitutive Parameters for Isotropic Sintering of Ceramics: *Deeksha Kodangal*¹; Rajendra Bordia¹; Elisa Torresani²; ¹Clemson University; ²San Diego State University

SPG-12: Design and Optimization of Ni-Mo-W-Cr-Al-Ti Alloys for High-Temperature Applications: *Sonali Ravikumar*¹; Naveen Kumar Nagaraja¹; Vijay K Vasudevan¹; ¹University of North Texas

SPG-13: Exploring the Interaction of Plastic Anisotropy and Strain-Rate Sensitivity for a 6061-T6 Aluminum: *Carter Fietek*¹; Jeremy Seidt¹; Hojun Lim²; Yannis Korkolis³; ¹The Ohio State University; ²Sandia National Labs; ³TU Dortmund

SPG-14: Investigate the Wear Behavior for Magnesium Alloys (AS41) and (AS41•C): *Yasser Fouad*¹; ¹King Saud University

SPG-15: Optimizing Design & Loading Parameters for Zirconia Compact Tension Testing: *Riya Titus*¹; Jason Griggs¹; Kartikeya Jodha²; Alvaro Bona³; Paula Benetti³; Michael Roach¹; Susana Marrocho¹; Yuanyuan Duan¹; Jeannette Simino¹; ¹University of Mississippi Medical Center; ²Loma Linda University; ³The University of Passo Fundo

SPG-16: Silica Fiber-Based Thermal Mapping of Solid Shell Growth in Peritectic Steels Using a Continuous Casting Mold Simulator: *Rony Kumer Saha*¹; Muhammad Anwarul Nazim¹; Thinius Natarajan¹; Koustav Dey¹; Ronald O'Malley¹; Jie Huang¹; ¹Missouri University of Science and Technology

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Iron and Steel (Ferrous Alloys)

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPG-17: Numerical Investigation of Gas Stirring in Oval-Shaped Ladles: Effects of Plug Activation and Injection Rate: *Kiranchandru Lingeswaran*¹; ¹Purdue University Northwest

SPG-18: Optical Fiber-Based Safety Monitoring in Electric Arc Furnaces: *Manoj Kumar Pullagura*¹; Rony Kumer Saha¹; Ogbale Collins Inalegwu¹; Koustav Dey¹; Jie Huang¹; Ronald O'Malley¹; ¹Missouri University of Science and Technology

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Materials-Environment Interactions

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPG-19: Space-Materials Testing Advanced Research with Laser Initiated Tunable Environment (STARLITE): *Liam Clink*¹; Enam Chowdhury¹; Wolfgang Windl¹; ¹Ohio State University

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Modeling

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPG-20: Design, Simulation, and 3D Printing of Tesla Valves for Biomedical Fluidic Applications: *Saisri Nakirekanti*¹; Varun Chandra Sarkonda¹; Janet Dong¹; Donglu Shi¹; Braxton Forde¹; Je Hyeong Bahk¹; ¹University of Cincinnati

SPG-21: Dynamic Atomic-Scale Electron Avalanche Breakdown in Solid Dielectrics: *Yang Xie*¹; Jian Wang¹; ¹Wuhan University of technology

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Nanomaterials

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPG-22: Developing MXene/Self-Healable Polymer Composites to Enhance the Longevity of Silicon Anodes for Sodium-Ion Batteries: *Yolmarie Del Valle Gonzalez*¹; Zachary D. Hood¹; Sixbert P. Muhoza¹; ¹Argonne National Laboratory

SPG-23: Electrospinning Barium Titanate Nanofibers and Processing Related Issues in Aqueous Media: *Kerstin Neuhauser*¹; Hasan Razouq¹; Thomas Berger¹; Oliver Diwald¹; ¹University Salzburg

SPG-24: Hybrid Carbon Nanostructure Obtained by Plasma Enhanced Chemical Vapor Deposition of Vertically Aligned Carbon Nanofibers on Compressed 3D Graphene: *Amulya Gundabathini*¹; Vesselin Shanov¹; Qichen Fang¹; ¹University of Cincinnati

SPG-25: Synergistic Enhancement of Mechanical and Tribological Properties of Multiwalled Carbon Nanotubes Reinforced Inconel 718 Composites: *Sanoj Karki*¹; Satyavan Digole¹; Tushar Borkar¹; ¹Cleveland State University

SPG-26: Synthesis and Characterisation of Cu₃V_xSe₄-X Nanocrystals: Intermediate Bandgap and Potential Solar Energy Applications: *Godwin Mante*¹; Soham Kadam¹; Nikunj Kumar Padhiyar¹; ¹University of Dayton

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Nuclear Energy

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPG-27: Visualization of Microplastic Migration in Soil via Gadolinium-Doped Composites and Neutron Imaging: *Thai Nguyen*¹; Subhash Risbud¹; Wesley Frey¹; ¹University of California, Davis

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Processing and Manufacturing

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-28: Advanced Resin Transfer Molding Processing with Additive Manufacturing For Composite Aerospace Components: *Alec Macchia*¹; Khalid Aldhahri¹; Daniel Young¹; ¹Wright State University

SPG-29: Electric Field and Friction Assisted Sintering of Nanocrystalline WC-Co Films: An In-Situ Study: *Bunty Tomar*¹; Pranjal Nautiyal¹; ¹Oklahoma State University

SPECIAL TOPICS

2025 Graduate Student Poster Contest — Sustainability, Energy, and the Environment

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPG-30: Advancing Sustainability in Glass Recycling: From Waste Flow Modeling to Novel Applications: *Deniz Saadatpour*¹; Matthew Lake¹; Gabrielle Gaustad¹; Collin Wilkinson¹; ¹Alfred University

SPG-31: Ambient-Processed and Eco-Friendly Semitransparent Perovskite Solar Cells: *Cyril Chu Fubin Kumachang*¹; Brittlee Reese¹; Tawanda J. Zimudzi¹; Ivy M. Asuo¹; Nutifafa Y. Doumon¹; ¹Pennsylvania State University

SPG-32: Beneficiation of Primary Copper Making and Electric Arc Furnace Steelmaking Slags: *Daniel Goettlich*¹; Basak Anameric¹; ¹Montana Tech

SPG-33: Characterization of Corrosion Product in X65 Pipeline Steel for CO₂ Transport: *Emma Coatney*¹; Lawrence Cho¹; Kip Findley¹; May Martin²; Andrew Slifka²; Ross Rentz²; ¹Colorado School of Mines; ²National Institute of Standards and Technology

SPG-34: Photoexcitation-Induced Point Defects in BaTiO₃ and TiO₂ Nanostructures: *Guillem Vives Ollé*¹; Thomas Berger¹; Gilles Bourret¹; Oliver Diwald¹; ¹Paris Lodron Salzburg University

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Additive Manufacturing

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-1: Detection of Lifecycle Deviation from Fabrication to Produced L-PBF Part: *Peter Burdick*¹; Laura Bruckman¹; Anthony Lino¹; Kristen Hernandez¹; ¹Case Western Reserve University

SPU-2: Industrial Black Hills Minerals: Characterization for Application in Ceramic Additive Manufacturing: *Calder Lange*¹; Katrina Donovan²; ¹Middlebury College; ²South Dakota School of Mines

SPU-3: Intermediate-Temperature Oxidation Behavior of CoCrNi Additively Manufactured Alloys: *Trevor Baldock*¹; Emmanuelle Marquis¹; Reza Roumina¹; ¹University of Michigan

SPU-4: Non-Destructive Testing Methods for Applications in Metal 3D Printing: *Jonathan Amirault*¹; ¹Worcester Polytechnic Institute

SPU-5: Validating Indentation-Based Techniques as a Rapid Method for Assessing Additively Manufactured Metals: *Rachel Tsang*¹; ¹Worcester Polytechnic Institute

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Artificial Intelligence

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-6: Synthesizability Evaluation of Copolymers Using Transformers: *Sidh Jaddu*¹; ¹Thomas Jefferson High School for Science and Technology

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Biomaterials

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPU-7: Characterization of Poly(Ethylene Glycol) Diacrylate (PEGDA) Hydrogels for Vitreous Substitutes: *George Liu¹; Meghal Keskar¹; Katelyn Swindle-Reilly¹; ¹The Ohio State University*

SPU-8: Engineering a Non-Antibiotic Biomimetic Nano-Urchin for Broad-Spectrum and Long-Acting Antibacterial Spraying: *Xinyue Wang¹; ¹Wuhan University of Technology*

SPU-9: Evaluation of Antioxidant-Loaded Nanoparticles in PEG-Based Hydrogel for Post-Operative Ocular Care: *Leah Danish¹; Meghal Keskar¹; George Liu¹; Katelyn Swindle-Reilly¹; ¹The Ohio State University*

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Ceramic and Glass Materials

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPU-10: Bactericidal and Dissolution Properties of Lithia-Borate Glass-Polymer Composites: *Claire Bogaard¹; Mario Affatigato²; Avery Murray³; ¹Missouri University of Science and Technology; ²Coe College; ³Cedar Rapids Jefferson High School, IA*

SPU-11: Cold Sintering of Limestone Mining Waste: *Ian Blair¹; ¹South Dakota School of Mines & Technology*

SPU-12: Exploring the Possibilities of Aluminophosphate Materials for Long-Term Storage of Radioiodine: *Mary Lucy¹; Charmayne Lonergan¹; Jack Ryan¹; ¹Missouri University of Science and Technology*

SPU-13: Influence of Heterovalent Doping on Tetrahedral N Interstitial Formation in Dilute GaAsN Alloys: *Matteo Carcassi¹; Joshua Cooper¹; Rachel Goldman¹; Dasha Womack¹; Zhucong Xi¹; Liang Qi¹; ¹University of Michigan*

SPU-14: LZ45P Glass Durability Study: *Rachel Leerssen¹; ¹Missouri University of Science and Technology*

SPU-15: Mechanical Properties of Nichrome Fiber Reinforced Magnesium Aluminate Spinel: *Emily Hadden-Ford¹; Sharmin Mostari¹; Ricardo Castro¹; ¹Lehigh University*

SPU-16: Particle Size-Controlled Densification of Ultra-High Temperature Ceramics: *Sarah Hall¹; Jonathan Kaufman²; Connor Wyckoff²; Lisa Rueschhoff³; ¹SOCH; ²AV Inc; ³Air Force Research Laboratory*

SPU-17: Quantification of Gas Separation in Kaolinite Clay Membranes for Hydrogen Gas Filtration: *Ryan McGinnis¹; Grover Coors²; Sandrine Ricote¹; Ivar Reimanis¹; ¹Colorado School of Mines; ²Hydrogen Helix*

SPU-18: Structural Characterization of NdTiO (NTO), A High Temperature Ferroelectric: *K. Lakshitha¹; Sanjay Prasad Kannan¹; ¹Anna University*

SPU-19: Synthesis of Doped ZnO Varistor Nanoparticle for Enhanced Electrical Properties: *Emma Eleson¹; Sevag Momjian¹; Clive Randall¹; ¹The Pennsylvania State University*

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Fundamentals and Characterization

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

SPU-20: Bridging Magnetic and Electric Domains: Developing Design Principles for Hybrid Magnetolectric Materials: *Andrew Hope¹; Eve Mozur¹; ¹Colorado School of Mines*

SPU-21: Computer Vision Morphological Analysis of Metal Powders via Scanning-Electron Micrographs: *Jonah Carter¹; Stephen Price¹; ¹Worcester Polytechnic Institute*

SPU-22: Filament Attribute Comparison: *Cordelia McKelvy¹; ¹North Carolina State University*

SPU-23: Flow Induced Crystallization of Polyethylene Grafted Nano Particles: *Alisha Kohl¹; ¹Pennsylvania State University*

SPU-24: Gallium Oxide for Use as a Ultra Wide Band Gap Semiconductor: *Connor Beakes¹; Robert Lavelle²; William Everson²; Daniel Erdely²; Luke Lyle²; Scott Pistner²; Mason Cleff²; Sammy Hallacher¹; David Snyder²; ¹Penn State; ²Applied Research Laboratory at Penn State*

SPU-25: Maximizing Size-Misfit Cation Solubility in Rock Salt High-Entropy Oxides: *Joseph Petruska¹; Matthew Furst¹; Dhiya Srikanth¹; Kaylin Lamaute¹; Jon-Paul Maria¹; Saeed S. I. Almishal¹; ¹Penn State University*

SPU-26: Mechanical Behavior of a Unique B2 Medium-Entropy Alloy: *Wyeth Haddock¹; ¹University of Connecticut*

SPU-27: Probing the Elastic and Plastic Anisotropy of Single-Crystal Superalloys Using Nanomechanical Testing: *David Gaetano¹; Kidus Abebe¹; Aurelia Moriyama-Gurish¹; Colton Basar¹; Udo Schwarz¹; Amit Datye¹; ¹Yale University*

SPU-28: Understanding Transport Properties Below T_c in Topological Superconductor CuxBi2Se3: *Shawn Rottinghaus¹; ¹Missouri University of Science and Technology*

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Iron and Steel (Ferrous Alloys)

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-29: A Microstructural Analysis of Friction Stir Processed Ferrous Alloys: *Amrita Anand*¹; Erik Herbert²; Wei Tang²; Alice Perrin²; ¹Pennsylvania State University; ²Oak Ridge National Laboratory

SPU-30: Effect of Heat Treatment on HSLA Steel: *Clark Nguyen*¹; ¹Missouri University of Science and Technology

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Modeling

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-31: Computational Studies of Amorphous Silicon Dioxide as an Anode Material for Lithium-Ion Batteries: *Aishwarya Muralidhar*¹; Ying Ma¹; ¹University of Wisconsin - Eau Claire

SPU-32: Development of a New CALPHAD Database for the Fe-Ni-P System: *Zachary Miller*¹; Ugochukwu Ochieze¹; Eric Payton¹; Matthew Steiner¹; ¹University of Cincinnati

SPU-33: Stabilizing Altermagnetism in FeSb₂ via Strain: *Alyssa McPhee*¹; Amy Liu²; ¹Denison University; ²Georgetown University

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Nanomaterials

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-34: Ligand Shell Density Controls Photoinduced Detachment in Colloidal CdSe Quantum Dots: *Jacob Cho*¹; McKenna Grega¹; Robert Brown¹; John Asbury¹; ¹Pennsylvania State University

SPU-35: Optimization of Nb₃C₂T_x MXene Synthesis for Improved Yield and Flake Quality: *Pratyush Chettri*¹; Krutarth Kamath¹; Brian Wyatt¹; Anupma Thakur¹; Nithin Chandran B.S.¹; Babak Anasori¹; ¹Purdue University

SPU-36: Role of Annealing in Improving the Quality of PMMA-Transferred Monolayer MoS₂: *Pavan Kumar Reddy Po*¹; Chen Chen¹; Rohini Sanikop¹; Joan Redwing¹; ¹Penn State University

SPU-37: Self-Assembled Monolayers as a Tunneling Barrier in Metal-Insulator-Metal Diode for Nanoparticle Optical Rectenna: *Jawad Mahmud*¹; ¹Rutgers University

SPU-38: Surface Modification of Ti₃C₂T_x MXenes with Organic Ligands: *Aditi Akella*¹; Krutarth Kamath¹; Babak Anasori¹; ¹Purdue University

SPU-39: Tools for Modeling the Self-Assembly of DNA-Coated Pentatwinned Nanorods: Timothy Moore¹; Joseph Burkhart¹; *Mia Frank*¹; Sharon Glotzer¹; ¹University of Michigan Ann Arbor

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Nuclear Energy

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-40: Thermal Conductivity Measurements of High Temperature Fluoride and Chloride Salts: *Samuel Nasman*¹; Troy Munro¹; Jacob Numbers¹; Britton Baltich¹; Isaac Walker¹; Andrew Christiansen¹; Ryan Ruth¹; Hailey Snodgrass¹; ¹BYU TEMP Lab

SPECIAL TOPICS

2025 Undergraduate Student Poster Contest — Sustainability, Energy, and the Environment

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

SPU-41: Selective Electrodeposition of Nickel and Cobalt Using pH-Dependent Chelating Agents: *Isabella Ellis*¹; Katherine Fowler²; Thomas Walker¹; Jihye Kim¹; ¹Colorado School of Mines; ²Lewis and Clark University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

17th 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; Wei Ji, Wuhan University of Technology

Tuesday PM | September 30, 2025
 Exhibit Hall C/D | Convention Center

N-1: Designing and Implementing the Waste-to-Wealth Approach for Development of Metallurgical and Nanoscale Materials from Solar Panel Waste: *Maarij Alfi*¹; Maira Khaleel¹; Salwa Zafar¹; Muhammad Abdul Basit¹; ¹Institute of Space Technology



N-3: Recycling of Fe and Sm Through Selective Carbothermal Reduction of SmFeO₃: *Mario Caccia*¹; Mitchell Harvey²; Courtney Young²; ¹Alfred University; ²Montana Technological University

CERAMIC AND GLASS MATERIALS

2D Materials: Synthesis, Properties, and Applications — Poster Session

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

Program Organizers: Christopher Shuck, Rutgers University; Dave Estrada, Boise State University; Nicholas Glavin, Air Force Research Laboratory

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

D-1: Broadband Optical Synapses Enabled by Wafer-Scale Flexible 2D PtSe Arrays: *Sang Sub Han*¹; Jung Han Kim²; Hee-Suk Chung¹; Yeonwoong Jung³; ¹Korea Basic Science Institute; ²Dong-A University; ³University of Central Florida

D-2: Effect of Hydrated Silica-Coir-Based Nanoparticles on the Remediation of Waste Cooking Oil Contaminated Soil for Maize (Zea mays) Cultivation: Joshua Onaifo¹; Godfrey Otabor¹; Esther Ikhuoria¹; Blessing Ilegbinjile¹; ¹Ambrose Alli University, Ekpoma, Edo State, Nigeria

D-3: Investigating the Influence of Silver Nano Shell on the Optical and Thermal Properties of Polydimethylsiloxane: *Ashish Kumar*¹; Abhishek Kumar¹; Moutushi Choudhury²; ¹Chandigarh University; ²Amity University

D-4: Monolayer Nanofilm Fabrication of Ultra-small Bimetallic Cobalt-Alumina Oxide Nanoparticles for Enhanced Carbon Nanotube Synthesis: *Bishow Regmi*¹; ¹University of Cincinnati

BIOMATERIALS

3D Printing of Biomaterials and Devices — Poster Session

Sponsored by: TMS: Biomaterials Committee

Program Organizers: Sahar Vahabzadeh, Northern Illinois University; Solaiman Tarafder, South Dakota State University; Amit Bandyopadhyay, Washington State University; Susmita Bose, Washington State University

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

C-1: Alkali-Heat Treated Titanium Loaded with Curcumin for Bone Tissue Engineering; Release Kinetics and In Vitro Biological Properties: Andrew Cedillo¹; *Sahar Vahabzadeh*¹; ¹Northern Illinois University

C-2: Copper-Based Antimicrobial Filters Fabricated via a Hybrid 3D Printing–Casting Approach: *Sheikha Aljnaa*¹; Amjad Khalil¹; Oraib Al-Ketan¹; Sabarinathan Palaniyappan¹; Dalaq Ahmed¹; ¹King Fahd University of Petroleum & Minerals

C-3: In Vivo Performance of Additive Manufacturing Implants vs. Commercially Available Implants: *Mari Koike*¹; Azusa Seki²; Yutaka Yanaba³; Susan Hummel⁴; Toru Okabe⁵; ¹Nippon Dental University; ²Fukushima Medical Device Development Support Centre; ³University of Tokyo Institute of Industrial Science; ⁴Harry S. Truman Memorial Veterans' Hospital; ⁵Baylor College of Dentistry

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; Li Ma, Johns Hopkins Applied Physics Laboratory; Charles Fisher, Office Of Naval Research; Brandon McWilliams, US Army Research Laboratory; Yeon-Gil Jung, Korea Institute of Ceramic Engineering & Technology

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

Session Chair: Jing Zhang, Purdue University

A-1: Explore Feedstock Powders and Binder Systems Using an Open-Source Binder Inkjet 3D Printer: *Andrew Gillespie*¹; Jing Zhang¹; ¹Purdue University

A-2: Integration of Additive Manufacturing Techniques in Novel Electric Motor Design and Fabrication: *Andrew Gillespie*¹; Tiraruek Ruekamnuaychok¹; Liwei Zhang¹; Scott Sudhoff¹; Jing Zhang¹; ¹Purdue University

A-3: Modeling Powder Sintering Process Using Lattice Boltzmann Method: *Liwei Zhang*¹; Rou Chen²; Huidan (Whitney) Yu¹; Jing Zhang¹; ¹Purdue University; ²China Jiliang University

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

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

A-4: Tailoring Material Properties of 3D Printed Alumina Through DLP Printing and Firing Parameters: *Adriana Joyce*¹; ¹SiNAPTIC Technologies

A-15: Versatile Ceramic Slurry Formulations for Photopolymerization-Based Additive Manufacturing: *Jošt Oblak*¹; Jakob König¹; Matjaž Spreitzer¹; ¹Jozef Stefan Institute

ADDITIVE MANUFACTURING

Additive Manufacturing of Polymeric-Based Materials: Potentials and Challenges — Poster Session

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

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

A-6: Effect of Environmental Conditions on Mechanical Properties of 3D-Printed Glass Microfiber Reinforced Polyamide (PA-12) Composites: *Jeet Thapa*¹; Adedamola Adeyemi¹; Toufik Kanit¹; Ahsan Mian¹; ¹Wright State University

A-16: Rheological Study of Soybean Oil and Titanium Oxide Suspensions for Developing 4D Porous Materials: *Isaac Ntiamoah*¹; Zahra Bahrani¹; Abby Whittington¹; Carolina Tallon¹; ¹Virginia Polytechnic Institute and State University

ADDITIVE MANUFACTURING

Additive Manufacturing, Directed Energy Deposition of Metals: Processing – Microstructure – Mechanical Property Relationships — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Joy Gockel, Colorado School of Mines

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

A-5: Alloy Design of Printable Precipitation Strengthened Al-Zn Alloys Using Grain Refinement and Crack Mitigation Alloying Strategies: *Anne Dunn*¹; John O'Connell¹; Bhaskar Majumdar¹; ¹New Mexico Institute of Mining and Technology

A-7: Compositionally Optimized Superalloys for Additive Manufacturing: Understanding the Microstructure-Crack Resistance-Property Relationship: *Tae-Gyeong Kim*¹; A-Reum Lee¹; Hyun-Uk Hong¹; Chan-Hee Lee²; Won-Suk Ko³; Byung-Soo Lee⁴; Hae-Jin Lee⁴; ¹Changwon National University; ²Korea Advanced Institute of Science and Technology; ³Inha University; ⁴Korea Institute of Industrial Technology

A-8: Development of Printable High Strength Aluminum-Copper Alloys for Additive Manufacturing Applications Using Grain Refinement and Crack Mitigation Alloying Strategies: *John O'Connell*¹; Anne Dunn¹; Bhaskar Majumdar¹; ¹New Mexico Institute of Mining and Technology

A-9: Interactions Between Grain Characteristics and Ion Irradiation in Additively Manufactured CoCrFeNi-Based High-Entropy Alloys: *Jiaxuan Li*¹; Wei-Ying Chen²; Meimei Li²; *Shunyu Liu*¹; ¹Clemson University; ²Argonne National Laboratory

A-10: Microstructures and Tensile Properties of BN-Reinforced Aluminum Composites Manufactured by Directed Energy Deposition: *Sumin Kim*¹; Yoon Suk Choi¹; Tae Yang Bang¹; JaeHyeong Kim¹; HaeJu Jo¹; WookJin Lee¹; ¹Pusan National University

A-11: Porosity Prediction with Multi-Layer Perceptron from Thermal Imaging of DED of Steel and Inconel: *Aniqa Lim*¹; Francisco Robles Hernandez¹; ¹University of Houston

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Poster Session

Sponsored by: ACerS Other

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

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

A-12: Additive Manufacturing of High Density Ultra High Temperature Ceramics for Aerospace Applications: *Varad Agarwal*¹; Ambreen Nisar¹; ¹Florida International University

A-13: Microstructural Evaluation of Thin-Wall Sections of 316L Stainless Steel Produced by Laser Powder-Bed Fusion Processing: *Alan Jankowski*¹; Joshua Yee¹; Manuel Lopez-Martinez¹; Ryan Nishimoto¹; Meghan Rogers¹; ¹Sandia National Laboratories

A-14: One Go Approach on Developing Topologically Interlocked Materials (TIMs) via Fused Filament Fabrication Process: *Sabarinathan Palaniyappan*¹; Ahmed S Dalaq¹; ¹King Fahd University of Petroleum and Minerals

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments VI — Poster Session

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Cheng Sun, Clemson University; Caitlin Kohnert, Los Alamos National Laboratory; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Khalid Hattar, University of Tennessee Knoxville

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

L-1: Quantifying Amorphous Fractions Using Different Characterization Techniques: *Will Gardner*¹; Cale Overstreet¹; Maik Lang¹; Eric O'Quinn¹; ¹University of Tennessee Knoxville

L-2: Radiation-Induced Amorphization in WO and MoO: Structural Response: *Katherine Parker-Repscher*¹; Cale Overstreet¹; Maik Lang¹; Eric O'Quinn¹; ¹University of Tennessee, Knoxville

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Coatings for Wear and Corrosion Protection — Poster Session

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

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

Session Chair: Evelina Vogli, Flame Spray Inc.

H-1: Effect of Chromium Content on Intermetallic Growth and Heat Resistance in Hot-Dip Aluminized Ferritic Stainless Steels: *Euijin Jung*¹; Jihun Choi¹; Daeyoon Kim¹; Jooyoul Huh¹; ¹Korea University

H-2: Enhanced Wear Resistance of AS41 Magnesium Alloy via Plasma Electrolytic Oxidation: *Bruno Pereira*¹; Thiago Gontarski¹; Ricardo Torres¹; Paulo Soares Jr¹; ¹Pontificia Universidade Católica do Paraná

H-3: Enhancing Tribological and Corrosive Properties of AM60 and AZ91 Magnesium Alloys via PEO Surface Modification: *Paulo Soares*¹; Tarciana Toscano¹; Bruno Pereira¹; Ricardo Torres¹; ¹Pontificia Universidade Católica do Paraná

H-4: Modern Corrosion and Wear-Resistant Coatings Obtained using FA-Charges Operating in Aggressive Conditions of Industrial Production: *Borys Sereda*¹; Irina Kruglyak¹; Dmytro Sereda¹; ¹DSTU

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Poster Session

Sponsored by: ACerS Other

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

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

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

H-5: Measuring the Residual Resistivity Ratios of Superconductive Materials Under Cryogenic Conditions: *Quentin Taylor*¹; Kirsten Lovelace¹; Sonya Smith¹; ¹Howard University

H-6: Numerical Methodology to Predict Fatigue Life of Thermal Barrier Coatings: *SangLim Lee*¹; HyunSu Lee¹; Yoon Suk Choi¹; SangWon Myeong²; HunHee Kim²; ¹Pusan National University; ²Doosan Enerbility

H-7: Vibration Based Analysis of Debonding Defects in a Structure Composed of Multi-Layered Materials with an Application Prospects in Marine Structure: *Dawit Yona*¹; ¹Gdansk University of Technology

MATERIALS-ENVIRONMENT INTERACTIONS

Advancement of Measurement Technologies for Harsh Environments — Poster Session

Sponsored by: TMS: Energy Committee

Program Organizers: Ruchi Gakhar, Idaho National Laboratory; Ammon Williams, Idaho National Laboratory; Tae-sic Yoo, Idaho National Laboratory

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H-8: Neutron Irradiation and Characterization of NV Centers in Diamond for Quantum Sensor Applications in Reactor Dosimetry: Luke Shoen¹; Jarod Remy¹; Lei Cao¹; ¹The Ohio State University

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 Ubc, Boise State University; Matjaž Spreitzer, Jožef Stefan Institute; Tanmoy Maiti, IIT Kanpur

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D-5: Cobalt Ferrite–PZT Composite Sensor Assembled at Room Temperature for High-Sensitivity Magnetoelectric Detection: Luiz Cotica¹; Lilian Pereira¹; Gustavo Dias¹; Ivair Santos¹; Ruyan Guo²; Amar Bhalla²; ¹State University of Maringa; ²University of Texas at San Antonio

D-6: Compact Custom Designed Antenna for Underground Wireless Communication: Hollis Alden¹; Amar Bhalla¹; Ruyan Guo¹; ¹University of Texas at San Antonio

D-7: Enabling Controlled Growth of Zinc Oxide Nanostructures Through High-Throughput Chemical Bath Deposition: Sean Garnsey¹; Ruyan Guo¹; Amar Bhalla¹; ¹University of Texas at San Antonio

D-8: Entropy Stabilized Oxides with Ultra-Low Thermal Conductivity: Emerging Class of High Temperature Thermoelectrics: Tanmoy Maiti¹; ¹IIT Kanpur

D-9: Machine Learning Models as a Useful Tool for Predicting the Dielectric Breakdown Strength: Matthew Mileski¹; Adib Samin¹; ¹Air Force Institute of Technology

D-10: Magnetoelectric Nanorobots for Targeted Treatment: Soutik Betal¹; Amar Bhalla²; Ruyan Guo²; ¹IIT Delhi; ²University of Texas- San Antonio

D-11: Redox-Driven Modulation of Optoelectronic Performance in Dy-Doped MoO Thin Films: Md Zulkernain Haider¹; Kartik Ghosh¹; ¹Missouri State University

D-12: Structural and Microstructural Properties in (5A)BO₃ High-Entropy Ferroelectric Ceramics – Effect of the Ba²⁺ Concentration: Karine Felix Santos de Jesus¹; Marco Antonio Rodriguez Martinez²; Ruyan Guo³; Amar S. Bhalla³; John C. Mantilla Ochoa¹; Jose de los Santos Guerra¹; ¹Universidade Federal de Uberlandia; ²Universidade de Brasilia; ³University of Texas at San Antonio

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Process Metallurgy — Poster Session

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

Program Organizers: Yashwanth Injeti, Big River Steel; Viraj Ashok Athavale, Nucor Steel Memphis Inc; Judy Qiujin Li, ClevelandCliffs

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F-1: Research on the Flow Field of 550mm×700mm Rectangular Bloom Mold by SEN Parameters: Haitao Ma¹; Weiqiang Chen¹; Xueqian Cao¹; Jie Chen¹; Yanhui Sun²; ¹MCC Capital Engineering & Research Incorporation Limited; ²University of Science and Technology Beijing

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

Program Organizers: Manoj Mahapatra, University of Alabama-Birmingham; James Hemrick, Oak Ridge National Laboratory; John Hardy, Pacific Northwest National Laboratory; Jorgen Rufner, Idaho National Laboratory

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N-4: System Analysis of an Internal Combustion Engine (ICE) – Solid Oxide Fuel Cell (SOFC) Hybrid Cycle: Paul Kalungi¹; Jose Colon Rodriguez²; David Tucker³; Nana Zhou³; Nor Harun³; Edward Sabolksy¹; ¹West Virginia University; ²NETL / West Virginia University; ³National Energy Technology Laboratory

MODELING

Advances in Multiphysics Modeling and Multi-Modal Imaging of Functional Materials — Poster Session

Sponsored by: ACerS Basic Science Division

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

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Exhibit Hall C/D | Convention Center

J-1: Modeling the Impact of Stress and Roughness on Electrodeposition in All-Solid-State Batteries: *Kaniza Islam*¹; Yanzhou Ji¹; Noriko Katsube¹; ¹The Ohio State University

LIGHTWEIGHT ALLOYS

Advances in Titanium Technology — Poster Session

Sponsored by: TMS: Titanium Committee

Program Organizers: G. Babu Viswanathan, Ohio State University; Michael Mills, Ohio State University; Sriram Vijayan, Michigan Technological University; Abhishek Sharma, Worcester Polytechnic Institute; Soumya Nag, Oak Ridge National Laboratory; Thomas Broderick, Federal Aviation Administration; Simon Ringer, University of Sydney; Vasisht Venkatesh, Howmet Aerospace; Paraic O'Kelly, Ohio State University

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G-1: Facile Synthesis of Porous Ti Foams for Enhanced Cell Ingrowth into the Pores: *Mayank Garg*¹; Tushar Borkar¹; Sanoj Karki¹; ¹Cleveland State University

G-2: High-Temperature Material Properties of Titanium Alloy Sheet at Different Strain Rates: *Yujin Chae*¹; *Minki Kim*¹; ¹Korea Institute Of Industrial Technology

G-3: Microstructural Evolution and Mechanical Property Enhancement in Ti80(CoFeNi)20 Ultrafine Eutectic Composites via Thermal Processing: *Muhammad Aoun Abbas*¹; Dilshodbek Yusupov¹; Ki Buem Kim¹; ¹Sejong University

IRON AND STEEL (FERROUS ALLOYS)

Advances in Understanding of Martensite in Steels III — Poster Session

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

Program Organizers: Viraj Ashok Athavale, Nucor Steel Memphis Inc; Michael Gammage, DEVCOM Army Research Laboratory; Daniel Baker, LIFT

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Exhibit Hall C/D | Convention Center

F-2: Effects of Manganese Sulfide Morphology on Bending Fracture Mechanism of Martensitic Steel: *Tatsuya Otsuki*¹; Yoshinobu Yasuoka¹; Yuma Asada¹; Shingo Fujinaka¹; Takashi Yasutomi¹; Shunji Hiwatashi¹; ¹Nippon Steel

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; Oliver Diwald, Paris Lodron Universitaet Salzburg; Hyunjoo Choi, Kookmin University

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K-1: Aqueous Synthesis of Copper Nanoparticles for Creation of Lightweight Multifunctional Nanocomposites: *Gabrielle Grey*¹; Rianna Gupta¹; Alan Taub¹; Mark Hammig¹; ¹University of Michigan

K-3: Eco-Friendly Nanoceramic(YSZ)-Chitosan Thin Films: *Evan Woodward*¹; Natalie Westwood¹; Mst Sharmin Mostari¹; Kavan Joshi¹; Ricardo Castro¹; ¹Lehigh University

K-4: In Situ Temperature-Dependent X-Ray Diffraction Study of Sn-Doped BaTiO Piezoelectric Ceramic: *Jacob Akana*¹; Neamul Khansur¹; ¹Case Western Reserve University

K-5: Ni²⁺ Mediated Enhanced Microstructural, Optical, and Multiferroic Properties of 0.9KNbO₃- 0.1BaNi_{0.5}Nb_{0.5}O₃- δ Electro-Ceramics for Photovoltaic Applications: *Ankit Chahar*¹; ¹Jawaharlal Nehru University

MATERIALS-ENVIRONMENT INTERACTIONS

Corrosion, Protection and Damage Monitoring of Advanced Materials in Natural and Specific Environments — Poster Session

Sponsored by: ACerS Education and Professional Development Council, ACerS Energy Materials and Systems Division, TMS Energy Committee, TMS: Energy Conversion and Storage Committee, TMS: Corrosion and Environmental Effects Committee

Program Organizers: Xueyuan Zhang, Gamry Instruments; Guang-ling Song, Southern University of Science and Technology

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Session Chairs: Guang-ling Song, Southern University of Science and Technology; John Zhang, Gamry Instruments; Qixin Zhou, The University of Akron

H-9: Performance Evaluation of Pipeline Coating Disbondment Under Excessive Cathodic Protection: *Yuhan Su*¹; Qixin Zhou¹; ¹University of Akron

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Poster Session

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Sepideh Akhbarifar, The Catholic University of America -Vitreous State Lab; Jianhua Tong, Clemson University; Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Charmayne Lonergan, Missouri University of Science and Technology; Armin Feldhoff, Leibniz University Hannover; Takayoshi Katase, Institute of Science Tokyo; Bed Poudel, Pennsylvania State University; Ekaterina Pomerantseva, Drexel University; Kai He, University of California, Irvine

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N-5: Design, Physicochemical Characterization, and Electrochemical Evaluation of Choline Chloride- and Betaine-Based Deep Eutectic Solvents for Energy Storage Applications: *Maria Quiñonez-Angulo*¹; José Díaz-Arriaga²; Evelyn Olivares Rodríguez²; Mara Beltrán-Gastélum²; Sergio Pérez-Sicairos²; Davita Watkins¹; Moisés Salazar-Gastélum²; ¹The Ohio State University; ²Tecnológico Nacional de México/Instituto Tecnológico de Tijuana

N-6: High Charge-Discharge Performance of Stacking-Sequence Disordered SiC with Carbon as Anode Material for Lithium-Ion Battery: *Manshi Ohyanagi*¹; Kento Nakanishi¹; Tomoya Takeda¹; Kenshiro Shirai¹; Takahito Imai¹; Minehiko Ohta¹; ¹Ryukoku University

N-7: Innovative Air-Free Shuttle Enables 24-Hour Air Free Transfer of Li-Ion Battery Materials for SEM/FIB Characterization and Analysis: *Feng Shen*¹; ¹Scientific Bridge LLC

N-8: MLIP-Driven Insights into Structural Changes and Oxygen Dimerization in Li-Rich Ni-Rich Oxide Cathodes: *Prottay Malakar*¹; Mohammad Babar¹; Bernardo Barbiellini²; Arun Bansil³; Venkat Viswanathan¹; ¹University of Michigan; ²LUT University; ³Northeastern University

N-9: New Technological Advances Enable Portable Powder X-Ray Diffractometer (XRD) to Operate in a Glovebox: *Feng Shen*¹; ¹Scientific Bridge LLC

N-10: Tradeoffs Curves for AC Losses in Superconducting and Normal Metal Conductors Relevant to MW Class High Power Density Electric Motor Applications: *Hyuk Kwon*¹; Michael Sumption¹; Edward Collings¹; ¹Ohio State University

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, WORLDEX Industry & Trading Co., Ltd.; Hua-Tay Lin, Guangdong University of Technology; Michael Halbig, NASA Glenn Research Center

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D-13: Effects of Acid/Water Ratio in the Sol-Gel Process for Ceria-Doped Zirconia Particles on Shapes, Crystal Structures, and Compression Behaviors: *Yun Sik Park*¹; Yi Je Cho¹; ¹Sunchon National University

D-14: Effects of Electrode and Substrate Optimization on Solid Oxide Cell Performance: *Susanna Tanck*¹; Meghan Stout¹; ¹Nexceris, LLC

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Challenges, Advances, and Applications — Poster Session

Sponsored by: ACerS Glass and Optical Materials Division

Program Organizers: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, Indian Institute of Technology Delhi

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Session Chairs: Morten Smedskjaer, Aalborg University; N. M. Anoop Krishnan, IIT Delhi

D-15: Copper Ion-Exchange of Tin Mixed-Alkali Silicate Glass: *Jacob Kasprzyk*¹; William LaCourse¹; ¹Alfred University

D-16: Downselection of Crystalline Ensembles for Efficient First-Principles Modeling of Glassy Materials: *Raphael Stone*¹; Rachel Kurchin¹; ¹Carnegie Mellon University

D-17: Non-Destructive Sequential Imaging of Indentation-Induced Cracking in Oxide Glasses by *In Situ* Nanotomography: *M. Faizal Ussama Jalaludeen*¹; Kritika Singh²; Jonas A. Finkler¹; Johan F. S. Christensen¹; Soeren S. Soerensen¹; Menghan Shi¹; Sidsel M. Johansen¹; Sudheer Ganiseti¹; Imke Greving²; Morten M. Smedskjaer¹; ¹Aalborg University; ²Institute of Material Physics, Helmholtz-Zentrum Hereon

D-18: Structural Transformation of Solids Derived From Crystalline, Amorphous, and Nanoparticle GeO₂ Sources: *Monisha Murthi*¹; Andrew Fernandes¹; Steve Feller²; David Sidebottom¹; Joel Destino¹; ¹Creighton University; ²COE College

D-19: Understanding the Structural Role of Indium in Aluminoborosilicate Glass: A Multi-Spectroscopic Study: *Amir Ashjari*¹; Andrew Ogrinc²; Ricardo Lancelotti³; Randall Youngman⁴; Henrik Bradtmüller⁵; Myungkoo Kang¹; Seong Kim²; Doris Möncke¹; ¹Alfred University; ²Pennsylvania State University; ³Federal University of São Carlos; ⁴Corning Incorporated; ⁵University of São Paulo

FUNDAMENTALS AND CHARACTERIZATION

High-Entropy Materials: Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond VI — Poster Session

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

Program Organizers: Shuozhi Xu, University of Oklahoma; 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-1: A Methodological Study on Data Representation for Machine Learning Modelling of Thermal Conductivity of Rare-Earth Oxides: *Amiya Chowdhury*¹; Acacio Rincon Romero¹; Halar Memon¹; Eduardo Aguilar-Bejarano¹; Tanvir Hussain¹; Graziela Figueredo¹; ¹University of Nottingham

E-3: Influence of Ti on the Microstructure and Mechanical Characteristics of (CrFeNiCu)_{100-x}Ti_x High Entropy Alloys: *Dilshodbek Yusupov*¹; Sung Hwan Hong¹; Muhammad Aoun Abbas¹; Hae Jin Park¹; Ki Buem Kim¹; ¹Sejong University

E-4: Investigation on Effect of Minor Elements in the Mechanical Behavior and Microstructure of (AlCoCrNi)_{100-xy}Mn_xV_y High-Entropy Alloys: *Rakhmatjon Gaipov*¹; Elyorjon Jumaev¹; Omon Sultonov¹; Jakhongir Bakirov¹; Turaboy Shermatov²; Ki Buem Kim³; ¹University of Business and Science; ²The Science Olympiad Center; ³Sejong University

E-5: Precipitation Hardening Feasibility Within the D022 Phase Range of AlCrMoTiV High Entropy Alloys: *Basil Ochieze*¹; ¹PGE Applied Resources Laboratory

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Hybrid Organic-Inorganic Materials for Alternative Energy — Poster Session

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University; Alessandro Martucci, University of Padova

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N-11: Reducing Interfacial Impedance at the Metal-Organic Molecule Joint via Electrografting: *Camila Jaillita*¹; Henrique De Aguiar Minami²; Jorge Seminario²; Noe Alvarez¹; ¹University of Cincinnati; ²Texas A&M University

SPECIAL TOPICS

IGNITE MSE: Bridging Gaps in Innovation and Collaboration — Poster Session

Sponsored by: ACerS President's Council of Student Advisors

Program Organizers: Pattiya Pibulchinda, Northwestern University; Marcus Fish, The American Ceramic Society; Amanda Engen, The American Ceramic Society; Nathaniel McIlwaine, American Ceramic Society

Tuesday PM | September 30, 2025
Exhibit Hall C/D | Convention Center

O-1: A Materials Journey from STEM to STEAM: *Jon Kellar*¹; Michael West¹; Katrina Donovan¹; ¹South Dakota School of Mines and Technology

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; Zhengtao Gan, Arizona State University; Lei Li, Pacific Northwest National Laboratory; Yucheng Fu, Pacific Northwest National Laboratory; Philip Goins, US Army Research Laboratory

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B-1: Effects of Temperature and Strain Rate on Dynamic Recrystallization and Recovery of Aluminum Alloy 2618: *Venkata Yateendra Guthula*¹; Matthew Steiner¹; Christopher Calhoun¹; ¹University of Cincinnati

B-2: Machine Learning Model for Estimating the Number of Grains in Ti-6Al-4V XRD Patterns: *Gabriel Ponon*¹; Mohommad Redad Mehdi¹; Ozan Dernek¹; Hemant Sharma²; Pawan Tripathi¹; Roger French¹; ¹Case Western Reserve University; ²Argonne National Laboratory

D-21: Signal Analysis During Micro Hole Drilling Process on Single Crystal Silicon for Semiconductor Device Fabrication Process: *Hwa-Sub Lee*¹; Jun Sae Han¹; Doo-Sun Choi¹; Eun-Ji Gwak¹; ¹Korea Institute of Machinery & Materials

PROCESSING AND MANUFACTURING

Lightweight Composites, Materials & Alloys — Poster Session

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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M-1: Characterization of Composite Metal Foams Joined Through Brazing: *Afsaneh Rabiei*¹; John Cance¹; Chinmaya Prerana Inguva¹; ¹North Carolina State University

M-2: Effects of Trace Elements on Microstructure, Mechanical Properties and Corrosion Characteristics of Al 3000 Based Alloys for Micro-Channel Tube in Heat Exchangers: *Hyeon-Taek Son*¹; Yong-Ho Kim¹; Hyo-Sang Yoo¹; Byong-Gwon Lee¹; Eun-Chan Ko¹; ¹Korea Institute of Industrial Technology

M-3: Evaluation of Microstructure and Mechanical Properties of Al-B Alloys With Varying Fe and Rare Earth Additions: *Hyo-Sang Yoo*¹; Yong-Ho Kim¹; Byeong-Kwon Lee¹; Eun-Chan Ko¹; Hyeon-Taek Son¹; ¹Korea Institute of Industrial Technology

M-4: Fabrication of Multi-Layered Aluminum Composite Sheets via Accumulative Roll Bonding (ARB) Process: *Jung Han Kim*¹; Dae Seong Han¹; Daeyeon Kim¹; ¹Gyeongbuk Institute of IT Convergence Industry Technology

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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Session Chair: Alexander Dupuy, University of Connecticut

D-20: Revisitation of Powder Flowability Interpretation From Tap Densification Response: *Caleb Rhine*¹; Andrew Guariglia¹; Jacob Dahlhauser¹; ¹University of Tennessee Knoxville

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Poster Session

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

Program Organizers: Fei Peng, Clemson University; Kathy Lu, University of Alabama Birmingham; Dillpuneet Aidhy, Clemson University; Yi Je Cho, Suncheon National University

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B-3: Machine Learning of the Creep Life of Heat-Resistant Steel and Thermodynamical Analysis Using Generative AI: *Taehyeon Cho*¹; Yoon Suk Choi¹; Wangrok Seok¹; ¹Pusan National University

B-4: Machine Learning Prediction of Oxidation Behaviors of Graphite Materials in Accidental Conditions of High Temperature Gas-Cooled Reactors: *Jae Min Kim*¹; *Yi Je Cho*¹; ¹Suncheon National University

MATERIALS-ENVIRONMENT INTERACTIONS

Materials Under Extreme Environment — Poster Session

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

Program Organizers: Robert Slapikas, DEVCOM Army Research Laboratory; Anindya Ghoshal, DEVCOM Army Research Laboratory; Douglas Wolfe, Pennsylvania State University

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H-11: Development of Superhard High-Entropy Carbide and Carbonitrides for Extreme Environments via FAST Sintering: *Lucas Wilson*¹; ¹Penn State

H-12: Understanding the Effects of Microstructure Through Crystal Plasticity Models: *Zyrick Bermudez*¹; Adib Samin¹; ¹Air Force Institute of Technology

NUCLEAR ENERGY

Metallic Nuclear Fuel Design, Fabrication and Characterization — Poster Session

Sponsored by: TMS: Materials Characterization Committee, TMS: Nuclear Materials Committee

Program Organizers: Ericmoore Jossou, Massachusetts Institute of Technology; Linu Malakkal, Idaho National Laboratory; Nana Ofori-Opoku, McMaster University; Anil Prasad, Canadian Nuclear Laboratories; Lingfeng He, North Carolina State University; Marat Khafizov, Ohio State University

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L-3: Volume Fraction of Porosity and Distinct Phases in Irradiated FAST U-Zr Fuel Using Manual Point Counting and Automatic Image Analysis: Lily Alberts¹; Nicole Rodriguez Perez²; Sobhan Patnaik²; Geoffrey Beausoleil²; Maria Okuniewski¹; ¹Purdue University; ²Idaho National Laboratory

FUNDAMENTALS AND CHARACTERIZATION

Microstructural Control in Materials Processing: Role of Phase Transformation Pathways — Poster Session

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Bharat Gwalani, North Carolina State University; Soumya Nag, Oak Ridge National Laboratory; Abhishek Sharma, Worcester Polytechnic Institute; Sriswaroop Dasari, University of Texas at El Paso; Ashley Paz y Puente, University of Cincinnati; Paul Gibbs, Los Alamos National Laboratory; Sophie Primig, University of New South Wales

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E-6: Effect of Heat Treatment Time on the Fatigue Life of 304 Stainless Steel Corrugated Pipes: Jaehyeon Park¹; Yoon Suk Choi¹; ¹Pusan National University

NANOMATERIALS

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

Sponsored by: ACerS Other

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

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

K-7: Controlled Growth of Vertically Aligned Carbon Nanotubes Using Narrow Size-Distributed Fe-Al Bimetallic Nanoparticles: Md Rakib Mahmud¹; ¹University of Cincinnati

K-8: Optimizing Iron Nanoparticles as Tracers for Magnetic Particle Imaging: Will Graham¹; ¹University of Tennessee Space Institute

K-9: Synthesis and Characterization of Flexible Poly(aminophenylboronic acid) Nanorods for Reversible, High Affinity Glycoprotein Capture at Physiological Conditions: Hussian Maanaki¹; Kayla Lenz²; Terry Xu²; Jun Wang¹; ¹Nanodiagnostic Technology, LLC; ²University of North Carolina at Charlotte

IRON AND STEEL (FERROUS ALLOYS)

New Frontiers in Physical Metallurgy of Steels — Poster Session

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

Program Organizers: Badirujjaman Syed, Arcelormittal Global Research And Development; Maedeh Pourmajidian, Arcelormittal Global R&D - East Chicago

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Session Chairs: Maedeh Pourmajidian, ArcelorMittal Global R&D - East Chicago; Badirujjaman Syed, ArcelorMittal Global R&D - East Chicago

F-4: Comparison of Microstructure and Mechanical Properties of the Heterogeneous Nanostructured SUS316LN Stainless Steels: Hiromi Miura¹; Chihiro Watanabe¹; ¹Toyohashi University of Technology

F-5: Effect of Specimen Thickness and Remaining Ligament on the K_{IS} Value in Fracture Toughness Evaluation According to ASTM E399: Kideuk Min¹; Hyeong-Gyu Kim¹; Hyeon-Su Jang¹; Hak-Min Lee¹; Hyun-Sun Choi¹; ¹PILETA

BIOMATERIALS

Next Generation Biomaterials — Poster Session

Sponsored by: ACerS Bioceramics Division, TMS: Biomaterials Committee

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

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Session Chairs: Tanveer Tabish, University of Oxford; Roger Narayan, University of North Carolina

C-5: 3D Printing of Paclitaxel-Loaded Hydrogel Scaffolds for Postoperative Esophagus Treatment: Yang Li¹; Min Wang¹; ¹University of Hong Kong

C-6: Dual-Sided Laser-Induced Graphene Microheaters for Biomedical Applications: Collin Richards¹; Prakriti Dhungana¹; Byung-Wook Park¹; ¹Youngstown State University

C-7: Eco-Friendly Synthesis of Amyloid Fibrils From Wheat Flour for Potential Applications: Anindita Ganguly¹; Pelagia-Irene Gouma¹; ¹The Ohio State University

C-8: Flexible Microelectrode Array Fabrication Based on Polymer Coated CNT Fibers for Neurological Applications: Nilni Weerawarna¹; ¹University of Cincinnati

C-10: Magnetite Nanoparticles-Polydimethylsiloxane Nanocomposite Interactions With Lasers for the Hyperthermia Treatments of Localized Triple-Negative Breast Cancer: A Comparison of Magnetite Nanospheres and Nanorods: Chukwudi Ezeala¹; John Obayemi²; Wole Soboyejo³; ¹Worcester State University; ²Worcester Polytechnic Institute; ³SUNY Polytechnic Institute

C-11: Next-Generation Cephalomedullary Femoral Nailing: Additive Manufacturing of Hybrid PEEK Composites for Enhanced Fixation Device Performance: Farah Hamandi¹; ¹Robson Forensic

C-12: Permeability of Biopolymers Composed of Polycaprolactone (PCL) and Corn Husk Fibers: Marco Del Razo-Ramirez¹; Régula N. Hernández-Hernández¹; Rosa Vázquez-García¹; Zianya Gómez Soto¹; Sofia Vázquez Rodríguez²; Maria Veloz-Rodríguez¹; ¹Universidad Autónoma del Estado de Hidalgo; ²Universidad Autónoma de Nuevo León

C-13: Structural and Thermal Stability of Gallium-Doped Hydroxyapatite: Preston Guynup¹; Scott Mixture¹; Timothy Keenan¹; ¹Alfred University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Phasing Out Carbon: Phase Transformation Challenges in Decarbonization Technologies — Poster Session

Sponsored by: TMS: Phase Transformations Committee

Program Organizers: Matthew Steiner, University of Cincinnati; Eric Payton, University of Cincinnati; James Zuback, National Institute of Standards and Technology; Alec Saville, Elementum 3D; Bryan Lim, Oak Ridge National Laboratory; Ian Zuazo, ArcelorMittal Global R&D - Industeel

Tuesday PM | September 30, 2025
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N-12: Magnetic Effects of Dilute P Alloying on Fe-Ni Alloys: Luke Begemann¹; Ugochukwu Philip Ochieze¹; Matthew Steiner¹; ¹University of Cincinnati

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Porous Materials for Energy and Environment Applications — Poster Session

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

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

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Session Chair: Lan Li, Boise State University

N-13: Structural Study of Formation of (Bi_{0.2}Na_{0.2}K_{0.2}Ba_{0.2}Ca_{0.2})TiO₃ Mesoporous High-Entropy Perovskites: Patrice Prosper¹; Andrei Jitianu²; ¹The Graduate Center of the City University of New York; ²Lehman College, City University of New York

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

Program Organizers: Morsi Mahmoud, Abdullah Al Salem University (AASU); Rishi Raj, University of Colorado; Motoyasu Sato, Chubu University; Dinesh Agrawal, Pennsylvania State University; Christina Wildfire, National Energy Technology Laboratory; Guido Link, Karlsruhe Institute of Technology; Daudi Waryoba, Pennsylvania State University

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M-5: Vacuum Melting and Elevated Temperature Forming of High Purity Cu-S Alloy for Semiconductor Interconnect Seed Applications: *Collin Whitt*¹; Eduardo del-Rio¹; ¹Tosoh SMD

NUCLEAR ENERGY

Progressive Solutions to Improve the Corrosion Resistance of Nuclear Waste Storage Materials — Poster Session

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

L-4: Developing Glass Frits for Hanford High-Level Waste Immobilization: *Brynn McGrail*¹; John Vienna¹; Jose Marcial¹; Xiaonan Lu¹; Jess Rigby¹; ¹Pacific Northwest National Laboratory

PROCESSING AND MANUFACTURING

Sintering and Related Powder Processing Science and Technologies — Poster Session

Sponsored by: TMS: Powder Materials Committee, ACerS Basic Science Division

Program Organizers: Charles Maniere, CNRS; Eugene Olevsky, San Diego State University; Ricardo Castro, Lehigh University; Elisa Torresani, San Diego State University; Diletta Giuntini, Eindhoven University of Technology; Wolfgang Rheinheimer, University of Stuttgart

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M-6: Influence of Precursor Chemistry and Calcination Temperatures on the Phase Purity and Microstructure of Gadolinium Zirconate: *Rushikesh Magdum*¹; William Fahrenholtz²; Gregory Hilmas¹; David Lipke¹; ¹Missouri University of Science and Technology, Rolla

M-9: Understanding Particle Packing Through Finite-Size Lennard-Jones Molecular Dynamics: *Nathaniel Paddock*¹; Richard Riman¹; Ryan Silles¹; ¹Rutgers

CERAMIC AND GLASS MATERIALS

Solid-State Optical Materials and Luminescence Properties — Poster Session

Sponsored by: ACerS Basic Science Division, ACerS Glass and Optical Materials Division

Program Organizers: Mathieu Allix, Laboratoire CEMHTI; Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Institute of Low Temperature and Structure Research; Jan Hostaša, CNR ISSMC - Institute of Science, Technology and Sustainability for Ceramics

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D-22: Large Area Micropatterning of CdSe Nanoplatelets: *Hagmar Tinoco Madeira*¹; Maya Ramamurthy¹; Yidenekachew Donie¹; Vivian Ferry¹; ¹University of Minnesota Twin Cities

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development IV — Student Poster Session

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

Program Organizers: Joshua Mueller, Michigan Technological University; Adriana Eres-Castellanos, Los Alamos National Laboratory; Jonah Klemm-Toole, Colorado School of Mines; Colin Stewart, US Naval Research Laboratory; Pello Uranga, CEIT-BRTA; Jeongho Han, Hanyang University; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Hyunseok Oh, University of Wisconsin - Madison; Alexandra Glover, Michigan Technological University

Tuesday PM | September 30, 2025
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Session Chair: Joshua Josh, Michigan Technological University

F-7: Effect of Cu on Microstructure and Fracture Toughness of Steels for Sustainable Recycling: *Sijia Wu*¹; Junya Inoue¹; ¹The University of Tokyo

F-8: Investigation of Mechanical Properties of Dual-Phase Steel in Cryogenic Temperatures: *Yang Guo*¹; Chris Kovacs²; Michael Sumption¹; Edward Collings¹; C.G Cantemir¹; ¹The Ohio State University; ²Scintillating Solutions LLC

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Poster Session

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

Program Organizers: Xiaofeng Guo, Washington State University; Kyle Brinkman, Clemson University; Alexandra Navrotsky, Arizona State University; Kristina Lilova, 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: Kyle Brinkman, Clemson University

H-13: Larnite Ca₂SiO₄: High-Temperature Mass Spectrometric Study of Thermodynamic Properties: *Sergey Shornikov*¹; ¹Vernadsky Institute of Geochemistry of RAS

MATERIALS-ENVIRONMENT INTERACTIONS

Understanding Corrosion-Related Cracking — Poster Session

Sponsored by: TMS: Corrosion and Environmental Effects Committee

Program Organizers: Tianle Cheng, National Energy Technology Laboratory; Hyokyung Sung, Kookmin University; Gordon Tatlock, University of Liverpool

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H-14: Predicting Environmentally Assisted Fatigue Crack Growth in AA7075 Using Machine Learning Approaches: *Daniel Egbuzie*¹; Christopher Taylor¹; Jenifer Locke¹; Olivia Underhill¹; ¹Ohio State University

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