Technical Meeting and Exhibition

MS&T23

MATERIALS SCIENCE & TECHNOLOGY

October 1–4, 2023 | Columbus, Ohio

PRELIMINARY TECHNICAL PROGRAM

The content in the preliminary program was generated on July 17, 2023. However, changes are still being implemented for the technical program. Please refer to the online session sheets for the most up-to-date information.

The American Ceramic Society www.ceramics.org

AIST Association for Iron & Steel Technology

TMS The Minerals, Metals & Materials Society

Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring				
Directed Energy Deposition	TUE	AM	C170	46
Laser Powder Bed Fusion	WED	AM	C170	63
Agile Additive Manufacturing by Employing Breakthrough Functionalities				
Towards Agile and Adaptive AM	MON	AM	C160A/160B	16
Phase Transformations and Microstructure Evolution during Post-Processing of Additively Manufactured Metals				
Phase Transformations and Microstructure Evolution during Post Processing I	MON	AM	C170	24
Phase Transformations and Microstructure Evolution during Post Processing II	MON	PM	C170	42
Artificial Intelligence				
Leveraging Integrated Computational Materials Engineering for High-fidelity Physics-based and Machine Learning Models				
Session I	TUE	AM	A120	55
Materials Informatics for Images and Multi-dimensional Datasets				
Session I	MON	PM	A121	40
Session II	TUE	AM	A121	56
Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics				
Poster Session	TUE	PM	Exhibit Hall A	105
AI/ML Aided Materials Design and Study	WED	AM	A121	74
Machine Learning for High Performance Materials	WED	PM	A121	90
Biomaterials				
3D Printing of Biomaterials and Devices				
Session I	MON	AM	A221	9
Session II	MON	PM	A221	27
Poster Session	TUE	PM	Exhibit Hall A	95
Next Generation Biomaterials				
Next Generation Biomaterials I	MON	AM	A222	24
Next Generation Biomaterials II	MON	AM	A222	41
Next Generation Biomaterials III	TUE	AM	A222	57
American Ceramics Society Bioceramics Division Awards Presentations	TUE	AM	A222	58
Poster Session	TUE	PM	Exhibit Hall A	106
Next Generation Biomaterials Parallel Session I	WED	AM	A221	74
Next Generation Biomaterials Parallel Session II	WED	AM	A222	75
Next Generation Biomaterials IV	WED	PM	A222	90
Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments				
Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments	MON	AM	A223	26
Poster Session	TUE	PM	Exhibit Hall A	106
Society for Biomaterials: Biomaterial Applications				
Poster Session	TUE	PM	Exhibit Hall A	107
Nanotechnology	WED	AM	A224	77
Tissue Engineering and Wound Healing	WED	PM	A224	91
Society for Biomaterials: Biomaterial Applications in Today's Industry: Development, Translation & Commercialization				
Biomaterials Development, Translation & Commercialization	MON	PM	A223	43
Poster Session	TUE	PM	Exhibit Hall A	107
Society for Biomaterials: Student Poster Contest + Rapid Fire				
Presentations	TUE	AM	A221	59
Poster Session	TUE	PM	Exhibit Hall A	107

Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Fundamentals and Characterization				
Emergent Materials under Extremes and Decisive In Situ Characterizations				
Next Generation X-ray and Neutron Technologies for Advanced Characterization	MON	AM	A220	18
In situ Characterization of Fuels and Ceramics Under Extreme Conditions	MON	PM	A220	35
Grain Boundaries, Interfaces, and Surfaces: Fundamental Structure-Property-Performance Relationships				
Microstructure	MON	AM	A215	20
Atomistics	MON	PM	A215	37
Grain Boundary Properties	TUE	AM	A215	51
Poster Session	TUE	PM	Exhibit Hall A	102
Mechanics	WED	AM	A215	69
High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond IV				
Processing and Properties	MON	PM	A216	37
Materials Design and Discovery	TUE	AM	A216	52
Poster Session	TUE	PM	Exhibit Hall A	102
Theory and Modeling	WED	AM	A216	69
Materials Structure and Characterization	WED	PM	A216	87
Interface-mediated Phenomena in Structural Materials				
Interface Structure and Kinetics	MON	PM	A214	39
Interface-related Mechanics	TUE	AM	A214	54
Poster Session	TUE	PM	Exhibit Hall A	103
Interfaces in Advanced Materials	WED	AM	A214	72
Interface-promoted Deformation	WED	PM	A214	89
Metal Powder Synthesis and Processing: Fundamental Aspects and Modeling				
Session I	MON	AM	A214	23
Synthesis, Characterization, Modeling and Applications of Functional Porous Materials				
Porous Materials I	TUE	AM	A220	59
Porous Materials II	WED	AM	A220	78
Porous Materials III	WED	PM	A220	93
Iron and Steel (Ferrous Alloys)				
Advancements in Steel Structural Refinement				
Advancements in Steel Structural Refinement	MON	AM	A212	13
Poster Session	TUE	PM	Exhibit Hall A	98
Advances in Ferrous Metallurgy				
Session I	MON	AM	A210	15
Session II	MON	PM	A210	32
Poster Session	TUE	PM	Exhibit Hall A	99
Student Poster Session	TUE	PM	Exhibit Hall A	99
Advances in Understanding of Martensite in Steels II				
Poster Session	TUE	PM	Exhibit Hall A	100
Crystallography and Modelling	WED	AM	A211	65
Microstructure Evolution and Properties	WED	PM	A211	84
Steels for Sustainable Development II				
Poster Session	TUE	PM	Exhibit Hall A	108
Steels for Sustainable Development I	WED	AM	A210	78
Steels for Sustainable Development II	WED	PM	A210	92
Lightweight Alloys				
Light Metal Technology				
Aluminum-rare Earth Alloys and Composites	MON	PM	A212	39
Aluminum Casting and Diecasting	TUE	AM	A212	55
Poster Session	TUE	PM	Exhibit Hall A	105
Hexagonal Structured Lightweight Alloys	WED	AM	A212	73

Program At A Glance

Topic Area/Symposium	Date	Time	Room	Page
Nuclear Energy				
Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments IV				
Microscopy I	MON	AM	A125	12
Microscopy II/Synchrotron/Acoustics	MON	PM	A125	31
Mechanical Testing/Thermal Properties	TUE	AM	A125	47
Poster Session	TUE	PM	Exhibit Hall A	97
Ceramics for a New Generation of Nuclear Energy Systems and Applications				
Ceramic Waste Forms	MON	AM	A124	17
Molten Salts and Shielding Materials	MON	PM	A124	33
Ceramic Fuels	TUE	AM	A124	48
Poster Session	TUE	PM	Exhibit Hall A	100
Complex Ceramics	WED	AM	A124	66
Radiation-induced Defects in Model Oxides	WED	PM	A124	85
Progressive Solutions to Improve Corrosion Resistance of Nuclear Waste Storage Materials				
Modeling and Experimental: Structure Properties (Dissolution Kinetics, Mechanical Properties, Sulfur Solubility) of Nuclear Waste Glasses	WED	AM	A125	76
Modeling Sensitivities of Environmental Stress Corrosion Cracking of Steel Canisters and Experiments for Protective Coatings	WED	PM	A125	91
Processing and Manufacturing				
Advanced Joining Technologies for Automotive Lightweight Structures				
Poster Session	TUE	PM	Exhibit Hall A	98
Friction Stir Welding (FSW) and Self-pierce Riveting (SPR)	WED	AM	B244/245	64
Resistance Spot Welding and Other Advanced Joining Technologies	WED	PM	B244/245	83
Advances in Surface Engineering				
Advances in Surface Engineering	MON	AM	B244/245	15
Poster Session	TUE	PM	Exhibit Hall A	99
Processing and Performance of Materials Using Microwaves, Electric and Magnetic Fields, Ultrasound, Lasers, and Mechanical Work – Rustum Roy Symposium				
Session I	MON	AM	B235	25
Session II	MON	PM	B235	42
Poster Session	TUE	PM	Exhibit Hall A	106
Sustainability, Energy, and the Environment				
15th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing				
Advanced Ceramics Manufacturing I	MON	AM	B242/243	9
Advanced Ceramics Manufacturing II	MON	PM	B242/243	27
Polymeric and Metallic Materials, and Computational Methods	TUE	AM	B242/243	44
Poster Session	TUE	PM	Exhibit Hall A	95
Advanced Ceramics for Environmental Remediation				
Session I	TUE	AM	B244/245	47
Session II	WED	AM	B240/241	64
Session III	WED	PM	B240/241	82
Energy Materials for Sustainable Development				
D.T. Rankin Award Ceremony	MON	AM	B240/241	19
Energy Storage I; Energy Conversion and Harvesting I	MON	AM	B240/241	19
Energy Conversion and Harvesting II; Electrocatalyst and Photocatalyst	MON	PM	B240/241	36
Energy Storage II; Energy Conversion and Harvesting III	TUE	AM	B240/241	50
Poster Session	TUE	PM	Exhibit Hall A	101
Hybrid Organic-inorganic Materials for Alternative Energy				
Hybrid Organic-inorganic Materials I	WED	AM	B242/243	71
Hybrid Organic-inorganic Materials II	WED	PM	B242/243	88

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

15th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Advanced Ceramics Manufacturing I

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Fu, Wuhan University of Technology; Allen Apblett, Oklahoma State University

Monday AM | October 2, 2023
B242/243 | Greater Columbus Convention Center

Session Chairs: Bai Cui, University of Nebraska-Lincoln; Enrico Bernardo, University of Padova; Young-Wook Kim, University of Seoul

8:00 AM Invited
Advanced Manufacturing of Lunar Regolith Simulants for In-Situ Resource Utilization: *Bai Cui*[1]; Xiang Zhang[1]; Shayan Gholami[2]; Yong-Rak Kim[2]; Youngjae Kim[3]; [1]University of Nebraska-Lincoln; [2]Texas A&M University; [3]Korea Institute of Civil Engineering and Building Technology

8:30 AM Invited
Amino Acid Mediated Green Synthesis of Cobalt Molybdate: *Allen Apblett*[1]; Fahad Alqahtani[1]; [1]Oklahoma State University

9:00 AM Invited
Factors Affecting the Thermal Conductivity of Liquid-phase Sintered Silicon Carbide Ceramics: *Young-Wook Kim*[1]; Hyun-Sik Kim[1]; [1]University of Seoul

9:30 AM Invited
Structure and Stability of Cement-Zeolite Systems for Enhanced Carbon Uptake in Ambient Conditions: Atolo Tuinukuafe[1]; *Jessica Rimsza*[1]; [1]Sandia National Laboratories

10:00 AM Break

10:20 AM Invited
Nanoclays in Biomaterials Design: From Regenerative Medicine to Invitro Disease Models: *Kalpana Katti*[1]; Dinesh Katti[1]; Sharad Jaswandkar[1]; Hanmant Gaikwad[1]; Preetham Ravi[1]; Quyen Hoang[1]; [1]North Dakota State University

10:50 AM
Fabrication and Material Properties of Silicon Nitride Bearing Grade Balls for Hybrid Ball Bearing Applications.: *Jae-Woong Ko*[1]; Ha-Neul Kim[1]; Young-Jo Park[1]; Byung-Dong Hahn[1]; Jong-Jin Choi[1]; Dong-Won Lee[1]; Mi-Ju Kim[1]; Ho Jin Ma[1]; Jae-Wook Lee[1]; [1]Korea Institute of Materials Science

11:10 AM Invited
Transparent Yttria Ceramics Fabricated Using Direct Ink Writing Printing and Vacuum Sintering: *Matthew Fiato*[1]; Jiao Li[1]; Guangran Zhang[1]; Yiquan Wu[1]; [1]Alfred University

BIOMATERIALS

3D Printing of Biomaterials and Devices — Session I

Sponsored by: ACerS Bioceramics Division

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

Monday AM | October 2, 2023
A221 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
3D Printed Biodegradable Polyester Scaffolds that Address Wound Biofilms and Bacterial Colonization: *Abraham Joy*[1]; Deliris Ortiz[1]; [1]The University of Akron

8:40 AM
3D Biofabrication Strategies for Highly-aligned Fibrous Soft Tissues: *Rohan Shirwaiker*[1]; [1]North Carolina State University

9:00 AM
Bone Tissue Engineering under Fluid Flow Conditions for Development of Invitro Testbeds of Cancer Metastasis: *Kalpana Katti*[1]; Dinesh Katti[1]; Haneesh Jasuja[1]; Quyen Hoang[2]; Hanmant Gaikwad[1]; Shrinwanti Ghosh[1]; Preetham Ravi[1]; Dipayan Sarkar[1]; Kalidas Shetty[1]; Anu Gaba[2]; Parth Vyas[2]; Sharad Jaswandkar[1]; [1]North Dakota State University; [2]Sanford Research

9:20 AM
3D Printing of Design-specific PEEK-based Standalone Bioactive Implants: *Prabaha Sikder*[1]; [1]Cleveland State University

9:40 AM
Additively Manufactured Biodegradable Porous Zn-Mg Alloy: *Yageng Li*[1]; Yuzhe Zheng[1]; Luning Wang[1]; [1]University of Science and Technology Beijing

10:00 AM Break

10:20 AM
Polymer Additive Manufacturing for Micro Medical Device Applications: *Roger Narayan*[1]; [1]University of North Carolina

10:40 AM
Curcumin and Epigallocatechin Gallate Enhance Osteogenic and Antibacterial Properties of HA-coated Titanium Implant: *Priya Kushram*[1]; Susmita Bose[1]; [1]Washington State University

11:00 AM
Engineered Living Material with pH-responsive Shape-morphing Capability Fabricated by 3D Printing: *Shan Liu*[1]; Weinan Xu[1]; [1]The University of Akron

11:20 AM
Engineering Porosity for the Stiffness-Matching of Nickel-Titanium Mandibular Graft Fixation Plates: *Luis Olivas-Alanis*[1]; Andrew Nguyen[1]; Agnieszka Chmielewska[1]; Sahil Khambhampati[1]; Stephen Niezgoda[1]; Ciro Rodriguez[2]; David Dean[1]; [1]The Ohio State University; [2]Tecnologico de Monterrey

11:40 AM
In Vivo and In Vitro Bio-corrosion of Zirconia-toughened Alumina (ZTA)-Ti6Al4V-Hydroxyapatite (HA) Load-bearing Articulation Implant Surfaces: *Jose Avila*[1]; Stefano Guariento[1]; Sushant Ciliveri[1]; Susmita Bose[1]; Amit Bandyopadhyay[1]; [1]Washington State University

SPECIAL TOPICS

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

Sponsored by: ACerS/Education and Professional Development Council

Monday AM | October 2, 2023
B130 | Greater Columbus Convention Center

9:00 AM Invited
Polymer Derived Ceramics-A New Class of Materials Unrivaled by Others: *Kathy Lu*[1]; [1]University of Alabama at Birmingham

ADDITIVE MANUFACTURING

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

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Computational Materials Science and Engineering Committee, TMS: ICME Committee

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

Monday AM | October 2, 2023
C150 | Greater Columbus Convention Center

Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory; Brando McWilliams, CCDC Army Research Laboratory; Yeon-Gil Jung, Changwon National University

8:00 AM Keynote
Effect of Baseplate Temperature on the Residual Stress Evolution in a Nickel-Aluminum Bronze Wire-arc Additive Manufacturing Build: *Matthew Dantin*[1]; Jack Canaday[1]; Charles Fisher[1]; [1]Naval Surface Warfare Center Carderock Division

8:20 AM
Physics-constrained, Inverse Design of High-temperature Strength Printable Aluminum Alloys with Low Cost and CO_2 Emissions for High Demand Industries: *Benjamin Glaser*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

8:40 AM
A Molecular Dynamics Study on the Micro Cold Spray of Zinc Oxide Films: *Scott Burlison*[1]; Michael Becker[1]; Desiderio Kovar[1]; [1]University Of Texas At Austin

9:00 AM
Gas Atomization of Mg-Zn-Ca-Mn Alloy Powder for Additive Manufacturing: *Daehyun Cho*[1]; Avey Thomas[1]; Agnieszka Chmielewska[1]; David Dean[1]; Alan Luo[1]; [1]The Ohio State University

9:20 AM
Quantification of Carbide Pickup and Quality Control of SS 316L Manufactured via Binder Jet Printing: *Pooja Maurya*[1]; P.Chris Pistorius[1]; Alex Gaudio[1]; Asim Smailagic[1]; [1]Carnegie Mellon University

9:40 AM
Simulating the 3D Printing Process of Hydroxyapatite Powders: *Mohammad Qureshi*[1]; Artemis Stamboulis[1]; William Griffiths[1]; [1]University of Birmingham

10:00 AM Break

10:20 AM
Examining the Effect of an Oxide Layer on the Deposition of Tantalum Films via Micro-Cold Spray: *Stephen Bierschenk*[1]; Michael Becker[1]; Desiderio Kovar[1]; [1]University of Texas at Austin

10:40 AM
Open-source Numerical Simulations of Melt Pool Physics in Laser Powder Bed Fusion Processes: *Craig Weeks*[1]; Jonathan Malen[1]; Satbir Singh[1]; [1]Carnegie Mellon University

11:00 AM
Optimizing the Surface Treatment Parameters for 718 Superalloy Using Probabilistic Finite Element Simulation: *Amir Yahyaeian*[1]; Zhe Lu[2]; Xiaoping Du[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis; [2]University of Science and Technology Liaoning

11:20 AM
Utilizing Cellular Automata to Resolve Process Parameter to Microstructure Correlations in LPBF Additively Manufactured Parts: *Michael Fazzino*[1]; Serge Nakhmanson[1]; Rainer Hebert[1]; Lukasz Kuna[2]; [1]University of Connecticut; [2]Naval Research Lab

11:40 AM
3-Dimensional Microstructure Characterization of Laser Powder Bed Fusion IN625 and IN718: *Edwin Schwalbach*[1]; Michael Chapman[1]; Megna Shah[1]; Michael Uchic[1]; Lyle Levine[2]; Brandon Lane[2]; Nik Hrabe[2]; Orion Kafka[2]; Newell Moser[2]; Robert Carson[3]; Jim Belak[3]; [1]Air Force Research Labroatory; [2]National Institute of Standards and Technology; [3]Lawrence Livermore National Laboratory

ADDITIVE MANUFACTURING

Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications — Extrusion-based AM and Binder Jet

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; Xiangyang Dong, Missouri Univ of Science and Technology; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, Pennsylvania State University

Monday AM | October 2, 2023
C161A/161B | Greater Columbus Convention Center

Session Chairs: Rodney Trice, Purdue University; Xuan Song, University of Iowa

8:00 AM
Aqueous Slurry Development and Characterization for Multiple-Oxide Direct Ink Writing: *Patrick Snarr*[1]; Corson Cramer[1]; Joseph Beaman[2]; Andrew Nelson[1]; [1]Oak Ridge National Laboratory; [2]The University of Texas at Austin

8:20 AM
Calcium-phosphate Cement-based Inks for Direct Ink Printing of Bioceramic Constructs: H. Engin Sever[1]; *Caner Durucan*[1]; [1]METU

8:40 AM
Direct Ink Writing of Semiconductive Oxide-based Sensors for High-temperature Applications: *Nicholas Winch*[1]; Javier Mena[1]; Margaret Raughley[2]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; [1]West Virginia University; [2]Harbison Walker International

9:00 AM
Additive Manufacturing of Solid-state Electrolytes for Lithium Metal Batteries: *John Obielodan*[1]; Jacob Ferguson[1]; Zhezhen Fu[2]; [1]University of Wisconsin-Platteville; [2]Pennsylvania State University - Harrisburg

9:20 AM
Fused Deposition Modeling of Polycarbosilane to Manufacture Silicon Carbide-based Materials: *Maxime Cheype*[1]; Fabrice Rossignol[1]; Vincent Pateloup[1]; Samuel Bernard[1]; [1]IRCER-CNRS

9:40 AM
On the Thermal Shock Resistance of Additively Manufactured Aluminum Oxide: *Jamieson Brechtl*[1]; Marco Martinez[1]; Bola Yoon[2]; Joseph Cesarano[3]; Kashif Nawaz[1]; Edgar Curzio[1]; [1]Oak Ridge National Laboratory; [2]Saint-Gobain; [3]Robocasting Enterprises

10:00 AM Invited
The Influence of Print Layer Orientation on the Mechanical Properties of SIC and CF/SIC CMCS Formed via Direct Ink Writing: *Rodney Trice*[1]; Kyle Cox[1]; Jeffrey Youngblood[1]; [1]Purdue University

10:30 AM Break

10:50 AM
Ceramic 3D Printing Utilizing Binder Jetting Technology for Medical Uses: *Sagar K G*[1]; [1]Cambridge Institute of Technology

11:10 AM
Materials Development for Demanding Applications with Binderjet WC-Co: *Paul Prichard*[1]; Zhuqing Wang[1]; Matthew Bonidie[1]; [1]Kennametal Inc.

11:30 AM Invited
Use of Powder Bed Fabrication Processes for Ceramic Additive Manufacturing: *Reeja Jayan*[1]; Alexander Gourley[1]; [1]Carnegie Mellon University

ADDITIVE MANUFACTURING

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

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

Monday AM | October 2, 2023
C151 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Laser-scanning of Arc-melted Al Alloys: Are They Representative of Additively Manufactured Ones?: *Zhaoxuan Ge*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

8:20 AM
Laser Powder-bed Fusion of Ternary Al-Ce-X Alloys with Slow-diffusing Transition Metals (Mn, Cr, V, Mo, W): *Clement Ekaputra*[1]; Jovid Rakhmonov[2]; Christian Leinenbach[3]; David Dunand[1]; [1]Northwestern University; [2]Northwestern University, Oak Ridge National Laboratory; [3]Empa Swiss Federal Laboratories for Materials Science & Technology, École Polytechnique Fédérale de Lausanne (EPFL)

8:40 AM
Development and Characterization of Aluminum Alloy A20X Lattices: *Kevin Le*[1]; Michael Brand[1]; Robin Montoya[1]; Colt Montgomery[1]; John Carpenter[1]; [1]Los Alamos National Laboratory

9:00 AM
Optimization of Aluminum Feedstock Powder for Cold Spray Additive Manufacturing Using a Through-process Experimental Approach: *Kyle Tsaknopoulos*[1]; Bryer Sousa[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

9:20 AM
Evaluation of Mechanical Property of Recycled AM AlSi10Mg: Mert Coskun[1]; *Kerem Dizdar*[2]; Gurkan Tarakci[1]; Gokhan Ozer[1]; Derya Dispinar[3]; [1]FSMVU; [2]Istanbul Technical University; [3]Foseco

9:40 AM
Properties of AlSi10Mg/SiC Composites Manufactured by Laser Powder Bed Fusion: *Achim Conzelmann*[1]; Hans Jürgen Seifert[2]; Hadi Mozaffari-Jovein[1]; [1]Furtwangen University; [2]Karlsruhe Institute of Technology

10:00 AM Break

10:20 AM
The Effect of Mg Content on the Process-structure Relationships of Cold Spray Deposited Al-Mg Alloys: Gregory Kubacki[1]; *Lorena Perez-Andrade*[1]; Munsu Kim[1]; Luke Brewer[1]; [1]University of Alabama

10:40 AM
Effect of Printing Parameters, Print Orientation, and Surface Finish Effects on the Mechanical and Fatigue Behavior of A6061-RAM2: *Matthew Jones*[1]; Keeley Elliot[2]; Christopher Yakacki[2]; Carl Frick[3]; [1]University of Wyoming; [2]University of Colorado Denver; [3]Colorado School of Mines

11:00 AM
Novel, Elevated Temperature Al-Ce-Mo Alloy Designed for Additive Manufacturing: *Kevin Graydon*[1]; Thinh Huynh[1]; David Hicks[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]ALMMII

11:20 AM
Prediction of Thermal Conductivity of Al-Alloys: Finite Element Simulations Combined with Statistical Analysis and Machine Learning: *Shuvodeep De*[1]; Sunyong Kwon[1]; Dongwon Shin[1]; Yousub Lee[1]; [1]ORNL

11:40 AM
Additive Manufacturing Wire Feedstocks Derived from Recycled Aluminum: *Jamie McIntyre*[1]; John Carsley[2]; Amy Clarke[1]; Kester Clarke[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines; [2]Novelis

12:00 PM
Powder Fabrication and Laser Powder Bed Fusion of Highly-reinforced Metal Matrix Composites: *Ethan Parsons*[1]; [1]Massachusetts Institute of Tech Lincoln Lab

ADDITIVE MANUFACTURING

Additive Manufacturing of Titanium-based Materials: Processing, Microstructure and Material Properties — Session I

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Titanium Committee

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

Monday AM | October 2, 2023
C171 | Greater Columbus Convention Center

Session Chair: Ola Harrysson, North Carolina State University

8:00 AM
Development of Clean Hot Isostatic Pressing for AM Ti64: *Chad Beamer*[1]; [1]Quintus Technologies LLC

8:20 AM
Measurement of Residual Stresses with High Resolution EBSD in Additively Built Commercially Pure Titanium: *Claire Adams*[1]; Amit Bandyopadhyay[1]; David Field[1]; [1]Washington State University

8:40 AM Invited
Process-Microstructure-property Relationships in AM Ti-6Al-4V: *Anthony Rollett*[1]; [1]Carnegie Mellon University

9:20 AM
Microstructure Mechanical Property Relationship for Post Heat-treated Electron Beam Melted Ti-6Al-4V Alloy: *Amit Kumar Singh*[1]; Anish Ranjan[1]; Sushil Mishra[1]; [1]Indian Institute of Technology Bombay

9:40 AM
Rapid Assessment of the Fatigue Resistance of Electron Beam Melted Ti-6Al-4V Using a Multi-Step Test (MST): *Jacob Pellicotte*[1]; Md Abir Hossain[1]; Calvin Stewart[1]; [1]The Ohio State University

10:00 AM Break

10:20 AM
Tensile and Fatigue Behavior of an Additively Manufactured Near-titanium Alloy: *Yu Zou*[1]; [1]University of Toronto

10:40 AM
Studying Nanoscale Ti5Si3 Quasi-continuous Network in the Selective Laser Melted Titanium Matrix Nanocomposites: *Dian Li*[1]; Xing Zhang[2]; Sydney Fields[1]; Rongpei Shi[3]; Yiliang Liao[2]; Yufeng Zheng[1]; [1]University of Nevada, Reno; [2]Iowa State University; [3]Harbin Institute of Technology, Shenzhen

11:00 AM
Understanding the Microstructure and Deformation Behavior in the Selective Laser Melted Ti-5Al-5Mo-5V-3Cr Alloy: Sydney Fields[1]; Dian Li[1]; Deepak Pillai[1]; Yiliang Liao[2]; *Yufeng Zheng*[1]; [1]University of Nevada-Reno; [2]Iowa State University

11:20 AM
Comparing Fatigue Behavior of L-PBF Samples of Nb-48%Ti Produced with Two Different Types of Powder: *Fernando Landgraf*[1]; Mario Boccalini[2]; Willy Moraes[1]; Cesar Azevedo[1]; [1]University of Sao Paulo; [2]IPT- Instituto de Pesquisas Tecnológicas

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments IV — Microscopy I

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Cheng Sun, Idaho National Laboratory; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

Monday AM | October 2, 2023
A125 | Greater Columbus Convention Center

Session Chair: Michael Short, Massachusetts Institute of Technology

8:00 AM Invited
Multimodal Characterization of Materials Corrosion in Molten Salts: *Lingfeng He*[1]; [1]North Carolina State University

8:30 AM Invited
Probing Nanoscale Properties of Radioactive Material by Advanced Correlative Microscopy: *Shawn Riechers*[1]; Joshua Silverstein[1]; Andrew Casella[1]; [1]Pacific Northwest National Laboratory

9:00 AM
Effect of Solutes on the Radiation Induced Segregation in Ferritic Alloys at 3- grain Boundaries: *Azza Rahmouni*[1]; [1]Cea Paris-SACLAY

9:20 AM Invited
Mapping Elemental Distributions Across Thin Corrosion Films Formed on Nuclear Reactor Core and Structural Materials via Ex-situ And In-situ Atom Probe Tomography: *Elizabeth Kautz*[1]; Angela Gerard[2]; Kayla Yano[3]; Sandra Taylor[3]; Sten Lambeets[3]; Daniel Perea[3]; Arun Devaraj[3]; John Scully[2]; Daniel Schreiber[3]; [1]Rensselaer Polytechnic Institute; [2]University of Virginia; [3]Pacific Northwest National Laboratory

9:50 AM Break

10:10 AM Invited
Capturing 3D Evolution of Twin Networks in Titanium as a Function of Applied Strain: *Hi Vo*[1]; P Pinney[2]; M.M. Schneider[1]; R.J. McCabe[1]; M. Arul Kumar[1]; Carlos Tomé[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory; [2]University of Connecticut

10:40 AM
Four-dimensional Scanning Transmission Electron Microscopy (4D-STEM) Characterization of Intergranular Corrosion of Austenitic Stainless Steels in Lead-bismuth Eutectic: Yang Yang[1]; *Zhiyu Zhang*[1]; Sarah Wang[2]; Peter Hosemann[3]; Andrew Minor[2]; [1]Pennsylvania State University; [2]Lawrence Berkeley National Laboratory; [3]University of California, Berkeley

11:00 AM
Advanced In-situ Strain Mapping for Zr Oxidation by 4D-STEM: *Yongwen Sun*[1]; Yang Yang[1]; Ying Han[1]; Dan Zhou[2]; Hugo Garza[2]; Alejandro Perez[3]; Thanos Galanis[3]; [1]Penn State University; [2]DENSsolutions; [3]NanoMEGAS SPRL

MATERIALS-ENVIRONMENT INTERACTIONS

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

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

Monday AM | October 2, 2023
A123 | Greater Columbus Convention Center

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

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8:00 AM
Effects of BN Content on the Microstructure and Mechanical Properties of Cr3C2–NiCr-BN Composite Coatings Prepared by a Novel Ethanol-fueled HVOF Process: *Mohammad Arab Pour Yazdi*[1]; Shaowu Liu[2]; Jiri Nohava[1]; Hongjian Wu[3]; Xinliang Xie[4]; Zexin Yu[5]; Michel Moliere[6]; Hanlin Liao[6]; [1]Anton-Paar Tritec; [2]University of Lille, CNRS, INRAE; [3]Helmut Schmidt University; [4]Nanjing Technology University; [5]Soochow University; [6]Univ. Bourgogne Franche-Comté

8:20 AM
Ceramic Coating as a Diffusion Barrier to Prevent Saddle Marks in Continuous Homogenization of Aluminum 6000 Series: *Mojtaba Mohammad*[1]; Carmo Perrella[1]; Larry Pershin[2]; Javad Mostaghimi[2]; [1]Matalco; [2]University of Toronto

8:40 AM
Benefits of Yttria-doping in Ytterbium Disilicate Environmental Barrier Coatings: Dawson Smith[1]; Vincent Mika[1]; Molly O'Connor[2]; Robert Golden[3]; Rodney Trice[1]; *Michael Titus*[1]; [1]Purdue University; [2]Praxair Surface Technologies; [3]Rolls Royce

9:00 AM
Novel Thermal Barrier Coatings Stable up to 1700°C: *Melina Endsley*[1]; Collin Holgate[1]; Akane Suzuki[2]; Joshua Margolies[3]; Carlos Levi[1]; Tresa Pollock[1]; [1]University of California Santa Barbara; [2]GE Aerospace; [3]GE Vernova

9:20 AM
Sustainable Development of Spray Parameters for Thermal Spray: *Viswanathan Venkatachalapathy*[1]; [1]State University of NewYork, Stonybrrook

9:40 AM
Corrosion-Resistant Coatings for Storage Canister: *Evelina Vogli*[1]; [1]Lm Group Holdings Inc.

10:00 AM Break

10:20 AM
Structural Integrity Assessment of Cold Spray Repaired High-Strength Aluminium Alloy 7075 Specimens: *Ali Bakir*[1]; Xiang Zhang[1]; Matthew Dore[2]; [1]Conventry University; [2]The Welding Institue

10:40 AM
The dDevelopment of Resistance Seam Cladding for Corrosion Resistant Liners in Linepipe: *Jerry Gould*[1]; [1]Edison Welding Institute

11:00 AM
The Importance of Controlling UV Coating Temperature to Stabilize Viscosity during Application to Reduce Energy Consumption: *Michael Bonner*[1]; [1]Saint Clair Systems, Inc.

11:20 AM
Tribological and Anti-scaling Performance of Graphene-enriched Thin Polymer Coatings: *Virendra Singh*[1]; Alireza Zolfaghari[1]; Manuel Marya[1]; [1]Schlumberger

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IRON AND STEEL (FERROUS ALLOYS)

Advancements in Steel Structural Refinement — Advancements in Steel Structural Refinement

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

Program Organizers: Charles Enloe, Steel Dynamics; Emmanuel De Moor, Colorado School of Mines

Monday AM | October 2, 2023
A212 | Greater Columbus Convention Center

Session Chairs: Charles Enloe, Steel Dynamics; Emmanuel De Moor, Colorado School of Mines

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8:00 AM
Effect of Austempering Conditions on the Microstructure and Mechanical Properties of Bainitic Steels: *Je-Wook Jang*[1]; Sangyoon Lee[1]; [1]POSCO

8:20 AM
Microstructural Characterization of Austenite Decomposition Products in a 0.18C-0.15Si-1.9Mn-0.8Cr Steel Held Near M_s through Mössbauer Spectroscopy: *Spencer Topper*[1]; Emmanuel De Moor[1]; John Speer[1]; [1]Colorado School of Mines

8:40 AM
Investigating the Effects of Si and Al on Microstructure and Properties of As-Cast AHSS Slabs: *Nhu Ngo*[1]; Bryan Webler[1]; P. Chris Pistorius[1]; [1]Carnegie Mellon University

9:00 AM
Interactions between Ferrite Recrystallization and Ferrite to Austenite Phase Transformation in Vanadium Micro-alloyed Cold Rolled Steel: *Cheoljun Bae*[1]; Jongmyeong Kim[1]; [1]Hyundai Steel

9:20 AM
The Effect of Initial Microstructure on the Mechanical Properties and Recrystallization Behavior of Vanadium Micro-alloyed Cold Rolled Steel: *JongMyeong Kim*[1]; Cheoljun Bae[1]; [1]Hyundai Steel

9:40 AM
Nb Forms and Distribution of the Weld Metal and the Underlying Mechanisms: *Wenguang Liao*[1]; Xun Liu[1]; [1]The Ohio State University

10:00 AM Break

10:20 AM
Grain Misorientation Characterization of Continuously-cooled Vanadium Microalloyed Steels for Ferrite Classification: *Adam Church*[1]; Emmanuel De Moor[1]; Lawrence Cho[1]; Anastasiya Tselikova[2]; Rolf Schmidt[2]; Kip Findley[1]; [1]Advanced Steel Processing and Products Research Center; [2]Vantage Alloys

10:40 AM
Strengthening Effect Induced by Hierarchical Structured Nanoparticles in ODS Ferritic Alloy: *Peng Zhang*[1]; Lin Zhang[1]; Xuanhui Qu[1]; Ye Liu[2]; [1]University of Science and Technology Beijing; [2]Xiangtan University

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CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Novel Processing of Functional Ceramics; Ferroelectrics and Piezoelectrics

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 AM | October 2, 2023
B231 | Greater Columbus Convention Center

Session Chair: Amar Bhalla, The University of Texas at San Antonio

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8:00 AM
Additive Manufacturing of Flex Sensors: Characterization and Evaluation: *Carlos Acosta*[1]; Sean Garnsey[1]; Wasim Hafiz Dipon[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]The University of Texas at San Antonio

8:20 AM
Cold Sintering Assisted Densification of High-performance Dielectric Materials: *Jing Guo*[1]; Xiaomeng Li[1]; Mingming Si[1]; Hong Wang[2]; [1]Xi'an Jiaotong University; [2]Southern University of Science and Technology

8:40 AM
Design for in-situ Computer Vision-based Automation of Drop-on-Demand Inkjet Drop Formation Optimization: *Maximilian Estrada*[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]University of Texas at San Antonio

9:00 AM Invited
Domain Tailoring in Magnetic ZnFe2O4 Ferrite by Reactive Flash Sintering Technique: Soumyadeep Sur[1]; Parmanand Tyagi[1]; *Shikhar Jha*[1]; [1]Indian Institute of Technology Kanpur

9:20 AM
Hybrid Solder Joints: Morphology and Shear Strength of Sn-3.5Ag Solder Joints Prepared Using Flux Doped with Ceramic Nanoparticles: *Irina Wodak*[1]; [1]TU Wien

9:40 AM Invited
PLD Growth of Highly Crystalline STO and PZT on Graphene Oxide-Buffered Silicon Surface: *Matjaž Spreitzer*[1]; Urška Trstenjak[1]; Zoran Jovanovi[2]; [1]Jožef Stefan Institute; [2]Vina Institute of Nuclear Sciences

10:00 AM Break

10:20 AM
Ferroelectricity in 2D Sn-based Monochalcogenides and Their Heterostructures: *Ramesh Paudel*[1]; S. Pamir Alpay[1]; [1]University of Connecticut

10:40 AM
Enhancement of Ferroelectric and Electrocaloric Properties in Relaxor Ceramics via Processing-related Microstructural Features: *Brigita Rozic*[1]; Hana Ursic[1]; Marko Vrabelj[1]; Lovro Fulanovic[2]; Andraz Bradesko[3]; Venkata Ramana[4]; Barbara Malic[1]; Tadej Rojac[1]; Zdravko Kutnjak[1]; [1]Jozef Stefan Institute; [2]Technical University of Darmstadt; [3]Laboratoire Structures, Propriétés et Modélisation des Solides, CentraleSupélec, Université ParisSaclay; [4]I3N-Aveiro, University of Aveiro

11:00 AM
Polar Nanostructure in Composition Modulated $Pb(Zr,Ti)O_3$ Superlattice: *Yukio Sato*[1]; Goki Kimura[2]; Sang Kweon[2]; Goon Tan[3]; Isaku Kanno[2]; [1]Kumamoto University; [2]Kobe University; [3]Osaka Metropolitan University

11:20 AM
Porous PZT Toughened via MgO Inclusions: *Ben Prevoznak*[1]; Eric Neuman[2]; Geoff Brennecka[1]; [1]Colorado School of Mines; [2]Sandia National Laboratories

11:40 AM Invited
Piezopermittivity for Capacitance-based Stress/Strain Sensing: *Deborah Chung*[1]; [1]State University of New York Buffalo

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Metallurgy — Session I

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

Program Organizers: Shannon Clark, ArcelorMittal Dofasco; Lijia Zhao, Northeastern University

Monday AM | October 2, 2023
A210 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Effect of Intercritical Annealing Parameters on the Mechanical Properties of a Medium-Mn Third Generation Advanced High Strength Steel: *Kazi Bhadhon*[1]; Thomas Sydor[1]; Ana Cardoso[2]; Frank Goodwin[2]; Joseph McDermid[1]; [1]McMaster University; [2]International Zinc Association

8:20 AM
Accurate Classification of Bainitic and Tempered Martensitic Steels with Advanced Deep Learning Methods: *Xiaohan Bie*[1]; Juancheng Li[1]; Manoj Arthanari[1]; Evelin Barbosa de Melo[1]; Jun Song[1]; Steve Yue[1]; [1]McGill University

8:40 AM
Localized Carbon Pickup Defect in Ultra-low Carbon Interstitial Free Steel: *Malavikha Rajivmoorthy*[1]; William King[1]; [1]Cleveland-Cliffs Research and Innovation Center

9:00 AM
Influence of Prestraining and Baking on Low-cycle Fatigue Characteristics of Complex Phase Steel: *Mei Zhang*[1]; [1]Shanghai University

9:20 AM
Abrasive Wear Behaviour of Carbide Free Bainitic Steel: *Ajeet Rajput*[1]; Sourav Das[1]; [1]Indian Institute of Technology Roorkee

9:40 AM
High-Resolution, High-Speed Digital Holographic Microscopy of Ferrous Metals: *Jose Albert Guevara*[1]; Junya Inoue[1]; [1]The University of Tokyo

10:00 AM Break

10:20 AM
In-situ Laser Ultrasonic Measurements of Phase Transformation Kinetics on Dual-phase Steels During Stepped Cooling: Nobumasa Hayashi[1]; *Mariana Rodrigues*[1]; Matthias Miltzer[1]; [1]The University of British Columbia

10:40 AM
Evolution of Heterogeneous Carbon Distribution during Austempering of TRIP Steel: Miku Watanabe[1]; *Goro Miyamoto*[1]; Satoshi Morooka[2]; Tadashi Furuhara[1]; [1]Tohoku University; [2]Japan Atomic Energy Agency

11:00 AM
Nb forms and distribution of the weld metal and the underlying mechanisms: *Wenguang Liao*[1]; Xun Liu[1]; [1]The Ohio State University

11:20 AM
Segregation-induced Transition during Early Stages of Liquid-metal Embrittlement in an Advanced High-strength Steel: Yuki Ikeda[1]; Hsu-Chih Ni[2]; Hassan Ghassemi-Armaki[3]; Anirban Chakraborty[4]; Jim Zuo[2]; Reza Darvishi-Kamachali[1]; *Robert Maass*[1]; [1]Federal Institute of Materials Research and Testing (BAM); [2]University of Illinois at Urbana-Champaign; [3]General Motors R&D; [4]ArcelorMittal Global Research and Development

11:40 AM
The Effects of Substrate Aluminum Content on Fe-Zn Intermetallic Reactions and Liquid Metal Embrittlement in Third Generation Advanced High Strength Steels: *Jake Colburn*[1]; Jonah Klemm-Toole[1]; John Speer[1]; [1]Colorado School of Mines

PROCESSING AND MANUFACTURING

Advances in Surface Engineering — Advances in Surface Engineering

Sponsored by: TMS Surface Engineering Committee

Program Organizers: Rajeswaran Radhakrishnan, Faraday Technology Inc; Timothy Hall, Faraday Technology Inc; Michael Roach, University of Mississippi Medical Center; Sandip Harimkar, Oklahoma State University; Tushar Borkar, Cleveland State University; Rajeev Gupta, North Carolina State University; Bharat Jasthi, South Dakota School of Mines & Technology

Monday AM | October 2, 2023
B244/245 | Greater Columbus Convention Center

Session Chairs: Santosh More, Faraday Technology Inc; Alex Fertig, Faraday Technology Inc

8:00 AM
A Study on Surface Oxidation Behavior of Ferritic Stainless Steel for SOFC Interconnect: *JungHyun Kong*[1]; JongHee Kim[1]; JinSuk Kim[1]; KwangMin Kim[1]; KiHoon Jo[1]; [1]POSCO/Stainless Steel Research Group

8:20 AM
Bio-inspired Surface Engineering of an La_2NiO_4 Electrode to Modify Electrochemical Activity for Electrolysis: *Cole Klemstine*[1]; Yu Zhong[2]; Xingbo Liu[1]; Wenyuan Li[1]; Kathy Sabolsky[1]; Edward Sabolsky[1]; [1]West Virginia University; [2]Worcester Polytechnic Institute

8:40 AM
Detection of Breath Acetone via Au-decorated V2O5 Thin Film/Ag Nanoparticles: *Bader Alghamdi*[1]; Qasem Drmosh[1]; Nawaf Alharbi[1]; Mohammed Aburuzaizah[1]; [1]King Fahd University of Petroleum and Minerals (KFUPM)

9:00 AM
Solid Lubricant Coatings Based on Nanoscrolls Prepared Using Reduced Graphene Oxide and Titanium Dioxide for High Lubricity Applications: *Pratik Sanjiv Kasbe*[1]; Christopher Dellacorte[1]; Weinan Xu[1]; [1]The University of Akron

9:20 AM
The Effect of Anodizing and Sealing Treatments on the Surface Mechanical Properties of Diecast AlSi9Cu3(Fe) Alloy: *Giulia Scampone*[1]; Giulio Timelli[1]; [1]University of Padova

9:40 AM
Characterization of Laser Driven Shockwaves and Applications in Materials Testing and Processing: Stanley Bovid[1]; *Kent Talbert*[1]; Dietrich Kiesewetter[1]; [1]LSP Technologies

10:00 AM Break

10:20 AM
Enhanced Wear Resistance of the Ultrastrong Ultrasonic Shot Peened Aeroengine M50 Bearing Steel with Gradient Nanostructured Surface Layer: *Fei Yin*[1]; [1]Wuhan University of Technology

10:40 AM
Exploring the Particle-substrate Interface in Cold Spray Applications via Single Particle Impacts: *Veera Panova*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

11:00 AM
Optimization of Coating Property of Zinc-aluminium Flake Coated Bolt for Construction Equipment: *Seung Hyoun Nam*[1]; Gi Beom Kim[1]; Jin Ho Kim[2]; Se Hun Cheon[3]; Ki Wook Kong[3]; Tae Dong Park[1]; [1]Hyundai Construction Equipment; [2]Korea Shipbuilding & Offshore Engineering; [3]L'beste GAT LTD.

11:20 AM
Patterned Surface Deformation for Tuning Strength and Functionality: Sam Scott[1]; Joby Anthony[1]; *Mark Atwater*[1]; [1]Liberty University

11:40 AM
Improved Performance of Stainless Steels with Low Temperature Surface Hardening: *Temitope Oluwafemi*[1]; [1]Bodycote

12:00 PM
Effect of Plasma Process Parameters on the Microstructure and Corrosion Properties of a High Strength Al Alloy: *Priyanshi Agrawal*[1]; Yong Chae Lim[1]; Jiheon Jun[1]; Zhili Feng[1]; Bradley Lokitz[1]; [1]Oak Ridge National Laboratory

ADDITIVE MANUFACTURING

Agile Additive Manufacturing by Employing Breakthrough Functionalities — Towards Agile and Adaptive AM

Sponsored by: TMS: Additive Manufacturing Committee

Program Organizers: Soumya Nag, Oak Ridge National Laboratory; John Carpenter, Los Alamos National Laboratory; Peeyush Nandwana, Oak Ridge National Laboratory; Lang Yuan, University of South Carolina; Alex Kitt, Edison Welding Institute

Monday AM | October 2, 2023
C160A/160B | Greater Columbus Convention Center

Session Chairs: John Carpenter, Los Alamos National Laboratory; Lang Yuan, University of South Carolina

9:00 AM Invited
Making, Measuring, and Modeling Gradient Materials: *Peter Collins*[1]; [1]Iowa State University

9:30 AM Invited
Designing Against Failure in Additive Manufacturing: From Fracture in Monolithic Samples to Designing Functionally Graded Materials: *Allison Beese*[1]; [1]Pennsylvania State University

10:00 AM Invited
Toward Control of Part Distortion and Quality for Hybrid Additive/Subtractive Manufacturing: *Yousub Lee*[1]; Thomas Feldhausen[1]; Mithulan Paramanathan[1]; Dennis Brown[1]; Rangasayee Kannan[1]; Lauren Heinrich[1]; James Haley[1]; Peeyush Nandwana[1]; Christopher Fancher[1]; Shuvo De[1]; Srdjan Simunovic[1]; Brian Post[1]; [1]Oak Ridge National Laboratory

10:30 AM Break

10:50 AM Invited
Beyond 3D Printing of Metals: Toward Location-Specific Property and Behavior Control: *Raymundo Arroyave*[1]; [1]Texas A&M University

11:20 AM Invited
Radial Bimetallic Structures Via Wire Arc Additive Manufacturing: *Lile Squires*[1]; Ethan Roberts[1]; Amit Bandyopadhyay[1]; [1]Washington State University

EDUCATION AND CAREER DEVELOPMENT

Career Transition: How to Navigate the Job Market? Insights from Academia and Industry — Navigate your Career in an Evolving Professional Sphere

Sponsored by: ACerS President's Council of Student Advisors, ACerS PCSA-EPC Committee

Program Organizers: Srinivasa Kartik Nemani, Indiana University-Purdue University; Ian Slagle, Georgia Institute of Technology

Monday AM | October 2, 2023
A121 | Greater Columbus Convention Center

Session Chairs: Kartik Nemani, Purdue school of Engineering; Pattiya Pibulchinda, Northwestern University

9:20 AM
STEM Outreach in Ceramics and Glass: How to Inspire the Next Generation of Professionals: *Amanda Engen*[1]; [1]The American Ceramic Society

9:50 AM
Navigating Career Choices: Identifying Personality and Professional Traits to Pursue the Right Path: *Babak Anasori*[1]; [1]Purdue University Indianapolis

10:20 AM Break

10:40 AM
How to Catalyze Your Career with TMS: *Brad Boyce*[1]; [1]TMS President; Distinguished Staff, Sandia National Laboratories

11:10 AM
Professional Skills for Global Environments: *Theresa Davey*[1]; [1]Tohoku University

NUCLEAR ENERGY

Ceramics for New Generation Nuclear Energy System Application — Ceramic Waste Forms

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

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Maik Lang, University of Tennessee; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Enrique Saez, Clemson University; Jinsuo Zhang, Virginia Polytechnic Institute and State University

Monday AM | October 2, 2023
A124 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Metal-halide Perovskites as Innovative and Cost-effective Salt Waste Form: *Jie Lian*[1]; [1]Rensselaer Polytechnic Institute

8:30 AM Invited
AI/ML-assisted Design of Phosphate Nuclear Waste Forms: *James Saal*[1]; Vinay Hegde[1]; Sarah Allec[1]; Jincheng Du[2]; Thiruvilla Mahadevan[2]; Jayani Kalahe[2]; Brian Riley[3]; John Vienna[3]; Saehwa Chong[3]; [1]Citrine Informatics; [2]The University of North Texas; [3]Pacific Northwest National Laboratory

9:00 AM
Iron-phosphate Glass-ceramics for the Immobilization of Dehalogenated Chloride-based Waste Salt: *Harmony Werth*[1]; Paige Murray[1]; Krista Carlson[1]; Brian Riley[2]; [1]Univerisity of Nevada Reno; [2]Pacific Northwest National Laboratory

9:20 AM
A New Method for Measuring Refractory Corrosion of Ceramics in Glass: *Matthew Page*[1]; Wenxia Li[1]; Bruce Wiersma[1]; Jake Amoroso[1]; [1]Savannah River National Laboratory

9:40 AM
Crucible-scale Corrosion Testing of Monofrax® K-3 Refractory in Contact with Glass Melts: *Wenxia Li*[1]; Matt Page[1]; Bruce Wiresma[1]; Jake Amoroso[1]; [1]Savanah River National Lab

10:00 AM Break

10:20 AM Invited
Crystal Growth of Actinide Materials as Potential Nuclear Waste Forms: *Hans-Conrad Zur Loye*[1]; [1]University of South Carolina

10:50 AM Invited
Decoding the Structural Descriptors Controlling Nepheline Crystallization in Borosilicate-based Nuclear Waste Glasses: *Ashutosh Goel*[1]; Ambar Deshkar[1]; Yingcheng Zhang[1]; Ping Lu[2]; Randall Youngman[3]; Jinjun Ren[4]; Pierre Florian[5]; Jiri Brus[6]; Gregory Tricot[7]; Alfonso Pedone[8]; [1]Rutgers, The State University of New Jersey; [2]Wuhan University of Technology; [3]Corning Incorporated; [4]Chinese Academy of Sciences; [5]CNRS, Orleans; [6]Academy of Sciences of the Czech Republic; [7]CNRS, UMR 8516; [8]University of Modena and Reggio Emilia

11:20 AM
Stability of Radiation–Induced Bixbyite Phase in δ–$Sc_4Hf_3O_{12}$: *Masanari Iwasaki*[1]; Yusuke Kanazawa[1]; Maulik Patel[2]; Gianguido Baldinozzi[3]; Kurt Sickafus[4]; Manabu Ishimaru[1]; [1]Kyushu Institute of Technology; [2]University of Liverpool; [3]Centre National de la Recherche Scientifique; [4]Los Alamos National Labolatry

11:40 AM
Microstructure and Mechanical Properties of Ceramics in Y-Ti-O System: *Lingfeng He*[1]; Xiaofei Pu[2]; Eitan Hershkovitz[3]; Timothy Yoo[3]; Honggyu Kim[3]; Kaustubh Bawane[4]; Fidelma Giulia Di Lemma[4]; Tadachika Nakayama[5]; Hisayuki Suematsu[5]; Koichi Niihara[5]; [1]North Carolina State University; [2]National Renewable Energy Laboratory; [3]University of Florida; [4]Idaho National Laboratory; [5]Nagaoka University of Technology

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Nanomaterials Synthesis & Patterning

Sponsored by: ACerS Basic Science Division, ACerS Electronics 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 at Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Indiana University-Purdue University Indianapolis

Monday AM | October 2, 2023
B234 | Greater Columbus Convention Center

Session Chairs: Haitao Zhang, University of North Carolina at Charlotte; Babak Anasori, Indiana University–Purdue University Indianapolis

8:00 AM Invited
Micro- and Nanopatterning and Texturing of 3-dimensional Surfaces and Structures: *Gary Zabow*[1]; [1]National Institute of Standards & Technology (NIST)

8:30 AM
Ultra-Resolution 3-Dimensional Nanopatterning of Functional Materials: Karla Del Cid-Ledezma[1]; Luis Ortiz[1]; Hurayra Lizu[1]; Fei Wang[1]; Adanma Akoma[1]; *Bryan Huey*[1]; [1]University of Connecticut

8:50 AM
Mold-Free Manufacturing of Highly Sensitive and Fast Response Pressure Sensors through High-Resolution 3D Printing and Conformal Oxidative Chemical Vapor Deposition Polymers: *Jinwook Baek*[1]; Yujie Shan[1]; Mitesh Mylvaganan[1]; Yuxuan Zhang[1]; Fei Qin[1]; Han Wook Song[2]; Huachao Mao[1]; Sunghwan Lee[1]; [1]Purdue University; [2]Korea Research Institute of Standards and Science

9:10 AM
Molecule-like Lanthanide-oxide Clusters in ZnO: *Gunnar Westin*[1]; [1]Uppsala University

9:30 AM
Rubbing Powders: Interfacial Radical Formation in Compacted Nanoparticle Ensembles: *Oliver Diwald*[1]; Thomas Schwab[1]; Aicher Korbinian[1]; Keith McKenna[2]; John Dunlop[1]; [1]Paris Lodron Universitaet Salzburg; [2]University of York

9:50 AM Break

10:10 AM Invited
Controlled Synthesis and Dimensionalities of Metal Halide Perovskites by Solution-based Approaches: Weiguang Zhu[1]; *Jie Lian*[1]; [1]Rensselaer Polytechnic Institute

10:40 AM
Novel Insights into the Microwave-assisted Polyol Synthesis of Metal Nanoparticles for Catalytic Air Pollution Control: *Yunzi Xin*[1]; Kunihiko Kato[1]; Takashi Shirai[1]; [1]Nagoya Institute of Technology

11:00 AM
Catalyst Instability Induced Precursor Production and Growth of Si-based Nanostructures: Shifat Us Sami[1]; *Haitao Zhang*[1]; [1]University of North Carolina at Charlotte

11:20 AM
In Situ Solid-Phase Crystallization of Layered Complex Oxides from Amorphous Precursors in the Transmission Electron Microscope: Jenna Wardini[1]; George F. Harrington[2]; Dennis Kemp[3]; Roger A. De Souza[3]; *William Bowman*[1]; [1]Uc Irvine; [2]University of Bath; [3]RWTH Aachen University

11:40 AM
Developments of Perovskite-Structured Transparent Conducting Electrode for Perovskite Solar Cells: La-Doped $SrSnO_3$ Bulk and Thin Films: *Yogesh Kumar*[1]; [1]Khalsa College, Garhdiwala

EDUCATION AND CAREER DEVELOPMENT

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

Sponsored by: TMS: Education Committee, TMS: Accreditation Committee

Program Organizers: Alison Polasik, Campbell University; Jeffrey Fergus, Auburn University

Monday AM | October 2, 2023
A120 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Introductory Comments

8:05 AM
Innovation in the Undergraduate Curriculum: Advanced Instrumentation in Research Courses: *Mario Affatigato*[1]; Steve Feller[1]; [1]Coe College

8:25 AM
Improving Motivation and Learning of Computational Modeling in Undergraduate MSE Students: *Alison Polasik*[1]; [1]Campbell University

8:45 AM
Using Jupyter Tools to Design Accessible, Scalable, and Interactive Learning Experiences in Materials Science and Engineering: *Enze Chen*[1]; Mark Asta[1]; Andrew Minor[1]; [1]University of California, Berkeley

9:05 AM
New Course Design: "Teaching Materials Science & Engineering": *Vincent Sokalski*[1]; [1]Carnegie Mellon University

9:25 AM
Undergraduate Research in Glass and Materials Science: An NSF Conference Grant: *Steve Feller*[1]; Mario Affatigato[1]; [1]Coe College

9:45 AM
ABET: Updates and Changes: *Gregg Janowski*[1]; Janet Callahan[2]; [1]University of Alabama at Birmingham; [2]Michigan Technological University

10:05 AM Break

10:25 AM Panel Discussion: Preparing for Your ABET Visit

FUNDAMENTALS AND CHARACTERIZATION

Emergent Materials Under Extremes and Decisive In Situ Characterizations — Next Generation X-ray and Neutron Technologies for Advanced Characterization

Sponsored by: ACerS Basic Science Division

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

Monday AM | October 2, 2023
A220 | Greater Columbus Convention Center

Session Chair: Hua Zhou, Argonne National Laboratory

8:00 AM Invited
Magnetic Scattering and Spectroscopy at High Pressures at APS and APS-U: *Daniel Haskel*[1]; [1]Argonne National Laboratory

8:30 AM Invited
Perspectives of IXS and NRS Studies in the APSU Era: *Jiyong Zhao*[1]; [1]Advanced Photon Source, Argonne National Laboratory

9:00 AM Invited
Neutron Scattering for Studying Materials Under Extreme Conditions: *Yaohua Liu*[1]; [1]Oak Ridge National Laboratory

9:20 AM Invited
In-situ/Operando Characterization of Emerging Materials with MeV Ultrafast Electron Diffraction at SLAC National Accelerator Laboratory: *Xiaozhe Shen*[1]; [1]SLAC National Accelerator Laboratory

9:40 AM
Capturing Laser Induced Dynamics of Materials via Single-Shot Ultrafast Transmission Electron Microscopy: *Volkan Ortalan*[1]; [1]University of Connecticut

10:00 AM Break

10:20 AM Invited
Modulation of Structure-function Motifs in Optoelectronic Metal Halides Using High Pressure: *Xujie Lu*[1]; [1]Center for High Pressure Science & Technology Advanced Research

10:50 AM Invited
Pressure-induced Non-monotonic Crossover of Steady Relaxation Dynamics in a Metallic Glass: *Qiaoshi Zeng*[1]; [1]Hpstar

11:10 AM Invited
HP-XAFS and Its Application to Topological Insulator Bi2Te3: *Xinguo Hong*[1]; [1]Center for High Pressure Science and Technology Advanced Research

11:30 AM
Pressure-Temperature Phase Diagram of Fluorapatite: *Andrew Strzelecki*[1]; Emma Carlsen[2]; Stella Chariton[3]; Vitali Prakapenka[3]; Chris Bradley[1]; Garrett Euler[1]; Xiaofeng Guo[2]; Florie Caporuscio[1]; Hakim Boukhalfa[1]; Hongwu Xu[4]; [1]Los Alamos National Laboratory; [2]Washington State University; [3]University of Chicago; [4]Los Alamos National Laboratory & Arizona State University

11:50 AM
Polar Magnets in High-Pressure Exotic Perovskites: *Yifeng Han*[1]; Alexandra Navrotsky[1]; [1]Arizona State University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — D.T. Rankin Award Ceremony

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Kyle Brinkman, Clemson University; Armin Feldhoff, Leibniz University Hannover; Charmayne Lonergan, Pacific Northwest National Laboratory; Zhezhen Fu, Pennsylvania State University - Harrisburg; Dhruba Panthi, Kent State University; Janusz Tobola, AGH UST, Faculty of Physics and Applied Computer Science

Monday AM | October 2, 2023
B240/241 | Greater Columbus Convention Center

Session Chair: Krista Carlson, University of Nevada

8:00 AM Invited
D.T. Rankin Award Ceremony and Awardee's Talk: *Krista Carlson*[1]; Jake Amoroso[2]; [1]University of Nevada, Reno; [2]Savannah River National Laboratory

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Energy Storage I; Energy Conversion and Harvesting I

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Kyle Brinkman, Clemson University; Armin Feldhoff, Leibniz University Hannover; Charmayne Lonergan, Pacific Northwest National Laboratory; Zhezhen Fu, Pennsylvania State University - Harrisburg; Dhruba Panthi, Kent State University; Janusz Tobola, AGH UST, Faculty of Physics and Applied Computer Science

Monday AM | October 2, 2023
B240/241 | Greater Columbus Convention Center

Session Chairs: Yang Bai, University of Oulu; Armin Feldhoff, Leibniz University Hannover

8:20 AM Keynote
Cation-Driven Assembly of Dissimilar Nanoflakes to Form Two-dimensional Heterostructure Electrodes for Energy Storage: *Ekaterina Pomerantseva*[1]; [1]Drexel University

9:00 AM Invited
Ferroelectric Nanocomposites for Enhanced Solar Energy Conversion: *Joe Briscoe*[1]; [1]Queen Mary University of London

9:30 AM Invited
Charge Storage Mechanisms in Layered Oxide Supercapacitors: *Scott Misture*[1]; [1]Alfred University

10:00 AM Break

10:20 AM Invited
Developing Fast Chargeable Safe and Inexpensive Li-ion Batteries: *Palani Balaya*[1]; [1]National University of Singapore

10:50 AM
Electrically Conductive Electrets as a New Untapped Source of Electrical Energy: *Deborah Chung*[1]; [1]State University of New York Buffalo

11:10 AM Invited
High Thermoelectric ZT in Half-Heusler Alloys: A Preview: *Joseph Poon*[1]; [1]University of Virginia

11:40 AM
Performance Improvement of MXene-based Perovskite Solar Cells: Hugo Lemos[1]; Jessica Rossato[1]; Silvia Fernandes[1]; *Carlos Graeff*[1]; [1]UNESP

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Current Issues and Functional Applications — Glass Chemistry, Design, and Characterization

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Charmayne Lonergan, Pacific Northwest National Laboratory; Ashutosh Goel, Rutgers, The State University of New Jersey

Monday AM | October 2, 2023
B132 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Accelerating Glass Discovery Using Artificial Intelligence and Machine Learning: *N M Anoop Krishnan*[1]; [1]Indian Institute of Technology Delhi

8:30 AM
Structural Role of High Field Strength Cations in Oxide Glasses: Network Modifier or Network Former?: *Sabyasachi Sen*[1]; [1]University of California, Davis

9:00 AM
Aluminum and Iron in Silicate Glasses and 5.1.8 Crystal: *Raine Antonio*[1]; Malin Wilkins[1]; John Bussey[1]; John McCloy[1]; [1]Washington State University

9:20 AM
The Ductility of Silicate Glasses is Driven by Topological Heterogeneity: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

9:40 AM
Mixed Modifier Effects on Structural, Mechanical, Chemical, and Mechanochemical Properties of Sodium Calcium Aluminosilicate Glass: Hongshen Liu[1]; *Andrew Ogrinc*[1]; Yinan Lin[1]; Collin Wilkinson[2]; Karan Doss[1]; Aubrey Fry[1]; Conghang Qu[1]; Hongtu He[3]; Timothy Gross[4]; Nicholas Smith[4]; John Mauro[1]; Seong Kim[1]; [1]Penn State University; [2]Alfred University; [3]Southwest University of Science and Technology; [4]Corning Inc

10:00 AM Break

10:20 AM
Deciphering the Structural Origins of High Sulfur Solubility in Vanadium-containing Borosilicate Glasses: *Rajan Saini*[1]; Ashutosh Goel[1]; Daniel R. Neuville[2]; Randall E. Randall E. Youngman[3]; [1]Rutgers University; [2]IPGP CNRS; [3]Corning Incorporated

10:40 AM
Rheological Behavior of Heavy-Metal Oxychloride Glass-Forming Liquids: *Jacob Lovi*[1]; Bruce Aitken[2]; Sabyasachi Sen[1]; [1]University of California at Davis; [2]Corning Incorperated

11:00 AM
Topological Phases and Melt Dynamics of the Equimolar Ternary Ge-As-S and Ge-P-Se Glass Systems: *Badriah Almutairi*[1]; Aaron Welton[2]; Punit Boolchand[2]; [1]Princess Nourah Bint Abdulrahman University; [2]University of Cincinnati

11:20 AM
Investigation of Glasses Containing Heavy Metal Oxides as a Replacement to Lead Oxide: *Elizabeth Tsekrekas*[1]; Alexis Clare[1]; [1]Alfred University

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

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

Monday AM | October 2, 2023
A215 | Greater Columbus Convention Center

Session Chairs: Catherine Bishop, University of Canterbury; Wolfgang Rheinheimer, FZ Juelich

8:00 AM Invited
A Potential Mechanism for Abnormal Grain Growth in Thin Films on c-sapphire: *Dominique Chatain*[1]; Blandine Courtois[1]; Gerhard Dehm[2]; [1]CNRS/CINAM; [2]MPIE

8:30 AM Invited
Addressing the Stability and Reliability Challenges in Perovskite Solar Cells via Microstructural and Interfacial Tailoring: *Nitin Padture*[1]; [1]Brown University

9:00 AM
The Role of Grain Boundary Stiffness during Grain Boundary Migration in Ni Polycrystals: *Zipeng Xu*[1]; Fadi Abdeljawad[2]; Gregory Rohrer[1]; [1]Carnegie Mellon University; [2]Clemson University

9:20 AM
The Effects of Large Pores on Abnormal Grain Growth in Calcia Doped Alumina: *Daniel DeLellis*[1]; Amanda Krause[1]; [1]Carnegie Mellon University

9:40 AM
Anisotropic Interface Motion in Polycrystalline Films: *Danny Hermawan*[1]; John Blendell[1]; R. Edwin Garcia[1]; [1]Purdue University

10:00 AM Break

10:20 AM
Modeling SiN Crystallization in Microelectronics Manufacturing Using Phase-field Method: *Aashique Rezwan*[1]; Jennie Podlevsky[1]; Calvin Parkin[1]; Khalid Hattar[2]; James Lane[1]; Tesia Janicki[1]; Scott Grutzik[1]; Edwin Chiu[1]; Chris Bishop[1]; Hojun Lim[1]; [1]Sandia National Laboratories; [2]University of Tennessee, Knoxville

10:40 AM
Direct Observation of Anisotropic Growth of Nickel Oxide Nanostructure by the Terrace-ledge-kink Mechanism: Boyi Qu[1]; *Klaus van Benthem*[1]; [1]University of California, Davis

11:00 AM
Examining Multiple Generations of Complexion Transitions in Eu-doped MgAl2O4: *Alicia Koenig*[1]; Caroline Riedel[1]; Christopher Marvel[2]; Martin Harmer[1]; [1]Lehigh University; [2]Louisiana State University

11:20 AM
Segregation Engineering in Metal Oxide Nanoparticle-derived Ceramics: *Oliver Diwald*[1]; Korbinian Aicher[1]; Thomas Schwab[1]; Gregor Zickler[1]; [1]Paris Lodron Universitaet Salzburg

11:40 AM
Blacklight Sintering of Ceramics: *Wolfgang Rheinheimer*[1]; Lukas Porz[2]; Michael Scherer[2]; Lovro Fulanovic[2]; Till Frömling[3]; Jürgen Rödel[2]; [1]Julich Research Center; [2]TU Darmstadt; [3]Fraunhofer IWKS

12:00 PM
Thermo-kinetic Analysis of Zinc Aluminate Nanoparticles Coarsening: *Ricardo Castro*[1]; [1]Lehigh University

MATERIALS-ENVIRONMENT INTERACTIONS

High Temperature Corrosion and Degradation of Structural Materials — I. Carbon Dioxide, Steam, and Interfacial Stability

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

Monday AM | October 2, 2023
A122 | Greater Columbus Convention Center

Session Chair: To Be Announced

9:00 AM Invited
Comparison and Mechanism of High-temperature Oxidation Behavior of Additively Manufactured Haynes 282 to Wrought Haynes 282 in Direct-fired Supercritical CO_2 Power Cycle Environments: *Casey Carney*[1]; Nicholas Lamprinakos[2]; Richard Oleksak[1]; Omer Dogan[1]; Anthony Rollett[2]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University

9:30 AM
Effect of Temperature and Impurities on the Oxidation Behavior of Ni-based Alloys in Hot CO2-rich Gases: *Richard Oleksak*[1]; Joseph Tylczak[1]; Lucas Teeter[1]; Casey Carney[1]; Ömer Doğan[1]; [1]National Energy Technology Laboratory

9:50 AM
Environmental Creep Behavior of Austenitic Steels in CO2: *Richard Oleksak*[1]; Kyle Rozman[1]; Ömer Doan[1]; [1]National Energy Technology Laboratory

10:10 AM Break

10:30 AM
T91 Boiler Tube Oxidation Performance and Oxide Spallation in Supercritical Steam Thermal Cycling Conditions: *Casey Carney*[1]; Gordon Holcomb[1]; [1]National Energy Technology Laboratory

10:50 AM
Evolution of Interfacial Morphogenesis and Stability of Alloys in Harsh Environments: *Krishnan Raja*[1]; [1]University of Idaho

SPECIAL TOPICS

History of Materials Science and Engineering — Material Classes and Choices

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

Program Organizers: Robert Hackenberg, Los Alamos National Laboratory; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Olivier Hardouin Duparc, LSI - CNRS; Kester Clarke, Colorado School of Mines; Goro Miyamoto, Tohoku University

Monday AM | October 2, 2023
A213 | Greater Columbus Convention Center

Session Chairs: Tadashi Furuhara, Tohoku University; Robert Hackenberg, Los Alamos National Laboratory

8:00 AM Invited
History of Steel Research in Institute for Materials Research ("KINKEN") of Tohoku University: *Tadashi Furuhara*[1]; [1]Institute for Materials Research, Tohoku University

8:30 AM Invited
Microalloyed Forging Steels – Evolution from Laboratory to Industrial Application: *Chester Van Tyne*[1]; [1]Colorado School of Mines

9:00 AM Invited
History of Extra Super Duralumin Development and Its Spirit Inherited by UACJ: *Hideo Yoshida*[1]; Mami Mihara-Narita[2]; Hidetoshi Uchida[3]; [1]ESD Laboratory; [2]Nagoya Institute of Technology; [3]UACJ Corporation

9:30 AM Invited
A Perspective on the Uses of Ceramics in Nuclear Reactors LA-UR-23-23416: *Erik Luther*[1]; [1]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
Experiments of a German Engineer Starting a Blast Furnace in Brazil, in 1818: *Fernando Landgraf*[1]; [1]University of Sao Paulo

10:50 AM
The Development of Artificially-made Siliceous Ceramic Bodies (i.e. Stonepaste) in the Middle East between the 11th and 17th Centuries: *Moujan Matin*[1]; [1]University of Toronto

11:20 AM
The Transition from Old Iron to New Steel in China: *Tengshi Liu*[1]; [1]Shanghai University

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — New 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; Mike Alexander, Allied Mineral Products; Eric Faierson, Iowa State University; Keith DeCarlo, Blasch Precision Ceramics

Monday AM | October 2, 2023
B233 | Greater Columbus Convention Center

Session Chair: William Fahrenholtz, Missouri University of Science and Technology

8:00 AM Invited
Machine-Learning-Based, Online Estimation of Ceramic's Microstructure Upon the Laser Spot Brightness During Laser Sintering: Jianan Tang[1]; Siddhartha Sarkar[1]; Hua Huang[1]; Xiao Geng[1]; Jianhua Tong[1]; Lionel Vargas-Gonzalez[2]; Nicholas Ku[2]; Dongsheng Li[3]; Hai Xiao[1]; *Fei Peng*[1]; [1]Clemson University; [2]DEVCOM Army Research Laboratory; [3]Advanced Manufacturing LLC

8:30 AM Invited
Nondestructive Materials Characterization Using Ultrasound: Towards a Deeper Understanding of the Cold Sintering Process: *Andrea Arguelles*[1]; Haley Jones[2]; Christopher Wheatley[2]; Susan Trolier-McKinstry[3]; Clive Randall[3]; [1]Penn State University; Materials Research Institute, Millennium Science Complex ; [2]Penn State University; [3]Materials Research Institute, Millennium Science Complex; Penn State University

9:00 AM
Limitations on the Sintering of Graded Particle Systems: *Daniel Delia*[1]; William Carty[1]; [1]Alfred University

9:20 AM
Microstructure and Electrical Conductivity of Sol-gel Synthesized and Spark Plasma Sintered Doped-lanthanum Gallate: *Eliana Muccillo*[1]; Shirley Reis[1]; Cyrille Gonin[2]; Marcos Berton[2]; Reginaldo Muccillo[1]; [1]Energy and Nuclear Research Institute; [2]SENAI Institute for Innovation in Electrochemistry

9:40 AM
Micromechanical Properties and Microstructures of AC and DC Flash-sintered Alumina: *Chao Shen*[1]; Tongjun Niu[1]; Bo Yang[1]; Jaehun Cho[2]; Zhongxia Shang[1]; Tianyi Sun[1]; Anyu Shang[1]; R. Edwin Garcia[1]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Kumoh National Institute of Technology

10:00 AM Break

10:20 AM Invited
Densification of Dual Phase High Entropy Boride-Carbide Ceramics by Pressureless Sintering: *William Fahrenholtz*[1]; Steven Smith[1]; Greg Hilmas[1]; [1]Missouri University of Science and Technology

10:50 AM
Laser Sintering of Silica-titania Glass: *Siddhartha Sarkar*[1]; [1]Clemson University

11:10 AM
Exploring New Flux Chemistries to Expand the Cold Sintering Process: *Julian Fanghanel*[1]; Clive Randall[1]; [1]Pennsylvania State University

CERAMIC AND GLASS MATERIALS

Mesoscale Phenomena in Functional Polycrystals and Their Nanostructures — Ferroelectric, Dielectric and Thermal Phenomena

Sponsored by: ACerS Electronics Division

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

Monday AM | October 2, 2023
B230 | Greater Columbus Convention Center

Session Chairs: Serge Nakhmanson, University of Connecticut; Ilya Sochnikov, University of Connecticut

8:00 AM
Modeling Local Dielectric Dispersion in Ferroelectric BaTiO3 with Domain Walls: *Ashok Gurung*[1]; John Mangeri[2]; Charles Schwarz[1]; S Alpay[1]; Serge Nakhmanson[1]; [1]University of Connecticut; [2]Luxembourg Institute of Science and Technology

8:20 AM Invited
Characterization of Phase and Domain Switching in Sn-doped BCZT Piezoceramics with Large Electromechanical Strains: Abhijit Pramanick[1]; *Laurent Daniel*[1]; Sarangi Venkateshwarlu[2]; Valentin Segouin[1]; Yang Ren[2]; [1]GeePs-CentraleSupelec; [2]City University of Hong Kong

8:50 AM
Processing and Electrical Characterization of Bulk Nano-grained Hafnia-based Ceramics: *Eric Patterson*[1]; Sara Mills[2]; James Wollmershauser[1]; Kevin Anderson[1]; Boris Feigelson[1]; Evan Anguish[3]; Jennifer Andrew[3]; [1]U.S. Naval Research Laboratory; [2]ASEE Post Doctoral Associate, U.S. Naval Research Laboratory; [3]University of Florida

9:10 AM Invited
Bidirectional Dynamic Mechanical Writing of Polar Bubbles: *Jaegyu Kim*[1]; Yeongki Yeo[1]; Yong-Jun Kwon[1]; Jeongdae Seo[1]; Chan-Ho Yang[1]; [1]KAIST

9:40 AM
Strain-tuned Quantum Materials: *Ilya Sochnikov*[1]; Joshua Bedard[1]; Jacob Franklin[1]; [1]University of Connecticut

10:00 AM Break

10:20 AM Invited
Mesoscale Dipoles via Strain Induced Correlations in an Atomic-layer Superlattice: *Maitri Warusawithana*[1]; [1]University of North Florida

10:50 AM Invited
Causality and Machine Learning Models of Ferroics From Atomistic Simulations: *Ayana Ghosh*[1]; [1]Oak Ridge National Laboratory

11:20 AM Invited
Heat-assisted Ferroelectric Reading for High Speed Ultrahigh-density Ferroelectric Data Storage: *Yasuo Cho*[1]; [1]New Industry Creation Hatchery Center, Tohoku University

11:50 AM Invited
Hierarchical Ceramic Composites for Ultra-high Temperature Applications: *Laura Silvestroni*[1]; Nicola Gilli[2]; Jeremy Watts[3]; William Fahrenholtz[3]; [1]CNR - ISTEC; [2]CNR; [3]Missouri University of Science and Technology

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FUNDAMENTALS AND CHARACTERIZATION

Metal Powder Synthesis and Processing: Fundamental Aspects and Modeling — Session I

Sponsored by: TMS: Powder Materials Committee

Program Organizers: Kyle Tsaknopoulos, Worcester Polytechnic Institute; Timothy Prost, Uniformity Labs; Jordan Tiarks, Ames National Laboratory; Franz Hernandez, Ames Laboratory

Monday AM | October 2, 2023
A214 | Greater Columbus Convention Center

Session Chairs: Kyle Tsaknopoulos, Worcester Polytechnic Institute; Jordan Tiarks, Ames National Laboratory; Timothy Prost, Uniformity Labs

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8:00 AM
Effect of Li Concentration on Morphology of Precipitates in Nanocrystalline Cu-3Ta: Joshua Smeltzer[1]; B. Hornbuckle[2]; Kiran Solanki[3]; Martin Harmer[1]; Kristopher Darling[2]; *Christopher Marvel*[4]; [1]Lehigh University; [2]US Army Combat Capabilities Development Command; [3]Arizona State University; [4]Louisiana State University

8:20 AM
Microstructural Characterization of Zn-3Mg(wt.%) Processed by High-pressure Torsion: *Tanzilur Rahman*[1]; Connor Wasick[1]; Hakan Yilmazer[2]; Megumi Kawasaki[3]; Burak Dikici[4]; Kaveh Edalati[5]; Carl Boehlert[1]; [1]Michigan State University; [2]Yildiz Technical University; [3]Oregon State University; [4]Ataturk University; [5]Kyushu University

8:40 AM
Resolving the Sintering Conundrum of Tungsten Alloys: *Lin Zhang*[1]; Zhongyou Que[1]; Xingyu Li[1]; Xuanhui Qu[1]; [1]University Of Science and Technology Beijing

9:00 AM
FEM Analysis of Temperature and Stress Distribution Behavior of Al20Cr20Fe25Ni25Mn10 High Entropy Alloy in Spark Plasma Sintering: Effect of Consolidation Time on Microstructure: *Lehlogonolo Kanyane*[1]; M Tlotleng[1]; N Malatji[1]; [1]Tshwane University of Technology

9:20 AM
Vacuum Hot Pressing of Oxide-dispersion Strengthened (ODS) Ferritic Steel Powders Guided by Temperature-scanning High-energy X-ray Powder Diffraction Analysis: *Landon Hickman*[1]; Emma Cockburn[2]; Nicolas Argibay[1]; Jordan Tiarks[1]; Rameshawari (Sherry) Naorem[1]; Iver Anderson[1]; Sid Pathak[2]; [1]Ames Laboratory; [2]Iowa State University

9:40 AM
Advanced Characterization of Defects in Superalloy Powders Atomized by Various Methods and Effects on Net-shape HIP Product: *Benjamin Georgin*[1]; Hamish Fraser[2]; Brian Welk[2]; [1]Exponent; [2]The Ohio State University

10:00 AM Break

10:20 AM
Flowability and Suitability of Mechanically Derived Powders for Additive Manufacturing: *David Bahr*[1]; John Barnes[2]; John Martin[3]; [1]Purdue University; [2]Metal Powder Works; [3]HRL Laboratories

10:40 AM
Microstructure Alignment Effects from Engineered Cooling during Additive Manufacturing of Alnico Magnets from Pre-alloyed Powder : *Iver Anderson*[1]; Luke Gaydos[1]; Tyler Rodriguez[1]; Emrah Simsek[2]; Ryan Ott[2]; Emily Rinko[3]; Wei Tang[2]; Matthew Kramer[2]; Nicolas Argibay[2]; [1]Iowa State University Ames Laboratory; [2]Ames National Lab; [3]Kansas City National Security Campus

11:00 AM
Understanding the Geometry Accuracy and Surface Roughness of Thin Wall Structures for 316L Stainless Steel in Laser Powder Bed Fusion Additive Manufacturing: *Tianyu Zhang*[1]; Loewer Matthew[1]; Haralson Reid[1]; Lang Yuan[1]; [1]University of South Carolina

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MODELING

Multi Scale Modeling of Microstructure Deformation in Material Processing — Multi Scale Modeling of Microstructure Deformation in Material Processing

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

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

Monday AM | October 2, 2023
A225 | Greater Columbus Convention Center

Session Chairs: Lukasz Madej, AGH University; Krzysztof Muszka, AGH University

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8:00 AM Invited
Modeling Microstructure Evolution for Solidification During Additive Manufacturing Using Cellular Automata: *Indranil Roy*[1]; John S Coleman[1]; Matt R Rolchigo[1]; Alex Plotkowski[1]; Shuanglin Chen[2]; Ying Yang[2]; [1]Oak Ridge National Laboratory; [2]Computherm LLC

8:30 AM
Explicit Separation of Edge and Screw Dislocation Mobility and Density Evolution Law in BCC Single Crystal Plasticity Model: *Cathy Bing*[1]; Philip Eisenlohr[1]; [1]Michigan State University

8:50 AM
Fine-tuning Superelastic Behavior of NiTi SMAs via Nanoscale Concentration Modulation Created by Ni4Ti3 Nanoprecipitate Dissolution: *Zexu Chen*[1]; Hariharan Sriram[1]; Longsheng Feng[1]; Yunzhi Wang[1]; [1]The Ohio State University

9:10 AM
An Experimental and Modeling Study of Vacancy Diffusion Creep and Segregation in Multicomponent Alloys: *Chaitanya Bhave*[1]; Sriswaroop Dasari[1]; Sourabh Kadambi[1]; Boopathy Kombaiah[1]; [1]Idaho National Laboratory

9:30 AM
A New Die Design for the Constrained Groove Pressing Process to Achieve Homogeneity and Uniform Properties: *Swapnil Sawalkar*[1]; David Field[1]; [1]Washington State University

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials I

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Monday AM | October 2, 2023
A222 | Greater Columbus Convention Center

Session Chairs: Min Wang, University of Hong Kong; Tanveer Tabish, University of Oxford

8:00 AM Invited
Designing and 3D Printing of Graded Tissue Engineering Scaffolds: *Min Wang*[1]; [1]University of Hong Kong

8:20 AM
Chemical Risk Calculators (CHRIS): Regulatory Tools for Assessing Medical Device Leachables: *David Saylor*[1]; [1]US FDA

8:40 AM Invited
3D Printing of Diamond as a Biomaterial Using 3DP Technologies: *Kate Fox*[1]; [1]RMIT University

9:00 AM Invited
Nanostructured Biomaterial Derived From Reactive Organotrialkoxysilanes: *Prem Pandey*[1]; [1]Indian Institute of Technology, BHU

9:20 AM
Synthesis and Characterization of Nanofibrous Chitosan/Hydroxyapatite Microspheres: Song Chen[1]; *Akiyoshi Osaka*[2]; [1]Taiyuan Univ Tech; [2]Okayama University

9:40 AM
Nitric Oxide Releasing Two-dimensional Raphene: A Romance of Many Dimensions: *Tanveer Tabish*[1]; [1]University of Oxford

10:00 AM Break

10:20 AM Invited
Salicylic Acid-loaded Gelatin Methacryloyl Microneedles as a Potential Drug Delivery System in Plants Diseases: *Oguzhan Gunduz*[1]; [1]Marmara University

10:40 AM
Extracellular Matrix Inspired Biomaterials for Tissue Engineering: *Peter Ma*[1]; [1]University of Michigan

11:00 AM
Label-free Measurement of Cell Viability in Hydrogel Scaffolds Using Optical Coherence Tomography: *Carl Simon*[1]; [1]National Institute of Standards & Technology

11:20 AM
Biofabrication Using Spider Silk Proteins: *Thomas Scheibel*[1]; [1]Universität Bayreuth

11:40 AM
Using Matrix Assisted Pulsed Laser Evaporation to Create Biomedical Coatings: *Andrew Sachan*[1]; Roger Narayan[1]; [1]North Carolina State University

ADDITIVE MANUFACTURING

Phase Transformations and Microstructure Evolution during Post-Processing of Additively Manufactured Metals — Phase Transformations and Microstructure Evolution during Post Processing I

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Bij-Na Kim, Carpenter Additive; Amy Clarke, Colorado School of Mines; Mark Aindow, University of Connecticut; Eric Lass, University of Tennessee-Knoxville; Richard Fonda, Naval Research Laboratory; Ashley Paz Y Puente, University of Cincinnati

Monday AM | October 2, 2023
C170 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Microstructure Engineering of Specialty Alloys via Post Advanced Manufacturing Thermal Treatments: *Sophie Primig*[1]; [1]University of New South Wales

8:40 AM
Impact of Heat Treatment Rates on Phase Transformation in Additively Manufactured Gamma Prime Superalloys IN738LC: *Marcus Lam*[1]; [1]Monash University

9:00 AM
Liquid-induced Heat Treatment for Eliminating the Anisotropy in Mechanical Properties of Laser Additive Manufactured IN718 Alloy: Xiaogang Hu[1]; Zhuoyu Li[1]; *Qiang Zhu*[1]; [1]Southern University of Science and Technology

9:20 AM
Microstructural Evolution of One and Two Step Heat Treatments on Electron Beam Powder Bed Fusion Fabricated Haynes 282: *Alivia Mourot*[1]; Avantika Gupta[1]; Sriram Vijayan[1]; Joerg Jinschek[1]; Carolin Fink[1]; [1]Ohio State University

9:40 AM
A Process Optimization Framework for Laser-wire Direct Energy Deposition Superalloy Haynes 282: Porosity, Microstructure, and Mechanical Properties: *Rui Feng*[1]; Kristin Tippey[1]; Chantal Sudbrack[1]; [1]National Energy Technology Laboratory

10:00 AM Break

10:20 AM Invited
Influence of Post Processing Annealing on Precipitation and Deformation Behavior of Additvely Processed Beta Titanium Alloys: Srinivas Aditya Mantri[1]; Mohan Sai Kiran Kumar Yadav Nartu[1]; Sriswaroop Dasari[1]; Abhishek Sharma[1]; Riyadh Salloom[1]; Fan Sun[2]; Srinivasan Srivilliputhur[1]; Narendra Dahotre[1]; Frederic Prima[2]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]Institut de Recherche de Chimie Paris

11:00 AM
Microstructure-based Heat Treatment Design of Selective Laser Melted Ti-6Al-4V to Overcome Strength-Ductility Trade-off: *Yoon-Hwan Jo*[1]; Hyuk-Uk Hong[1]; Chanhee Lee[1]; Chiwon Kim[2]; Jungmin Han[3]; Yonghyuk Choi[3]; [1]Changwon National University; [2]Korea Institute of Materials Science; [3]Doosan Enerbility

11:20 AM
Tuning the Precipitate Microstructure in the Selective Laser Melted Ti-6Al-2Sn-4Zr-2Mo Alloy via Post Heat Treatment: *Deepak Pillai*[1]; Sydney Fields[1]; Dian Li[1]; Yufeng Zheng[1]; [1]University of Nevada, Reno

11:40 AM
Understanding the Microstructure Evolution Pathway During the Post Heat Treatment in the Direct Energy Deposited Ti-5Al-5Mo-5V-3Cr Alloy: *Sydney Fields*[1]; Dian Li[1]; Yufeng Zheng[1]; [1]University of Nevada, Reno

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PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Manufacturing Division

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum & Minerals; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Christina Wildfire, National Energy Technology Laboratory; Zhiwei Peng, Central South University

Monday AM | October 2, 2023
B235 | Greater Columbus Convention Center

Session Chairs: Morsi Mahmoud, King Fahd University of Petroleum and Minerals; Daudi Waryoba, Penn State DuBois

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8:00 AM Invited
Reviewing a Unified Phenomenological Comprehension on Non-thermal Effects in Microwave-assisted Materials Processing: *Boon Wong*[1]; [1]No Affiliation (Retired)

8:20 AM
Fabrication of Large Stress Windows and High Cyclic Stability Functionally Graded NiTi Alloy Based on Direct Current Heat Treatment: *Qie Xi*[1]; Zhao Zhihao[1]; Lin Jianping[1]; Min Junying[1]; Xiao Yao[1]; [1]TongJi University

8:40 AM
High-speed Synchrotron X-ray Imaging of Microstructural Refinement Mechanisms During Ultrasonic Melt Processing in Metal Additive Manufacturing: *Lovejoy Mutswatiwa*[1]; Lauren Katch[1]; Nathan Kizer[1]; Tao Sun[2]; Samuel Clark[3]; Kamel Fezzaa[3]; Christopher Kube[1]; [1]Pennsylvania State University; [2]University of Virginia; [3]Argonne National Laboratory

9:00 AM
Microstructure Evolution and Property Enhancement of 3D-printed Graphene via Cold Rolling: *Vamsi Krishna Reddy Kondapalli*[1]; Kyle Brittingham[1]; Mahnoosh Khosravifar[1]; Vesselin Shanov[1]; [1]University of Cincinnati

9:20 AM Invited
Spark Plasma Sintering of Silicon Nitride without and with Sintering Additive: *Manshi Ohyanagi*[1]; Misaki Inoue[1]; Kenshiro Shirai[1]; [1]Ryukoku University

9:40 AM Invited
Inhibition of Biofilm Formation on Glass Specimens when Subjected to AC Electromagnetic Fields of 20 kHz to 30 kHz: *Hideyuki Kanematsu*[1]; Dana Barry[2]; Natsu Aoyama[1]; Hidekazu Miura[3]; Akiko Ogawa[1]; Risa Kawai[1]; Takeshi Kogo[1]; Nobumitsu Hirai[1]; Toshio Kamijo[4]; Takehito Kato[5]; Michiko Yoshitake[6]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Clarkson University; [3]Suzuka University of Medical Science; [4]National Institute of Technology (KOSEN), Tsuruoka College; [5]National Institute of Technology (KOSEN), Oyama College; [6]National Institute for Materials Science

10:10 AM Break

10:30 AM Invited
Microwave Sintering for Lunar Base Construction: *Holly Shulman*[1]; [1]DrHollyShulman LLC

11:00 AM Invited
Microwave Direct Iron Reduction Studies: *Christina Wildfire*[1]; Ranjani Siriwardane[1]; Chris Pistorius[2]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University

11:30 AM Invited
The Role and Characterization of the Native Oxide Shell of Copper Metal Powder Spherical Particles During High Frequency Microwave Processing: *Morsi Mahmoud*[1]; Guido Link[2]; Manfred Thumm[2]; [1]King Fahd University of Petroleum & Minerals; [2]Karlsruhe Institute of Technology,

LIGHTWEIGHT ALLOYS

Recent Developments in Light-Weight Composites and Materials — Microstructures and Properties I

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

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Nikhil Gupta, New York University; Aashish Rohatgi, Pacific Northwest National Laboratory; Sudip Bhattacharya, 6K Inc.

Monday AM | October 2, 2023
A211 | Greater Columbus Convention Center

Session Chair: Ramasis Goswami, US Naval Research Laboratory

8:00 AM Invited
Strengthening Mechanisms of Ultrasonically Refined A356 (Al-Si-Mg) Aluminum Alloy: *Katherine Rader*[1]; Aashish Rohatgi[1]; [1]Pacific Northwest National Laboratory

8:30 AM Invited
Engineering Superhardness in Carbides: *Kevin Anderson*[1]; James Wollmershauser[1]; Heonjune Ryou[1]; Ramasis Goswami[1]; Edward Gorzkowski[1]; Boris Feigelson[1]; [1]U.S. Naval Research Laboratory

9:00 AM Invited
Analysis of the Indentation Size Effect in the Vickers Microhardness Measurement in Alloy Ti5Al2.5Sn: *Nathan Fleming*[1]; Samuel R Meyer[1]; Ramachandra Canumalla[1]; [1]Weldaloy Metallurgical Laboratory C/O Weldaloy Specialty Forgings

9:30 AM Invited
Development of Eutectic Aluminum Alloys for High Temperature Applications: Opemipo Adetan[1]; Obidimma Ikeh[1]; Aman Kshirsagar[1]; *Dinc Erdeniz*[1]; [1]University of Cincinnati

10:00 AM Break Coffee Break

10:20 AM
Effect of Aging on the Strength and Failure Mechanisms of an Aluminum-Cerium Based Alloy: *Opemipo Adetan*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

10:40 AM
Numerical and Experimental Ballistic Performance Investigation of Carbon-aramid and Carbon-UHMWPE Polymer Composites for Ballistic Applications: *Ricardo Sirot*[1]; Lorenzo Matilac[1]; Eduardo Magdaluyo[1]; [1]University of the Philippines

BIOMATERIALS

Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments — Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments

Sponsored by: Society for Biomaterials

Program Organizers: Christopher Siedlecki, Penn State College of Medicine; Nicholas Ziats, Case Western Reserve University; Noelle Comolli, Villanova University; Anirban Sen Gupta, Case Western Reserve University

Monday AM | October 2, 2023
A223 | Greater Columbus Convention Center

Session Chair: Christopher Siedlecki, Penn State University

8:00 AM Invited
Antimicrobial Surface Engineering: Towards Infection Resistant Implants: *Annabel Braem*[1]; Merve Kübra Aktan[1]; Nur Hidayatul Nazirah Kamarudin[2]; Marie Van der Gucht[3]; Naiera Zayed[4]; Rob Lavigne[3]; Wim Teughels[4]; [1]KU Leuven Department of Materials Engineering; [2]Universiti Kebangsaan Malaysia; [3]KU Leuven Laboratory of Gene Technology; [4]KU Leuven Department of Oral Health Sciences

8:40 AM
Development of Composite Si3N4-PEKK Biomaterial Coatings to Improve Ti6Al4V's Antibacterial Properties and Osteogenic Response: *Jackson Hendry*[1]; Tony Decarmine[2]; James Porteus[2]; Douglas Hoxworth[1]; B. Sonny Bal[1]; Ryan Bock[1]; Thomas Webster[3]; [1]SINTX Tchnologies Inc.; [2]Oxford Performance Materials, Inc.; [3]3School of Health Sciences and Biomedical Engineering

9:00 AM
Antimicrobial Coatings Based on Antimicrobial Peptides for Biomedical Applications: *Artemis Stamboulis*[1]; [1]University of Birmingham

9:20 AM
Tailoring of Antimicrobial Surface Through Nanostructured Ceramic Coatings: *Junghyun Cho*[1]; Shota Sakurai[1]; Karin Sauer[1]; [1]Binghamton University (State University of New York)

9:40 AM
Surface Modification Strategies for Inhibiting Biofilm Formation on Biomaterials: *Christopher Siedlecki*[1]; Alyssa Ochetto[2]; Chen Chen[3]; Dongxiao Sun[1]; Asma Khursheed[1]; Harry Allcock[3]; Lichong Xu[1]; [1]Penn State College of Medicine; [2]Rowan University; [3]Penn State University

10:00 AM Break

10:20 AM
Protein Adsorption on Surface-modified Bioactive Glasses and Its Impact on Cell Response: *Virginia Alessandra Gobbo*[1]; Vijay Parihar[1]; Paula Turkki[1]; Mirko Prato[2]; Enrica Vernè[3]; Silvia Spriano[3]; Vesa Hytönen[1]; Susanna Miettinen[1]; Jonathan Massera[1]; [1]Tampere University; [2]Istituto Italiano di Tecnologia; [3]Politecnico di Torino

10:40 AM
Topographical Effect on Hs27 Fibroblast Response: *Chunghwan Kim*[1]; Michael Robitaille[2]; Joseph Christodoulides[2]; Yisha Ng[1]; Marc Raphael[2]; Wonmo Kang[1]; [1]Arizona State University; [2]Naval Research Laboratory

11:00 AM
Cancer Cell-substrate Microenvironment Crosstalk in Metastasis Progression in Tissue Engineering Scaffolds: *Dinesh Katti*[1]; Sharad Jaswandkar[1]; Hanmant Gaikwad[1]; Kalpana Katti[1]; [1]North Dakota State University

11:20 AM
Surface Modification of MgZnCa Alloys Using Plasma Electrolytic Oxidation to Assess Corrosion Resistance and Biocompatibility: *Emily England*[1]; Guillermo Domínguez[2]; Paul Williams[2]; Carl Boehlert[1]; Javier LLorca[2]; Mónica Echeverry-Rendón[2]; [1]Michigan State University; [2]IMDEA Materials

11:40 AM
Comparison of Various Post Coating Treatments on Plasma Sprayed HA Coatings: *Jujhar Singh*[1]; Gursharan Singh[1]; Manoj Mittal[2]; Shubham Sharma[3]; [1]IKG Punjab Technical University; [2]I.K. Gujral Punjab Technical University; [3]Chandigarh University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

15th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Advanced Ceramics Manufacturing II

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Fu, Wuhan University of Technology; Allen Apblett, Oklahoma State University

Monday PM | October 2, 2023
B242/243 | Greater Columbus Convention Center

Session Chairs: Allen Apblett, Oklahoma State University; Federico Smeacetto, Politecnico di Torino; Hisayuki Suematsu, Nagaoka University of Technololgy

2:00 PM Invited
Corrosion Resistant Coatings on Steel for Nuclear Energy Applications: *Kathy Lu*[1]; Hyeon Joon Choi[1]; [1]Virginia Polytechnic Institute and State University

2:30 PM Invited
Synthesis of a Novel Cuprate with Gold under a High Oxygen Partial Pressure: *Hisayuki Suematsu*[1]; N. Yoshida[1]; Z. Feng[1]; T. M. D. Do[1]; T. Nakayama[1]; [1]Nagaoka University of Technololgy

3:00 PM
Molten Oxide Electrolysis for Reducing the Carbon Footprint of Technology-critical Metals: Kathryn Ford[1]; Aaron Marshall[1]; Matthew Watson[1]; *Catherine Bishop*[1]; [1]University of Canterbury

3:20 PM Break

3:40 PM Invited
Recycling Strategies for End-of-Life Solid Oxide Cell Materials: *Federico Smeacetto*[1]; Simone Anelli[1]; Sofia Saffirio[1]; Alice Benedetto Mas[1]; Silvia Fiore[1]; Massimo Santarelli[1]; Sergii Pylypko[2]; Sonia Fiorilli[1]; [1]Politecnico di Torino; [2]Elcogen

4:10 PM
Green Synthesis of Calcium Molybdate Using Bimetallic Precursors: *Allen Apblett*[1]; Ahmed Moneeb[1]; Cory Perkins[1]; Bhawani Regmi[1]; [1]Oklahoma State University

4:30 PM
Strategies for Patenting "Green" Technologies: *Van Vekris*[1]; [1]Marks & Clerk

4:50 PM Invited
Designing Low Temperature Sintered Ultra-uniform Nanocrystalline Ceramics: *Yanhao Dong*[1]; [1]Tsinghua University

BIOMATERIALS

3D Printing of Biomaterials and Devices — Session II

Sponsored by: ACerS Bioceramics Division

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

Monday PM | October 2, 2023
A221 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Impact of Fluid Flow on Bone Metastasis of Prostate Cancer: Invitro Testbeds of Bone Metastasis: *Dinesh Katti*[1]; Haneesh Jasuja[1]; Quyen Hoang[1]; Preetham Ravi[1]; Parth Vyas[2]; Sharad Jaswandkar[1]; Kalpana Katti[1]; [1]North Dakota State University; [2]Sanford Health

2:20 PM
Utilizing Chaotic Advection to Bioprint Hydrogel Sheets with User-Defined, High-Resolution Internal Cell Layers: *Ryan Hooper*[1]; Cynthia González[2]; Amanee Abu Arish[1]; Anna Beck[1]; Caleb Cummings[1]; Ciro Rodríguez[2]; Grissel Trujillo de Santiago[2]; Mario Moisés Alvarez[2]; David Dean[1]; [1]The Ohio State University; [2]Tecnológico de Monterrey

2:40 PM
Polycaprolactone Stent with Hexagonal Unit Structure for the Treatment of Trachea Stenosis: *Di Fan*[1]; Yusuf Dikici[1]; Ozan Akkus[1]; [1]Case Western Reserve University

3:00 PM
Silica-Doped 3D Printed Scaffold Loaded with Carvacrol Nanoparticles for Bone Tissue Engineering: *Aditi Dahiya*[1]; Susmita Bose[1]; [1]Washington State University

3:20 PM Break

3:40 PM
Multifunctional Peptide Design for Functional Biomaterials: *Candan Tamerler*[1]; [1]University of Kansas

4:00 PM
An Additive Manufacturing-oriented Design Approach: Hip Joint Case Study: *Lakshana Mohee*[1]; [1]ANSYS Granta

4:20 PM
Multi-axis Melt Electrowriting Fabrication of Membranes with Curving Surfaces Using Novel Biomaterials: *Javier Vazquez-Armendariz*[1]; Raquel Tejeda-Alejandre[2]; Anuja Kulkarni[1]; Davita Watkins[1]; Katelyn Swindle-Reilly[1]; Ciro Rodriguez[2]; David Dean[1]; [1]The Ohio State University; [2]Tecnologico de Monterrey

4:40 PM
Three-Dimensional Printing of Low Viscosity Bioinks Utilizing a Gelatin Printing Support Bath: *Emily Lazarus*[1]; Iris Rivero[1]; [1]Rochester Institute of Technology

SPECIAL TOPICS

ACerS Richard M. Fulrath Award Session

Sponsored by: ACerS

Monday PM | October 2, 2023
B130 | Greater Columbus Convention Center

2:20 PM Invited
Understanding Microscopic Origin of Physical Properties in Functional Ceramics: *Yukio Sato*[1]; [1]Kumamoto University

3:00 PM Invited
Next Generation Energy Storage Materials for Carbon Neutral Society: *Fuminori Mizuno*[1]; [1]Toyota Motor Corporation

3:20 PM Break

3:40 PM Invited
Advanced Materials for Aerospace Propulsion and Power Systems: *Amjad Almansour*[1]; [1]NASA Glenn Research Center

4:00 PM Invited
Dielectric Material for High Temperature Multilayer Ceramic Capacitors and Insulating Resistance Degradation Mechanism: *Sanshiro Aman*[1]; [1]TDK Corporation

4:20 PM Invited
Defect-Informed Design and Discovery of Solid-State Ionics for Energy Applications: *Nicola Perry*[1]; [1]University of Illinois Urbana-Champaign

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling, Simulation and Machine Learning - Structure & Property I

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Computational Materials Science and Engineering Committee, TMS: ICME Committee

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

Monday PM | October 2, 2023
C150 | Greater Columbus Convention Center

Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory

2:00 PM Keynote
Microstructure Evolution Simulation of Inconel 718 Superalloy during Laser Powder Bed Fusion (LPBF) Process: *Li Ma*[1]; Ali Ramazani[1]; [1]Johns Hopkins University Applied Physics Laboratory

2:20 PM
Effect of Size, Location, and Aspect Ratio of Pores on Ductility of PBF-LB Ti-6Al-4V: Experiments and Simulations: *Erik Furton*[1]; Selda Nayir[1]; Allison Beese[1]; [1]Pennsylvania State University

2:40 PM
Predicting Microstructural Evolution in Laser Powder Bed Fusion Additive Manufacturing Using Physics-based Machine Learning: *Prahalad Rao*[1]; Alex Riensche[1]; Ben Bevans[1]; Grant King[2]; Ajay Krishnan[3]; [1]Virginia Tech; [2]University of Nebraska-Lincoln; [3]Edison Welding Institute

3:00 PM
Simulation of Anisotropic Mechanical Behavior of Additively Manufactured Ti-6Al-4V Wall Structures using VPSC: *Rajib Halder*[1]; Anthony Rollett[1]; Jake Benzing[2]; [1]Carnegie Mellon University; [2]National Institute of Standards and Technology

3:20 PM Break

3:40 PM Invited
Nano-scale High Entropy Alloys Design through Additive Manufacturing by Controlling Melting Mechanism and Screening Structural Evolutions during Process: *Ali Ramazani*[1]; [1]Massachusetts Institute of Technology

4:00 PM
High-fidelity AM Simulation Using the Material Point Method: *Sam Reeve*[1]; Kwitae Chong[1]; Austin Isner[1]; Stuart Slattery[1]; Duan Zhang[2]; Jim Belak[3]; [1]Oak Ridge National Laboratory; [2]Los Alamos National Laboratory; [3]Lawrence Livermore National Laboratory

4:20 PM
Mechanical Properties of Truss-based Nanolattices: A Molecular Dynamics Study: Sahar Choukir[1]; *Chandra Veer Singh*[2]; [1]University of Toronto; [2]University of Toronto

4:40 PM
Modeling In-Situ Phase Transformation in Inconel 718 and EH36: A Study Using Phase Field and Phase Fraction Models: *Jakub Mikula*[1]; Rajeev Ahluwalia[1]; Robert Laskowski[1]; Kewu Bai[1]; Kai Ren[2]; Youxiang Chew[3]; Guglielmo Vastola[1]; Yong-Wei Zhang[1]; [1]Institutive of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR); [2]State Key Laboratory of Fluid Power and Mechatronic Systems, School of Mechanical Engineering, Zhejiang University; Key Laboratory of Advanced Manufacturing Technology of Zhejiang Province, School of Mechanical Engineering, Zhejiang University; [3]Singapore Institute of Manufacturing Technology (SIMTech), Agency for Science, Technology and Research (A*STAR)

5:00 PM
Multi-Model Monte Carlo Simulations of Mechanical Behavior of Additively Manufactured Metals: *Joshua Pribe*[1]; Patrick Leser[2]; Saikumar Yeratapally[1]; George Weber[2]; Brodan Richter[2]; Andrew Kitahara[1]; Edward Glaessgen[2]; [1]National Institute of Aerospace; [2]NASA Langley Research Center

3:20 PM Break

3:40 PM Invited
Additive Manufacturing of Ceramic Cutting Tools with Chip Breaker and Their Metal Cutting Behavior: Shanghua Wu[1]; Li He[1]; *Donglin Lyu*[1]; [1]Guangdong University of Technology

4:10 PM
Laser Powder Bed Fusion of Tungsten Carbide-Nickel Geometries Leveraging Thermomechanical Modeling: *Alexander Gourley*[1]; Edgar Mendoza Jimenez[1]; Reeja Jayan[1]; Jack Beuth[1]; [1]Carnegie Mellon University

4:30 PM Invited
Ultra-fast Laser Sintering of Ceramics and Glasses, and Machine Learning-based, Processing-microstructure-property Predictions for Laser-sintered Ceramics and Glasses: Xiao Geng[1]; Jianan Tang[1]; Siddhartha Sarkar[1]; Yunfeng Shi[2]; Liping Huang[2]; Rajendra Bordia[1]; Dongsheng Li[3]; Hai Xiao[1]; *Fei Peng*[1]; [1]Clemson University; [2]Rensselaer Polytechnic Institute; [3]Advanced Manufacturing LLC

ADDITIVE MANUFACTURING

Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications — Vat Photopolymerization and Laser Powder Bed Fusion

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; Xiangyang Dong, Missouri Univ of Science and Technology; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, Pennsylvania State University

Monday PM | October 2, 2023
C161A/161B | Greater Columbus Convention Center

Session Chair: Fei Peng, Clemson University

2:00 PM
Preliminary Fractographic Observations from a Round Robin on Flexural Strength of an Additively-manufactured High-purity Alumina: *George Quinn*[1]; Russell Maier[1]; [1]NIST

2:20 PM
Custom Manufacturing of Shape-conforming Battery Components Using VPP: *Bharat Yelamanchi*[1]; Sina Bakhtar Chavari[1]; Alexis Maurel[2]; Ana Martinez[2]; Cameroun Sherrard[3]; Eric MacDonald[2]; Pedro Cortes[1]; [1]Youngstown State University; [2]The University of Texas at El Paso; [3]Marshall NASA

2:40 PM
Evaluation of Calibration Measurements for Accelerated Development of Ceramic Vat Photopolymerization Process and Post-process Parameters: *Nellie Pestian*[1]; Joy Gockel[1]; [1]Colorado School of Mines

3:00 PM
Additive Manufacture of Cordierite Ceramic Materials via Digital Light Processing: *Jung-Ting Tsai*[1]; Andrew Chihpin Chuang[2]; Dileep Singh[2]; [1]National Taiwan University of Science and Technology; [2]Argonne National Laboratory

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ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Cu-, Ni-, and W-based Alloys

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

Monday PM | October 2, 2023
C151 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Toward High Strength and High Conductivity Copper Alloys via Additive Manufacturing: *Keita Nomoto*[1]; Kangwei Chen[1]; Simon Ringer[1]; [1]University of Sydney

2:20 PM
Evolution of the Texture and Variant Selection during Beta to Alpha Transformation in Wire Arc Additive Manufactured Nickel Aluminum Bronze: *Dillon Watring*[1]; David Rowenhorst[1]; Richard Fonda[1]; [1]Naval Research Laboratory

2:40 PM
Study of Printability and Melt Pool Geometry in W&W-alloys by Additive Manufacturing: *Amaranth Karra*[1]; Aditya Rohan Narra[1]; Bryan Webler[1]; [1]Carnegie Mellon University

3:00 PM
Process Structure Relationships of Pure Tungsten and Tungsten Alloys Fabricated via Electron Beam Powder Bed Fusion: *Christopher Ledford*[1]; Patxi Fernandez-Zelai[1]; Juilo Ortega Rojas[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

3:20 PM
Additive Manufacturing of Tungsten through Novel Multi Laser Processing: *Cameron Gygi*[1]; [1]Cdme

3:40 PM Break

4:00 PM
Nanoindentation Studies on the Surface Properties of Additively Manufactured Ni-base Alloys: *Oliver Bürgi*[1]; Youxing Chen[2]; Liuqing Yang[2]; Alex Bridges[3]; John Shingledecker[3]; [1]The University of North Carolina at Charlotte, Karlsruhe Institute of Technology; [2]The University of North Carolina at Charlotte; [3]Electric Power Research Institute

4:20 PM
Identification of Phases in a NiCr-V FGM Fabricated via DED AM Through Experiments and Computational Modeling: *Beril Tonyali*[1]; Hui Sun[1]; Zi-Kui Liu[1]; Allison Beese[1]; [1]Pennsylvania State University

4:40 PM
Role of Microstructural Constituents on Deformation under Monotonic Tensile Strain of Additively Manufactured Ni-Al Bronze: *Veronika Mazanova*[1]; Aeriel Leonard[1]; [1]Ohio State University

5:00 PM
Thermal Analysis for Characterizing Effects of Metallurgical Conditions in LDED Fabricated Ti-rich NiTi Shape Memory Alloys: *Foster Feni*[1]; Blake Miller[1]; Reginald Hamilton[1]; [1]The Pennsylvania State University

5:20 PM
Influences of Introduced Oxide Dispersions on Failure Modes in Additively Manufactured Superalloy: *Tim Gabb*[1]; Christopher Kantzos[1]; Timothy Smith[1]; Henry DeGroh[1]; Aaron Thompson[2]; QuynhGiao Nguyen[1]; [1]NASA Glenn Research Center; [2]NASA Glenn Research Center/HX5, LLC

ADDITIVE MANUFACTURING

Additive Manufacturing of Titanium-based Materials: Processing, Microstructure and Material Properties — Session II

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Titanium Committee

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

Monday PM | October 2, 2023
C171 | Greater Columbus Convention Center

Session Chair: Ulf Ackelid, Freemelt AB

2:00 PM Invited
Correlating Laser Based Powder Bed Processing Conditions to the Fatigue Behavior of Additively Manufactured Ti-6Al-4V with As-Built Surfaces: *Jayme Keist*[1]; Scott Tokarz[1]; Edward Reutzel[1]; Vernon Cole[2]; Debasis Sengupta[2]; [1]Pennsylvania State University; [2]CFD Research Corporation

2:40 PM
Formation of the Equilibrium Phases (+) in Ti-6Al-4V Alloy via Powder Bed Fusion Using Laser Beam (PBF-LB): *Bartlomiej Wysocki*[1]; Tatiana Zakharava[1]; Michal Zietala[1]; Wojciech Nowak[1]; Agnieszka Chmielewska[2]; [1]Cardinal Stefan Wyszynski University in Warsaw; [2]Ohio State University

3:00 PM
In-situ Synchrotron Diffraction Study of Tensile Deformation of Bimodal Microstructure in L-PBF Processed Ti-6Al-4V: *Pushkar Dhekne*[1]; [1]KU Leuven

3:20 PM Break

3:40 PM
Microstructure Evolution Effects from Variable Preheat Temperature in Laser Powder-bed Fusion of Ti-6Al-4V: *Evan Adcock*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

4:00 PM
On Variant Selection and Texture Evolution in Laser Powder Bed Fusion (L-PBF) of Ti-6Al-4V: *Dina Fouad*[1]; Moataz Attallah[1]; [1]University of Birmingham

4:20 PM
Structural Developments and Nano-mechanical Properties of 3d Printed Zirconia Reinforced TI6AL4V: *Peter Olubambi*[1]; Thato Sharon Tshephe[1]; [1]University of Johannesburg

4:40 PM
Tensile and Fatigue Crack Growth Rate Assessment of Ti-6Al-4V ELI Alloy Produced By Laser Powder Bed Fusion: *Akhilesh Goyal*[1]; Shyamprasad Karagadde[1]; Bhallamudi Ravi[1]; [1]IIT Bombay

5:00 PM
Variations Across Length Scales in Additively Manufactured Ti-6Al-4V Parts: Challenges to Repeatability and Reproducibility: *Venkatavaradan Sunderarajan*[1]; Utkarsh Thakre[1]; Suman Das[1]; [1]Georgia Institute of Technology

ADDITIVE MANUFACTURING

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 | October 2, 2023
C160A/160B | Greater Columbus Convention Center

Session Chairs: Dr. Navin Manjooran, Chairman, Solve; Prof. Gary Pickrell, Virginia Tech

2:00 PM Introductory Comments

2:40 PM
Binder Jetting and Characterization of Porous Structures: Pierangeli Rodriguez de Vecchis[1]; Andrew Zilavy[1]; Teddi Sedlar[1]; *Markus Chmielus*[1]; [1]University of Pittsburgh

3:00 PM
GKN Aerospace Deposition of a Laser Wire DED 2.5m Titanium Aerostructure Demonstrator: *Leon Hill*[1]; Jeremy Tylenda[1]; [1]GKN Aerospace

3:20 PM
Atomic Layer Deposition Coatings for Additive Manufacturing Feedstock Modification and Improvement: *Chris Gump*[1]; Joseph Gauspohl[1]; Brianna Boeyink[1]; Brandon Castro[1]; [1]Forge Nano

3:40 PM Break

4:00 PM
Critical Comparison of Advanced Non-destructive Evaluation Technologies for Laser Powder Bed Fusion Components: *Jacque Berkson*[1]; Antonio Ramirez[1]; Desmond Bourgeois[1]; [1]The Ohio State University

4:20 PM
Designing High-Strength Aluminum and Superalloys for Laser Powder Bed Fusion: Analyzing Cases of Success and Failure: *Marcus Lam*[1]; [1]Monash University

4:40 PM
High-strength Aluminum Alloy Selection for Space Optical Instruments: *Walter Zimbeck*[1]; Zachary Post[1]; Steven Storck[1]; Robert Mueller[1]; Benjamin Stewart[1]; William Swartz[1]; Gerard Otter[2]; Floris van Kempen[2]; [1]Johns Hopkins University Applied Physics Laboratory; [2]The Netherlands Organization for Applied Research (TNO)

5:00 PM
Electrochemical Surface Finishing of Additively Manufactured Materials: *Alex Fertig*[1]; Huong Le[1]; Stephen Snyder[1]; Timothy Horn[2]; Timothy Hall[1]; Maria Inman[1]; [1]Faraday Technology; [2]North Carolina State University

5:20 PM
Effect of Process Parameters on Bead Geometry of Low Carbon Alloy Steel Manufactured by Wire Arc Directed Energy Deposition: *Siddharth Patil*[1]; [1]Coventry University

5:40 PM Concluding Comments

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments IV — Microscopy II/Synchrotron/Acoustics

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Cheng Sun, Idaho National Laboratory; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

Monday PM | October 2, 2023
A125 | Greater Columbus Convention Center

Session Chair: Michael Short, Massachusetts Institute of Technology

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2:00 PM Invited
STEM-based Mapping of Nanoscale Point Defects Produced via Temperature, Irradiation, And Corrosion: *Sean Mills*[1]; Steven Zeltmann[2]; Peter Ercius[3]; Aaron Kohnert[4]; Blas Uberuaga[4]; Andrew Minor[1]; [1]University of California, Berkeley; [2]Cornell University; [3]Lawrence Berkeley National Laboratory; [4]Los Alamos National Laboratory

2:30 PM
Phase Stability of Delta-ZrH Under Ion Irradiation: *Darren Parkison*[1]; Matheus Tunes[2]; Wei-Ying Chen[3]; Thomas Nizolek[2]; Yongqiang Wang[2]; Matthew Chancey[2]; Tarik Saleh[2]; Peter Hosemann[1]; Caitlin Kohnert[2]; [1]University of California, Berkeley; [2]Los Alamos National Laboratory; [3]Argonne National Laboratory

2:50 PM
High-Temperature Irradiation Behavior of Piezoelectric Aluminum Nitride: *Ryan Chesser*[1]; Marat Khafizov[1]; [1]The Ohio State University

3:10 PM Break

3:30 PM Invited
Enabling Multiscale Materials Characterization with Machine Learning: *Reeju Pokharel*[1]; [1]Los Alamos National Laboratory

4:00 PM
Structural Stability of REE-PO4 (REE=Sm,Tb) under Swift Heavy Ion Irradiation: *Cale Overstreet*[1]; Eric O'Quinn[1]; William Cureton[2]; Julia Leys[3]; Guido Deissmann[4]; Stefan Neumeier[4]; Chien-Hung Chen[5]; Maik Lang[1]; [1]University of Tennessee Knoxville; [2]Oak Ridge National Laboratory; [3]Karlsruhe Institute of Technology; [4]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research; [5]Stanford University

4:20 PM
Transition Metal Carbonitride Materials Exposed to Swift Heavy Ions: *Jacob Minnette*[1]; Evan Williams[1]; Donald Chaney[1]; Eric O'Quinn[1]; William Cureton[2]; Matthew Kurley[2]; Changyong Park[3]; Christina Trautmann[4]; Maik Lang[1]; [1]University of Tennessee, Knoxville; [2]Oak Ridge National Laboratories; [3]Argonne National Laboratories; [4]GSI Helmholtz

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MATERIALS-ENVIRONMENT INTERACTIONS

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

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

Monday PM | October 2, 2023
A123 | Greater Columbus Convention Center

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

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2:00 PM
Surface Preparation and Process Optimization on Thin Film Coating to Reduce Wafer Warpage for Advanced Packaging Applications in Semiconductor Industry.: *Amit Kumar*[1]; [1]Other

2:20 PM
Open-Air Plasma Assisted Organosilicon Coating on AM60 Mg Alloy for Corrosion Protection: *Jiheon Jun*[1]; Yong Chae Lim[1]; Yi-Feng Su[1]; Daphne Pappas[2]; Ryan Robinson[2]; [1]Oak Ridge National Laboratory; [2]Plasmatreat USA

2:40 PM
Effect of Sustainable Silica-rich Graphene Analogues to Achieve High-Performance Corrosion Resistance Coating for Carbon Steel: *Anu Verma*[1]; Chandra Tiwary[1]; Jayanta Bhattacharya[1]; [1]Indian Institute of Technology, Kharagpur

3:00 PM
Development and Wear Behaviour of Compositional Gradient and Multi-layered Ni-W Alloy Coatings: *Nitin Wasekar*[1]; [1]ARCI

3:20 PM Break

3:40 PM
Improvement of Cutting Performance of Titanium Based Vacuum Brazed Diamond Tools Excursively Coating via Physical Vapor Deposition: Yunus Emre Erbay[1]; *Berrak Bulut*[2]; Il Kerti[1]; [1]Yildiz Technical University; [2]Marmara University

4:00 PM
Highly Robust CeO2/C3N4-modified NiP Electroless-plated Coatings: Christian Arro[1]; Eman Fayyad[1]; Mostafa Sliem[1]; Kamel Eid[1]; Noora Al-Qahtani[1]; *Aboubakr Abdullah*[1]; [1]Qatar University

4:20 PM
ZnO-doped C3N4 Nanocapsules-modified NiP Metallic Coating: Fatma Nabhan[1]; Eman Fayyad[1]; Kamel Eid[1]; Mostafa Sliem[1]; *Aboubakr Abdullah*[1]; [1]Qatar University

4:40 PM
Effect of Micro-arc Oxidation Voltage on the Morphology and Electrochemical Properties of AZ31B Magnesium Alloy: *Kaab Bin Tayyab*[1]; Ameeq Farooq[1]; Ahsan Saleem[1]; [1]University of the Punjab

5:00 PM
Effect of Calcium Phosphorous Molar Ratio on Biocompatibility of 316L Stainless Steel: *Sreeparna Ghosh*[1]; P. Mitra[1]; Mahua Chaudhuri[1]; [1]Jadavpur University

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Dielectrics & Metrology; Memristors & Transisitors

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 | October 2, 2023
B231 | Greater Columbus Convention Center

Session Chair: Ruyan Guo, The University of Texas at San Antonio

2:20 PM
Electrical-lead-related Stray Inductance Causing Overassessment of the Electrical Resistance Measured by Using the Two-probe Method: *Deborah Chung*[1]; Min Kyoung Kim[1]; [1]State University of New York Buffalo

2:40 PM
Investigation of the Effects of the Most Common Impurities of Bayer Alumina on the Dielectric Properties: *Alexander Schuster*[1]; Antje Liersch[1]; [1]Hochschule Koblnez

3:00 PM Invited
Performance of Distorted Perovskites for Dielectric Applications: *Narsingh Singh*[1]; Meghan Brandt[1]; Narasimha Prasad[2]; Ching Hua Su[3]; Bradley Arnold[1]; Fow-Sen Choa[1]; Kamdeo Mandal[4]; Vishnu Shankar Rai[4]; Laxman Singh[4]; [1]University of Maryland Baltimore County; [2]NASA Langley Research Center; [3]NASA Marshall Space Flight Center; [4]Indian Institute of Technology BHU

3:20 PM Break

3:40 PM
Interfacial-type Memristive Devices for Neuromorphic Computing: Sundar Kunwar[1]; Samip Karki[1]; Nicholas Cuccineillo[1]; Pinku Roy[1]; Di Zhang[1]; Alessandro Mazza[1]; Reid Markland[1]; *Aiping Chen*[1]; [1]Los Alamos National Laboratory

4:00 PM
CMOS-compatible Oxide Memristors Based on SiO_2 for Adaptive Neuromorphic Computing: *Fei Qin*[1]; Han Wook Song[2]; Sunghwan Lee[1]; [1]Purdue University; [2]Korea Research Institute of Standards and Science

4:20 PM
Engineering the Carrier Density for Thin Film Transistors Using Multimodal Encapsulation of p-SnOx: *Donghun Lee*[1]; Joonsoo Choi[1]; Han Wook Song[2]; Sunghwan Lee[1]; [1]Purdue University; [2]Korea Research Institute of Standard and Science

4:40 PM
Influence of Electron Beam Irradiation on the Electrical and Optical Properties of InGaZnO Thin Film Transistor: *Byung-Hyuk Jun*[1]; Daejong Kim[1]; Hyeon-Geun Lee[1]; [1]Korea Atomic Energy Research Institute

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Metallurgy — Session II

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

Program Organizers: Shannon Clark, ArcelorMittal Dofasco; Lijia Zhao, Northeastern University

Monday PM | October 2, 2023
A210 | Greater Columbus Convention Center

Session Chair: Krista Limmer, DEVCOM Army Research Laboratory

2:00 PM
In Situ Microstructure Evaluation of Low Density Steel: *Krista Limmer*[1]; Frank Kellogg[2]; [1]DEVCOM Army Research Laboratory; [2]SURVICE Engineering

2:20 PM
Failure Investigation and Crack Characterization of a HSS Roll Spalling in Hot Strip Mill: Piyas Palit[1]; Prabhas Gokarn[1]; *Kuppili Padma Sri*[1]; Soumendu Monia[1]; Anup Kumar[1]; [1]Tata Steel Ltd

2:40 PM
Electromagnetic Stirrer as a System to Control the High-quality Steel Production: *Monika Zielinska*[1]; Hongliang Yang[2]; Lukasz Madej[3]; Lukasz Malinowski[1]; [1]ABB Sp. z o. o.; [2]ABB AB/Metallurgy, Sweden; [3]AGH University of Science and Technology

3:00 PM
Effective Characterization of Highly Deformed Microstructures Using EBSD Pattern Matching Techniques: *Michael Hjelmstad*[1]; Pat Trimby[1]; Aimo Winkelmann[2]; [1]Oxford Instruments; [2]ST Development GmbH

3:20 PM
A Novel Method of Size Reduction of Low Carbon Ferro Chrome and Other Hard to Crush Low Carbon Ferro Alloys: *Prabhash Gokarn*[1]; Anup Kumar[1]; Vijay Tiwari[1]; Kamlesh Maurya[1]; Siddharth Guha[1]; Hari Om Bairwa[1]; [1]Tata Steel

3:40 PM Break

4:00 PM
Investigation on Improving the Castability and Canceling the Ca Treatment for Low Carbon Aluminum Killed Steels: *Fubin Gao*[1]; Fuming Wang[1]; Xin-hua Wang[1]; Min Jiang[1]; Xiang Zhang[2]; [1]University of Science and Technology Beijing; [2]Wuhan University of Science and Technology

4:20 PM
Failure Investigation of Edger Roll Housing Bolts in a Hot Strip Mill of an Integrated Steel Plant: *Soumendu Monia*[1]; Piyas Palit[1]; Hari Bairwa[1]; Prabhash Gokarn[1]; Anup Kumar[1]; [1]Tata Steel

4:40 PM
Optimization of Electroslag Remelting Slag System and Its Physicochemical Properties for Nuclear Power Steel 18MnD5: *Qi Li*[1]; Yanhui Sun[1]; Zhenquan Jing[1]; [1]University of Science and Technology Beijing

5:00 PM
Segmentation of Microscopy Images of Lower Bainite (LB) and Tempered Martensite (TM) High Strength Steels: *Xiaohan Bie*[1]; Manoj Arthanari[1]; Evelin Barbosa de Melo[1]; Jun Song[1]; Steve Yue[1]; [1]McGill University

5:20 PM
Innovative Electroslag Technology for the Restoration of Forged Steel Parts: *Borys Sereda*[1]; Irina Kruhliak[1]; Yuriy Petrusha[2]; Natalya Gura[2]; Dmytro Sereda[1]; [1]DSTU; [2]NUZP

NUCLEAR ENERGY

Ceramics for New Generation Nuclear Energy System Application — Molten Salts and Shielding Materials

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

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Maik Lang, University of Tennessee; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Enrique Saez, Clemson University; Jinsuo Zhang, Virginia Polytechnic Institute and State University

Monday PM | October 2, 2023
A124 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Engineered Ceramic Composites for Neutron Moderation and Shielding in Advanced Reactors: *Jason Trelewicz*[1]; Bin Cheng[1]; David Sprouster[1]; Lance Snead[1]; Edward Duchnowski[2]; Nicholas Brown[2]; Ethan Peterson[3]; [1]Stony Brook University; [2]University of Tennessee Knoxville; [3]Massachusetts Institute of Technology

2:30 PM
Metal Hydride Moderators: A Historical Perspective of Their Design and Implementation: *Aditya Shivprasad*[1]; Caitlin Kohnert[1]; Tyler Smith[1]; Thomas Nizolek[1]; Joseph Wermer[1]; Vedant Mehta[1]; Michael Cooper[1]; Nolan Regis[1]; James Torres[1]; Alexander Long[1]; Sven Vogel[1]; Erik Luther[1]; Holly Trellue[1]; Christopher Matthews[1]; Tarik Saleh[1]; Venkateswara Dasari[1]; [1]Los Alamos National Laboratory

2:50 PM
Development of Radiation Attenuating Geopolymer-particulate Composites: *Alex Fields*[1]; Jianxin Zhou[1]; Ali Ozer[1]; Angela Di Fulvio[1]; Waltraud Kriven[1]; [1]University of Illinois Urbana-Champaign

3:10 PM
Welding Development of Cladding Materials for Ceramic Fuels: *Lydia Mayer*[1]; [1]Idaho National Laboratory

3:30 PM Break

3:50 PM Invited
Scalable Manufacturing of Garnet Structured LLZO Ceramic Tubes With Applications in Next Generation Fusion Systems: *Kyle Brinkman*[1]; [1]Clemson University

4:20 PM Invited
Evolution of the Chemical State in Molten Salt Reactors during Operation and Implications for Materials Behavior: *Theodore Besmann*[1]; Juliano Schorne-Pinto[1]; Mina Aziziha[1]; Clara Dixon[1]; Jorge Paz Soldan Palma[1]; Ronald Booth[1]; Amir Mofrad[1]; [1]University of South Carolina

4:50 PM
Uncertainty Quantification and Propagation of NaCl-KCl-$MgCl_2$ Thermodynamic Functions for Molten Salt Applications: *Jorge Paz Soldan Palma*[1]; Juliano Schorne-Pinto[1]; Mina Aziziha[1]; Ronald Booth[1]; Theodore Besmann[1]; [1]University of South Carolina

5:10 PM
Thermodynamic Assessment of Chromium and Nickel Corrosion in Molten Fluoride Salts: *Mina Aziziha*[1]; Juliano Schorne-Pinto[1]; Clara Dixon[1]; Jacob Yingling[1]; Jorge Paz Soldan Palma[1]; Johnathan Ard[1]; Theodore Besmann[1]; [1]University of South Carolina

MODELING

Computation Assisted Materials Development for Improved Corrosion Resistance — Session I

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Brian Gleeson, University of Pittsburgh

Monday PM | October 2, 2023
A224 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Atomic Origin of CO2-promoted Oxidation Dynamics of Chromia-forming Alloys: *Guangwen Zhou*[1]; [1]State University of New York

2:40 PM
Fundamental Design of Alloys Resistant to H-embrittlement: Simulation Insights on Nanoscale H-defects Interactions: *Matthew Melfi*[1]; S. Mohadeseh Taheri-Mousavi[1]; [1]Carnegie Mellon University

3:00 PM
Modeling Changes in Scale Formation on Copper-nickel Alloys in Response to Environment Changes: *Steven Policastro*[1]; Rachel Anderson[1]; [1]Naval Research Laboratory

3:20 PM Break

3:40 PM Invited
Phase-field Modeling of Internal Oxidation in High-temperature Ni-Cr Alloys: Peichen Wu[1]; Rishi Pillai[2]; *Ankit Kumar*[1]; [1]Arizona State University; [2]Oak Ridge National Laboratory

4:20 PM
Phase Field Modeling of Molten Salt Dealloying Corrosion of NiCr Alloys: *Nathan Bieberdorf*[1]; Xueyang Wu[2]; Laurent Capolungo[2]; Mark Asta[1]; [1]University of California Berkeley; [2]Los Alamos National Laboratory

4:40 PM
A Phase Field Model to Simulate Crack Initiation from Pitting Site in Isotropic and Anisotropic Elastoplastic Material: *Christian Mathew*[1]; Yao Fu[1]; Jie Song[1]; Kelvin Sangoi[1]; [1]Virginia Tech

5:00 PM
Investigate the Interfacial Behavior between Molten Fluoride Salt and Ni-Cr Alloy with ReaxFF Molecular Dynamics: *Hamdy Arkoub*[1]; Swarit Dwivedi[1]; Adri van Duin[1]; Miaomiao Jin[1]; [1]Penn State University

NANOMATERIALS

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics 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 at Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Indiana University-Purdue University Indianapolis

Monday PM | October 2, 2023
B234 | Greater Columbus Convention Center

Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Haitao Zhang, University of North Carolina at Charlotte

2:00 PM Invited
Tuning Nano/Microstructure and Properties by Densification of Metastable Powders: Gottlieb Uahengo[1]; Darren Dewitt[1]; Yasuhiro Kodera[1]; *Javier Garay*[1]; [1]University of California, San Diego

2:30 PM
Synthesis of TiO_2/Graphene Oxide Core-shell Nanoparticles via Catalyst-free Microwave-assisted Reaction for Highly Efficient Photocatalysis: *Kunihiko Kato*[1]; Yunzi Xin[1]; Takashi Shirai[1]; [1]Nagoya Institute of Technology

2:50 PM
Structural and Compositional Analyses of Ba_2YbNbO_6-doped $YBa_2Cu_3O_{7-x}$ Superconducting Thin Films: *Masanari Kuroki*[1]; Manabu Ishimaru[1]; Tomoya Horide[1]; Kaname Matsumoto[1]; Ryusuke Kita[2]; [1]Kyushu Institute of Technology; [2]Shizuoka University

3:10 PM
Colossal Enhancement of the Thermoelectric Power Factor of La0.7Ca0.2Ni0.25Ti0.75CoO3 Epitaxial Thin Films by Exsolution: *Mohammad El Loubani*[1]; Gene Yang[1]; Tae-sik Oh[2]; Dongkyu Lee[1]; [1]University of South Carolina; [2]Auburn University

3:30 PM Break

3:50 PM Invited
The Role of Collagen Piezoelectricity in the Intrafibrillar Mineralization: Jinha Kwon[1]; *Hanna Cho*[1]; [1]The Ohio State University

4:20 PM
Influence of Powder Annealing on Spontaneous Polarization and Recombination Centers in BaTiO3 Nanocrystals: *Oliver Diwald*[1]; Ellie Neige[1]; Thomas Schwab[1]; Maurizio Musso[1]; Thomas Berger[1]; Gilles Bourret[1]; [1]Paris Lodron Universitaet Salzburg

4:40 PM
Metal Thiophosphates Under Pressure: Evolution of Magnetic and Ferroelectric Properties: *Michael Susner*[1]; [1]AFRL Materials and Manufacturing Directorate

5:00 PM
Growth and Characterization of Novel Single Crystals as Potential Thermoelectric Materials: *Nusrat Yasmin*[1]; Md Fahel Bin Noor[1]; Tiglet Besara[1]; [1]Missouri State University

5:20 PM
Synthesis and Exploration of Half-Heusler and two Other Ternary Intermetallic Single Crystals: *Md Fahel Bin Noor*[1]; Nusrat Yasmin[1]; Tiglet Besara[1]; [1]Missouri State University

EDUCATION AND CAREER DEVELOPMENT

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

Sponsored by: TMS: Education Committee, TMS: Accreditation Committee

Program Organizers: Alison Polasik, Campbell University; Jeffrey Fergus, Auburn University

Monday PM | October 2, 2023
A120 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM
Inclusive Teaching: Team Based Approach to Driving Inclusion as a Route to Mutual Respect for Team Members: *Steven Yalisove*[1]; [1]University of Michigan

2:25 PM
Reflective Learning for Engineering Students: *Natalie Van Tyne*[1]; [1]Virginia Polytechnic Institute and State University

2:45 PM
Supporting Students through Seminars on Success Strategies: *Susan Gentry*[1]; [1]University of California, Davis

3:05 PM Break

3:25 PM Panel Discussion: Supporting Diversity through Mentoring and Allyship

FUNDAMENTALS AND CHARACTERIZATION

Emergent Materials Under Extremes and Decisive In Situ Characterizations — In situ Characterization of Fuels and Ceramics Under Extreme Conditions

Sponsored by: ACerS Basic Science Division

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

Monday PM | October 2, 2023
A220 | Greater Columbus Convention Center

Session Chair: Xiaofeng Guo, Washington State University

2:00 PM Invited
In Situ Characterization and Modeling of Spent UO2 Fuel under Ion Irradiation: *Lingfeng He*[1]; Yunyuan Lu[1]; Cameron Howard[2]; Chao Jiang[2]; Sudipta Biswas[2]; Dewen Yushu[2]; Jatuporn Burns[2]; Wei-Ying Chen[3]; [1]North Carolina State University; [2]Idaho National Laboratory; [3]Argonne National Laboratory

2:30 PM Invited
Irradiation Induced Structural and Thermal Conductivity Changes in Nuclear Fuels: *Linu Malakkal*[1]; Amey Khanolkar[1]; Zilong Hua[1]; Marat Khafizov[2]; Chris Marianetti[3]; David Hurley[1]; [1]Idaho National Laboratory; [2]The Ohio State University; [3]Columbia University

3:00 PM
In-situ Raman Studies on Synthesis and Oxidation of $UC_{1-x}N_x$: *Sam Karcher*[1]; Xiaofeng Guo[1]; John McCloy[1]; [1]Washington State University

3:20 PM Break

3:40 PM Invited
Structural Manipulation of Ceramic Materials via Extreme Conditions: *Maik Lang*[1]; Eric O'Quinn[1]; Alexandre Solomon[1]; Casey Corbridge[1]; Cale Overstreet[1]; Christina Trautmann[2]; Antonio Fuentes[3]; [1]University of Tennessee; [2]Gesellschaft fuer Schwerionenforschung; [3]Cinvestav Unidad Saltillo

4:10 PM Invited
Will High-entropy Carbides Be Enabling Materials for Extreme Environments?: *Bai Cui*[1]; Fei Wang[1]; Lanh Trinh[1]; Luke Wadle[1]; Yongfeng Lu[1]; Kaustubh Bawane[2]; Zilong Hua[2]; Linu Malakkal[2]; Lingfeng He[3]; Cody Dennett[4]; Frederic Monteverde[5]; [1]University of Nebraska-Lincoln; [2]Idaho National Laboratory; [3]North Carolina State University; [4]Massachusetts Institute of Technology; [5]National Research Council of Italy – Institute of Science, Technology and Sustainability for Ceramics

4:40 PM
In-situ Observations of the High Temperature Melting Behaviour of Ce-brannerite: *Malin Dixon Wilkins*[1]; John McCloy[1]; [1]Washington State University

5:00 PM
Characterization of Amorphous Ordering in Polymer-Derived Silicon Oxycarbide Ceramics with Electron Nanobeam Diffraction: *Advaith Rau*[1]; Colin Ophus[2]; Mary Scott[3]; Karen Bustillo[2]; Kathy Lu[1]; [1]Virginia Polytechnic Institute and State University; [2]Lawrence Berkeley National Laboratory; [3]University of California - Berkeley

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Energy Conversion and Harvesting II; Electrocatalyst and Photocatalyst

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Kyle Brinkman, Clemson University; Armin Feldhoff, Leibniz University Hannover; Charmayne Lonergan, Pacific Northwest National Laboratory; Zhezhen Fu, Pennsylvania State University - Harrisburg; Dhruba Panthi, Kent State University; Janusz Tobola, AGH UST, Faculty of Physics and Applied Computer Science

Monday PM | October 2, 2023
B240/241 | Greater Columbus Convention Center

Session Chairs: Zhenzhen Fu, Penn State; Ekaterina Pomerantseva, Drexel University

2:00 PM Invited
Texturing Ca3Co4-xO9- Ceramics via Electrospun Nanoribbons: A Route to High-performance Thermoelectrics: *Armin Feldhoff*[1]; Katharina Kruppa[1]; Itzhak Maor[2]; Frank Steinbach[1]; Meirav Mann-Lahav[2]; Gideon Grader[2]; [1]Leibniz University Hannover; [2]Technion

2:30 PM Invited
Twin Perovskie Nanocomposite Cathodes for High-Performance Protonic Ceramic Fuel Cells: Jiawei Zhang[1]; Ashley Gomez[1]; Ryo Kitamura[1]; Minda Zhou[1]; *Jianhua Tong*[1]; [1]Clemson University

3:00 PM
Superconductors and Cryogenic Conductors for Electric Aircraft Propulsion Systems: *Mike Sumption*[1]; [1]Ohio State University

3:20 PM Break

3:40 PM
Synergistic Photothermal-thermoelectric-photovoltaic Energy Generation via Transparent Nanohybrids of Porphyrin and Iron Oxide: *Donglu Shi*[1]; Mengyao Lyu[1]; Jou Lin[1]; Yuxin Wang[1]; John Krupczak[2]; [1]University of Cincinnati; [2]Hope College

4:00 PM
The Effect of A-site Doping Elements and Concentrations on the Diffusivity and Ionic Conductivity of La2NiO4+ Studied by Ab Initio Calculations: Songge Yang[1]; Wenyuan Li[2]; Xingbo Liu[2]; Edward Sabolsky[2]; *Yu Zhong*[1]; [1]Worcester Polytechnic Institute; [2]West Virginia University

4:20 PM
Metal Composite Nano-Catalysts for Enhanced Solid Oxide Fuel Cell Operation and Stability within Hydrocarbon Containing Fuels: *Saad Waseem*[1]; Edward Sabolsky[1]; Katarzyna Sabolsky[1]; Richard Hart[2]; Seunghyuck Hong[2]; [1]West Virginia University; [2]GE, Research Center

4:40 PM
Accelerated Investigation of Electrocatalysts with Integrated Computational Approaches: *Lingxiao Mu*[1]; Susan Sinnott[1]; [1]The Pennsylvania State University

5:00 PM
A Study of the Role of Molten Salt Treatment in the Observed Improved Water Splitting Ability of SrTiO3: *Nnamdi Ene*[1]; Mingyi Zhang[1]; Gregory Rohrer[1]; Paul Salvador[1]; [1]Carnegie Mellon University

5:20 PM
Enhanced Stability, Photoluminescence Quantum Yields, and Charge Transport Properties of TiO2-coated CsPbBr3 Quantum Dots for Photoelectrochemical Applications: *Paravee Vas-Umnuay*[1]; [1]Chulalongkorn University

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Current Issues and Functional Applications — Interactions of Glass with Water and Radiation

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Charmayne Lonergan, Pacific Northwest National Laboratory; Ashutosh Goel, Rutgers, The State University of New Jersey

Monday PM | October 2, 2023
B132 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Water Content within Phosphate Glasses and Its Role as a Modifier: *Lucas Greiner*[1]; Sierra Kucko[1]; Doris Möncke[1]; [1]Alfred University

2:20 PM
Glass with Hydration-induced Compressive Stress Profiles: *Timothy Gross*[1]; Emily Aaldenberg[1]; Jingshi Wu[1]; [1]Corning Research and Development Corporation

2:40 PM
Revealing the Structure of the Sodium-leached Layer of Soda Lime Silica Glass: A Comprehensive Spectroscopic Analysis: *Andrew Ogrinc*[1]; Yuxing Zhou[1]; Seung Ho Hahn[1]; Yen-Ting Lin[1]; Seong Kim[1]; [1]Penn State University

3:00 PM
Radiation Effects on Amorphous Chalcogenides: *Spoogmay Khan*[1]; Gang Chen[1]; [1]Ohio University

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

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

Monday PM | October 2, 2023
A215 | Greater Columbus Convention Center

Session Chairs: Hadas Sternlich, Lawrence Berkeley; Dylan Jennings, FZ Juelich

2:00 PM Invited
In-situ Air-free 4D-STEM Biasing of Model Lithium-sulfur Batteries: *Hadas Sternlicht*[1]; Benjamin Savitzky[2]; Alpesh Shukla[3]; Colin Ophus[2]; Andrew Minor[1]; [1]University of California, Berkeley and Lawrence Berkeley National Laboratory; [2]Lawrence Berkeley National Laboratory; [3]ZoNexus, LLC

2:30 PM Invited
Structural Defects and Functional Interfaces in Epitaxial Thin Films of Complex Oxide Materials: Nuria Bagues[1]; Louise Colfer[2]; Elahe Farghadany[3]; Michael Schmidt[2]; Robert E. A. Williams[1]; Alp Sehirlioglu[3]; Lynette Keeney[2]; *David McComb*[1]; [1]Ohio State University; [2]Tyndall National Institute; [3]Case Western Reserve University

3:00 PM
Predicting Interface Stability and Oxygen Vacancy Formation at Misfit Dislocations in CeO2/SrTiO3 Heterostructures: *Kurt Dawson*[1]; Pratik Dholabhai[1]; [1]Rochester Institute of Technology

3:20 PM
Void Nucleation in Cu Bicrystals: Unraveling the Role of Tilt Grain Boundaries through Atomistic Investigation: *Armin Shashaani*[1]; Panthea Sepehrband[1]; [1]Santa Clara University

3:40 PM Break

4:00 PM
Grand Canonical Optimization of Symmetric Tilt Grain Boundary Structure in Hexagonal Close-packed Titanium: *Enze Chen*[1]; Tae Wook Heo[2]; Brandon Wood[2]; Mark Asta[1]; Timofey Frolov[2]; [1]University of California, Berkeley; [2]Lawrence Livermore National Laboratory

4:20 PM
Anisotropy of Electric Field Effects on Grain Boundary Core Structures: William Hahn[1]; *Klaus van Benthem*[1]; [1]University of California, Davis

4:40 PM
Chemical Ordering Delays Grain Boundary Complexion Transitions in NbMoTaW: *Ian Geiger*[1]; Timothy Rupert[1]; [1]University of California Irvine

5:00 PM
Grain Boundary Phase Transformations in Segregated Metallic Alloys: *Timofey Frolov*[1]; Vivek Devulapalli[2]; Tobias Brink[2]; Christian Liebscher[2]; [1]Lawrence Livermore National Laboratory; [2]MPIE

5:20 PM
Characterization of Grain Boundary Phase Transformations: *Ian Winter*[1]; Robert Rudd[2]; Tomas Oppelstrup[2]; Timofey Frolov[2]; [1]Sandia National Laboratories; [2]Lawrence Livermore National Laboratory

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond IV — Processing and Properties

Sponsored by: TMS Alloy Phases Committee

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

Monday PM | October 2, 2023
A216 | Greater Columbus Convention Center

Session Chairs: Peter Liaw, University of Tennessee; Bai Cui, University of Nebraska

2:00 PM Invited
Superior High-temperature Strength in a Supersaturated Refractory High-entropy Alloy: Rui Feng[1]; Bojun Feng[2]; Michael Gao[1]; Chuan Zhang[3]; Joerg Neuefeind[4]; Jonathan Poplawsky[4]; Yang Ren[5]; Ke An[4]; Michael Widom[2]; *Peter Liaw*[6]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University; [3]CompuTherm LLC; [4]Oak Ridge National Laboratory; [5]Argonne National Laboratory; [6]The University of Tennessee, Knoxville

2:30 PM
Advanced Manufacturing of High-entropy Carbide Ceramics by Selective Laser Sintering and Spark Plasma Sintering: *Bai Cui*[1]; Xiang Zhang[1]; Fei Wang[1]; Xin Chen[1]; Yongfeng Lu[1]; [1]University of Nebraska-Lincoln

2:50 PM
Mechanical Behaviour of a Low-SFE FCC Ternary Medium Entropy Alloy Subjected to High Pressure Torsion: *Saumya Jha*[1]; Krishanu Biswas[1]; Nilesh Gurao[1]; [1]Indian Institute of Technology Kanpur

3:10 PM
On the Mesoscale Complexity of Macroscopically-smooth Plastic Flow in an Al-Containing High-Entropy Alloy: *Jamieson Brechtl*[1]; Rui Feng[1]; Peter Liaw[2]; Benoît Beausir[3]; Hafsa Jaber[3]; Tatiana Lebedkina[3]; Mikhail Lebyodkin[3]; [1]Oak Ridge National Laboratory; [2]University of Tennessee; [3]Université de Lorraine

3:30 PM Break

3:50 PM
Mechanical Properties of the Dual-phase Multi-Principal Element Alloy $W_5Mo_{15}Fe_{40}Ni_{40}$: *Riya Barua*[1]; Thomas Balk[1]; [1]University of Kentucky

4:10 PM
Stress Induced Martensite Transformation and Superelastic Effect in TiZrHfNbAl High Entropy Alloys: *Xidong Hui*[1]; Lu Wang[1]; Yandong Wang[1]; [1]University of Science and Technology Beijing

4:30 PM
Study on Early-stage Irradiation Damage in Concentrated Solid-solution Alloys by Nanoindentation: *Liuqing Yang*[1]; Youxing Chen[1]; Jimmie Miller[1]; William John Weber[2]; Yanwen Zhang[3]; [1]University of North Carolina at Charlotte; [2]The University of Tennessee, Knoxville; [3]Oak Ridge National Laboratory

4:50 PM
Dislocation-mediated Plasticity in Entropy Stabilized Oxides at Room Temperature: Xin Wang[1]; Justin Cortez[1]; Alexander Dupuy[1]; Julie Schoenung[1]; *William Bowman*[1]; [1]University of California, Irvine

5:10 PM
Thermal Properties and Calcium-Magnesium-Aluminosilicate (CMAS) Corrosion Resistance of High Entropy Rare-earth Phosphate $(Lu_{0.2}Yb_{0.2}Er_{0.2}Y_{0.2}Gd_{0.2})PO_4$: A Novel Environmental Barrier Coating (EBC) Candidate: *Keith Bryce*[1]; Yueh-Ting Shih[1]; Liping Huang[1]; Jie Lian[1]; [1]Rensselaer Polytechnic Institute

5:30 PM
Nanocrystalline High-entropy Alloys: Synthesis, Mechanical Properties, and Thermal Stability: *Yu Zou*[1]; [1]University of Toronto

MATERIALS-ENVIRONMENT INTERACTIONS

High Temperature Corrosion and Degradation of Structural Materials — II. Refractory and High Entropy Alloys

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

Monday PM | October 2, 2023
A122 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
On the Thermodynamic Properties of $CrTaO_4$: A Computational Perspective: *Adib Samin*[1]; Tanner Gordon[1]; Lucas Heaton[1]; [1]Air Force Institute of Technology

2:30 PM
Cyclic Oxidation of NbTiZr Using a Resistive Heating System: *Charlie Brandenburg*[1]; David Beaudry[2]; Jean-Philippe Couzinié[3]; Loïc Perrière[3]; Mitra Taheri[2]; Elizabeth Opila[1]; [1]University of Virginia; [2]Johns Hopkins University; [3]Univ Paris Est Creteil, CNRS, ICMPE

2:50 PM
Oxidation and Hot Corrosion Performance of Fe-Cr-Ni Based Alloys: *Haofei Sun*[1]; Jing Liu[1]; [1]University of Alberta

3:10 PM
High Temperature Oxidation Behavior of Zr vs ZrC: *Connor Stephens*[1]; Michael Richwine[1]; Elizabeth Opila[1]; [1]University of Virginia

3:30 PM Break

3:50 PM
High-throughput Investigation of Microstructure & High Temperature Oxidation Behavior of CrMoNbTaW: *Md Imran Noor*[1]; Paul Rottmann[1]; [1]University of Kentucky

4:10 PM
Investigation of Dry Corrosion Performance in Multi-component Alloys Using CSAFs: *Camille Ferris*[1]; Nicholas Golio[1]; Hervé Martinez[2]; Andrew Gellman[3]; [1]Universite de Pau et des Pays de l'Adour, E2S UPPA, CNRS, IPREM, Pau, France; [2]Centrale Casablanca, Centre de Recherche Systèmes Complexes et Interactions, Bouskoura Ville Verte, Morocco; [3]W.E. Scott Institute for Energy Innovation, Carnegie Mellon University

SPECIAL TOPICS

History of Materials Science and Engineering — People and Institutions

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

Program Organizers: Robert Hackenberg, Los Alamos National Laboratory; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Olivier Hardouin Duparc, LSI - CNRS; Kester Clarke, Colorado School of Mines; Goro Miyamoto, Tohoku University

Monday PM | October 2, 2023
A213 | Greater Columbus Convention Center

Session Chairs: Kester Clarke, Colorado School of Mines; Ian Zuazo, ArcelorMittal Global R&D - Industeel

2:00 PM Invited
At the Beginning: Materials Science and Engineering at Northwestern: *Peter Voorhees*[1]; [1]Northwestern University

2:30 PM Invited
John W Cahn: Architect of a Discipline: *W Craig Carter*[1]; [1]Massachussetts Institute of Technology

3:00 PM Invited
Hub Aaronson and His Impact on the Field of Solid State Phase Transformations: *George Spanos*[1]; [1]TMS

3:30 PM Break

3:50 PM Invited
Between Science and Engineering - The German Contribution to the Establishment of MSE: *Pedro Dolabella Portella*[1]; Peter Gumbsch[2]; [1]Fraunhofer Inst Werkstoffmechanik IWM; [2]Fraunhofer Inst Werkstoffmechanik IWM and Karlsruher Inst Technologie KIT

4:20 PM Invited
The Burgeoning of Materials Science and Engineering in France 1865 - 1914: Yves Bienvenu[1]; *Olivier Hardouin Duparc*[1]; [1]School of Mines paris

4:50 PM Invited
The History of IRSID, the French Steel Research Institute: Marc Grumbach[1]; *Ian Zuazo*[2]; [1]ex-IRSID; [2]ArcelorMittal Global R&D - Industeel

5:20 PM
Materials Science vs. Engineering – Paradoxes, Peculiarities, and Tensions in an Ever-Evolving Field: *Robert Hackenberg*[1]; [1]Los Alamos National Laboratory

FUNDAMENTALS AND CHARACTERIZATION

Interface-mediated Phenomena in Structural Materials — Interface Structure and Kinetics

Sponsored by: TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, University of Nebraska-Lincoln; Nigel Shepherd, University of North Texas; Andres Bujanda, U.S. Army Research Laboratory; Lin Shao, Texas A&M University

Monday PM | October 2, 2023
A214 | Greater Columbus Convention Center

Session Chairs: Lin Zhou, AMES LAb and ISU; Reinhold Dauskardt, Stanford University

2:00 PM Keynote
Investigation of Dislocation-grain Boundary Interactions Through In-situ Direct Tensile Testing with High-resolution Electron Backscatter Diffraction: Dongyue Xie[1]; Tongjun Niu[1]; Muh-chang Chen[2]; Jonathan Gigax[1]; Mohammed Zikry[2]; Abigail Hunter[1]; Saryu Fensin[1]; *Nan Li*[1]; [1]Los Alamos National Laboratory; [2]North Carolina State University

2:40 PM
Diffusion Bonding of Titanium to Vanadium: *Bernard Gaskey*[1]; Sara Ricci[1]; Cody Miller[1]; Saryu Fensin[1]; John Carpenter[1]; [1]Los Alamos National Laboratory

3:00 PM
Effect of Silicate Ions with Different Structures on Solidification Behavior of Mechanochemically Activated Coal Ash Powders: *Takumi Sangu*[1]; Yunzi Xin[1]; Kunihiko Kato[1]; Takashi Shirai[1]; [1]Nagoya Institute of Technology

3:20 PM Invited
In-situ TEM Study of Grain Boundary Motion in 2D Skyrmion Lattice: A Combined Individual and Collective Particle Motion: *Lin Zhou*[1]; Xiaotian Fang[1]; Valeri Viteri-Pflucker[1]; Jian Wang[1]; Alexander King[1]; [1]Ames Laboratory

3:50 PM Break

4:10 PM
Kinetics of Interfacial Defects Associated with the Formation of Special Boundaries Under Conditions of Synthesis of Complex Functionally Active Charges: Borys Sereda[1]; Irina Kruhliak[1]; *Dmytro Sereda*[1]; Vitaliy Voloh[1]; [1]DSTU

4:30 PM Keynote
Formation Mechanisms and Kinetics of Coating Deposition Using Open-air Spray-Plasma Processing: *Reinhold Dauskardt*[1]; [1]Stanford University

5:00 PM
Interfacial Reactions in Co/Bi2Te3 and Co/Bi2Se3 Couples: *Sinn-wen Chen*[1]; Jia–Ruei Chang[1]; He-cheng Ang[1]; [1]National Tsing Hua University

5:20 PM
Understanding Dislocation-interface Interactions during Recrystallization of Mg-Ca-Zn Alloys: *Rogine Gomez*[1]; Aeriel Leonard[1]; [1]The Ohio State University

5:40 PM
Understanding Grain Boundary Segregation in FeCr Alloys: Multiscale Modeling and Experiments: *Sourabh Bhagwan Kadambi*[1]; Mukesh Bachhav[1]; Boopathy Kombaiah[1]; Jia-Hong Ke[1]; [1]Idaho National Laboratory

LIGHTWEIGHT ALLOYS

Light Metal Technology — Aluminum-rare Earth Alloys and Composites

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University

Monday PM | October 2, 2023
A212 | Greater Columbus Convention Center

Session Chair: Xiaoming Wang, Purdue University

2:00 PM
Solidification Evolution, Microstructure and Tensile Properties of Al-Mg-Sc Alloys: *Jose Spinelli*[1]; Anderson Nunes[1]; Guilherme Gouveia[1]; Leonardo Gomes[1]; [1]Ufscar

2:20 PM
Effect of Salt Flux and T6 Treatment of Al-Cu Alloy Using Rare-earth Element: *Jose Marcelino Da Silva Dias Filho*[1]; Jonas Valloton[1]; Ahmed Qureshi[1]; Hani Henein[1]; [1]University of Alberta

2:40 PM
Effect of Zr-Er-Y L12 Phase on Precipitation Behavior of Al-Zn-Mg Alloy: *Yong-You Kim*[1]; Kwangjun Euh[1]; Hyeon-woo Son[1]; Zhirou Zhang[1]; [1]Korea Institute of Materials Science

3:00 PM
Influence of Ce, Ni and Cu on Castability and Mechanical Properties of Al Piston Alloys: Kerim Kayikcioglu[1]; Selim Temel[2]; Hayati Sahin[1]; Ali Gungor[2]; *Derya Dispinar*[1]; Kerem Dizdar[3]; [1]Foseco; [2]Parsat Piston; [3]Istanbul Technical University

3:20 PM
The Beneficial Effects of Ce Additions on High-Fe Secondary Al-Si Casting Alloys: *Michael Moodispaw*[1]; Emre Cinkilic[2]; Alan Luo[1]; [1]Ohio State University; [2]Hakkari University

3:40 PM Break

4:00 PM
Selective Laser Melting of a TiB2/Al-Cu-Mg-Ni-Sc Composite: Chenglu Tang[1]; *Xiaoming Wang*[1]; [1]Purdue University

4:20 PM
Thermal Properties and Corrosion Response of Cast Al-Ce-Mg Alloy for Heat Exchanger Applications: *Jamieson Brechtl*[1]; Mike Kesler[1]; Melanie Moses-DeBusk[1]; Xiaohua Hu[1]; Ryan Lane[2]; David Weiss[3]; Kashif Nawaz[1]; [1]Oak Ridge National Laboratory; [2]Virginia Tech; [3]Eck Industries, Inc.

4:40 PM
The Myth on the Pore Formation in Aluminum Casting on the Alloying with Rare Earth Elements: *Hayati Sahin*[1]; Gael Zaragoza[1]; Derya Dispinar[1]; [1]Foseco

5:00 PM
Development of Al-Ce-(Fe)-(Mg) Alloys for Elevated Temperature and High Strength Applications: *Michael Moodispaw*[1]; Emre Cinkilic[2]; Alan Luo[1]; [1]Ohio State University; [2]Hakkari University

5:20 PM
Effect of Erbium and Europium Addition on Microstructure and Mechanical Properties of A356, A206 and A201 Alloys: *Hayati Sahin*[1]; Derya Dispinar[1]; [1]Foseco

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CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Processing of Carbides, Borides, and Nitrides

Sponsored by: ACerS Manufacturing Division

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

Monday PM | October 2, 2023
B233 | Greater Columbus Convention Center

Session Chairs: Valerie Wiesner, NASA Langley Research Center; Surojit Gupta, University of North Dakota

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2:00 PM Invited
Optimizing Ceramic Surfaces for Dust-tolerant Lunar Exploration: *Valerie Wiesner*[1]; Christopher Wohl[1]; Glen King[1]; Jonathan Hernandez[2]; Keith Gordon[1]; Lopamudra Das[2]; Samuel Ruiz[3]; Luke Wadle[3]; Bai Cui[3]; [1]NASA Langley Research Center; [2]National Institute of Aerospace; [3]University of Nebraska-Lincoln

2:30 PM
Effect of Binder Phase on TiB2-TiC Based Cermet Materials on the Microstructure and Mechanical Properties: *Zhezhen Fu*[1]; [1]Pennsylvania State University - Harrisburg

2:50 PM
Embedded Wire CVD of Silicon Carbide for Homogeneous Joining and SiC-SiC Composite Fabrication: *Jeff Vervlied*[1]; Mark Schaefer[1]; [1]Free Form Fibers

3:10 PM
Phase and Nanostructure of Polymer Derived Monolithic SiC at Ultrahigh Temperatures: *Rahul Anand*[1]; Kathy Lu[1]; [1]Virginia Tech

3:30 PM
Microstructure-phase Evolution, and Comparison in Properties of Spark Plasma Sintered SiC Reinforced ZrB2-HfB2 Composites: *Rubia Hassan*[1]; Kantesh Balani[1]; [1]IIT Kanpur

3:50 PM Break

4:10 PM Invited
Design Paradigm for Fabricating MAB Phases: *Surojit Gupta*[1]; [1]University of North Dakota

4:40 PM
Thermogravimetric Analysis of Converting Refractory Oxides to Multi-component Carbide: *Heonjune Ryou*[1]; Austin Martin[1]; Lavina Backman[1]; Matthew Laskoski[1]; James Wollmershauser[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory

5:00 PM
Reaction Flash Sintering of Ti0.5Zr0.5N and Ti0.5Al0.5N Ternary Metal Nitrides: *Suprabha Das*[1]; Andriy Durygin[1]; Vadym Drozd[1]; Md Shariful Islam Sozal[1]; Jesse Smith[2]; Zhe Cheng[1]; [1]Florida International University; [2]Argonne National Laboratory

5:20 PM
Mechanisms of Delamination within Co-extruded Silicon Carbide: *Olivia Brandt*[1]; Rodrigo Orta[1]; Jeffrey Youngblood[1]; Rodney Trice[1]; [1]Purdue University

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ARTIFICIAL INTELLIGENCE

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division

Program Organizers: Amanda Krause, Carnegie Mellon University; Alp Sehirlioglu, Case Western Reserve University; Daniel Ruscitto, GE Research

Monday PM | October 2, 2023
A121 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Nanoscale Metrology of Materials Studied by Advanced Electron Microscopy Imaging and Spectroscopy.: *Nasim Alem*[1]; [1]Penn State University

2:30 PM
Rapid Grain Segmentation From Grayscale Micrograph Through Computer Vision Method: *Yu-Tsen Yi*[1]; Junwon Seo[1]; Nicholas Lamprinakos[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

2:50 PM
Phase Segmentation of Steel Microstructures via Semi Supervised Deep Learning: *Nikhil Chaurasia*[1]; Shikhar Jha[1]; Sandeep Sangal[1]; [1]Indian Institute of Technology Kanpur

3:10 PM
Microstructure Statistics for Property Prediction in Multifunctional Electrode Composites Using Random Forests: *William Huddleston*[1]; Hugh Smith[1]; Yinghui Wu[1]; Alp Sehirlioglu[1]; [1]Case Western Reserve University

3:30 PM Break

3:50 PM Invited
Structure-property Relationships Derived From Electron Microscope to Atomistic Simulations: *Ayana Ghosh*[1]; [1]Oak Ridge National Laboratory

4:20 PM
Multi-modal Image Registration for Materials Characterization: *Zachary Varley*[1]; Marc De Graef[1]; Gregory Rohrer[1]; Megna Shah[2]; Sean Donegan[2]; Michael Uchic[2]; [1]Carnegie Mellon University; [2]Air Force Research Laboratory

4:40 PM
Informing Autonomous Processing via STEM-EELS Using Variational Autoencoders for Classification and Decision: *Jonathan Hollenbach*[1]; Mitra Taheri[1]; [1]Johns Hopkins University

5:00 PM Invited
Semi-automated Hierarchical Clustering Model for 4D-STEM Datasets: *Chuqiao Shi*[1]; Nannan Mao[2]; Yao Yang[3]; Jing Kong[2]; Yimo Han[1]; [1]Rice University; [2]Massachusetts Institute of Technology; [3]University of California, Berkeley

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CERAMIC AND GLASS MATERIALS

Mesoscale Phenomena in Functional Polycrystals and Their Nanostructures — Thermal, Transport, Optical and Mechanical Phenomena

Sponsored by: ACerS Electronics Division

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

Monday PM | October 2, 2023
B230 | Greater Columbus Convention Center

Session Chairs: Javier Garay, University of California, San Diego; Edward Gorzkowski, Naval Research Laboratory

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2:00 PM
Modeling Thermoelectric Figure of Merit in Complex Materials at Mesoscale: *Dharma Raj Basaula*[1]; Mohamad Daeipour[1]; Boris Feygelson[2]; Serge Nakhmanson[1]; [1]University of Connecticut; [2]Naval Research Lab

2:20 PM
Computer Simulation as a Tool to Optimize Electronic Conduction.: *Chinonso Ugwumadu*[1]; Kiran Prasai[2]; David Drabold[1]; [1]Ohio University; [2]Stanford University

2:40 PM
Enhanced Electron Transport in Metal-Carbon Composites: *Kishor Nepal*[1]; Chinonso Ugwumadu[1]; Keerti Kappagantula[2]; David Drabold[1]; [1]Ohio University; [2]Pacific Northwest National Laboratory

3:00 PM
Optical Behavior and Electro-optic Performance in Fine Grained Lead-free Ceramics: *Alexander Dupuy*[1]; Javier Garay[2]; [1]University of California, Irvine; [2]University of California, San Diego

3:20 PM Break

3:40 PM Keynote
Liquid Crystalline Diffractive Waveplates: Ultrathin, Planar Optics: *Jonathan Slagle*[1]; [1]AFRL/RXEP

4:20 PM
Acoustic Phonon Spectra Modification and Light Emission Properties of Rare Earth Doped Polycrystalline Alumina: *Javier Garay*[1]; [1]University of California, San Diego

4:40 PM
Optical Properties of Chalcophosphate Materials in the Visible and Infrared Range: *Mariacristina Rumi*[1]; [1]Air Force Research Laboratory

5:00 PM
Structure Property Relationships in Complex, Multi-phase, Polycrystalline Materials: *Mir Al-Masud*[1]; Naji Mashrafi[1]; Adnan Taqi[1]; Matthew Beck[1]; [1]University of Kentucky

5:20 PM
Grain Size Dependence of Mechanical Properties of Nanocrystalline Magnesium Aluminate MgAl2O4: *Seok-Woo Lee*[1]; Jessica Maita[1]; Sarshad Rommel[1]; James Wollmershauser[2]; Edward Gorzkowski[2]; Boris Feigelson[2]; Mark Aindow[1]; [1]University of Connecticut; [2]US Naval Research Laboratory

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BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials II

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Monday PM | October 2, 2023
A222 | Greater Columbus Convention Center

Session Chairs: Soshu Kirihara, Osaka University; Steven Naleway, University of Utah

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2:00 PM Invited
Emerging Materials and Applications for Biophotonics and Optical Fiber Biosensing: *Roman Kostecki*[1]; Heike Ebendorff-Heidepriem[1]; [1]The University of Adelaide

2:20 PM
Freeze Casting of Porous Biomaterials: *Steven Naleway*[1]; [1]University of Utah

2:40 PM Invited
Functional Biochips and Chemical Sensors Fabricated by Femtosecond Laser 3D Processing: *Koji Sugioka*[1]; Shi Bai[1]; Kotaro Obata[1]; [1]RIKEN Center for Advanced Photonics

3:00 PM
Invited: Living-cell Environmental Sensing: *Pelagia-Irene Gouma*[1]; [1]Ohio State University

3:20 PM Break

3:40 PM
Pathological Calcifications: More From Solid State NMR and Modeling: *Christian Bonhomme*[1]; [1]Sorbonne University

4:00 PM Invited
Stability and Meta-stability of Zirconia Phases Would Explain Confusion of Zirconia Behaviors in Bio-ceramics: *Masahiro Yoshimura*[1]; [1]National Cheng Kung University

4:20 PM
Stereolithographic Additive Manufacturing of Biological Ceramic Implants with Functionally Modulated Geometries: *Soshu Kirihara*[1]; [1]Osaka University

4:40 PM Invited
Using Additive Manufacturing for Next Generation Biomaterials: *Dan Thoma*[1]; [1]University of Wisconsin-Madison

5:00 PM
Investigation of Initial Bone Tissue Reaction of Hydroxyapatite/Collagen Bone-like Nanocomposite: *Masanori Kikuchi*[1]; Tomoka Hasegawa[2]; Norio Amizuka[2]; [1]National Institute for Materials Science; [2]Hokkaido University

ADDITIVE MANUFACTURING

Phase Transformations and Microstructure Evolution during Post-Processing of Additively Manufactured Metals — Phase Transformations and Microstructure Evolution during Post Processing II

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

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Bij-Na Kim, Carpenter Additive; Amy Clarke, Colorado School of Mines; Mark Aindow, University of Connecticut; Eric Lass, University of Tennessee-Knoxville; Richard Fonda, Naval Research Laboratory; Ashley Paz Y Puente, University of Cincinnati

Monday PM | October 2, 2023
C170 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Laser Reheating and Polishing of Powder-blown Directed Energy Deposition: *Sarah Wolff*[1]; [1]The Ohio State University

2:40 PM
Additive Manufacturing of 718 Ni ODS Alloys and Haynes 230 Alloys with Nanoprecipitates: *Xinghang Zhang*[1]; Ben Stegman[1]; Bo Yang[1]; Zhongxia Shang[1]; Jack Lopez[1]; William Jarosinski[1]; [1]Purdue University

3:00 PM
Microstructure and Mechanical Characterization of As-deposited and Forged Wire Arc Additively Manufactured (WAAM) 316LSi: *Brett Ley*[1]; Vishnu Ramasamy[1]; John Lewandowski[1]; [1]Case Western Reserve University

3:20 PM Break

3:40 PM
Use of In Situ TEM Heating to Study Transformation Pathways for Metastable Phases in New Candidate Alloys for Additive Manufacturing: *Mingxuan Li*[1]; Baris Yavas[1]; Mark Aindow[1]; [1]University of Connecticut

4:00 PM
Observation of Structure Coarsening During Annealing of Additively Manufactured Ti-6Al-4V: *Aditya Bose-Bandyopadhyay*[1]; David Field[1]; [1]Washington State University

4:20 PM
Influence of Post-process Forging on Microstructure and Properties of LPBF AlSi10Mg: *Austin Ngo*[1]; Svitlana Fialkova[2]; Noah Kohlhorst[3]; Glenn Daehn[3]; John Lewandowski[1]; [1]Case Western Reserve University; [2]North Carolina A&T University; [3]The Ohio State University

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Manufacturing Division

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum & Minerals; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Christina Wildfire, National Energy Technology Laboratory; Zhiwei Peng, Central South University

Monday PM | October 2, 2023
B235 | Greater Columbus Convention Center

Session Chairs: Christina Wildfire, National Energy Technology Laboratory ; Hideyuki Kanematsu, Suzuka College

2:00 PM Invited
Post-processing of Irradiated FeCrAl by Electron Wind Force: *Daudi Waryoba*[1]; Hajin Oh[1]; Aman Aman[1]; [1]Pennsylvania State University

2:30 PM
Microwave Synthesis of Cobalt Ferrite-reduced Graphene Oxide Composites: Soban Afzal[1]; *Morsi Mahmoud*[1]; Tawfik Salaeh[1]; [1]King Fahd University of Petroleum & Minerals

2:50 PM
Effects of Heat Treatment under External Magnetic Field on Microstructure and Mechanical Properties of Ferritic/Martensitic Steels: *Haluk Karaca*[1]; Kirk Lemmen[1]; Osman Anderoglu[2]; Nan Li[3]; Stu Maloy[4]; XiaTong Yang[2]; Keaton Looper[1]; [1]University Of Kentucky; [2]University of New Mexico; [3]Los Alamos National Laboratory; [4]Pacific Northwest National Laboratory

3:10 PM
Effects on Aluminum Alloys During Heat Treatment in a Magnetic Field: *Kirk Lemmen*[1]; Haluk Karaca[1]; Paul Rottmann[1]; Heather Murdoch[2]; Daniel Magagnosc[2]; Damilola Alewi[1]; Keaton Looper[1]; [1]University of Kentucky; [2]US Army

3:30 PM
Ultrasonic Vibration Acoustic Softening Effect on Al2219 Varying Grain Size: *Thomas Kang*[1]; Xun Liu[1]; [1]The Ohio State University

LIGHTWEIGHT ALLOYS

Recent Developments in Light-Weight Composites and Materials — Machine Learning, Performance and Simulation

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

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Nikhil Gupta, New York University; Aashish Rohatgi, Pacific Northwest National Laboratory; Sudip Bhattacharya, 6K Inc.

Monday PM | October 2, 2023
A211 | Greater Columbus Convention Center

Session Chair: Tanjore Jayaraman, United States Air Force Academy

2:00 PM
Ballistic Performance Simulation of Ultra-high Molecular Weight Polyethylene-pineapple Leaf Fiber-reinforced Epoxy Matrix Composite Using Finite Element Analysis: *Aljohn Jay Punongbayan*[1]; Ricardo Sirot[1]; Raymart Bonete[1]; Eduardo Magdaluyo[1]; [1]University of the Philippines

2:20 PM Invited
Selection and Future Directions of Conventional High-temperature Titanium Alloys for Aeroengines Applying Decision-science Methods: *Ramachandra Canumalla*[1]; Tanjore Jayaraman[2]; [1]Weldaloy Specialty Forgings; [2]United States Air Force Academy

3:00 PM Invited
Machine Learning on Li-based Battery Materials: *Suchismita Goswami*[1]; [1]Mest

3:30 PM Break

3:50 PM Invited
Dielectric Behavior of Carbon Fiber Polymer-matrix Structural Composites and Its Relevance to Structural Self-sensing: *Deborah Chung*[1]; [1]State University of New York Buffalo

4:20 PM
Unprecedented Sensing of the Twisting in Fiber Tows, as Shown for Carbon Fiber by Inductance-based Self-sensing, which Provides Fast, Low-cost and Large-format Sensing: *Deborah Chung*[1]; Min Kyoung Kim[1]; [1]State University of New York Buffalo

BIOMATERIALS

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

Sponsored by: Society for Biomaterials

Program Organizers: Katelyn Swindle-Reilly, The Ohio State University; Stephanie Steichen, DuPont; J. Zach Hilt, University of Kentucky

Monday PM | October 2, 2023
A223 | Greater Columbus Convention Center

Session Chairs: Katelyn Swindle-Reilly, The Ohio State University; Stephanie Steichen, DuPont; J. Zach Hilt, University of Kentucky

2:00 PM
Smart 3D Microtechnologies for Biology and Human Health: *David Gracias*[1]; [1]Johns Hopkins University

2:20 PM Invited
Tailored Hydrogel Scaffolds for Tissue Engineering: *Muhammad Rizwan*[1]; [1]Michigan Technological University

2:50 PM
Water-responsive 4D Printing Ink From a Maize Protein Zein: Ali Raza[1]; Yubei Zhang[1]; Huajie Wang[2]; *Jin-Ye Wang*[1]; [1]Biomedical Engineering, Shanghai JiaoTongue University; [2]Jiaxing Yaojiao Medical Device Co. Ltd.

3:10 PM
The Impact of Cerium Oxide Nanoparticles on ROS Release Rate in Mice Organs: A Minireview: Ikhazuagbe Ifijen[1]; Doreen Omorogbe[1]; *Best Atoe*[2]; [1]Rubber Research Institute of Nigeria; [2]Worldwide Heallthcare

3:30 PM Break

3:50 PM
Development of 3D-Printed Antimicrobial Si3N4-PEEK Cervical Spine Devices: Paul DeSantis[1]; Cemile Başgül[1]; Tabitha Derr[1]; Chelsey McMinn[2]; Jackson Hendry[2]; Douglas Hoxworth[2]; Thomas Schaer[3]; B. Sonny Bal[2]; Noreen Hickok[4]; Steven Kurtz[1]; *Ryan Bock*[2]; [1]Drexel University; [2]SINTX Technologies; [3]University of Pennsylvania; [4]Thomas Jefferson University

4:10 PM
Nanostructured K-wires, Potential Biomedical Applications for UFG 316L: *Bahram Saleh*[1]; Manoj Kodigudla[2]; David Dick[2]; Amey Kelkar[2]; Vijay Goel[2]; Girius Antanaitis[3]; Fumie Yusa[1]; Yasuaki Osawa[4]; Ryosuke Mizuno[4]; Takafumi Komatsu[4]; Hassan Serhan[1]; [1]Rosies Base LLC; [2]The University of Toledo; [3]GA Medical Pty Ltd; [4]Komatsuseiki Kosakusho Co., Ltd.

4:30 PM
Photo-absorptive Biomineral for the Restoration of Acid-eroded Human Enamel Using Femtosecond Laser: *Animesh Jha*[1]; Sarathkumar Loganathan[1]; Eric Barimah[1]; Geeta Sharma[1]; Simon Strafford[1]; [1]University of Leeds

4:50 PM
Introducing Highly Translucent Grades and Additive Manufacturing to the Dental Zirconia Workflow: *Andraž Kocjan*[1]; Tadej Mirt[2]; Martin Schwentenwein[3]; Raul Bermejo[4]; Peter Jevnikar[2]; [1]Jožef Stefan Institute; [2]Faculty of Medicine, University of Ljubljana; [3]Lithoz GmbH; [4]Montanuniversität Leoben

5:10 PM
Ultrashort Pulsed Laser-assisted Biomineral Coating on a 3D-Printed Titanium Implant for Enhancing Osseointegration: *Sarathkumar Loganathan*[1]; Geeta Sharma[1]; Eric Barimah[1]; Edward Attenborough[2]; Jensen AW[2]; Animesh Jha[1]; [1]University of Leeds; [2]Attenborough Dental

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

15th Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Polymeric and Metallic Materials, and Computational Methods

Sponsored by: ACerS Engineering Ceramics Division

Program Organizers: Surojit Gupta, University of North Dakota; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Fu, Wuhan University of Technology; Allen Apblett, Oklahoma State University

Tuesday AM | October 3, 2023
B242/243 | Greater Columbus Convention Center

Session Chairs: Surojit Gupta, University of North Dakota; Lan Li, Boise State University; Santosh More, Faraday Technology Inc.

8:00 AM
A Sustainable and Energy-efficient Electrochemical Technology for Dewatering of Cellulosic Nanomaterials: Santosh Vijapur[1]; *Santosh More*[1]; Timothy Hall[1]; EJ Taylor[1]; Maria Inman[1]; Stephen Snyder[1]; Kim Nelson[2]; [1]Faraday Technology Inc.; [2]AVAPCO LLC

8:20 AM
Computational Methods for Designing Effective Compatibilizers for Recycled Polymer Blends: *Manav Bhati*[1]; Mohammad Atif Faiz Afzal[1]; Andrea Browning[1]; Mathew Halls[1]; [1]Schrodinger Inc.

8:40 AM
Development of Novel Functional Materials from Biomass: *Surojit Gupta*[1]; [1]University of North Dakota

9:00 AM
Little Known Nylon: Bio-Based Feedstocks and Synthesis for Nylon 5,9: *Abigail Stanlick*[1]; Peter Meyer[1]; Ting-Han Lee[1]; Prerana Carter[1]; Michael Forrester[1]; Eric Cochran[1]; [1]Iowa State University

9:20 AM Invited
Molecular Quantum Materials for Energy- and Time-Saving Quantum Computation: *Lan Li*[1]; [1]Boise State University

9:50 AM Break

10:10 AM
Energy Efficiency and Thermo-mechanically Affected Zone Size in Solid-state Welding: *Blake Barnett*[1]; Anupam Vivek[1]; Glenn Daehn[1]; [1]Ohio State University

10:30 AM
The Roles of Co and Ni Additions to High Solute Content Fe-contaminated Al Alloys in Beneficing Microstructure and Tensile Properties: *Jose Spinelli*[1]; Marcella Xavier[1]; [1]Ufscar

10:50 AM
The Investigation of an Energy-efficient Coking Technique Based on the Hot Tamping Operation: *Qingwen Wei*[1]; Keliang Pang[2]; Cai Liang[1]; [1]Southeast University; [2]Ansteel Beijing Research Institute

11:10 AM
Coke Gasification Pulverization and Carbon Bearing Powder Characteristics in a Blast Furnace: *Ji Wu*[1]; Cai Liang[1]; [1]Southeast University

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling, Simulation and Machine Learning - Machine Learning and Artificial Intelligence

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Computational Materials Science and Engineering Committee, TMS: ICME Committee

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

Tuesday AM | October 3, 2023
C150 | Greater Columbus Convention Center

Session Chairs: Li Ma, Johns Hopkins University Applied Physics Laboratory; Jing Zhang, Indiana University - Purdue University Indianapolis

8:00 AM
3D Deep Learning for Porosity Analysis in Additive Manufacturing: *Daniel Diaz*[1]; Xingyang Li[1]; Yuheng Nie[1]; Elizabeth Holm[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]University of Michigan

8:20 AM
Analyzing and Predicting Surface Roughness in Laser Powder Bend Fusion: *Miguel Correa*[1]; Nathan Post[2]; Andrew Neils[2]; Jack Lesko[2]; [1]University of Notre Dame; [2]Roux Institute, Northeastern University

8:40 AM
Predicting Material Properties in Additive Manufacturing Using Acoustic Signatures and Machine Learning: *Alec Mangan*[1]; Dan Thoma[1]; [1]University of Wisconsin Madison

9:00 AM
Use of Machine Learning to Identify Process-Structure-Property Relationships in PBF-LB AlSi10Mg: *Qixiang Luo*[1]; Allison Beese[1]; [1]Pennsylvania State University

9:20 AM
Physics Informed Reduced Order Model for Directed Energy Deposition Simulations in MALAMUTE: *Anant Raj*[1]; Hany Abdel-Khalik[1]; Luis Nunez[2]; Yifeng Che[2]; Wen Jiang[2]; Rongjie Song[2]; [1]Purdue University; [2]Idaho National Laboratory

9:40 AM
Quantification of Spatter Counts and Trajectories in Laser Powder Bed Fusion Using Machine Learning Analysis of High Speed Imaging: Christian Gobert[1]; *Jack Beuth*[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM
Computational and Experimental Study of Up-/Down-surface Characteristics of Sloped Samples in L-PBF Process: *Nismath V H*[1]; Santosh Rauniyar[1]; Kevin Chou[1]; [1]University of Louisville

10:40 AM
Self-supervised Learning of Spatiotemporal Thermal Signatures in Additive Manufacturing Using Reduced Order Physics Models and Transformers: *Patxi Fernandez-Zelai*[1]; Sebastien Dryepondt[1]; Amir Ziabari[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

11:00 AM
Crystal Plasticity Finite Element Creep Modeling of Powder Bed Fused 316H Steel: *Sagar Bhatt*[1]; Mark Messner[1]; [1]Argonne National Laboratory

11:20 AM
A Unified Treatment of Alloy Dependent Material Properties and Process Parameters for Accurate Solidification Simulations for AM Based on CALPHAD: *Paul Mason*[1]; Amer Malik[2]; Quang Minh Do[2]; Johan Jeppsson[2]; Andreas Markstrom[2]; [1]Thermo-Calc Software Inc.; [2]Thermo-Calc Software AB

11:40 AM
Automated Bulk Melt Pool Contour Data Acquisition from Micrographs Using Computer Vision: *Joshua Fody*[1]; [1]NASA Langley Research Center

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ADDITIVE MANUFACTURING

Additive Manufacturing of Ceramic-based Materials: Process Development, Materials, Process Optimization and Applications — Novel and Emerging Ceramic AM 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; Xiangyang Dong, Missouri Univ of Science and Technology; Yiquan Wu, Alfred University; Paolo Colombo, University of Padova; Rajendra Bordia, Clemson University; Long-Qing Chen, Pennsylvania State University

Tuesday AM | October 3, 2023
C161A/161B | Greater Columbus Convention Center

Session Chair: Lisa Rueschhoff, Air Force Research Laboratory

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8:00 AM
A Novel Integrated Additive Manufacturing and Laser Processing Method for Protonic Ceramic Energy Devices: Hua Huang[1]; Tianyi Zhou[1]; Minda Zou[1]; Patrick Kuzbary[1]; Jacob Conrad[1]; Kyle S. Brinkman[1]; Hai Xiao[1]; Fei Peng[1]; *Jianhua Tong*[1]; [1]Clemson University

8:20 AM
Additive Continuous Microwave Sintering for Lunar Construction: *Holly Shulman*[1]; [1]DrHollyShulman LLC

8:40 AM
Learning and Challenges to Scale Ceramics Additive Manufacturing to Industrial Scale: *Francois Beauchaud*[1]; Nikolai Sauer[1]; [1]Bosch Advanced Ceramics

9:00 AM Invited
Hydrothermal-assisted Jet Fusion: A Selective Cold Sintering Approach: *Xuan Song*[1]; [1]University of Iowa

9:30 AM Invited
Challenges and Future Directions for Ceramic Additive Manufacturing in Incorporation of Fiber Reinforcements and Machine Learning Strategies: *Lisa Rueschhoff*[1]; Luke Baldwin[1]; James Hardin[1]; Jonathan Kaufman[1]; [1]Air Force Research Laboratory

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ADDITIVE MANUFACTURING

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

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

Tuesday AM | October 3, 2023
C151 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Processing-Microstructure-Properties Relations in Open Air Additive Manufacturing of Stainless Steel 316L: *Hunter Rauch*[1]; Mala Sharma[1]; Wes Mitchell[1]; Ted Reutzel[1]; [1]Penn State

8:20 AM
Corrosion Fatigue Characteristics of Laser Powder Bed Fused 316L Stainless Steels in Chloride-containing Solution: *Kevin Sangoi*[1]; Jie Song[1]; Yao Fu[1]; [1]Virginia Tech

8:40 AM
Effect of Post-processing on Porosity, Secondary Phases, and Mechanical Behavior of Binder Jet Fabricated Stainless Steels: *Nancy Huang*[1]; Olivia Cook[1]; Christopher Kube[1]; Andrea Argüelles[1]; Allison Beese[1]; [1]Pennsylvania State University

9:00 AM
Effects of Process Parameters on Mechanical Behavior of Wire Arc Additively Manufactured (WAAM) AISI 316LSi: *Vishnu Ramasamy*[1]; John Lewandowski[1]; [1]Case Western Reserve University

9:20 AM
Investigating the Processing-structure-property Relationship for AISI M2 High-speed Tool Steel Processed on Binder Jetting: *Amit Choudhari*[1]; Tushar Borkar[1]; [1]Cleveland State University

9:40 AM
L-PBF Fabrication of Chemically Homogenous Stainless Steel Deposits Using Dry Metal Alloy (DMA) Powder Feedstock: *Stephen Hanson*[1]; Sudhakar Vadiraja[1]; Nathan Huft[1]; Janice Lucon[1]; [1]Montana Technological University

10:00 AM Break

10:20 AM
Maraging Steel 350 Manufactured by Laser Powder Bed Fusion: *Elias Jelis*[1]; Matthew Feurer[1]; [1]US Army DEVCOM AC

10:40 AM
Materials Characterization of AISI 8620 Steel Manufactured through DED System: *Ipfi Mathoho*[1]; [1]CSIR Pretoria

11:00 AM
Mechanical and Magnetostrictive Properties of Additively Manufactured $Fe_{81}Al_{19}$ Rods: *Nicholas Jones*[1]; Jin Yoo[1]; Bryan Kessel[1]; Thomas Mion[2]; Emily Holcombe[1]; Paul Lambert[1]; [1]Naval Surface Warfare Center, Carderock Division; [2]Naval Research Laboratory

11:20 AM
Laser Powder Directed Energy Deposition of 17-7 PH Stainless Steel: Alex Barbosa[1]; Fabio Mariani[1]; Rodrigo Dourado da Silva[1]; Piter Gargarella[2]; Reginaldo Coelho[3]; *Kahl Zilnyk*[1]; Antonio Ramirez[4]; [1]Aeronautics Institute of Technology; [2]Federal University of São Carlos; [3]University of São Paulo ; [4]The Ohio State University

11:40 AM
Parameter Optimization and Flaw Type Dependent Tensile Properties of 15-5PH Stainless Steel Manufactured by Laser Powder Bed Fusion: *Nicolas Ayers*[1]; Cameron Lucas[2]; Asif Mahmud[1]; Andrew Ostrowski[1]; Nemanja Kljestan[3]; Marco Knezevic[3]; Yongho Sohn[1]; [1]University of Central Florida; [2]SV Microwave; [3]University of New Hampshire

12:00 PM
Understanding Processing-Microstructure-Property Relationships for WAAM and LP-DED in Duplex Stainless Steels: *Grant Johnson*[1]; Maria Quintana[1]; Sougata Roy[2]; Peter Collins[1]; [1]Iowa State University; [2]University of North Dakota

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ADDITIVE MANUFACTURING

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 | October 3, 2023
C160A/160B | Greater Columbus Convention Center

Session Chairs: Dr. Navin Manjooran, Chairman, Solve; Prof. Gary Pickrell, Virginia Tech

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8:00 AM Introductory Comments

8:40 AM
Development of Eco-efficient Cement Compositions for 3D Printing Using the Concepts of Rheology: Francisco Jordão Nunes de Lima[1]; José Augusto Ferreira Sales de Mesquita[1]; *Roberto Cesar de Oliveira Romano*[1]; Rafael Giuliano Pileggi[1]; [1]University of Sao Paulo

9:00 AM
In-process Orbiting Laser-assisted Material Extrusion-based Additive Manufacturing for the Improvement of Mechanical and Geometrical Properties: *Pu Han*[1]; Shams Torabnia[1]; M Faisal Riyad[1]; Mohammed Bawareth[1]; Keng Hsu[1]; [1]Arizona State University

9:20 AM
Mechanical Characterization of As-built and Post-processed In-situ Alloyed Cu-4 at% Cr-2 at% Nb Made via Laser Powder Bed Fusion: *Jackson Smith*[1]; David Scannapieco[1]; David Ellis[2]; John Lewandowski[1]; [1]Case Western Reserve University; [2]NASA Glenn Research Center

9:40 AM
Solid State Welding of Additively Manufactured Type 304L SS: Paul Korinko[1]; *Jeremy Rogers*[1]; Timothy Krentz[1]; [1]Savannah River National Laboratory

10:00 AM
Design for Inspectability as a Challenge: *Cindy Waters*[1]; [1]Naval Surface Warfare Center Carderock Div

10:20 AM Break

10:40 AM
Process Mapping of Fe-3.5Si Produced through Laser Powder Bed Fusion and Relevant Properties: *Patrick Faue*[1]; Behzad Rankouhi[1]; Dan Thoma[1]; Frank Pfefferkorn[1]; [1]University of Wisconsin - Madison

11:00 AM
Mechanical Properties of SA508 Gr.3 Low Alloy Steel Using Directed Energy Deposition: *Wonjong Jeong*[1]; Young-Bum Chun[2]; Suk Hoon Kang[2]; Chang Kyu Rhee[2]; Chang Hyoung Yoo[3]; Seongjin Yoo[3]; Hongmul Kim[3]; Ho Jin Ryu[1]; [1]Korea Advanced Institute of Science & Technology; [2]Korea Atomic Energy Research Institute; [3]HANA AMT

11:20 AM
Identifying True Cracking States: Challenges and Practices for Crack-Susceptible Alloys in Additive Manufacturing: *Marcus Lam*[1]; [1]Monash University

11:40 AM Concluding Comments

ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Directed Energy Deposition

Sponsored by: TMS: Additive Manufacturing Committee

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

Tuesday AM | October 3, 2023
C170 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Customized Glove Box for In Situ Monitoring of Laser Directed Energy Deposition: *Sarah Wolff*[1]; Marwan Haddad[2]; [1]Texas A&M University; [2]The Ohio State University

8:40 AM
Two-color Melt Pool Thermal Imaging on Powder-blown Laser-DED to Advance Understanding of Melt Pool Thermal-fluid Physics: *Alexander Myers*[1]; Guadalupe Quirarte[1]; Jack Beuth[1]; Jonathan Malen[1]; [1]Carnegie Mellon University

9:00 AM
Real Time Observations of In-Situ Alloying Molybdenum and Ti-6Al-4V in Laser Directed Energy Deposition Additive Manufacturing: *Marwan Haddad*[1]; Aslan Bafahm Alamdari[1]; Kristina May[1]; Hui Wang[2]; Benjamin Gould[3]; Sarah Wolff[1]; [1]Ohio State University; [2]Texas A&M college station; [3]Advanced Performance Materials, The Chemours Company

9:20 AM
Exploring a Supervisory Control System Using ROS2 and IoT Sensors: *Matthew Roach*[1]; Bradley Jared[1]; [1]University of Tennessee, Knoxville

9:40 AM
Fill Impact Welding: Additive Manufacturing through Ballistic Impact of Metallic Sheets: *Anupam Vivek*[1]; Mohammed Abdelmaola[1]; Jianxiong Li[2]; Yu Mao[3]; Glenn Daehn[1]; [1]The Ohio State University; [2]Cornell University; [3]Applied Impulse Inc.

10:00 AM Break

10:20 AM
Melt Pool Scale Process Monitoring for Laser Hot Wire Additive Directed Energy Deposition: Brandon Abranovic[1]; Elizabeth Chang-Davidson[1]; *Jack Beuth*[1]; [1]Carnegie Mellon University

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SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advanced Ceramics for Environmental Remediation — Session I

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

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

Tuesday AM | October 3, 2023
B244/245 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Advanced Materials for Photocatalytic and Photoelectrochemical CO2 Reduction: *Oomman Varghese*[1]; [1]University of Houston

8:30 AM Invited
Confinement and Heterointerface Re-construction in 2D Materials for Water Oxidation Catalysis: *Kassa Ibrahim*[1]; [1]Ca'Foscari University of Venice

9:00 AM Invited
Photocatalysis and Photosensitization Using Atomically Precise Metal Nanoclusters for Solar Energy Harvesting and Conversion: *Nicola Pinna*[1]; Ye Liu[1]; Yu Wang[1]; [1]Humboldt-Universitaet zu Berlin

9:30 AM Invited
Copper Oxide Nanoparticles as a Metal Ion Source for Enhanced Catalytic Stability of Laccase: *Olivia Graeve*[1]; F. Javier Suarez[1]; Sergio Ojeda Santillán[1]; Rafael Vazquez-Duhalt[2]; [1]University of California San Diego; [2]Universidad Nacional Autónoma de México

10:00 AM Break

10:20 AM Invited
The Multipurpose Aspect of Thin Film Ceramic Materials for Photovoltaics and Photocatalysis: *Alessandro Romeo*[1]; Elisa Artegiani[1]; Narges Thorabi[1]; [1]University of Verona

10:50 AM Invited
Highly Performing Solar-Light-Driven Photodegradation of Metronidazole by Nickel Hexacyanoferrate Nanocubes: *Federico Polo*[1]; Edlind Lushaj[1]; Matteo Bordin[1]; Letizia Liccardo[1]; [1]Ca' Foscari University of Venice

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NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments IV — Mechanical Testing/Thermal Properties

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Cheng Sun, Idaho National Laboratory; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

Tuesday AM | October 3, 2023
A125 | Greater Columbus Convention Center

Session Chair: Michael Short, Massachusetts Institute of Technology

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8:00 AM Invited
Accelerated Creep Testing for High-Temperature and Nuclear Applications: *Calvin Stewart*[1]; Jacob Pellicotte[1]; Md Abir Hossain[1]; [1]The Ohio State University

8:30 AM
Effect of Strain Rate on Tensile Properties of C250 Maraging Steel: *Makhan Singh*[1]; Fisseha Weldemariam[1]; Naresh Bhatnagar[1]; [1]Indian Institute of Technology Delhi

8:50 AM
In Situ SEM Nanomechanics at Cryogenic Temperatures: *Eric Hintsala*[1]; Kevin Schmalbach[1]; Sanjit Bhowmick[1]; Douglas Stauffer[1]; [1]Bruker Nano Surfaces and Metrology

9:10 AM Invited
Assessing the Ability of Nuclear Fuel Performance Codes to Predict Radially Resolved Properties in Oxide Fuels: *Marat Khafizov*[1]; Joshua Ferrigno[1]; Aysenur Toptan[2]; Fabiola Cappia[2]; Tsvetoslav Pavlov[2]; [1]Ohio State University; [2]Idaho National Laboratory

9:40 AM
Accelerated Assessment of Microstructure-Mechanical Property Relationships in Ni Based Superalloys: *Kevin Schmalbach*[1]; Toshio Osada[2]; Eric Hintsala[1]; Douglas Stauffer[1]; Takahito Ohmura[2]; [1]Bruker Nano; [2]National Institute for Materials Science

10:00 AM Break

10:20 AM
Interdiffusion Behaviour of UN with Zircaloy-4 via Diffusion Couple Studies: *Max Salata-Barnett*[1]; James Buckley[1]; James Paul[2]; Dave Goddard[3]; Tim Abram[1]; [1]Univeristy of Manchester; [2]The National Nuclear Laboratory ; [3]The National Nuclear Laboratory

10:40 AM
Thermodynamic Modeling and Calculation of Phase Formation Processes Under Irradiation Conditions of Uranium-plutonium Nitride Fuel: *Alexander Slobodov*[1]; Alexey Krasikov[1]; Mikhail Radin[1]; Anna Ivanova[1]; [1]St.Petersburg Institute of Technology; ITMO University

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CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Thermoelectrics & Magnetoelectrics; Ionic Conduction, EM Sheiding, & Quantum 2.0

Sponsored by: ACerS Electronics Division

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

Tuesday AM | October 3, 2023
B231 | Greater Columbus Convention Center

Session Chair: Matjaz Spreitzer, Jozef Stefan Institute

8:00 AM Invited
Anderson's Localization in Perovskites: Excellent Tool to Decouple Electron and Heat Transport in Oxide Thermoelectrics: *Tanmoy Maiti*[1]; [1]IIT Kanpur

8:20 AM
Designing Rare Earth Free High Entropy Oxide with Tungsten Bronze Structure for Thermoelectric Application: *Subhra Jana*[1]; Tanmoy Maiti[1]; [1]IIT Kanpur

8:40 AM
Enhanced Thermoelectric Performance of Nanocomposite with New Generation 2D Material MXene: *Pragya Dixit*[1]; Tanmoy Maiti[1]; [1]IIT Kanpur

9:00 AM
Finite Elements Simulation of Magnetoelectric Materials Fabricated by Additive Manufacturing: *William Flynn*[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]University of Texas at San Antonio

9:20 AM
Magnetically Assisted High-specificity Targeted Drug Delivery Using Magnetoelectric Nanorobots: *Nandan Murali*[1]; Simran Kaur Rainu[1]; Neetu Singh[1]; Soutik Betal[1]; [1]Indian Institute of Technology Delhi, New Delhi

9:40 AM
Magnetoelectric Nanorobot - A Revolutionary Nanoscale Device for Targeted Treatment: *Soutik Betal*[1]; Amar Bhalla[2]; Ruyan Guo[2]; [1]IIT Delhi; [2]University of Texas- San Antonio

10:00 AM Break

10:20 AM
Processing and Properties of Diamond Crystals for Quantum Applications: Lakshmi Ramasubramanian[1]; Manish Singh[1]; *Raj Singh*[1]; [1]Oklahoma State University

10:40 AM
Fabrication of Fexible Nanocomposites Based on PVC, Electrical and Magnetic Nano-fillers for the Shielding Against Unwanted Electromagnetic Waves: *HM Fayzan Shakir*[1]; Tingkai Zhao[1]; Khadija Zubair[1]; [1]Northwestern Polytechnical University

11:00 AM
The Composition-structure-property Relationship of Silica Doped NASICON Glassy Electrolyte for Na-ion Batteries: *Shweta Keshri*[1]; Indrajeet Mandal[1]; Nitya Nand Gosvami[1]; Amarnath R. Allu[2]; N M Anoop Krishnan[1]; [1]Indian Institute of Technology Delhi; [2]CSIR Central Glass & Ceramic Research Institute

11:20 AM
Demonstration of VQE Simulation of CoFe2O4@BaTiO3 Core-shell Nanoparticles: *Matthew Trippy*[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]University of Texas at San Antonio

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NUCLEAR ENERGY

Ceramics for New Generation Nuclear Energy System Application — Ceramic Fuels

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

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Maik Lang, University of Tennessee; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Enrique Saez, Clemson University; Jinsuo Zhang, Virginia Polytechnic Institute and State University

Tuesday AM | October 3, 2023
A124 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Status and Outlook of Tristructural Isotropic Coated Particle Fuel Technology: *Tyler Gerczak*[1]; John Hunn[1]; [1]Oak Ridge National Laboratory

8:30 AM
Thermal Property Mapping of Surrogate TRISO Particles: *Michael Moorehead*[1]; Zilong Hua[1]; Boone Beausoleil[1]; David Hurley[1]; [1]Idaho National Laboratory

8:50 AM
Analysis of Radially Resolved Thermal Conductivity in High Burnup Mixed Oxide Fuel: *Joshua Ferrigno*[1]; Tsvetoslav Pavlov[2]; Narayan Poudel[2]; Daniele Salvato[2]; Brian Merritt[3]; Alex Hansen[3]; Troy Munro[3]; Fabiola Cappia[2]; Marat Khafizov[1]; [1]The Ohio State University; [2]Idaho National Laboratory; [3]Brigham Young University

9:10 AM Invited
Modeling of Pressure-driven Inter-granular Fracture in High Burnup Structure UO2 during LOCA Using a Phase-field Approach: *Wen Jiang*[1]; [1]North Carolina State University

9:40 AM
Creep Predictions in UO_2 by Atomistic to Meso-scale Simulations: Conor Galvin[1]; William Neilson[1]; Christopher Matthews[1]; *David Andersson*[1]; Michael Cooper[1]; [1]Los Alamos National Laboratory

10:00 AM Break

10:20 AM Invited
Advanced Characterization of Nuclear Fuels to Support Qualification of Nuclear Fuels: *Joshua White*[1]; [1]Los Alamos National Laboratory

10:50 AM Invited
Thermal Oxidation and Thermodynamics of Uranium Nitride and Uranium Carbide: *Xiaofeng Guo*[1]; Vitaliy Goncharov[1]; Juejing Liu[1]; Sam Karcher[1]; Emma Carlsen[1]; John McCloy[1]; Arjen van Veelen[2]; Andrew Strzelecki[2]; Hongwu Xu[2]; Joshua White[2]; [1]Washington State University; [2]Los Alamos National Laboratory

11:20 AM
High Density Uranium Nitride Fuels for Advanced Nuclear Reactors: *Ryan Finkelstein*[1]; Sarah Cole[1]; Allyssa Bateman[1]; Elizabeth Sooby[2]; Brian Jaques[1]; [1]Boise State University; [2]University of Texas San Antonio

11:40 AM
Phase Equilibria and Thermodynamics of Uranium Mononitride Fuel Undergoing Burn-Up in a Lead-cooled Reactor: *Ronald Booth*[1]; E. Reece McManus[1]; Antoine Claisse[2]; Theodore Besmann[1]; [1]University of South Carolina; [2]Westinghouse

MODELING

Computation Assisted Materials Development for Improved Corrosion Resistance — Session II

Program Organizers: Rishi Pillai, Oak Ridge National Laboratory; Brian Gleeson, University of Pittsburgh

Tuesday AM | October 3, 2023
A224 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Dissolution of Metal Nanoparticles in Solution: Atomic-scale Computational Investigation: *Susan Sinnott*[1]; Robert Slapikas[2]; Ismaila Dabo[1]; [1]Pennsylvania State University; [2]Army Research Laboratory

8:40 AM
Classical Molecular Dynamics Simulation of Electrochemical Oxidation and Dissolution of Platinum Alloy Nanoparticles: *Stephen Holoviak*[1]; Ismaila Dabo[1]; Susan Sinnott[1]; [1]Pennsylvania State University

9:00 AM Invited
Nanoporous High Entropy Alloys: A New Class of Materials with Remarkable Mechanical and Corrosion Properties: *Celine Hin*[1]; Jarod Worden[1]; [1]Virginia Tech

9:40 AM
On the Effects of Texture and Grain Morphology on Hydrogen Transport Towards Notch Tips: *Alireza Tondro*[1]; Hamidreza Abdolvand[1]; [1]University of Western Ontario

10:00 AM Break

10:20 AM Panel Discussion

MODELING

Computational Discovery, Understanding, and Design of Multi-principal Element Materials — Session I

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

Program Organizers: Shuozhi Xu, University of Oklahoma; Douglas Spearot, University of Florida; Jia Li, Hunan University; Michael Gao, National Energy Technology Laboratory; Levente Vitos, Royal Institute of Technology (KTH)

Tuesday AM | October 3, 2023
A223 | Greater Columbus Convention Center

Session Chairs: Douglas Spearot, University of Florida; Liang Qi, University of Michigan

8:30 AM Keynote
Computational Studies of Deformation Twinning in BCC Complex Concentrated Alloys: Ganlin Chen[1]; Amir Zahiri[1]; *Liang Qi*[1]; [1]University of Michigan

9:10 AM
ML-Based High-Throughput Search to Identify Refractory High Entropy Alloy with Trade-off Mechanical Properties: *Stephen Giles*[1]; Debasis Sengupta[1]; Hugh Shortt[2]; Peter Liaw[2]; [1]CFD Research Corp; [2]University of Tennessee

9:30 AM
A New Modified Embedded Atom Method Potential to Understand Plasticity in VNbTaTiZr High Entropy Alloy: *Mashroor Shafat Nitol*[1]; Khanh Dang[1]; Chanho Lee[2]; Saryu Fensin[1]; [1]Los Alamos National Laboratory; [2]Auburn University

9:50 AM
The Elastic Properties and Stacking Fault Energy of FeNiMoW: *Sarah O'Brien*[1]; Matthew Beck[1]; [1]University of Kentucky

10:10 AM Break

10:30 AM Invited
Quantitative and Graphical Characterization of the Four Core Effects of High Entropy Alloy (High Entropy Materials) Based on Site Preference: *Bo Wu*[1]; Rong Chen[1]; Liangji Weng[1]; Tianliang Xie[1]; Chubo Zhang[1]; Yan Zhao[1]; Baisheng Sa[1]; Pingqiang Dai[2]; [1]Fuzhou University; [2]Fujian University of Technology

11:00 AM
Effects of Short-range Order in Medium Entropy Alloy CoCrNi: *Shuozhi Xu*[1]; Wu-Rong Jian[2]; Irene Beyerlein[3]; [1]University of Oklahoma; [2]Stanford University; [3]University of California, Santa Barbara

NANOMATERIALS

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics 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 at Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Indiana University-Purdue University Indianapolis

Tuesday AM | October 3, 2023
B234 | Greater Columbus Convention Center

Session Chairs: Michael Naguib, Tulane University ; Babak Anasori, Indiana University–Purdue University Indianapolis

8:00 AM Keynote
Hydroxide Derived Nanomaterials and Their Properties: *Michel Barsoum*[1]; Hussain Badr[1]; [1]Drexel University

8:40 AM Invited
MXenes Beyond $Ti_3C_2T_x$: Controlling Optical, Electronic, and Thermal Properties through Chemistry: *Christopher Shuck*[1]; [1]Rutgers University

9:10 AM
Accelerating MXene Synthesis: High-Yield Ti3C2Tx Flake Production through Shortened Etching and Controlled Delamination Processes: *Valeriia Poliukhova*[1]; Babak Anasori[1]; [1]Indiana University - Purdue University Indianapolis

9:30 AM
Rapid and Scalable Solid-state Synthesis of 2D Transition Metal Carbo-chalcogenides (TMCCs): *Ahmad Majed*[1]; Michael Naguib[1]; [1]Tulane University

9:50 AM Break

10:10 AM Invited
Unveiling Nanoscale Strain in Two-dimensional Semiconductors via Near-field Optical Microscopy: Jin Myung Kim[1]; Peiwen Ma[1]; Soyeong Kwon[1]; *SungWoo Nam*[1]; [1]University of California, Irvine

10:40 AM
Graphene-metal Composites as High-temperature Electrical Conductors: Hamzeh Kashani[1]; Won June Choi[1]; Chunghwan Kim[1]; *Wonmo Kang*[1]; [1]Arizona State University

11:00 AM
Design of Ordering in Double Transition Metal Mo2Nb2C3Tx MXenes: *Brian Wyatt*[1]; Anupma Thakur[1]; Kat Nykiel[1]; Zachary Hood[2]; Shiba Adhikari[2]; Krista Pulley[1]; Wyatt Highland[1]; Alejandro Strachan[1]; Babak Anasori[1]; [1]Purdue University; [2]Argonne National Laboratory

11:20 AM
Effect of 2D MXenes on the Properties of ZrC-Ti3C2 Composites: Nithin Chandran[1]; Austin Vohrees[2]; Yooran Im[3]; *Srinivasa Kartik Nemani*[2]; Ravi Kumar N V[1]; Babak Anasori[2]; [1]IIT Madras; [2]Indiana University-Purdue University; [3]Colorado School of Mines

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Energy Storage II; Energy Conversion and Harvesting III

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Kyle Brinkman, Clemson University; Armin Feldhoff, Leibniz University Hannover; Charmayne Lonergan, Pacific Northwest National Laboratory; Zhezhen Fu, Pennsylvania State University - Harrisburg; Dhruba Panthi, Kent State University; Janusz Tobola, AGH UST, Faculty of Physics and Applied Computer Science

Tuesday AM | October 3, 2023
B240/241 | Greater Columbus Convention Center

Session Chairs: Eva Hemmer, University of Ottawa; Joe Briscoe, Queen Mary University of London

8:00 AM
Towards Designing Mn- and Fe-rich Cathode Materials in Sodium-ion Batteries: *Hugh Smith*[1]; Iwnetim Abate[1]; [1]Massachusetts Institute of Technology

8:20 AM
Processing and Characterization of Epitaxial Cathode-electrolyte Interfaces in All-solid-state Thin-film Lithium-ion Batteries: *Yumi Ikuhara*[1]; Shunsuke Kobayashi[1]; Kei Nakayama[1]; Craig Fisher[1]; Akihide Kuwabara[1]; Yuichi Ikuhara[2]; [1]Japan Fine Ceramics Center; [2]The University of Tokyo

8:40 AM
Ceramics Nanocomposite Materials for Novel Energy Harvesting and Heat Management: *Zdravko Kutnjak*[1]; Brigita Rozic[1]; Zouhair Hanani[1]; Daoud Mezzane[2]; Mimoun El Marssi[3]; Hana Ursic[1]; Matjaz Spreitzer[1]; [1]Jozef Stefan Institute; [2]Cadi Ayyad University; [3]Univerity of Picardie Jules Verne

9:00 AM
Facile Routes to Synthesis Electrochemical Energy Storage Materials and Their Patterned Deposition to Construct Planar Micro-supercapacitors: *Muxuan Yang*[1]; Weinan Xu[1]; [1]University of Akron

9:20 AM
Modeling and Performance Evaluation of Barocaloric Refrigeration: *Naveen Weerasekera*[1]; Bikram Bhatia[1]; [1]University of Louisville

9:40 AM
Roles of Particle Size, Shape and Crystallographic Orientation on the Performance of the $BaTiO_3$-based Piezoelectric Generators: Buse Muslu[1]; Seval Kınden[1]; Sakhavat Dadashov[1]; Mustafa Talha Yasar[1]; *Ender Suvaci*[1]; [1]Eskisehir Technical University

10:00 AM Break

10:20 AM
Oxide-halide Perovskite Composites for Simultaneous Recycling of Piezoceramics and Solar Cells: *Yang Bai*[1]; [1]University of Oulu

10:40 AM
Processing and Performance of High Entropy Oxide as Anodes for Lithium-ion Batteries: *Ting Shen*[1]; Guozhong Cao[2]; Rajendra Bordia[1]; [1]Clemson University; [2]University of Washington

11:00 AM
Tailoring the Sulfur Electrode for Enhanced Kinetics and Longevity of Li-S Batteries: *Yuxuan Zhang*[1]; Han Wook Song[2]; Sunghwan Lee[1]; [1]Purdue University West Lafayette; [2]Korea Research Institute of Standards and Science

11:20 AM
Application of Coal-derived Graphites as Lithium-ion Battery Anodes: *Kody Wolfe*[1]; Caleb Gula[1]; Abigail Paul[1]; Yahya Al-Majali[1]; John Staser[1]; Jason Trembly[1]; [1]Ohio University

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CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Engineering Ceramics: Microstructure Characterization and Related Properties

Sponsored by: ACerS Engineering Ceramics Division

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

Tuesday AM | October 3, 2023
B232 | Greater Columbus Convention Center

Session Chairs: Young-Wook Kim, University of Seoul; Junichi Tatami, Yokohama National University

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8:00 AM Keynote
Grain Boundary Atomic Structures, Segregation, Diffusion and Migration in Al2O3: *Yuichi Ikuhara*[1]; [1]University of Tokyo

8:40 AM Invited
In Situ Observations of Local Atomic Behavior Upon Deformation and Fracture Phenomena in Ceramic Materials: *Eita Tochigi*[1]; [1]The University of Tokyo

9:10 AM Invited
Heterointerface and Grain Boundary Energies, Chemical Segregation, and Their Influence on Microstructure in Multiphase Ceramics: Komal Syed[1]; Nadjia Motley[1]; *William Bowman*[1]; [1]University of California, Irvine

9:40 AM Invited
Strategy to Estimate Mechanical Properties of Engineering Ceramics by Using AI-determined Grain Information and Simulation: *Manabu Fukushima*[1]; Kiyoshi Hirao[1]; Yuki Nakashima[1]; Kimiya Aoki[2]; Shingo Ozaki[3]; Wataru Nakao[3]; [1]National Institute of Advanced Industrial Science and Technology (AIST); [2]Chukyo University; [3]Yokohama National University

10:10 AM Break

10:30 AM Invited
Fabrication of High Strength Alumina with Residual Stress by EPD in Strong Magnetic Field: *Tohru Suzuki*[1]; Atsushi Nagase[2]; Hajime Kiyono[2]; Tetsuo Uchikoshi[1]; [1]National Institute for Materials Science; [2]Shibaura Institute of Technology

11:00 AM
Synthesis and Microstructural Evolution of Novel Polymer-Derived Silicon Oxycarbide – Exfoliated Montmorillonite Ceramic Nanocomposites: *Advaith Rau*[1]; Kathy Lu[1]; [1]Virginia Polytechnic Institute and State University

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CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Current Issues and Functional Applications — Cooper Distinguished Lecture

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Charmayne Lonergan, Pacific Northwest National Laboratory; Ashutosh Goel, Rutgers, The State University of New Jersey

Tuesday AM | October 3, 2023
B132 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Glassy Disorder and Macroscopic Properties: *Lothar Wondraczek*[1]; [1]University of Jena, Germany

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FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

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

Tuesday AM | October 3, 2023
A215 | Greater Columbus Convention Center

Session Chairs: Moritz Kindelmann, FZ Juelich; William Bowman, UC Irvine

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8:00 AM Invited
Which Interfaces Matter Most? Variability in Grain Boundary Defect Chemistry and Conductivity in a Concentrated Solid Electrolyte
: Hasti Vahidi[1]; Alejandro Mejia[2]; Shengquan Xuan[1]; Angel Cassiadoro[2]; Abednego Abdi[2]; David Mebane[2]; *William Bowman*[1]; [1]University of California, Irvine; [2]West Virginia University

8:30 AM Invited
Grain Boundary–property Relation in an Improper Ferroelectric Polycrystal: *Jan Schultheiss*[1]; [1]Universitaet Augsburg

9:00 AM
Predicting Grain Boundary States and Transitions in Ferroelectrics: *Catherine Bishop*[1]; R. Edwin García[2]; K.S.N Vikrant[3]; [1]University of Canterbury; [2]Purdue University; [3]IIT Delhi

9:20 AM
Influence of Ba Non-stoichiometry and Dopants on the Processing and Properties of Doped $BaZrO_3$: *Julian Ebert*[1]; Dylan Jennings[1]; Doris Sebold[1]; Qianli Ma[1]; Wolfgang Rheinheimer[1]; [1]Forschungszentrum Jülich GmbH

9:40 AM
Investigation of Grain Boundaries in $SrTiO_3$: Correlation of Space Charge and Non-Arrhenius Grain Growth: *Pascal Zahler*[1]; Dylan Jennings[1]; Wolfgang Rheinheimer[1]; [1]Forschungszentrum Juelich

10:00 AM Break

10:20 AM Invited
Highly Conductive Grain Boundaries in Cold Sintered $BaZr_{0.7}Ce_{0.2}Y_{0.1}O_{3-\948}$ Proton Conductors: *Moritz Kindelmann*[1]; Sonia Escolastico[2]; Laura Almar[2]; Ashok Vayalla[1]; Dylan Jennings[1]; Wendelin Deibert[1]; Wilhelm Albert Meulenberg[1]; Wolfgang Rheinheimer[1]; Martin Bram[1]; Jose Serra[2]; Joachim Mayer[1]; Olivier Guillon[1]; [1]Forschungszentrum Jülich GmbH; [2]Universitat Politècnica de València

10:50 AM
Mixed Ionic Electronic Conduction Caused by Phase Transformation and Interfacial Segregation in an Entropy Stabilized Oxide: *William Bowman*[1]; Hasti Vahidi[1]; [1]University of California, Irvine

11:10 AM
Useful Inputs from Metal Oxide Gas Sensor Research to Understand SOFC Cathode Degradation: *Anna Staerz*[1]; [1]Colorado School of Mines

11:30 AM
Elemental Segregation in Iron Strontium Titanate Solid Solutions: *Dylan Jennings*[1]; M. Pascal Zahler[1]; Di Wang[2]; Qianli Ma[1]; Wendelin Deibert[1]; Christian Kübel[3]; Stefan Baumann[1]; Joachim Mayer[4]; Wolfgang Rheinheimer[1]; [1]Institute for Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Forschungszentrum Jülich; [2]Institute of Nanotechnology & Karlsruhe Nano Micro Facility, Karlsruhe Institute of Technology; [3]Institute of Nanotechnology & Karlsruhe Nano Micro Facility, Karlsruhe Institute of Technology, Technical University Darmstadt; [4]Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons, Materials Science and Technology (ER-C 2), Forschungszentrum Jülich

11:50 AM
The Formation of Stacking Faults in Barium Zirconate Type Perovskites: *Dylan Jennings*[1]; Julian Ebert[1]; Hongchu Du[2]; Qianli Ma[1]; Laura-Alena Schäfer[1]; Doris Sebold[1]; Joachim Mayer[2]; Wolfgang Rheinheimer[1]; [1]Institute for Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Forschungszentrum Jülich; [2]Ernst Ruska-Centre for Microscopy and Spectroscopy of Electrons, Materials Science and Technology (ER-C-2), Forschungszentrum Jülich

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond IV — Materials Design and Discovery

Sponsored by: TMS Alloy Phases Committee

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

Tuesday AM | October 3, 2023
A216 | Greater Columbus Convention Center

Session Chairs: Michael Titus, Purdue University; Elaf Anber, Johns Hopkins University

8:00 AM Invited
Machine Learning Oxidation Resistance in Refractory Alloys and High-throughput Experiments: Sharmila Karumuri[1]; Saswat Mishra[1]; Akhil Bejjipurapu[1]; Vincent Mika[1]; Collin Scott[1]; Noah Hallberg[1]; Kenneth Sandhage[1]; Ilias Bilionis[1]; Alejandro Strachan[1]; *Michael Titus*[1]; [1]Purdue University

8:30 AM Invited
High-Temperature Oxidation of Refractory High Entropy Alloys: Role of Reactive Elements on Scale formation.: *Elaf Anber*[1]; David Beaudry[1]; Sebastian Lech[1]; Nathan Smith[2]; Michael Waters[2]; Loic Perriere[3]; Jean-Phillippe Couzinie[3]; James Rondinelli[2]; Chris Wolverton[2]; Elizabeth Opila[4]; Mitra Taheri[1]; [1]Johns Hopkins University; [2]Northwestern University; [3]University Paris-Est Créteil (UPEC) - IUT; [4]University of Virginia

9:00 AM
Data and Decision Science-driven Selection of High-entropy Alloy Coatings for Hot Forging Dies: *Tanjore Jayaraman*[1]; Ramachandra Canumalla[2]; [1]United States Air Force Academy; [2]Weldaloy Specialty Forgings

9:20 AM
Development of BCC-B2 Microstructure in Nb-Ti-Ru Refractory Superalloys: *Melanie Moczadlo*[1]; Eric Lass[1]; [1]University of Tennessee-Knoxville

9:40 AM
Computational and Experimental Investigation of High Entropy Superalloys for Enhanced Creep Resistance: *Hemanth Maradani*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

10:00 AM Break

10:20 AM
Entropy Boosting Ionic Conductivity in Crystalline Solids: *Yan Chen*[1]; Hui Wang[2]; [1]Oak Ridge National Laboratory; [2]University of Louisville

10:40 AM
Surface Enhancement of Refractory Multi-principal Element Alloys Containing Al by Gas Nitriding: *Yu-Hsuan Lin*[1]; David Poerschke[1]; [1]University of Minnesota

11:00 AM
Understanding Oxidation Behavior and Microstructure Evolution of Si-based Coatings Formed on Refractory Multi-principal Element Alloys: *Brady Bresnahan*[1]; David Poerschke[1]; [1]University of Minnesota

MATERIALS-ENVIRONMENT INTERACTIONS

High Temperature Corrosion and Degradation of Structural Materials — III. Molten Salts & Harsh Environments

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

Tuesday AM | October 3, 2023
A122 | Greater Columbus Convention Center

Session Chair: To Be Announced

9:00 AM Invited
High Temperature Materials Study for HCl+SO2 and HF+P2O5 Environments: *Ken Kane*[1]; Cassidy Carroll[1]; Cavin Mooers[1]; James Johnson[1]; John Mathews[1]; David Blanchard[1]; [1]JHU/APL

9:30 AM
Liquid Metal Embrittlement Assessment of F82H in Li: *Marie Romedenne*[1]; Charles Hawkins[1]; Dean Pierce[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

9:50 AM
Corrosion Behavior of Compositionally Gradient Additively Manufactured 316L Stainless Steel Doped with Hafnium in Eutectic NaCl-$MgCl_2$ Molten Salt at 700 °C: *Laura Hawkins*[1]; Jingfan Yang[2]; Michael Woods[1]; Ruchi Gakhar[1]; Lin Shao[3]; Xiaoyuan Lou[2]; Daniel Murray[1]; Lingfeng He[4]; [1]Idaho National Laboratory; [2]Purdue University; [3]Texas A&M University; [4]North Carolina State University

10:10 AM Break

10:30 AM
Evaluating Corrosivity of Molten Salts Using Halide Optical Basicity Index: *Krishnan Raja*[1]; Dev Chidambaram[2]; [1]University of Idaho; [2]University of Nevada, Reno

10:50 AM
Stress Assisted Corrosion Behavior of Al0.1CrCoFeNi High Entropy Alloy in a Molten NaCl-Na2SO 4 Salt: *Wylie Simpson*[1]; James Earthman[1]; [1]University of California Irvine

11:10 AM
Effect of Gaseous Environments and Alloy/Coatings Composition on the Mixed Deposit-induced Degradation of Advanced Alloys/Coatings: *Atharva Chikhalikar*[1]; David Poerschke[1]; [1]University of Minnesota, Twin Cities

SPECIAL TOPICS

History of Materials Science and Engineering — Phenomena and Techniques I

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

Program Organizers: Robert Hackenberg, Los Alamos National Laboratory; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Olivier Hardouin Duparc, LSI - CNRS; Kester Clarke, Colorado School of Mines; Goro Miyamoto, Tohoku University

Tuesday AM | October 3, 2023
A213 | Greater Columbus Convention Center

Session Chairs: Goro Miyamoto, Tohoku University; Robert Hackenberg, Los Alamos National Laboratory

8:00 AM Invited
Corrosion Science Over the Past Century: *Gerald Frankel*[1]; [1]Ohio State University

8:30 AM Invited
A Historical Overview of the Development of Grain Coarsening Theory: *Eric Payton*[1]; Burton Patterson[2]; [1]University of Cincinnati; [2]University of Florida

9:00 AM
The History of Quantitative Fractography and Fractal Geometry in Ceramics: *John Mecholsky*[1]; [1]University of Florida

9:30 AM Invited
A Brief History of Texture and Anisotropy: *Anthony Rollett*[1]; Guenter Gottstein[2]; [1]Carnegie Mellon University; [2]RWTH Aachen University

10:00 AM Break

10:20 AM
Floris Osmond and the Discovery of Steel Microstructures: *Ian Zuazo*[1]; David Quidort[2]; [1]ArcelorMittal Global R&D - Industeel; [2]Industeel France

10:50 AM
Pierre Armand Jacquet and Electrolytic Polishing: *Olivier Hardouin Duparc*[1]; [1]LSI - CNRS

MODELING

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

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

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

Tuesday AM | October 3, 2023
A225 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Hole Expansion Testing of Thin Sheet Materials at Various Strain Rates for Advanced Constitutive Model Calibration: *Jeremy Seidt*[1]; Yannis Korkolis[1]; Carter Fietek[1]; Hojun Lim[2]; [1]The Ohio State University; [2]Sandia National Laboratories

8:30 AM
Coupled Crystal Plasticity and Phase-field Fracture Model for Single Crystal Plastic Deformation and Failure Prediction: *Aashique Rezwan*[1]; Nicole Aragon[1]; Hojun Lim[1]; [1]Sandia National Laboratories

8:50 AM
Crystal Plasticity Modeling of Ti-6Al-4V Alloy under Uncertainty with Surrogate Optimization and Experimental Validation: *Mohamed Elleithy*[1]; Pinar Acar[1]; [1]Virginia Tech

9:10 AM
Prediction of Forming Limits for Austenitic Stainless Steel Tubes: Krishna Raju[1]; P. Reddy[2]; Sandeep Saahu[1]; *K. Narasimhan*[1]; [1]India Institute of Technology Bombay; [2]JNTU Anantha Pur

9:30 AM
The Role of Plastic Anisotropy on the Reorientation Trajectories of BCC Polycrystals: *Matthew Kasemer*[1]; Ezra Mengiste[1]; Dominic Piedmont[2]; Xuan Zhang[3]; Mark Messner[3]; Jun-Sang Park[3]; [1]University of Alabama; [2]University of Illinois at Urbana-Champaign; [3]Argonne National Laboratory

9:50 AM
Deformation Behavior of Lightweight Clad Sheet: Experiment and Modeling: *Yongju Kim*[1]; Gang Hee Gu[1]; Rae Eon Kim[1]; Min Hong Seo[2]; Hyoung Seop Kim[1]; [1]POSTECH; [2]POSCO

10:10 AM Break

10:30 AM
Plastic Deformation and Failure Predictions of Al-6061 with Inhomogeneities Using Finite Element Modeling Techniques Across Different Length Scales: *Nicole Aragon*[1]; Aashique Rezwan[1]; Ill Ryu[2]; Hojun Lim[1]; [1]Sandia National Laboratories; [2]The University of Texas at Dallas

10:50 AM
Micromechanical Modeling of Additively Manufactured Inconel 625 Informed by in situ High-energy X-ray Diffraction: *Reilly Knox*[1]; Robert Carson[2]; Katherine Shanks[3]; Jim Belak[2]; Darren Pagan[1]; [1]Pennsylvania State University; [2]Lawrence Livermore National Laboratory; [3]Cornell High Energy Synchrotron Source

11:10 AM
The Contribution of the Platform MaterialDigital (PMD) in Building Up a Materials Data Space – Application to Mechanical Testing: *Pedro Dolabella Portella*[1]; Peter Gumbsch[2]; [1]Fraunhofer Inst Werkstoffmechanik IWM; [2]Fraunhofer Inst Werkstoffmechanik IWM and Karlsruher Institut für Technologie KIT

FUNDAMENTALS AND CHARACTERIZATION

Interface-mediated Phenomena in Structural Materials — Interface-related Mechanics

Sponsored by: TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, University of Nebraska-Lincoln; Nigel Shepherd, University of North Texas; Andres Bujanda, U.S. Army Research Laboratory; Lin Shao, Texas A&M University

Tuesday AM | October 3, 2023
A214 | Greater Columbus Convention Center

Session Chairs: Xinghang Zhang, Purdue University; Liming Xiong, North Carolina State University

8:00 AM Invited
Mechanical Behavior and Thermal Stability of Nanotwinned Al Alloys: *Xinghang Zhang*[1]; Nicholas Richter[1]; Yifan Zhang[2]; Mingyu Gong[3]; Jian Wang[4]; [1]Purdue University; [2]Los Alamos National Laboratory; [3]Shanghai Jiaotong University; [4]University of Nebraska, Lincoln

8:40 AM
Atomistic Dynamics of Pre-existing Edge Dislocations in FCC Metals at High Strain Rates: Arrhenius to Non-Arrhenius Transition: *Akarsh Verma*[1]; Sandeep Singh[2]; Shigenobu Ogata[1]; [1]Osaka University; [2]Indian Institute of Technology Roorkee

9:00 AM
Effects of Phase Boundaries on Enhanced Hardness in a Microstructurally Stable Nanocrystalline Ni-based Alloy: *Mari-Therese Burton*[1]; Alicia Koenig[1]; Helen Chan[1]; Christopher Marvel[2]; Martin Harmer[1]; [1]Lehigh University; [2]Louisiana State University

9:20 AM
3D Interface-enabled High Strength and Deformability in Cu/Nb Nanolaminates: *Justin Cheng*[1]; Shuozhi Xu[2]; Eric Hintsala[3]; Jon Baldwin[4]; Youxing Chen[5]; Nicolas Fuchs-Lynch[6]; Mauricio De Leo[1]; Irene Beyerlein[6]; Nathan Mara[1]; [1]University of Minnesota Twin Cities; [2]University of Oklahoma; [3]Bruker Nano Surfaces; [4]Los Alamos National Laboratory; [5]University of North Carolina Charlotte; [6]University of California Santa Barbara

9:40 AM Invited
Modeling the Interface-Mediated Mechanical, Thermal, Mass Transport and Their Interactions from Atomistic to Microscale: Methodology, Mechanisms, and Applications: *Liming Xiong*[1]; [1]NC State University

10:20 AM Break

10:40 AM
Mesoscale Description of Interface-mediated Plasticity: *Jinxin Yu*[1]; Jian Han[1]; David Srolovitz[2]; Ngan Alfonso[2]; [1]City University of Hong Kong; [2]Hong Kong University

11:00 AM
Influence of Grain Boundary Sliding on Plastic Deformation in FCC Nanocrystalline Metals: *Jonathan Cappola*[1]; Jian Wang[2]; Lin Li[1]; [1]Arizona State University; [2]University of Nebraska-Lincoln

11:20 AM
Interface Strengthening in As-cast and Laser-modified Al-Si Eutectic Alloys: *Wenqian Wu*[1]; Bingqiang Wei[1]; Amit Misra[2]; Jian Wang[1]; [1]University of Nebraska-Lincoln; [2]University of Michigan

11:40 AM
Mechanistic-design of Advanced Hierarchical Ti-Ti$_2$AlC Metal-MAX Multilayered Nanolaminates: *Skye Supakul*[1]; Sid Pathak[1]; Krishna Yaddanapudi[2]; Garritt Tucker[3]; [1]Iowa State University; [2]University of California, Davis; [3]Colorado School of Mines

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ARTIFICIAL INTELLIGENCE

Leveraging Integrated Computational Materials Engineering for High-fidelity Physics-based and Machine Learning Models — Session I

Sponsored by: TMS: ICME Committee

Program Organizers: William Frazier, Pacific Northwest National Laboratory; Philip Goins, Army Research Laboratory; Lei Li, Pacific Northwest National Laboratory; Yucheng Fu, Pacific Northwest National Laboratory

Tuesday AM | October 3, 2023
A120 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
A Machine Learning Framework for Material-systems Intelligence: *Christopher Rudolf*[1]; [1]US Naval Research Laboratory

8:20 AM
Digital Polycrystalline Microstructure Generation Using Diffusion Probabilistic Models: *Patxi Fernandez-Zelai*[1]; Jiahao Cheng[1]; Jason Mayeur[1]; Amir Ziabari[1]; Michael Kirka[1]; [1]Oak Ridge National Laboratory

8:40 AM
Application of Machine Learning Framework in Predicting Creep Response of High Temperature Alloys: *Md Abir Hossain*[1]; Jacob Pellicotte[1]; Calvin Stewart[1]; [1]The Ohio State University

9:00 AM
Simulating Macroscale Microstructures Using Advanced Programming and Numerical Methods: *Evan Lieberman*[1]; Caleb Yenusah[1]; Adrian Diaz[1]; Ricardo Lebensohn[1]; Nathaniel Morgan[1]; [1]Los Alamos National Laboratory

9:20 AM
Development of a Silicon Carbide Machine Learned Interatomic Potential for Extreme Environments: *Michael MacIsaac*[1]; Salil Bavdekar[1]; Douglas Spearot[1]; Ghatu Subhash[1]; [1]University of Florida

9:40 AM
Hybrid Simulation Method Based on Molecular Dynamics and Machine Learning to Improve Property Prediction with Lower Computational Cost in Complex System: *Owais Ahmad*[1]; Somnath Bhowmick[1]; [1]IIT Kanpur

10:00 AM Break

10:20 AM
New Refractory High Entropy Alloys Discovery by Physics Discovery: *Lele Luan*[1]; Chen Shen[1]; Scott Oppenheimer[1]; Feng Zhang[1]; Ryan Jacobs[1]; Liping Wang[1]; [1]GE Research

10:40 AM
Novel Convolutional-Recurrent Hybrid Neural Network for Predicting Fission Gas Release in UO$_2$ Nuclear Fuel: *Peter Toma*[1]; Md Muntaha[1]; Joel Harley[1]; Michael Tonks[1]; [1]University of Florida

11:00 AM
Robotic Bending of Craniomaxillofacial Graft Fixation Plates: *Brian Thurston*[1]; Javier Vazquez-Armendariz[1]; Luis Olivas-Alanis[1]; Tobias Mahan[1]; Ciro Rodriguez[1]; Michael Groeber[1]; Stephen Niezgoda[1]; Hany Emam[1]; Roman Skoracki[1]; Jian Cao[1]; Glenn Daehn[1]; David Dean[1]; [1]The Ohio State University

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LIGHTWEIGHT ALLOYS

Light Metal Technology — Aluminum Casting and Diecasting

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University

Tuesday AM | October 3, 2023
A212 | Greater Columbus Convention Center

Session Chair: Alan Luo, Ohio State University

8:00 AM
Assesment of Mechanical Behavior of Tilt Poured A201 and Nb Doped A356 Alloy in Correlation of CT Scan Metrics with Finite Element Simulations: *Kamil Armagan Gul*[1]; Can Dizdar[1]; Ozgur Aslan[2]; Derya Dispinar[1]; Eyüp Kayali[1]; [1]Istanbul Technical University; [2]Atilim University

8:20 AM
Assessment of Material Behavior Models to Simulate Cast Aluminum Alloy Mechanical Behaviors: *Kamil Armagan Gul*[1]; Derya Dispinar[2]; Eyüp Kayali[1]; Ozgur Aslan[3]; [1]Istanbul Technical University; [2]Foseco Non Ferrous; [3]Atilim University

8:40 AM
Characterisation of A201 Alloy Produced by Low Pressure Die Casting into Resin Sand Moulds: *Ali Kalkanli*[1]; Ahmet Altun[2]; Cem Cetinkaya[2]; Levent Subas[3]; Bars Bilal Altıntas[3]; Erdem Bektas[3]; Guray Akbulut[3]; [1]Middle Technical University; [2]Altun Foundry; [3]TE

9:00 AM
Effect of Melt Thermal-rate Treatment on Microstructure and Mechanical Properties in Al-Zn-Mg-Cu Alloy Billets Fabricated by Direct-chill Casting: *Byung-joo Kim*[1]; Young-Hee Cho[1]; Hyun-Seok Cheon[1]; Jisu Kim[1]; Su-Hyeon Kim[1]; [1]Korea Institute of Materials Science

9:20 AM
Evolution of Spheroidal -AlFeSi Phase in 1200 Aluminum by 3D Visualization Using FIB-SEM: *Mami Narita*[1]; Hisashi Sato[1]; Yoshimi Watanabe[1]; Tetsuya Motoi[2]; Hideo Yoshida[3]; [1]Nagoya Institute of technology; [2]UACJ Foil Corporation; [3]ESD Laboratory

9:40 AM
Role of Alloying Elements and Solidification Conditions on the Evolution of Fe-rich Intermetallic Phases in Recycled Al-Si Alloys with Higher Fe: *Nagasivamuni Balasubramani*[1]; Michael Moodispaw[1]; Gabriel Garcia[1]; Chuan Zhang[2]; Alan Luo[1]; [1]The Ohio State University; [2]CompuTherm

10:00 AM Break

10:20 AM
Mechanical Property Comparison of Al11Si Wheels Grain Refined by Ti, Nb and Nucleant 1582: Ferhat Aydogan[1]; Kerem Dizdar[2]; Hayati Sahin[3]; Elvan Mentese[1]; *Derya Dispinar*[3]; [1]Doktas Wheels; [2]Istanbul Technical University; [3]Foseco

10:40 AM
Mechanical Property of Nb Grain Refined AlSi11 Alloy: *Kerem Dizdar*[1]; Semih Ates[1]; Ozan Guler[2]; Gokhan Basman[3]; Derya Dispinar[4]; Fahir Arisoy[1]; [1]Istanbul Technical University; [2]Kormetal; [3]Eti Krom; [4]Foseco

11:00 AM
Optimization of Die Casting Process with Various Oxygen Concentration: *Gi-Geun Hong*[1]; Yoon Suk Choi[2]; Youngcheol Lee[1]; [1]Korea Institute of Industrial Technology; [2]Pusan National University

11:20 AM
Investigation on the Grain Refinement of Mg-Al Alloys by Superheating Process Using Rapid Solidification Process: *Sungsu Jung*[1]; Yongho Park[2]; Youngcheol Lee[1]; [1]Korea Institute of Industrial Technology; [2]Pusan National University

11:40 AM
Hardness-thermal Conductivity Synergy in Al-Si-Mg Casting Alloy: *Saif Kayani*[1]; Kwangjun Euh[1]; Jung-Moo Lee[1]; Young-Hee Cho[1]; [1]Korea institute to Materials Science

CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — New Advances in Ceramic Processing II: Conventional vs. Additive Manufacturing

Sponsored by: ACerS Manufacturing Division

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

Tuesday AM | October 3, 2023
B233 | Greater Columbus Convention Center

Session Chairs: Alexis Lewis, National Science Foundation; Eduardo Saiz Gutierrez, Imperial College London

8:00 AM Invited
Trends and Opportunities in Manufacturing and Processing of Advanced Ceramic Materials at the National Science Foundation: *Alexis Lewis*[1]; [1]National Science Foundation

8:30 AM Invited
Ceramic Powder Processing ("Think Like a Particle?" or Perhaps "Think Like a Defect?"): *William Carty*[1]; Hyojin Lee[1]; [1]New York State College of Ceramics at Alfred University

9:00 AM
In Situ Video Monitoring of Zirconium Active Braze Alloy for Joining Al_2O_3 to Kovar: *Anthony McMaster*[1]; Anne Grillet[1]; Pankaj Kumar[2]; Patrick Price[1]; [1]Sandia National Laboratories; [2]University of New Mexico

9:20 AM
Design of a Polymer-Metal-Nanoparticle System for Polymer Infiltration and Pyrolysis to Form Ceramic Composites: *Jared Delcamp*[1]; Kara Martin[2]; Nicholas Posey[1]; Katherine Acord[2]; Christina Thompson[3]; Matthew Dickerson[2]; [1]UES/AFRL; [2]AFRL; [3]University of Kentucky/AFRL

9:40 AM Invited
Embedded Printing in Ceramics: *Eduardo Saiz*[1]; Shitong Zhou[1]; Iuliia Tirichenko[1]; Harry Payne[1]; Yinglun Hong[1]; Florian Bouville[1]; Xun Zhang[2]; Philip Withers[2]; [1]Imperial College of London; [2]University of Manchester

10:10 AM Break

10:30 AM Invited
Additive Manufacturing of Transparent Optical Ceramics: *Yiquan Wu*[1]; [1]Alfred University

11:00 AM Invited
Tailoring Thermal Insulation Ceramic Architectures from Additive Manufacturing: *Shenqiang Ren*[1]; [1]University at Buffalo, The State University of New York

11:30 AM Invited
Binder Jet Additive Manufacturing for Advanced Ceramics: *Nicholas Ku*[1]; Animesh Bose[2]; Mathew Ivill[1]; Lee Magness[1]; Jeffrey Swab[1]; Steven Kilczewski[1]; Kristopher Behler[1]; Lionel Vargas-Gonzalez[1]; [1]DEVCOM - Army Research Laboratory; [2]Optimus Alloys

ARTIFICIAL INTELLIGENCE

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

Sponsored by: ACerS Basic Science Division, ACerS Electronics Division

Program Organizers: Amanda Krause, Carnegie Mellon University; Alp Sehirlioglu, Case Western Reserve University; Daniel Ruscitto, GE Research

Tuesday AM | October 3, 2023
A121 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
The Conundrum of Ambiguous Feature Sets in Materials Informatics for Images: *Kevin Field*[1]; Gabriella Bruno[1]; Matthew Lynch[1]; Ryan Jacobs[2]; Dane Morgan[2]; [1]University of Michigan; [2]University of Wisconsin

8:30 AM
Machine Learning Segmentation Methods for Fatigue Fracture Surface Defect Analyses: Austin Ngo[1]; *Oluwatumininu Adeeko*[1]; David Scannapieco[1]; John Lewandowski[1]; [1]Case Western Reserve University

8:50 AM
Using Computer Vision to Cluster Fatigue Life Based on Small Crack Characteristics: *Katelyn Jones*[1]; Paul Shade[2]; Reji John[2]; Elizabeth Holm[3]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Air Force Research Lab; [3]University of Michigan

9:10 AM Invited
Efficient Void Shape Optimization Using Deep Generative Convolutional Neural Networks: Zihan Wang[1]; *Anindya Bhaduri*[2]; Sandipp Krishnan Ravi[2]; Piyush Pandita[2]; Changjie Sun[2]; Liping Wang[2]; [1]University of Connecticut; [2]GE Research

9:40 AM
Out-of-Domain Prediction of Material Property Using Deep Learning: *Thomas Lu*[1]; Aarti Singh[1]; [1]Carnegie Mellon University

10:00 AM Break

10:20 AM
Predicting the Occurrence and Mechanism of Liquid Metal Embrittlement Using Machine Learning: *Benjamin Begley*[1]; Justin Norkett[1]; Cameron Frampton[1]; Victoria Miller[1]; [1]University of Florida

10:40 AM
Topic Modelling Framework for Rapid Digestion of Additive Manufacturing Literature: *Benjamin Glaser*[1]; [1]Carnegie Mellon University

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NANOMATERIALS

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

Sponsored by: ACerS Other

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

Tuesday AM | October 3, 2023
B235 | Greater Columbus Convention Center

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

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8:00 AM Introductory Comments

9:00 AM
The Utilization of Musa paradisiaca L. in the Green Synthesis of Iron Oxide Nanoparticles: *Esther Ikhuoria*[1]; Rachel Okojie[1]; Ita Uwidia[1]; Ikhazuagbe Ifijen[2]; Doris Ikechukwu[1]; [1]University of Benin; [2]Rubber Research Institute of Nigeria

9:20 AM
Nanoparticles Against Various Types of Bacteria: A Concise Review: Ikhazuagbe Ifijen[1]; Presley Ohikhena[2]; Best Atoe[3]; *Doreen Omorogbe*[4]; [1]Rubber Research Institute of Nigeria; [2]Roadmap Construction Company Limited; [3]Worldwide Healthcare; [4]University Basic Education

9:40 AM
Cool Coat: A Wearable Solution for Advanced Thermal Management: *Qichen Fang*[1]; Ayush Raut[1]; Kyle Brittingham[1]; Vamsi Krishna Reddy Kondapalli[1]; Myoungok Kim[1]; Ashley Kubley[1]; Vesselin Shanov[1]; [1]University of Cincinnati

10:00 AM Break

10:20 AM
Development and Dissemination of Reference Materials of SWCNT Dispersions as Conductive Additive for Secondary Battery Electrode: *Jooyeon Ha*[1]; Boram Jeon[1]; Hoyoun Yoo[1]; [1]Korea Testing Laboratory

10:40 AM
Coating and Embedding Selenide Nanocrystals for Optical Applications: *Hong Huang*[1]; [1]Wright State University

11:00 AM
Organic Quantum Materials for Excitonic Applications: *Lan Li*[1]; [1]Boise State University

11:20 AM
Nanoscale GDC Catalyst Infiltration for Mitigating Fuel Electrode Degradation in SOECs: *Emily Ghosh*[1]; John-In Lee[1]; Jillian Mulligan[1]; Uday Pal[1]; Srikanth Gopalan[1]; Soumendra Basu[1]; [1]Boston University

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BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials III

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Tuesday AM | October 3, 2023
A222 | Greater Columbus Convention Center

Session Chairs: Bikramjit Basu, Indian Institute of Science; Annabel Braem, Katholieke Universiteit Leuven

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8:00 AM Invited
3D Printing and Natural Medicine: Convergence of Knowledge to Treat Bone Disorders: *Susmita Bose*[1]; [1]Washington State University

8:20 AM
A Novel Polymethylmethacrylate Silicon Nitride Bone Cement: Guiseppe Pezzotti[1]; Elia Marin[1]; Qing Yang[2]; Obinna Ajunwa[2]; Enrico Marsili[3]; B. Bal[4]; *Bryan McEntire*[4]; [1]Kyoto Institute of Technology; [2]Nazarbayev University; [3]Nottingham Ningbo China Beacons of Excellence Research and Innovation Institute; [4]SINTX Technologies, Inc.

8:40 AM
Better Osteogenesis of Electrically Active Hydroxyapatite-Calcium Titanate Biocomposites in a Rabbit Animal Model: *Prafulla Mallik*[1]; Bikramjit Basu[2]; Kantesh Balani[3]; [1]Indira Gandhi Institute of Technology Sarang; [2]IISc Bangalore ; [3]IIT Kanpur

9:00 AM Invited
Biomimetic Scaffolds for Bone Regeneration Applications: Role of Ions in Calcium Phosphates-based Biomaterials: *Antonia Ressler*[1]; [1]Tampere University

9:20 AM Invited
Organic/Inorganic Hybrid Micelle Nanostructure for Near Infrared Biomedical Photonics: *Kohei Soga*[1]; Masakazu Umezawa[1]; Masao Kamimura[1]; [1]Tokyo University of Science

BIOMATERIALS

Next Generation Biomaterials — American Ceramics Society Bioceramics Division Awards Presentations

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Tuesday AM | October 3, 2023
A222 | Greater Columbus Convention Center

Session Chairs: Bikramjit Basu, Indian Institute of Science; Annabel Braem, Katholieke Universiteit Leuven

9:40 AM Introductory Comments

9:50 AM Invited
Larry L. Hench Lifetime Achievement Award: Regenerative Engineering and Bioceramics: *Cato Laurencin*[1]; [1]University of Connecticut

10:30 AM Break

10:50 AM Invited
Tadashi Kokubo Award: Design of Glasses for Soft Tissue Engineering - Challenges and Future Research Directions From the Perspective of a Materials Scientist: *Ashutosh Goel*[1]; Aditya Kumar[2]; [1]Rutgers, The State University of New Jersey; [2]Missouri S&T

11:20 AM Invited
Global Young Bioceramicist Award: Silicate Based Bioactive Glasses: What Have We Learned So Far?: *Saurabh Kapoor*[1]; [1]Sterlite Technologies

11:40 AM Invited
Bioceramics Young Scholar: Novel Solution to Resolve Machine Default 'Core-Shell' Mode of Bioceramics Binderjetting: Validation in Microstructure and Mechanical Properties: *Srimanta Barui*[1]; Deepa Mishra[2]; Gowtham NH[2]; Bikramjit Basu[2]; [1]University of Connecticut Health; [2]Indian Institute of Science

LIGHTWEIGHT ALLOYS

Recent Developments in Light-Weight Composites and Materials — Microsrtuctures and Properties II

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

Program Organizers: Ramasis Goswami, Naval Research Laboratory; Tanjore Jayaraman, United States Air Force Academy; Nikhil Gupta, New York University; Aashish Rohatgi, Pacific Northwest National Laboratory; Sudip Bhattacharya, 6K Inc.

Tuesday AM | October 3, 2023
A211 | Greater Columbus Convention Center

Session Chair: Ramchandra Canumala, Weldaloy

8:00 AM
Effect of Cooling Rate on High Temperature Mechanical Properties Al-Ce Based Alloys: *Obidimma Ikeh*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

8:30 AM Invited
Mitigating the Recrystallization Process in Cold Worked Cu-Al2O3 Composite: *Ramasis Goswami*[1]; [1]Naval Research Laboratory

9:00 AM
Influence of Cryo-FSP on Microstructural Evolution and Mechanical Behaviour of Stir Cast AA5083-SiC Nanocomposite: *Gaurav Rajan*[1]; Suhrit Mula[1]; [1]IIT Roorkee

9:20 AM
Energy Absorption Property of Aluminum Foam Developed by Reinforcing Aluminum Alloy(LM24) with Cermet Hollow Spheres (CHS) of Diameters Ranging from 3 to 6 mm.: *Fisseha Weldemariam*[1]; Makhan Singh[1]; Naresh Bhatnagar[1]; [1]Indian Institute of Technology

9:40 AM
Thermal Expansion of Al-Ca Deformation Processed Metal-metal Composites: *Dustin Hickman*[1]; Trevor Riedemann[2]; Iver Anderson[2]; [1]Iowa State University; [2]Ames National Laboratory

10:00 AM Break

10:20 AM Invited
High Strength Light-weight Al Matrix Composites Reinforced with Al-Cu-Fe Quasicrystal: Yagnesh Shadangi[1]; *Nilay Mukhopadhyay*[2]; [1]Indian Institute of Technology (BHU); Seoul National University; [2]Indian Institute of Technology (BHU)

BIOMATERIALS

Society for Biomaterials: Student Poster Contest + Rapid Fire — Presentations

Sponsored by: Society for Biomaterials

Program Organizers: Roger Narayan, University of North Carolina; Katelyn Swindle-Reilly, The Ohio State University; David Kohn, University of Michigan; Christopher Siedlecki, Penn State College of Medicine

Tuesday AM | October 3, 2023
A221 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Rapid Fire Posters

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Electronics Division, ACerS Basic Science Division

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

Tuesday AM | October 3, 2023
A220 | Greater Columbus Convention Center

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

8:00 AM Keynote
Thermodynamic Stability of Boron Imidazolate Frameworks (BIFs) Synthesized by Mechanochemistry: *Alexandra Navrotsky*[1]; Gerson Leonel[1]; Cameron Lenox[2]; Tomislav Friščić[2]; [1]Arizona State University; [2]McGill University

8:40 AM Invited
CO_2 Conversion Catalyzed by Open Metal Sites in Porous Framework Materials: *Wei Zhou*[1]; [1]National Institute of Standards and Technology

9:10 AM Invited
Neutron and X-ray Scattering Measurements of Materials for Hydrogen Storage: *Ryan Klein*[1]; Craig Brown[2]; [1]National Renewable Energy Laboratory; [2]National Institute of Standards and Technology

9:40 AM Invited
Structure and Sorption Properties of Nickel-3-Amino-Isonicotinate (Ni-NH_2-INA), a Microporous Material for CO_2 Capture Application: *Winnie Wong-Ng*[1]; Jeffrey Culp[2]; Yu-Sheng Chen[3]; Peter Zavalij[4]; Daniel Siderius[1]; Tieyan Chang[3]; Mingjian Zhang[3]; [1]National Institute of Standards and Technology; [2]National Energy Technology Laboratory; [3]University of Chicago; [4]University of Maryland

10:10 AM Break

10:30 AM Invited
Accelerating Development of Porous Sorbents for Direct Air Capture Using High Throughput Computing and Machine Learning: *David Sholl*[1]; Logan Brabson[2]; Xiaohan Yu[2]; Sihoon Choi[2]; Andrew Medford[2]; Anuroop Sriram[3]; [1]Oak Ridge National Laboratory; [2]Georgia Institute of Technology; [3]Meta AI Research

11:00 AM Invited
Utilizing, Tuning, and Modeling Adsorption in Flexible MOFs for Improved Separation of Binary Mixtures: *Lukas Bingel*[1]; Krista Walton[1]; [1]Georgia Institute of Technology

11:30 AM
Structures of MOF: More Insight from 17O Solid State NMR: *Christian Bonhomme*[1]; Yining Huang[2]; Christel Gervais[1]; [1]Sorbonne University; [2]University of Western Ontario

11:50 AM Invited
Porosity at the Molecular Level in C_{60} Fullerene-based Structures: *Lawrence Cook*[1]; Gregory Brewer[1]; Winnie Wong-Ng[2]; [1]Catholic University of America; [2]NIST

CERAMIC AND GLASS MATERIALS

The American Ceramic Society Journal Awards Symposium — American Ceramic Society Journal Awards Session

Sponsored by: ACerS Other

Program Organizer: John Mauro, Pennsylvania State University

Tuesday AM | October 3, 2023
B230 | Greater Columbus Convention Center

Session Chair: John Mauro, The Pennsylvania State University

8:00 AM Invited
Phase Stability and CMAS Corrosion Resistance Optimization of Rare Earth Disilicates for Environmental Barrier Coating Application via High Entropy Design: *Luchao Sun*[1]; Jingyang Wang[1]; [1]Institute of Metal Research

8:30 AM Invited
NZSP-MS/PEO-NaBF4 Ceramic-polymer Composite-electrolyte for Conformal Solid-state Na-ion Batteries: Sushmita Dwivedi[1]; Sudharshan Vasudevan[1]; *Palani Balaya*[1]; [1]National University of Singapore

9:00 AM Invited
SiOC-based Strain Gauge with Ultrahigh Piezoresistivity at High Temperatures: *Emanuel Ionescu*[1]; Emmanuel Ricohermoso[2]; Ralf Riedel[2]; [1]Fraunhofer IWKS; [2]TU Darmstadt

9:30 AM Invited
Synchrotron X-ray Multiscale Tomography: Visualization of Heterogeneous Microstructures, Defects, and Microfractures in Ceramics: *Gaku Okuma*[1]; Fumihiro Wakai[1]; [1]National Institute for Materials Science

10:00 AM Break

10:30 AM Invited
Vacancy Ordering in Substoichiometric Zirconium Carbide: *Theresa Davey*[1]; Ying Chen[1]; [1]Tohoku University

11:00 AM Invited
Vibrational Spectroscopy Analysis of Silica and Silicate Glass Networks: Hongshen Liu[1]; Huseyin Kaya[2]; Yen-Ting Lin[1]; *Andrew Ogrinc*[1]; Seong Kim[1]; [1]Penn State University; [2]Corning Inc

11:30 AM Invited
Journal of the American Ceramic Society 2nd Century Trailblazers Award Lecture: *John Mauro*[1]; [1]Pennsylvania State University

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Frontiers of Thermodynamics

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

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

Tuesday AM | October 3, 2023
A123 | Greater Columbus Convention Center

Session Chair: Xiaofeng Guo, Washington State University

8:00 AM Invited
ACerS Navrotsky Award: Thermodynamic Stability, Radiation Damage and Leaching Effects in Tunnel Structured Hollandite Materials: *Kyle Brinkman*[1]; [1]Clemson University

8:40 AM Invited
Deep Learning for Large-scale Prediction of Melting Temperature and Materials Properties: *Qijun Hong*[1]; [1]Arizona State University

9:10 AM Invited
New Classes of Phase Diagrams for Materials in Extreme Environments: *Wenhao Sun*[1]; [1]University of Michigan

9:40 AM Invited
Heat Capacity of Microgram Oxide Samples by Fast Scanning Calorimetry: *Alexandra Navrotsky*[1]; Laura Bonatti[1]; Ben Brugman[1]; Tamilarasan Subramani[1]; Kurt Leinenweber[1]; [1]Arizona State University

10:10 AM
Formation of Carbon Nanotubes from Multilayered Graphene in Astrophysical Settings: *Abhishek Thakur*[1]; Krishna Muralidharan[1]; Abu Asaduzzaman[2]; Thomas Zega[1]; Lucy Ziurys[1]; [1]University of Arizona; [2]The Pennsylvania State University

SPECIAL TOPICS

MS&T23 Plenary Session

Tuesday PM | October 3, 2023
Union Station Ballroom A | Greater Columbus Convention Center

2:00 PM Welcome Comments

2:05 PM Introductory Comments

2:10 PM Plenary
TMS Plenary Speaker: Lightweight Materials and Sustainable Manufacturing: The Role of Integrated Computational Materials Engineering (ICME): *Alan Luo*[1]; [1]Ohio State University

2:50 PM Award Presentation

2:55 PM Introductory Comments

3:00 PM Plenary
ACerS Edward Orton, Jr. Memorial Lecture: Microscopy is All You Need: The Rise of Autonomous Science: *Sergei Kalinin*[1]; [1]University of Tennessee, Knoxville

3:40 PM Award Presentation

3:45 PM Introductory Comments

3:50 PM Plenary
AIST Adolf Martens Memorial Steel Lecture: Practical Applications of Physical Metallurgy to Industrial Steel Product Development: *Keith Taylor*[1]; [1]SSAB

4:30 PM Award Presentation

4:35 PM Concluding Comments

SPECIAL TOPICS

ACerS Frontiers of Science and Society: The Rustum Roy Lecture

Sponsored by: ACerS

Tuesday PM | October 3, 2023
B130 | Greater Columbus Convention Center

Session Chair: Young-Wook Kim, University of Seoul

1:00 PM Invited
Strategically Aligned Additive Manufacturing: Disruptor to Global Supply Chains and Enabler of Sustainable Societal Development: *Mritunjay Singh*[1]; [1]Ohio Aerospace Institute

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — AM Modeling, Simulation and Machine Learning - Structure & Property II

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Computational Materials Science and Engineering Committee, TMS: ICME Committee

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

Wednesday AM | October 4, 2023
C150 | Greater Columbus Convention Center

Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Li Ma, Johns Hopkins University Applied Physics Laboratory

8:00 AM
Finite Element Simulation Based on Constitutive Model of Cellular-structured Metals Produced by Additive Manufacturing: *Hyoung Seop Kim*[1]; [1]Pohang University of Science and Technology

8:20 AM
The Effect of Disorder and Constitutive Material on the Mechanical Properties of Bioinspired Honeycombs: Sahar Choukir[1]; *Chandra Veer Singh*[1]; [1]University of Toronto

8:40 AM
Formation and Strengthening of Triple-twinned Alpha Variants in Additive Manufactured Titanium Alloy via Atomistic Simulation: *Hao Wang*[1]; Xuezheng Yue[1]; [1]University of Shanghai for Science and Technology

9:00 AM
Better Understanding of Cracking Phenomena in High-Strength Superalloys through Multiphysics Modeling in Additive Manufacturing: *Marcus Lam*[1]; [1]Monash University

ADDITIVE MANUFACTURING

Additive Manufacturing of High and Ultra-high Temperature Ceramics and Composites: Processing, Characterization and Testing — SLA/Binder Jet and Miscellaneous Techniques

Sponsored by: ACerS Engineering Ceramics Division, ACerS Manufacturing Division, ACerS Young Professionals Network

Program Organizers: Corson Cramer, Oak Ridge National Laboratory; Greg Hilmas, Missouri University of Science and Technology; Lisa Rueschhoff, Air Force Research Laboratory; David Mitchell, Oak Ridge National Laboratory

Wednesday AM | October 4, 2023
C161A/161B | Greater Columbus Convention Center

Session Chairs: David Mitchell, Oak Ridge National Laboratory; Lisa Rueschhoff, Air Force Research Laboratory

8:00 AM
Anisotropic Shrinkage of Additively Manufactured Ceramics Via Stereolithography: Kevin Strong[1]; *Brian Lester*[1]; Dale Cillessen[1]; [1]Sandia National Laboratories

8:30 AM
Residual Stress in Additively Manufactured Alumina via Stereolithography: *James Nance*[1]; Kevin Strong[1]; Dale Cillessen[1]; [1]Sandia National Laboratories

8:50 AM
Additive Manufacturing of Silicon Nitride Using Stereolithography: *Corson Cramer*[1]; Beth Armstrong[1]; Trevor Aguirre[1]; Steve Bullock[1]; David Mitchell[1]; [1]Oak Ridge National Laboratory

9:10 AM
Vat Photopolymerization-based Additive Manufacturing of Different Non-oxide Ceramics: Martin Schwentenwein[1]; *Shawn Allan*[2]; [1]Lithoz GmbH; [2]Lithoz America LLC

9:40 AM
Towards Binder Jet Additive Manufacturing of High-temperature Ceramics - Understanding the Fundamentals to Overcome Processing Challenges: *Daniel Oropeza*[1]; [1]University of California, Santa Barbara

10:10 AM Break

10:30 AM
Preceramic Polymer Binders for Binder Jet Additive Manufacturing of Silicon Carbide: *Dustin Gilmer*[1]; Amy Elliott[2]; Steve Bullock[2]; Corson Cramer[2]; [1]UT-Oak Ridge Innovation Institute; [2]Oak Ridge National Laboratory

10:50 AM
Interpenetrating Phase Heterogeneous Ceramic-refractory Metal Composite Materials Created via Additive Manufacturing: *David Mitchell*[1]; Christopher Ledford[1]; Trevor Aguirre[1]; Corson Cramer[1]; Steven Bullock[1]; Michael Kirka[1]; Michael Lance[1]; Tomas Grejtak[1]; [1]Oak Ridge National Laboratory

11:10 AM
Carbide Based Fiber Growth by Laser Chemical Vapor Deposition: Kenan Fronk[1]; Charlie Cook[1]; *Gregory Thompson*[1]; [1]University of Alabama

ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing - Miscellaneous Section I

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

Wednesday AM | October 4, 2023
C151 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Characterization of Biodegradable Mg-1.2Zn-0.5Ca-0.5Mn Alloy Powder for Additive Manufacturing: *Agnieszka Chmielewska*[1]; Daehyun Cho[1]; Thomas Avey[1]; Alan Luo[1]; David Dean[1]; [1]The Ohio State University

8:20 AM
Development of Titanium-Zirconium-Molybdenum Alloy for Structural Material Usage in Microreactors: *John Carpenter*[1]; Michael Brand[1]; Joseph Goodrich[1]; Rose Bloom[1]; [1]Los Alamos National Laboratory

8:40 AM
Hot Deformation Behaviour of TiAlMn Alloys Fabricated Using Laser Engineered Net Shaping (LENS): *Sibusisiwe Motha*[1]; Monnamme Tlotleng[2]; Nthabiseng Maledi[1]; Michael Bodunrin[1]; [1]University of the Witwatersrand; [2]Council for Scientific and Industrial Research

9:00 AM
Monolithic and Bimetallic M250 Structures via WAAM: Amit Bandyopadhyay[1]; Aruntapan Dash[1]; *Lile Squires*[1]; Jose Avila[1]; Susmita Bose[1]; Victor Champagne[2]; [1]Washington State University; [2]US Army Research Laboratory

9:20 AM
On the Origin of Cracking in Laser Powder Bed Fusion Processed LaCe(Fe,Mn,Si)13, and the Impact of Post-Processing: *Kun Sun*[1]; Moataz Attallah[1]; [1]University of Birmingham

9:40 AM
CALPHAD Aided Design of Aluminum Alloys for Additive Manufacturing: *Emily Moore*[1]; [1]Lawrence Livermore National Laboratory

10:00 AM Break

10:20 AM
Development of Metal Powders for Additive Manufacturing: *Lorena Perez*[1]; Luke Brewer[1]; [1]University of Alabama

10:40 AM
Energy-efficient 4D Printing of Green Metals: *Chaolin Tan*[1]; [1]Singapore Institute of Manufacturing Technology(SIMTech), A*STAR

11:00 AM
Environmental Degradation of AM-fabricated Structural Alloys: *Guy Ben Hamu*[1]; [1]SCE - Shamoon College of Engineering

11:20 AM
Femtosecond Laser-controlled Melting of CoresShell Metallic Nanoparticles- insights from Molecular Dynamics Atomistic Simulations: *Iman Salehinia*[1]; Michael Zawadzki[1]; [1]Northern Illinois University

11:40 AM
Multi-scale Processing-structure-property Relationships for Directed Energy Deposition: *William Kunkel*[1]; Dan Thoma[1]; [1]University of Wisconsin-Madison

12:00 PM
Origin of Epitaxy Loss in Laser Powder Bed Fusion: *Prosenjit Biswas*[1]; Ji Ma[1]; [1]University of Virginia

ADDITIVE MANUFACTURING

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

Sponsored by: TMS: Additive Manufacturing Committee

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

Wednesday AM | October 4, 2023
C171 | Greater Columbus Convention Center

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

8:00 AM Introductory Comments

8:05 AM
Thermal Strategies for Producing Metallic Components from Metal-polymer Feed-stock via Material Extrusion: *Matthew Caputo*[1]; Jacob Wetherill[1]; Grace Marhulik[1]; [1]Pennsylvania State University - Shenango

8:25 AM
NdFeB and SmFeN Anisotropic Permanent Magnets in a Polyamide Matrix Made with Additive Manufacturing: *James Kemp*[1]; Haobo Wang[2]; M. Parans Paranthaman[1]; [1]Oak Ridge National Laboratory; [2]The University of Tennessee, Knoxville

8:45 AM Invited
Polymer Additive Manufacturing of Low-cost Agile Tooling for Sheet Metal Forming: *Sam Storts*[1]; Ryan Hahnlen[2]; Alex Miller[1]; Muheeb Hijazeen[1]; Carley Miller[1]; Belquis Mbayu[1]; Rohan Madan[1]; Jacob Ross[1]; Jason Walker[1]; [1]The Ohio State University; [2]Honda Development & Manufacturing of America, LLC

9:15 AM
Quick Cure Silicones for Nontraditional Architectures: *Anna Guell Izard*[1]; Lemuel Perez Perez[1]; Jeremy Lenhardt[1]; Todd Weisgraber[1]; Ilse Van Meerbeek[1]; A. Melody Golobic[1]; [1]LLNL

9:35 AM Question and Answer Period

9:45 AM Break

10:05 AM
Beyond Throughput-resolution-flexibility Tradeoffs with Mutliplexed Fused Fabrication: *Jeremy Cleeman*[1]; Rajiv Malhotra[1]; [1]Rutgers University

10:25 AM
Manufacturing of High-Quality Polymer Powders for Selective Laser Sintering Using Thermally Induced Phase Separation and In-situ Sol Gel Process: *Muxuan Yang*[1]; Weinan Xu[1]; [1]University of Akron

10:45 AM
3D Printing of Silicone-Based Flexible Materials with Embedded Sensors for Soft Robotic Actuator Applications: *Emrah Demirkal*[1]; Konstantinos Sierros[1]; Derrick Banerjee[1]; John Burke[1]; Rowan Barto[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; [1]West Virginia University

11:05 AM Question and Answer Period

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Session III

Sponsored by: ACerS Other

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

Wednesday AM | October 4, 2023
C160A/160B | Greater Columbus Convention Center

Session Chairs: Dr. Navin Manjooran, Chairman, Solve; Prof. Gary Pickrell, Virginia Tech

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8:00 AM
Development of an Inconel Heat Exchanger via Binder Jetting Additive Manufacturing: *Mark Du*[1]; Joseph Hayes[2]; Kyle Myers[2]; Wenhua Yu[1]; Dileep Singh[1]; [1]Argonne National Laboratory; [2]ExOne Operating LLC

8:20 AM
Mechanical Properties of Hybrid Additively Manufactured Stainless Steel 316L: *Andrew Neils*[1]; David Hayrikyan[2]; Gerard Desjardins[2]; Nathan Post[1]; Jack Lesko[1]; [1]Roux Institute at Northeastern University; [2]bluShift Aerospace

8:40 AM
Novel Use of Laser Powder Bed Fusion Printed Copper for Electronic Resistance Spot Welding Applications: *John Martin*[1]; Brooke Dyer[2]; Mike Gaskill[2]; Frank Deley[2]; Virgil Solomon[1]; [1]Youngstown State University; [2]Taylor-Winfield Technologies, Inc.

9:00 AM
Sensitivity of Surface Porosity in Powder Bed Fusion to Process Parameters: Corey Smithson[1]; Taylor Davis[1]; Tracy Nelson[1]; *Nathan Crane*[1]; [1]Brigham Young University

9:20 AM
Intellectual Property and Legal Challenges for Additive Manufacturing: *Van Vekris*[1]; [1]Marks & Clerk

9:40 AM
Evaluation of Environmentally Assisted Cracking on Wire Arc Additively Manufactured (WAAM) AISI 316LSi: *Vishnu Ramasamy*[1]; John Lewandowski[1]; [1]Case Western Reserve University

10:00 AM Break

10:20 AM
Fabrication of Auxetic Metal Structures through Sacrificial Template Replication: *Aref Golsorkhi*[1]; Dinc Erdeniz[1]; [1]University of Cincinnati

10:40 AM
The Control of Tailored Microstructure and Thermoelectric Properties in Additively Manufactured Materials: *Connor Headley*[1]; Roberto Herrera del Valle[1]; Ji Ma[1]; Prasanna Balachandran[1]; Vijayabarathi Ponnambalam[2]; Saniya LeBlanc[2]; Dylan Kirsch[3]; Joshua Martin[3]; [1]University of Virginia; [2]George Washington University; [3]National Institute of Standards and Technology

11:00 AM
Ultra-High Temperature Performance of Additively Manufactured Refractory Alloys: *Kelly Orsborn*[1]; Eric Brizes[2]; Omar Mireles[3]; Antonio Ramirez[1]; [1]Ohio State University; [2]NASA GRC; [3]NASA MSFC

11:20 AM Concluding Comments

ADDITIVE MANUFACTURING

Additive Manufacturing: Equipment, Instrumentation and In-Situ Process Monitoring — Laser Powder Bed Fusion

Sponsored by: TMS: Additive Manufacturing Committee

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

Wednesday AM | October 4, 2023
C170 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Quantification of Build Interruptions through In-Process Monitoring and Mechanical Test: *Cameron Gygi*[1]; [1]Cdme

8:40 AM
Robust Detection of L-PBF Process Anomalies Using High-speed On-axis Melt Pool Pyrometry: *Brendan Croom*[1]; Steven Storck[1]; Vincent Pagan[1]; Mary Daffron[1]; Ari Lax[1]; Robert Mueller[1]; [1]JHU Applied Physics Laboratory

9:00 AM
Investigating the Effect of Part Geometry on Microstructure for Laser Powder Bed Fusion of Bismuth Telluride using In-Situ Process Monitoring: *Clay Perbix*[1]; Nellie Pestian[1]; Joe Walker[2]; Saniya LeBlanc[3]; Joy Gockel[1]; [1]Colorado School of Mines; [2]Arctos; [3]George Washington University

9:20 AM
An Efficiency Study of Multi-Mode Laser Profiles: *Austin Tiley*[1]; Ersilia Cozzolino[2]; Edward Herderick[3]; Antonio Ramirez[1]; [1]The Ohio State University; [2]University of Naples Ferico II; [3]NSL Analytical

9:40 AM Invited
Detecting Failures in Laser Powder Bed Fusion Additive Manufacturing of Lattice Structures Using Multi-sensor Data and Machine Learning: *Prahalad Rao*[1]; Anis Asad[1]; Ben Bevans[1]; Aiden Martin[2]; Nick Calta[2]; Brian Giera[2]; Gabe Gauss[2]; Philip DePond[2]; [1]Virginia Tech; [2]Lawrence Livermore National Labs

10:20 AM Break

10:40 AM
In-situ Pyrometric Sensing for Real-time AM Process Monitoring and Control: *Steven Storck*[1]; Vincent Pagán[1]; Brendan Croom[1]; MAry Daffron[1]; Ari Lax[1]; Robert Mueller[1]; Mark Foster[2]; Colin Goodman[2]; Morgan Trexler[1]; [1]Johns Hopkins Applied Physics Laboratory; [2]Johns Hopkins University

11:00 AM
Reinforcement Learning for In-situ Melt Pool Control during Laser Powder Bed Fusion: *Anant Raj*[1]; Latif Adurzada[1]; Benjamin Stegman[1]; Charlie Owen[1]; Hany Abdel-Khalik[1]; Xinghang Zhang[1]; John Sutherland[1]; [1]Purdue University

11:20 AM
Implementing Statistical Process Control in Laser Powder Bed Fusion Metal Additive Manufacturing: *Venkatavaradan Sunderarajan*[1]; Suman Das[1]; [1]Georgia Institute of Technology

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advanced Ceramics for Environmental Remediation — Session II

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

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

Wednesday AM | October 4, 2023
B240/241 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Multifunctional Materials for Emerging Technologies: *Federico Rosei*[1]; [1]INRS Centre for Energy, Materials and Telecommunications

8:30 AM Invited
Building Oxide Semiconductor Structures; From Atom Structure to Microstructure: *Gunnar Westin*[1]; [1]Uppsala University

9:00 AM Invited
Design and Structuring of Microporous Ceramics for CO2 Capture and Utilization: *Farid Akhtar*[1]; [1]Lulea University of Technology

9:30 AM Invited
In Situ Vibrational Spectroscopy Studies of CO2 Electroreduction at Cu-based Electrocatalysts: *Heng-Liang Wu*[1]; [1]National Taiwan University

10:00 AM Break

10:20 AM Invited
Small yet Bright?! Microwave-assisted Synthesis of Upconverting Nanoparticles: *Eva Hemmer*[1]; [1]University of Ottawa

10:50 AM
Ceramic Materials for Sustainable Capture and Reuse of Plant Nutrients as Fertilizer: *Allen Apblett*[1]; Ciara Kelley[1]; Patrick Kitzel[1]; [1]Oklahoma State University

PROCESSING AND MANUFACTURING

Advanced Joining Technologies for Automotive Lightweight Structures — Friction Stir Welding (FSW) and Self-pierce Riveting (SPR)

Sponsored by: TMS: Aluminum Committee, ACerS Manufacturing Division

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

Wednesday AM | October 4, 2023
B244/245 | Greater Columbus Convention Center

Session Chairs: Michael Bonner, Saint Clair Systems, Inc.; Yan Huang, Brunel University London

8:00 AM Invited
Multi-materials Dissimilar Joints by Friction Self-piercing Riveting for Lightweight Vehicle Applications: *Yong Chae Lim*[1]; Yuan Li[1]; Hui Huang[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

8:30 AM
Dissimilar Material Joining of Superwood to Aluminum by Self-Pierce Riveting and Rivbonding: *Matt Hartsfield*[1]; Ali Nassiri[1]; Liangbing Hu[2]; Alan Luo[1]; [1]The Ohio State University; [2]University of Maryland

8:50 AM
Lightweight Welds of Armor Steels Using Friction Stir Welding: *Jhoan Guzman*[1]; Paul Lida[1]; Martin McDonnell[2]; Antonio Ramirez[1]; [1]The Ohio State University; [2]The United States Army Combat Capabilities Development Command (DEVCOM) Ground Vehicle Systems Center (GVSC)

9:10 AM
A Novel Self-reacting Tool Design to Weld Thick Aluminium Plates Using Friction Stir Welding - Weld Characteristics and Performance Analysis: Aishwary Mishra[1]; Ilyas Hussain[2]; *Jose Immanuel Rajan*[2]; [1]IIST Trivandrum ; [2]IIT Bhilai

9:30 AM
Resistance Sintering Technique for Advance Metal Matrix Composite Creation: *Olga Eliseeva*[1]; Srinath Kistampally[2]; Jerry Gould[1]; [1]Ewi; [2]Martinrea

9:50 AM
The Role of Material Selection and Thermal Cycling on Tool Life in Refill Friction Stir Spot Welding: *Michael Eff*[1]; Rafael Giorjao[1]; Arnold Wright[2]; Dave Hofferbert[2]; [1]Ewi; [2]BOND Technologies

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Session I

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

Wednesday AM | October 4, 2023
A120 | Greater Columbus Convention Center

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

8:00 AM Introductory Comments

8:40 AM
Corrosion Phenomena in Additively Manufactured Aluminum Alloys Containing Quasicrystalline Dispersoids: *Sarshad Rommel*[1]; Mingxuan Li[1]; Thomas Watson[2]; Callie Benson[3]; Rainer Hebert[1]; Mark Aindow[1]; [1]University of Connecticut; [2]Pratt & Whitney; [3]Collins Aerospace

9:00 AM
Effect of Laser Surface Treatment on the Corrosion and Fatigue Performance of AA5456-H116 Alloys: *Rajaguru Jeyamohan*[1]; Mohammed A. Shabana[1]; Ji Ma[1]; James T. Burns[1]; John R. Scully[1]; [1]University of Virginia

9:20 AM
Performance of High Z and High-density Multifunctional Materials in Harsh Environments: *Narsingh Singh*[1]; Ching Hua Su[2]; Bradley Arnold[1]; Fow-Sen Choa[1]; Narasimha Prasad[3]; Aria Tauraso[1]; Meghan Brandt[1]; Amalthea Trobare[1]; Eric Bowman[1]; [1]University of Maryland Baltimore County; [2]NASA Marshall Space Flight Center; [3]NASA Langley Research Center

9:40 AM
Understanding SCC Resistance and Failure in AF96 Welded Joints: *Mary Cefaratti*[1]; Antonio Ramirez[1]; Jenifer Locke[1]; [1]Ohio State University

10:00 AM Break

10:20 AM
Crack Tip pH Measurements in Al-Cu-Mg and Al-Zn-Mg Alloys to Understand Differences In Corrosion Fatigue Behavior: *Gabby Montiel*[1]; Jenifer Locke[1]; [1]The Ohio State University

10:40 AM
Ceramic Far-Field Passive Wireless Sensors for High Temperature Measurement: *Kevin Tennant*[1]; Brian Jordan[1]; Noah Strader[1]; Daryl Reynolds[1]; Mark Jerabek[1]; Jay Wilhelm[2]; Edward Sabolsky[1]; [1]West Virginia University; [2]Ohio University

11:00 AM
Environment-Assisted Cracking Behavior of 5xxx-Series Aluminum Alloys in Atmospheric Environments: *Gabriella Marino*[1]; Zachary Harris[2]; Patrick Steiner[2]; James Burns[1]; [1]University of Virginia; [2]University of Pittsburgh

11:20 AM
Coarsening and Globularization in Eutectic Ni-Ce Alloys: *Syeda Bushra Haider*[1]; Eric Lass[1]; [1]University of Tennessee, Knoxville

11:40 AM Concluding Comments

IRON AND STEEL (FERROUS ALLOYS)

Advances in Understanding of Martensite in Steels II — Crystallography and Modelling

Sponsored by: TMS: Steels Committee

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - Industeel; Mohsen Asle Zaeem, Colorado School of Mines; Janelle Wharry, Purdue University; Eric Payton, University of Cincinnati; Goro Miyamoto, Tohoku University; Eric Lass, University of Tennessee-Knoxville; Amy Clarke, Colorado School of Mines; MingXin Huang, University of Hong Kong; Kester Clarke, Colorado School of Mines

Wednesday AM | October 4, 2023
A211 | Greater Columbus Convention Center

Session Chairs: Ian Zuazo, ArcelorMittal Global R&D - Industeel; Mohsen Asle Zaeem , Colorado School of Mines; Eric Payton, University of Cincinnati

8:00 AM Invited
Substructure and Crystallographic Features of As-quenched Lath Martensitic Steels: *Akinobu Shibata*[1]; Goro Miyamoto[2]; Shigekazu Morito[3]; Akiko Nakamura[1]; Taku Moronaga[1]; Houichi Kitano[1]; Ivan Gutierrez-Urrutia[1]; Toru Hara[1]; Kaneaki Tsuzaki[1]; [1]National Institute for Materials Science; [2]Tohoku University; [3]Shimane University

8:30 AM Invited
Geometrical Aspect of Variant-pairing of Martensite in Steel: *Tomonari Inamura*[1]; Nozomi Takahashi[1]; Yuri Shinohara[1]; Yasuaki Tanaka[2]; Hiroyuki Kawata[2]; [1]Tokyo Institute of Technology; [2]Nippon Steel

9:00 AM Invited
Excess Solute Carbon and Retained Tetragonality in Autotempered and Tempered Fe-C Lath Martensite: *Naoki Maruyama*[1]; Shinichiro Tabata[2]; [1]Osaka University; [2]Nippon Steel Corporation

9:30 AM
Low Temperature Martensitic Transformations in Fe-Ni Alloys: Insight from Iron Meteorite Analyses: *Frederic Danoix*[1]; Raphaele Danoix[1]; Fabien Cuvilly[1]; Jerome Gattacceca[2]; Clara Maurel[2]; Matthieu Gounelle[3]; Mathieu Roskosz[3]; Louna Perez[3]; Mohamed Gouné[4]; [1]Groupe de Physique des Matériaux - CNRS Univ. Rouen Normandy; [2]CNRS, Aix-Marseille Univ, IRD, INRAE, CEREGE, Aix en Provence, France; [3]Museum National d'Histoire Naturelle; [4]Institut de Chimie et de la Matière Condensée de Bordeaux

9:50 AM Break

10:20 AM
Modelling of Martensite Formation in Steels Under Various Thermomechanical Conditions: *Hemantha Yeddu*[1]; [1]LUT University

10:40 AM
Phase Field Study of Tempering in Maraging Steels: *Rajeev Ahluwalia*[1]; Jakub Mikula[1]; Yingzhi Zheng[1]; Robert Laskowski[1]; Kewu Bai[1]; Guglielmo Vastola[1]; Yongwei Zhang[1]; [1]Institute of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR)

11:00 AM
Substructure Boundary Sliding in Lath Martensite Quantitatively Investigated by Using Molecular Dynamics (MD) Simulation and Experiment: *Meng Zhang*[1]; Shuang Gong[1]; Junya Inoue[1]; [1]The University of Tokyo

CERAMIC AND GLASS MATERIALS

Ceramics and Glasses Modeling by Simulations and Machine Learning — Simulations and Machine Learning I

Sponsored by: ACerS Glass & Optical Materials Division

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

Wednesday AM | October 4, 2023
B231 | Greater Columbus Convention Center

Session Chairs: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington

8:00 AM Invited
Using Deep Learning to Develop a Smart and Sustainable Cement Manufacturing Process: *Aditya Kumar*[1]; Taihao Han[1]; Jardel P. Gonçalves[2]; Gaurav Sant[3]; Narayanan Neithalath[4]; [1]Missouri University of Science and Technology; [2]Federal University of Bahia; [3]University of California, Los Angeles; [4]Arizona State University

8:40 AM
Development of a Machine Learned Interatomic Potential for Shock Simulations of Boron Carbide: *Kimia Ghaffari*[1]; Salil Bavdekar[1]; Douglas Spearot[1]; Ghatu Subhash[1]; [1]University of Florida

9:00 AM
Comparison of Core Level Chemical Shift in $CH_3NH_3PbBr_3$ Perovskite Due to Surface Terminations and Orientations of CH_3NH_3 Ion: *Prakash Khanal*[1]; Alisha Adhikari[1]; Marton Kollar[2]; Endre Horvath[2]; Laszlo Forro[2]; Matthias Muntwiler[2]; J. Hugo Dil[2]; Andrew Weber[3]; Paul Rulis[1]; [1]University of Missouri Kansas City; [2]Institute of Physics; [3]ICFO-Institut de Ciencies Fotoniques

9:20 AM
Generation of Spectral Neighbor Analysis Potentials for Alpha Boron and Comparison of the Results with the Angular Dependent Potential: *Prakash Khanal*[1]; Paul Rulis[1]; [1]University of Missouri Kansas City

9:40 AM
Lithium Dopant and Surface Effects on the Band Gap of Calcium Hexaboride (CaB6) Using DFT Methods: *Roxana Morton*[1]; Alan Hirales[2]; Victor Vasquez[1]; Olivia Graeve[2]; [1]University of Nevada; [2]University of California, San Diego

10:00 AM Break

10:20 AM Invited
Decoding the Structural Genome of Silicate Glasses: *Qi Zhou*[1]; [1]UCLA

11:00 AM
Combining Experimental and Simulation Datasets in Machine Learning for Glass Properties Prediction: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

11:20 AM
Machine Learning Prediction of Heat Capacity for Solid Mixtures of Pseudo-binary Oxides: *Julian Barra*[1]; Simone Audesse[1]; Rajni Chahal[1]; Stephen Lam[1]; [1]University of Massachusetts Lowell

11:40 AM
Fracture Resistance of Rare-earth Phosphates as Environmental Barrier Coatings under CMAS Corrosion: *Subrato Sarkar*[1]; Rahul Rahul[1]; Kartik Josyula[1]; Keith Bryce[1]; Jie Lian[1]; Liping Huang[1]; Lucy Zhang[1]; Suvranu De[2]; [1]Rensselaer Polytechnic Institute; [2]FAMU-FSU College of Engineering

NUCLEAR ENERGY

Ceramics for New Generation Nuclear Energy System Application — Complex Ceramics

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

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Maik Lang, University of Tennessee; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Enrique Saez, Clemson University; Jinsuo Zhang, Virginia Polytechnic Institute and State University

Wednesday AM | October 4, 2023
A124 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Development Strategy for SiC/SiC Composite Accident Tolerant Fuel Cladding: *Takaaki Koyanagi*[1]; Yutai Katoh[1]; [1]Oak Ridge National Laboratory

8:30 AM Invited
Disordered Enthalpy-entropy Descriptor for High-entropy Ceramics Discovery: *Stefano Curtarolo*[1]; [1]Duke University

9:00 AM Invited
Processing of High Entropy Metal Carbides: A New Class of Ultrahigh Temperature, Irradiation Resistant Ceramics: *Olivia Graeve*[1]; Ved Vakharia[1]; [1]University of California San Diego

9:30 AM Invited
Investigating the Effects of Irradiation on Microstructure, Micromechanical and Thermal Properties of High Entropy Carbide Ceramics: *Kaustubh Bawane*[1]; Lanh Trinh[2]; Fei Teng[1]; Zilong Hua[1]; Linu Malakkal[1]; Samuel Ruiz[2]; Fei Wang[2]; Bai Cui[2]; Lingfeng He[3]; [1]Idaho National Laboratory; [2]University of Nebraska-Lincoln; [3]North Carolina State University

10:00 AM Break

10:20 AM Invited
Non-Equilibrium Ionic Transport in Oxides: *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory

10:50 AM Invited
Investigating the Radiation Response of Oxide Materials with Neutron Scattering: *Eric O'Quinn*[1]; Jorg Neuefeind[2]; Clara Grygiel[3]; Christina Trautmann[4]; Maik Lang[1]; [1]University of Tennessee, Knoxville, [2]Oak Ridge National Laboratory; [3]CIMAP, CEA-CNRS-ENSICAEN-UNICAEN, 14070 Caen Cedex 5, France; [4]GSI Helmholtzzentrum für Schwerionenforschung,, Technische Universität Darmstadt

11:20 AM Invited
Oxygen Vacancy Formation Energetics in MgO-based High Entropy Oxides from DFT and Experimental Validation: Oriyomi Opetebu[1]; Ting Shen[1]; Rajendra Bordia[1]; *Dilpuneet Aidhy*[1]; [1]Clemson University

MODELING

Computational Discovery, Understanding, and Design of Multi-principal Element Materials — Session II

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

Program Organizers: Shuozhi Xu, University of Oklahoma; Douglas Spearot, University of Florida; Jia Li, Hunan University; Michael Gao, National Energy Technology Laboratory; Levente Vitos, Royal Institute of Technology (KTH)

Wednesday AM | October 4, 2023
A223 | Greater Columbus Convention Center

Session Chairs: Shuozhi Xu, University of Oklahoma; Yunzhi Wang, Ohio State University

8:30 AM Keynote
Computational Microstructural Design for Multi-phase Multi-principal Element Alloys: Shalini Roy Koneru[1]; Kamal Kadirvel[2]; Zachary Kloenne[1]; Hamish Fraser[1]; *Yunzhi Wang*[1]; [1]Ohio State University; [2]CompuTherm LLC

9:10 AM
Yield Strength-Plasticity Trade-off and Uncertainty Quantification in ML-based Design of Refractory High-entropy Alloys: *Stephen Giles*[1]; Debasis Sengupta[1]; Hugh Shortt[2]; Peter Liaw[2]; [1]CFD Research Corp; [2]University of Tennessee

9:30 AM
Critical Shear Stress Distribution and Average Dislocation Mobility in FeNiCrCoCu High Entropy Alloys Computed via Atomistic Simulations: Yixi Shen[1]; *Douglas Spearot*[1]; [1]University of Florida

9:50 AM
Phase Field Simulation of AgCuNi Ternary Alloy: Exploring Ag-CuNi Precipitation and Immiscibility: *Serzat Safaltin*[1]; Pamir Alpay[1]; [1]University of Connecticut

10:10 AM Break

10:30 AM Invited
Hybrid Machine Learning Approach for Designing Refractory High Entropy Alloys: *Debasis Sengupta*[1]; Stephen Giles[1]; Hugh Shortt[2]; Peter Liaw[2]; [1]CFD Research Corp; [2]University of Tennessee

11:00 AM
Modelling and Simulation on Mechanical Behavior of High-entropy Alloys: *Yang Chen*[1]; Baobin Xie[1]; Weizheng Lu[1]; Jia Li[1]; [1]Hunan University

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Mechanical Properties & Microscopy Applications

Sponsored by: ACerS Basic Science Division, ACerS Electronics 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 at Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Indiana University-Purdue University Indianapolis

Wednesday AM | October 4, 2023
B234 | Greater Columbus Convention Center

Session Chairs: Wonmo Kang, Arizona State University; Edward Gorzkowski, Naval Research Laboratory

8:00 AM Invited
Microstructure and Micromechanical Behavior of Flash-sintered TiO2: *Xinghang Zhang*[1]; Bo Yang[1]; Haiyan Wang[1]; [1]Purdue University

8:30 AM Invited
Mechanical and Thermal Properties of Entropy Stabilized Oxides: *Ravi Kumar*[1]; [1]IIT Madras

9:00 AM
Designing Nanostructures in Complex Concentrated and Entropy Stabilized Oxide Thin Films: Huiming Guo[1]; *William Bowman*[1]; [1]University of California, Irvine

9:20 AM
Graphene-coated Wires for Structural Application: Improved Mechanical Properties, Outstanding Strength Efficiency, and Enhancement Mechanism: *Won June Choi*[1]; Maxwel Kulak[1]; Uschuas Das[1]; Chunghwan Kim[1]; Wonmo Kang[1]; [1]Arizona State University

9:40 AM
Mechanical behavior of Core/Shell Copper/Aluminum Metallic Nanoparticles- Insights from Molecular Dynamics Atomistic Simulations: *Iman Salehinia*[1]; Phillip Tomich[1]; [1]Northern Illinois University

10:00 AM Break

10:20 AM Invited
Mechanical Characterization of Thin Films via Constant Strain Rate Membrane Deflection Experiments: Hojang Kim[1]; Jae-Hoon Choi[1]; Zhuo Feng Lee[1]; *Gi-Dong Sim*[1]; [1]KAIST

10:50 AM Invited
Nanostructured Surfaces for Quantitative Live Cell Microscopy Applications: Michael Robitaille[1]; Joseph Christodoulides[1]; Jeff Byers[1]; *Marc Raphael*[1]; [1]Naval Research Laboratory

11:20 AM
Graphene-metal Composites for Enhanced Mechanical and Electrical Properties: *Jonghyun Eun*[1]; Wonjune Choi[1]; Jiali Yao[1]; Wonmo Kang[1]; [1]Arizona State University

11:40 AM
Iron Nanoparticles for Magnetic Imaging Applications: *Aleia Williams*[1]; Lu Liu[1]; Charles Johnson[1]; Jacqueline Johnson[1]; [1]University of Tennessee Space Institute

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Engineering Ceramics: Advanced Processing and Properties

Sponsored by: ACerS Engineering Ceramics Division

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

Wednesday AM | October 4, 2023
B232 | Greater Columbus Convention Center

Session Chairs: Amjad Almansour, Glenn Research Center-NASA; Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences

8:00 AM Invited
Unique Route to Grow Oxide Single-crystals Electrochemically: *Nobuhito Imanaka*[1]; [1]Osaka University

8:30 AM Invited
Design and Processing of Advanced Glass and Ceramics for Energy Conversion: Challenges and Perspectives: *Federico Smeacetto*[1]; Milena Salvo[1]; Monica Ferraris[1]; [1]Politecnico di Torino

9:00 AM
Degradation of SOEC Air Electrodes After Sintering: *Brian Gorman*[1]; Heather Slomski[1]; Nicholas Strange[2]; Sarah Shulda[3]; Michael Dzara[3]; David Ginley[3]; [1]Colorado School of Mines; [2]SLAC; [3]National Renewable Energy Laboratory

9:20 AM
Mechanical and Thermal Properties and Plasma Resistance of Y-Al-O-Based Ceramics: *Katsumi Yoshida*[1]; Shunya Yamamoto[1]; Anna Gubarevich[1]; Kento Matsukura[2]; Tetsuya Goto[3]; [1]Tokyo Institute of Technology; [2]Nippon Yttrium Co., Ltd.; [3]Tohoku University

9:40 AM
Two Step Sintering of Calcined Alumina Formed by Different Methods: *Daniel Delia*[1]; Hyojin Lee[1]; William Carty[1]; [1]Alfred University

10:00 AM Break

10:20 AM Invited
Stereolithographic Additive Manufacturing of Ceramic Components with Functionally Geometric Structures: *Soshu Kirihara*[1]; Fiona Spirrett[1]; [1]Osaka University

10:50 AM
Developing Defect Pyrochlores with Low Thermal Conductivity: *Sepideh Akhbarifar*[1]; [1]Catholic University of America -Vitreous State Lab

11:10 AM
Porous Silicon Nitride Ceramics for RF Radomes Fabricated by Slip Casting: *Averyonna Kimery*[1]; Rodney Trice[1]; Carlos Martinez[1]; [1]Purdue University

11:30 AM
A Backbone Polymer Investigation into the Impact of α-Al_2O_3 Particulate Morphology on the Rheological Properties of High Ceramic Solid Loading Slips for Slip Casting: *Erin Valenzuela-Heeger*[1]; [1]University of Birmingham

CERAMIC AND GLASS MATERIALS

Glasses and Optical Materials: Current Issues and Functional Applications — Glass Research for Optical and Energy-Related Challenges

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Charmayne Lonergan, Pacific Northwest National Laboratory; Ashutosh Goel, Rutgers, The State University of New Jersey

Wednesday AM | October 4, 2023
B132 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Effect of Strain Rate on Mechanical and Fractographic Behaviour of Silica Based Optical Fibers: *Saurabh Kapoor*[1]; [1]Sterlite Technologies

8:20 AM
Pushing Compositional Limits of Optical Fibers Fabricated Using the Molten Core Method: *Miranda Stone*[1]; Thomas Hawkins[1]; John Ballato[1]; [1]Clemson University

8:40 AM
Volatile Crystalline Semiconductor Core Fibers: *Thomasina Zaengle*[1]; John Ballato[1]; Ursula Gibson[1]; Thomas Hawkins[1]; Colin McMillen[1]; [1]Clemson University

9:00 AM
Nanoindentation Induced Deformation and Structural Evolution of Silicate Glass: *Linfeng Ding*[1]; [1]Donghua University

9:20 AM
New Composition Design to Improve Impact Resistance of Ultra-thin Glass for Foldable Display: *Seungho Kim*[1]; Gyuin Shim[1]; Jinsu Nam[1]; Woon Jin Chung[2]; [1]Samsung Display Co. Ltd.; [2]Kongju National University

9:40 AM
Optical Characteristics of Transition Metal Doped II-VI Multifunctional Crystals: *Aria Tauraso*[1]; Amalthea Trobare[1]; Leslie Scheurer[1]; Ching Hua Su[2]; Bradley Arnold[1]; Fow-Sen Choa[1]; Brian Cullum[1]; Laxman Singh[2]; Narsingh Singh[1]; [1]University of Maryland Baltimore County; [2]NASA Marshall Space Flight Center

10:00 AM Break

10:20 AM
Er/Yb Co-doped Fully Transparent Yttrium-Lanthanum-Tellurite Glass-Ceramics for ~3 µm Emission: *Pritha Patra*[1]; Annapurna Kalyandurg[1]; [1]CSIR-Central Glass and Ceramic Research Institute

10:40 AM
Progress Towards New Sodium Glassy Solid Electrolytes: *Steve Martin*[1]; Madison Olson[1]; Alec Wakefield[1]; Nicholas Oldham[1]; Noah Riley[1]; Mary Okkema[1]; Christopher Martin[1]; [1]Iowa State University

11:00 AM
Revealing the Superior Scratch-resistance of Graphene-glass Surfaces: *Sourav Sahoo*[1]; Zuhaa Khan[2]; Sajid Mannan[1]; Utkarsh Tiwari[1]; N M Anoop Krishnan[1]; Nitya Nand Gosvami[1]; [1]Indian Institute of Technology (IIT) Delhi; [2]National Institute of Technology Srinagar

11:20 AM
Bismuth Borosilicate Glass Containing Eu2O3 Stabilized Gold Nanoparticles with High Third-order Optical Nonlinearity: *Shivani Singla*[1]; Venu Achanta[2]; Om Pandey[3]; Gopi Sharma[4]; [1]Chandigarh University, Mohali; [2]National Physical Laboratory; [3]Thapar Institute of Engineering & Technology; [4]Kanya Maha Vidyalaya

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

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

Wednesday AM | October 4, 2023
A215 | Greater Columbus Convention Center

Session Chairs: R. Edwin García, Purdue University; Shen Dillon, UC Irvine

8:00 AM Invited
Charged Dislocations in Ionic Ceramics: K.S.N. Vikrant[1]; *R. Edwin Garcia*[2]; [1]IIT; [2]Purdue University

8:30 AM Invited
Disordered Interfaces in Nanocrystalline Al-Ni-Ce: Origins of Microstructural Stability and Mechanical Performance: *Glenn Balbus*[1]; Johann Kappacher[2]; David Sprouster[3]; Fulin Wang[4]; Jungho Shin[5]; Yolita Eggeler[6]; Timothy Rupert[7]; Jason Trelewicz[3]; Daniel Kiener[2]; Verena Maier-Kiener[2]; Daniel Gianola[8]; [1]Air Force Research Laboratory, Materials and Manufacturing Directorate; [2]Montanuniversität Leoben; [3]Stony Brook University; [4]Shanghai Jiao Tong University; [5]Gangneung-Wonju National University; [6]Laboratory for Electron Microscopy, Karlsruhe Institute of Technology; [7]University of California, Irvine; [8]University of California, Santa Barbara

9:00 AM
In-situ Measurement of Interfacial Energies at High Temperature Using Micromechanics and Microscopy: *Devon Coffman*[1]; Khalid Hattar[2]; Shen Dillon[3]; [1]University of Illinois Urbana-Champaign, and CINT at Sandia National Laboratory; [2]University of Tennessee, Knoxville; [3]University of California, Irvine

9:20 AM
Correlation Between Segregation Behaviors of Ca and Y Doping Atoms and Mechanical Properties in Magnesium Aluminate Spinel: *Alexander Campos Quiros*[1]; Metri Zughbi[1]; Animesh Kundu[1]; Masashi Watanabe[1]; [1]Lehigh University

9:40 AM
Cold-rolling of NiTiCu Shape Memory Alloys at Different Temperatures and Post-deformation Annealing and the Study of Interplay between Rolling Temperature, Microstructure, Mechanical and Physical Properties: *Shashi Varukuti*[1]; K S Suresh[1]; [1]IIT Roorkee

10:00 AM Break

10:20 AM
A Molecular Dynamics Based Atomistic-scale Study to Investigate Mechanical Properties of 3 Incoherent Non-Arrhenius Grain Boundary: T Dora[1]; Sandeep Singh[2]; *Akarsh Verma*[3]; Shigenobu Ogata[3]; Radha Mishra[1]; [1]Birla Institute of Technology And Science, Pilani; [2]Indian Institute of Technology Roorkee; [3]Osaka University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond IV — Theory and Modeling

Sponsored by: TMS Alloy Phases Committee

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

Wednesday AM | October 4, 2023
A216 | Greater Columbus Convention Center

Session Chairs: Michael Gao, National Energy Technology Laboratory; Chandra Veer Singh, University of Toronto

8:00 AM Invited
Predicting Thermodynamic, Thermal, and Mechanical Properties of MoNbTaTi-based Refractory High Entropy Alloys: *Michael Gao*[1]; Saro San[1]; Yi Wang[1]; Vishnu Raghuraman[2]; Mike Widom[2]; John Sharon[3]; [1]National Energy Technology Laboratory; [2]Carngie Mellon University; [3]Raytheon Technologies Research Center

8:30 AM
Advancing Fast-ionic Conductors Through Rare-earth High Entropy Oxides: *MaryKate Caucci*[1]; Jacob Sivak[1]; Saeed Almishal[1]; Billy Yang[1]; Sai Venkata Gayathri Ayyagari[1]; Jerry Bejger[2]; Jon-Paul Maria[1]; Nasim Alem[1]; Ismaila Dabo[1]; Christina Rost[2]; Susan Sinnott[1]; [1]The Pennsylvania State University; [2]James Madison University

8:50 AM
Machine Learning-assisted Property Mapping of Al-Co-Cr-Fe-Ni High-Entropy Alloys from First-principles Calculations: Guangchen Liu[1]; Songge Yang[1]; *Yu Zhong*[1]; [1]Worcester Polytechnic Institute

9:10 AM
Ordering in Multi-principal Component UHTC Carbides: *Theresa Davey*[1]; Ying Chen[1]; [1]Tohoku University

9:30 AM
Machine Learning-driven Design of High Entropy Alloys to Catalyze CO2 Reduction Reaction: *Chandra Veer Singh*[1]; Zhi Chen[1]; [1]University of Toronto

9:50 AM Break

10:10 AM
Elastic Constants Predictions in Multi-Principal Element Alloys from DFT and Machine Learning: Nathan Linton[1]; *Dilpuneet Aidhy*[1]; [1]Clemson University

10:30 AM
Dislocation Dynamics in NbMoTaW, Body Centered Cubic Multi-principal Element Alloy: *Abu Anand*[1]; Chandraveer Singh[1]; [1]University of Toronto

10:50 AM
A First-principles Study of Calculation Parameters Affecting Vacancy Formation Energy in CoCrNi and CoCrFeNiMn High-entropy Alloys, with Comparison to Creep Activation Energy: Christopher Lafferty[1]; Peter Liaw[1]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology

11:10 AM
Prediction of the Ordering Behavior of Alloying Atoms and Diverse Properties of Alloy Phases with Complex Compositions and/or Complex Structures: *Bo Wu*[1]; Panhong Zhao[1]; Cheng Qian[1]; Yang Qiao[1]; Longju Su[1]; [1]Fuzhou University

11:30 AM
Investigation of Mechanical Properties and Ductility-strength Trade-offs in Multi-Principal Element Alloys through First-principles Database: Abu Anand[1]; Szu-Jia Liu[1]; *Chandraveer Singh*[1]; [1]University of Toronto

MATERIALS-ENVIRONMENT INTERACTIONS

High Temperature Corrosion and Degradation of Structural Materials — IV. Ceramic Composites

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

Wednesday AM | October 4, 2023
A122 | Greater Columbus Convention Center

Session Chair: To Be Announced

9:00 AM Invited
Solid Particle Erosion of Ceramic Matrix Composites and Environmental Barrier Coatings: Current Progress and Future Direction: *Michael Presby*[1]; Jamesa Stokes[1]; Bryan Harder[1]; [1]NASA Glenn Research Center

9:30 AM
Ablation Resistance of Ultra-high Temperature Polymer-derived Ceramic-matrix Composites: *Elia Zancan*[1]; Jon Binner[1]; [1]University of Birmingham

9:50 AM
Intermediate Temperature Oxidation of Melt Infiltrated SiC/BN/SiC CMCs: *Sarah Beth Holles*[1]; Elizabeth Opila[1]; Katie Detwiler[2]; [1]University of Virginia; [2]Air Force Research Laboratory

10:10 AM Break

10:30 AM
The Investigation of Oxidation-resistance Mechanisms of Multicomponent Diboride-SiC Composites from 1300 to 1700 ˚C: *Yonggang Yan*[1]; Kun Wang[1]; [1]Alfred University

10:50 AM
Oxidation of Additively Manufactured AM-ZrB2-30vol%SiC under CO2 Exposure: *Marharyta Lakusta*[1]; William Fahrenholtz[1]; Jeremy Watts[1]; Gregory Hilmas[1]; David Lipke[1]; [1]Missouri University of Science and Technology

SPECIAL TOPICS

History of Materials Science and Engineering — Phenomena and Techniques II

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

Program Organizers: Robert Hackenberg, Los Alamos National Laboratory; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Olivier Hardouin Duparc, LSI - CNRS; Kester Clarke, Colorado School of Mines; Goro Miyamoto, Tohoku University

Wednesday AM | October 4, 2023
A213 | Greater Columbus Convention Center

Session Chairs: Olivier Hardouin Duparc, LSI - CNRS; Ashley Paz y Puente, University of Cincinnati

8:00 AM Invited
Larry Kaufman, CALPHAD, Digitization of Thermodynamics, and Materials Design: Zi-Kui Liu[1]; *Shun-Li Shang*[1]; [1]Pennsylvania State University

8:30 AM Invited
The History of Field Ion Microscopy and Atom Probe Tomography: The First Images of Atoms: *Thomas Kelly*[1]; Frederic Danoix[2]; [1]Steam Instruments, Inc.; [2]Universite de Rouen

9:00 AM Invited
The Effect of the Kirkendall Effect: The Metastable States and the Energy Barriers to Its Discovery and Acceptance: *Ashley Paz Y Puente*[1]; [1]University of Cincinnati

9:30 AM Invited
200 Years of Recrystallization Studies: *Dorte Juul Jensen*[1]; [1]Technical University of Denmark

10:00 AM Break

10:20 AM Invited
Historical Aspects of Polycrystal Plasticity: *Ronald Armstrong*[1]; [1]University of Maryland

10:50 AM
Raman vs. Born, after Eddington vs. Chandrasekhar: Crystals and Stars: *Olivier Hardouin Duparc*[1]; [1]LSI - CNRS

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Hybrid Organic-inorganic Materials for Alternative Energy — Hybrid Organic-inorganic Materials I

Sponsored by: ACerS

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

Wednesday AM | October 4, 2023
B242/243 | Greater Columbus Convention Center

Session Chairs: Alessandro Martucci, University of Padova; Andrei Jitianu, Lehman College of The City University of New York

8:00 AM Invited
Biomolecular Engineering for Electrochemical Applications in Fuel Cells/Electrolyzers and Beyond: *Julie Renner*[1]; [1]Case Western Reserve University

8:30 AM Invited
Tuned Wettability of Sol-gel Hybrid Coatings for Humid Air and Saturated Vapor Condensation: *Alessandro Martucci*[1]; [1]University of Padova

9:00 AM
The Production and Analysis of Hybrid Organic-inorganic Nanostructures for Use in Photovoltaic Systems: *Ahmed Adel Abdelazeez*[1]; [1]UNC Charlotte

9:20 AM Invited
A Universal Synthesis Strategy for Tuneable Metal-organic Framework Nanohybrid: *Nicola Pinna*[1]; Wei Zhang[1]; [1]Humboldt-Universitaet Zu Berlin

9:50 AM Break

10:10 AM Invited
2D Double-Transition Metal Carbides (MXenes) for Hydrogen Evolution Reaction: Anupma Thakur[1]; Brian Wyatt[1]; *Babak Anasori*[1]; [1]Purdue University Indianapolis

10:40 AM Invited
Coarse-Grained Simulations of Polymer-Grafted Nanoparticle Monolayers: *Lisa Hall*[1]; [1]The Ohio State University

11:10 AM Invited
Exfoliated Ceramics for Catalytic Applications: *Alp Sehirlioglu*[1]; Kevin Pachuta[1]; Benjamin Hirt[1]; Huaixuan Cao[2]; Micah Green[2]; Emily Pentzer[2]; [1]Case Western Reserve University; [2]Texas A&M University

11:40 AM
Self-healing Engineered Multilayers Coatings for Protection of Magnesium Alloy AZ31B: *Andrei Jitianu*[1]; Mario Aparicio[2]; Jadra Mosa[2]; Zainab Abd Al-Jaleel[1]; Jennifer Guzman[1]; Lisa Klein[3]; [1]Lehman College of The City University of New York; [2]Instituto de Cerámica y Vidrio, Consejo Superior de Investigaciones Científicas (CSIC), Spain; [3]Rutgers University

MODELING

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

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

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

Wednesday AM | October 4, 2023
A225 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
A Rule-free Computational Prediction of the Slip-interface Reaction and the Subsequent Microstructure Evolution in Heterogeneous Materials under Deformation: *Liming Xiong*[1]; [1]NC State University

8:30 AM
Microstructure-sensitive Calculations of Metal Nanocomposite Electrical Conductivity: *William Frazier*[1]; Aditya Nittala[1]; Overman Nicole[1]; Christopher Smith[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

8:50 AM
Modeling Grain Boundary Mediated Plasticity with Massively Parallel Atomistic Simulations: *Timofey Frolov*[1]; Nicolas Bertin[1]; Alexander Chernov[1]; Ian Winter[1]; Tomas Oppelstrup[1]; [1]Lawrence Livermore National Laboratory

9:10 AM
An Investigation on the Microstructural Uncertainty in Molecular Dynamic Simulations of Polycrystalline Nickel: *Meizhong Lyu*[1]; Anqi Qiu[2]; Elizabeth Holm[1]; [1]University of Michigan; [2]Carnegie Mellon University

9:30 AM
Effects of Defects on Stress- and Thermally-induced Martensitic Transformation of Nanocrystalline NiTi Alloys: A Molecular Dynamics Study: *Zhihao Zhao*[1]; Jianping Lin[1]; Yao Xiao[1]; Junying Min[1]; [1]Tongji University

9:50 AM Invited
Measurement and Modeling of Hydride Induced Rotation and Dislocation Fields in Zirconium Polycrystals: *Hamidreza Abdolvand*[1]; Masoud Taherijam[1]; Saiedeh Marashi[1]; [1]The University of Western Ontario

10:20 AM Break

10:40 AM
Quantifying the Role of Coarse Intermetallic Particles on Twinning Behavior: Benjamin Anthony[1]; *Victoria Miller*[1]; [1]University of Florida

11:00 AM
Unravelling the Nucleation and Growth Mechanism of {11-22} Twin in Titanium: Andriy Ostapovets[1]; *Ritu Verma*[2]; Anna Serra[3]; [1]Institute of Physics of Materials, Czech Academy of Sciences; [2]Central European Institute of Technology - Brno University of Technology; [3]Universitat Politécnica de Catalunya, Campus Nord

11:20 AM
Assessing the Predictive Capabilities of Precipitation Strengthening Models for Deformation Twinning in Mg Alloys Using Phase-field Simulations: *Darshan Bamney*[1]; Laurent Capolungo[1]; [1]Los Alamos National Laboratory

11:40 AM
Misorientation Effects in Single Crystal Plasticity Finite Element Modeling: *John Shimanek*[1]; Zi-Kui Liu[1]; Allison Beese[1]; [1]Penn State

FUNDAMENTALS AND CHARACTERIZATION

Interface-mediated Phenomena in Structural Materials — Interfaces in Advanced Materials

Sponsored by: TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, University of Nebraska-Lincoln; Nigel Shepherd, University of North Texas; Andres Bujanda, U.S. Army Research Laboratory; Lin Shao, Texas A&M University

Wednesday AM | October 4, 2023
A214 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Co-deformation Behavior of Additively Manufactured Nanolamellar Eutectic High-entropy Alloys: *Yu Zou*[1]; [1]University of Toronto

8:40 AM
Atomistic Simulations of the Effect of Alloying on Solid/Liquid Interfacial Free Energies: *Ian Winter*[1]; Michael Chandross[1]; [1]Sandia National Laboratories

9:00 AM Invited
The Role of Interfaces on Second Phase Nucleation and Attendant Mechanical Response in Structural High Entropy Alloys: Sriswaroop Dasari[1]; Abhishek Sharma[1]; Bharat Gwalani[2]; Deep Choudhuri[3]; Srinivasan Srivilliputhur[1]; *Rajarshi Banerjee*[1]; [1]University of North Texas; [2]North Carolina State University; [3]New Mexico Institute of Mining and Technology

9:40 AM
Heterogeneous Nucleation of γ' Precipitates at Annealing Twin Boundaries in Superalloys: A Phase Field Study: *Vignesh Karunakaran*[1]; Longsheng Feng[1]; Hariharan Sriram[1]; Semanti Mukhopadhyay[1]; Michael Mills[1]; Yunzhi Wang[1]; [1]The Ohio State University

10:00 AM Break

10:20 AM Keynote
On the Importance of Interfaces in Gradient Materials for Structural Applications: Katie O'Donnell[1]; Matt Dolde[1]; Peyman Samimi[1]; Iman Ghamarian[1]; Maria Jose Quintana[1]; *Peter Collins*[1]; [1]Iowa State University

11:00 AM
Role of Heterogeneity on Formability in Al1050/Steel/Al1050 Laminated Sheets: *Rae Eon Kim*[1]; Yeon Taek Choi[1]; Hyoung Seop Kim[1]; [1]Postech

11:20 AM
Gradation of Additive Manufactured Polymer-Metal Interfaces for Increased Toughness: *Carlos Mora Salcedo*[1]; Mathew Kuttolamadom[1]; [1]Texas A&M

11:40 AM
Molecular Dynamics Simulations of Austenite-Martensite Interfaces in NiTi Shape Memory Alloys: *Gabriel Plummer*[1]; Mikhail Mendelev[1]; John Lawson[1]; [1]NASA Ames Research Center

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LIGHTWEIGHT ALLOYS

Light Metal Technology — Hexagonal Structured Lightweight Alloys

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University

Wednesday AM | October 4, 2023
A212 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Improved Strength in Mg-Al Dissimilar Impact Welding by Surface Nanocrystallization of Mg Alloy Sheet: *Jianyue Zhang*[1]; Jianxiong Li[1]; Jiashi Mao[1]; Yu Mao[1]; Xuejun Huang[1]; Anupam Vivek[1]; Glenn Daehn[1]; Alan Luo[1]; [1]The Ohio State Univerisity

8:20 AM
Corrosion Analysis of an Absorbable Mg-0.6%Si-2%Zn Alloy: *Guilherme de Gouveia*; Guilherme Koga[1]; José Spinelli[1]; [1]Federal University of São Carlos - Brazil

8:40 AM
Effects of Pass Strains of Multi-directional Forging and Additive Cold Rolling of Pure Ti on the Microstructural Evolution and Mechanical Properties: *Hiromi Miura*[1]; Yojiro Oba[1]; Masakazu Kobayashi[1]; Chihiro Watanabe[2]; [1]Toyohashi University of Technology; [2]Kanazawa University

9:00 AM
Effects of Sn on Microstructure Evaluation and Dynamic Recrystallization of an Mg-Ca Alloy: *Hossain Rashed*[1]; Shad Mim[1]; Bijoy Mallick[1]; [1]Bangladesh University of Engineering & Technology

9:20 AM
Elastic-plastic Approach on Transformation of LPSO Phases in a Mg-RE Alloy by Nanoindentation: *Petra Maier*[1]; Merle Schmahl[2]; Claudia Fleck[2]; [1]University of Applied Sciences Stralsund; [2]Technische Universität Berlin

9:40 AM
Precipitate-strengthened Micromechanical Behaviors of Magnesium Alloy Under Cyclic Loading: Chuhao Liu[1]; Di Xie[2]; Yanfei Gao[2]; Peter Liaw[2]; *Huamiao Wang*[1]; [1]Shanghai Jiao Tong University; [2]The University of Tennessee

10:00 AM Break

10:20 AM
Production of Titanium Wire from Scrap Material Using Continuous Extrusion Machine: *Michal Duchek*[1]; David Hradil[1]; [1]COMTES FHT

10:40 AM
Role of Guinier-Preston Zones in Achieving High Strength-ductility in a New Mg-Zn-Al-Ca-Mn-Ce Sheet Alloy: *Jiashi Miao*[1]; Fei Xue[2]; Tian Liu[2]; Thomas Avey[1]; Emmanuelle Marquis[2]; Alan Luo[1]; [1]Ohio State University; [2]University of Michigan, Ann Arbor

11:00 AM
Role of Interfaces on the Orientation Dependent Spheroidization Response of á-colonies in Ti-6Al-4V Alloy: *Shibayan Roy*[1]; Antony Rollett[2]; [1]Indian Institute of Technology (IIT) Kharagpur; [2]Carnegie Mellon University

11:20 AM
Observation of Impact Deformation and Fracture on Severe Plastic Deformed Ti by Using Synchrotron Radiation: *Masakazu Kobayashi*[1]; Yojiro Oba[1]; Hiromi Miura[1]; Chihiro Watanabe[2]; Shogo Furuta[1]; [1]Toyohashi University of Technology; [2]Kanazawa University

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CERAMIC AND GLASS MATERIALS

Manufacturing and Processing of Advanced Ceramic Materials — Novel Processing of Oxide Ceramics

Sponsored by: ACerS Manufacturing Division

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

Wednesday AM | October 4, 2023
B233 | Greater Columbus Convention Center

Session Chairs: Keith DeCarlo, Blasch Precision Ceramics; Andrea Arguelles, Pennsylvania State University

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8:00 AM Invited
Processing Ceramic Powders in Non-aqueous Mediums - How Polarity of the Suspension Medium Effects Dispersion: *Keith DeCarlo*[1]; [1]Blasch Precision Ceramics

8:30 AM
Surface Area Reduction During the Sintering of Alumina: *Daniel Delia*[1]; Hyojin Lee[1]; William Carty[1]; [1]Alfred University

8:50 AM
The Influence of Cr on Microstructural Evolution of Alumina: Yathreb Shalabi[1]; Rachel Marder[1]; *Wayne Kaplan*[1]; [1]Technion - Israel Institute of Technology

9:10 AM
Manipulating Instrument Setup Parameters to Increase the Range for Particle Size Measurement: *Emelia Enke*[1]; Daniel Delia[1]; Hyojin Lee[1]; William Carty[1]; [1]Alfred University

9:30 AM
Manufacturing Feasibility of the Cold Sintering Process for Large-scale Ceramic Dielectrics: *Christopher Wheatley*[1]; Clive Randall[1]; Andrea Argüelles[1]; [1]Pennsylvania State University

9:50 AM Break

10:10 AM Invited
From Flash Sintering to Ultrafast Sintering without an Electric Field and Electrochemically Controlled Microstructural Evolution: *Jian Luo*[1]; [1]University of California, San Diego

10:40 AM
Surface Reactivity and Processing Properties of Metal Oxide Nanoparticles for Ceramics: *Oliver Diwald*[1]; Thomas Schwab[1]; Hasan Razouq[1]; Gregor Zickler[1]; [1]Paris Lodron Universitaet Salzburg

11:00 AM
Demystifying Sol-gel Processing of Rare-earth Disilicates for Environmental Barrier Coatings: *Alejandro Salanova*[1]; Jon Ihlefeld[1]; [1]University of Virginia

11:20 AM
A Cold Sintering Study of ZnO and Dopants - With a View Towards Varistor Characteristics: *Sevag Momjian*[1]; Julian Fanghanel[1]; Zhongming Fan[1]; Clive Randall[1]; [1]Pennsylvania State University

11:40 AM
Measurement of High Temperature Mechanical Property Data for Modeling Applications: Hyojin Lee[1]; *John Castle*[1]; William Carty[1]; [1]Alfred University

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ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — AI/ML Aided Materials Design and Study

Sponsored by: ACerS Engineering Ceramics Division

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

Wednesday AM | October 4, 2023
A121 | Greater Columbus Convention Center

Session Chairs: Pinar Acar, Virginia Tech; Kathy Lu, Virginia Tech

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8:00 AM Invited
Computing Grain Boundary "Phase" Diagrams: From Thermodynamic Models and Atomistic Simulations to Machine Learning: *Jian Luo*[1]; [1]University of California, San Diego

8:30 AM
Autonomous Learning of Phase Trajectories via Physics-inspired Graph Neural Networks: *James Chapman*[1]; Bamidele Aroboto[1]; Shaohua Chen[2]; Yang Jiao[2]; Tim Hsu[3]; Brandon Wood[3]; [1]Boston University; [2]Arizona State University; [3]Livermore National Laboratory

8:50 AM
AI/ML Aided Drug Biomolecule and Materials Design: *Mehdi Yazdani-Jahromi*[1]; Ali Khodabandeh Yalabadi[1]; Aida Tayebi[1]; Niloofar Yousefi[1]; Elayaraja Kolanthai[1]; Craig J. Neal[1]; Sudipta Seal[1]; Ozlem Ozmen Garibay[1]; [1]University of Central Florida

9:10 AM
High-throughput, Ultra-fast Laser Fabrication of Alumina sample arrays and Deep-learning Based Prediction of Realistic Alumina Microstructure from Hardness: *Xiao Geng*[1]; Jianan Tang[1]; Siddhartha Sarkar[1]; Tianyi Zhou[1]; Jianhua Tong[1]; Rajendra Bordia[1]; Hai Xiao[1]; Dongsheng Li[2]; Fei Peng[1]; [1]Clemson University; [2]Advanced Manufacturing LLC

9:30 AM
Online Mechanical Properties Control for Steel Coils Using Machine Learning Model: *Junho Park*[1]; Joo Hyun Ryu[1]; Kyung Rae Jo[1]; Tae Kyo Han[1]; [1]Posco

9:50 AM Break

10:10 AM Invited
Development of Machine Learning Interatomic Potentials to Model Materials Processing & Performance in Multicomponent Systems: *Ridwan Sakidja*[1]; Marium Mou[1]; Nur Octoviawan[1]; Tyler McGilvry-James[1]; Gaige Riggs[1]; [1]Missouri State University

10:40 AM
Process Cycle Modeling with AI: *Vyacheslav Romanov*[1]; [1]DOE-NETL

11:00 AM
Optimizing Heat Treatment Routes for Ni-based Alloys Using Monte Carlo Tree Search: *Vickey Nandal*[1]; Sae Dieb[1]; Dmitry Bulgarevich[1]; Toshio Osada[1]; Toshiyuki Koyama[2]; Satoshi Minamoto[1]; Masahiko Demura[1]; [1]NIMS; [2]Nagoya University

11:20 AM
Optical and Photothermal Property Prediction of Gold Nanoparticle/polymer Hybrid Films Through Machine Learning and Finite Element Modeling: *Yi Je Cho*[1]; Kathy Lu[2]; [1]Sunchon National University; [2]Virginia Tech

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BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials Parallel Session I

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Wednesday AM | October 4, 2023
A221 | Greater Columbus Convention Center

Session Chairs: Songül Ulağ, Marmara University; Shih-Jung Liu, Chang Gung University

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8:00 AM
3D-printed Dental Membrane Scaffolds From Polyvinly Alcohol/Starch/Nano-Hydroxyapatite Enriched Antimicrobial Punica granatum L. Extract: *Hatice Karabulut*[1]; [1]Marmara University

8:20 AM
3D Printed Drug-eluting Implants for Orthopedic Applications: *Shih-Jung Liu*[1]; [1]Chang Gung University

8:40 AM Invited
3D Printing and Evaluation of Hydrogel-blend Scaffolds Based on Methacrylate-modified Chitosan for Tissue Regeneration: Xiaodie Chen[1]; Jinwei Liu[1]; *Min Wang*[1]; [1]University of Hong Kong

9:00 AM
3D Printing of PRP-loaded Gelatin/Sodium Alginate/Hydroxyapatite Composite Scaffolds for Bone Tissue Engineering Applications: *Tufan Arslan Tut*[1]; [1]Marmara University

9:20 AM
Continuous Monitoring of Biomarkers with Minimally-invasive Wearable Microneedle Patch Sensors: *Andreas Stein*[1]; Yevedzo Chipangura[1]; Vilma Brandao[1]; Xiaohang Zhi[1]; Sarah Swisher[1]; Philippe Buhlmann[1]; Elizabeth Lusczek[1]; Eric Wise[1]; Greg Beilman[1]; [1]University of Minnesota

9:40 AM
Engineered Porosity Bone Scaffold Bioceramics via Directional Freeze Casting: *Komalakrushna Hadagalli*[1]; Bikramjit Basu[2]; Rajendra Bordia[1]; [1]Clemson University; [2]Indian Institute of Science

10:00 AM Break

10:20 AM
Engineering Elastin-like Peptides to Control Solid Surface Properties: *Julie Renner*[1]; [1]Case Western Reserve University

10:40 AM Invited
Fabrication of Drug-loaded Hydrogel-based Microneedles (HBM) for the Treatment of Epilepsy: *Songul Ulag*[1]; [1]Marmara University

11:00 AM
Viral Behaviors and the Evaluation on Stainless Steels: *Hideyuki Kanematsu*[1]; Dana Barry[2]; Toma Tamura[1]; Ruka Matsumoto[1]; Akiko Ogawa[1]; Risa Kawai[1]; Takeshi Kogo[1]; Nobumitsu Hirai[1]; Toshio Kamijo[3]; Takehito Kato[4]; Michiko Yoshitake[5]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Clarkson University; [3]NIT (KOSEN), Tsuruoka College; [4]NIT (KOSEN), Oyama College; [5]National Institute for Materials Science (NIMS)

11:20 AM Invited
Combining Traditional Electronics Packaging and NanoJet Aerosol Printing to Develop an Implantable High-density In-line Connector: *Janet Gbur*[1]; William Kozak[2]; Anuvi Gupta[2]; Marcelino Essien[3]; Dave Keicher[3]; Douglas Shire[4]; [1]VA Northeast Ohio Healthcare System; Case Western Reserve University; [2]Case Western Reserve University; [3]Integrated Deposition Systems, Inc.; [4]VA Northeast Ohio Healthcare System

11:40 AM
Analysis of Nutrient Components in Organic Compost Leachate as Bio-based Agents for Therapeutic Applications in Agriculture: *Ita Uwidia*[1]; Sarah Emmanuel[1]; Etinosa Oshodin[1]; [1]University of Benin

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials Parallel Session II

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Wednesday AM | October 4, 2023
A222 | Greater Columbus Convention Center

Session Chairs: Miroslawa El Fray, West Pomeranian University of Technology; Sahar Vahabzadeh, Northern Illinois University

8:00 AM
Gentamicin-loaded Polyvinyl Alcohol (PVA)/Sucrose Solution Coated on Microneedles for Transdermal Drug Delivery: *Esra Pilavci*[1]; [1]Marmara University

8:20 AM Invited
Molecularly Imprinted Polymer Nanogels: Synthetic Peptide Antibodies for Biomedical Therapy and Diagnostics: *Karsten Haupt*[1]; [1]Compiègne University of Technology

8:40 AM
Next Generation Injectable Biomaterials for Soft Tissue Repair: *Miroslawa El Fray*[1]; Gokhan Demirci[1]; Malwina Niedźwiedź[1]; [1]West Pomeranian University of Technology

9:00 AM
Production of Individualized Symblepharon Rings: *Musa Ayran*[1]; [1]Marmara University

9:20 AM
Strontium Silicate: A Potential Bioceramic for Clinical Applications: *Shinn-Jyh Ding*[1]; [1]Chung Shan Medical University

9:40 AM
Surface-Roughness-Induced Plasticity in a Biodegradable Zn Alloy: Zhangzhi Shi[1]; Meng Li[1]; Xiangmin Li[1]; *Lu-Ning Wang*[1]; [1]University of Science and Technology Beijing

10:00 AM Break

10:20 AM
Surface Modification of Titanium by Physical and Chemical Routes for Hard Tissue Regeneration: *Sahar Vahabzadeh*[1]; Dexter Kling[1]; [1]Northern Illinois University

10:40 AM
Synthesis and Characterization of Biodegradable Polydisulfide From Renewable Resources: *Peter Polyak*[1]; Aswathy Sasidharan Pillai[1]; Kristof Molnar[1]; Judit Puskas[1]; [1]The Ohio State University

11:00 AM
Understanding BioTribological Performances of 3D Printed TiTaCu Alloys: *Jose Avila*[1]; Sushant Ciliveri[1]; Amit Bandyopadhyay[1]; [1]Washington State University

11:20 AM
Programmable Microbial Biosynthesis of Hierarchical Biomimetic Composites in 3D Printed Soft Bioreactors: *Shan Liu*[1]; Weinan Xu[1]; [1]The University of Akron

CERAMIC AND GLASS MATERIALS

Phase Transformations in Ceramics: Science and Applications — Session I

Sponsored by: ACerS Basic Science Division

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay V. Khare, University of Toledo; Scott Mccormack, University Of California, Davis; Theresa Davey, Tohoku University

Wednesday AM | October 4, 2023
B230 | Greater Columbus Convention Center

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

8:00 AM Invited
Spinodal Decomposition in Ferroelectric Crystals: *Catherine Bishop*[1]; [1]University of Canterbury

8:30 AM
Effect of Cations Decoration on Ti3C2Tx MXene, its Stability and Phase Transformation at High Temperatures: *Srinivasa Kartik Nemani*[1]; Austin Vohrees[1]; Yooran Im[2]; Nithin Chandran[3]; Anupma Thakur[1]; Babak Anasori[1]; [1]Indiana University-Purdue University; [2]Colorado School of Mines; [3]IIT Madras

8:50 AM
Elevated Temperature Phase Control of Two-dimensional Mo2TiC2Tx Carbide Through Defect Engineering: *Brian Wyatt*[1]; Matthew Boebinger[2]; Paul Kent[2]; Zachary Hood[3]; Shiba Adhikari[3]; Srinivasa Nemani[1]; Murali Muraleedharan[2]; Annabelle Bedford[1]; Wyatt Highland[1]; Babak Anasori[1]; [1]Purdue University; [2]Oak Ridge National Laboratory; [3]Argonne National Laboratory

9:10 AM Invited
Phase Transformations in Ceramic Materials under Extreme External Forcing: *Eric O'Quinn*[1]; Alexandre Solomon[1]; Casey Corbridge[1]; Maik Lang[1]; [1]University of Tennessee

9:40 AM
Structural Evolution of MgAl2O4 and NiAl2O4 Disordered Spinel Oxides Studied via In Situ Neutron Total Scattering: *John Hirtz*[1]; Eric O'Quinn[1]; Igor Gussev[1]; Joerg Neuefeind[2]; Maik Lang[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

10:00 AM Break

10:20 AM Invited
Phase Stability and Cation Partitioning in Multi-rare Earth Aluminates and Zirconates: Yueh-Cheng Yu[1]; *David Poerschke*[1]; [1]University of Minnesota

10:50 AM
Progress on Phase Stability of Substituted Rare Earth Disilicate Compositions for Environmental Barrier Coatings: *Christine Brockman*[1]; V. V. Rohit Bukka[1]; Amjad Almansour[2]; Pankaj Sarin[1]; [1]Oklahoma State University; [2]NASA Glenn Research Center

11:10 AM
Microstructural Evolution and Associated Kinetics of Seeded Solid State Single Crystal Growth of CoTi2O5: *Junyan Zhang*[1]; Connor McNamara[1]; Kevin Anderson[2]; Animesh Kundu[1]; Helen Chan[1]; Jeffrey Rickman[1]; [1]Lehigh University; [2]U.S. Naval Research Laboratory

11:30 AM Invited
Crystal Structure Solution and Phase Transformations of CaZr4(PO4)6 and SrZr4(PO4)6: *Benjamin Hulbert*[1]; Julia Brodecki[1]; Waltraud Kriven[1]; [1]University of Illinois at Urbana Champaign

NUCLEAR ENERGY

Progressive Solutions to Improve Corrosion Resistance of Nuclear Waste Storage Materials — Modeling and Experimental: Structure Properties (Dissolution Kinetics, Mechanical Properties, Sulfur Solubility) of Nuclear Waste Glasses

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

Program Organizers: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech; Daniel Cassar, Brazilian Center for Research in Energy and Materials (CNPEM)

Wednesday AM | October 4, 2023
A125 | Greater Columbus Convention Center

Session Chairs: Madeleine Jordache, Stevens Institute of Technology; Daniel Cassar, Brazilian Center for Research in Energy and Materials (CNPEM); Gary Pickrell, Virginia Tech

8:00 AM Introductory Comments

8:05 AM Invited
An Integrated Data-driven and Physics-driven Approach Towards Discovering Optimal Nuclear Waste Immobilization Glass: *N M Anoop Krishnan*[1]; [1]Indian Institute of Technology Delhi

8:35 AM Invited
Structural Descriptors Controlling Sulfur Solubility in Borosilicate Glasses: *Ashutosh Goel*[1]; Rajan Saini[1]; Xinyi Xu[1]; Randall Youngman[2]; Hellmut Eckert[3]; John McCloy[4]; [1]Rutgers, The State University of New Jersey; [2]Corning Incorporated; [3]Sao Paulo University; [4]Washington State University

9:05 AM Invited
Gel Layer Structures and Properties of Silicate Glasses: Understanding the Corrosion of Glasses for Nuclear Waste Disposal: *Jincheng Du*[1]; [1]University of North Texas

9:35 AM Invited
Topological Model of the Dissolution Kinetics of Borosilicate Glasses: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

BIOMATERIALS

Society for Biomaterials: Biomaterial Applications — Nanotechnology

Sponsored by: Society for Biomaterials

Program Organizers: David Kohn, University of Michigan; Guigen Zhang, University of Kentucky; Claudia Loebel, University of Michigan; William Wagner, McGowan Institute for Regen Med

Wednesday AM | October 4, 2023
A224 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM
Oxidative Stress Responsive Nanoparticles for Sustained Protein Delivery in Treatment of Ocular Degeneration: *Megan Allyn*[1]; Sheigo Tamiya[1]; Katelyn Swindle-Reilly[1]; Andre Palmer[1]; [1]The Ohio State University

8:20 AM
Novel Biocompatible Nanoparticle Emulsion for Sustained Therapeutic Drug Delivery: Ruth Negru[1]; Fernando Borges[1]; Fouad Teymour[1]; Georgia Papavasiliou[1]; *Marcella Vaicik*[1]; [1]Illinois Institute of Technology

8:40 AM
Selective Cellular Interaction of PEI Functionalized Silver Nanoparticles with Pathogenic Microorganisms: Prem Pandey[1]; *Atul Tiwari*[1]; [1]Indian Institute of Technology, BHU

9:00 AM
Antimicrobial Activity of Silicon Nitride Infiltrated Fabrics: Brittany Heath[1]; Chelsey McMinn[2]; Sherry Van Mondfrans[2]; Jackson Hendry[2]; Douglas Hoxworth[2]; B. Sonny Bal[2]; Kylene Kehn-Hall[1]; *Ryan Bock*[2]; [1]Virginia Polytechnic Institute and State University; [2]SINTX Technologies

9:20 AM
Multifunctional Lanthanide-doped Nanomaterials for Imaging and Sensing: *Eva Hemmer*[1]; [1]University of Ottawa

9:40 AM
Recent Advancement in Materials for Biomedical and Biosensor Technology: *Osama Butt*[1]; Bushra Rashid[2]; [1]University of the Punjab; [2]National Defense University of Malaysia

10:00 AM Break

10:20 AM
A Biomimetic Gold-manganese Nanozyme for Double Starvation Therapy Enhanced Chemodynamic Tumor Therapy: *Xiaonan Li*[1]; [1]South University of Science and Technology

10:40 AM
The Use of Psidium Guajava L. as a Bio-reducing Agent in the Green Synthesis of Silver Oxide Nanoparticles: *Ita Uwidia*[1]; Esther Ikhuoria[1]; Rachel Okojie[1]; Ikhazuagbe Ifijen[2]; Ikechukwu Doris[1]; [1]University Of Benin; [2]Rubber Research Institute of Nigeria

11:00 AM
Molecular Weight of Polyethylenime Dependent Formation of Gold Nanoparticles and Their Biomedical Application: Prem Pandey[1]; *Govind Pandey*[1]; [1]Indian Institute of Technology, BHU

11:20 AM
Structural and Some Mechanical Properties of Parquetina Nigrescens Pod Nanoparticles Reinforced Polylactic Acid Composites: Sefiu Bello[1]; Boluwatife Olukunle[1]; *Abdul Ganiyu Alabi*[1]; Raphael Adeyemo[2]; [1]Kwara State University, Malete; [2]Gateway (ICT) Polytechnic, Saapade

11:40 AM
Eumelanin: A Promising Material for Bio-based Electronics: *Carlos Graeff*[1]; [1]UNESP

CERAMIC AND GLASS MATERIALS

Solid-state Optical Materials and Luminescence Properties — Session I

Sponsored by: ACerS Basic Science Division

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Mathieu Allix, Laboratoire CEMHTI; Kiyoshi Shimamura, National Institute for Materials Science; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Polish Academy of Sciences

Wednesday AM | October 4, 2023
B235 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Overview of Optical Materials at NRL: *Woohong (Rick) Kim*[1]; Shyam Bayya[1]; Jesse Frantz[1]; Brandon Shaw[1]; Colin Baker[1]; Vinh Nguyen[1]; Darryl Boyd[1]; Dan Gibson[1]; Dan Rhonehouse[1]; Adam Floyd[1]; Joshua Gild[1]; Lynda Busse[1]; Rafael Gattass[1]; Bryan Sadowski[1]; Fred Kung[1]; Geoff Chin[1]; Tony Zhou[1]; Robert Nicol[1]; Jasbinder Sanghera[1]; [1]Naval Research Laboratory

8:20 AM Invited
Fabrication and Optical Properties of Transparent Zinc Gallate Spinel Ceramics: *Sebastien Chenu*[1]; [1]ISCR - Glass and Ceramic Team

8:40 AM
Ultraviolet Excitation of Trivalent Europium in Alumina: *John Krebs*[1]; Alex Sobey-Strick[1]; [1]Franklin & Marshall College

9:00 AM
A New Family of Multinary Telluride Nanocrystals for Infrared Applications: *Soubantika Palchoudhury*[1]; Sohini Sengupta[1]; Fajer Almanea[1]; Venkateswar Rao[1]; Sarah Maglosky[1]; [1]University of Dayton

9:20 AM
Ultrafast Laser-induced Damage and Non-linear Optical Properties of Metal Thiophosphates: *Mohamed Yaseen Noor*[1]; Ryan Siebenallar[1]; Aamir Mushtaq[1]; Gulsum Kilic[1]; Justin Twardowski[1]; Conrad Kuz[1]; Adam Fisher[1]; Liam Clink[1]; Michael Susner[2]; Enam Chowdhury[1]; [1]The Ohio State University; [2]Airforce Research Laboratory

9:40 AM Invited
Study of Surface Effects in Yb^{3+} Doped Garnet Nanopowders for Understanding Grain Boundary Processes in Laser Ceramics: Fabrication and Spectroscopic Properties: *Vitalii Boiko*[1]; Sebastian Cieśla[2]; Mariusz Stefański[1]; Dariusz Hreniak[1]; [1]Institute of Low Temperature and Structure Research; [2]Wroclaw University of Science and Technology

10:00 AM Break

10:20 AM
Photoluminescent Behaviors of Mixed Metal Thiophosphates $XScP_2S_6$ (X=Ag, Cu) Above and Below Bandgap: *Ryan Siebenaller*[1]; Mohamed Noor[1]; Rahul Rao[2]; Michael Susner[2]; Enam Chowdhury[1]; [1]Ohio State University; [2]Air Force Research Lab

10:40 AM
Processing and Optical Properties of Noncubic RE-doped Ga2O3 Transparent Ceramics: *Jiao Li*[1]; Guangran Zhang[1]; Matthew Fiato[1]; Yiquan Wu[1]; [1]Alfred University

11:00 AM
Surface Morphology and Fracturing of Femtosecond Laser-irradiated Calcium Fluoride: *Emma DeAngelis*[1]; Justin Twardowski[1]; Conrad Kuz[1]; Enam Chowdhury[1]; [1]The Ohio State University

11:20 AM
Study of Garnet Scintillating Single Crystal Fiber Grown by Laser Heated Pedestal Growth Method: *Xibin Wang*[1]; Anhua Wu[1]; Junfeng Chen[1]; Liangbi Su[1]; Zhonghan Zhang[1]; Huamin Kou[1]; Xiang Li[1]; Yun Dai[1]; Zheng Zhang[1]; Jiang Li[1]; [1]Shanghai Institute of Ceramics, Chinese Academy of Sciences

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development II — Steels for Sustainable Development I

Sponsored by: TMS: Steels Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Kester Clarke, Colorado School of Mines; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Matthias Militzer, University of British Columbia; Ana Luiza Araujo, CBMM North America Inc.; Mahesh Somani, University of Oulu; Ilchat Sabirov, Imdea Materials Institute

Wednesday AM | October 4, 2023
A210 | Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited
Microstructural Engineering and Accelerated Test Method Development to Achieve Low Cost, High Performance Solutions for Hydrogen Storage and Delivery: *Kip Findley*[1]; Lawrence Cho[1]; Pawan Kathayat[1]; Jason Kong[1]; John Speer[1]; Chris San Marchi[1]; Joseph Ronevich[1]; Samantha Lawrence[1]; Mary O'Brien[1]; Ashok Saxena[1]; Don Brown[1]; Bjorn Clausen[1]; [1]Colorado School of Mines

8:40 AM
Effect of Strength on Fracture Toughness of Line Pipe Steel Under High Pressure Hydrogen Environment: *Hikaru Imayama*[1]; Daichi Izumi[1]; Junji Shimamura[1]; Yoshihiro Nishihara[1]; Hiroshi Okano[1]; [1]JFE Steel Corporation

9:00 AM
Investigation of Microstructure and Fracture Performance of 9 wt.% Nickel Steel for Application Laser Arc Hybrid Welding: *Jeong Yeol Park*[1]; Changwook Ji[1]; Jooyong Cheon[1]; Hyun Uk Jun[1]; [1]Korea Institute of Industrial Technology

9:20 AM
The Relationship Between Microstructure and Mechanical Properties in the Coarse-grain Heat-affected Zone of Line Pipe Steels: *Sabyasachi Roy*[1]; Matthias Militzer[1]; Warren Poole[1]; [1]The University of British Columbia

9:40 AM
Temperature-dependent Strain Hardening Behavior and Deformation Pathways in Austenitic Stainless Steels Under Cryogenic Conditions: *Digvijay Singh*[1]; Takahiro Sawaguchi[1]; Susumu Takamori[1]; Fumiyoshi Yoshinaka[1]; Satoshi Emura[1]; [1]National Institute for Materials Science, Japan

10:00 AM Break

10:20 AM Invited
Pathways for Steel Decarbonization - A Comparative Study With Alternative Materials: *Sridhar Seetharaman*[1]; [1]Arizona State University

11:00 AM
Enabling the Design of Industrial Heat Treatments with Induction-coupled Thermomagnetic Processing Using Multiscale Modeling and Simulation: *Michael Tonks*[1]; Richard Hennig[1]; Dallas Trinkle[2]; Ling Li[3]; Charlie Li[4]; [1]University of Florida; [2]University of Illinois, Urbana-Champaign; [3]Virginia Tech; [4]DANTE Solutions

11:20 AM
Simulation of Accelerated Cooling of Thick Steel Products: *Matthew Sztanko*[1]; Shixin Zhou[1]; Vladan Prodanovic[1]; Matthias Militzer[1]; [1]The Centre for Metallurgical Process Engineering/University of British Columbia

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Electronics Division, ACerS Basic Science Division

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

Wednesday AM | October 4, 2023
A220 | Greater Columbus Convention Center

Session Chairs: Winnie Wong-Ng, National Institute of Standards and Technology (NIST); Kevin Huang, University of South Carolina

8:00 AM Invited
Density Functional Theory Studies of the Carbonation of Portlandite and Brucite: *Eric Cockayne*[1]; [1]National Institute of Standards and Technology

8:30 AM Invited
High-throughput, Ultra-fast Laser Sintering of Ceramics and Machine-learning Based Prediction on Processing-Microstructure-Property Relationships: Jianan Tang[1]; Xiao Geng[1]; Siddhartha Sarkar[1]; Yunfeng Shi[2]; Jianhua Tong[1]; Rajendra Bordia[1]; Dongsheng Li[3]; Hai Xiao[1]; *Fei Peng*[1]; [1]Clemson University; [2]Rensselaer Polytechnic Institute; [3]Advanced Manufacturing LLC

9:00 AM Invited
Uncovering Structure-property Relationships in Complex, Inhomogeneous Materials: High-throughput Calculation of Stochastic Materials: *Matthew Beck*[1]; [1]University of Kentucky

9:30 AM Invited
Powder Design for Additive Manufacturing of Porous Metals: *Braden Jones*[1]; Mark Atwater[1]; [1]Liberty University

10:00 AM Break

10:20 AM Invited
Development of Low-cost Nanoporous Ceramic Composite Membranes for Micro/Ultra-filtration: *V. V. Rohit Bukka*[1]; Christine Brockman[1]; Pankaj Sarin[1]; [1]Oklahoma State University

10:50 AM Invited
Direct Conversion of the Captured CO2 into Valuable Products Using CO2 Transport Membrane Reactor: Kangkang Zhang[1]; *Kevin Huang*[1]; [1]University of South Carolina

11:20 AM
Fabricating Nitinol Microtubes via Gas-phase Alloying: A Computational and Experimental Feasibility Study: *Sravya Josyula*[1]; Ravi Kumar[1]; Ugochukwu Ochieze[1]; Abdulquadri Oriola[1]; Eric Payton[1]; Ashley Paz y Puente[1]; [1]University of Cincinnati

11:40 AM
Lignin-based Catalyst for Room-temperature Carbon Monoxide Conversion and Applications in Respiratory Devices: *Donovan Mafukidze*[1]; Chuancheng Duan[1]; Yi Zheng[1]; [1]Kansas State University

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MATERIALS-ENVIRONMENT INTERACTIONS

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

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

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

Wednesday AM | October 4, 2023
A123 | Greater Columbus Convention Center

Session Chair: Xiaofeng Guo, Washington State University

8:00 AM Invited
Thermodynamic and Kinetic Considerations of CMAS Reactions with Rare-earth Monosilicates: Cameron Miller[1]; *Elizabeth Opila*[1]; [1]University of Virginia

8:30 AM Invited
Stability and use of Nitride and Carbide Nuclear Fuels in Advanced Reactors and Nuclear Propulsion in Space: *Theodore Besmann*[1]; Ronald Booth[1]; Reece McManus[1]; Juliano Schorne-Pinto[1]; Jhonathan Rosales[2]; Antoine Claisse[3]; [1]University of South Carolina; [2]National Aeronautical and Space Administration; [3]Westinghouse Electric Company

9:00 AM Invited
Thermodynamics of Bicrystal Metal-oxide Interfacial Failure at High Temperature: *Shen Dillon*[1]; [1]University of California, Irvine

9:30 AM
Thermochemistry of Co Transition Metal Nitrides: *Laura Bonatti*[1]; Tamilarasan Subramani[1]; Kristina Lilova[1]; Alexandra Navrotsky[1]; [1]Arizona State University

9:50 AM Break

10:10 AM
Mixing Behaviors in Group IV and V Oxides and Diborides: *Stuart Ness*[1]; Scott McCormack[1]; [1]University of California, Davis

10:30 AM
Thermodynamic Assessment of Ce_3In by Experimental and Computational Methods: *Andrew Strzelecki*[1]; Sajib Barman[1]; Cody Cockreham[1]; Samantha Couper[1]; S. Parker[1]; Najeb Abdul-Jabbar[1]; Mark Wartenbe[1]; Young-Jay Ryu[2]; Emma Carlsen[3]; Stella Chariton[2]; Vitali Prakapenka[2]; Maddury Somayazulu[4]; Curtis Kenny-Benson[4]; Bethany Chidester[1]; Margaret Reece[1]; W. Phelan[1]; Paul Tobash[1]; Hakim Boukhalfa[1]; Sarah Hernadez[1]; Eric Bauer[1]; Jeremy Mitchell[1]; Hongwu Xu[5]; [1]Los Alamos National Laboratory; [2]University of Chicago; [3]Washington State University; [4]Argonne National Laboratory; [5]Los Alamos National Laboratory & Arizona State University

10:50 AM
Thermodynamics of Cr-alloy Coated Zr-alloy Cladding Systems: *Theresa Davey*[1]; Ying Chen[1]; [1]Tohoku University

11:10 AM
Thermodynamic Modelling Possibilities of High-persistent (Thermally, Mechanically, Chemically) Functional Materials: *Alexander Slobodov*[1]; Andrey Evdokimov[1]; Sergey Bogdanov[1]; Roman Efimov[1]; Aiman Baibulanova[1]; [1]St. Petersburg Institute of Technology; ITMO University

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SPECIAL TOPICS

ACerS Robert B. Sosman Award Symposium — Sosman Presentation

Sponsored by: ACerS Basic Science Division

Wednesday PM | October 4, 2023
B130 | Greater Columbus Convention Center

1:00 PM Invited
Defect Disorder in Electronic Ceramics: Designing Functionality: *Elizabeth Dickey*[1]; [1]Carnegie Mellon University

ADDITIVE MANUFACTURING

Additive Manufacturing of High and Ultra-high Temperature Ceramics and Composites: Processing, Characterization and Testing — Extrusion/DIW/ Robocasting

Sponsored by: ACerS Engineering Ceramics Division, ACerS Manufacturing Division, ACerS Young Professionals Network

Program Organizers: Corson Cramer, Oak Ridge National Laboratory; Greg Hilmas, Missouri University of Science and Technology; Lisa Rueschhoff, Air Force Research Laboratory; David Mitchell, Oak Ridge National Laboratory

Wednesday PM | October 4, 2023
C161A/161B | Greater Columbus Convention Center

Session Chair: Corson Cramer, Oak Ridge National Laboratory

2:00 PM
3D Printing of Ceramic Composites: *Eduardo Saiz*[1]; Shitong Zhou[1]; Iuliia Tirichenko[1]; Florian Bouville[1]; Qiaosong Cai[1]; Victoria Vilchez[1]; Rohit Malik[1]; [1]Imperial College

2:30 PM
Robocasting Sintered SiC and Alumina for Extreme Applications: *Joe Cesarano*[1]; Mathew Esquibel[1]; Nik Ninos[2]; Sajjad Bigham[3]; Kashif Nawaz[4]; [1]Robocasting Enterprises; [2]Calix Ceramics; [3]North Carolina State University; [4]Oak Ridge National Labs

2:50 PM
Extrusion Based 3-D Printing of Reinforced SiC Using Hydrogel Pastes: *Anthony Brandl*[1]; Scott Misture[1]; Junjun Ding[1]; [1]Alfred University

3:10 PM
Additive Manufacturing for Functionally Graded Advanced Ceramics: *Nicholas Ku*[1]; Joshua Pelz[2]; Matthew Guziewski[1]; Franklin Kellogg[1]; Michael Golt[1]; Clara Mock[1]; Samuel Hirsch[1]; Phillip Goins[1]; Lionel Vargas-Gonzalez[1]; [1]US Army Research Laboratory; [2]University of California, San Diego

3:40 PM Break

4:00 PM
Additive Manufacturing of Silicon Carbide Ceramics at the Micron-/ nano- Particle Size for Hypersonic Capabilities: *Grant Baldwin*[1]; Kun Wang[1]; [1]Alfred University

4:20 PM
Effect of Variations in Carbon Fiber Loading of Silicon Carbide and Zirconium Diboride Cmcs Through Direct Ink Writing: *Jonathan Kaufman*[1]; Connor Wyckoff[1]; Benjamin Lam[2]; Christopher Kassner[1]; Katherine Acord[2]; Lisa Rueschhoff[2]; [1]UES Inc; [2]Air Force Research Laboratory

4:40 PM
High Temperature Materials Focus at LLNL: *Gabriella King*[1]; James Cahill[1]; [1]Lawrence Livermore National Laboratory

ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Multi-material, Functionally-graded Materials and High Entropy Alloys

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

Wednesday PM | October 4, 2023
C151 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
A Material Binning Approach to Laser Powder Manufacturing of Multi-material Composition Structures: *Suyash Niraula*[1]; Naiyer Shokri[1]; Thomas Berfield[1]; [1]University of Louisville

2:20 PM
En-Situ Alloying by Powder Bed Doping to form Functionally Graded Materials with LPBF: McKay Sperry[1]; David Carter[1]; *Nathan Crane*[1]; [1]Brigham Young University

2:40 PM
Functionally Graded Materials Compositional Path Design Considering Cracking Using Scheil and Equilibrium Simulations: *Zhening Yang*[1]; Hui Sun[1]; Allison Beese[1]; ZI-Kui Liu[1]; [1]Penn State University

3:00 PM
In-situ Carbide-driven CoCrFeMnNi High-entropy Alloy Matrix Nanocomposites Manufactured by Laser Powder Bed Fusion: Carbon Content and Heat Treatment Effects on Microstructure, Room and Cryogenic Tensile, High Temperature Creep Properties: *Kee-Ahn Lee*[1]; Young-Kyun Kim[1]; So-Yeon Park[1]; Sangsun Yang[2]; [1]Inha University; [2]Korea Institute of Materials Science

3:20 PM Break

3:40 PM
Extraordinary Combination of Strength and Ductility in an Additively Manufactured Fe-based Medium Entropy Alloy through In Situ Formed η-nanoprecipitate and Heterogeneous Microstructure: *Farahnaz Haftlang*[1]; Eun Seong Kim[1]; Jihye Kwon[1]; Yoon-Uk Heo[1]; Hyoung Seop Kim[1]; [1]POSTECH

4:00 PM
Operando X-ray Diffraction Reveals Solidification Pathway of High Entropy Alloys with Different Degrees of Metastability: Akane Wakai[1]; Amlan Das[2]; *Atieh Moridi*[1]; [1]Cornell University; [2]Cornell High Energy Synchrotron Source

ADDITIVE MANUFACTURING

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Ni-based Alloys

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

Wednesday PM | October 4, 2023
C150 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Deformation Mechanisms of Additively Manufactured Hastealloy-X: A Neutron Diffraction Experiment and Crystal Plasticity Modeling: *Hamidreza Abdolvand*[1]; Ali Bonakdar[2]; Ahmed Aburakhia[1]; Amirhosein Mozafari[1]; [1]The University of Western Ontario; [2]Siemens Energy Canada Limited

2:20 PM
Laser Powder Bed Fusion of Crack-free High Gamma Prime Rene 77 Superalloy: Processing, Heat Treatment, Mechanical Properties and Applications: *Marcus Lam*[1]; [1]Monash University

2:40 PM
Microstructure and Mechanical Properties of Alloy 718 Blocks by Wire Arc Additive Manufacturing: *Bing Han*[1]; Manuel Marya[1]; Srinand Karuppoor[1]; [1]Schlumberger

3:00 PM
Stress Relaxation Testing to Assess the Creep Performance of Inoculated Alloy 230 Processed with Laser Powder Bed Fusion: *Daniel McConville*[1]; Ben Rafferty[2]; Kevin Eckes[2]; Jeremy Iten[2]; Amy Clarke[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines; [2]Elementum 3D

3:20 PM Break

3:40 PM
Surpassing know Creep Resistance for Haynes 282 through Wire Arc Additive Manufacturing: *Sophia Hill*[1]; Jonah Klemm-Toole[1]; [1]Colorado School of Mines

4:00 PM
Processing-structure-property Relationship of 3D Printed Metals via Hot Wire Direct Energy Deposition: *Bharat Yelamanchi*[1]; Virgil Solomon[1]; Andrew Prokop[1]; Brian Vuksanovich[1]; John Carballo[1]; Jackie Ruller[1]; Aayush Alok[1]; Mukesh Kalel[1]; Holly Martin[1]; Pedro Cortes[1]; [1]Youngstown State University

4:20 PM
Atomic-scale Understanding of the Role of Grain Boundary Elements on Crack-free Additively Manufactured Superalloys: *Paraskevas Kontis*[1]; Stoichko Antonov[2]; Arthur Després[3]; Guilhem Martin[3]; [1]Norwegian University of Science and Technology; [2]National Energy Technology Laboratory; [3]University Grenoble Alpes

4:40 PM
Densification and Microstructural Evolution and Characterization of Binder Jet Printed and Sintered Porous Ni-Mn-Ga Magnetic Shape-Memory Alloys: *Pierangeli Rodriguez De Vecchis*[1]; Amir Mostafaei[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Illinois Institute of Technology

ADDITIVE MANUFACTURING

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

Sponsored by: TMS: Additive Manufacturing Committee

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

Wednesday PM | October 4, 2023
C171 | Greater Columbus Convention Center

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

2:00 PM Introductory Comments

2:05 PM
Characterization of Processing and Performance Properties of Ammonium Perchlorate Composite Propellant for Use in an Additive-manufacture System: Dylan Purcell[1]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology

2:25 PM Invited
Material Extrusion Additive Manufacturing of Thermoset-based Short Fiber Composites: *Brett Compton*[1]; [1]University of Tennessee

2:55 PM
Extrusion of Compounded rPET with Graphite Powder into Filament for Material Extrusion (MEX) Additive Manufacturing Technology: *Trent Townsend*[1]; Ola Rashwan[1]; Matthew Caputo[2]; [1]Pennsylvania State University - Harrisburg; [2]Pennsylvania State University - Shenango

3:15 PM Question and Answer Period

3:25 PM Break

3:45 PM
Fatigue Analysis of 3D Printed PEEK (Polyetheretherketone): *Ola Rashwan*[1]; Mohammed Sakayl[1]; [1]Pennsylvania State University-Harrisburg

4:05 PM
Enhancing Interphase Strength of Glass Fiber Polymer Matrix Composites - A Molecular Dynamics Study: *Xiawa Wu*[1]; [1]Penn State Behrend

4:25 PM
Investigating Antimicrobial Efficacy of Printed PEEK Coated with AgNPs: *Caden Kurzenknabe*[1]; Ola Rashwan[1]; [1]Penn State University-Harrisburg

4:45 PM
Photopolymer-metal Composites Based on Metal Foil Deposition on Additive Manufactured Substrates: *Sagar K G*[1]; [1]Cambridge Institute of Technology

5:05 PM Question and Answer Period

ADDITIVE MANUFACTURING

Additive Manufacturing: Design, Materials, Manufacturing, Challenges and Applications — Session IV

Sponsored by: ACerS Other

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

Wednesday PM | October 4, 2023
C160A/160B | Greater Columbus Convention Center

Session Chairs: Dr. Navin Manjooran, Chairman, Solve; Prof. Gary Pickrell, Virginia Tech

2:00 PM Introductory Comments

2:20 PM
Thermal Management in High Heat Flux Environments: a Metal Additive Manufacturing Approach: *Alexander Lark*[1]; Gehn Ferguson[1]; Ryan Carter[1]; Robert Mueller[1]; Gianna Valentino[2]; [1]Johns Hopkins University Applied Physics Laboratory; [2]University of Maryland

2:40 PM
Surface Patterning of Sacrificial Nodules Using L-PBF in Improving Corrosion Properties of Lightweight Al-Mg Alloy: *Fanyue Kong*[1]; Minh Tran[1]; Elena Romanovskaia[1]; Valentin Romanovski[1]; Ji Ma[1]; John Scully[1]; [1]University of Virginia

3:00 PM
Additive Manufacturing of Graded Tungsten Lattices for Radioactive Material Transport: *Caleb Hatler*[1]; Zachary Persha[1]; Jason Benkoski[2]; Dan Thoma[1]; [1]University of Wisconsin Madison; [2]Los Alamos National Laboratory

3:20 PM Break

3:40 PM
Aiming the Susceptibility to Weld Solidification Cracking in Laser Powder Bed Fusion 316L Stainless Steel: *Jhoan Guzman*[1]; Jacque Berkson[1]; Samuel Casto[1]; Antonio Ramirez[1]; [1]The Ohio State University

4:00 PM
Co-designing and LPBF Additive Manufacturing of Complex Thermo-fluidic Components of Concentrating Solar-Thermal Power Plants - A Comprehensive Study of Printing Heat Exchangers and Solar Receivers: *Junwon Seo*[1]; Nicholas Lamprinakos[1]; Erfan Rasouli[2]; Ines-Noelly Tano[2]; Austin Marshall[2]; Daniel Satko[3]; Subbarao Raikar[4]; Ansel Blumenthal[5]; Andrea Ambrosini[5]; Owen Hildreth[4]; Ayman Salem[3]; Vinod Narayanan[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]University of California, Davis; [3]MRL Materials Resources LLC; [4]Colorado School of Mines; [5]Sandia National Laboratories

4:20 PM
Processing of Inconel 718 Structures Via Wire Arc Additive Manufacturing: *Lile Squires*[1]; Amit Bandyopadhyay[1]; Victor Champagne[2]; [1]Washington State University; [2]US Army Research Laboratory

4:40 PM
Structural Robustness in Additively Manufactured Lattice Structures: *Mrinaal Lorengo*[1]; Ji Ma[1]; [1]University of Virginia

5:00 PM
Acoustic Energy Assisted Metal Powder Consolidation for Additive Manufacturing: *M Faisal Riyad*[1]; Pu Han[1]; Shams Torabnia[1]; Mohammed Bawareth[1]; Keng Hsu[1]; [1]Arizona State University

5:20 PM Concluding Comments

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Advanced Ceramics for Environmental Remediation — Session III

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

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

Wednesday PM | October 4, 2023
B240/241 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Plasmonic Gas Sensors for Environmental Monitoring: *Alessandro Martucci*[1]; [1]University of Padova

2:30 PM Invited
Porous 2D Materials for Water Remediation and Diagnostics: *Giovanni Fanchini*[1]; [1]University of Western Ontario

3:00 PM
Engineered Ceramics for Enhanced Weathering CO2 Capture: *Brian Gorman*[1]; David Nowacek[2]; [1]Colorado School of Mines; [2]Ironstone Strong, Ltd

3:20 PM
Stripping and Regeneration of Magnetite Adsorbent Used in an Ion Exchange System: *Trevor Russell*[1]; Jerome Downey[1]; Richard LaDouceur[1]; Gary Wyss[1]; [1]Montana Technological University

PROCESSING AND MANUFACTURING

Advanced Joining Technologies for Automotive Lightweight Structures — Resistance Spot Welding and Other Advanced Joining Technologies

Sponsored by: TMS: Aluminum Committee, ACerS Manufacturing Division

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

Wednesday PM | October 4, 2023
B244/245 | Greater Columbus Convention Center

Session Chairs: Yong Chae Lim, Oak Ridge National Laboratory; Yan Huang, Brunel University London

2:00 PM Keynote
Achieving Success Joining Advanced Structural Materials with Automated Adhesive and Sealer Dispensing Systems: *Michael Bonner*[1]; [1]Saint Clair Systems, Inc.

2:30 PM
Application of an Innovative Interlayer Technology on Advanced Materials for the Automotive Industry: *Liya Amanuel*[1]; Antonio Ramirez[1]; [1]Ohio State University

2:50 PM
Design of Shape Memory Wire Actuators by Impact Welding: Biswanath Paira[1]; *Boyd Panton*[1]; Anupam Vivek[1]; Brian Thurston[1]; Glenn Daehn[1]; [1]Ohio State University

3:10 PM
Effect of Spreading Behavior of Adhesives in Resistance Spot Welding Bonding (RSWB): *Henry León-Henao*[1]; Antonio Ramirez[1]; [1]The Ohio State University

3:30 PM Break

3:50 PM
Design and Development of 3D Printed Fastening Mechanisms for Similar Material Single-lap Joints: *Haris Khan*[1]; Maqsoora Nazim[1]; Farooq Akram[1]; [1]National University of Sciences and Technology

4:10 PM
Development of an Analytical Model for Electrode Wear during Resistance Spot Welding: *Rafael Giorjao*[1]; Olga Eliseeva[1]; Jerry Gould[1]; [1]EWI

4:30 PM
Quality Improvement Method of Resistance Spot Welding Process Aluminum Alloy: *Changwook Ji*[1]; Sugwook Kang[1]; Jaehun Kim[1]; Jooyong Cheon[1]; Jeong Yeol Park[1]; [1]Korea Institute of Industrial Technology

4:50 PM
Ultrasonic Aided Resistance Spot Welding of Dissimilar Materials: *Muhammad Atif Makhdoom*[1]; [1]University of the Punjab

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Session II

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

Wednesday PM | October 4, 2023
A120 | Greater Columbus Convention Center

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

2:00 PM Introductory Comments

3:00 PM
Behavior of Select Refractories in Plastics Gasification Environments: Omer Doğan[1]; *Griffin Patterson*[2]; Kristin Tippey[1]; Jinichiro Nakano[1]; Anna Nakano[1]; Hugh Thomas[1]; [1]National Energy Technology Laboratory; [2]Harbison Walker International

3:20 PM
Castable Eutectic Ni-Ce Superalloys Strengthened by a γ/γ Microstructure: S. Bushra Haider[1]; Elizabeth Heon[1]; *Eric Lass*[1]; [1]University of Tennessee-Knoxville

3:40 PM Break

4:00 PM
Computational Design of Yttrium-Rare Earth Alloyed Disilicates as Environmental Barrier Coatings: *Shiqiang Hao*[1]; Richard Oleksak[1]; Ömer Doan[1]; Michael Gao[1]; [1]National Energy Technology Laboratory

4:20 PM
Doped Lanthanum Chromite-refractory Based Composites Sensors for High Temperature Monitoring in Harsh Environments Systems: *Javier Mena*[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; Katarzyna Sabolsky[1]; Rowan Barto[1]; Nicholas Voorstad[1]; [1]West Virginia University

4:40 PM
Cold-rolled 3D Graphene Sheets as a Protective Material in the Fluorocarbon Plasma Environment: *Vamsi Krishna Reddy Kondapalli*[1]; Kyle Brittingham[1]; Guangqi Zhang[1]; Mahnoosh Khosravifar[1]; Vesselin Shanov[1]; [1]University of Cincinnati

5:00 PM
Heat Treatment Design of Inconel 740H and Modified Superalloy for Microstructure Stability and Creep Properties Enhancement: *CheolHyeok Yang*[1]; DongMin Kim[1]; ChiWon Kim[1]; HiWon Jeong[2]; HyunUk Hong[1]; [1]Changwon University; [2]Korea Institute of Materials Science

5:20 PM Concluding Comments

IRON AND STEEL (FERROUS ALLOYS)

Advances in Understanding of Martensite in Steels II — Microstructure Evolution and Properties

Sponsored by: TMS: Steels Committee

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - Industeel; Mohsen Asle Zaeem, Colorado School of Mines; Janelle Wharry, Purdue University; Eric Payton, University of Cincinnati; Goro Miyamoto, Tohoku University; Eric Lass, University of Tennessee-Knoxville; Amy Clarke, Colorado School of Mines; MingXin Huang, University of Hong Kong; Kester Clarke, Colorado School of Mines

Wednesday PM | October 4, 2023
A211 | Greater Columbus Convention Center

Session Chairs: Goro Miyamoto, Tohoku University; Janelle Wharry, Purdue University

2:00 PM
In-situ Neutron Diffraction Analysis of Deformation-induced Transformation Behavior in High-strength and High-ductility Metastable Austenitic Stainless Steel Produced by Cold-rolling and Partitioning Method: *Yuta Matsumura*[1]; Goro Miyamoto[2]; Yongie Zhang[2]; Tadashi Furuhara[2]; Yo Tomota[3]; [1]Tokushu Kinzoku Excel Co., Ltd.; [2]Tohoku University; [3]National Institute of Advanced Industrial Science and Technology

2:20 PM
Evolution of Dislocation Structure during Plastic Deformation in Lath Martensite of Low-Carbon Steel Observed by ECCI: *Shuang Gong*[1]; Junya Inoue[1]; [1]The University of Tokyo

2:40 PM
Investigation on Gigapascal Martensitic Microstructures for Higher Bendability of Advanced High-strength Hot Stamped Steel: *Byung-Gil Yoo*[1]; Jewoosoo Kim[1]; Seok-Hyeon Kang[1]; Seong Kyung Han[1]; Tae Woo Kwon[1]; Jae-il Jang[2]; [1]Hyundai Steel; [2]Hanyang University

3:00 PM
Effect of Thermomechanical Strategy and Ni-Mo Alloying on High Strength Quenched and Tempered Thick Plates: Xabier Azpeitia[1]; Nerea Isasti[1]; Hardy Mohrbacher[2]; Eric Detemple[3]; *Pello Uranga*[1]; [1]CEIT and TECNUN (University of Navarra); [2]NiobelCon bvba; [3]AG der Dillinger Hüttenwerke

3:20 PM Break 3:20 - 3:40 PM

3:40 PM Invited
Investigating Microstructural Transitions of Austempered Ductile Iron in Slurry Wear Applications: *Tom Kanaby*[1]; [1]Dana Limited

4:10 PM
Influence of Strain Rate on Mechanical Behavior and Microstructure Evolution of Fe-0.10C-5Mn Medium Manganese Steel: *Mei Zhang*[1]; [1]Shanghai University

4:30 PM
Achieving 1.4 GPa Tensile Strength with Good Ductility in a Novel Low-alloy Low-carbon Martensite Steel: *Pravendra Singh*[1]; Murugesh R.[1]; Suhrit Mula[1]; Sadhan Ghosh[1]; [1]Indian Institute of Technology Roorkee

CERAMIC AND GLASS MATERIALS

Ceramics and Glasses Modeling by Simulations and Machine Learning — Simulations and Machine Learning II

Sponsored by: ACerS Glass & Optical Materials Division

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

Wednesday PM | October 4, 2023
B231 | Greater Columbus Convention Center

Session Chairs: Mathieu Bauchy, UCLA; Aditya Kumar, MS&T

2:00 PM Invited
A B-C Story, Investigated by A.I. and CALPHAD: *Olivier Hardouin Duparc*[1]; Romuald Béjaud[2]; Antoine Jay[3]; Olivier Rapaud[4]; Nathalie Vast[1]; [1]LSI-CNRS-CEA; [2]CEA-DAM-DIF; [3]Université Toulouse; [4]CEC Limoges

2:40 PM
AIMD Simulation of Early Stages in Pyrolysis of SiCON Polymers: *Peter Kroll*[1]; [1]University of Texas at Arlington

3:00 PM
A "Machine-Learning Potential" for SiCO Ceramics: *Mitchell Falgoust*[1]; Peter Kroll[1]; [1]University of Texas at Arlington

3:20 PM Break

3:40 PM Invited
Atomistic Perspectives in Characterizing Crystalline Defect Formation in Amorphous Silicon Nitride: *Tesia Janicki*[1]; Carlos Chacon[1]; Edwin Chiu[1]; Jason Gibson[2]; Scott Grutzik[1]; Khalid Hattar[3]; Richard Hennig[2]; Hojun Lim[1]; Calvin Parkin[1]; Jennie Podlevsky[1]; Aashique Rezwan[1]; Chris Bishop[1]; J. Matthew Lane[1]; [1]Sandia National Laboratories; [2]University of Florida; [3]University of Tennessee Knoxville

4:20 PM
Defect Chemistry and Electrical Properties of Doped BaTiO3: *Yuki Sakai*[1]; Minoru Ryu[1]; Yoshiki Iwazaki[1]; [1]Taiyo Yuden Co., Ltd.

4:40 PM
An ICME Approach for Short Fiber Reinforced Ceramic Matrix Composite via Direct Ink Writing: *Jason Sun*[1]; James Chen[1]; [1]University at Buffalo

5:00 PM
First-Principles Modeling of Thermodynamics and Kinetics of Thin-Film Tungsten Carbides: *Jiayang Wang*[1]; Alexander Sredenschek[1]; David Sanchez[1]; Da Zhou[1]; Mauricio Terrones[1]; Susan Sinnott[1]; [1]Penn State University

NUCLEAR ENERGY

Ceramics for New Generation Nuclear Energy System Application — Radiation-induced Defects in Model Oxides

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

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Maik Lang, University of Tennessee; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Enrique Saez, Clemson University; Jinsuo Zhang, Virginia Polytechnic Institute and State University

Wednesday PM | October 4, 2023
A124 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Interface Effect on the Distributions of Radiation Induced Defects: *Farida Selim*[1]; [1]Bowling Green State University

2:30 PM Invited
Atomistic Understanding of Thermal Conductivity Degradation in Irradiated Oxide Fuels: *Marat Khafizov*[1]; Saqeeb Adnan[1]; Erika Nosal[1]; Miaomioa Jin[2]; Linu Malakkal[3]; Amey Khanolkar[3]; Shuxiang Zhou[3]; Zilong Hua[3]; Kaustubh Bawane[3]; Boopathy Kombaiah[3]; Chao Jiang[3]; Lingfeng He[4]; Michael Manley[5]; David Hurley[3]; [1]Ohio State University; [2]Pennsylvania Satate University; [3]Idaho National Laboratory; [4]North Carolina State University; [5]Oak Ridge National Laboratory

3:00 PM Invited
Thermal Energy Transport in Solids with Extended Defects: A New Insight from Phonon Scattering in Extended Strain Fields: *Anter El-Azab*[1]; Ryan Deskins[1]; [1]Purdue University

3:30 PM Break

3:50 PM Invited
Proton Irradiation and Characterization of ThO2, UxTh1-xO2, CeO2, UO2 and Zr:UO2 Single Crystals: *James Mann*[1]; Karl Rickert[2]; Timothy Prusnick[2]; Cody Dennett[3]; David Turner[4]; Lin Shao[5]; [1]Air Force Research Laboratory; [2]KBR; [3]Massachusetts Institute of Technology; [4]Azimuth Corporation; [5]Texas A&M University

4:20 PM
Phonon Modal Analysis of Thermal Transport in ThO2 with Defects: *Beihan Chen*[1]; Linu Malakkal[2]; Marat Khafizov[3]; Miaomiao Jin[1]; [1]Pennsylvania State University; [2]Idaho National Laboratory; [3]Ohio State University

4:40 PM
Modeling the Effect of Point Defect Scattering on the Thermal Conductivity of ThO2: *Erika Nosal*[1]; Saqeeb Adnan[1]; Miaomiao Jin[2]; Linu Malakkal[3]; Marat Khafizov[1]; [1]The Ohio State University; [2]The Pennsylvania State University; [3]Idaho National Laboratory

5:00 PM
Impact of Phonon Resonant Scattering on Thermal Conductivity of Uranium-doped ThO2: *Saqeeb Adnan*[1]; Zilong Hua[2]; Erika Nosal[1]; Amey Khanlokar[2]; David Hurley[2]; Marat Khafizov[1]; [1]Ohio State University; [2]Idaho National Laboratory

MODELING

Computational Discovery, Understanding, and Design of Multi-principal Element Materials — Session III

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

Program Organizers: Shuozhi Xu, University of Oklahoma; Douglas Spearot, University of Florida; Jia Li, Hunan University; Michael Gao, National Energy Technology Laboratory; Levente Vitos, Royal Institute of Technology (KTH)

Wednesday PM | October 4, 2023
A223 | Greater Columbus Convention Center

Session Chairs: Dilpuneet Aidhy, Clemson University; Shunli Shang, Pennsylvania State University

2:00 PM Keynote
Charge-Density based Convolutional Neural Networks for Property Prediction in High Entropy Alloys: Jacob Fisher[1]; Serveh Kamrava[2]; Pejman Tahmasebi[2]; *Dilpuneet Aidhy*[1]; [1]Clemson University; [2]Colorado School of Mines

2:40 PM
Microstructural Engineering via Heat Treatments in Multi-principal Element Alloy Systems with Miscibility Gaps: *Shalini Roy Koneru*[1]; Kamal Kadirvel[2]; Zachary Kleonne[1]; Hamish Fraser[1]; Yunzhi Wang[1]; [1]Ohio State University; [2]CompuTherm LLC

3:00 PM
Effect of Elasticity in Microstructural Evolution of Multi-component, Multi-phase System: Jeonghwan Lee[1]; *Kunok Chang*[1]; [1]Kyung Hee University

3:20 PM Break

3:40 PM Invited
Predicting Ideal Shear Strength of Dilute Multicomponent Ni-based Alloys by an Integrated First-principles, CALPAHD, and Correlation Analysis: *Shuang Lin*[1]; Shun-Li Shang[1]; John Shimanek[1]; Yi Wang[1]; Allison M Beese[1]; Zi-Kui Liu[1]; [1]Penn State University

4:10 PM
Ab-Initio Investigation of Jahn-Teller Distortions within High Entropy Oxide Systems Using Recently Developed Meta-GGA Functionals: *Jacob Sivak*[1]; MaryKate Caucci[1]; Saeed Almishal[1]; Christina Rost[2]; Ismaila Dabo[1]; Jon-Paul Maria[1]; Susan Sinnott[1]; [1]Pennsylvania State University; [2]James Madison University

4:30 PM
First-principles Study for Discovery of High-entropy MXenes: *HyunWoo Seong*[1]; Min Seok Lee[1]; Ho Jin Ryu[1]; [1]KAIST

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Functional Ceramics & Polymer-derived Ceramics

Sponsored by: ACerS Basic Science Division, ACerS Electronics 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 at Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Indiana University-Purdue University Indianapolis

Wednesday PM | October 4, 2023
B234 | Greater Columbus Convention Center

Session Chairs: Kathy Lu, Virginia Tech; Gurpreet Singh, Kansas State University

2:00 PM Invited
Enabling Materials Chemistry for Functional Ceramics: *Shenqiang Ren*[1]; [1]University at Buffalo, The State University of New York

2:30 PM Invited
Intrinsic and Extrinsic Control in Gas Phase Deposition Processes for Functional Ceramics: *Thomas Fischer*[1]; Sanjay Mathur[1]; [1]University of Cologne

3:00 PM
Polymeric SiCO Aerogels for Oil-water Separation: *Hannah Hayes*[1]; Peter Kroll[1]; [1]University of Texas at Arlington

3:20 PM
Polymer Grafted Zirconia Nanoparticles as a Processible Precursor to Zirconium-based Ceramics: *James Ponder*[1]; Nicholas Posey[1]; Kara Martin[1]; Matthew Dickerson[2]; [1]UES, Inc.; [2]AFRL

3:40 PM Break

4:00 PM
Polymer Derived Hierarchically Porous Silicon Oxycarbide Ceramics through Bio-templating: *Ummen Sabu*[1]; Rajendra Bordia[1]; [1]Clemson University

4:20 PM
Preceramic Nanomaterials from Ionically Complexed Polymers and Particles: *Nicholas Posey*[1]; Jared Delcamp[1]; Matthew Dickerson[2]; [1]UES, Inc.; [2]AFRL

4:40 PM
Phase Formation and High Temperature Electrical Conductivity in Novel Polymer-Derived Silicon Oxycarbide – $Ti_3C_2T_x$ MXene Nanocomposites: *Advaith Rau*[1]; Kathy Lu[1]; [1]Virginia Polytechnic Institute and State University

5:00 PM
Investigation of Sodium and Potassium Ion Storage Behavior of WS2 Nanosheet Loaded Polymer Derived SiOC Fibers: *Sonjoy Dey*[1]; Gurpreet Singh[1]; [1]Kansas State University

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Engineering Ceramics: Ceramic Matrix Composites and Applications

Sponsored by: ACerS Engineering Ceramics Division

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

Wednesday PM | October 4, 2023
B232 | Greater Columbus Convention Center

Session Chairs: Federico Smeacetto, Politecnico di Torino; Jie Zhang, Institute of Metal Research, Chinese Academy of Sciences

2:00 PM Invited
Strategic Advancements on Environmental Barrier Coatings for SiCf/SiC Composite: *Jingyang Wang*[1]; [1]Shenyang National Laboratory for Materials Science, Institute of Metal Research

2:30 PM
Densification, Microstructure, and Thermal Properties of Zirconium Diboride (ZrB2) with Carbon Additions: *Yue Zhou*[1]; William Fahrenholtz[1]; Gregory Hilmas[1]; [1]Missouri University of Science and Technology

2:50 PM
Development of Binary B4C-TiB2 and Ternary B4C-SiC-TiB2 Ceramic-matrix Composites for Armor Applications: *Emirhan Karadagli*[1]; Besim Dara[1]; Ahmet Toksoy[1]; Bura Çiçek[2]; [1]Roketsan Missiles Inc.; [2]Yldz Technical University

3:10 PM Invited
Combinatorial and High-throughput Screening Approaches of Advanced Ceramics for High Temperature Applications: *Jie Zhang*[1]; Xirui Lv[1]; Jingyang Wang[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

3:40 PM Break

4:00 PM
Thermal Property and Corrosion Resistance of Xenotime-type Rare Earth Phosphates for Environmental Barrier Coatings: *Bishnu Majee*[1]; Keith Bryce[1]; Jie Lian[1]; Liping Huang[1]; [1]Rensselaer Polytechnic Institute

4:20 PM
Comparison of Alternate Methods of Fracture Toughness Determination via Strength Analysis: Nhu Dinh[1]; *John Mecholsky*[1]; [1]University of Florida

4:40 PM
Al2O3-WC Ceramic Composites with Extremely Improved Mechanical Strength by Interfacial Segregation of Dilute Dopants: *Tomohiro Nishi*[1]; Tomoko Hishida[1]; Yusuke Katsu[1]; Yasuyuki Okimura[1]; Takeshi Mitsuoka[1]; Katsuyuki Matsunaga[2]; [1]Niterra Co., Ltd.; [2]Nagoya Univ.

5:00 PM
Mechanical, Thermal and Oxidation Properties of $Al_4SiC_4/Y_3Al_5O_{12}$ Ceramics: *Atsuko Tanaka*[1]; Anna Gubarevich[1]; Katsumi Yoshida[1]; [1]Tokyo Institute of Technology

5:20 PM
Designing Novel Dielectric Composites with High Thermal Conductivity via Cold Sintering: *Javier Mena-Garcia*[1]; Arnaud Ndayishimiye[1]; Zhongming Fan[1]; Steven Perini[1]; Wenjie Li[1]; Bed Poudel[1]; Shashank Priya[1]; Brian Foley[2]; John Gaskins[2]; Clive Randall[1]; [1]The Pennsylvania State University; [2]Laser Thermal

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond IV — Materials Structure and Characterization

Sponsored by: TMS Alloy Phases Committee

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

Wednesday PM | October 4, 2023
A216 | Greater Columbus Convention Center

Session Chair: Milan Heczko, Ohio State University

2:00 PM
Multi-scale Characterization of 3D Printable CrCoNi-based ODS-MPEA Designed for High-temperatures and Extreme Environments: *Milan Heczko*[1]; Timothy Smith[2]; Christopher Kantzos[2]; Veronika Mazanova[1]; Antonin Dlouhy[3]; Michael Mills[1]; [1]Ohio State University; [2]NASA Glenn Research Center; [3]Institute of Physics of Materials CAS

2:20 PM
Study of Microstructure and Deformation Behavior of MnFeNi Medium Entropy Alloy: *Jiashi Miao*[1]; Xuejun Huang[1]; Alan Luo[1]; [1]Ohio State University

2:40 PM
Effect of Surface Microstructure Modification on the Oxidation Behavior of a TaTiCr RMPEA: *Noah Welch*[1]; Maria Quintana[1]; Todd Butler[2]; Peter Collins[1]; [1]Iowa State University; [2]Air Force Research Laboratory, WPAFB

3:00 PM
How Can We Tune the Short-range Order (SRO) in Multi-principal Element Alloys (MPEA)s?: *Ying Han*[1]; Hangman Chen[2]; Yongwen Sun[1]; Jian Liu[3]; Wen Chen[3]; Penghui Cao[2]; Yang Yang[1]; [1]Pennsylvania State University; [2]University of California, Irvine; [3]University of Massachusetts

3:20 PM
Automated Characterization of Refractory High Entropy Alloys: *Eddie Gienger*[1]; Denise Yin[1]; Justin Rokisky[1]; Lisa Pogue[1]; Christopher Stiles[1]; [1]Johns Hopkins University Applied Physics Lab

3:40 PM Break

4:00 PM
Oxidation and Microstructures of Non-body Centered High Entropy Alloys: *Mckenna Hitter*[1]; SK Varma[1]; [1]University of Texas at El Paso

4:20 PM
Effect of Phase Interface on Stretch-flangeability of Metastable Ferrous Medium-entropy Alloys: *Yeon Taek Choi*[1]; Peyman Asghari-Rad[2]; Jae Wung Bae[3]; Hyoung Seop Kim[1]; [1]Pohang University of Science and Technology; [2]Pennsylvania State University; [3]Pukyong National University

4:40 PM
Synthesis and Characterization of High Entropy Nitrides: *Suprabha Das*[1]; Vadym Drozd[1]; Andriy Durygin[1]; Md Shariful Islam Sozal[1]; Mike Cinibulk[2]; Jesse Smith[3]; Xianming Bai[4]; Yong Ding[5]; Zhe Cheng[1]; [1]Florida International University; [2]Air Force Research Laboratory ; [3]Argonne National Laboratory; [4]Virginia Institute of Technology; [5]Georgia Institute of Technology

5:00 PM
Nanograin Stabilization in High Entropy Alloy Without the Need for "Extra" Solute: *Moses Adaan-Nyiak*[1]; Ahmed Tiamiyu[1]; [1]University of Calgary

MATERIALS-ENVIRONMENT INTERACTIONS

High Temperature Corrosion and Degradation of Structural Materials — V. Thermal/Environmental Barrier Coatings

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

Wednesday PM | October 4, 2023
A122 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Impact of Environmental Barrier Coating Chemistries on the Oxidation of Si-base Materials: *Mackenzie Ridley*[1]; Michael Lance[1]; Trevor Aguirre[1]; Kenneth Kane[2]; Bruce Pint[1]; [1]Oak Ridge National Laboratory; [2]Johns Hopkins Applied Physics Laboratory

2:30 PM
Discovery of High Entropy Rare Earth Disilicates for Extreme Environments: *Laura Doumaux*[1]; Milena Milich[2]; Hunter Schonfeld[2]; Mackenzie Ridley[3]; Davide Robba[4]; Luka Vlahovic[4]; Kostantinos Boboridis[4]; Elizabeth Opila[1]; Patrick Hopkins[2]; [1]University of Virginia, Materials Science and Engineering; [2]University of Virginia, Mechanical and Aerospace Engineering; [3]Oak Ridge National Laboratory; [4]European Commission, Joint Research Centre (JRC), Karlsruhe, Germany

2:50 PM
Thermophysical Properties of Xenotime Inspired Rare Earth Phosphate EBCs: *Pádraigín Stack*[1]; William Riffe[1]; Elizabeth Opila[1]; [1]University of Virginia

3:10 PM
Investigating Fifth Oxide Effect on CMXAS Glass Properties: *Clark Luckhardt*[1]; Elizabeth Opila[1]; [1]University of Virginia

3:30 PM Break

3:50 PM
Development of Ablation-Resistant, High Emittance Coatings for Carbon/Carbon Composites for Hypersonic Application: *Abdullah Al Saad*[1]; Carlos Martinez[1]; Rodney Trice[1]; [1]Purdue University

4:10 PM
Oxidation of B2-(Ru,Pd)Al Alloys for Bond Coat Applications: *Yueh-Cheng Yu*[1]; David Poerschke[1]; [1]University of Minnesota

4:30 PM
Surface Coatings Providing Protection Against High Temperatures and Corrosion in the Production of Coke: Borys Sereda[1]; Irina Kruhliak[1]; *Dmytro Sereda*[1]; [1]DSTU

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Hybrid Organic-inorganic Materials for Alternative Energy — Hybrid Organic-inorganic Materials II

Sponsored by: ACerS

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

Wednesday PM | October 4, 2023
B242/243 | Greater Columbus Convention Center

Session Chair: Chang-Yong Nam, Brookhaven National Laboratory

2:00 PM Invited
Hybrid Materials Based on Carbon Nanotube – Copper: *Noe Alvarez*[1]; [1]University of Cincinnati

2:30 PM Invited
Potassium-based Batteries: Advantages and Challenges: *Yiying Wu*[1]; [1]Ohio State University

3:00 PM Invited
Static and Dynamic Mechanical Characteristics of Li-Ion Conducting Polymer/Ceramic Composite Membranes: *Hong Huang*[1]; [1]Wright State University

3:30 PM Break

3:50 PM Invited
Two-dimensional Material Additives in Hybrid Perovskite Solar Cells for Improving Performance and Stability: *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory

4:20 PM Invited
Two-dimensional Transition Metal Carbo-Chalcogenides, MXenes, and their Hybrids for Electrochemical Energy Storage and Conversion: Ahmed Majed[1]; Elham Loni[1]; Kun Liang[1]; *Michael Naguib*[1]; [1]Tulane University

MODELING

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

Sponsored by: TMS: Computational Materials Science and Engineering Committee, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee, TMS: Advanced Characterization, Testing, and Simulation Committee

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

Wednesday PM | October 4, 2023
A225 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Monte Carlo Grain Growth Simulations of Discontinuous Changes in Grain Boundary Velocity Induced by Grain Boundary Transformations: *Christopher Marvel*[1]; Caroline Riedel[2]; Houliang Zhou[2]; Ben Zalatan[2]; Brian Chen[2]; Martin Harmer[2]; [1]Louisiana State University; [2]Lehigh University

2:30 PM
A Solid Solution Strengthening Model with Ab Initio Calculations and Experiments for Solid Solution Al Alloys: *Taiwu Yu*[1]; Thomas Barkar[2]; Bartek Kaplan[2]; Paul Mason[1]; [1]Thermo-Calc Software Inc; [2]Thermo-Calc Software AB

2:50 PM
Prediction and Quantification of Suzuki Segregation at Stacking Faults in FCC-based Alloys and Compounds: Victoria Tucker[1]; Dongsheng Wen[2]; Thomas Mann[1]; Michael Fahrmann[3]; *Michael Titus*[1]; [1]Purdue University; [2]University of Liverpool; [3]Haynes International

3:10 PM
Validation Experiments Developed for Casting Modeling: *Jonah Duch*[1]; Meghan Gibbs[1]; Mathew Hayne[1]; [1]Los Alamos National Laboratory

3:30 PM Break

3:50 PM
Accurate Prediction of Dislocation, Twin and Crack-Tip Behavior in HCP and BCC Ti: *Tongqi Wen*[1]; Anwen Liu[2]; Rui Wang[2]; Linfeng Zhang[3]; Jian Han[2]; Han Wang[4]; David Srolovitz[1]; Zhaoxuan Wu[2]; [1]The University of Hong Kong; [2]City University of Hong Kong; [3]DP Technology; [4]Institute of Applied Physics and Computational Mathematics

4:10 PM
Diffusion in Curved Grain Boundaries: *Anqi Qiu*[1]; Ian Chesser[2]; Elizabeth Holm[3]; [1]Carnegie Mellon University; [2]Los Alamos National Laboratory; [3]University of Michigan, Ann Arbor

4:30 PM
From Anti-Arrhenius to Arrhenius Behavior in a Dislocation-obstacle Bypass: *Mohammad Nahavandian*[1]; Enrique Martinez Saez[1]; Soumit Sarkar[1]; [1]Clemson University

FUNDAMENTALS AND CHARACTERIZATION

Interface-mediated Phenomena in Structural Materials — Interface-promoted Deformation

Sponsored by: TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, University of Nebraska-Lincoln; Nigel Shepherd, University of North Texas; Andres Bujanda, U.S. Army Research Laboratory; Lin Shao, Texas A&M University

Wednesday PM | October 4, 2023
A214 | Greater Columbus Convention Center

Session Chairs: Nan Li, Los Alamos National Lab; Carl Boehlert, Michigan State University

2:00 PM Keynote
Localized Phase Transformation (LPT) at Stacking Faults and Twin Boundaries and Their Impact on Properties: Yuchi Wang[1]; Longsheng Feng[1]; Yipeng Gao[1]; Ashton Egan[1]; Timothy Smith[2]; Hao Tang[3]; Qing-Jie Li[3]; Ju Li[3]; Michael Mills[1]; *Yunzhi Wang*[1]; [1]The Ohio State University; [2]NASA Glenn Research Center; [3]Massachusetts Institute of Technology

2:40 PM
Experimental Constraints on the Grain Growth Kinetics of Rhenium: *Christopher Thom*[1]; Todd Leonhardt[1]; [1]Rhenium Alloys, Inc.

3:00 PM
Understanding the Interface Strain Induced HCPBCC Phase Transformation in Nanolaminate Mg: *Kevin Jacob*[1]; Siddhartha Pathak[1]; [1]Iowa State University

3:20 PM Break

3:40 PM Keynote
Investigating the Deformation Mechanisms for Allvac 718Plus Superalloy Containing Bi-modally Distributed ' Precipitates: Geeta Kumari[1]; *Carl Boehlert*[1]; M Sundararaman[2]; S Sankaran[2]; [1]Michigan State University; [2]IIT Madras

4:20 PM Invited
Computing Grain Boundary "Phase" Diagrams: From Thermodynamic and Structural Characters to Mechanical Properties and an Emergent Concept of High-Entropy Grain Boundaries (HEGBs): *Jian Luo*[1]; [1]University of California, San Diego

5:00 PM
A Novel Spinel Ferrite-Hexagonal Ferrite Composite for Enhanced Magneto-electric Coupling in a Composite with PZT: *Sujoy Saha*[1]; Bhabindra Dawadi[1]; Rao Bidthanapally[1]; Gopalan Srinivasan[1]; [1]Oakland University

5:20 PM
Nanoscale Hydration at the Collagen-mineral Interface's Role in Overall Tissue Strength of Human Cortical Bone: *Elizabeth Montagnino*[1]; Samantha Ferengul[1]; Thomas Siegmund[1]; John Howarter[1]; [1]Purdue University

LIGHTWEIGHT ALLOYS

Light Metal Technology — Smart Manufacturing Light Weight Metals and Alloys

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University

Wednesday PM | October 4, 2023
A212 | Greater Columbus Convention Center

Session Chair: Xiaopeng Li, University of New South Wales

2:00 PM Invited
A Machine-learning Assisted Optimization Approach and Microstructure Characterization Method for Laser Powder Bed Fusion: *Xiaopeng Li*[1]; [1]University of New South Wales

2:20 PM
A Case of Update on 330kA Aluminium Potline in China: *Hong Li*[1]; [1]Guangxi GIG Yinhai Aluminium Group

2:40 PM
Assesment of the Mechanical Properties of an AlMg7Cu2 Alloy with TiBZrMoV Alloying at Different T6 Solution Heat Treatment Conditons and Modeling of Its Behavior by Continuum Mechanics Approach: Kamil Armagan Gul[1]; Kerem Can Dizdar[1]; Eyüp Kayali[1]; Ozgur Aslan[2]; *Derya Dispinar*[3]; [1]Istanbul Technical University; [2]Atilim University; [3]Foseco Non Ferrous

3:00 PM
Investigating Hydrogen Porosity in Aluminum Laser Welding Using a Three-dimensional Cellular Automaton Model: *Nicole Trometer*[1]; Michael Moodispaw[1]; Wayne Cai[2]; Teresa Rinker[2]; Shardul Kamat[2]; Zachary Velasco[2]; Alan Luo[1]; [1]The Ohio State University; [2]General Motors Company

3:20 PM
Importance of Runner Design in the Reproducibility of Tensile Tests: *Hayati Sahin*[1]; Derya Dispinar[1]; [1]Foseco

3:40 PM Break

4:00 PM
Electrochemical Responses of the 3D Printed Al-alloy in the Solid/Liquid Transition Process of an Inorganic Phase Change Material: *Xingyue Yong*[1]; HaoTian Ji[1]; YuanYuan Zhao[1]; [1]Beijing University of Chemical Technology

4:20 PM
Phase Stability in Laser Melted Microstructures of Al-X (X=Zr, Nb, V) Alloys: *Alice Perrin*[1]; Weicheng Zhong[1]; Ke An[1]; Yuri Osetskiy[1]; Alex Plotkowski[1]; Kevin Sisco[2]; Ying Yang[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee-Knoxville

4:40 PM
Physics-constrained, Inverse Design of High-temperature, High-strength, Creep-resistant Printable Al Alloys Using Machine Learning Methods: *S. Mohadeseh Taheri-Mousavi*[1]; [1]Carnegie Mellon University

5:00 PM
Study on the Improvement of the Mechanical Properties Heavy Commercial Vehicle's Wheel by the Molten-forged on the A356 Alloy: *Min Seok Moon*[1]; Myeong Han Yoo[2]; Ki Won Kim[1]; James Kim[3]; [1]I Squared M Co., Ltd.; [2]Korea Carbon Industry Promotion Agency; [3]ARTEXG Co., Ltd.

5:20 PM
Through-thickness Heterogeneity in the Mechanical Properties of Hot Rolled AA7075-T651: *Damilola Alewi*[1]; Paul Rottmann[1]; Haluk Karaca[1]; Kirk Lemmen[1]; [1]University of Kentucky

5:40 PM
Inductance-based Structural Self-sensing, as Shown for Sensing Shape-changing Deformation In Aluminum: *Deborah Chung*[1]; Min Kyoung Kim[1]; [1]State University of New York Buffalo

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Machine Learning for High Performance Materials

Sponsored by: ACerS Engineering Ceramics Division

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

Wednesday PM | October 4, 2023
A121 | Greater Columbus Convention Center

Session Chairs: Yi Je Cho, Sunchon National University; Kathy Lu, Virginia Tech

2:00 PM Invited
Machine Learning-assisted Exploration of the Chemistry-processing Design Space Under Additive Manufacturing: Application to an FCC HEA Space: *Raymundo Arroyave*[1]; [1]Texas A&M University

2:30 PM Invited
Accurate Prediction of Oxygen Vacancy Concentration with Disordered A-site Cations in High-entropy Perovskite Oxides: *Jiyun Park*[1]; Boyuan Xu[1]; Jie Pan[2]; Dawei Zhang[3]; Stephan Lany[4]; Xingbo Liu[5]; Jian Luo[3]; Yue Qi[1]; [1]Brown University; [2]Michigan State University; [3]University of California San Diego; [4]National Renewable Energy Laboratory; [5]West Virginia University

3:00 PM
Machine Learning-based Prediction of the Mechanical Properties of Microalloyed Steel Subjected to Thermomechanical Controlled Processing: *Sushant Sinha*[1]; Denzel Guye[1]; Xiaoping Ma[2]; Kashif Rehman[2]; Stephen Yue[1]; Narges Armanfard[1]; [1]McGill University; [2]Algoma Steel Inc.

3:20 PM
Machine Learning for Phase Prediction of High-entropy Alloys Assisted by Imbalance Learning: Yoon Suk Choi[1]; *Libin Zhang*[1]; Dae-Geun Nam[2]; [1]Pusan National University; [2]Korea Institute of Industrial Technology

3:40 PM Break

4:00 PM
Physics-informed Machine Learning for Crystal Plasticity Model Calibration of Ti-7Al Alloy: *Pinar Acar*[1]; Ender Eger[1]; Arulmurugan Senthilnathan[1]; Mahmudul Hasan[1]; [1]Virginia Tech

4:20 PM Invited
Prediction of the Mechanical Response of Zirconia-reinforced Metal-matrix Composite Using Deep Learning Approaches: *Maryam Shakiba*[1]; Marwa Yacouti[1]; [1]University of Colorado - Boulder

4:50 PM Invited
Representation, Regeneration and Prediction of Microstructure in Additive Friction Stirring via Deep Regeneration Neural Network: *Yunhui Zhu*[1]; Xiaofeng Wu[1]; Hang Yu[1]; [1]Virginia Tech

5:20 PM
Predicting Creep Response of Inconel 738 Superalloy in Additive Manufacturing Using Machine Learning: *Zhen Xu*[1]; Qiang Zhu[1]; [1]Southern University of Science and Technology

BIOMATERIALS

Next Generation Biomaterials — Next Generation Biomaterials IV

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

Wednesday PM | October 4, 2023
A222 | Greater Columbus Convention Center

Session Chairs: Pavel Evdokimov, Lomonosov Moscow State University; Sierra Kucko, Alfred University

2:00 PM
Polycaprolactone-based Polymerized High Internal Phase Emulsions with Bioceramic Inclusions: *Sierra Kucko*[1]; Timothy Keenan[1]; [1]Alfred University

2:20 PM
Effect of Release of Garlic Extract from CaP Bone Grafts for Bone Tissue Engineering Applications: *Priya Kushram*[1]; Susmita Bose[1]; [1]Washington State University

2:40 PM
Exploring the Potential of Carvacrol for Orthopaedic Applications: In Vitro Gene Expression and In Vivo Studies: *Aditi Dahiya*[1]; Susmita Bose[1]; [1]Washington State University

3:00 PM
Fabrication of PLA/Bismuth Ferrite Scaffolds and Investigation of the Release Potential of Amoxicillin Under the Influence of Magnetic Field: *Zekiye Akdag*[1]; [1]Marmara University

3:20 PM Break

3:40 PM
High-permeable Ceramic Implants with a Tailored Architecture, Fabricated via Stereolithography, for Personalised Bone-tissue Engineering: *Pavel Evdokimov*[1]; Valery Putlayev[1]; [1]Lomonosov Moscow State University

4:00 PM
Investigation of Tin Addition on Mechanical and Corrosion Behavior of Mg-Zn-Si Alloy: *Gaurav Gupta*[1]; Sourav Ganguly[2]; Jayant Jain[3]; Sudhanshu Singh[1]; [1]IIT Kanpur; [2]CSIR-Institute of Minerals & Materials Technology (CSIR-IMMT); [3]Indian Institute of Technology Delhi

CERAMIC AND GLASS MATERIALS

Phase Transformations in Ceramics: Science and Applications — Session II

Sponsored by: ACerS Basic Science Division

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay V. Khare, University of Toledo; Scott Mccormack, University Of California, Davis; Theresa Davey, Tohoku University

Wednesday PM | October 4, 2023
B230 | Greater Columbus Convention Center

Session Chair: Pankaj Sarin, Oklahoma State University

2:00 PM
Computational Study of Site-disordered $AgSbI_4$: *Chinmay Khare*[1]; Victor Barone[2]; Richard Irving[2]; [1]Ottawa Hills High School; [2]University of Toledo

2:20 PM
Using Total Scattering Techniques to Explore Fundamental Aspects of the Structural Organization in Weberite-type Tantalate Oxides: *Igor Gussev*[1]; Gianguido Baldinozzi[2]; Eric O'Quinn[1]; Joerg Neuefeind[3]; Maik Lang[1]; [1]University of Tennessee; [2]Université Paris-Saclay; [3]Oak Ridge National Laboratory

2:40 PM
Enhancing Oxidation Resistance of Silicon Nitride Using Ca^{2+} Stabilizer: *Prapassorn Numkiatsakul*[1]; Waltraud Kriven[1]; Tonghun Lee[1]; Kenneth Kim[2]; Chol-Bum Kweon[2]; [1]University of Illinois Urbana Champaign; [2]Combat Capabilities Development Command Army Research Laboratory

NUCLEAR ENERGY

Progressive Solutions to Improve Corrosion Resistance of Nuclear Waste Storage Materials — Modeling Sensitivities of Environmental Stress Corrosion Cracking of Steel Canisters and Experiments for Protective Coatings

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

Program Organizers: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech; Daniel Cassar, Brazilian Center for Research in Energy and Materials (CNPEM)

Wednesday PM | October 4, 2023
A125 | Greater Columbus Convention Center

Session Chairs: Madeleine Jordache, Stevens Institute of Technology; Gary Pickrell, Virginia Tech; Daniel Cassar, Brazilian Center for Research in Energy and Materials (CNPEM)

2:00 PM Introductory Comments

2:05 PM Invited
Evaluating the Sensitivities of an Environmental Cracking LEFM-based Model for Use in Realistic Lifetime Predictions of Nuclear Waste Storage Casks: *Sarah Blust*[1]; James Burns[1]; [1]University of Virginia

2:35 PM
Chloride-induced Stress Corrosion Crack in Spent Nuclear Fuel Canisters: Understanding and Mitigating: *Haozheng Qu*[1]; Janelle Wharry[1]; [1]Purdue University

2:55 PM
SiON Protective Coatings for U-shaped Stainless Steel: *Hyeon Joon Choi*[1]; Kathy Lu[1]; [1]Virginia Polytechnic Institute and State University

BIOMATERIALS

Society for Biomaterials: Biomaterial Applications — Tissue Engineering and Wound Healing

Sponsored by: Society for Biomaterials

Program Organizers: David Kohn, University of Michigan; Guigen Zhang, University of Kentucky; Claudia Loebel, University of Michigan; William Wagner, McGowan Institute for Regen Med

Wednesday PM | October 4, 2023
A224 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM
Magnetoactive Hydrogels to Fabricate Tissue Patterns: *Claudia Loebel*[1]; Avinava Roy[1]; Zhang Zenghao[1]; Abdon Pena-Francesch[1]; [1]University of Michigan

2:20 PM
Cell Encapsulation and Delivery in Tissue Engineering Using Bijels-derived Bicontinuous Structures: Haoran Sun[1]; William Lu[1]; *Min Wang*[1]; [1]University of Hong Kong

2:40 PM
Bio-inspired Multifunctional Carbon Scaffolds for Tissue Engineering: *Sharmila Mukhopadhyay*[1]; Wenhu Wang[1]; Soham Parikh[2]; [1]University of Maine; [2]Wright State University

3:00 PM
Therapeutic Potential of Mesoporous Nanoparticles Loaded Cardiac Patch for Mending Broken Hearts: *Syed Baseeruddin Alvi*[1]; Muhamad Mergaye[1]; Divya Sridharan[1]; Abbey Forehand[1]; Niki Blackstone[1]; Uzair Ahmed[1]; Xianyao Xu[1]; Heather Powell[1]; Mahmood Khan[1]; [1]Ohio State University

3:20 PM Break

3:40 PM
Crosslinked Microfluidic Protein-based Microgels for Cardiac Tissue Engineering: *Chao Liu*[1]; Douglas Wu[1]; Valinteshley Pierre[1]; Yiwen Gao[1]; Sam Senyo[1]; [1]Case Western Reserve University

4:00 PM
UV Crosslinking for Micropatterning Decellularized Heart Matrix: *Valinteshley Pierre*[1]; Chao Liu[1]; Elif Ertugral[2]; Douglas Wu[1]; Chandrasekhar Kothapalli[2]; Samuel Senyo[1]; [1]Case Western Reserve University; [2]Cleveland State University

4:20 PM
Bioinspired Adhesives for Surgical Glue Applications: *Julie Liu*[1]; [1]Purdue University

4:40 PM Invited
Electroadhesion of Hydrogels to Tissues: A Simple Way to Perform Suture-less Surgical Repair: *Srinivasa Raghavan*[1]; [1]University of Maryland

5:00 PM
Double-Crosslinking-Double-Network Injectable Hydrogels Design for Wound Treatment: *Lei Wang*[1]; [1]Beijing University of Science and Technology

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CERAMIC AND GLASS MATERIALS

Solid-state Optical Materials and Luminescence Properties — Session II

Sponsored by: ACerS Basic Science Division

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Mathieu Allix, Laboratoire CEMHTI; Kiyoshi Shimamura, National Institute for Materials Science; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Polish Academy of Sciences

Wednesday PM | October 4, 2023
B235 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Leveraging Material Microstructure and Linear/Non-linear Absorption for Pulsed Laser Welding of Ceramics: *Javier Garay*[1]; [1]University of California, San Diego

2:20 PM Invited
Development of Non-cubic Fluorapatite Laser Ceramics: *Hiroaki Furuse*[1]; Koji Morita[1]; Byung-Nam Kim[1]; Tohru Suzuki[1]; [1]National Instiute for Materials Science

2:40 PM Invited
Spark Plasma Sintering of Mesporous Powders: *Lianjun Wang*[1]; Wan Jiang[1]; [1]Donghua University

3:00 PM Invited
Neodymium Cluster Evolution in Fluorite Laser Crystal: A Combined DFT and Synchrotron X-ray Absorption Fine Structure Study: *Fengkai Ma*[1]; Liangbi Su[2]; Zhenqiang Chen[1]; [1]Jinan University; [2]Shanghai Institute of Ceramics, Chinese Academy of Sciences

3:20 PM Break

3:40 PM Invited
Study on the Spectral Properties, Ionic Cluster Evolution and MIR Laser Performance of Er:CaF2 Crystals: *Zhen Zhang*[1]; [1]Shanghai Institute of Ceramics, Chinese Academy of Sciences

4:00 PM
Transparent Magnesium Gallate Ceramics Synthesized Through a Combination of Solid-State Reaction and Spark Plasma Sintering: *Zixu Peng*[1]; Jiao Li[1]; Matthew Fiato[1]; Yiquan Wu[1]; [1]Alfred University

4:20 PM Invited
Crystallography, Phase Stability and Luminescence Behavior of Eu-doped $Ca_{4-x}Sr_xLaO(BO_3)_3$ Compounds: *Olivia Graeve*[1]; Senam Tamakloe[1]; [1]University of California San Diego

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IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development II — Steels for Sustainable Development II

Sponsored by: TMS: Steels Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Kester Clarke, Colorado School of Mines; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Matthias Militzer, University of British Columbia; Ana Luiza Araujo, CBMM North America Inc.; Mahesh Somani, University of Oulu; Ilchat Sabirov, Imdea Materials Institute

Wednesday PM | October 4, 2023
A210 | Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Coating-free Press Hardening Steels with Low Carbon Footprint: *Jianfeng Wang*[1]; Zhou Wang[1]; Mingfeng Shi[1]; Sarah Tedesco[1]; [1]General Motors Global Research and Development

2:40 PM
Effects of Enriched Copper Content on the Welding Behavior of Scrap-based Low Carbon Steels: *Henry Geerlings*[1]; Jonah Klemm-Toole[1]; Amy Clarke[1]; Kester Clarke[1]; Sridhar Seetharaman[1]; [1]Colorado School of Mines

3:00 PM
Mitigating Cu-induced Hot-shortness in Recycled Steel Products through Thermomechanical Processing: *Lionel Promel*[1]; David Landi[1]; Sridhar Seetharaman[2]; Jonah Klemm-Toole[1]; Amy Clarke[1]; Kester Clarke[1]; [1]Colorado School of Mines; [2]Arizona State University

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Electronics Division, ACerS Basic Science Division

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

Wednesday PM | October 4, 2023
A220 | Greater Columbus Convention Center

Session Chairs: Lan Li, Boise State University; Di Wu, Washington State University

2:00 PM Invited
Implications of Nanoscale Amorphous Metal Oxide Electrode Materials for Lithium Ion Batteries: *Hui Xiong*[1]; [1]Boise State University

2:30 PM Invited
Selective Lithium Extraction from Brines and Production Of Battery-Grade LiOH Using Porous H2TiO3 Ion Sieve Adsorbents Integrated with Electrodialysis: Greeshma Gadikota[1]; *Rajashekhar Marthi*[1]; Hassnain Asgar[1]; Akanksh Mamidala[1]; John McLennan[1]; Michael McKibben[1]; [1]Cornell University

3:00 PM Invited
Optimized Porous Superhydrophobic Coating to Prevent Carbon Steel Corrosion: *Fangming Xiang*[1]; David Hopkinson[1]; [1]National Energy Technology Laboratory

3:30 PM Break

3:50 PM Invited
Synergizing Structural and Functional Hierarchy in Porous Catalysts and Sensors for Mitigation of Aqueous Pollutants.: *Sharmila Mukhopadhyay*[1]; Sanskar Shresta[1]; Manisha Choudhary[1]; Wenhu Wang[1]; [1]University of Maine

4:20 PM
Preparation of Porous Catalytic Intermetallic Alloys Under Conditions of Synthesis of Complex Functionally Active Charges: *Borys Sereda*[1]; Yuriy Belokon[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

4:40 PM
Facile Synthesis, Structural and Catalytic Performances of the Porous Carbon Foam Composites Containing Carbon Nanotubes and Graphene Oxide as Reinforcements: *Muhammad Khan*[1]; Emrah Unalan[1]; [1]Middle East Technical University

5:00 PM
Novel Method for Continuous Production of Coal-derived Carbon Foam: *Caleb Gula*[1]; Yahya Al-Majali[1]; [1]Institute for Sustainable Energy and the Environment

MATERIALS-ENVIRONMENT INTERACTIONS

Thermodynamics of Materials in Extreme Environments — Thermodynamics of Molten Salt Systems

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

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

Wednesday PM | October 4, 2023
A123 | Greater Columbus Convention Center

Session Chair: Kyle Brinkman , Clemson University

2:00 PM Invited
An Ab Initio Study of the Thermodynamic and Thermophysical Properties of Pu-bearing Salts: *Benjamin Beeler*[1]; Kai Duemmler[1]; David Andersson[2]; [1]North Carolina State University; [2]Los Alamos National Laboratory

2:30 PM Invited
Molecular Dynamics Simulations of the Structures and Transport properties of UCln (n=3, 4) in NaCl and MgCl2 Molten Salts: *Bo Li*[1]; [1]Vanderbilt University

3:00 PM Invited
Thermodynamics of Molten Salts for the Fluoride Salt Cooled High-temperature Reactor: *Jacob McMurray*[1]; Gus Merwin[1]; Francesco Carotti[1]; Som Mossadeghian[1]; Ryan Gallagher[1]; Kaitlin Johnson[1]; Kevin Chan[1]; Matt Denman[1]; George Young[1]; [1]Kairos Power

3:30 PM Break

3:50 PM Invited
Exploring and Implementing Thermodynamic Models for Liquid and their Applications to Thermodynamic Modeling of Molten Salts: Rushi Gong[1]; Shun-Li Shang[1]; Vitaliy Goncharov[2]; Bryn Merrill[2]; Xiaofeng Guo[2]; *Zi-Kui Liu*[1]; [1]Pennsylvania State University; [2]Washington State University

4:20 PM
Thermodynamic Assessment of the MgCl2-NaCl-KCl-CsCl Pseudo-quaternary System for Calculation of Volatile Fission Product (Cesium) Behavior in Molten Chloride Reactors: *Clara Dixon*[1]; Juliano Schorne-Pinto[1]; Mina Aziziha[1]; Jorge Paz Soldan Palma[1]; Theodore Besmann[1]; [1]University Of South Carolina

4:40 PM
Determination of Mixing Enthalpy of La and U in Chloride Molten Salt: *Xiaofeng Guo*[1]; Vitaliy Goncharov[1]; Bryn Merrill[1]; William Smith[1]; Hongwu Xu[2]; Rushi Gong[3]; Shunli Shang[3]; Zi-Kui Liu[3]; Aurora Clark[4]; [1]Washington State University; [2]Los Alamos National Laboratory; [3]Pennsylvania State University; [4]University of Utah

Technical Meeting and Exhibition

MS&T23

MATERIALS SCIENCE & TECHNOLOGY

October 1–4, 2023 | Columbus, Ohio

POSTER SESSION
with Presenters

Monday, October 2		
Poster Installation	2:00 p.m. – 4:00 p.m.	
Tuesday, October 3		
Poster Installation	8:00 a.m. – 9:00 a.m.	(if you cannot set-up your poster on Monday)
Poster Session Viewing	2:00 p.m. – 4:30 p.m.	
Poster and Exhibit Reception	4:30 p.m. – 6:00 p.m.	
Poster Presentations	4:40 p.m. – 6:00 p.m.	(please stand by your poster at this time to discuss your research with attendees)
Wednesday, October 4		
Poster Session Viewing	9:00 a.m. – 2:00 p.m.	
Poster Removal	3:00 p.m. – 4:00 p.m.	

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

15th 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; Mritunjay Singh, Ohio Aerospace Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Hisayuki Suematsu, Nagaoka University of Technololgy; Enrico Bernardo, University of Padova; Rajiv Asthana, University of Wisconsin; Yiquan Wu, Alfred University; Zhengyi Fu, Wuhan University of Technology; Allen Apblett, Oklahoma State University

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Briquetting Waste Glass Fines to Enable Recycling: *River Pao*[1]; Scott Misture[1]; [1]Alfred University

Effect of Heating Rate during Sulfurization on the Growth of Ethanol Based Solution Processed Cu2ZnSnS4 Thin Films: *Rahul Jain*[1]; Indu Gupta[2]; Bhaskar Mohanty[3]; [1]Chandigarh Group of Colleges, Jhanjeri; [2]Chandigarh University; [3]Thapar Institute of Engineering and Technology

Facile Growth of Cu2ZnSn(SSe)4 Thin Films with Controlled Phase and Microstructure from Ethanol Based Molecular Solutions: *Indu Gupta*[1]; Rahul Jain[2]; Bhaskar Mohanty[3]; [1]Chandigarh University; [2]Chandigarh Group of Colleges, jhanjeri; [3]Thapar Institute of Engineering and Technology

Mesoporous Silica Material with Yolk Shell Morphology for Effective Removal of Environmental Pollutants: *Zafar Ali*[1]; [1]POFs pakistan

Rapid Method Development and Optimization for Environmental Monitoring by Gas Chromatography Using ProEZGC – A Free Web-based Software: *Erica Pack*[1]; [1]Restek

Response of Ghana's Akokorowa Iron Ore to Reduction by Carbonaceous Material Generated from Pyrolytic Chars of End-of-Life Tyres: *James Dankwah*[1]; Georgina Thompson[1]; Jessica Dankwah[2]; Awan Abdul Rashid Mohammed[3]; [1]University of Mines and Technology; [2]Goldfields Ghana Limited (Damang Mine); [3]Ghana Geological Survey Authority

STUDENT EVENTS

2023 Undergraduate Student Poster Contest — 2023 Undergraduate Student Poster Contest

Program Organizer: Yolanda Natividad, American Ceramic Society

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Fabrication of Magnetoelectric Composite Materials and Application in Communication at Low Frequency: *Tong Zhang*[1]; [1]Wuhan University of Technology

Generalized Self-assembly of Two-dimensional Transition Metal Carbides to Metal Powders: *Jacob Patenaude*[1]; Brian Wyatt[1]; [1]Indiana University, Purdue University - Indianapolis

Grain Characterization of Titanium After Friction Stir Process: *Sebastian Walker*[1]; [1]Washington State University

Ni Single Atoms on MoS2 Nanosheets Enabling Enhanced Kinetics of Li-S Batteries: *Chenxu Dong*; [1]Wuhan University of Technology

Optimizing Heat Treatment Parameters to Unveil the Mechanical Response of Nano-scale Ultrastructure of the Precipitates: *Kapil Sharma*[1]; Kaustav Barat[2]; Sudipta Patra[2]; Anish Karmakar[1]; [1]Indian Institute of Technology Roorkee; [2]CSIR-National Aerospace Laboratories, Bangalore

Phase and Atomic Occupancy Stability Analysis of Double Transition Metal MAX Phases: A Step Toward Machine Learning Discovery of New 2D Materials: *Bethany Wright*[1]; Brian Wyatt[1]; Babak Anasori[1]; [1]Purdue School of Engineering & Technology and Integrated Nanosystems Development Institute, Indiana University Purdue University Indianapolis

Preparation of Two-dimensional Ca2NaNb4O13 Perovskite Nanosheet Inks and Study on Inkjet Printing High-performance Microcapacitors: *Yang Xie*[1]; [1]Wuhan University of Technology

Study on Low Temperature Electrolyte of Sodium Ion Battery: *Keyu Du*[1]; [1]Wuhan University of Technology

The Content and Distribution of Steel Fiber in Ultra-high Performance Concrete (UHPC) Based on Non-destructive Testing: *Zhoulong Huang*[1]; Zhonghe Shui[1]; [1]Wuhan University of Technology

Understanding the Evolution of Microstructure and Precipitates in Wire Arc Additive Manufactured Nickel-Aluminum-Bronze Alloy: *Elisabeth Kuebel*[1]; Aeriel Leonard[2]; [1]The Ohio State University; [2]The Ohio State University

BIOMATERIALS

3D Printing of Biomaterials and Devices — Poster Session

Sponsored by: ACerS Bioceramics Division

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

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

3D Bioprinting for Ophthalmic Applications: *Peter Jansen*[1]; Mia Jeter[1]; Vedshree Deshmukh[1]; Cynthia Roberts[1]; Katelyn Swindle-Reilly[1]; [1]The Ohio State University

Core/shell PCL/PLGA for Controlled Release of Antibiotic and Tissue Engineering: *Sahar Vahabzadeh*[1]; Dexter Kling[1]; Aaron Strickland[2]; James Gras[2]; Farid Ahmadpour Esmaeilabadi[1]; [1]Northern Illinois University; [2]iFyber

D-Flate: Exoskeletal Venous Pump Made Using 3D-Printed Metamaterial: *Gianna Lambert*[1]; Yusuf Dikici[1]; Karem Harth[1]; Ozan Akkus[1]; [1]Case Western Reserve University

Measurement of Volumetric Tribo-corrosion of Zirconia-toughened Alumina (ZTA)-Ti6Al4V-Hydroxyapatite (HA) Composite Femoral Heads Articulating Against Ultra-high Molecular Weight Polyethylene (UHMWPE): *Jose Avila*[1]; Amit Bandyopadhyay[1]; [1]Washington State University

Release of Natural Medicines from 3D Printed CaP Improves Bone Formation: *Priya Kushram*[1]; Susmita Bose[1]; [1]Washington State University

Synergistic Effects of Carvacrol and Curcumin Nanoparticle on 3D Printed Scaffold for Bone Tissue Engineering: *Aditi Dahiya*[1]; Susmita Bose[1]; [1]Washington State University

ADDITIVE MANUFACTURING

Additive Manufacturing Modeling, Simulation, and Machine Learning: Microstructure, Mechanics, and Process — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Computational Materials Science and Engineering Committee, TMS: ICME Committee

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

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Session Chair: Jing Zhang, Indiana University - Purdue University Indianapolis

3D Printed Ceramics for Solid-state Battery Components: *Richard Sullivan*[1]; Adedapo Ajayi[1]; Wiljones Djoutsop[1]; Trista Rehmel[1]; Sumandeep Kaur[1]; Amir Yahyaeian[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis

Deep Learning Assisted Material Structure Property Linkage of 3D Printed AlSi10Mg Alloy: *Ibrahim Khalilullah*[1]; Constantin Solomon[1]; [1]Youngstown State University

Density Functional Theory Based Methods for Predicting Interfacial Strengths in Thermal Barrier Coatings with MXene Using Spark Plasma Sintering: *Tejesh Dube*[1]; Amir Yahyaeian[1]; Hassan Fatahbeygi[1]; Mahdi Ghanati[1]; Junseong Kim[2]; Yeon-Gil Jung[2]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis; [2]Changwon National University

Developing Virtual Reality Models to Simulate Additive Manufacturing Process: *Ethan Clark*[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis

Extrusion Based 3D Printing of Silicon Carbide: *Ryan Mathews*[1]; Andrei Petrusca[1]; Maddie Soderstrom[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis

Inkjet 3D Printing of Biodegradable Materials: *Andrew Gillespie*[1]; Ben Yap[1]; Aliana Shahimi[1]; Mahdi Ghanati[1]; Amir Yahyaeian[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis

Modeling Laser Heating Phenomenon in Refractory Metal Powder Bed Fusion Process: *Hassan Fatahbeygi*[1]; Mahdi Ghanati[1]; Amir Yahyaeian[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis

Simulation of Shell Thickness and Inclusions Trajectory in Casting Mold of Round Steel Billet Continuous Casting: Ya Chi Chang[1]; *Huey-Jiuan Lin*[1]; Zi Qi Gao[2]; Kuan Yu Chen[2]; Hsuan Chung Wu[2]; Ho Yen Hsieh[3]; Cheng Wen Chen[3]; Ming Hao Xu[3]; [1]National United University; [2]Ming Chi University of Technology; [3]Walsin Lihwa Corporation

ADDITIVE MANUFACTURING

Additive Manufacturing of High and Ultra-high Temperature Ceramics and Composites: Processing, Characterization and Testing — Poster Session

Sponsored by: ACerS Engineering Ceramics Division, ACerS Manufacturing Division, ACerS Young Professionals Network

Program Organizers: Corson Cramer, Oak Ridge National Laboratory; Greg Hilmas, Missouri University of Science and Technology; Lisa Rueschhoff, Air Force Research Laboratory; David Mitchell, Oak Ridge National Laboratory

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Advanced Manufacturing of Complex Zirconium Carbide Structures for Space Nuclear Propulsion: *Jackie Stone*[1]; Ryan Finkelstein[1]; Jhonathan Rosales[2]; Brian Jaques[1]; [1]Boise State University; [2]National Aeronautics and Space Administration

ADDITIVE MANUFACTURING

Additive Manufacturing of Polymeric-based Materials: Challenges and Potentials — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee

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

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Synthesis and Characterization of Electroplated Alloys on 3D Printed Preforms: *Grace Marhulik*[1]; Matthew Caputo[1]; [1]Pennsylvania State University - Shenango

ADDITIVE MANUFACTURING

Additive Manufacturing of Titanium-based Materials: Processing, Microstructure and Material Properties — Poster Session

Sponsored by: TMS: Additive Manufacturing Committee, TMS: Titanium Committee

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

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In-situ Detection and Ex-situ Characterization of Porosity in Laser Powder-bed Fusion (LPBF): *Nismath V H*[1]; Kevin Chou[1]; [1]University of Louisville

Surface Color Relation to Alpha Case Formation in Ti-6Al-4V: *Michaela von Schaumburg*[1]; Eric Payton[2]; Katrina Petro[3]; Matthew Hartshorne[3]; Michael Hirsch[3]; [1]The Greene Townhomes; [2]University of Cincinnati; [3]AFRL

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

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Session Chairs: Dr. Navin Manjooran, Chairman, Solve; Prof. Gary Pickrell, Virginia Tech

Comparison of Mechanical Properties of AZ-31 Mg alloy by Wire-based Arc Additive Manufacturing: *Changwook Ji*[1]; Jae-Deuk Kim[1]; Jooyong Cheon[1]; Jeong Yeol Park[1]; [1]Korea Institute of Industrial Technology

Data Management for Additive Manufacturing: *Matthew Roach*[1]; Dominik Kozjek[2]; Clayton Cooper[3]; Kathy Babusci[4]; Bradley Jared[1]; [1]University of Tennessee, Knoxville; [2]Northwestern University; [3]Case Western Reserve University; [4]The Ohio State University

NUCLEAR ENERGY

Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments IV — Poster Session

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Caitlin Kohnert, Los Alamos National Laboratory; Cody Dennett, Commonwealth Fusion Systems; Samuel Briggs, Oregon State University; Michael Short, Massachusetts Institute of Technology; Cheng Sun, Idaho National Laboratory; Khalid Hattar, University of Tennessee Knoxville; Yuanyuan Zhu, University of Connecticut

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Novel Method for Fabricating and Analysis of 3D Printed Composite for Radiation Shielding Containing Metalized Halloysite Nanotube: HM Nain[1]; David Mills[1]; [1]Louisiana Tech University

Evaluating the Microscale Deformation Mechanisms Operating in the Oxide Layer Formed on a Zr-2.5Nb Alloy After Exposure to High Temperature Water: *Adil Shaik*[1]; Matthew Topping[1]; Fei Long[1]; Kevin Daub[1]; Suraj Persaud[1]; Mark Daymond[1]; [1]Queen's University

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Coatings for Wear and Corrosion Protection — Poster Session

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

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

Development of Fusion Bonded Epoxy Coatings on Steel Components for the Improved UV and Corrosion Resistance Performance: *Abdullah Alnuzha*[1]; Arumugam Kumar[1]; [1]KFUPM University

Obtaining Protective Coatings TiAl, TiSi under Conditions of Synthesis of Complex Functionally Active Charges: *Borys Sereda*[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

PROCESSING AND MANUFACTURING

Advanced Joining Technologies for Automotive Lightweight Structures — Poster Session

Sponsored by: TMS: Aluminum Committee, ACerS Manufacturing Division

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

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Session Chair: Yan Huang, Brunel University London

Prediction of Tensile Strength of Electric Vehicle Parts Applying Dissimilar Material Friction Stir Welding Using Machine Learning: *Sungwook Kang*[1]; Kwangjin Lee[1]; [1]Korea Institute of Industrial Technology (KITECH)

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Materials for Harsh Environments — Poster Session

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

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Exhibit Hall A | Greater Columbus Convention Center

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

Material Properties of High-strength High Chromium TWIP Steels with Increased Corrosion Resistance: *Pavel Podany*[1]; Tomas Studecky[1]; [1]COMTES FHT a.s.

Metal-coated Halloysite Nanotube-Based Antimicrobial Filtration System for Space Mission Applications: David Mills; *Mohammed Bappy*[1]; [1]Louisiana Tech University

IRON AND STEEL (FERROUS ALLOYS)

Advancements in Steel Structural Refinement — Poster Session

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

Program Organizers: Charles Enloe, Steel Dynamics; Emmanuel De Moor, Colorado School of Mines

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Effect of High Temperature Exposure on the Tensile Behavior of Carbide Free Bainitic Steel - An In-situ Study: *Kishore Sakthivel*[1]; Sourav Das[1]; Suhrit Mula[1]; [1]IIT Roorkee

Effect of Strain on Variant Behavior and Strengthening Mechanism of Hot-rolled Nb-V High Strength Steel: *Murugesh kumar Ramar*[1]; Pravendra Singh[1]; Sadhan Ghosh[1]; [1]Indian Institute of Technology, Roorkee

CERAMIC AND GLASS MATERIALS

Advances in Dielectric Materials and Electronic Devices — Poster Session

Sponsored by: ACerS Electronics Division

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

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Conjugation of Semiconducting Quantum Dots with Ferroelectric Liquid Crystal: Electro-optic and Photoluminescence Study: *Gagandeep Kaur*[1]; Praveen Malik[1]; [1]Dr B R Ambedkar National Institute of Technology

Effect of Solvent Selection for In-film Reactions Yielding Zinc Oxide Nanostructures: *Sean Garnsey*[1]; William Flynn[1]; Carlos Acosta[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]University of Texas at San Antonio

Improvement of the Performance of Polymer Stabilised Cholesteric Liquid Crystals by Incorporating CdSe QDs: *Garima Chauhan*[1]; Praveen Malik[1]; [1]Dr B R Ambedkar National Institute of Technology

Influence of the Synthesis Conditions on the Structural and Microstructural Properties of $PbTiO_3$ Ferroelectric Thin Films: Marcos Aparecido dos Santos Mariano[1]; Ariano de Giovanni Rodrigues[2]; Elton Carvalho de Lima[3]; Ruyan Guo[4]; Amar Bhalla[4]; *Jose de los Santos Guerra*[1]; [1]Universidade Federal de Uberlandia; [2]Universidade Federal de Sao Carlos; [3]Universidade Federal do Tocantins; [4]The University of Texas at San Antonio

Investigation of Charge Transport Mechanism in Ba Doped Sr2CrMoO6 Double Perovskite Mixed Ionic Electronic Conductor: *Vivek Kumar*[1]; Sudha Saini[1]; Tanmoy Maiti[1]; [1]Indian Institute of Technology Kanpur

Investigation of the Dielectric Response in $AgNbO_3$-based Ferroelectric Ceramics: Tawan Hathenher Toledo Rosa[1]; Atair Carvalho da Silva[1]; Ruyan Guo[2]; Amar S. Bhalla[2]; *Jose de los Santos Guerra*[1]; [1]Universidade Federal de Uberlandia; [2]The University of Texas at San Antonio

Transition Metal Chalcogenide Perovskites for Energy Applications: *Sanjukta Mukherjee*[1]; [1]IIT Kanpur

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Metallurgy — Poster Session

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

Program Organizers: Shannon Clark, ArcelorMittal Dofasco; Lijia Zhao, Northeastern University

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New Properties of Bimetallic Steel Blanks Produced by Original Electroslag Technology: Borys Sereda[1]; Irina Kruhliak[1]; Yuriy Petrusha[2]; Natalya Gura[2]; *Dmytro Sereda*[1]; [1]DSTU; [2]NUZP

Numerical Simulation of Blast Furnace Process with Injection of Coke Oven Gas through Tuyere: *Hsuan-Chung Wu*[1]; Kuan-Yu Chen[1]; Huey-Jiuan Lin[2]; Shan-Wen Du[3]; Tsung-Yen Huang[3]; Bo-Jhih Lin[3]; [1]Ming Chi University of Technology; [2]National United University; [3]China Steel Corporation

Production of Rolled Steel 8640 with a Diameter of More than 240 mm: *Borys Sereda*[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

Role of Cerium on Transformation Kinetics and Mechanical Properties of Low Carbon Steels: *Chetan Kadgaye*[1]; Anish Karmakar[1]; [1]IIT Roorkee

IRON AND STEEL (FERROUS ALLOYS)

Advances in Ferrous Metallurgy — Student Poster Session

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

Program Organizers: Shannon Clark, ArcelorMittal Dofasco; Lijia Zhao, Northeastern University

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Anisotropy in Tensile and Charpy Impact Properties of Three API X70 Linepipe Steels for ERW Manufacturing Process: *Dong-Kyu Oh*[1]; Seung-Hyeok Shin[1]; Byoungchul Hwang[1]; [1]Seoul National University of Science and Technology

Comparative Study on the Properties and Microstructure of TMCP and QT Q550D: *Zheng Lei Tang*[1]; [1]University of Science and Technology Beijing

Comparative Study on the Role of Phosphorus and Sulfur Grain Boundary Segregation on the Hot Ductility in Low Carbon Steel: *Soo Hyun Kim*[1]; Sang Hum Kwon[2]; Jae Sang Lee[1]; Yoon Uk Heo[1]; [1]POSTECH; [2]POSCO

Effect of Casting Speed on Mixed Grade in Each Strand of Tundish during the Low Tundish-level Steel Grade Transition: *Sicheng Song*[1]; [1]University of Science and Technology Beijing

Effect of Tundish Refractories System on Nonmetallic Inclusions in Heavy-rail Steel U75V Deoxidized by Si-Mn: *Guo Zhijie*[1]; [1]USTB

Improvement in Mechanical Properties via Phase Transformations in Interstitial-free Steel: *Sandeep Yadav*[1]; Sadhan Ghosh[1]; [1]IIT Roorkee

PROCESSING AND MANUFACTURING

Advances in Surface Engineering — Poster Session

Sponsored by: TMS Surface Engineering Committee

Program Organizers: Rajeswaran Radhakrishnan, Faraday Technology Inc; Timothy Hall, Faraday Technology Inc; Michael Roach, University of Mississippi Medical Center; Sandip Harimkar, Oklahoma State University; Tushar Borkar, Cleveland State University; Rajeev Gupta, North Carolina State University; Bharat Jasthi, South Dakota School of Mines & Technology

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Session Chair: Santosh More, Faraday Technology Inc

Development and Application of Green Corrosion Inhibitor for Oil and Gas Pipeline-steels in Produced Water Media: *Anaum Nawaz*[1]; Haider Waseem[1]; Shabib Ishraq[1]; Kashif Deen[2]; [1]Central Michigan University; [2]The University of British Columbia

Evaluation of Mechanical Properties of AISI 8620 Steel`s Surface Modified through TIG Arcing Process: *Sachin Balbande*[1]; Sourav Das[1]; [1]Indian Institute of Technology Roorkee

On-site Electrochemical Impedance Spectroscopy to Surface Inspection of WFI Pharmaceutical Tank: *Luis Guilherme*[1]; Joey Kish[2]; Cecílio Fugivara[3]; Assis Benedetti[3]; [1]ACW Engineering; [2]McMaster University; [3]São Paulo State University

The Effects of Boronizing on TRIP Steel Surface Integrity: *Eric Noé Hernández Rodríguez*[1]; Alfredo Márquez-Herrera[1]; Gustavo Capilla-González[1]; Ricardo Mis-Fernández[2]; [1]University of Guanajuato; [2]CINVESTAV

Wear Resistance of Rapidly and Slowly Solidified AlSi10Mg-xNi Alloys: *Danusa Araujo de Moura*[1]; Guilherme Gouveia[1]; Jose Spinelli[1]; [1]UFSCar

IRON AND STEEL (FERROUS ALLOYS)

Advances in Understanding of Martensite in Steels II — Poster Session

Sponsored by: TMS: Steels Committee

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - Industeel; Mohsen Asle Zaeem, Colorado School of Mines; Janelle Wharry, Purdue University; Eric Payton, University of Cincinnati; Goro Miyamoto, Tohoku University; Eric Lass, University of Tennessee-Knoxville; Amy Clarke, Colorado School of Mines; MingXin Huang, University of Hong Kong; Kester Clarke, Colorado School of Mines

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Investigating the Effects of Heat Treatment on the Microstructure and Mechanical Properties of Low Carbon, Low Alloy, and High Yield Strength Steels Undergoing Temper Embrittlement: *Shannon Gerard*[1]; Michele Manuel[1]; Aroba Saleem[1]; [1]University of Florida

EDUCATION AND CAREER DEVELOPMENT

Career Transition: How to Navigate the Job Market? Insights from Academia and Industry — Poster Session

Sponsored by: ACerS President's Council of Student Advisors, ACerS PCSA-EPC Committee

Program Organizers: Srinivasa Kartik Nemani, Indiana University-Purdue University; Ian Slagle, Georgia Institute of Technology

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Session Chairs: Pattiya Pibulchinda, Northwestern University; Kartik Nemani, Purdue school of Engineering

ACerS President's Council of Student Advisors' Development of ACerS Section Outreach Kit Initiative: Shannon Rogers[1]; Michael Thuis[2]; Nathan McIlwaine[3]; *Hugh Smith*[4]; John Bussey[5]; [1]Colorado School of Mines; [2]Northwestern University; [3]Pennsylvania State University; [4]Massachusetts Institute of Technology; [5]Washington State University

Building Bridges: Engaging the Next Generation through Outreach Programs by the Ceramic and Glass Industry Foundation: Helen Widman[1]; *Amanda Engen*[1]; [1]The American Ceramic Society

Glass, Not Waste: Reduce-Reuse-Recycle: *Amir Ashjari*[1]; Lucas Greiner[1]; Doris Möncke[1]; [1]Alfred University

Insights and Lessons on Running a Student Leadership Program (PCSA): *Michael Thuis*[1]; Fox Thorpe[2]; [1]Northwestern University; [2]University of California Davis

Short Lived Glasses as Support for Photochemical Tissue Bonding: *Sierra Kucko*[1]; Lucas Greiner[1]; Doris Möncke[1]; [1]Alfred University

Sinks for Recycling Glass – New Applications that Avoid Landfills: *Lucas Greiner*[1]; William LaCourse[1]; Doris Möncke[1]; [1]Alfred University

CERAMIC AND GLASS MATERIALS

Ceramics and Glasses Modeling by Simulations and Machine Learning — Poster Session

Sponsored by: ACerS Glass & Optical Materials Division

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

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Discrete Element Simulation of Delamination in Thermal Barrier Coating: *Yafeng Li*[1]; Zhengzhao Ji[1]; Jing Zhang[2]; [1]Tiangong University; [2]Indiana University – Purdue University Indianapolis

Enhancing Toughness of Metal-organic Framework Glass by Incorporating Silicate Crystals: *Jiayu Yue*[1]; Neng Li[1]; [1]Wuhan University of Technology

NUCLEAR ENERGY

Ceramics for New Generation Nuclear Energy System Application — Poster Session

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

Program Organizers: Lingfeng He, North Carolina State University; Krista Carlson, University of Nevada, Reno; Maik Lang, University of Tennessee; Jake Amoroso, Savannah River National Laboratory; Brian Riley, Pacific Northwest National Laboratory; Enrique Saez, Clemson University; Jinsuo Zhang, Virginia Polytechnic Institute and State University

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Exhibit Hall A | Greater Columbus Convention Center

Synthesis of Uranium Nitride Nuclear Fuel: *Sarah Cole*[1]; Ryan Finkelstein[1]; Allyssa Bateman[1]; Elizabeth Sooby[2]; Brian Jaques[1]; [1]Boise State University; [2]University of Texas at San Antonio

MODELING

Computational Discovery, Understanding, and Design of Multi-principal Element Materials — Poster Session

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

Program Organizers: Shuozhi Xu, University of Oklahoma; Douglas Spearot, University of Florida; Jia Li, Hunan University; Michael Gao, National Energy Technology Laboratory; Levente Vitos, Royal Institute of Technology (KTH)

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Exhibit Hall A | Greater Columbus Convention Center

Ontology-based Digital Representations of Materials Testing in the MaterialDigital initiative: *Hossein Beygi Nasrabadi*[1]; Thomas Hanke[2]; Birgit Skrotzki[1]; [1]Bundesanstalt für Materialforschung und -prüfung (BAM); [2]Fraunhofer-Institut für Werkstoffmechanik (IWM), Freiburg, Germany

NANOMATERIALS

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Poster Session

Sponsored by: ACerS Basic Science Division, ACerS Electronics 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 at Birmingham; Edward Gorzkowski, Naval Research Laboratory; Michael Naguib, Tulane University; Sanjay Mathur, University of Cologne; Wonmo Kang, Arizona State University; Babak Anasori, Indiana University-Purdue University Indianapolis

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Exhibit Hall A | Greater Columbus Convention Center

Development of Si(pincers)2 Complexes for Printable Electronics: *Adesola Adeyemi*[1]; [1]University of North Carolina at Charlotte

Exfoliation and Characterization of Novel 2D Ferroelectric Materials: *Corbon Moss*[1]; Ryan Selhorst[1]; Rahul Rao[2]; [1]UES; [2]United States Airforce

Improved Electrochemical Properties of SiOC Composite for High Li Storage: *Shakir Bin Mujib*[1]; Mohammed Rasheed[1]; Gurpreet Singh[1]; [1]Kansas State University

SiC Fiber-reinforced CMCs: Towards High-temperature Structural Materials: *Mohammed Rasheed*[1]; Shakir Bin Mujib[1]; Gurpreet Singh[1]; [1]Kansas State University

Synthesis of High-Temperature Ceramics Based on Hafnium Carbide from a Precursor: *Shakir Bin Mujib*[1]; Mohammed Rasheed[1]; Saravanan Arunachalam[2]; Gurpreet Singh[1]; [1]Kansas State University; [2]Spirit AeroSystems

Ultra-low Content CNTs Enhanced the Mechanical Properties of Carbon Black/Nature Rubber Composites: *Ying Liu*[1]; Wenduo Chen[1]; Dazhi Jiang[1]; [1]Sun Yat-sen University

SUSTAINABILITY, ENERGY, AND THE ENVIRONMENT

Energy Materials for Sustainable Development — Poster Session

Sponsored by: ACerS Energy Materials and Systems Division

Program Organizers: Yang Bai, University of Oulu; Eva Hemmer, University of Ottawa; Krista Carlson, University of Nevada, Reno; Kyle Brinkman, Clemson University; Armin Feldhoff, Leibniz University Hannover; Charmayne Lonergan, Pacific Northwest National Laboratory; Zhezhen Fu, Pennsylvania State University - Harrisburg; Dhruba Panthi, Kent State University; Janusz Tobola, AGH UST, Faculty of Physics and Applied Computer Science

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Session Chair: Jianhua Tong, Clemson University

Bandgap-engineered Ferroelectric Ceramics for Photoelectric and Photovoltaic Applications: *Yang Bai*[1]; [1]University of Oulu

Bimetallic Indium-Tin Metal-Organic Framework Catalyst for CO2 Conversion to Formic Acid: *Nawaf Alharbi*[1]; Munzir Suliman[1]; Bader Alghamdi[1]; Muhammad Usman[1]; [1]King Fahad University of Petroleum and Minerals

Computational Modeling of Correlated Ion Transport in Polymer-Ceramic Composite Electrolytes: *Lauren Shepard*[1]; Susan Sinnott[1]; [1]The Pennsylvania State University

Electron Transfer Mechanism of Near-infrared-response ZnO/CuInS$_2$ S-scheme Photocatalyst for H_2O_2 Synthesis and Glycerol Oxidation: *Kai Meng*[1]; [1]Wuhan University of Technology

Smart Shoe Electricity Generation via Piezo-electric Transducers: *Siva Reddy Olpu*[1]; [1]G. Pullaiah College of Engineering and Technology

CERAMIC AND GLASS MATERIALS

Engineering Ceramics: Microstructure-Property-Performance Relations and Applications — Poster Session

Sponsored by: ACerS Engineering Ceramics Division

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

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Session Chair: Michael Halbig, Glenn Research Center-NASA

Glass Foams Produced from Glass Waste with No CO_2 Emission in the Foaming Process: *Evaldo Kubaski*[1]; Sergio Tebcherani[2]; Robson da Silva[1]; [1]State University of Ponta Grossa; [2]Universidade Tecnológica Federal do Paraná

CERAMIC AND GLASS MATERIALS

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

Sponsored by: ACerS Glass & Optical Materials Division

Program Organizers: Charmayne Lonergan, Pacific Northwest National Laboratory; Ashutosh Goel, Rutgers, The State University of New Jersey

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Assessing the Chemical Durability of Soda-lime-silica Glass with Beverages: *Vedant Badoni*[1]; Qinahui Qin[2]; Ashutosh Goel[2]; [1]Edison Academy Magnet School; [2]Rutgers, The State University of New Jersey

Novel Fibers for Quantum Computing: *Kristin Chapman*[1]; Thomas Hawkins[1]; Kasra Sardashti[1]; John Ballato[1]; [1]Clemson University

Redistribution of Na⁺ Ions in Mixed Alkali-lime Glasses: *Jacob Kaspryk*[1]; William LaCourse[1]; [1]Alfred University

Structural Effects of Alkali/Alkali Earth Cations on the Nickel-doped BK7 Type Borosilicate Glasses: *Amir Ashjari*[1]; Lucas Greiner[1]; Doris Möncke[1]; [1]Alfred University

Structure and Properties of Lead Borate and Lead Alumino-borate Glasses: *Elizabeth Tsekrekas*[1]; Nagia Tagiara[2]; Randall Youngman[3]; Efstratios Kamitsos[2]; Alexis Clare[1]; [1]Alfred University; [2]National Hellenic Research Foundation; [3]Corning Incorporated

FUNDAMENTALS AND CHARACTERIZATION

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

Sponsored by: ACerS Basic Science Division

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

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Session Chair: John Blendell, Purdue University

Understanding the Influence of Interfaces on the Texture Development in Mg-(Ca, Zn) Alloys during Recrystallization: *Rogine Gomez*[1]; Aeriel Leonard[1]; [1]The Ohio State University

FUNDAMENTALS AND CHARACTERIZATION

High Entropy Materials: Concentrated Solid Solutions, Intermetallics, Ceramics, Functional Materials and Beyond IV — Poster Session

Sponsored by: TMS Alloy Phases Committee

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

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Additive Manufacturing feasibility of MoNbTi Refractory Complex Concentrated Alloys: *Abdulquadri Oriola*[1]; Ravi Kumar[1]; Ugochukwu Ochieze[1]; Sravya Josyula[1]; Balbus Glenn[1]; Ashley Paz y Puente[1]; Eric Payton[1]; [1]University of Cincinnati

Effect of Composition and Temperature on the Formation of Intermetallic Coatings Based on Nickel and Aluminum on Iron and Titanium Surfaces during Laser Surface Treatment: *Alexander Slobodov*[1]; Dmitriy Gerashenkov[1]; Andrey Evdokimov[1]; Alexander Melentiev[1]; [1]St. Petersburg Institute of Technology; ITMO University

Effect of Heat Treatment on Microstructures and Mechanical Characteristics of Quaternary High Entropy Alloys: *Orifjon Mikhliev*[1]; Sarvar Rozikhodjaev[1]; Khasanjon Shanazarov[1]; Elyorjon Jumaev[1]; [1]FDI «Uzliti Engineering» LLC

Effects of Laser Shock Peening Surface Modification on Oxidation Behavior of NbTi-X
Refractory Complex Concentrated Alloys: *Ugochukwu Ochieze*[1]; Abdulquadri Oriola[1]; Ravi Kumar[1]; Sravya Josyula[1]; Matthew Steiner[1]; Eric Payton[1]; [1]University of Cincinnati

Formation of Intermetallic Alloys of the Ti-Al System with Low-melting Eutectic and Ti-Al under Conditions of Synthesis of Complex Functionally Active Charges: *Borys Sereda*[1]; Yuriy Belokon[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

Lightweight Refractory High Entropy Alloys with Excellent Specific Strength and Enhanced Ductility By In-situ Heterogeneous Structure: *Lianxi Hu*[1]; Yu Sun[1]; Yuan Yuan[1]; Fei Gao[1]; [1]Harbin Institute of Technology

Microstructure and Strengthening Mechanisms of Novel Lightweight TiAlV0.5CrMo Refractory High-entropy Alloy Fabricated by Mechanical Alloying and Spark Plasma Sintering: *Yu Sun*[1]; Fei Gao[1]; [1]Harbin Institute of Technology

Stretch Formability and Cryogenic Environmental Applicability of Fex(CoNi)90-xCr10 Ferrous Medium-entropy Alloys: *Yeon Taek Choi*[1]; Rae Eon Kim[1]; Jihye Kwon[1]; Do Won Lee[1]; Jae Wung Bae[2]; Hyoung Seop Kim[1]; [1]Pohang University of Science and Technology; [2]Pukyong National University

The Effect of W Concentration on the Thermodynamic Properties of MoNbTaW: *Sarah O'Brien*[1]; Matthew Beck[1]; [1]University of Kentucky

The Research Thermochemical Pressing Modes of Dual-phase Special Alloys for Obtaining Rational Intermetallic Structure: Borys Sereda[1]; Yuriy Belokon[1]; Irina Kruhliak[1]; *Dmytro Sereda*[1]; [1]DSTU

Thermal, Electrical, and Magnetic Properties of Multi-Principal Element Alloys: *Ravi Kumar*[1]; Ugochukwu Ochieze[1]; Bal Adhikari[1]; Abdulquadri Oriola[1]; Sravya Josyula[1]; Sarah Watzman[1]; Eric Payton[1]; [1]University of Cincinnati, Ohio

FUNDAMENTALS AND CHARACTERIZATION

Interface-mediated Phenomena in Structural Materials — Poster Session

Sponsored by: TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, University of Nebraska-Lincoln; Nigel Shepherd, University of North Texas; Andres Bujanda, U.S. Army Research Laboratory; Lin Shao, Texas A&M University

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Session Chair: Jian Wang, University of Nebraska - Lincoln

Synergistic Hardening and Damage Evolution on the Stretchability of Al1050/steel/Al1050 Sheets: *Rae Eon Kim*[1]; Yeon Taek Choi[1]; Hyoung Seop Kim[1]; [1]Postech

SPECIAL TOPICS

Late News Poster Session — Additive Manufacturing

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Exploring Rapid Prototyping for Studio Ceramics Based on Indirect 3D Printing Technique: *Oluwafemi Adelabu*[1]; Adekoya Adebowale[1]; [1]The Federal University of Technology

Microstructure and Mechanical Properties of STS316L and P21 Tool Steel Laser Laminated Functionally Graded Materials: *Dae-Geun Nam*[1]; Myeongji Jo[2]; Hyo-Seong Kim[3]; Gwangjoo Jang[1]; Taibong Son[4]; Myungsub Roh[5]; Byoungkoo Kim[1]; [1]Korea Institute of Industrial Technology; [2]Vitzro Nextech Co.; [3]Korea Shipbuilding & Offshore Engineering Co.; [4]Korea Nuclear Industry Research Association; [5]Daekyung Engineering Co.

Thermally Dynamic Ripening Induced Multi-modal Precipitation Strengthened NiTi Shape Memory Alloys by LENS: *Jiaqi Lu*[1]; [1]Wuhan University of Technology

SPECIAL TOPICS

Late News Poster Session — Ceramic and Glass Materials

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

A Study of Rare Earth Doped Multicomponent Luminescent Glasses: Optoelectronic Materials: *Satish Kumar*[1]; [1]Deenbandhu Chhotu Ram University of Science. & Technology Murthal

Behaviour of Ferroelastic and Ferroelectric Domains in AgNbO3 under Temperature and Stress Influence: *Xi Shi*[1]; Neamul Khansur[1]; [1]University of Erlangen Nuremberg

Influence of Alumina Additive on Densification and Mechanical Properties of B4C-SiC Composites: *Sonali Jamale*[1]; B. V. Manoj Kumar[1]; [1]IIT Roorkee

Structural Rearrangements During Relaxation of Lithium Disilicate Glass: *Ricardo Felipe Lancelotti*[1]; Sabyasachi Sen[2]; Edgar Zanotto[1]; [1]Federal University of Sao Carlos; [2]University of California at Davis

The Colossal Magneto Resistance and Properties of Ceramic Material Nb3Al and La2/3 Ca1/3 MnO3: *Priyanka Rakeshkumar Ghai*[1]; [1]TEMENOS

SPECIAL TOPICS

Late News Poster Session — Fundamentals and Characterization

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Calculation of Stress Intensity Factors for a Multiple Crack-hole Interaction Problem: *Asif Khawaja*[1]; Wieslaw Binienda[1]; [1]The University of Akron, Ohio

Deformation and Fracture Response of Single-crystal MAX Phases: *Milos Dujovic*[1]; Miladin Radovic[1]; Ankit Srivastava[1]; Thierry Ouisse[2]; [1]Texas A&M University; [2]Université Grenoble Alpes,

Existence of Single Crystal Structure in Congruent Melting Intermetallic Compound – Ni5Ge3: *Nafis Ul Haque*[1]; Oluwatoyin E. Jegede[2]; Andrew Mullis[2]; [1]NED University of Engineering & Technology; [2]University of Leeds

Optical Bandgap Modification in Unidirectionally Grown Pure and Doped Potassium Dihydrogen Phosphate: Vijeesh P[1]; *Muneer E M*[1]; Shifa K[1]; Vineeth R[1]; Arjun V[1]; [1]The Cochin College

Studies on Al-Cu-Fe Stable Quasicrystal and Its Nanocomposites: *Nilay Mukhopadhyay*[1]; Yagnesh Shadangi[1]; [1]Indian Institute of Technology (BHU) Varanasi

SPECIAL TOPICS

Late News Poster Session — Iron and Steel (Ferrous Alloys)

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Characteristic Deformation Behavior of Heterogeneous-Nano structured SUS316LN Autenitic Stainless Steel at a Cryogenic Temperature: *Chihiro Watanabe*[1]; Norimitsu Koga[1]; Masakazu Kobayashi[2]; Hiromi Miura[2]; [1]Kanazawa Univeristy; [2]Toyohashi University of Technology

SPECIAL TOPICS

Late News Poster Session — Materials-Environment Interactions

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Assessing Wear Rate Based on Cutting Power Measurement: *Usma Riaz*[1]; [1]Korea Institute of Energy Research

SPECIAL TOPICS

Late News Poster Session — Modeling

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Microstructure Based Modeling Approach for the Fatigue Life Prediction of Hypo-eutectoid Steels: *Jonghoon Shin*[1]; Yoon Suk Choi[1]; Hyunki Kim[2]; Minwoo Kang[2]; Seunghyun Hong[2]; [1]Pusan National University; [2]Metallic Material Research Lab, Hyundai Motor Group

Numerical Analysis on the Local Deformation Behavior of the Fir Tree of Ni-based Superalloy Turbine Blade: *Tae Yang Bang*[1]; Yoon Suk Choi[1]; Seen Chan Kim[2]; Seong Hun Park[1]; Han Jong Kim[1]; Tae Jun Yun[3]; Jun Young Jeon[4]; [1]Pusan National University; [2]SK Energy; [3]Doosan Enerbility; [4]Korea Institute of Materials Science

SPECIAL TOPICS

Late News Poster Session — Nanomaterials

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Development of an Antibacterial Nanocomposite Film from Cocoa Residues: *Lesly Tejeda-Benitez*[1]; Maria Garcia-Espiñeira[1]; Barbara Arroyo-Salgado[1]; [1]University of Cartagena

Investigating Na+ ion Storage Behavior of WS2NT Encapsulated SiOC Fibers: *Sonjoy Dey*[1]; Gurpreet Singh[1]; [1]Kansas State University

Manufacturing and Characterization of Ferromagnetic Nano-clusters in Si by One-step Diffusion for Microfluidic Based CTC Separation System: *Levent Trabzon*[1]; Mavlonov Giyosiddin[2]; Sobirjon Isamov[2]; Shaxboz Ibadillayev[2]; [1]Istanbul Teknik Üniversitesi; [2]Taskhent Tashkent State Technical University

Photon Up-conversion in Pure and Doped Carbon Quantum Dots Synthesized from Gelatine: *Vijeesh P*[1]; Muhammed P S[1]; Flagon Xavier[1]; [1]The Cochin College

Regulating Na+ and K+ Ion Storage into TMD Alloys: Effect of Upper Voltage Cut-off Technique: *Sonjoy Dey*[1]; Arijit Roy[1]; Gurpreet Singh[1]; [1]Kansas State University

SPECIAL TOPICS

Late News Poster Session — Nuclear Energy

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Proton Irradiation Damage and Corrosion Behaviour of Al and/or Zr Added Fe-Ni Based ODS Alloy: *Arpan Arora*[1]; Suhrit Mula[1]; [1]IIT Roorkee

SPECIAL TOPICS

Late News Poster Session — Processing and Manufacturing

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Challenges in Friction Stir Welding of the Dissimilar Thickness T-lap Joint: *Tran Tra*[1]; Masakazu Okazaki[2]; Duong Hao[1]; [1]Nha Trang University; [2]Niigata Institute of Technology

Powder Metallurgy of Electrical Contacts: *Mahesh Darji*[1]; [1]Squared-Schneider Electric North America

SPECIAL TOPICS

Late News Poster Session — Sustainability, Energy, and the Environment

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

A High-Performance Li-Ion Battery Based on Polymer-Derived Silicon-Oxycarbide/Graphene Nanoplatelets Composites: *Dillip Panda*[1]; Gangadhar Jella[2]; Nawraj Sapkota[1]; Michelle Greenough[1]; Apparao Rao[1]; Ravindran Sujith[2]; Rajendra Bordia[1]; [1]Clemson University; [2]BITS Hyderabad, India

Permeation of Carbon Dioxide in Tungsten-doped Lanthanum Molybdenum Oxide/Lithium-Sodium-Potassium Carbonates Dual Composite Ceramic Membranes: Midilane Medina[1]; Sabrina Carvalho[1]; Francisco Tabuti[1]; Eliana Muccillo[1]; Fabio Fonseca[1]; *Reginaldo Muccillo*[1]; [1]IPEN-USP

LIGHTWEIGHT ALLOYS

Light Metal Technology — Poster Session

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Numerical Simulation of Effect of Process Parameters on Solidification Structure in Titanium Alloy TC4 Vacuum Arc Remelting Process: *Zhenquan Jing*[1]; Yanhui Sun[1]; Rui Liu[1]; [1]University of Science and Technology Beijing

ARTIFICIAL INTELLIGENCE

Materials Processing and Fundamental Understanding Based on Machine Learning and Data Informatics — Poster Session

Sponsored by: ACerS Engineering Ceramics Division

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

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Session Chair: Kathy Lu, Virginia Tech

Multi-objective Optimization for Improving Mechanical Properties of Aluminum Alloys: A Data Analytics Approach with Machine Learning and Genetic Algorithms: *Su-Jeong Kim*[1]; Yoon-Suk Choi[1]; Su-Hyeon Kim[2]; [1]Pusan National University; [2]Korea Institute of Materials Science

Simple Data Analytics Approach Coupled with Physics-based Model for Improved Prediction of Creep Rupture Life: *TaeJoo Lee*[1]; Yoon Suk Choi[1]; Chang Ho Lee[1]; [1]Pusan National University

CERAMIC AND GLASS MATERIALS

Mesoscale Phenomena in Functional Polycrystals and Their Nanostructures — Poster Session

Sponsored by: ACerS Electronics Division

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

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Alchemy of Graphite: The Many Faces of Coal: *Chinonso Ugwumadu*[1]; David Drabold[1]; [1]Ohio University

High-throughput Approach for Predicting Optical Properties of Crystals: *Fatin Ishtiyaq*[1]; Sanjeev K. Nayak[1]; Serge Nakhmanson[1]; [1]University of Connecticut

Numerical Analysis of the Influence of the Second-phase Particle Morphology on the Alloy Microstructure Evolution: *M Nabil Bhuiyan*[1]; Serge Nakhmanson[1]; Lesley Frame[1]; [1]University of Connecticut

MODELING

Multi Scale Modeling of Microstructure Deformation in Material Processing — Poster Session

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

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

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Exhibit Hall A | Greater Columbus Convention Center

Session Chairs: Krzysztof Muszka, AGH University; Lukasz Madej, AGH University

Data Transfer Methods in the Coupled Random Cellular Automata Finite Element Model of Dynamic Recrystallisation: Mateusz Sitko[1]; Kacper Pawlikowski[1]; *Lukasz Madej*[1]; [1]AGH University of Science and Technology

Finite Volume Based Multi-contact Modeling to Study Detailed Mechanical Response of an Elastic Material: *Ranjan Dhakal*[1]; Philip Cardiff[1]; [1]Graz University of Technology

Modeling the Effect of Recovery Treatment on the Mechanical Response of Nano Structure Material: *Khaled Adam*[1]; [1]Georgia Southern University

Assessment of the Elastic Properties of FeMnNiCoMo System Based on the Nanoindentation Measurements and Molecular Dynamic Simulations: *Krzysztof Muszka*[1]; Kamil Cichocki[1]; Jakub Kawako[1]; Piotr Baa[1]; [1]AGH University of Science and Technology

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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Exhibit Hall A | Greater Columbus Convention Center

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

Characterization of Aging Behavior and Chemistry of Silver Nanoparticle Ink for Aerosol Printing: *Sylvie Crowell*[1]; Caroline Kromalic[1]; Mitchell Melander[1]; Janet Gbur[1]; [1]Case Western Reserve University

Optimization of Extraction Methods for Maximum Recovery of Quercetin and Total Flavonoids from Red Onion Peel Wastes: *Zeinab Velisdeh*[1]; David Mills[1]; [1]Louisiana Tech University

Thermal Transport in Electrically Tunable Thermal Switches Based on Multilayer Graphene and CNT: *Saqeeb Adnan*[1]; Pietro Steiner[2]; Coskun Kocabas[2]; Marat Khafizov[1]; [1]The Ohio State University; [2]The University of Manchester

BIOMATERIALS

Next Generation Biomaterials — Poster Session

Sponsored by: ACerS Bioceramics Division

Program Organizers: Roger Narayan, University of North Carolina; Tanveer Tabish, University of Oxford; Shawn Allan, Lithoz America LLC

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Antimicrobial Coatings Composed of Chitosan, Poly Vinyl Alcohol, and Zinc-coated Halloysite Nanotubes (HNTs): Sindhu Datla[1]; *David Mills*[1]; [1]Louisiana Tech University

Electrospun Bilayer Vascular Grafts with Excellent Mechanical Strength and Anticoagulation Property: Jizhuo Chen[1]; *Min Wang*[1]; [1]University of Hong Kong

PROCESSING AND MANUFACTURING

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

Sponsored by: ACerS Basic Science Division, ACerS Manufacturing Division

Program Organizers: Morsi Mahmoud, King Fahd University of Petroleum & Minerals; Dinesh Agrawal, Pennsylvania State University; Guido Link, Karlsruhe Institute of Technology; Motoyasu Sato, Chubu University; Rishi Raj, University of Colorado; Christina Wildfire, National Energy Technology Laboratory; Zhiwei Peng, Central South University

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Improving Reliability of Ultrasonic Fatigue Testing through Comparative Analysis of Conventional and Ultrasonic Fatigue Tests on SS400 Material: *Sungsu Jung*[1]; Youngcheol Lee[1]; [1]Korea Institute of Industrial Technology

Research on Green Laser Welding Process and Monitoring Technologies for Manufacturing Parts of Electric Vehicles: *Heeshin Kang*[1]; Hyunjong Yoo[1]; Jiwhan Noh[1]; Jiyeon Choi[1]; Soojin Choi[1]; Junsu Park[1]; Myungjin Kim[1]; Jongsik Kim[1]; Eunjoon Chun[1]; [1]Korea Institute of Machinery and Materials

BIOMATERIALS

Society for Biomaterials: Biological Response to Materials and Material's Response to Biological Environments — Poster Session

Sponsored by: Society for Biomaterials

Program Organizers: Christopher Siedlecki, Penn State College of Medicine; Nicholas Ziats, Case Western Reserve University; Noelle Comolli, Villanova University; Anirban Sen Gupta, Case Western Reserve University

Tuesday PM | October 3, 2023
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Dual Function of Plasma Nanocoatings in Cardiovascular Stent Applications: *Thi Thu Ha Phan*[1]; Thao Thi Phuong Phan[2]; [1]Thai Nguyen University of Technology - Vietnam; [2]University of Missouri - Columbia

Investigation of Strontium-Copper-Dopped Sol-gel Bioglass for Soft-tissue Repair: *Danielle Perry*[1]; [1]Alfred University

Synthesis and Characterization of Mesoporous -Tricalcium Phosphate Powders Using Spray Drying for Orthopedic Applications: *Andualem Belachew Workie*[1]; [1]National Taiwan University of Science and Technology

BIOMATERIALS

Society for Biomaterials: Biomaterial Applications — Poster Session

Sponsored by: Society for Biomaterials

Program Organizers: David Kohn, University of Michigan; Guigen Zhang, University of Kentucky; Claudia Loebel, University of Michigan; William Wagner, McGowan Institute for Regen Med

Tuesday PM | October 3, 2023
Exhibit Hall A | Greater Columbus Convention Center

Session Chair: To Be Announced

A Study on the Stress Analysis of the Vertebral Body According to the Posture of Patients Undergoing Lumbar Bone Implant Surgery: *Sungwook Kang*[1]; Jong-Moon Hwang[2]; [1]Korea Institute of Industrial Technology (KITECH); [2]Kyungpook National University Hospital

Bioelectricity and Biomarker Acid Dual Targeting Fe3O4@Cu2-xS Nanoparticles for Photothermal Cancer Cell Killing: Zicheng Deng[1]; *Yuxin Wang*[1]; Donglu Shi[1]; [1]University of Cincinnati

Blow Spinning of Polyvinyl Alcohol (PVA) and Polyvinylpyrrolidone (PVP) Scaffolds Embedded with Zinc Halloysite Nanotubules (HNTs): *Anthony Monistere*[1]; David Mills[1]; [1]Louisiana Tech University

Lens Epithelial Cell Response to Polymer Surface Chemistry, Mechanical Properties and Micropatterns: *Hamid Hamedi*[1]; Katelyn Swindle-Reilly[1]; Raima Puri[1]; Heather Chandler[1]; Derek Hansford[1]; Hanna Cho[1]; Michael Lee[1]; [1]Ohio State University

Raman and SEM-EDAX Analysis of Lithium and Gallium Doped Silicate and Borosilicate Sol Gel Bio Glasses for Anti Inflammatory Response: *Andrew Barnikel*[1]; [1]Alfred University

BIOMATERIALS

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

Sponsored by: Society for Biomaterials

Program Organizers: Katelyn Swindle-Reilly, The Ohio State University; Stephanie Steichen, DuPont; J. Zach Hilt, University of Kentucky

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Exhibit Hall A | Greater Columbus Convention Center

Session Chairs: Katelyn Swindle-Reilly, The Ohio State University; Stephanie Steichen, DuPont; J. Zach Hilt, University of Kentucky

NOMAD: Novel Biomaterials to Prevent Dental Peri-implant Infections: *Annabel Braem*[1]; Merve Kübra Aktan[1]; Jef Vleugels[1]; Bart Van Meerbeek[2]; Wim Teughels[2]; Isabelle François[3]; Laurent Gremillard[4]; Yann Chevolot[5]; Emmanuelle Laurenceau[5]; Mariano Sanz[6]; Ariana Barlic[7]; Nestor Rodriguez[8]; Henny van der Mei[9]; Nicolas Courtois[10]; John Hanrahan[11]; Melissa Courtney[11]; Shane Keaveney[12]; Manuela Sonja Killian[13]; Karin Thevissen[14]; [1]KU Leuven Department of Materials Engineering; [2]KU Leuven Department of Oral Health Sciences; [3]Health House; [4]Centre National de la Recherche Scientifique Lyon; [5]Ecole Centrale de Lyon; [6]Universidad Complutense de Madrid; [7]Educell; [8]Atrineo; [9]University Medical Center Groningen; [10]Anthogyr; [11]Glantreo; [12]Croom Precision Tooling; [13]Universität Siegen; [14]KU Leuven Centre of Microbial and Plant Genetics

BIOMATERIALS

Society for Biomaterials: Student Poster Contest + Rapid Fire — Poster Session

Sponsored by: Society for Biomaterials

Program Organizers: Roger Narayan, University of North Carolina; Katelyn Swindle-Reilly, The Ohio State University; David Kohn, University of Michigan; Christopher Siedlecki, Penn State College of Medicine

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Biodegradable Zn-Li-Cu Alloy with High Mechanical Properties and New Ternary Phases: *Meng Cao*[1]; Zhe Xue[1]; Zhangzhi Shi[1]; Luning Wang[1]; [1]University of Science and Technology Beijing

Carvacrol and Curcumin: Potential Therapeutic Agents for Bone Defects Treatment: *Aditi Dahiya*[1]; Susmita Bose[1]; [1]Washington State University

Effect of Patient-specific Blood Biomarkers on Nanoparticle-cell Interactions: *Veronica Contreras*[1]; Wilson Poon[1]; [1]University of Texas at El Paso

Improvement and Validation of Computational Model of Biliary Stent Behavior: *Ainsley Westbrook*[1]; Morgan Verheyen[1]; Aeryn Cronin[1]; Joanna Thomas[1]; [1]Mercer University

Loading and Elution Efficiency of T2DA Loaded on Electrospun Chitosan Decanoic and Hexanoic Modified Membranes via Soaking Method: *Tibirni Yusuf*[1]; [1]University of Memphis

Mixed Brownian Alignment and Néel Rotations in Superparamagnetic Iron Oxide Nanoparticle Suspensions Driven by an AC Field: *Saqlain Shah*[1]; [1]Forman Christian College (University) Lahore

Natural Medicinal Compounds Enhance Osteogenic and Antibacterial Properties of Calcium Phosphate-coatedTitanium: *Priya Kushram*[1]; Susmita Bose[1]; [1]Washington State University

CERAMIC AND GLASS MATERIALS

Solid-state Optical Materials and Luminescence Properties — Poster Session

Sponsored by: ACerS Basic Science Division

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Rong-Jun Xie, Xiamen University; Mathieu Allix, Laboratoire CEMHTI; Kiyoshi Shimamura, National Institute for Materials Science; Liangbi Su, Shanghai Institute of Ceramics; Dariusz Hreniak, Polish Academy of Sciences

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Exhibit Hall A | Greater Columbus Convention Center

Fabrication and Optical Property Characterization of Silver Thin Film Using Magnetron Sputtering Method: *Mahdi Ghanati*[1]; Hassan Fatahbeygi[1]; Jing Zhang[1]; [1]Indiana University – Purdue University Indianapolis

IRON AND STEEL (FERROUS ALLOYS)

Steels for Sustainable Development II — Poster Session

Sponsored by: TMS: Steels Committee

Program Organizers: Jonah Klemm-Toole, Colorado School of Mines; Kester Clarke, Colorado School of Mines; Ian Zuazo, ArcelorMittal Global R&D - Industeel; Matthias Militzer, University of British Columbia; Ana Luiza Araujo, CBMM North America Inc.; Mahesh Somani, University of Oulu; Ilchat Sabirov, Imdea Materials Institute

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Exhibit Hall A | Greater Columbus Convention Center

Effect of Cooling Rate and Tempering Temperature on Hydrogen Embrittlement of Tempered Martensitic Steel for High-pressure Hydrogen Storage: *Sang-Gyu Kim*[1]; Hee-Chang Shin[1]; Byoungchul Hwang[1]; [1]Seoul National University of Science and Technology

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

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Session Chair: Xiaofeng Guo, Washington State University

Role of Anion in Extraction of Lithium from the [Li-Al] Layered Double Hydroxides: A Thermodynamic Insight: *Jayanthi Kumar*[1]; Parans Paranthaman[1]; Alexandra Navrotsky[2]; [1]Oak Ridge National Laboratory; [2]Arizona State University

Determination of the Activation Energy of the Formation of Intermetallic Compounds in the Ni-Al and Ti-Al System during Thermochemical Pressing: *Borys Sereda*[1]; Yuriy Belokon[1]; Irina Kruhliak[1]; Dmytro Sereda[1]; [1]DSTU

Effect of Temperature on the Solubility of Corrosion Products of Structural Materials in the Form of Spinels (Fe–Cr–Ni Systems): *Alexander Slobodov*[1]; Ann Ivanova[2]; Vladimir Kritsky[3]; Anton Gavrilov[3]; Yulia Vorozhtsova[2]; Dmitry Kremnev[1]; [1]St. Petersburg State Institute of Technology; [2]ITMO University; [3]JSC "Atomenergoproekt"

High-temperature Study of Calcium Oxide Evaporation: *Sergey Shornikov*[1]; [1]Vernadsky Institute of Geochemistry of RAS

Influence of pH of the Coolant, Concentration of Corrosion Products on the Rate of Formation of Deposits in the Internal Circuit Equipment of Power Units: *Ann Ivanova*[1]; Alexander Slobodov[2]; Vladimir Kritsky[3]; Anton Gavrilov[3]; Sergey Shornikov[3]; [1]ITMO University; [2]St. Petersburg State Institute of Technology; [3]Vernadsky Institute of Geochemistry and Analytical Chemistry of Russian Academ of Sciences

Mass Spectrometric Study of Wollastonite Evaporation Processes: *Sergey Shornikov*[1]; [1]Vernadsky Institute of Geochemistry of RAS

Thermodynamic Properties of Special Alloys of the Ti-Al System Formed during Synthesis: *Borys Sereda*[1]; Yuriy Belokon[1]; Irina Kryhliak[1]; Dmytro Sereda[1]; [1]DSTU

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